12

STEP-BY-STEP SYSTEMS
NO. 355A
MISCELLANEOUS ALARM CIRCUIT
ALARM CONTROL AND AISLE PILOTS
PERMANENT SIGNAL TIMING CIRCUIT

CHANGES

B. Changes in Apparatus

B.1 Added
A Capacitor 441D - Option ZN - Fig. 1
H Capacitor 441D - Option ZP - Fig. 19

D. Description of Changes

D.1 Precise tone lead designations are added to figures 1 and 19.

D.2 Figure 1 has been revised to show the designation of Option ZM and the addition of ZN.

D.3 Figure 19 has been revised to show the designation of Option ZO and the addition of ZP.

D.4 Note 111 is added and notes 102 and 105 are revised to explain the use of options ZM, ZN, ZO and ZP.

D.5 Note 302 is added to standardize the color of lamp caps for different alarms.

D.6 Information is added to Table B for connecting this circuit to L-Type Multiplex. Information is added to Table A for connecting this circuit to the Multi-Contact and Alarm Circuit.

F. Changes in CD Sections

F.1 In Section II - 2.03 - Change (a) to read:
"(a) Connects paths busy tone to the alarm checking terminal provided that relay MJ does not operate."

F.2 In Section II - 2.06 - Change (b) to read:
"(b) Connects line busy tone to the alarm checking terminal."

F.3 In Section II - 4.03 - Change under "Trouble Conditions are..." as follows:
"Minor - SxS Line busy tone"
and
"Major - SxS Line Concentrator Paths busy tone"

F.4 In Section III - 4.01 Change (CM) to read:
"(CM) L-Type Multiplex SD-50895-01".
Add: (CO) Multi-Contact and Alarm Circuit - SD-35005-01.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5225-LCB
WECO DEPT 5152-RTO-WEA

STEP-BY-STEP SYSTEMS
NO. 355A
MISCELLANEOUS ALARM CIRCUIT
PERMANENT SIGNAL TIMING CIRCUIT

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SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 This circuit provides audible and visual alarm signals when trouble occurs in the No. 355A office circuits, or in a toll office in the same building. The audible and visual alarms do not function while the office is unattended. It also provides for transferring alarms to a switchboard in the same building or to a distant office over a separate cable pair, or by connection to an alarm sender which transmits the alarms over the operator office trunks. The circuit also provides timing intervals for delaying alarms, and for timing permanent signal lockout for first selectors and selector repeaters.

SECTION II - DETAILED DESCRIPTION

1. GENERAL

1.01 When a circuit trouble occurs, relays function to connect a tone, indicative of the type of trouble, to the alarm checking terminal, and when the office is attended (relay PL operated) to sound an audible alarm, and to light a lamp indicating the location of the trouble, except for permanent signals. When the office is unattended, the alarm indication is transmitted to a switchboard or an attended maintenance center. Provision is made for aisle pilot lamps at the end of each aisle, where the size of the office justifies the provision of such lamps.

1.02 The audible and visual signals function only when the office is attended, and transmission of alarms is cut off concurrently. On entering the office, the maintenance man presses a nonlocking key which causes the transmission of alarms to be cut off, the Coin Trunk Timed Release Circuit to be made ineffective, and the audible and visual alarms to function when trouble occurs. A guard lamp is also lit and a timing circuit is started. After a definite time interval (20 to 30 minutes, or more if the timing circuit was previously started) the visual alarms are cut off, the Coin Trunk Timed Release Circuit is made effective, and the transmission of alarms is restored. However, the audible alarm will function if a trouble occurs, and the maintenance man by again depressing the key will restore the visual signals and cut off the alarm transmission. Provision is made for canceling this feature where an office is attended during regular hours.

1.03 The relays used in transmitting major alarms are supplied with ABS battery through a relay which will substitute signal battery in case of failure of ABS battery. This is to insure transmission to an attended office or maintenance center when either the main discharge fuse or the ABS battery fuse fails.

2. AUDIBLE ALARM

MAJOR ALARM, STEP-BY-STEP CIRCUITS NO DELAY

2.01 A trouble condition requiring a major alarm with no delay connects battery through a resistance to relay DF, Fig. 12, or direct ground to relay PG, Fig. 14. Either of these will connect ground to lead 2, as will certain other circuits (see Table A). Relays DF and PG also light aisle pilot lamps, if provided. Ground on lead 2 operates relay MJ which:

(a) Removes tone from the alarm checking terminal.

