LINE FINDERS

OPERATION TESTS

701A, 701B, 711A, AND 711B PBX

1. GENERAL

1.01 This section describes the methods of testing the operating features of line finders in the 701A, 701B, 711A, and 711B PBX.

1.02 This section has been reissued for the following reasons:

(a) To revise the title of the section to include the 701B and 711B PBX.

(b) To add information regarding the voltage applied to the equipment and to the test equipment.

(c) To revise Test C to provide for testing line finder groups having up to 44 line finders.

(d) To add information to Test C to point out that the beginning point of the test depends on the first equipped lines.

(e) To change the title of Test D from Particular Extension Test to Particular Station Line Test.

Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The tests covered are:

A. ***Operation Test:*** This test simulates the calling line conditions on the line finder bank terminal of the test lines.

B. ***Restricted Service Test:*** This test checks that busy tone is heard when a restricted level is dialed.

C. ***Group and Chain Circuit Test:*** This test is a rapid check for continuity of the chain circuit and the proper sequence operation of all line finders.

D. ***Particular Station Line Test:*** This test checks the operating features of the line circuit and line finders from any particular terminal in a group.

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

1.04 ***In Tests A and B,*** connections to the test line A and B jacks should be reversed on each alternating test cycle, unless otherwise specified, in order to make a complete test of line finder B and F relays. When testing a line finder in connection with a specified case of trouble, test first with the connection one way and then the other.

1.05 ***Test D*** is primarily intended for use when it is necessary to check the operation of a particular station line in connection with a complaint.

1.06 If the newer type line finders with the test jack located on the switch are added to an existing shelf containing older line finders where the test jacks are mounted in a jack panel, it is assumed that both old and new line finders will be tested from the jack panel.

1.07 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 installations 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.

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1.08 *Lettered Steps:* A letter a, b, c, etc., added to a step number in Parts 3 and 4 of this section, indicates an action which may or may not be required depending on 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 of each item are covered in the paragraph indicated by the number in parentheses.

TABLE A

APPARATUS	A	B	C	D	E
Test Set (2.02)	1	1	—	1	—
Head Tel Set or Test Set (2.03)	1	1	—	1	—
Cord (2.04)	1	—	—	—	—
Cord (2.05)	4	4	—	—	—
Cord (2.06)	1	1	—	—	—
Cord (2.07)	—	—	—	1	—
Cord (2.08)	—	—	—	1	1
Tool (2.09)	—	—	—	—	1

2.02 Test set J54701A or J54701B (SD-66073-01) or J94704 (SD-90416-01).

2.03 No. 1011G dial hand test set equipped with No. 2W39A cord assembly consisting of W2CL cord, No. 471A jack, and No. 240A plug.

2.04 Testing cord, W2M cord, 9 feet long, equipped with one No. 310 plug, and two No. 59 cord tips (No. 2W12A cord).

2.05 Patching cord, P3E cord, 6 feet long, equipped with two No. 310 plugs (No. 3P7A cord).

2.06 Patching cord, P3H cord, 10 feet long, equipped with one No. 240A plug and one No. 310 plug (No. 3P2C cord).

2.07 Testing cord, W2C cord, 10 feet long, equipped with one No. 310 plug and two No. 59 cord tips (No. 2W6A cord).

2.08 Testing cord, W1B cord, 10 feet long, equipped with one No. 310 plug and one KS-6780 connecting clip and one No. 108 cord tip (No. 1W5A cord).

2.09 No. 375A make-busy tool or No. 477A make-busy tool.

3. PREPARATION

STEP	ACTION	VERIFICATION
	Tests A and B	
1	Establish connections shown in Fig. 1 using either dial hand test set or head telephone set and 3P7A cord or 3P2C cord depending on where line finder test jacks are located.	
2a	If dial hand test set is used, operate the following keys on test set: TEST SET — KEY OPERATED SD-90416-01 — HS SD-66073-01 — TRS	
3a	Operate dial hand test set switch to TALK position.	
4b	If test set per SD-90416-01 is used — Operate PBX key.	

