

LINE FINDERS—WITHOUT CONTROL CIRCUIT
OPERATION TESTS
USING 2-PARTY MESSAGE-RATE TYPE TEST SET
SD-31151-01 (X-61404A) OR SD-31258-01 (J34702A)
AND AUXILIARY TEST SET SD-32173-01 (J34726)
STEP-BY-STEP SYSTEMS

1. GENERAL

PAGE

1.01 This section describes a method of testing operating features of 50-, 100-, and 200-point, 3-wire and 4-wire line finders, using the 2-party message-rate type test set in step-by-step offices. It also covers line finder tests in those community dial offices in which the line finders are of the newer type, with the test jack located on the switch. It also describes the use of the auxiliary test set in conjunction with the regular test set.

the operating features of finders, and the continuity and polarity of trunks to the message register trunk circuit beyond. It also checks the A or TR lead for continuity to the message register trunk circuit and for freedom from crosses and grounds. It further checks that the S and A or TR leads are not reserved.

8

1.02 This section is reissued to add a notification to perform tests during periods of light traffic to minimize interference with normal traffic. This reissue does not effect the Equipment Test List.

C. Make Busy from Circuit Beyond:
This test checks the sleeve circuit through the line finder, in the normal position, to the line finder D relay.

9

1.03 To minimize interference with normal traffic, these tests should be performed during periods of light traffic. Upon immediate completion of the tests, the test keys should be restored to normal, and the test cords should be removed from the equipment under test.

D. Line Finder Operation—B, C, and F Relay Test Coin and Noncoin—Line Finders Arranged for Maximum Sleeve Potential 2.4 Volts Negative: This test checks the operating features of the line finder, and the continuity and polarity of the trunk to the selector or trunk circuit beyond. It also checks the B and F relays for nonoperate requirements, and C relays for hold and release requirements.

12

1.04 The tests covered are:

PAGE

A. Line Finder Operation Test—Coin and Noncoin: This test checks the operating features of line finders, and the continuity and polarity of the trunk to the selector or trunk circuit beyond.

7

B. Line Finder Operation and Registration Test—100- and 200-Point Line Finders Used for 2 Party Message-Rate Service: This test checks

E. Line Finder Operation—B, C, and F Relay Test—Coin and Noncoin—Line Finders Arranged for Maximum Sleeve Potential of 4.3 Volts Negative or 7 Volts Negative: This test checks the operating features of the line finder, and the continuity and polarity of the trunk to the selector or trunk circuit beyond. It also checks the B and F relays of the line finder for nonoperate requirements, the C relay for hold and

PAGE

release requirements, and requires the use of auxiliary test set SD-32173-01. This test is intended for use in those offices where line finders are equipped with a simplex battery network on the C relay to increase the maximum allowable sleeve potential to 7 volts negative, and line finders modified to operate with maximum sleeve potential of 4.3 volts negative.

16

F. Test of E Relay of Line Finders in Position 2, 12, or 22:

This test checks the operation of the E relay of line finders in position 2, 12, or 22 on a marginal basis, and is intended as a supplement to Tests A, B, D, and E. This test is necessary due to the test line appearing on the tenth level of these line finders and this level being permanently connected to solid ground. Therefore, some level other than the tenth level is used for applying the resistance ground to the commutator segment for marginally checking the E relay on these finders.

16

1.05 Tests A, B, D, E, and F can be conducted with or without the remote control feature of the test set and both methods are covered. Test D assumes that if the remote control method is used, the test set is modified to provide for remote control operation in connection with the line finder C relay release test.

1.06 Tests D and E require a spare or nonbusy line circuit, which will be called the "marked line," on the same level and bank as the test line terminal.

(a) In the case of 200-point finders the *mate line* is also required. For example the mate is 15 if 115 is used as the marked line, or vice versa.

1.07 For testing the newer types of line finders having the test jack located on the switch, test set SD-31258-01 will require ZM wiring, as shown on issue 14D of the circuit. Test set SD-31151-01 cannot be used with the newer line finders as its circuit has not been modified for this use.

1.08 When Test B, D, or E is made, it is not necessary to make Test A on the same testing cycle.

1.09 In performing these tests, service may be affected by possible dial tone delays or denial of service.

1.10 The test equipment specified in this section is designed to apply proper marginal tests (simulated critical circuit conditions) when the circuit under test and the test equipment have an applied voltage of 48.5 to 50. In those offices where power plants are normally operated at more than 50 volts, the battery voltage should be reduced and maintained within the required limits while the tests are being made.

