

LINE FINDERS — WITHOUT CONTROL CIRCUIT  
OPERATION TESTS  
USING DIAL HAND TEST SET  
STEP-BY-STEP SYSTEMS

1. GENERAL

1.01 This section describes methods of testing the operating features of 3- and 4-wire line finders of the newer type which have the test jacks located on the finders, and testing the line lockout feature of the associated selectors and selector repeaters.

1.02 The tests covered are:

A. Line Finder Operation Test: This test checks the vertical and horizontal stepping of the line finder and checks that successive calls are served by alternate finders by transfer of the start lead ground.

B. Line Finder Line Selection Tests: This test checks that the line finder selects a subscriber line that is originating a call. With 4-wire line finders it checks the continuity of the fourth (A) lead when used for message register operation or for class-of-service indication, identification, or restriction.

C. Line Lockout and Selector Switching Time-out Release Test: This test checks the line lockout and selector switch time-out release features on permanent lines.

D. Line Lockout and Selector Repeater Switch Time-out Release Test: This test checks the line lockout and selector switch time-out features on permanent lines when the line finders are associated with selector repeaters.

1.03 Test D is used to determine that the line lockout and selector switch time-out release features are functioning on permanent lines, when the line finders are associated with selector repeaters insofar as releasing the selector repeater and line finder are concerned. A test of the feature for releasing the trunk to the main office is covered in Sections 226-330-502 and 225-300-500.

1.04 In Tests B, C, and D, a subscriber line (preferably an unused one) should

be used for the line finder release and line lockout tests.

1.05 In performing these tests, service may be adversely affected by possible dial tone delays or denial of service, as in Test A.

1.06 Lettered Steps: A letter a, b, c, etc, added to a step number in Part 3 or 4 of this section, indicates an action which may or may not be required, depending upon local conditions. The condition under which a lettered step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

Test B

2.01 Test lamp, to be assembled locally, consisting of a No. 38B lamp socket equipped with a 2Y lamp connected in parallel with a No. 63AK (600 ohm) resistance (for use on 4-wire line finders where the fourth lead is used for message register operation).

2.02 No. 893 cord, 6 feet long, equipped with two No. 360 tools (1W13B cord), one KS-6278 clip, and one No. 624B tool (for use on 4-wire line finders where the fourth lead is used for class-of-service indication).

Tests B, C, and D

2.03 No. 1011G handset (dial hand test set), connected to a W2CJ cord, 4 feet long, equipped with a No. 360A tool, a No. 360B tool (2W41A cord), and two No. 624B tools (for use in connecting handset to line finder bank terminal strip).

2.04 No. 509 receiver (dc resistance 1100 ohms) connected to a W2AB cord, 6 feet long, equipped with two No. 360A tools (2W21A cord), a No. 365 tool and a No. 411A tool (for use in connecting resistance ground to the tip side of prepay coin lines).

2.05 KS-3008 stop watch, or equivalent.

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### 3. PREPARATION

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>All Tests</u>		
1a	If alarm sender cutoff ACO key is provided - Operate ACO key momentarily	SDR CO and G lamps lighted
2b	If ACO key is not provided - Follow local instructions relative to disabling the signaling feature	

### 4. METHOD

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>A. Line Finder Operation Test</u>		
3	With MB keys of all line finders in normal position - Operate finder start test key TST  <u>Note:</u> Should a subscriber originate a call while the TST key is operated, the test may be interrupted momentarily while a finder hunts for the calling line, but after the line is seized, operation of the remaining finders will continue. Seizure of a line is indicated by the finder stopping and being held on a terminal while other idle finders continue to operate and release in proper order.	Each idle line finder in turn, beginning with No. 1 or 11, steps vertically to proper level, cuts in, rotates to eleventh rotary step, and releases  <u>Note:</u> With the start lead alternating arrangement, the first switch in the first subgroup may not necessarily operate, as this depends on which start lead was used last.
4	After last finder in group operates - First choice in group re-operates  <u>Note:</u> Leave test key operated until finders complete another cycle. Note that last finder operated in first cycle does not operate on this second cycle.	Each idle line finder again reoperates and releases in proper order
5	When last finder in group operates - Restore TST key to normal	Line finder operations cease