(b) Grounds a lead to sound an audible alarm which will operate if relay PL is operated.

(c) Grounds one lead and opens another used in transmitting alarms as described in section 6.

MAJOR ALARM - STEP-BY-STEP INTERTOLL ARRANGED FOR CAMA - NO DELAY

2.02 A trouble condition requiring a major alarm connects ground to lead 9 in Fig. 1 (see Table A), operating relay CMJ which:

(a) Connects steady HT1 tone to the alarm checking terminal.

(b) Grounds lead 2 for transmitting alarms as described in section 6.

(c) Grounds a lead to the audible alarm, which will sound if relay PL is operated.

A. Major Alarm - Step-by-Step Line Concentrator Control Circuit - No Delay

2.03 A trouble condition requiring a major alarm connects ground to lead 19 in Fig. 19 (see Table A), operating relay LC which:

(a) Connects a steady-tone LT1-120 ipm to the alarm checking terminal provided that relay MJ does not operate.

(b) Grounds lead 2 and opens lead 3 in transmitting alarms described in 6.

(c) Grounds a lead to the audible alarm, which will sound if relay PL is operated.

B. Major Alarm - Step-by-Step Common Control and Noncommon Control TOUCH-TONE Calling

2.04 A trouble condition requiring a major alarm connects ground to lead 9 in Fig. 1 or lead 20 in Fig. 20 (see Table A), operating relay CMJ or CTMJ, respectively, which:

(a) Connects steady-tone HT1 to the alarm checking terminal, provided that relay MJ in Fig. 1 or relay LC in Fig. 19 does not operate.

(b) Grounds lead 2 and opens lead 3 in transmitting alarms as described in 6.

(c) Grounds a lead to sound an audible alarm that will operate if relay PL is operated.

MAJOR ALARM WITH DELAY

2.05 When a major alarm with delay is required, ground through a lamp, (shunted by a resistor) operates CB, Fig. 16, and in turn J. If T1 and T3 are released at this time, J operates L and T1 (T1 is slow to operate) L operated, locks to J. T1 operated, operates T2, which takes 2 to 4 minutes for its operation. T2 operates T3, which in turn operates K and releases T1, and in turn, T2 and T3. (T1, T2, and T3 also serve other functions, and may be operating when J operates. In this case, L will not operate until T1 and T3 are both released.) When T3 operates, K operates through the front contact of the operated L relay, and will lock to L and:

(a) Operate MJ which functions as described in 2.01 to 2.05.

(b) Opens the ground to T1.

(c) Furnishes ground to CB to light the aisle pilot lamp when provided.

(d) Furnishes battery to Fig. 16, which when aisle pilots are not provided, short circuits the high resistance winding of CB to light the lamp of the circuit originating the alarm. Thus , the audible and visual signals are delayed until K operates.

MINOR ALARM, STEP-BY-STEP CIRCUITS, NO DELAY

2.06 A minor alarm without delay will connect negative battery through a resistance to relay FA-Fig. 13, or positive battery through a resistance to relay FAP-Fig. 13A, or direct ground to relay HLV-Fig. 15. Any of these will light an aisle pilot lamp, if provided, and connect ground to lead 5, as well as certain other circuits (see table A). This operates MN which:

(a) Grounds a lead for sounding an audible alarm.

(b) Connects busy tone to the alarm checking terminal.

(c) Grounds a lead used for transmitting alarms - (see 6).

A. Minor Alarm - Step-by-Step Intertoll Arranged for CAMA - No Delay

2.07 A trouble condition requiring a minor alarm connects a ground to lead 10 in Fig. 1 (see Table A), operating relay CMN which:

(a) Connects HT1 tone interrupted at 120 ipm to the alarm checking terminal.

(b) Grounds lead MN for transmitting alarms as described in section 6.

(c) Grounds a lead to the audible alarm, which will sound if relay PL is operated.

B. Minor Alarm - Step-by-Step Common Control and Noncommon Control TOUCH-TONE Calling - No Delay

2.08 A trouble condition requiring a major alarm connects a ground to lead 10 in Fig. 1 or lead 21 in Fig. 20 (see Table A), operating CMN or CTMN relay, respectively, which:

(a) Connects HT1 tone interrupted at 120 ipm to the alarm checking terminal.

(b) Grounds lead MN for transmitting alarms as described in 6.

(c) Grounds a lead to the audible alarm, which will sound if relay PL is operated.