1.11 Lettered Steps: A letter a, b, c, etc, added to a step number in Parts 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

2.01 The apparatus required for each test is shown in Table A. The details for each item are covered in the paragraph indicated by the number in parentheses.

2.02 J33702A (SD-31258-01), or X-61404A (SD-32151-01).

2.03 40B (or 40A) (remote control) test set.

2.04 Head telephone set (associated with line finder test set).

2.05 J34726 (SD-32173-01).

2.06 Patching cord, P3K cord, 12 feet long, equipped with 310 plugs (3P15B cord) (for use when battery and ground jack is used to supply battery and ground to the line finder test set).

2.07 Testing cord, W2M cord, 9 feet long, equipped with a 310 plug and two 59 cord tips (tip

TABLE A

APPARATUS	TESTS					
	A	B	C	D	E	F
Line finder test set (2.02)	1	1	-	1	1	1
Test set (2.03)	1	1	-	1	1	1
Head telephone set (2.04)	1	1	-	1	1	1
Auxiliary test set (2.05)	-	-	-	-	1	-
Patching cord (2.06)	1	1	-	1	1	1
Testing cord (2.07)	1	1	-	1	1	1
Patching cords (2.08)	*	*	-	*	*	-
Patching cord (2.09)	1	1	-	1	1	-
Patching cord (2.10)	1	1	-	1	1	-
477A (make-busy) tool	-	-	1	-	-	-
Testing cord (2.11)	-	-	-	1	-	-
Testing cord (2.12)	-	-	-	-	1	-
Testing cord (2.13)	-	-	-	-	1	-
Special cord (2.14)	-	-	-	-	-	1
Testing cord (2.15)	-	-	-	-	-	1

* As required, see 2.08 and Table B.

and sleeve connected) (for use when battery and ground block, or spare fuse not exceeding 5 amperes and frame ground is used to supply battery and ground to line finder test set).

2.08 Patching cord, P3E cord, 10 feet long, equipped with 310 plugs (P6F cord) (for use in connecting line finder test set to test line, or to line finder test jack.)

2.09 Patching cord, P3AA cord, 10 feet long, equipped with a 310 plug and a 240A plug (3P30A cord), modified by removing the red lead from terminal 3 and transferring the black lead from terminal 1 to terminal 3 (for use in connecting the line finder test set to line finder when test jack is located on switch).

TABLE B

P3E CORDS REQUIRED FOR TESTING VARIOUS TYPES OF LINE FINDERS

TEST JACK LOCATION	50- OR 100-POINT LINE FINDERS		200-POINT LINE FINDERS	
	3-WIRE	4-WIRE	3-WIRE	4-WIRE
Not on line finder	2	3	3	1
On line finder	1	2	2	-

2.10 Patching cord, P6B cord, 11 feet long, equipped with a 310 red-shell plug, a 310 black-shell plug, and two 240B plugs (6P6A cord) (for use in connecting the test line associated with 200-point, 4-wire line finders to the line finder test set).

2.11 Testing cord, W3AJ cord, 12 feet long, equipped with a 310 black-shell plug and a 620A tool (3W13B cord). A modified Frankel clip attached to cord is provided to clip on bank rod when the 620A tool is inserted into the bank.

2.12 Testing cord, W1H cord, 10 feet long, equipped with a 347B (or 47B) plug and a 360A tool (1W8A cord). In addition, one KS-6278 clip with a 108 cord tip or a 141 cord tip is required (for use in connecting battery to the auxiliary test set).

2.13 Testing cord, W3AJ cord, 12 feet long, equipped with a 310 red-shell plug and a 620A tool (3W13A cord). A modified Frankel clip attached to cord is provided to clip on bank rod when the 620A tool is inserted into the bank.

2.14 Test cord assembly shown in Fig. 1, consisting of a W3M cord, 6 feet long, equipped with a 310 plug and three 360 tools (3W4A cord); a W2W cord, 6 feet long equipped with a 310 plug and two 360 tools (2W17A cord); an 893 cord, 6 feet long, with a 360 tool at each end (W13B cord); a 419A tool; and three 141 cord tips [for use in connecting line finder test set to line finder test

jack and commutator (test jack not located on finder)].