#### B. Line Finder Line Selection Tests

3	At the line finder bank terminal strip - With the handset switch in MON position - Connect handset to tip and ring terminal of a subscriber line (see 1.04)	
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#### 4-wire Line Finders

4c	If fourth lead (A) is used for class-of-service indication, identification, or restriction - Connect ground to terminal A at line finder bank terminal strip using No. 893 cord	
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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
5d	If fourth lead (A) is used to operate a message register - Connect ground through test lamp to terminal A at line finder bank terminal strip	
6	Operate handset switch to TALK position On prepay coin lines - Apply ground through the No. 509 receiver to tip side of the line momentarily to obtain dial tone	Line finder operates smoothly and stops on line used for test Dial tone heard
<u>3-wire Finders</u>		
7	Dial digit ( ) leading to succeeding selector	Dial tone removed
<u>4-wire Finders</u>		
8c	If fourth lead (A) is used for class-of-service indication, identification, or restriction - Dial code ( ) which will direct selector or selectors to a level or trunk which will simulate the service condition	Proper indication received  <i>Note:</i> In some cases it may be necessary to check with the operator as the indication is not always received by the tester.
9d	If fourth lead (A) is used to operate a message register - Dial a connector multiple test line terminal ( ) or an office telephone terminated in a battery reversing connector group	Test line seized or office telephone answered Ringing tripped Test lamp lights within 2 to 5-1/2 seconds
<u>All Finders</u>		
10	Operate handset switch to MON position	Line finder releases Test lamp (if provided) extinguished
11	Operate handset switch to TALK position On prepay coin lines - Apply ground through the No. 509 receiver to the tip side of line momentarily	Alternate choice line finder in same subgroup operates smoothly and stops on line under test Dial tone heard
12	Repeat Steps 7 through 10 on alternate line finder	
13	Select another subscriber line associated with next line finder subgroup and repeat Steps 3 through 12	
14	Repeat tests on all remaining line finders using a subscriber line associated with each subgroup	
15	When tests are completed - Disconnect handset from line finder bank terminals	

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>C. Line Lockout and Selector Switch Time-out Release Test</u>		
<u>Line Circuit Equipped With Lockout Relay and Not Provided With Wiring to Reduce Time of Lockout Feature</u>		
3	At line finder bank terminal strip - Connect handset to tip and ring terminals of a subscriber line equipped with a lockout relay (see 1.04)	
4	Operate handset switch to TALK position	Line finder operates smoothly and stops on terminals of line used for test Dial tone heard Line finder releases after 2 to 8 minutes Subscriber line not reselected by another line finder PS lamp lights
5	Operate handset switch to MON position	PS lamp extinguished
6	Repeat Steps 4 and 5 to test the alternate line finder of subgroup	
7	Select another subscriber line associated with next subgroup and repeat Steps 3 through 6	
8	Repeat tests on all remaining subgroups using a subscriber line associated with each subgroup	
9	Disconnect handset from line finder bank terminal strip	
<u>Line Circuit Not Equipped With Lockout Relay and Not Provided With Wiring to Reduce Time of Lockout Feature</u>		
10	At line finder bank terminal strip - Connect handset to tip and ring terminals of subscriber line not equipped with lockout relay	
11	Operate handset switch to TALK position On prepaid coin lines - Apply ground through No. 509 receiver to tip side of line, momentarily	Line finder operates smoothly and stops on terminals of line used for test Dial tone heard Line finder releases after 2 to 8 minutes Alternate line finder in same subgroup operates and seizes line used for test and above verification is repeated
12	Select another subscriber line associated with next line finder subgroup repeating Steps 10 and 11	
13	Repeat test on all remaining subgroups using subscriber line associated with each subgroup	
14	Disconnect handset from line finder bank terminal strip	
<u>Line Circuit Equipped With Lockout Relay and Provided With Wiring to Reduce Time of Lockout Feature</u>		
15	At line finder bank terminal strip - Connect handset to tip and ring terminals of a subscriber line equipped with a lockout relay	