MINOR ALARM WITH DELAY

2.09 Minor alarms requiring delay will connect ground through a lamp and resistance to relay RM, Fig. 17, which

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grounds lead 6 to Fig. 1, or the alarm will connect ground to lead 6 directly. This operates N which starts the operation of T1, T2, and T3 as described in 2.05. With T1 and T3 released, P operates then locks to N. When T3 next operates, MN operates, and functions as described in 2.06 and also:

(a) Opens the operating circuit for T1.

(b) Locks to N

(c) Grounds a lead to RM to light lamp AP if provided, and when aisle pilots are not furnished also connects battery to shunt the high resistance winding of RM, to light the lamp in the circuit originating the alarm. Thus the audible and visual signals are delayed until MN operates.

LOW CABLE INSULATION AND CUMULATIVE PERMANENT SIGNAL ALARMS

2.10 When more than a specified number of permanent signals occur or when low insulation on cables is detected, ground over lead MP operates MP which:

(a) Connects dial tone to the alarm checking circuit and ground over lead B from the associated circuit will sound the audible alarm.

(b) Grounds a lead to transmit an alarm as described in section 6.

2.11 Leads ST1 and PB2 are brought out to provide timing pulses to the cable insulation alarm and permanent signal alarm circuit, when it is required. A timed pulse occurring once every 20 to 30 minutes is used for connecting the test relay of that circuit to cable pairs. The timing cycle is started by a ground on the ST1 lead from the cable insulation alarm circuit causing relays T4, T5, and T6 to operate in turn as described in 2.15. At the end of the cycle T6 relay connects ground to lead PB2 which operates the timing circuit relay of the cable insulation circuit. It should be noted that when the cable insulation alarm is provided, relays T4, T5, and T6 are in continuous operation. When the alarm checking terminal is dialed, relay AC operating connects ground to lead SR to reset the sensitrol relay of the associated circuit.

INDIVIDUAL PERMANENT SIGNAL AND RINGING MACHINE START

2.12 Whenever a selector or selector repeater is seized or a connector permanent occurs, ground is connected through a resistance to the main lead 7, Fig. 1, or an auxiliary lead 7-, Fig. 21, operating a PS or PSE-relay. For a selector repeater permanent, ground is connected to lead 8, Fig. 1, operating M. which in turn operates M1. M1 operated:

(a) Locks under control of M2 and M3.

(b) Connects 1400-ohm ground to operate, or to hold PS, Fig. 1.

(c) Closes ground to the MS lead to start the ringing machine.

(d) Closes ground to lead JW to the line finder control circuit. (If there is an all finders busy condition while M1 remains operated, an alarm will be given by the line finder control circuit).

(e) Connects ground to start relays T1, T2, and T3 operating in that order, if not already functioning.

(f) Closes lead to M2, which after M1 releases will operate for 1/2 second every 3 seconds under control of lead RR. The functions of relays T1, T2, and T3 are described in paragraph 3.01.

2.13 When ground is removed from lead 8 at the end of a permanent signal condition, or on release of a first selector arranged for lockout, M releases. M releasing:

(a) Opens the operating circuit for M1, which however is locked operated.

(b) Provides a locking circuit through M1 for M3.

(c) Closes lead RR through M1 to M2.

2.14 On the first operation of M2, M3 operates partially to close spring 5-6 top and 3-4 bottom, and on release of M2 (which removes a short circuit around the P winding of M3) M3 operates fully and locks under control of M and

M1, or M2. On the next operation of M2, M1 is short circuited and releases, in turn releasing M2 and M3. Thus, release of M1 is delayed for 2-1/2 to 5-1/2 seconds after the release of M If M reoperates in this interval, as it will when there is a permanent signal on a line not arranged for lockout in a line finder group arranged for lockout in a line finder circuit to M2 is opened and M3 is released, thus preventing the release of M1. This is necessary to prevent release of PS on a permanent signal on a line of the type above mentioned. Such release would prevent marking the alarm checking terminal for a permanent signal alarm, as described in 2.15.

2.15 Any PS or PSE-operated operates C, when T6 and T4 are released. C locks to PS and operates T4, which in turn operates T5. T5 is slow to operate (20 to 30 minutes) and operates T6, T6 operates D which locks to PS, releases C, and connects code 1 generator to the alarm checking terminal. T6 also releases T4 and in turn T5, which releases T6. The release of C removes the ground which operated T4. Relays T4, T5, and T6 also operate in the same manner to perform other functions described in paragraphs 2.10, 2.11, and 11.1.

