DESCRIPTION OF OPERATION

Linefinder Continuity Test Set (Circuit EE-SC-9812)

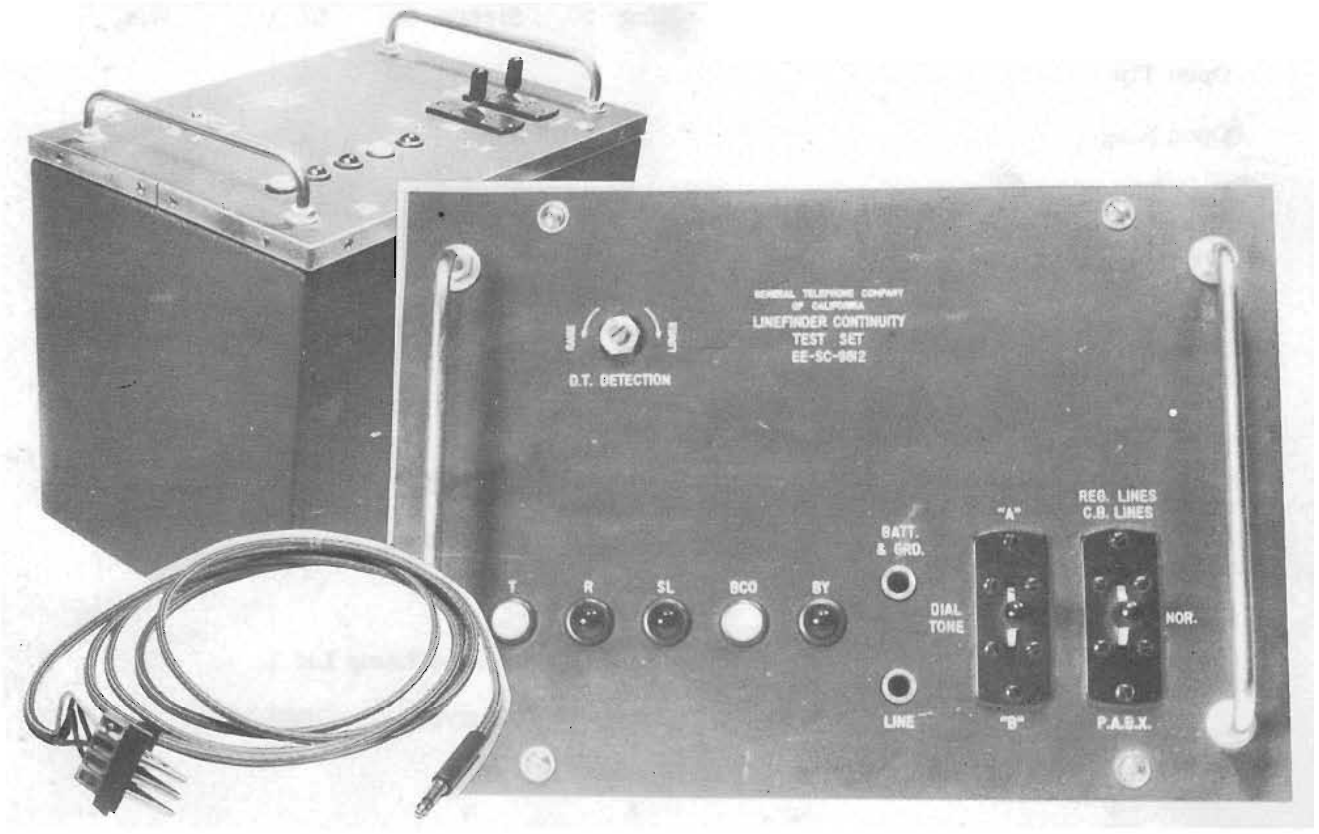

Fig. 1. Views of Linefinder Continuity Test Set To Show Location of the Lamps, Jacks, Keys and Dial Tone Detection Potentiometer. The Test Cord is Also Shown.

1. GENERAL

1.01 This Practice describes the linefinder continuity test set (EE-AM-9812). See Fig. 1.

1.02 The circuit provides:

A. A means for automatic seizure and release of the linefinder.

B. A means for testing the tip, ring and sleeve for continuity.

C. A means for testing the tip, ring and sleeve for polarity.

D. A means for checking the operate adjustment of the line relay.

E. A means for testing the tip, ring and sleeve for crosses.

F. A means for stopping the tests wherein trouble is encountered.

G. A means for indicating the type of trouble encountered.

H. A means for testing for dial tone.

I. A means for testing linefinder switches used with coin box repeaters.

J. A means for testing PABX lines.

1.03 The test set should not be used unless the office voltage is 49.9 volts.

Trouble between the terminal block and the line cut-off relays.