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
16	Insert plug of W2AS cord (associated with miscellaneous alarm circuit) into LO jack on line finder frame	
17	Operate handset switch to TALK position	Line finder operates smoothly and stops on terminals of line used for test Dial tone heard
18	Approximately 10 seconds after hearing dial tone - Operate No. 522A key momentarily	
19	After another 10-second interval - Reoperate No. 522A key momentarily  <u>Caution: It is necessary to wait the 10-second interval, so as to prevent falsely releasing subscriber connection.</u>	Line finder releases Subscriber line not reselected by another line finder PS lamp lights  Note: The line finder may release on first operation of No. 522A key, depending upon the position of the permanent signal timing circuit at the time subscribers line is seized; however, it should always release upon the second operation of the key.
20	Operate handset switch to MON position	PS lamp extinguished
21	Repeat Steps 15 and 17 through 20 to test alternate line finder	
22	Select another subscriber line associated with next subgroup and repeat Steps 17 through 21	
23	Repeat tests on all remaining subgroups using subscriber line associated with each subgroup	
24	Remove cord from LO jack and disconnect handset from line finder terminal strip	
<u>Line Circuit Not Equipped With Lockout Relay and Provided With Wiring to Reduce Time of Lockout Feature</u>		
25	At line finder bank terminal strip - Connect handset to tip and ring terminals of a subscriber line not equipped with a lockout relay	
26	Insert plug of W2AS cord (associated with miscellaneous alarm circuit) into LO jack on line finder frame	
27	Operate handset switch to TALK position On prepay coin lines - Apply ground through the No. 509 receiver to the tip side of the line momentarily	Line finder operates smoothly and stops on terminals of line under test Dial tone heard
28	Approximately 10 seconds after hearing dial tone - Operate No. 522A key momentarily	

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
29	After another 10-second interval - Reoperate No. 522A key momentarily  <u>Caution: It is necessary to wait the 10-second interval, so as to prevent falsely releasing subscriber connection.</u>	Line finder releases Alternate line finder in same subgroup operates smoothly and stops on terminals of line under test Dial tone heard  Note: The line finder may release on First operation of No. 522A key, depend- ing upon position of permanent signal timing circuit at the time the subscriber line is seized; however, it should always release upon the second operation of the key.
30	Operate Handset switch to MON position	
31	Select another subscriber line associated with next line finder sub- group, repeating Steps 25 and 27 through 30	
32	Repeat test on all remaining sub- group using subscriber line associated with each subgroup	
33	Remove cord from LO jack and disconnect handset from line finder terminal strip	

D. Line Lockout and Selector Repeater Switch Time-out Release Test

Line Groups With All Lines Equipped With Lockout Relays

3	At the line finder bank terminal strip - Connect handset to tip and ring of subscriber line	
4	Operate handset switch to TALK posi- tion	Line finder operates smoothly and stops on subscriber line used for test Dial tone heard Line finder releases after 24 to 56 seconds Subscriber line is not reseized by another line finder Associated PS lamp lights
5	Operate handset switch to MON posi- tion	PS lamp extinguished
6	Repeat Steps 4 and 5 to test alternate switch	
7	Select another subscriber line assoc- iated with next subgroup and repeat Steps 3 through 6	
8	Repeat tests on all remaining subgroups using a subscriber line associated with each subgroup	
9	Disconnect handset from line finder bank terminal strip	

