LINE CIRCUITS AND LINE FINDERS - OPERATION TESTS
740E PBX

1. GENERAL

1.01 This section describes a method of testing the operating features of line finders in a No. 740E P B X and a method of testing the dial station line circuits on an individual circuit basis. Test set circuit, SD-66073-01 (J54701B), is used for line finder, restricted service, and station line tests. The section also covers the purpose of each test.

1.02 The tests covered are:

(A) Line Finder Operation
(B) Restricted Service
(C) Group and Chain Circuit
(D) Make Busy from Circuit Beyond
(E) Particular Station Line Circuit

1.03 Test (B) should preferably be made during periods of light traffic.

1.04 Test (E) is intended primarily for tests where service reports are involved.

1.05 The test of the jack circuit associated with the dial station line circuit is included in the sections covering line circuits of manual switchboards used with the No. 740E P B X These sections also cover the manual station line circuits with connector bank terminal connections.

2. APPARATUS

Tests (A), (B) and (E)

2.01 Test set J54701B (SD-66073-01).

2.02 Test telephone set (part of test set),
or
No. 1011G dial hand test set equipped with a 2W39A cord assembly consisting of a W2CL cord, a No. 471A jack and a No. 240A plug.

2.03 Testing cord—One W2M cord, 9 feet long, equipped with one No. 310 plug (2W12A cord) (black cord for use in establishing test circuit battery and ground connections).

Tests (A) and (B)

2.04 Patching cords—Three P3E cords, 6 feet long, equipped with two No. 310 plugs (3P7A cord).

Test (D)

2.05 One No. 477A (or No. 375A) (make busy) tool.

Test (E)

2.06 Testing cord—One W1B cord, 10 feet long, equipped with one No. 310 plug (1W5A cord).

2.07 Testing cord—One W2C cord, 10 feet long, equipped with one No. 310 plug (2W6A cord) (green cord for use in establishing test connections to station line terminals).

3. PREPARATION

Tests (A), (B) and (E)

3.01 Locate the test set at the line finder side of the line frame. Operate the 740E key in the test set.

3.02 Connect the black testing cord to the BAT jack of the test set. Then, connect the No. 59 cord tip on the sleeve conductor (red) to ground, and connect the No. 59 cord tip on the tip conductor (white) to the equipment end of a fuse on the fuse panel.

3.03 Connect the test telephone set to the TEL jacks of the test set, or connect the dial hand test set to the HS jack of the test set.

Note 1: **When using a dial hand test set,** operate the TRS (transmitter) key on the test set, operate the switch of the hand set to the TALK position, and use the hand set dial instead of the test set dial in making tests. Also operate the switch of the cord assembly to the ON position and leave it in this position for the duration of the test.

Note 2: **When using the test telephone set,** leave the TRS key in the normal position except when found necessary to talk over the test line.

Tests (A) and (B)

3.04 Using a patching cord, connect the A jack of the test set to the TST A jack of the line finder jack panel.

3.05 Using a patching cord, connect the C jack of the test set to the TST C jack of the line finder jack panel.

3.06 Connect one plug of a patching cord to the LF jack of the test set.

4. METHOD

(A) Line Finder Operation

4.01 This test checks the ability of the line finder to hunt and find the test line terminal and to cut through to the associated selector.

4.02 First note that the line finder to be tested is normal. Then using the patching cord connected to the LF jack, plug into the L FDR jack on the jack panel for the line finder under test.

4.03 Operate the LP (loop) key on the test set. Observe that the line finder operates smoothly and stops on the test line terminal. Then, immediately disconnect the plug from the TST C jack.

4.04 Note that dial tone is heard in the receiver. Dial a digit and note that dial tone is removed.

Note: **In a 2 digit P B X** dial a connector level. **In a 3 digit P B X,** dial a selector level having access to connectors.

4.05 Restore the LP key to normal and observe that the line finder restores to normal.

4.06 If other switches in the group are to be tested, reinsert the patching cord plug into the TST C jack. Then, remove the plug from the L FDR jack of the line finder tested.

4.07 When testing is completed, remove all testing and patching cords used for the test.

(B) Restricted Service

4.08 This test checks that the restricted service indication is transmitted through the line finder from the line circuit to the selector.

4.09 First note that the line finder to be tested is normal. Then using the patching cord connected to the LF jack, plug into the L FDR jack at the jack panel for the line finder under test.

