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STEP-BY-STEP SYSTEMS
NO. 1,350A OR 355A
TRUNK CIRCUIT
NO. 1,350A, 355A OR 356A
AUXILIARY LINE CIRCUIT
FOR OPERATING SUBSCRIBERS REGISTER
WITH DELAYED CHARGE INTERVAL
USING REGULAR CENTRAL OFFICE BATTERY

CHANGES

D. DESCRIPTION OF CHANGES

D.1 In Fig. A at the bracket for leads "A", "R", "T", and "S" connecting to line finder, "or to trunk circuit" is added to the connecting information.

F. CHANGES IN DESCRIPTION OF OPERATION

F.1 Under 4. Connecting Circuits, add:

4.15 Converter Trunk - TOUCH-TONE Calling - SD-32326-01.

4.16 Register Trunk and Link - SD-32353-01 - (Trunk Portion).

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 2363-RJJ, JR-GO

CIRCUIT DESCRIPTION

CD 32082-01
Issue 4-D
Appendix 2-D
Dwg. Issue 14-D

**STEP BY STEP SYSTEMS
NO. 1, 350A, OR 355A
TRUNK CIRCUIT
NO. 1, 350A, 355A, OR 356A
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FOR OPERATING SUBSCRIBERS REGISTER
WITH DELAYED CHARGE INTERVAL
USING REGULAR CENTRAL OFFICE BATTERY**

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The RLS leads shown in Figs. 52, 53, and 56 and leads 5 and 11 in Fig. 51 were rated A&M Only for 355A offices.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2335-MPC-FBB-ER

STEP BY STEP SYSTEMS
NO. 1, 350A OR 355A
TRUNK CIRCUIT
NO. 1, 350A, 355A OR 356A
AUXILIARY LINE CIRCUIT
FOR OPERATING SUBSCRIBERS REGISTER
WITH DELAYED CHARGE INTERVAL
USING REGULAR CENTRAL OFFICE BATTERY

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 Figure 51 that was Std. is now rated Mfr. Disc.
- D.2 Figure 58 and equipment Note 206 were not shown previously.
- D.3 Connections to Figure 58 for Figures 52, 54, 55, and 57 were added.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2335-MEB-FBB-JW

STEP BY STEP SYSTEMS
NO. 1, 350A, OR 355A
TRUNK CIRCUIT
NO. 1, 350A, 355A, OR 356A
AUXILIARY LINE CIRCUIT
FOR OPERATING SUBSCRIBERS REGISTER
WITH DELAYED CHARGE INTERVAL
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CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Added Fig. 3 to repeat class of service indication to operator by individual subscriber's line, so that a high resistance ground from the finder repeated as direct ground and low or direct resistance ground is repeated as high resistance ground to the first selector.

D.2 Notes 102 and 103 revised to reflect above change.

All other headings under Changes, no change.

1. PURPOSE OF CIRCUIT

1.1 This circuit provides an individual message rate trunk between the line finder and first selector or an auxiliary line circuit between the subscribers line and the line relay circuit. The subscribers message register is operated with regular central office battery if the charge condition persists for an interval determined by the associated interrupter circuit.

1.2 When used as a message rate trunk this circuit also provides means for connecting a class of service indication to an operator office trunk in accordance with the class of service indication received from the subscribers line circuit.

2. WORKING LIMITS

2.1 Maximum External Circuit Loop 1000 Ohms
Minimum Insulation Resistance 15,000 Ohms

3. FUNCTIONS

3.1 To provide for operating the subscribers message register, when battery is reversed towards the originating subscriber, after a delay of approximately 2 seconds minimum to 5.5 seconds maximum when used with the miscellaneous alarm circuit or 2 seconds minimum to 3 seconds maximum when used with the interrupter and alarm circuit.

3.2 To provide a start signal to the associated interrupter and to remove the start after the circuit has functioned to operate the subscribers message register.

3.3 To connect operating battery to the subscribers message register for .05 second minimum.

3.4 To maintain a guarding ground on the lead to the register except when operating the register.

3.5 To repeat a class of service indication to the operator office trunk when the associated line finder has access to more than one class of lines and the class of service indication is received from the line circuit.

3.6 When used as an auxiliary line circuit to by-pass the relay circuit to terminating calls.

4. CONNECTING CIRCUITS

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

4.01 No. 1 or 350A Four-Wire Line Finder, SD-31908-01.

4.02 No. 1 or 350A Three-Wire Selector, SD-30200-01.

4.03 No. 1 or 350A Four-Wire Selector, SD-31660-01.

4.04 No. 1 or 350A Three or Four-Wire Selector DA and RS, SD-31933-01.

4.05 No. 1 or 350A Four-Wire Selector RS, SD-31786-01.

4.06 No. 1 or 350A Interrupter and Alarm Circuit, SD-31494-01.

4.07 No. 355A Four-Wire Line Finder, SD-31909-01.

4.08 No. 355A Three or Four-Wire Selector, SD-32077-01.

- 4.09 No. 355A Three or Four-Wire Selector, SD-31964-01.
- 4.10 No. 355A or 356A Miscellaneous Alarm Circuit, SD-31978-01.
- 4.11 No. 350A Line Circuit, SD-32133-01.
- 4.12 No. 355A or 356A Line Circuit, SD-31777-01.
- 4.13 No. 355A Connector Circuit, SD-31737-01 (Typical).
- 4.14 No. 356A Connector Circuit, SD-30956-01 (Typical).