PICKUP ALARM

2.16 If a pickup lead becomes grounded, PU will operate over lead PUA while leads PU and PUA are connected through the pickup springs of the ringing machine. PU operate slow operate relay PU1. This relay will not operate on a momentary operation or PU, such as is caused when the continuity springs of a connector pick up relay bunch during release. PU1 operated short circuits the high resistance winding of PU to raise the potential of the grounded PUA and PU leads, and thus light the PU lamp of the shelf where the ground exists, and prevent premature operation of connector pickup relays on other shelves. PU1 also lights an alarm lamp and operates PU2 which:

(a) Locks to the grounded PKU lead during intervals while PU and PU1 are released.

(b) Connects ground to give a visual signal.

(c) Operates MN to originate a minor alarm as described in 2.06.

ALARM BATTERY SUPPLY ALARM

2.17 If the main ABS fails or if fuse B fails, relay AB will release. This:

(a) Lights alarm ABS

(b) Connects ground to lead PL to Fig. 7 to light lamp AP, if provided.

(c) Substitutes signal battery for ABS battery to the major alarm relays, timing relays T1 to T6 the alarm sender alarm bell, and other important relays.

(d) Operates relay MJ to give a major alarm as described in paragraph 2.01.

2.18 If the main positive battery supply ABSP fails or if fuse L fails, relay ABSP will release. This:

(a) Lights alarm lamp ABSP.

(b) Connects ground to lead PL to Fig. 7 to light lamp AP, if provided.

(c) Operates relay MJ to give a major alarm as described in paragraph 2.01.

(d) Removes positive battery from ASP lead to Alarm Sender.

3. PERMANENT SIGNAL LOCKOUT

3.01 When a permanent signal occurs in a line finder group arranged for lockout, lead 8 is grounded operating M and in turn M1. Relays M, M1, M2, and M3; and T1, T2, and T3 function as described in 2.12. T1 operates PA of Fig. 5 over lead A to remove ground from the PA leads to first selectors. (This ground provides for operation of the time-out relay of the selector.) When relay T3 operates 2 tc 4 minutes later, it holds relay PA operated over lead B and operates PB over lead C. This removes ground from the PB leads to first selectors. Removal of this ground causes release of the selector, and if the line is arranged for lockout, causes operation of the lockout relay. PB is released before PA to insure against premature release of selectors which would occur with ground on leads PA with leads PB open.

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4. ALARM CHECKING

ONE-ALARM CHECKING - FIG. A (MFR DISC.) AND OPTION N

4.01 When the alarm checking terminal is dialed:

(a) Tube B will trip the ringing without causing the connector to register a charge condition.

(b) If option N is provided ground via the TS1 lead will disable the automatic disconnect of calling party holds feature on the shelf of connectors serving the alarm checking terminal.

Relay AC operates:

(a) To start the ringing machine which will furnish the tones required for identifying the type of trouble.

(b) Connects ground to lead SR to restore the sensitrol relay of the cumulative permanent signal and low insulation resistance alarm circuit, if that relay has operated.

(c) To indicate to the alarm sender, when used, that the alarm checking terminal has been dialed.

ONE-ALARM CHECKING TERMINAL - FIG. B AND OPTION N

4.02 The same functions as described in 4.01 are performed. In addition to the function of the AC relay described in 4.01, relay S1 operates and:

(a) Grounds lead 8 to common control jack, key, and lamp circuit in order to retire alarms originated from common control circuit.

(b) Removes ground from lead AR to Line Concentrator Control Circuit in order to retire alarms originated from the Line Concentrator Control Circuit.

(c) Opens leads AL and AL1 to the miscellaneous alarm circuit for trouble ticketer frame in order to retire alarms originated from ANI circuits.

TWO-ALARM CHECKING TERMINALS - FIG. B, FIG. 20, AND OPTION N

4.03 When the first alarm checking terminal is dialed and a no-trouble condition tone is received, a second alarm checking terminal is then dialed. Sleeve relay S2 in Fig. 20 operates from the second alarm checking terminal and the same functions described in 6. are performed. In addition to the functions of the AC relay described in 4.01 relay S2 operated grounds lead 8 to common control jack, key, and lamp circuit in order to retire alarms originated from common control circuits.

