

STEP-BY-STEP SYSTEMS
NO. 1 OR 350A
LOCAL SELECTOR CIRCUIT
ARRANGED FOR SLEEVE REPEATING
ON ANY OR ALL LEVELSCHANGESB. Changes in ApparatusB.1 SupersededSuperseded By

C Network, 178A, Fig. 1
Option V

C Network, 840073431 Network:
Fig. 1, Option F.

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

C.1 The spring layout BSP figure for the A relay is changed from 11 to 726. The BSP figures are the same except that the 726 contains information on the newer silver/palladium contact material.

D. Description of Changes

D.1 Figure 1 is revised to show the replacement of the old 178A contact protection network with a new pigtail network. The new coded apparatus is designated option F and is rated Standard. The old contact protection network is designated option V and is rated Mfr. Disc.

D.2 Note 102 is revised and Note 105 is added to include information noted in D.1.

D.3 Equipment note 201 is added to explain the lead designations of the new coded network.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5225-LCB
WECO DEPT 5152-RTO-WEANOTICE

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Page 1
1 Page

STEP-BY-STEP SYSTEMS
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LOCAL SELECTOR CIRCUIT
ARRANGED FOR SLEEVE REPEATING
ON ANY OR ALL LEVELS

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 Fig. C is rated Mfr. Disc. and is replaced by Fig. B with "G" option.
- D.2 Option "G" added to Fig. B to permit sleeve repeating on all levels.
- D.3 Note 102 changed to add "G" option and rate Fig. C "Mfr. Disc.".
- D.4 Note 103 changed to add "G" option and remove reference to Fig. C.
- D.5 Note 301 formerly read: - Adjust the left normal post springs to operate on levels requiring the sleeve repeating feature.
- D.6 Note 303 changed to add "or on levels thru which connectors arranged for reverting calls are reached."
- D.7 Title changed to remove "not for use with connectors arranged to complete reverting calls".

All other headings under Changes, no change.

1. PURPOSE OF CIRCUIT

- 1.1 This circuit is to be used in a step-by-step office for establishing a connection from one station to another as first or intermediate selector in a local connection, where the resistance of the sleeve lead from the line finder to the connector would otherwise exceed 13 ohms.

2. WORKING LIMITS

- 2.1 Limits are for single office areas with 45-50 volt battery. for multi-office areas, for operator pulsing, and for single office areas with higher minimum voltage, see key sheets.

2.2 Pulsing from Subscriber

- 2.21 Max. Ext. Ckt. Loop (Ohms)
750* 850** 1000***

- 2.22 Min. Ins. Res. (Ohms) 15,000

* When using 1000 ohm loop and leak "B" in pulsing test set

** When using 1200 ohm loop and leak "A" in pulsing test set

*** When using 1400 ohm loop and leak "A" in pulsing test set

3. FUNCTIONS

- 3.1 To select a group of trunks as determined by the impulses sent out by the calling station.
- 3.2 To automatically select an idle trunk in the group selected.
- 3.3 To repeat ground towards the line finder from the following switches, on specified levels (Fig. B) or on all levels (Figs. A, C or Fig. B with "G" option).
- 3.4 To cut through the T.R.S. leads to following circuits when the sleeve repeating feature is ineffective.
- 3.5 To return all trunks busy tone to the calling station.
- 3.6 To extend the line or trunk, as the case may be, to an idle trunk.
- 3.7 To restore to normal upon the breaking down of a connection.
- 3.8 To place a guarding potential on the trunk seized.

4. CONNECTING CIRCUITS

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

- 4.1 Selector Circuit SD-30200-01*

- 4.2 Connector Circuit SD-30201-01*
 - 4.3 Switch Trouble Alarm Circuit SD-32043-01
 - 4.4 Misc. Tone and Tone Alarm Circuit SD-31521-01
 - 4.5 Selector Bank Multiple Circuit SD-32123-01
 - 4.6 Repeater Circuit SD-31779-01*
 - 4.7 Intercepting Trunk SD-31767-01
- *Typical Circuit

DESCRIPTION OF OPERATION

5. SEIZURE

When the circuit is seized the (A) relay operates over the subscriber's or trunk loop in turn operating (B) which opens the release circuit for the switch and prepares the circuit for the operation of the vertical magnet. Relay (B) also returns ground over the sleeve lead to hold preceding switches either directly or by operating relay (F) as described in Par. 7.