DESCRIPTION OF OPERATION

5. MESSAGE RATE TRUNK

5.1 Figs. 1, A and Options "Y" and "Z"

When this circuit is used as a message rate trunk it is connected between the line finder and first selector. The (CS) relay is poled not to operate until battery is reversed towards the calling subscriber. If this reversed battery condition persists for minimum 2 seconds to maximum 3 seconds the circuit will function to operate the subscribers message register.

When (CS) operates it connects battery through the primary and secondary windings of (A) in series to the "PKU" lead. If the interrupter is idle it will operate immediately from ground on the "PKU" lead or it will await ground on the "PKU" lead if the interrupter is going through its delay cycle. "A" operates, grounds lead "ST" to start the interrupter, if it is not in operation due to a start from another trunk, locks to the sleeve under control of (CH), closes lead "INT" to the winding of (CH), prepares a locking circuit for itself to lead "INT", opens its operating circuit and transfers lead "A", from the line finder, from ground on (A) to ground on (CH). If (CS) remains operated, when lead "INT" is grounded approximately 2 seconds later, (CH) operates through its lower continuity contacts and locks to the sleeve. (CH) operated opens the "PKU" lead operating circuit of (A), transfers the locking circuit of (A) to lead "INT" and removes ground and connects battery through resistance (A) to lead "A" to operate the subscribers message register. Lead "INT" is closed to ground for .05 second thereby providing time to operate the register. When lead "INT" opens, (A) releases which opens lead "ST", disconnects battery from lead "A" and reconnects ground thereto, and opens lead "INT". Lead "INT" locking circuit of (A) is carried through a separate make on (A) in order to prevent a charge without a delay in case the contacts which close lead "INT" to the winding of (CH) become shorted. If (CH)

operates due to this condition it opens the circuit to (A) and prevents a charge. When the call is terminated ground is removed from sleeve which permits (CH) to release and restore the circuit to normal.

5.2 Figs. 1 and A - Options "X" and "Z"

The circuit functions as in 5.1 with the following exceptions:

When (CS) operates it connects battery to the secondary winding of (A) and through the secondary winding to lead "A" of the miscellaneous alarm circuit. When the alarm circuit functions to connect ground to lead "A", (A) operates to close contacts 5-6B and 6-7T. The primary winding is shorted by sleeve ground through 5-6B. When ground is removed from lead "A", (A) operates completely thereby closing the interrupter lead to the lower contacts of (CH). After the delay interval of minimum 2 seconds to maximum 5.5 seconds, ground is again connected to lead "A" by the alarm circuit and (CH) operates. The circuit then functions as described in 5.1.

6. CLASS OF SERVICE INDICATION - FIG. 2

Where the associated line finder has access to more than one class of lines and the class of service indication is provided in accordance with the individual line, that is by an indication on lead "A" of the line circuit which is either an open, direct ground, resistance ground (3000 ohms) or ground through the subscribers message register, Fig. 2 is associated with Fig. 1 and "Z" option is omitted in Fig. 1.

When the line finder cuts through to the terminals of the calling line, lead "A" of the line circuit is connected to the winding of (CL). If the class of service indication is an open "A" lead, (CL) will not operate and consequently lead "A" to the first selector will not be closed. When the class of service indication is a resistance ground, (CL) will operate to close only its 6-7T and 6-7B contacts which will connect sleeve ground through resistance (C) to lead "A" towards the first selector, A direct ground or ground through a message register will operate (CL) completely thereby connecting sleeve ground to lead "A" towards the first selector. (CL) operated completely locks to the sleeve, transfers the line "A" to ground on contact of (A) and closes lead "PKU" or lead "A" of the miscellaneous alarm circuit to the winding of (A). If the line is equipped with a message register the circuit will then function as described in 5. If the class of service indication is direct ground the trunk will go through its operation but will perform no useful function.

7. CLASS OF SERVICE INDICATION - FIG. 3

Where the associated line finder has access to more than one class of lines and

the class of service indication is provided in accordance with the individual line, that is by an indication on lead "A" of the line circuit which is either an open, direct ground, resistance ground (3000 ohms) or ground through the subscribers message register, Fig. 3 may be associated with Fig. 1 and "Z" option is omitted in Fig. 1. With Fig. 3, a direct ground from the line ckt. transmits a 3000 ω ground toward the selector while a resistance ground in the line circuit transmits direct ground.

When the line finder cuts through to the terminals of the calling line, lead "A" of the line circuit is connected to the winding of (CL). If the class of service indication is an open "A" lead, (CL) will not operate and consequently lead "A" to the first selector will not be closed. When the class of service indication is a resistance ground, (CL) will operate to close only its 6-7T and 6-7B contacts which will connect sleeve ground to lead "A" towards the first selector, A direct ground or ground through

a message register will operate (CL) completely thereby connecting sleeve ground through resistance (C) to lead "A" towards the first selector. (CL) operated completely locks to the sleeve, transfers the line "A" to ground on contact of (A) and closes lead "PKU" or lead "A" of the miscellaneous alarm circuit to the winding of (A). If the line is equipped with a message register the circuit will then function as described in 5. If the class of service indication is direct ground the trunk will go through its operation but will perform no useful function.

8. AUXILIARY LINE CIRCUIT - FIGS. 1 AND B AND OPTIONS "Y" AND "Z" OR "X" AND "Z"

When this circuit is used as an auxiliary line circuit it is connected between the subscribers line and the regular line circuit less the connector multiple. The connector multiple, however, is connected so that (CS) is bypassed by terminating calls. On originating calls the circuit functions as described in 5 to charge the subscriber.

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DEPT. 2336-AH-RCD-YE