2.15 Testing cord, W3M cord, 15 feet long, equipped with a 310 plug, three 360 tools (3W4B cord), and two 419A tools. Connect one 419A tool to the 360A (sleeve) tool, and the other 419A tool to the 360B (ring) tool (for use in connecting line finder test set to line finder when test jack is located on switch).

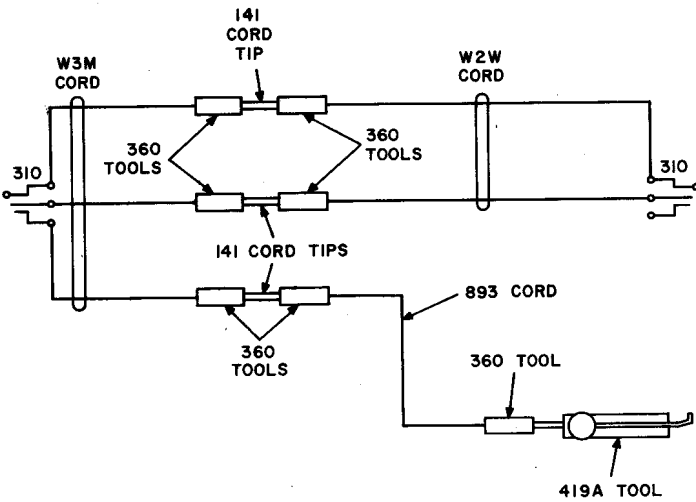


Fig. 1—Test Cord Assembly

3. PREPARATION

STEP	ACTION	VERIFICATION
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Tests A, B, D, E, and F

- 1 Patch test set BAT jack to 48V battery supply jack.

Note 1: To avoid possible grounding of battery supply lead, connect cord to test set first and, when disconnecting, remove cord from test set last.

Note 2: When using W2M cord, connect red (sleeve) conductor of cord to frame ground, white (tip) conductor to battery source on frame. (See Note 1.)

- 2 Connect head telephone set to test set TEL jacks.

Note: Leave TRS key in normal position except when necessary to talk on a connection.

- 3a If remote control is used—
Connect 40B (or 40A) remote control test set gray, black, red plugs to test set jacks G, BL, R, respectively.

STEP	ACTION	VERIFICATION
Tests A, B, D, and E		
For 50- or 100-Point, 3-Wire Line Finders		
4	Using P3E cord, connect test set jack A to test line jack A.	
For 50- or 100-Point, 4-Wire Line Finders		
	Using P3E cords, connect test set jacks A, B to test line jacks A, B, respectively.	
For 200-Point, 3-Wire Line Finders		
6	Using P3E cords, connect test set jacks A, B to test line jacks A, B, respectively.	
For 200-Point, 4-Wire Line Finders		
7	Using P6B cord, connect red-shell, black-shell plugs to test set A, B jacks, respectively, and connect 240B plugs of red, black cords to test line jacks A, B, respectively.	
	<i>Note:</i> In Tests A, B, and E, for 200-point, 3- or 4-wire finders, the connections to test line jacks A and B shall be reversed on each alternate testing cycle, unless otherwise specified, in order to make a complete test of finder B and F relays.	
All Finders		
8b	If test jack is not located on line finder— Using P3E cord, connect test set LF jack to test jack of line finder under test.	
9c	If test jack is located on line finder— Using P3AA cord, connect test set LF jack to test jack of line finder under test.	
Tests A, D, E, and F		
10	Operate LP key.	
11a	If remote control is used— Operate RC, RP keys for finders in noncoin line groups, or operate RC, CL keys for finders in coin line groups.	

SECTION 226-200-503

STEP	ACTION	VERIFICATION
12d	If test set SD-31151-01 is used— Operate FR key when testing flat rate or coin line groups.	
Test B		
13a	If remote control is used— Operate RC, TP keys.	
14d	If test set SD-31151-01 is used— Operate MR key.	
15	Operate LP key.	
16e	If test set SD-31258-01 is used— Turn L-S key to L position for 1400- or 1500-ohm range trunks, or to S position for trunks with less range.	
Test D		
1	Using W3AJ cord, insert 310 black-shell plug into line finder test set PL jack.	
Test E		
18	Using W1H cord, insert 347B plug into auxiliary test set B jack, connect clip to equipment end of 48-volt fuse, or, if line finder test set is so arranged, insert 141 cord tip into line finder test set battery pin jack.	
19	Using W3AJ cord, insert 310 red-shell plug into auxiliary test set TST jack.	
Test F		
20b	If test jack is not located on line finder— Insert plug of 6-foot W3M cord, as shown in Fig. 1, into test set LF jack.	
21c	If test jack is located on line finder— Insert plug of 15-foot W3M cord into test set LF jack.	

