

**TROUBLE LOCATION TESTS  
ON SUBSCRIBER CABLE PAIRS  
USING VOICE-FREQUENCY SWEEP TEST SETS  
AT TEST TRUNK RINGING CIRCUIT APPEARANCES  
AT THE MAIN FRAME**

**1. GENERAL**

**1.01** This section describes the procedures for making voice-frequency sweep tests on subscriber cable pairs at the office main distributing frame by lifting the remote reference trunk and inserting test equipment. This type of test procedure may be used in an office arranged to function with a remote local test desk.

**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 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 decades, .001-1.110 MF range, 1% accuracy, 7A, G.R. 1419A or equivalent.
- (4) Cord, P3E, 3 ft., equipped with one 310 plug and one plug to match sweep set.
- (5) Cord, P3N, 6 ft., equipped with one 310 plug and one 241A plug (3P17B).
- (6) Test cord equipped with one 310 plug and three insulated alligator clips.
- (7) 3A Noise Measuring Set (see Section 103-611-100).

(8) 96A Test Set (see Section 106-230-105).

(9) Cord, 3W1A.

**2.02** The following item is required for trouble location tests per 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 suitable ground, or it may be equipped with a three-wire power cord. The telephone set lamps may be activated 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 cart that can be readily moved out of the way as necessary for other operations. The sweep set should be arranged for direct viewing to prevent reading 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 on the scope face for extended periods of time.

**3.03** The handset is used to place all test calls. The exclusion key is used to provide the proper sleeve condition to hold the connection during testing.

**3.04** A release must be obtained on the remote reference trunk. This trunk is then removed from service by removing the remote end protectors. The handset arrangement is then connected in its place.

**3.05** The sweep set is adjusted for impedance measurement or as required for the tests.

**4. TEST PROCEDURE**

**(A) To Seize a Loop**

**4.01** Remove the handset from hook and dial the telephone number for the desired line. Listen for idle line condition (no call in progress) and lift the exclusion key to hold the connection (requires connection to -48V battery and ground per Fig. 1 for proper sleeve condition).

**4.02** Operate the TEST PAIR button on the telephone set. The characteristic curve will appear on the sweep set.

**4.03** After testing is complete, hang up the handset to release the connection.

**(B) To Perform Other Tests**

**4.04** With the pair seized and the TEST PAIR button operated, it may be necessary to make other tests. To measure tip-ground char-

acteristics, operate the TEST TIP button on the telephone set. To measure ring-ground characteristics, operate the TEST RING button on the telephone set.

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

**4.06** 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.

**4.07** 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 3 KC FLAT network. An increase of 15 db or more with 3 KC FLAT weighting would indicate the widening of the sweep trace may be caused by 60 cps voltage induced in the pair.

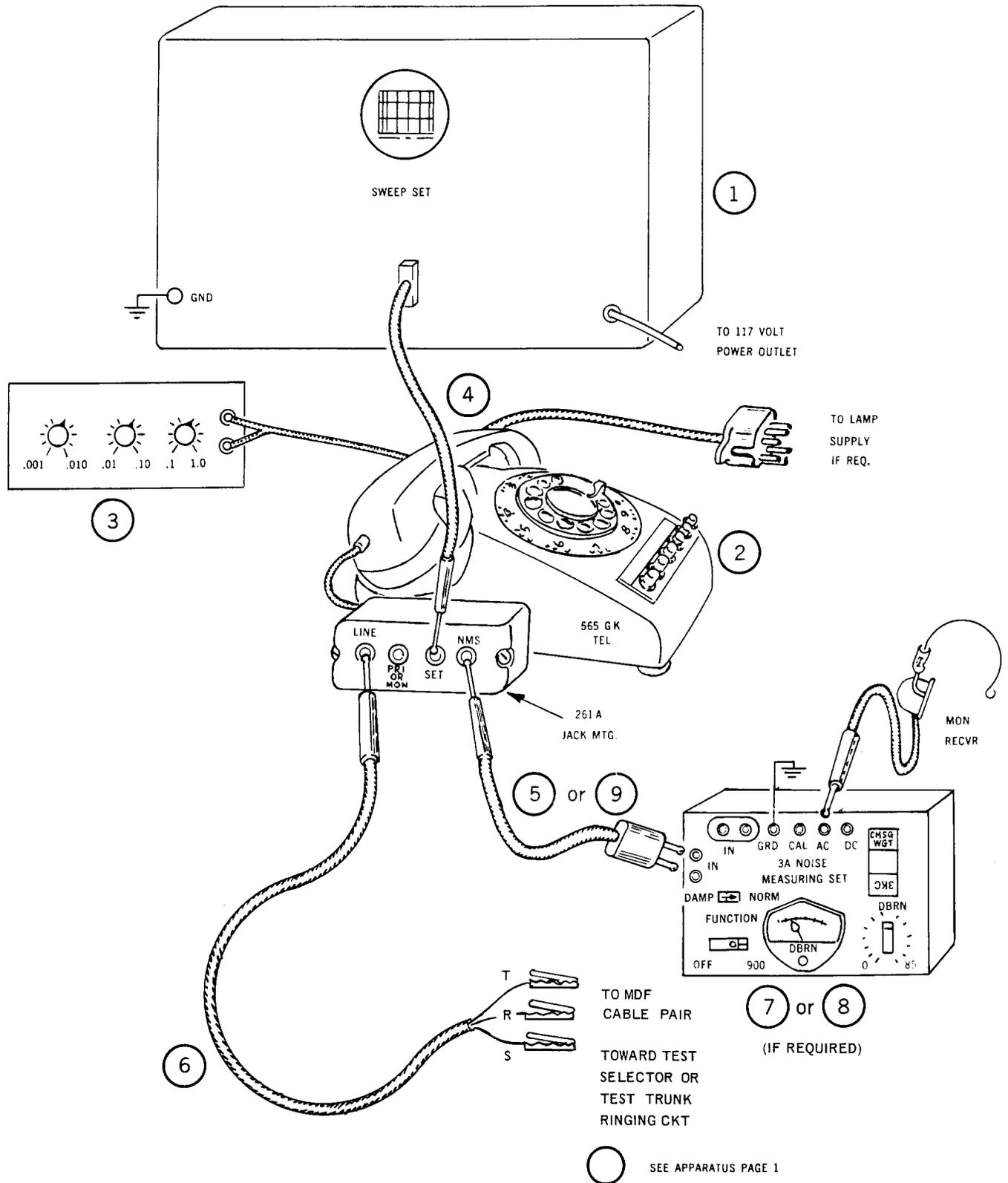


Fig. 1