TROUBLE CONDITIONS ARE INDICATED BY TONE AS FOLLOWS

Major - SXS	No tone
Major - SXS Intertoll - CAMA	HT1
Minor - SXS	Busy tone
Minor - SXS Intertoll - CAMA	HT1 - 120 ipm
More than specified number of permanent signals or low cable insulation	Dial Tone
Individual permanent signal	Code 1 Gen.
No trouble	Code 2 Gen.
Major - SXS Line Concentrator	LT1-120 ipm
Major - SXS Common Control or TOUCH-TONE Calling	HT1
Minor - SXS Common Control or TOUCH-TONE Calling	HT1 - 120 ipm
Major - MJ Mobile Radio Telephone Systems	2000 cycle tone

5. RELEASE TESTS OF LINE FINDERS - FIG. 9 AND 10

5.01 These figures are provided for use in released tests of line finders and associated selectors which have lockout relays.

5.02 When a line finder finds the test line in these tests, the associated first selector will cause lead 8 to be grounded. This circuit will then function as described in paragraphs 2.01 & 3.01 to release the selector and cause the test line relay to operate. This test of the first finder checks the operate time of T2. To eliminate waiting for relay T2 to operate on tests of subsequent finders, the key of Fig. 10 (with the associated cord connected to the jack of Fig. 9) is operated momentarily after the next finder has seized the test line. This operates T3, in turn operating PB and releasing T1. When the key is released PB and T3 release, T3 releasing PA. PB released connects ground to the PB leads to selectors before PA released connects ground to the PA leads. The PA lead grounded operates the lockout relay of the selector associated with the line finder under test, and of any other selectors seized but not cut through. T3 released operates slow operate relay

T1, which when operated operates PA to remove ground from the PA leads. After about 10 seconds (to allow for dialing on any service calls on selectors whose lockout relay may have operated while lead PA was grounded) the key is again operated. This operates T3 and in turn PB, which removes ground from lead PB to the selector thus allowing the selector and line finder to release and the line finder to release and the line lockout relay to operate.

6. TRANSMISSION OF ALARMS

OVER SEPARATE CABLE PAIR - FIG. 3

6.01 A major alarm, or more than a specified number of permanent signals, or low cable insulation will cause lead 2 or MP to be grounded, operating relay A if the ACO relay is released. This removes battery from the loop to the distant office to give a class A trouble indication. A minor trouble will ground lead MN operating B which reverses battery and ground on the loop to give a class B trouble indication. Leads AA and AB provide for tandem extension of alarms originating in an outlying office having an alarm checking terminal.

TO SWITCHBOARD - FIG. 4

6.02 Major and minor alarms ground leads 2 and MP or MN as described in 6.01, in turn grounding leads R (major and minor) to cause lighting of lamps in the switchboard. When relay PL is operated as described in 7, A operates to prevent transmission of alarms.

BY ALARM SENDER

6.03 When alarms are to be transmitted over operator office trunks, this circuit connects to the alarm sender. In step-by-step CAMA office, no connection is made to the alarm sender.

7. AUDIBLE AND VISUAL ALARM CUTOFF

7.01 While the office is unattended, the audible and visual alarms do not function, but alarms mark the alarms checking terminal and are transmitted to an attended office or switchboard, and the Coin Trunk Timed Relase Circuit is in condition to function.

7.02 When a maintenance man enters the office, he should operate key ACO, which operates relay ACO, which in turn:

(a) Locks under control of key RA and relay B1.

(b) Removes battery from lead SC to disable the Coin Trunk Timed Release Circuit.

(c) Disables the alarm sender.

(d) Operates PL, and lights lamp SDR-CO.

(e) Where C option is provided, connects ground through B1 to operate C1 when T4 and T6 are both released.

PL supplied ground and battery for circuits which should function only while the office is attended, and lights lamps ALM-CO and G. C1 operated:

(a) Locks to B1 and relay ACO through key ACO.

(b) Grounds a lead to operate T4.

(c) Connects a front contact of T6 to B1.

T4 operates T5, which after 20 to 30 minutes, operates T6, which in turn operates B1. B1 operated:

(a) Locks to keys ACO and RA.

(b) Supplies battery for the audible alarm to replace that furnished by PL.

(c) Provides battery to keep lamps ALM-CO and G lit when PL releases.

(d) Releases ACO and C1, which later removes the operating ground for T4.

7.03 ACO released:

(a) Restores functioning of the alarm sender and Coin Trunk Timed Release Circuit.