4. METHOD

STEP	ACTION	VERIFICATION
A. Line Finder Operation Test—Coin and Noncoin		
13	Note that line finder under test is in normal position.	
Finder for Noncoin and Coin Lines		
14a	If remote control is used— Momentarily depress ST (No. 1) key.	ST lamp lighted. Line finder operates smoothly, stops on test line terminals. Dial tone heard. REV lamp not lighted.
15e	If test set control is used— Operate RP key for noncoin groups or CL key for coin groups.	ST lamp lighted. Line finder operates smoothly, stops on test line terminals. Dial tone heard. REV lamp not lighted.
16f	If testing 3-wire line finders— Dial digit () leading to succeeding selector.	Dial tone removed.
17g	If testing 4-wire line finders in which fourth lead is used for operating a message register— Dial digit () leading to succeeding selector.	Dial tone removed.
18h	If testing 4-wire line finders in which fourth lead is used for class-of-service indication, identification, or classification— Dial code () which will direct selector(s) to proper level or trunk which will simulate service condition.	Proper indication received. Note: In some cases it may be necessary to check with the called position, as the indication is not always received by the tester.
Finders Used for Concentrating Manual Lines		
19a	If remote control is used— Momentarily depress ST (No. 1) key.	ST lamp lighted. Line finders operates smoothly, stops on test line terminals. Ringing induction heard. Call answered.
20e	If test set control is used— Operate RP key.	ST lamp lighted. Line finder operates smoothly, stops on test line terminals. Ringing induction heard. Call answered.
21	At switchboard— Disconnect when disconnect signal is received.	

SECTION 226-200-503

STEP	ACTION	VERIFICATION
All Finders		
22a	If remote control is used— Momentarily depress RLS (No. 3) key.	ST lamp extinguished. Line finder releases.
23e	If test set control is used— Restore RP or CL key.	ST lamp extinguished. Line finder releases.
24	Remove P3E or P3AA cord from line finder test jack.	
25	Unless other tests are to be made— Remove all test cords, restore all keys.	
B. Line Finder Operation and Registration Test—100- and 200-Point Line Finders Used for 2-Party Message-Rate Service		
17a	If remote control is used— With line finder under test in normal position— Momentarily depress ST (No. 1) key.	ST lamp lighted. Line finder operates smoothly, stops on test line terminals. Dial tone heard. REV lamp not lighted.
18f	If test set control is used— With line finder under test in normal position— Operate TP key.	ST lamp lighted. Line finder operates smoothly, stops on test line terminals. Dial tone heard. REV lamp not lighted.
19	Dial connector multiple test line in reverse battery connector group.	Test line seized. Ringing tripped. REV lamp lighted during test line loop closures.
		Note: If tripping does not occur during first or second ringing interval, operate the TRS key, remain on the connection for a short time, and if a customer answers, advise that a test is being made.
21f	If test set control is used— After REV lamp stops flashing and lights steadily (for about 5 seconds), restore TP key.	ST, REV lamps extinguished. TMR lamp momentarily lighted. Line finder releases.
22	Remove P3E or P3AA cord from line finder test jack.	
23	Unless other tests are to be made— Remove all test cords, restore all keys.	

STEP	ACTION	VERIFICATION
C. Make Busy from Circuit Beyond		
1	Insert 477A tool into line finder monitor jack or test jack springs 1, 2 (where test jack is provided on switch) in slow succession several times.	
22a	If remote control is used— Operate BF NO key, then B key.	
23a	Move 620A tool to select an idle line (or pair of lines for 200-point line finders) near middle of bank. (See 1.06).	
24a	Operate and hold RLS (No. 3) key.	TMR lamp not lighted (with 200-point line finders the RMR lamp should not light). <i>Note:</i> If TMR lamp lights, marked line is busy. If RMR lamp lights, mate line is busy. In either case, move 620A tool until an idle pair of lines is found.
25a	Release RLS (No. 3) key.	
26e	If test set control is used— Move 620A tool to select an idle line (or pair of lines) near middle of bank. (See 1.05.)	BY lamp not lighted.
27e	For 200-point line finders— Remove plug from PI jack and touch tip of plug to sleeve of jack.	BY lamp not lighted. <i>Note:</i> If BY lamp lights, it indicates a busy condition and another line, or pair of lines, must be selected. (See 1.06.)
28e	Reinsert plug into PL jack.	
29e	Operate BF NO key, then B key.	
Finders for Coin and Noncoin Groups		
30a	If remote control is used— Momentarily depress ST (No. 1) key.	ST lamp lighted. Line finder operates smoothly, stops on terminal to which 620A tool is connected. <i>Note:</i> Failure of line finder to stop indicates that C relay failed to meet its hold requirements, or that marked or mate line became busy before being seized by line finder under test. To test that marked and mate lines have not become busy, perform Step 31f.