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4.10 Operate the RS (restricted service) and LK (leak) keys at the test set. Observe that the line finder operates smoothly and stops on the test line terminal. Observe that the RS (restricted service) lamp in the test set is lighted, and note that dial tone is heard in the receiver.

Note: Where ground on the commutator of the test line level interferes with service (preventing line finders stepping above the test line level), disconnect the patching cord from the TST C jack to permit service. Reconnect the cord before proceeding with the test.

4.11 Dial a restricted level. Note that dial tone is removed and that busy tone is heard.

Note: If the test is made at a time other than light traffic, there is the possibility that all trunks may be busy, and the check of the restricted service feature is not made. In case of doubt, a visual check of the number of selectors or selector connectors dialed to the restricted level should be made to determine that all trunks are not busy.

4.12 Restore the LK key to normal. Observe that the line finder restores to normal and that the RS lamp is extinguished.

4.13 If other switches in the group are to be tested, remove the plug from the L FDR jack of the line finder tested. If not, remove all testing and patching cords used for the test.

(C) Group and Chain Circuit

4.14 This test checks the ability of the line finders in the group to start hunting in sequence, and it checks that the multiple chain circuit is opened when all line finders are busy.

4.15 Operate the group test TST (test) key located on the line finder jack panel. Observe that each idle line finder in turn, beginning with No. 1, steps to the level indicated below, then rotates to the tenth terminal and releases.

SEQUENCE OF OPERATION

Switch No.	Level Cut in
1, 11	1
10	2
9	3
8, 18	4
7, 17	5
6, 16	6
5, 15	7
4, 14	8
3, 13	9
2, 12	10

Note: If a subscriber originates a call while the TST key is operated, the test may be momentarily interrupted while a line finder seizes the calling line, after which the operation of the line finders will continue. The operation of a line finder due to a calling subscriber will usually be indicated by the line finder operating and not releasing, and the other idle line finders continuing to operate and release in the proper order.

4.16 If no failure is encountered, the last switch in the group opens the multiple chain circuit. This is indicated by the first line finder again operating. When this occurs, restore the TST key.

(D) Make Busy from Circuit Beyond

4.17 This test checks that the line finder is made busy if the associated switch (selector or selector connector) is made busy. This test is made from the monitor jack of the line finder.

4.18 Insert the No. 477A tool into the monitor jack of the line finder two or three times in slow succession. Check by sound that only the D relay operates and releases with each insertion and removal of the tool.

Caution: Do not insert the tool in the monitor jack of any line finder that is off normal. If the line finder starts to hunt at the instant the tool is inserted, immediately remove the tool.

(E) Particular Station Line Circuit

4.19 This test checks the operation of the dial station line circuit and its ability to operate properly with a line finder. It also checks the sleeve connection to connector banks. It does not cover the associated station jack circuit located at the P.B.X. switchboard.

4.20 Using the single conductor testing cord, connect the C jack of the test set to the CS punching of the LINE terminal strip of the station line under test. Observe that the BSY (busy) lamp of the test set is extinguished. If the BSY lamp is lighted, wait until it is extinguished or defer the test until the line becomes idle.

4.21 Using the green testing cord, connect the T jack of the test set to the T and R punchings of the LINE terminal strip. Operate the LP key on the test set. Observe that the line finder finds the line, that the BSY lamp is lighted, and that dial tone is heard in the receiver. Also, note that no other line finder is falsely started.

4.22 Dial the central office trunk level. Dependent upon line circuit under test and the type of connecting central office, check that one of the following conditions is obtained:

(a) **Dial tone** heard where the connecting central office is of the dial type.

(b) **The answer of an operator** heard where the connecting central office is of the manual type. Advise the operator that it is a test call.

(c) **Busy tone** heard if the line being tested is arranged for restricted service (ground on RS punching of the LINE terminal strip). See note under 4.11.

4.23 Restore the LP key to normal. Observe that the line finder returns to its normal position and that the BSY lamp is extinguished.

4.24 Operate the LK key of the test set. Observe that the line finder again finds the line, that the BSY lamp is lighted, and that dial tone is heard in the receiver. Dial the number of the line under test and note that busy tone is received.

4.25 Restore the LK key to normal. Observe that the line finder returns to its normal position and that the BSY lamp is extinguished.

4.26 Disconnect the testing cords from the line and the test set.

5. REPORTS

5.01 The required record of these tests should be entered on the proper form.