Indicated Trouble	(x) Indicates Lamps Lit				
	Tip	Ring	Sleeve	BCO	Busy
Open Tip				x	
Open Ring				x	
Open Sleeve					(Note 1)
X'd Ring and Sleeve	x		x		
X'd Tip and Sleeve	Busy condition shown with start key normal.				
Rev. Polarity				(Note 2)	

Trouble between the linefinder and the primary selector.
Trouble between the linefinder and the coin box repeater.
Trouble between the linefinder banks and the line and cut-off relays.
(See Note 4.)

Indicated Trouble	(x) Indicates Lamp Lit				
	Tip	Ring	Sleeve	BCO	Busy
Open Tip		x	x		
Open Ring	x		x		
Open Sleeve				(Note 2)	
X'd Ring and Sleeve	x		x		
X'd Tip and Sleeve					(Note 3)
Rev. Polarity (Sel)			x		
Rev. Polarity (CB)	(Flashing)	x	x		

Busy lamp lit with Start key at normal shows sleeve is grounded.
Coin Box lines - open tip or ring between the coin box repeater and the first selector, set will stop and show tip, ring and sleeve continuity.
No Dial Tone Indication - Set will stop and show tip, ring and sleeve continuity.

Note 1. Set will not start. (No BCO battery on sleeve).
Note 2. Linefinder will release and set will stop showing only BCO lamp lit.
Note 3. Same condition occurs, if subscriber seizes line during the time the test is beingperformed.
Note 4. On an open sleeve, the linefinder will not stop on the line and the test set will not lock up. An open sleeve can only be determined by observation of the linefinder.

Fig. 2.

1.04 See Fig. 2 for the lamps which are lit when a case of trouble is encountered. Each lamp pattern may indicate more than one type of trouble. However, only the type of trouble more likely to be encountered is shown in Fig. 2 for each lamp pattern.

1.05 Practice reissued to reflect modification made on test set. Fig. 2 shows changes in lamps lit for reverse polarity between linefinder and coin box repeater.

2. RELAY FUNCTIONS

2.01 BCO RELAY - It tests for BCO battery on the sleeve. It starts the test set. It lights the BCO lamp until the SL relay operates. It connects 1650Ω seizure loop to the line relay.

2.02 SL RELAY - It operates from a ground returned on the sleeve when the line relay operates. It lights the SLEEVE lamp. It transfers the holding circuit from the 1650Ω loop to a battery and ground bridge. It prepares part of the operate path for the D relay.

2.03 R RELAY - It operates to indicate continuity and correct polarity for the ring-side of the line. It lights the RING lamp. It prepares part of the operate path for the D relay.

2.04 T RELAY - It operates to indicate continuity and correct polarity for the tip side of the line. It lights the TIP lamp. It prepares part of the operate path for the D relay.

2.05 S RELAY - It operates from a ground returned on the sleeve. It locks up to a ground thru the springs on the D relay. It keeps line seizure loop open. This prevents the set from reoperating when an open sleeve condition is encountered between the linefinder and the selector.

2.06 D RELAY - It opens holding bridge from tip and ring. It releases the S and BCO relays.

2.07 DT RELAY - It operates from voltage received and amplified by the dial tone detection unit. It completes an operate path to the D relay when no trouble has been encountered.

3. CIRCUIT DESCRIPTION

Testing Regular or Coin Box Lines

3.01 Using the 2W12A cord assembly connect the battery and ground jack on the test set to a battery and ground source. Connect the white lead clip to the load side of a negative battery fuse. Connect the red lead clip to a positive battery (ground) bus. Connect clips to a battery and ground block when provided.

CAUTION: When completing the connection, connect the supply end last. When removing the connection, remove the supply end first. DO NOT obtain ground from a frame assembly.

Busy Line Test (Reg. and C.B. Lines)

3.02 Using the 3WG1V cord assembly connect the line jack to the selected line on the linefinder terminal block. If there is ground on the sleeve of the line under test, (with start key at normal position), the busy lamp lights. The busy lamp lights to indicate a busy line.

Idle Line Tests (Reg. and C.B. Lines)

3.03 If the busy lamp does not light it indicates that the line is idle. Operate the START key to the REG LINE, C.B. LINE position. The BCO battery on the sleeve will operate the BCO relay (of the test set) to close the X spring contacts. The BCO relay locks up to a ground thru springs of the D relay. The BCO relay in operating lights the BCO lamp and connects a 1650Ω seizure loop to the line relay.