SECTION 226-200-503

STEP	ACTION	VERIFICATION
31f	If finder failed to stop in Step 30a— Depress RLS (No. 3) key.	Line finder releases. <i>Note:</i> If the TMR lamp lights (or the RMR lamp with 200-point finders), select another pair of lines as covered in Steps 23a, 24a, 25a, and 30a. Restore RLS (No. 3) key.
32a	If remote control is used— Momentarily depress GRD (No. 2) key.	Line finder resumes rotary stepping, stops on test line terminal REV lamp not lighted. Dial tone heard.
33e	If test set control is used— Operate RP key for noncoin groups, or CL key for coin groups.	ST lamp lighted. Line finder operates smoothly, stops on terminal to which 620A tool is connected. <i>Note:</i> Failure of line finder to stop indicates that C relay failed to meet its hold requirements, or that marked or mate line became busy before being seized by line finder under test. To test that marked and mate lines have not become busy, perform Step 34g.
34g	If finder failed to stop in Step 33e— Restore B, BF NO, and RP or CL keys.	Line finder releases. <i>Note:</i> If BY lamp lights, the marked line is busy. If it does not light, and 200-point line finders are being tested, remove the plug from PL jack and touch tip of plug to sleeve of jack. If BY lamp lights the mate line is busy. In case either line is busy, select another pair of lines as covered in Steps 26e through 29e and 33e.
35e	If test set control is used— Momentarily depress C key.	Line finder resumes rotary stepping, stops on test line terminals. REV lamp not lighted. Dial tone heard.
36h	If testing 3-wire line finders— Dial digit () leading to succeeding selector.	Dial tone removed.
37i	If testing 4-wire line finders in which the fourth lead is used for operating a message register— Dial digit leading to succeeding selector.	Dial tone removed.
38j	If testing 4-wire line finders in which fourth lead is used for class-of-service indication, identification, or restriction— Dial code () which will direct selector or selectors to proper level, or trunk which will simulate service condition.	Proper indication received. <i>Note:</i> In some cases it may be necessary to check with the called position, as the indication is not always received by the tester.

STEP	ACTION	VERIFICATION
Finders Used for Concentrating Manual Lines		
39a	If remote control is used— Momentarily depress ST (No. 1) key.	ST lamp lighted. Line finder operates smoothly, stops on terminal to which 620A tool is connected. <i>Note:</i> Failure of line finder to stop indicates that C relay failed to meet its hold requirements, or that marked or mate line became busy before being seized by line finder under test. To test that marked and mate lines, have not become busy, perform Step 40k.
40k	If finder failed to stop in Step 39a— Depress RLS (No. 3) key.	Line finder releases. <i>Note:</i> If the TMR lamp lights (or th RMR lamp with 200-point finders), select another line, or pair of lines, as covered in Steps 23a, 24a, 25a, and 39a. Restore RLS (No. 3) key.
41a	If remote control is used— Momentarily depress GRD (No. 2) key.	Line finder resumes rotary stepping, stops on test line terminal. REV lamp not lighted. Ringing induction heard. Call answered.
42e	If test set control is used— Operate RP key for noncoin groups, or CL key for coin groups.	ST lamp lighted. Line finder operates smoothly, stops on terminal to which 620A tool is connected. <i>Note:</i> Failure of line finder to stop indicates that C relay failed to meet its hold requirements, or that marked or mate line became busy before being seized by line finder under test. To test that marked and mate lines have not become busy, perform Step 43l.
43l	If finder failed to stop in Step 42e— Restore B, BF NO, and RP or CL keys.	Line finder releases. <i>Note:</i> If BY lamp lights, the marked line is busy. If it does not light and 200-point line finders are being tested, remove the plug from PL jack and touch tip of plug to sleeve of jack. If BY lamp lights, the mate line is busy. In case either line is busy, select another line, as pair of lines, as covered in Steps 26e through 29e, and Step 42e.
44e	If test set control used— Momentarily depress C key.	Line finder resumes rotary stepping, stops on test terminal. REV lamp not lighted.