(b) Releases PL and extinguished the SDR-SDR-CO lamp.

If an alarm occurs at this time the audible alarm will sound, and the alarm will be transmitted. The maintenance man should, however, operate the ACO key as soon as the SDR-CO lamp is extinguished, and thus prevent transmission of alarms while he is in the office. Key ACO operated at this time will release B1 or C1, whichever is operated, and will reoperate ACO which will lock to B1 released, ACO will reoperate PL.

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7.04 Before the maintenance man leaves the office, he should depress key RA to release relays ACO, PL, B1, and C1 (or such of them as may be operated), and extinguish lamps ACO, SDR-CO, and G.

7.05 Where an office is regularly attended on a part-time basis, X option is not furnished. Relays ACO and PL will then operate when key ACO is operated, and will remain operated until key RA is operated.

8. AISLE PILOT RELAYS - FIG. 12 TO 17 AND AISLE PILOT LAMPS FIG. 7

8.01 When these relays operate as described in par. 2.01 to 2.09, ground is connected to light lamps AP when provided at the end of the aisle in which trouble occurred, provided battery is received over lead CR from relay PL. Lamps AP also light when trouble occurs on the circuits listed in Note 103 which connects ground to lead 18, Fig. 7.

9. TOLL AND NO. 355A ALARMS

9.01 Where a toll office is in the same building with a No. 355A office, the toll office may have its alarms segregated with its own audible and visual signals (but the audible signal of this circuit will operate for any trouble in the toll circuits). Or the toll alarm circuit may connect to the audible and visual signals of this circuit (ie, the bell and Fig. 7 and 8). Lead E from relay PL operates a cutoff relay in the toll alarm circuit. When the toll alarms are segregated, the T lamp of Fig. 1, and if provided, the TP lamp of Fig. 8 will light while the office is attended whenever there is a trouble in toll equipment, but the alarm checking terminal will not be marked. When relay PL releases, the transfer relay in the toll alarm circuit releases, transferring the toll alarms to this alarm circuit, marking the alarm checking terminal and transmitting the alarm to an attended office or switchboard.

10. PICKUP ALARM FOR 10-20 PARTY AUXILIARY INTERRUPTER - FIG. 18

10.01 In case the pickup lead for the 10-20 code auxiliary interrupter becomes grounded, relay PUA will operate during an open period of the pickup (during which the PKU and PUA leads are connected together in the interrupter circuit). PUA will then lock to the ground on the PKU lead, operating the minor alarm relay MN over lead 5, lighting the PU 20 lamp, and lighting an aisle pilot lamp over lead PL if relay PL is operated.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

None.

2. FUNCTIONAL DESIGNATIONS

None.

3. FUNCTIONS

3.01 To give visual and audible alarms when trouble occurs, during periods when the office is attended.

3.02 To transmit alarms to a switchboard in the same building or over a separate cable pair to a distant office, or by connection to an alarm sender, over operator office trunks.

3.03 To disable the coin trunk timed release circuit and to cut off transmission of alarms when the office is attended.

3.04 To provide for extinguishing the visual alarms, disabling the audible alarms, and restoring the functioning of the Coin Trunk Timed Release Circuit and transmission of alarms when the office is unattended.

3.05 To provide for extinguishing visual signals, restoring the transmission of alarms, and restoring functioning of the Coin Trunk Timed Release Circuit at the end of a definite time interval after the function of 3.03 is performed. This is to guard against leaving the office unattended with transmission of alarms cut off.

3.06 To differentiate between major and minor alarms transmitted to a switchboard or over a separate cable pair to a distant office.

3.07 To provide means whereby an operator or maintenance man can determine whether an alarm condition exists by dialing the alarm checking terminal. Tone supplied indicates the type of alarm as described in section II - 4.

3.08 To provide for relaying an alarm received from a toll office in the same building or from an outlying office or PBX to an attended maintenance center when this office is unattended.

3.09 To provide for starting the ringing machine when a selector is seized, or when the alarm checking terminal is dialed.

3.10 To provide an alarm for circuit conditions normally of short duration, only when the condition exists for an abnormal time. Permanent signals, release magnet alarms and line finder call blocked alarms are typical examples.

3.11 To provide appropriately timed ground impulses to selectors arranged for permanent signal lockout.

3.12 To provide alarms in case either the main discharge fuse, or the main ABS fuse blows, and to provide for transmission of these alarms to an attended maintenance center.