Continuity and Polarity Tests

3.04 The line relay operates and places a ground on the sleeve to operate the S and SL relays. The S relay will operate after the SL relay due to the slow to operate feature of the S relay. The SL relay in operating lights the SLEEVE lamp and extinguishes the BCO lamp. The SL relay in operating prepares part of the operating path for the D relay. The SL relay in operating removes the seizure loop (1650Ω) from across the line. The SL relay in operating connects battery in

series with the T relay to the tip side of the line. The SL relay in operating connects ground in series with the R relay to the ring side of the line.

3.05 If no trouble is encountered the T and R relays operate to ground and battery from the line under test. The T relay in operating lights the lamp marked TIP and prepares part of the operate path for the D relay. The T relay in operating lights the lamp marked RING, and prepares part of the operate path for the D relay. The S relay in operating opens the path between the seizure loop (1650Ω) and the line under test.

Dial Tone Detection Test

3.06 When the 1st or primary selector is seized dial tone is returned over the tip or ring side of the line. Dial tone is returned over the tip or ring side of the line depending on two things. First, the type of office; director or non-director. Second, the type of line; paystation or regular.

3.07 Operate the DIAL TONE key to the A or B position depending on the type of equipment in the central office being tested. The dial tone key should be operated to the position shown in Fig. 3. This will connect dial tone to the detection unit.

Central Office	Type of Equipment	Key Position
Director Office	Regular (Includes PABX)	A
Director Office	Coin Box	B
Non-Director Office	Regular (Includes PABX)	B
Non-Director Office	Coin Box	A

Fig. 3.

3.08 When the dial tone is received by the detection unit it is amplified to operate the DT relay. The DT relay in operating completes the path to the D relay, provided no trouble has been encountered. The D relay will operate from ground thru the SL relay springs.

Release

3.09 When the D relay operates it opens the tip and ring side of the line. The D relay in operating removes the locked ground from the S and BCO relays. The L relay, CO relay, linefinder and associated circuits restore to normal. The R, T, S, SL and BCO relays in the test set restore to normal. The test set will not operate until all of the equipment has restored to normal before testing the next linefinder.

Testing PABX Lines

3.10 Using the 2W12A cord assembly connect the battery and ground jack on the test set to a battery and ground source. Connect the white lead clip to the load side of a negative battery fuse. Connect the red lead clip to a positive battery (ground) bus. Connect clips to a battery and ground test block when provided.

CAUTION: When completing the connection, connect the supply end last. When removing the connection, remove the supply end first. DO NOT obtain ground from a frame assembly.

Busy Line Test (PABX Lines)

3.11 Using the 3WG1V cord assembly connect the line jack to the selected line on the linefinder terminal block. If there is ground on the sleeve of the line under test, (with start key at normal position), the busy lamp lights. The busy lamp lights to indicate a busy line.

Idle Line Test (PABX Lines)

3.12 If the busy lamp does not light it indicates that the line is idle. Operate the START key to the PABX position. When the start key is operated to the PABX position a ground is connected to the tip side of the line. The ground is also connected thru the 1650Ω seizure loop in the test set to the ring side of the line. The ground operates the line relay of the line under test.

Continuity and Polarity Tests

3.13 The line relay in operating places a ground on the sleeve to operate the S and SL relays. The SL relay in operating removes the ground which operated the line relay.

3.14 Operation of the test set from this point is exactly the same as for the regular and coin box lines. See paragraphs 3.06 thru 3.09.

4. SETTING THE DIAL TONE DETECTION POTENTIOMETER

4.01 Turn potentiometer in a counterclockwise direction so that maximum resistance is inserted into the circuit.

4.02 Operate the START key to the required position. The position to which the key is operated depends on the type of line to be tested. This will cause the linefinder to seize the line.

4.03 Turn potentiometer slowly in a clockwise direction. Turn until the tip, ring and sleeve lamps are extinguished on the test set. Potentiometer should be set so that the test set will not test more than 24 linefinders in 20 seconds.

5. DRAWINGS

5.10 The following drawings are listed for reference only and are not attached to this Practice.

1. EE-SC-9812 Schematic Circuit
2. EE-AM-9812 Assembly Drawing
3. EE-WD-9812 Wiring Diagram
4. EE-CE-9812 Circuit Explanation