SECTION 226-200-503

STEP	ACTION	VERIFICATION
		Ringing induction heard. Call answered.

45 At switchboard—
Disconnect when disconnect signal is received.

All Finders

46a If remote control is used—
Momentarily depress RLS (No. 3) key. ST lamp extinguished.
Line finder release.

47e If test set control is used—
Retore RP or CL key. ST lamp extinguished.
Line finder releases.

48m If testing 200-point line finders—
Remove 620A tool from finder bank, reinsert
it from right side of bank to test F relay of
finder.

49m Reverse plugs in test line A, B jacks and
proceed as in Steps 22a through 45 and 46a
or 47e.

50 Remove P3E or P3AA cord from line finder
test jack.

51 Unless other tests are to be made—
Remove 620A tool from line finder bank,
remove all test cords, restore all keys.

**E. Line Finder Operation—B, C, and F Relay
Test—Coin and Noncoin—Line Finder Arranged
for Maximum Sleeve Potential of 4.3 Volts
Negative or 7 Volts Negative**

Note: The auxiliary test set modified and
equipped with CH-CR key must be used when
testing finders arranged for operation with
4.3-volt negative sleeve potential.

20 Select an idle line finder other than one under
test, and make busy or select bank with
cleaned terminals, not equipped with a line
finder.

21 Insert 620A tool from right side of bank into
sleeve bank on same level in which test line
appears.

STEP	ACTION	VERIFICATION
22	Operate auxiliary test set BY key, move 620A tool to select idle pair of lines near middle of bank (marked and mate lines). (See 1.06.)	T or B lamp not lighted. Note: When either T or B lamps light, it indicates that one of the lines is busy and another pair of lines must be selected.
23	Restore BY key.	
24	Note that line finder under test is normal, then operate auxiliary test set TST key.	

Finders Used for Noncoin and Coin Lines

25a	If remote control is used— Momentarily depress ST (No. 1) key.	ST lamp lighted. Line finder operates smoothly, stops on terminals to which 620A tool is connected. Note: If finder stops, then releases, the indication is that the finder B or F relay failed to meet its nonoperate test. Failure of the finder to stop indicates that the marked or mate lines became busy before being seized by the line finder under test. To test that marked and mate lines have not become busy, perform Steps 26e and 27e.
26e	If finder failed to stop in Step 25a— Momentarily depress RLS (No. 3) key.	Line finder releases.
27e	Restore auxiliary test set TST key, then momentarily operate BY key.	If T or B lamp lighted, the marked or mate line is busy. In this case, select another pair of lines as covered in Steps 22 through 25a.
28f	If test set control is used— Operate RP key for noncoin groups or CL key for coin groups.	ST lamp lighted. Line finder operates smoothly, stops on terminals to which 620A tool is connected. Note: If finder stops, then releases, the indication is that the finder B or F relay failed to meet its nonoperate test. Failure of the finder to stop indicates that the marked or mate lines became busy before being seized by the line finder under test. To test that marked and mate lines have not become busy, perform Steps 29g and 30g.
29g	If finder failed to stop in Step 28f— Restore RP or CL key.	Line finder releases.
30g	Restore auxiliary test set TST key, then momentarily operate BY key.	If T or B lamp lights, the marked or mate line is busy.

SECTION 226-200-503

STEP	ACTION	VERIFICATION
		In this case select another pair of lines as covered in Steps 22, 23, 24, and 28f.
31h	If auxiliary test set is equipped with CH-CR key— Operate key to CH position.	Line finder does not step. Note: If finder resumes stepping it indicates C relay failed to meet its hold requirements.
32h	Operate key to CR position.	Line finder resumes rotary stepping, stops on test line terminals. REV lamp not lighted. Dial tone heard.
33i	If auxiliary test set is equipped with C key— Momentarily operate C key.	Line finder resumes rotary stepping, stops on test line terminals. REV lamp not lighted. Dial tone heard.
34j	If testing 3-wire line finders— Dial digit () leading to succeeding selector.	Dial tone removed.
35k	If testing 4-wire line finders in which the fourth lead is used to operate a message register— Dial a digit () leading to succeeding selector.	Dial tone removed.
36l	If testing 4-wire line finders in which fourth lead is used for class-of-service indication, identification, or restriction— Dial code () which will direct selector or selectors to proper level or trunk which will simulate service conditions.	Proper indication is received. Note: In some cases it may be necessary to check with the called position, as the indication is not always received by the tester.