3.13 To receive alarms from a toll office or toll circuits in the same building.

3.14 To provide for accelerated tests of line finders associated with first selectors arranged for permanent signal lockout.

3.15 To provide alarms for step-by-step intertoll circuits arranged for CAMA.

3.16 Provides means of retiring alarms from a remote location.

3.17 Provides means for two alarm checking terminals.

3.18 Provides means for disabling connector automatic disconnect of calling party holds when the alarm checking terminal is dialed.

3.19 Provides alarm leads paired with ground.

3.20 Provides connections for MJ mobile radio telephone systems to terminate trouble alarm and transmit a distinctive tone (2000 cycle) to the alarm checking terminal.

4. CONNECTING CIRCUITS

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

(a) Switch Trouble Alarm Circuit-Trunk Finders - SD-31514-01.

(b) 22-Point Line or Trunk Finder - SD-31793-01.

(c) Coin Trunk Timed Release Circuit - SD-31861-01.

(d) Subscriber Line with Rotary Line Switch - SD-31898-01.

(e) Cable Insulation and Permanent Signal Alarm Circuit - SD-31912-01.

(f) Line Finder Control Circuit - SD-31922-01.

(g) Miscellaneous Alarm Circuit - Fuse Alarms - SD-31974-01.

(h) Miscellaneous Alarm Circuit Prepay Coin Trunk and Coin Battery Fuse - SD-31975-01.

(i) Miscellaneous Alarm Circuit Coin and Message Rate Trunk Alarm - SD-31978-01.

(j) Miscellaneous Alarm Circuit Alarm Sender - SD-32193-01.

(k) Trunk Release Circuit - SD-31993-01.

(l) Two-Way Magneto Trunk Circuit - SD-32035-01. *

(m) Miscellaneous Alarm Circuit - Selectors - SD-32043-01.

(n) Miscellaneous Alarm Circuit - Connectors - SD-32045-01.

(o) Miscellaneous Alarm Circuit - Miscellaneous Shelves - SD-32048-01.

(p) Miscellaneous Alarm Circuit Selector - Repeaters - SD-32102-01.

(q) Line Load Control Circuit - SD-32069-01, SD-32108-01.

(r) Power Charge and Discharge Circuit - SD-80702-01.

(s) Power Discharge Circuit - SD-80720-02.

(t) Power Discharge Circuit - 130 Volt - SD-80760-01.

(u) Power Ringing Circuit - SD-81131-01,* SD-81225-01.

(v) AC Power Alarm Circuit - 806D Power Plant - SD-80893-01.

(w) Power Charge and Discharge Circuit - 105D Power Plant - SD-81134-01.

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(x) Toll Audible and Visual Alarm Circuit - SD-95075-01, SD-95063-01.

(y) N1 Carrier Telephone Application Schematic - SD-95124-01.

(z) Type O Carrier Telephone Application Schematic - SD-95150-01.

(aa) Civil Air Raid Warning Circuits - SD-95332-01, SD-95678-01.

(ab) Extension Alarm Circuit - SD-95484-01 *

(ac) Line Circuit for Public Emergency Reporting - SD-95873-01.

(ad) Two-Way Trunk Circuit - SD-96221-01. *

(ae) No-Such-Number Tone Supply - SD-96357-01.

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

(ag) Ringing Circuit - Tripping Supply - SD-81041-01.

(ah) Ringing Circuit - Superimposing Batteries - SD-81040-01.

(ai) Connector Bank Multiple Circuit (for Alarm Checking Terminal) - SD-32028-01.

(aj) Prepost - Pay Coin Box Trunk Circuit - SD-31873-01.

(ak) Rotary Out Trunk Switch Circuit - SD-30868-01. *

(al) Alarm Line Circuit, Toll Switchboard - SD-55135-01. *

(am) Permanent Signal Timing Circuit for Selector Repeaters - SD-31844-01.

(an) Call Blocked and Release Alarm for Finders - SD-32239-01.

(ao) Group and Alarm Relay Circuit for Line and Trunk Finder - SD-32194-01.

(ap) Automatic Trunk Test (ANI) - SD-32315-01.

(aq) Miscellaneous Circuit for Secondary Network and Bus Connector Frame - SD-95818-01.

(ar) Miscellaneous Circuit for Identifier Frame - SD-95819-01.

(as) Miscellaneous Circuit for Outpulser Frame - SD-95820-01.