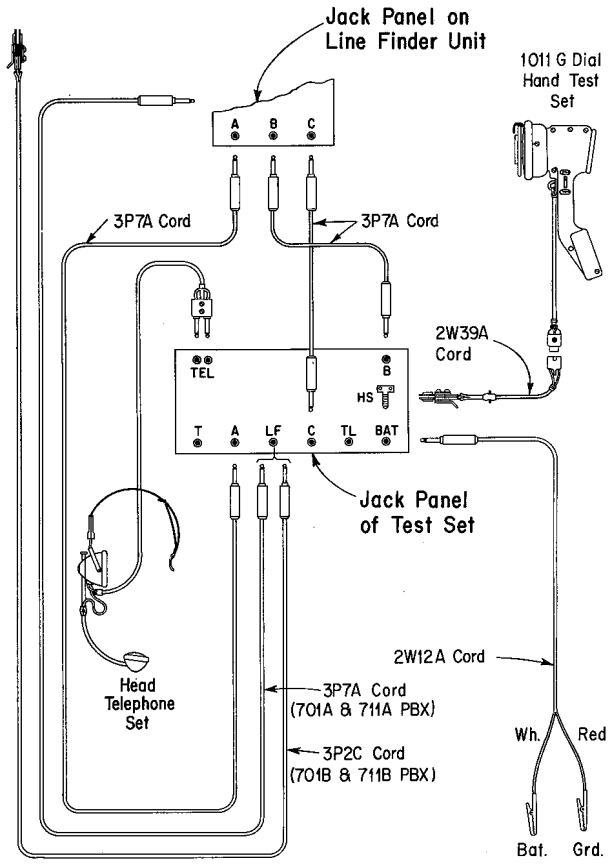

Fig. 1

4. METHOD

STEP	ACTION	VERIFICATION
	A. Operation Test	
5	Connect LF jack of test set to test jack of line finder being tested.	
6	Operate LP key.	Line finder operates smoothly and stops on terminals of test line. Dial tone heard.
7	Dial digit.	Dial tone removed.
8	Restore LP key.	Line finder restores to normal.
9	Remove 3P7A or 3P2C cord from line finder test jack.	
10	Repeat Steps 5 through 9 for each line finder to be tested.	
11	Restore all keys, remove all cords.	

STEP	ACTION	VERIFICATION
	B. Restricted Service Test	
	Using Test Set per SD-90416-01	
5	Connect LF jack of test set to test jack of line finder being tested.	
6	Operate SW key and then LK key.	Line finder operates smoothly and stops on terminal of test line. Dial tone heard.
7	Restore SW key.	
8	Dial restricted level.	Busy tone heard.
9	Restore LK key.	Line finder restores to normal.
10	Repeat Steps 6 and 7.	
11	Dial level above or below restricted level.	Busy tone not heard.
12	Restore LK key.	Line finder restores to normal.
13	Remove 3P7A or 3P2C cord from line finder test jack.	
14	Repeat Steps 5 through 13 for each line finder to be tested.	
15	Restore all keys, remove all cords.	
	Using Test Set per SD-66073-01	
16	Connect LF jack of test set to test jack of line finder being tested.	
17	Operate RS key and then LK key.	Line finder operates smoothly and stops on terminal of test line. Dial tone heard.. RS lamp lights.
18	Restore RS key.	
19	Dial restricted level.	Busy tone heard.
20	Restore LK key.	Line finder returns to normal. RS lamp extinguished.
21	Repeat Steps 17 and 18.	
22	Dial level above or below restricted level.	Busy tone not heard.
23	Restore LK key.	Line finder restores to normal.
24	Remove 3P7A or 3P2C cord from line finder test jack.	
25	Repeat Steps 16 through 24 for each line finder to be tested.	
26	Restore all keys, remove all cords.	

STEP	ACTION	VERIFICATION

C. Group and Chain Circuit Test

Note: The call block alarm may operate during this test. The restoral of the TST key at the end of the test should release the alarm. Where the alarms are extended to the attendant position or the central office, notify the proper persons to disregard the alarms until further notice.

1 Operate TST key.

Each idle line finder, in turn, beginning with No. 1, steps to the proper level as indicated in Table B, then rotates to the tenth step and releases.

