

CIRCUIT DESCRIPTION
AMERICAN TELEPHONE & TELEGRAPH CO.,
BELL TELEPHONE LABORATORIES, INC.
PRINTED IN U.S.A.

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Issue 1
Appendix 2-D
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PANEL SYSTEM
OBSERVING LINE CIRCUIT
MODIFICATION OF EXISTING
OBSERVING LINE CIRCUITS
IN LINE FINDER AND LINE SWITCH OFFICES
FOR OBSERVING ORIGINATING SERVICE
FROM CENTRAL OFFICE OBSERVING DESK

CHANGES

B. CHANGES IN APPARATUS

B.1 A B1003 relay (LS) supersedes a B34 relay.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The (LS) relay of Figure 2 was changed from a B34 to a B1003 relay to increase the limits of this circuit particularly when observing on nickel first coin lines.

D.2 Circuit note 114 was added.

All other headings, No Change.

AMERICAN TELEPHONE & TELEGRAPH CO.,
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DEPT. 332-A

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DEPT. OF DEVELOPMENT & RESEARCH
BELL TELEPHONE LABORATORIES, INC.
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CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 No change.

B. CHANGES IN APPARATUS

B.1 Added

(S) E1221 Relay
(SL) B424 Relay

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER THAN THOSE APPLYING
TO ADDED OR REMOVED APPARATUS

C.1 Fig. A - Relay (LF).

The connect ground column data formerly was 2T(S).

C.2 Fig. A - Relay (SL).

An asterick and reference to test note 1 were added.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Formerly the E1221 and B424 Relays were not specified for
use in figure A and circuit notes 111 and 112 were not shown.

DEVELOPMENT

1. PURPOSE OF CIRCUIT

1.1 No change.

2. WORKING LIMITS

2.1 No change.

OPERATION

3. FUNCTIONS

3.1 No change.

4. CONNECTING CIRCUITS

4.1 No change.

DETAILED DESCRIPTION

5. No change.

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PANEL SYSTEM
 OBSERVING LINE CIRCUIT
 MODIFICATION OF EXISTING
 OBSERVING LINE CIRCUITS
 IN LINE FINDER AND LINE SWITCH OFFICES
 FOR OBSERVING ORIGINATING SERVICE
 FROM CENTRAL SERVICE OBSERVING DESK

DEVELOPMENT

1. PURPOSE OF CIRCUIT

- 1.1 This circuit is intended for converting the individual line equipment of existing local dial service observing circuits, for use in connection with a common observing circuit at the local office end, and trunk and position circuits at a central observing bureau, for observing originating traffic on dial subscribers' lines in panel line finder and line switch offices.

2. WORKING LIMITS

			Subs. Sup.		Subs. Sup.	
			Fig. C		Fig. B&D	
	Subs. Sup.		(LF) B- per	(LF) L- per		
	Fig. A & 2		D-80019	D-80046 or L-501		
				Rot. Panel	Rot. Panel	
				Link Link	Link Link	
2.1	Max.Ext.Ckt.Loop	750 ω	635 ω	1000 ω	750 ω	1000 ω 750 ω
2.2	Min.Ins.Res.	10000 ω	-	-	-	-

OPERATION

3. FUNCTIONS

- 3.01 To connect to a line finder subscriber's line at the IDF terminals or to a line switch subscriber's line at the IDF and line switch terminals by means of plugs and cords.

- 3.02 To provide means for automatically connecting one subscriber's line at a time, to the trunk to the central observing bureau and excluding all others, if there is an idle position at the observing bureau that is occupied.
- 3.03 To prevent a subscriber's line from being connected to the trunk to the central observing bureau, if all observing positions are busy or unoccupied.
- 3.04 To transmit a signal to the common observing circuit when a call is originated.
- 3.05 To connect the "T", "R" and "MR" terminals of the subscriber's line circuit to the common observing circuit.
- 3.06 To close the register circuit for identifying the particular individual observing line circuit that is connected to the trunk to the central observing bureau.
- 3.07 To transmit a signal to the common observing circuit as soon as the subscriber's line is associated with a district selector.
- 3.08 To release from the common observing circuit automatically or under the control of an operator at the central observing bureau.
- 3.09 To provide for testing the individual observing line circuits after an observing connection has been released, in order to insure that an individual observing line circuit may be locked to the trunk to the central observing bureau, only at the time a call is originated on the associated subscriber's line circuit.
- 3.10 To prevent individual observing line circuits that are associated with subscribers' lines on which terminating traffic is taking place, from being locked to the common observing circuit.

4. CONNECTING CIRCUITS

- 4.1 Service observing circuit for observing local originating service at a central observing desk.
- 4.2 Dial subscribers' line circuits in panel line finder and line switch offices.

DETAILED DESCRIPTION5. CALL ORIGINATED - LINE FINDER LINE

When a call is originated on a line finder subscriber's line that is connected up for observation, the (LF) relay of the associated individual observing line circuit operates through normal contacts of the (S) relay, in parallel with the line relay over the subscriber's loop. The (LF) relay operated, connects the "G" lead through normal contacts of the (A) relay and primary winding of the (YK) relay over the "B" lead to battery in the common observing circuit. If the common observing circuit is in a condition to accept originated calls and is not already locked to another individual observing line circuit associated with a subscriber's line, direct ground is encountered on the "G" lead and the (YK) relay operates through its primary winding. The (YK) relay operated, closes a locking path through its secondary winding and make contacts, in parallel with the winding of the (A) relay over the "F" lead and through a relay in the common observing circuit to ground. This closure operates the (A) relay of the individual observing line circuit and the relay in the common observing circuit, which disconnects battery from the primary windings of all the (YK) relays and thereby prevents the operation of another (YK) relay. The operation of the (YK) relay, opens the series locking path for the (YK) relays of all succeeding circuits, closes the tip and ring of the line through make contacts to the common observing circuit and connects the "G" lead through another set of make contacts to the "P" lead to operate a relay in the common observing circuit to close the timing leads in that circuit. The (A) relay operated, disconnects the "G" lead from the primary winding of the (YK) relay, closes the "MR" terminal of the line circuit through to the common observing circuit and closes the "TN" and "U" leads to operate the proper register relays in the common observing circuit.