6. VERTICAL STEPPING

When the subscriber operates his dial to send impulses (A) will release and operate in unison with the pulses sent out by the dial, but (B) will remain operated throughout the series of pulses on account of its slow release feature. Each time (A) releases, it will send a pulse through (C) and the vertical magnet which causes the switch to step in a vertical direction and select the level desired. During this series of pulses (C) does not release on account of its slow release feature. (E) operates on the first vertical step thru the closed V.O.N. springs. (E) locks under control of the rotary interrupter springs. As soon as the series of pulses ceases, (C) will release after an interval and automatic rotary hunting for an idle trunk will start.

7. SLEEVE REPEATING

- 7.1 Fig. A or C - Sleeve Repeating On All Levels

When the circuit is seized relay (A) operates (B) in turn operating relay (F) which returns ground over the "S" lead for holding the preceding switches operated.

- 7.2 Fig. B With "G" Option - Sleeve Repeating on all Levels

On seizure relay (B) operates and returns ground over the back contacts of relay (F) to hold preceding switches

operated and also operate relay (F) which locks to ground thru relay (B) and returns direct ground to hold the preceding switches operated. On cut through relay (F) locks to the "S" from the succeeding circuit and maintains the holding ground to preceding circuits.

- 7.3 Fig. B - Sleeve Repeating on Specified Levels

On seizure relay B returns ground over back contacts of relay (F) to hold preceding switches operated. As the switch steps vertically relay (C) operates and opens the operating path of relay (F). When the dialed level has been reached relay (C) releases and operates relay (F) if the L.N.P. springs are operated. Relay (F) operated locks itself to relay (B) until cut through, at which time it locks to the "S" lead from the succeeding circuit. On levels where relay (F) operates it repeats ground over the "S" lead to hold preceding circuits operated. On levels where (F) does not operate the "S" lead will be cut through to the next circuit.

8. ROTARY HUNTING

When (C) releases after the vertical stepping has ceased the rotary magnet is energized through a front contact of (E). As soon as the rotary magnet opens its contacts (E) will release and allow the rotary magnet to release. The switch has taken one rotary step and placed the "S" brush in contact with one of the multiple bank terminals. If this terminal is busy (E) will be again energized over the "S" brush to the grounded bank terminal and cause the rotary magnet to step the brushes to the next terminal. This automatic stepping or hunting will continue until an idle terminal is found.

9. SEIZING THE IDLE TRUNK

When an idle terminal is found, (D) will operate from ground on the contact of (B) in series with (E), ((E) will not operate in series with (D)). During the process of hunting an idle trunk, (D) did not operate, since it was shunted out by ground on the "S" brush. The operation of (D) grounds the sleeve terminal to make the seized trunk busy to all other selectors and cuts the tip and ring leads from the calling station through to the tip and ring leads of the trunk beyond, and connects the sleeve brush to (T), to keep it operated when (B) releases. (D) operated opens the circuit to (A), which releases, in turn releasing (B).

10. ALL TRUNKS BUSY CONDITION

When all of the trunks in a group are busy the switch will take an eleventh

step, passing off the bank terminals and operating the cam springs to return an all trunks busy tone to the calling station and prevent the operation of (D) in order that the switch may be held operated by (A) and (B). If the calling station now disconnects, (A) will release and in turn will allow (B) to release releasing (F) if operated, and close the circuit of the release magnet which will energize and return the switch to normal. This function of releasing is used any time prior to the seizure of an idle trunk.

11. RELEASE AFTER AN IDLE TRUNK IS SEIZED

When the calling station disconnects under this condition, the trunk or switch beyond removes ground from the "S" brush

and allows (F) if operated to release and (D) to release. (D) in releasing closes the release magnet circuit and releases the switch.

12. TEST JACKS

By means of test jack this switch can be made busy in case it is out of order or for any tests which it may be desirable to make, also by plugging into test jack springs 1 and 2 with a test set the switch can be operated locally.

13. SPARK PROTECTION

Spark protection unit "C" reduces sparking at the contacts of relay (A).

BELL TELEPHONE LABORATORIES, INC.

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