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## 24A LOOP CHECKER

### 1. INTRODUCTION

**1.01** This section contains the description, connections, and operating instructions for the 24A loop checker. Also covered is the preparation and use of loop check ticket form E-4948.

**1.02** This section is reissued to include:

- Use of loop check ticket on other than survey basis.
- Illustration of production model loop checker.
- A facsimile of loop check ticket.

- Clarification of LENGTH dial setting in the OVER 18 position.
- Additional information on preparation of loop check ticket.
- Additional information on method of making loop check on coin lines.
- Example of meter needle remaining at extreme left end of yellow scale.

**1.03** Due to extensive changes marginal arrows have been omitted.

### 2. GENERAL

**2.01** The 24A loop checker shown in Fig. 1 provides a visual indication of transmission

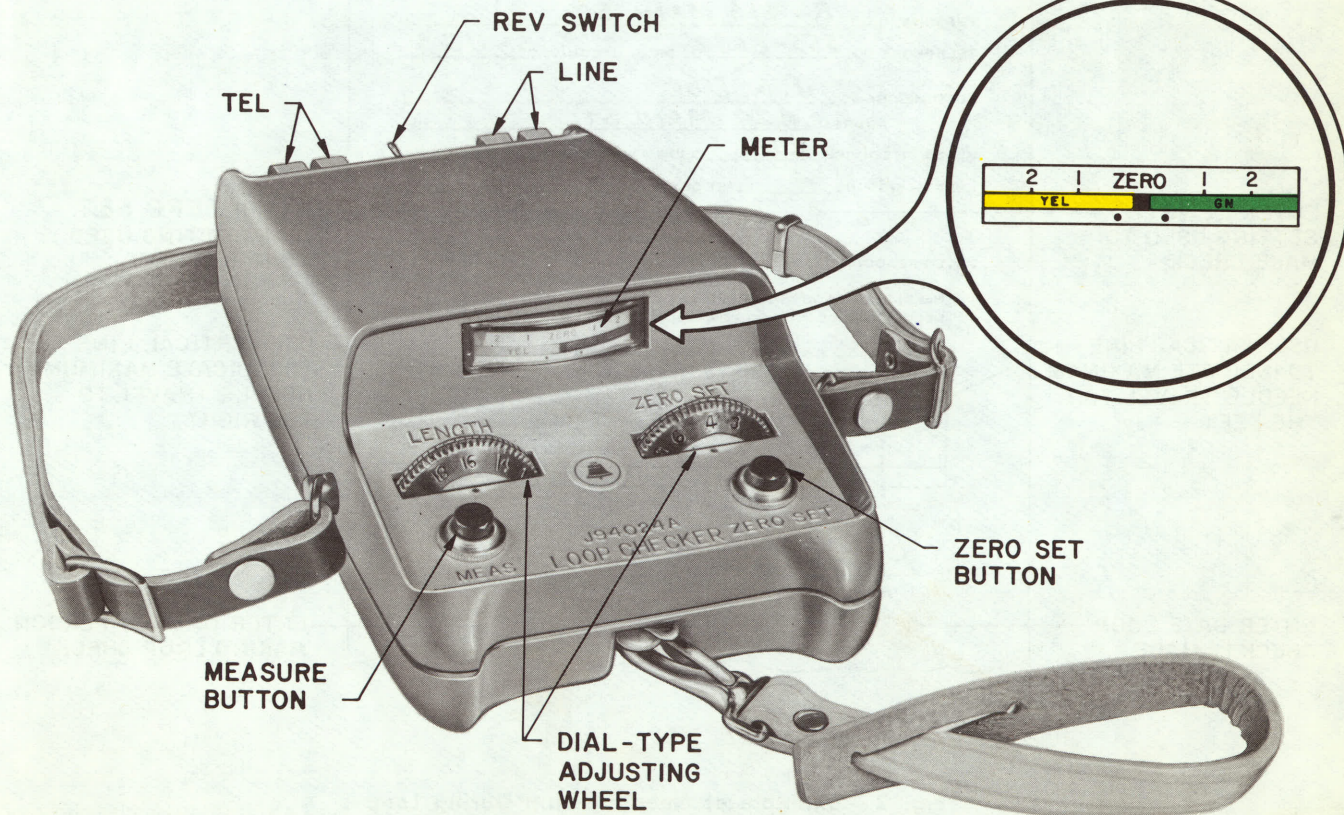


Fig. 1 — 24A Loop Checker

## SECTION 105-280-100

quality of a customer loop from the station to central office. It will test into step-by-step, No. 1, and No. 5 crossbar offices.