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>Line Groups Partially Equipped With Lockout Relays and a Subscriber Line Not Equipped With a Lockout Relay and Not Provided With Wiring to Reduce Time of Lockout Feature</u>		
10	At the line finder bank terminal strip - Connect handset to tip and ring of subscriber line not equipped with lockout relay	
11	Operate handset switch to TALK position	Line finder operates smoothly and stops on terminals of line used for test Dial tone heard Line finder releases after 2-1/2 to 8-1/2 minutes Alternate idle line finder in same subgroup seizes line used for test and above verification is repeated
12	Operate handset switch to MON position	
13	Select another subscriber line associated with next line finder subgroup, repeating Steps 10 through 12	
14	Repeat tests on all remaining subgroups using subscriber line associated with each subgroup	
15	Disconnect handset from line finder bank terminal strip	
<u>Line Groups Partially Equipped With Lockout Relays and Subscriber Line Equipped With Lockout Relay and Not Provided With Wiring to Reduce Time of Lockout Feature</u>		
16	At the line finder bank terminal strip - Connect handset to tip and ring of a subscriber line equipped with lockout relay	
17	Operate handset switch to TALK position	Line finder operates smoothly and stops on terminals of line used for test Dial tone heard Line finder releases in 2-1/2 to 8-1/2 minutes Subscriber line is not reselected by another line finder PS lamp lighted
18	Operate handset switch to MON position	PS lamp extinguished
19	Repeat Steps 17 and 18 to test the alternate line finder	
20	Select another subscriber line associated with next subgroup and repeat Steps 16 through 19	
21	Repeat tests on all remaining subgroups using a subscriber line associated with each subgroup	
22	Disconnect handset from line finder terminal strip	

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<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
<u>Line Groups Partially Equipped With Lockout Relays and a Subscriber Line Not Equipped With Lockout Relay and Provided With Wiring to Reduce Time of Lockout Feature</u>		
23	At line finder bank terminal strip - Connect handset to tip and ring of subscriber line not equipped with a lockout relay	
24	Insert plug of W2AS (associated with miscellaneous alarm circuit) cord into LO jack mounted on line finder frame	
25	Operate handset switch to TALK position	Line finder operates smoothly and stops on terminals of line used for test Dial tone heard
26	Approximately 56 seconds after dial tone is heard - Operate NO. 522A key momentarily	
27	After 10 seconds more - Reoperate No. 522A key momentarily	Line finder releases Alternate line finder in same subgroup and stops on terminals of line used for test Dial tone heard
<p>Note: The line finder may release on first operation of No. 522A key, depending upon the position of the permanent signal timing circuit at the time the subscriber line is seized; however, it should always release upon the second operation of key.</p>		
28	Select another subscriber line associated with next subgroup and repeat Steps 23 and 25 through 27	
29	Repeat tests on all remaining subgroups until all but one line finder has been tested	
30	Operate handset switch to MON position	Line finder releases
31	Operate handset switch to TALK position	Last line finder operates smoothly and stops on terminal used for test Line finder releases after 2-1/2 to 8-1/2 minutes
32	Remove plug from LO jack and disconnect handset from line finder bank terminal strip	

Line Groups Partially Equipped With Lockout Relays and Subscriber Line Equipped With Lockout Relay and Provided With Wiring to Reduce Time of Lockout Feature

33	At the line finder bank terminal strip - Connect handset to tip and ring of a subscriber line equipped with a lockout relay
34	Insert plug of W2AS (associated with miscellaneous alarm circuit) cord into LO jack mounted on line finder frame

<u>STEP</u>	<u>ACTION</u>	<u>VERIFICATION</u>
35	Operate handset key to TALK position	Line finder operates smoothly and stops on terminals of line used for test Dial tone heard
36	Approximately 56 seconds after dial tone is heard - Operate No. 522A key momentarily	
37	After 10 seconds more - Reoperate No. 522A key momentarily	Line finder releases Subscriber line not reselected by another line finder PS lamp lights  Note: The line finder may release on first operation of No. 522A key, depending on position of permanent signal timing circuit at the time the subscriber line is seized; however, it should always release upon the second operation of the key.
38	Operate handset key to MON position	PS lamp extinguished
39	Repeat Steps 35 through 38 to test alternate line finder	
40	Select another subscriber line associated with next subgroup and repeat Steps 33 and 35 through 39	
41	Repeat tests on all remaining subgroups until all but one line finder has been tested	
42	Operate handset switch to TALK position	Last line finder operates smoothly and stops on terminal of line used for test Dial tone heard Line finder releases after 2-1/2 to 3-1/2 minutes Subscriber line is not reselected by another line finder PS lamp lights
43	Operate handset switch to MON position	PS lamp extinguished
44	Remove plug from LO jack and disconnect handset from line finder bank terminals	