6. DISTRICT SELECTOR CONNECTED TO LINE FINDER LINE

As soon as the line circuit on which a call has been originated, is associated with a district selector, the sleeve of the line is made busy by the district selector and the (SL) relay operates in parallel with the subscriber's cut off relay. The (SL) relay operated, operates the (S) relay which disconnects the (LF) relay from the ring of the line, thereby releasing it. The release of the (LF) relay, disconnects the ground over the "G" lead from the "P" lead, which removes the shunt from a relay in the common observing circuit, allowing the relay to operate. The (S) relay is slow in operating, in order to provide sufficient time for the (YK) relay to operate

and lock the individual observing line circuit to the common observing circuit, before the (LF) relay is released due to the operation of the (S) relay.

7. CALL ORIGINATED - LINE SWITCH LINE

When a call is originated on a line switch subscriber's line that is connected up for observation, the (LS) relay of the associated individual observing line circuit operates in parallel with the line relay of the line switch circuit over the subscriber's loop. The (LS) relay operated, causes the (YK) and (A) relays to operate and lock over the "F" lead in series with a relay in the common observing circuit as described in paragraph 5. The (A) relay operated, performs the same functions as described in paragraph 5, and closes an additional set of make contacts that are required for message registration indications when both Fig. 2 and Fig. D are provided to adapt the individual observing line circuits for observing on either line switch or line finder subscribers' lines.

8. DISTRICT SELECTOR CONNECTED TO LINE SWITCH LINE

As soon as the line switch on which a call has been originated, is associated with an idle district selector, the cut off relay of the line switch circuit operates and opens the operating path of the line relay of the line switch circuit and the (LS) relay of the associated individual observing line circuit, causing both relays to release. The release of the (LS) relay disconnects the ground over the "G" lead from the "P" lead and permits the operation of the relay in the common observing circuit as described in paragraph 6.

9. SIMULTANEOUS CALLS ON MORE THAN ONE LINE

When simultaneous calls are originated on several subscribers' lines that are connected up for observation, the (LF) or (LS) relay of each of the individual observing line circuits, operates in parallel with the line relay of the respective line circuit. The (LF) or (LS) relays operated, connect ground from the "G" lead through their make contacts, normal contacts of the (A) and primary windings of the associated (YK) relays and over the "B" lead to battery in the common observing circuit. This closure causes the operation of each of the (YK) relays associated with the operated (LF) or (LS) relays. The operation of each (YK) relay however, opens the series locking path for all succeeding (YK) relays, and as soon as battery is removed from the "B" lead by the operation of a relay in the common observing circuit in series with the winding of the (A) relay and secondary winding of the (YK) relay of the lowest numbered individual observing line circuit connected in parallel to the "F"

lead to the common observing circuit, all the (YK) relays release except the one associated with the lowest numbered individual observing line circuit. This circuit arrangement insures that only one individual observing line circuit is locked to the common observing circuit at a time.

10. RELEASE OF INDIVIDUAL OBSERVING LINE CIRCUIT

When an individual observing line circuit that has been locked to the common observing circuit is released automatically or under control of an operator at the central observing bureau, ground is removed from the "F" lead and ground through a high resistance test relay is connected to the "G" lead by the operation of the release relay in the common observing circuit. The removal of ground from the "F" lead causes the (YK) and (A) relays of the individual observing line circuit and a relay in the common observing circuit to release. The (YK) and (A) relays released, disconnect the "T", "R" and "MR" terminals of the subscriber's line from the common observing circuit and open the "TN" and "U" leads to the register relays in the common observing circuit.

11. TEST TO INSURE THAT LINE CIRCUITS ARE LOCKED TO THE COMMON OBSERVING CIRCUIT ONLY AT THE TIME OF THE ORIGINATION OF A CALL

The release of the relay in the common observing circuit that was operated in series with the (YK) and (A) relays of the individual observing line circuit, connects battery to the "B" lead. If there are one or more calls in progress at this time on any of the line circuits connected up for observation, and the cut off relay of the line circuit has not yet been operated by a district selector, the (LF) or (LS) relay of each of the individual observing line circuits associated with these lines will be operated. Battery on the "B" lead from the common observing circuit is therefore connected through the primary windings of the (YK), normal contacts of the (A) and make contacts of the (LF) or (LS) relays that are operated and over the "G" lead to ground through a high resistance test relay in the common observing circuit. This closure operates the high resistance test relay in the common observing circuit, but the (YK) relays of the individual observing line circuits are marginal and do not operate under this condition. The operation of the high resistance test relay in the common observing circuit, holds the release relay operated and prevents direct ground from being connected to the "G" lead to lock an individual observing line circuit to the common circuit, until all the operated (LF) or (LS) relays of the individual observing line circuits have released and permitted the high resistance test relay of the common observing circuit