**2.02** Loop checks may be made either on a survey basis or on an individual basis.

- On a survey basis, certain spaces of the loop check ticket should be filled in by plant service center forces. These spaces are: Serial No., Cable No., Pair No., B.P., Terminal Loc., Telephone No., Panel and Jack or Dial Equiv., Customer Name, Address,

Class of Service, and Type of Set (see Fig. 2).

- On other than a survey basis (eg, installation or repair visit), the person making the loop check should originate a loop check ticket furnishing the above information.

**2.03** The line can be tested at the terminal or at any convenient point up to the connecting block at the set. However, it is desirable to make the loop check at the connecting block in order to test all of the loop, including drop and inside wire.

PRINTED IN U.S.A. FORM E-4948  
(2-62)

**LOOP CHECK TICKET**  
PLANT DATA

CABLE NO. 12 SERIAL NO. 16  
PAIR NO. 167 B.P. 9  
TERMINAL LOC. R-416 MAIN ST.  
TELEPHONE NO. 555-8642 PANEL & JACK OR DIAL EQUIV. 5-115  
CUSTOMER NAME J. A. DOE  
ADDRESS 420 MAIN ST.  
CLASS OF SERVICE RIF SHOW TYPE OF SET 302  
LENGTH SETTING 4 ZERO SETTING .3  
COULD NOT ZERO SET ☐

**ENTER LENGTH SETTING USED TO MAKE CHECK**

**ENTER ZERO SET DIAL SETTING USED TO MAKE CHECK**

METER READING:  
NEEDLE STAYS WITHIN GREEN AREA ☐  
NEEDLE SWINGS INTO YELLOW AREA ☒

ON A YELLOW READING INDICATE FULL EXTENT OF NEEDLE SWEEP BY USE OF TWO VERTICAL LINES

**USE VERTICAL LINE TO INDICATE MAXIMUM NEEDLE TRAVEL TO THE LEFT**

**USE VERTICAL LINE TO INDICATE MAXIMUM NEEDLE TRAVEL TO THE RIGHT**

2 1 ZERO 1 2  
YEL GN  
YELLOW READING VERIFIED BY RETEST ☒

DATE 9-25-62 CHECKED BY T. C. SMITH

**ENTER DATE LOOP CHECK IS MADE**

**ENTER NAME OF PERSON MAKING LOOP CHECK**

Fig. 2 — Example of Needle Swing During Loop Check, Form E-4948 (Reduced in Size)

**2.04** Setting the LENGTH and ZERO SET dials compensates for loop loss due to length and resistance.

**2.05** The dc power for the set is provided by the line under test. (There are no batteries in the set.)

### 3. DESCRIPTION

**3.01** The loop checker is a small, portable, special-purpose test set enclosed in a plastic case.

**3.02** The set is equipped with a meter whose scale is divided into two colored areas: yellow on the left and green on the right. The black center dividing line between the colored areas is marked ZERO. The calibrating area is between the two black dots on each side of the center line. There are index marks (designated 1 and 2) on both the yellow and green portions of the meter scale. These markings may be used as a guide in evaluating the cause of a yellow reading.

**3.03** On the face of the set are two nonlocking-type pushbuttons labeled MEAS and ZERO SET. Also on the face of the set are two dial-type adjusting wheels labeled LENGTH and ZERO SET, which control sensitivity-adjusting potentiometers.

**3.04** Two pairs of terminals for external connections are located on the rear of the set. One is marked LINE and the other is marked

TEL. A toggle switch marked REV is located between the two pairs of terminals. This switch reverses the polarity of the line to the set.

