

**TROUBLE LOCATION TESTS
ON SUBSCRIBER CABLE PAIRS
USING VOICE-FREQUENCY SWEEP TEST SETS
AT #14 TEST DESKS OR EQUIVALENT**

1. GENERAL

1.01 This section describes the procedures for making voice-frequency sweep tests on subscriber cable pairs at #14 Test Desks or equivalent.

1.02 The general theory of sweep testing is described in Section 330-450-100. Its application to subscriber loops is discussed in Section 330-450-102. The analysis and interpretation of sweep patterns as needed for precision location of transmission troubles is described in Section 330-450-507.

2. APPARATUS

2.01 The following items of equipment are required for all tests:

- (1) Voice-Frequency Sweep Test Set meeting the general requirements in Section 330-450-100.
- (2) Accessory Arrangement of 565GK Telephone Set per Section 330-450-102, Figs. 1-3. (Furnish locally.)
- (3) Decade Capacitor — 3 decade, .001-1.110 μ f range, 1% accuracy, 7A, General Radio 1419A or equivalent.
- (4) Cord, P3E, 3 ft., equipped with one 310 plug and one plug to match sweep set.
- (5) Cord, P3E, 3 ft., equipped with two 310 plugs (3P7B).
- (6) Cord P3N, 6 ft., equipped with one 310 plug and one 241A plug (3P17B).
- (7) Local Test Desk position, 14 type or equivalent.

(8) Noise Measuring Set — J94003A (3A) equipped with 497A network. (Refer to Section 103-611-100.)

2.02 The following item is required for some trouble location tests as described in Section 330-450-507:

Artificial Cable Kit — Western Electric 1A ACK or equivalent.

2.03 The sweep set requires a 117V AC power outlet and ground, or it should be equipped with a 3-wire power cord. The telephone set lamps may be activated with AC power by providing a 2012A transformer wired locally as indicated in Fig. 1 of Section 330-450-102.

2.04 It will usually be most convenient to arrange the test apparatus on a table or cart that can be readily moved out of the way as necessary for other operations. More accurate tests will result if the sweep set is positioned to permit direct viewing. Viewing from an angle may cause errors.

3. PREPARATIONS FOR TESTING

3.01 Connect the test apparatus as shown in Fig. 1. The numbers on the figure refer to the items in the apparatus list.

3.02 Connect the sweep test set to a suitable ground and plug the power cord into a 117V AC outlet. When the set has warmed up sufficiently, calibrate it in accordance with the manufacturer's manual.

Note: Do not allow the spot to stand in one location for extended periods of time as holes may be permanently burned in the coating on the face of the scope.

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3.03 The handset remains on-hook, and the exclusion key is normal (down) for all tests. Tests are normally made without ringing on the line (open circuit).

3.04 The sweep set is adjusted for impedance measurement or as required for each test.

4. TEST PROCEDURE

(A) To Seize a Loop Through Test Trunk

4.01 Operate the DIAL button on the telephone set.

4.02 Operate the test desk dial key. Requirement: Supervisory lamp lights.

4.03 Connect the P3E cord from the LINE jack of the telephone set to the test trunk jack. Requirement: Supervisory lamp is extinguished.

4.04 Dial the telephone number of the desired line.

Note: If the lamp lights before dialing is completed, the test connector is busy. If the lamp lights after dialing is complete, the line is busy.

4.05 Restore the test desk dial key to normal. Operate the TEST PAIR button on the telephone set. The characteristic curve of the line appears on the sweep set. To monitor the line at any time, depress the DIAL button again.

4.06 When testing is complete, release the line by operating the desk 3WO key.

Note: Do not put any pairs out of service or make connections at the frame if special safeguarding measures (SSM) or special service protection (SSP) devices are installed, unless a circuit release has been obtained.

(B) To Seize a Loop Through MDF Trunk

4.07 Operate the TEST PAIR key on the telephone set.

4.08 Connect the P3E cord from the LINE jack on the telephone set to the MDF trunk jack and request the desired pair to be connected at the main frame. When the connection is completed, the transmission characteristic curve of the line will appear on the sweep set.

4.09 When testing is complete, request that the pair be restored to service at the main frame.

(C) To Perform Other Tests

4.10 With the pair seized and the TEST PAIR button operated, it may be necessary to make other tests. To measure tip-ground characteristics, operate the TEST TIP button on the telephone set. To measure ring-ground characteristics, operate the TEST RING button on the telephone set.

4.11 To make shunt capacitance measurements, operate the CAL button on the telephone set. The decade capacitor is connected to the sweep set in place of the pair. The procedure for measurement of shunt capacitance and conversion of measurements to pair length is described in Section 330-450-507.

4.12 If noise measurements are requested, operate the NMS key of the telephone set. The 3A NMS is connected to the pair in place of the sweep set. The function switch of the NMS should be set to 900. The receiver of the NMS may be used as a monitor.

4.13 The C MSG network is used in the 3A NMS for noise measurements. When a widening of the sweep trace due to noise is noted, noise measurements may be made first with the C MSG network and then with the 3KC FLAT network. Differences of 15 db or more would indicate the widening of the sweep trace may be caused by 60CPS induced voltage.