Finder Used for Concentrating Manual Lines

37a	If remote control is used— Momentarily depress ST (No. 1) key.	ST lamp lighted. Line finder operates smoothly, stops on terminals to which 620A tool is connected. Note: If the finder stops, then releases, the indication is that the B or F relay failed to meet its nonoperate test. Failure of the finder to stop indicates that the marked or mate lines became busy before being seized by the line finder under test. To test that marked and mate lines have not become busy, perform Steps 38m and 39m.
38m	If finder failed to stop in Step 37a— Momentarily depress RLS (No. 3) key.	Line finder releases.

STEP	ACTION	VERIFICATION
39m	Restore auxiliary test set TST key, then momentarily operate BY key.	If T or B lamp lighted, the marked or mate line is busy. In this case, select another pair of lines as covered in Steps 22, 23, 24, and 37a.
40f	If test set control is used— Operate RP key for noncoin groups or CL key for coin groups.	ST lamp lighted. Line finder operates smoothly, stops on terminals to which 620A tool is connected. <i>Note:</i> If the finder stops, then releases, the indication is that the B or F relay failed to meet its nonoperate test. Failure of the finder to stop indicates that the marker or mate lines became busy before being seized by the line finder under test. To test that marked and mate lines have not become busy, perform Steps 41n and 42n.
41n	If finder failed to stop in Step 40f— Restore RP or CL key.	Line finder releases.
42n	Restore auxiliary test set TST key, then momentarily operate BY key.	If T or B lamp lights, the marked or mate line is busy. In this case select another pair of lines as covered in Steps 22, 23, 24, and 40f.
43h	If auxiliary test set is equipped with CH-CR key— Operate key to CH position.	Line finder does not step. <i>Note:</i> If finder resumes stepping it indicates C relay failed to meet its hold requirements.
44h	Operate key to CR position.	Line finder resumes rotary stepping, stops on test line terminals. Ringing indication heard. REV lamp not lighted. At switchboard— Call answered. <i>Note:</i> If call is answered in less than 4 seconds, ringing induction will not be heard.
45i	If auxiliary test set is equipped with C key— Momentarily operate C key.	Line finder resumes rotary stepping, stops on test line terminals. Ringing induction heard. REV lamp not lighted. At switchboard— Call answered. <i>Note:</i> If call is answered in less than 4 seconds, ringing induction will not be heard.

SECTION 226-200-503

STEP	ACTION	VERIFICATION
46	At switchboard— Disconnect when disconnect signal is received.	
All Finders		
47a	If remote control is used— Momentarily depress RLS (No. 3) key.	ST lamp extinguished. Line finder releases.
48f	If test set control is used— Restore RP or CL key.	ST lamp extinguished. Line finder releases.
49	Restore auxiliary test set TST key.	
50	Remove P3E or P3AA key from line finder test jack.	
51	Remove 620A tool from finder bank.	
52	Unless other tests are to be made— Remove all cords and restore all keys.	
F. Test of E Relay of Line Finders in Position 2, 12, or 22		
22b	If test jack is not located on line finder— Insert plug of W2W cord, Fig. 1, into test jack of line finder under test.	
23b	Connect 419 tool to segment of line finder commutator on some level other than tenth level.	
24c	If test jack is located on line finder— Clip 419A tool back (ring) conductor of 15-foot W3M cord to contact spring 3 of test jack of line finder under test.	
25c	Clip other 419A tool red (sleeve) conductor of cord to a commutator segment on some level other than tenth level.	
26	Note that line finder is normal.	
27a	If remote control is used— Momentarily depress ST (No. 1) key.	ST lamp lighted. Line finder steps to level on which 419A tool is connected, cuts in, rotates to 11th rotary step, then releases.
28e	If test set control is used— Operate RP key.	ST lamp lighted. Line finder steps to level on which 419A tool is connected, cuts in, rotates to 11th rotary step, then releases.

STEP	ACTION	VERIFICATION
29e	Restore RP key.	
30	Unless further tests are to be made— Remove all cords, restore all keys.	