TABLE B

LEVEL CUT IN	NUMBER OF LINE FINDERS			
	9	20	29	44
	SWITCH NUMBER			
1	1	1, 11	1, 11, 21	1, 11, 21, 31, 41
2		10, 20	10, 20	10, 20, 30, 40
3	9	9, 19	9, 19, 29	9, 19, 29, 39
4	8	8, 18	8, 18, 28	8, 18, 28, 38
5	7	7, 17	7, 17, 27	7, 17, 27, 37
6	6	6, 16	6, 16, 26	6, 16, 26, 36
7	5	5, 15	5, 15, 25	5, 15, 25, 35
8	4	4, 14	4, 14, 24	4, 14, 24, 34, 44
9	3	3, 13	3, 13, 23	3, 13, 23, 33, 43
10	2	2, 12	2, 12, 22	2, 12, 22, 32, 42

2 Restore TST key to normal after cycle is completed.

Note: The beginning point of the line finder group and chain circuit test depends on the first equipped lines, for example, when station line circuits 11-10 are not equipped the TST key is wired to the G group relay which is controlled by station line next in numerical order (21-20). Therefore the first switch to be seized is the lowest numbered on whose first level are lines served by the G relay operated by the TST key.

Example:

SW UNIT	LEVEL CUT IN
2, 12	1
1, 11	2
10	3
9	4
8, 18	5
7, 17	6
6, 16	7
5, 15	8
4, 14	9
3, 13	10

STEP	ACTION	VERIFICATION

D. Particular Station Line Test

1 Establish connections shown in Fig. 2 using either dial hand test set or head telephone set.

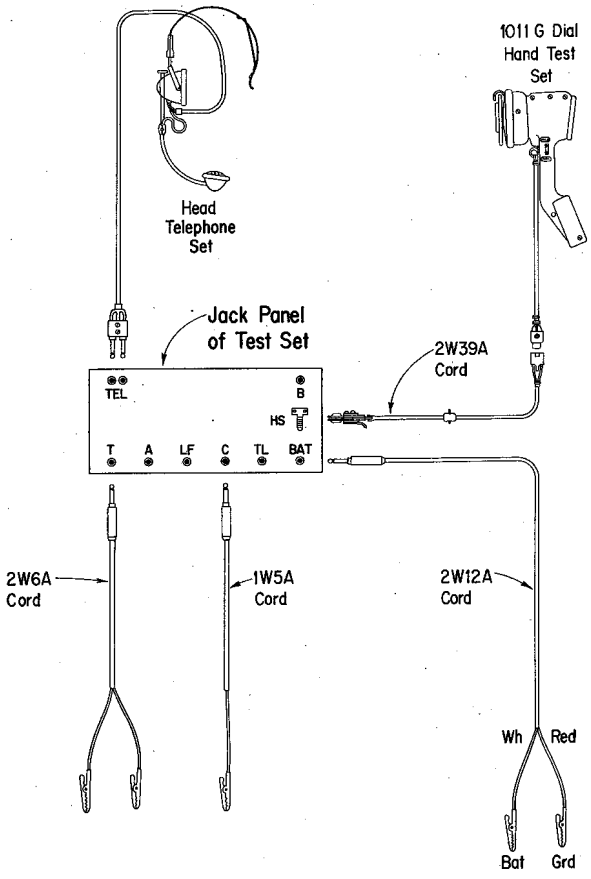

Fig. 2

2a If dial hand test set is used, operate the following keys on test set:

TEST SET	KEY OPERATED
SD-90416-01	**HS**
SD-66073-01	**TRS**

3a Operate dial hand test set switch to TALK position.

4b If test set per SD-90416-01 is used —
Operate PBX key.

5 Connect connecting clip of 1W5A cord to sleeve terminal of line under test.

If BSY lamp lights —
Defer test until station line is idle.

STEP	ACTION	VERIFICATION
6	When BSY lamp is not lighted — Connect 59 cord tips of 2W6A cord to tip and ring terminals of station line under test at frame terminal block.	
7	Operate LK key.	PBX dial tone heard.
8	Dial a central office trunk level.	In dial area — Central office dial tone heard. In manual area — Operator answers. If line under test is wired for restricted service on central office trunk level dialed — Busy tone heard.
9	Restore LK key.	Line finder restores to normal.
10	Operate LK key.	PBX dial tone heard.
11	Dial number of line under test.	Busy tone heard.
12	Restore LK key.	
13	Restore all keys, remove all cords.	

E. Make Busy from Circuit Beyond

1	Insert 375A or 477A tool into monitor jack of line finder two or three times in slow succession. ***Caution: Do not short-circuit the monitor jack of any line finder that is off normal. If the line finder starts to operate at the instant the tool is inserted immediately remove the tool.***	D relay operates and releases with each insertion and removal. Verify by sound.