(at) Miscellaneous Circuit for OITT Frame - SD-95822-01.

(au) Miscellaneous Circuit for Trouble Ticketer Frame - SD-95823-01.

(av) Miscellaneous Circuit for Outpulser Link Frame - SD-95826-01.

(aw) Distribution Fuse, Common Aisle, and Miscellaneous Individual Alarm Circuit - SD-95380-01.

(ax) Step-by-Step Intertoll with CAMA, Alarm Circuit - SD-32266-01.

(ay) Interrupter Relay Circuit - SD-31868-01.

(az) Audible and Visual Alarm Circuit - SD-96188-01.

(ba) Emergency Ring Back Circuit - SD-95083-01.

(bb) Telephone Repeater Battery Supply Circuit - SD-95242-01.

(bc) Rectifier Circuit - SD-81298-01.

(bd) CAMA Jack, Key, and Lamp Circuit - SD-32272-01.

(be) Step-by-Step Service Observing Circuit, Intertoll Dialing Office with CAMA - SD-32308-01.

(bf) Line Concentrator Control Circuit - SD-96536-01.

(bg) Load Transfer Circuit - SD-98091-01.

(bh) Translator Connector Circuit - for PBX Automatic Identified Outward Dialing - SD-99320-01.

(bi) N Carrier Telephone Signaling Order Wire and Alarms Circuit - SD-95142-01.

(bj) Manual Outgoing Trunk Test Frame Test Circuit - SD-32349-01.

(bk) Pulse Generator and Counting Circuit - SD-32310-01.

(bl) 24 Channel PCM Bank Type D1 Application Schematic - SD-97060-01.

(bm) T1 Carrier Application Schematic - SD-97080-01.

(bn) Jack, Key, and Lamp, and Plant Register Circuit - SD-32333-01 and SD-32359-01.

(bo) Common Control Alarm Circuit - SD-32361-01.

(bq) Power Systems Signaling Circuit - SD-81681-01.

(br) MJ Mobile Radio Telephone System - Alarm Circuit - SD-2R014-01.

(bs) Jack Access Circuit for Automatic Call-Through Test Circuit - SD-32523-01.

(bt) Auxiliary Timing Circuit - SD-32525-01.

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

(bv) 400A Tone Generator Circuit - SD-99303-01.

(bw) MJ Mobile Radio Telephone System - Test Panel Circuit - SD-2R055-01.

(bx) No. 101 ESS Maintenance Center for Control Unit - SD-1H052-01.

(by) No. 101 ESS Power Distribution and Power Alarm Circuit - SD-1H064-01.

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

(ca) Permanent Signal Holding Trunk Circuit - SD-32370-01.

(cb) Power Charge and Discharge Circuit (111A) - SD-81501-01. *

(cc) Power Supply Circuit (610B) - SD-81504-01. *

(cd) Discharge Circuit (410A) - SD-80942-01. *

(ce) PBX-AIOD - Fuse Alarm and Miscellaneous Circuit - SD-1C006-01.

(cf) Toll Systems - L Type Multiplex Application Schematic - For L60A or L120A Terminals - SD-50225-01.

(cg) Trap Applique Circuit for Calling Line Identification - SD-32533-01.

(ch) Common Systems - Miscellaneous Circuit Scanner Frame (CLI) - SD-1C211-01.

(ci) AIS Office Alarm Circuit - SD-1B251-01.

(cj) Step-by-Step Systems - Positive 48-Volt Battery Filter Circuit - SD-32537-01.

(ck) Auxiliary Coin Trunk Circuit - SD-32538-01.

(cl) Common Systems - Called Customer Signal Applique Circuit - SD-1C207-01.

(cm) Ringing Circuit - SD-31866-01.

(cn) Trunk Transmission Test Line Circuit - SD-96601-01.

* Typical

5. MANUFACTURING TESTING REQUIREMENTS

5.01 This circuit shall be capable of meeting all of the requirements of the Circuit Requirements Table.

SECTION IV - REASONS FOR REISSUE

D. Description of Changes

D.1 Connecting information is added to Table A for the Trunk Transmission Test Line Circuit.

D.2 In figures A, B, 1, 3, 19 and 20, off-normal battery leads were incorrectly shown as off-normal grounds. This was corrected.

D.3 This reissue also covers information authorized by subsequent appendixes to Issue 6D of this CD.

BELL TELEPHONE LABORATORIES, INCORPORATED

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