**3.05** A W2EY cord, a carrying strap, and a neck strap are supplied with the set.

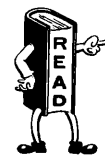
### 4. CALIBRATION

**4.01** There are no provisions for field calibration. To ensure proper operation a standard signal must be applied to the loop checker from time to time as follows:

- (1) Connect line terminals of 24A loop checker to terminals 53 and 54 of the 55D terminal block, located in the central office (usually in the same equipment bay with the 24B loop check generator).
- (2) Set the LENGTH dial to OVER 18. Observe that switch coupled to this control operates (clicks).
- (3) Turn the ZERO SET dial to its maximum counterclockwise position (to mark on dial).
- (4) Depress the MEAS button. If the needle indicates anywhere between the black dots at midscale of the meter, the set should operate satisfactorily.

### 5. CONNECTIONS

**5.01** Connect tip and ring of line under test to binding posts marked LINE. Use a W2EY cord or any convenient pair of wires. Connect 1011-type handset or equivalent to posts marked TEL. TALK-MON switch on handset should be in MON (monitor) position to avoid interference on line. (See Fig. 3.)



*All telephone sets connected to line under test must be on-hook during loop check.*

### 6. OPERATING INSTRUCTIONS

**6.01** Connect loop checker to line under test as described in Part 5. Check loop as follows:

- (1) Determine length setting by referring to a distance zone map.

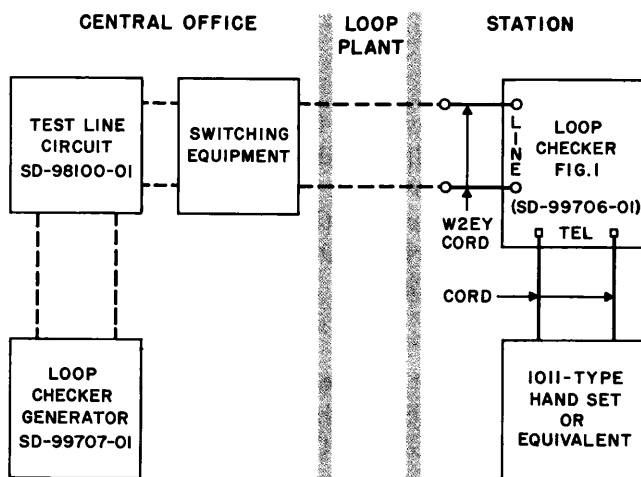


Fig. 3 — Block Diagram



**Note:** This map is a reproduction of a base map with zones circumscribed about the central office. Each zone represents 2000 feet of cable plant from the central office. The zones are designated with an appropriate length setting.

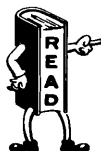
- (2) Set LENGTH dial for length of loop in kilofeet (1000 feet), if length of loop is between 2 and 18 kilofeet. For all loops greater than 18 kilofeet, set LENGTH dial to OVER 18; observe that switch coupled to this control operates (clicks).
- (3) Monitor line, if idle, operate TALK-MON switch on 1011-type handset to TALK position. (Leave in TALK position until measurement has been completed.)
- (4) Dial number assigned to the loop check test line in the central office.
- (5) When connection is established to test line, it is held by 1011-type handset (see Fig. 3). A tone sweeping from 1000 to 3000 cycles can be heard with varying loudness during entire test period.
- (6) Depress ZERO SET button and, while it is held down, adjust ZERO SET dial until needle on meter reads ZERO (midscale). If a reading is not obtained on the meter, operate REV (reversing) key. This reverses the line to the meter and avoids reconnecting and redialing. If after switch is reversed the meter still reads offscale, check line for a high-resistance connection.
- (7) After completing the ZERO setting as covered in Step 6 above, release ZERO SET button and depress MEAS button; observe the meter indications.

**Note:** While the MEAS button is depressed, the loudness of the tone heard in the handset will be reduced.

As the tone applied to the line changes frequency through several sweeping cycles (one cycle takes approximately 6 seconds), the needle will follow the level of the tone.

If needle sweeps into yellow area (to left of midscale), the line does not meet transmission requirements.

The length of scale covered by the meter needle during the sweep may vary depending on make-up of the loop. However, the needle must stay in the green area (to right of midscale) for line to be judged as meeting transmission requirements.



*If any party or extension station goes off-hook during the test, a faulty reading will be obtained and a retest should be made with all stations on-hook.*

## 7. RECORDING DATA ON LOOP CHECK TICKET

**7.01** A loop check ticket (Form E-4948) should be filled in for each loop tested.

**7.02** Settings used on LENGTH and ZERO SET dials should be recorded in spaces provided. This data will be of use in analyzing trouble conditions.

**Note:** In the event that the ZERO SET requirement per Part 6, Step (6) cannot be met, indicate this on the loop check ticket by checking block COULD NOT ZERO SET.

**7.03** If the meter needle stays within the green area of the scale during loop check, indicate this by checking block NEEDLE STAYS WITHIN GREEN AREA.

**7.04** If needle sweeps into yellow area during test, the call should be disconnected and the central office loop check test line should be redialed. This will ensure that a telephone was not taken off-hook during test (either an extension or another party on line).

**7.05** If on retest needle still swings into yellow area, indicate this by checking block NEEDLE SWINGS INTO YELLOW AREA. Also indicate extent of needle swing during loop check by means of two vertical lines as shown in Fig. 2.

METER READING:

NEEDLE STAYS WITHIN GREEN AREA ☐

NEEDLE SWINGS INTO YELLOW AREA ☒

ON A YELLOW READING INDICATE FULL EXTENT OF  
NEEDLE SWEEP BY USE OF TWO VERTICAL LINES

YELLOW READING VERIFIED BY RETEST ☒

DATE 9-25-62 CHECKED BY T.C. SMITH

**Fig. 4 — Example of Needle Remaining at Extreme Left End of Yellow Scale During Loop Check**

**7.06** If the needle stays at extreme left end of yellow scale during generator sweep, indicate this by means of a single vertical line as shown in Fig. 4.

#### **8. CHECKING LOOPS USED FOR DATA TRANSMISSION**

**8.01** On loops used for data transmission (ie, TWX, WADS, DATA-PHONE SERVICE, etc) there may be special line equipment assigned to the loop at the central office, as shown on TWX and WADS circuit layout record card (Form E-4921ML).

**8.02** If a loop is equipped with an E6 or E7 repeater, call plant service center to arrange to have the repeater removed and line cut through before using 24A loop checker.

**8.03** If a loop is equipped with a 1613A inductor or 837A network, the 24A loop checker may be used in the normal manner. However, if needle sweeps into yellow area on initial and retest, arrange to have the 1613A or 837A disconnected and line cut through. Then recheck loop again, recording results of test as described in 7.00.

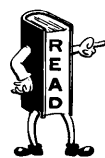
#### **9. SPECIAL SERVICE LINES**

**9.01** Lines equipped with dial impulse repeaters or dial long line circuits cannot be checked with the normal loop checking procedure. Special service lines may have other auxiliary equipment that will not give a true check. Consult circuit layout record or subscriber line circuit card to determine circuit makeup before making loop check. If circuit does not contain auxiliary equipment, make loop check and record results on Form E-4948 as described previously.

#### **10. COIN LINES**

**10.01** A faulty loop check may result on coin lines if coin relay path remains connected during check. To avoid this, the procedure should be as follows:

- (1) Remove coin set upper housing and connect loop checker to line. Connect 1011-type handset to TEL terminals of loop checker.
- (2) Operate TALK-MON switch of 1011-type handset to talk position. Apply ground through a 1000-ohm resistance (eg, 106A type or 111B type) to the ring side of the line. When dial tone is heard in handset, remove ground connection.



*The coin relay ground path must be open (ie, coin relay nonoperated) when adjusting the ZERO SET and when making measurement (when MEAS button is depressed).*

- (3) The loop check can now be made in the same manner as a noncoin line.

