

AT-8592 L1A AND L1B TEST SETS

DESCRIPTION AND USE

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1. GENERAL

1.01 This section provides instructions for testing cable pairs using the AT-8592 L1A and L1B Test Sets. These lightweight portable test sets have been designed for rapidly testing cable pairs on a GO, NO-GO basis at the central office main frame. The tester checks for dc voltage, length, resistance, and capacitance faults. All tests are performed simultaneously and the condition of the pair is indicated by means of colored lamps and audio tones. The test sets operate on commercial 115 volts ac 60 Hz power using a three-conductor cord.

1.02 This section is reissued to:

- Add reference to AT-8592 L1B Test Set
- Change Fig. 2 and Fig. 3
- Replace test cords.

Revision arrows are used to emphasize the more significant changes.

1.03 The test sets are used for:

- Defective pair recovery
- Cable record purification
- Testing the "too" count of cable throws

• Section testing in new construction.

1.04 The AT-8592 L1B Test Set is identical to the AT-8592 L1A Test Set except it does not have the ANA button or ANA input receptacle.

2. DESCRIPTION

2.01 This compact test set (Fig. 1) is approximately 12 inches by 6 inches by 11 inches and weighs about 10 pounds. The metal case of the test set is equipped with a strap for securing to a ladder step. The strap and the test cords, when not in use, are stored in a compartment of the removable cover (Fig. 2). Housed in the metal case are the following circuits:

- (a) A voltage sensing circuit establishes whether the pair has CO battery or is a dry spare. A negative potential greater than 22 volts gives an AMBER light and LOW frequency tone. A battery cross of greater than 22 volts also gives an AMBER light and LOW frequency tone.
- (b) A leakage resistance sensing circuit gives a RED (NO-GO) visual indication and no tone when the resistance to ground from either tip or ring is below 0.5 MΩ or when the resistance across the pair is below 1 MΩ. Either one of two red resistance lamps will indicate if the fault is tip to ground or ring to ground. If the resistance to ground is less than 200K, the red capacitance light will also come on. A tip to ring fault will cause both red resistance lamps to come on.
- (c) The capacitance balance sensing circuit detects opens and crosses by comparing the capacitance of each side to ground. An unbalance greater than ±(5 percent + 500 feet) gives a RED capacitance fault light and no tone.
- (d) The length measuring circuit compares the ring to ground capacitance with an adjustable

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internal standard when the length is "set in." Due to expected variations in cable capacitance, this set has been designed to accept pairs whose length is between the "set in" value and 1 to 3 kilofeet longer than the "set in" value. A length error gives no tone and the length indicator lamps indicate if the pair is longer or shorter than the "set in" value. The cable pair is measured by changing the length indicator setting until the short lamp comes on and then slowly changing the indicator setting until the short lamp goes out and the green lamp and H.F. tone

just comes on. The length measurement is based on a "standard" cable capacitance of $0.083 \mu\text{F}$ per mile. When the capacitance is other than $0.083 \mu\text{F}$ per mile, the length indicator will give only a RELATIVE indication of the pair length. A pair good on all tests gives a GREEN (GO) light and HIGH frequency tone.

(e) A neon lamp across the cable pair is used to indicate a generator pair or a foreign voltage greater than 65 volts ac or 95 volts dc.

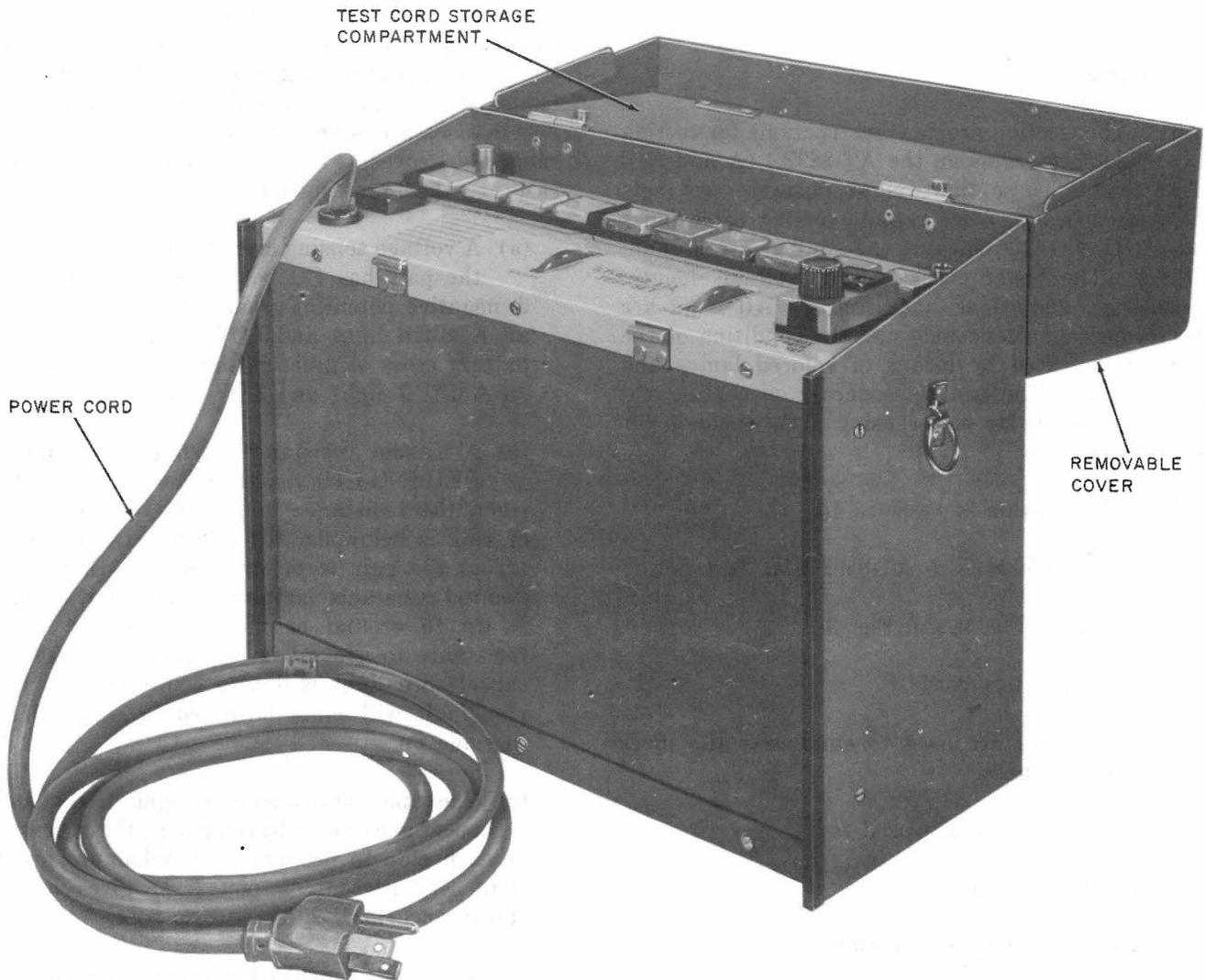


Fig. 1—AT-8592 Pair Tester

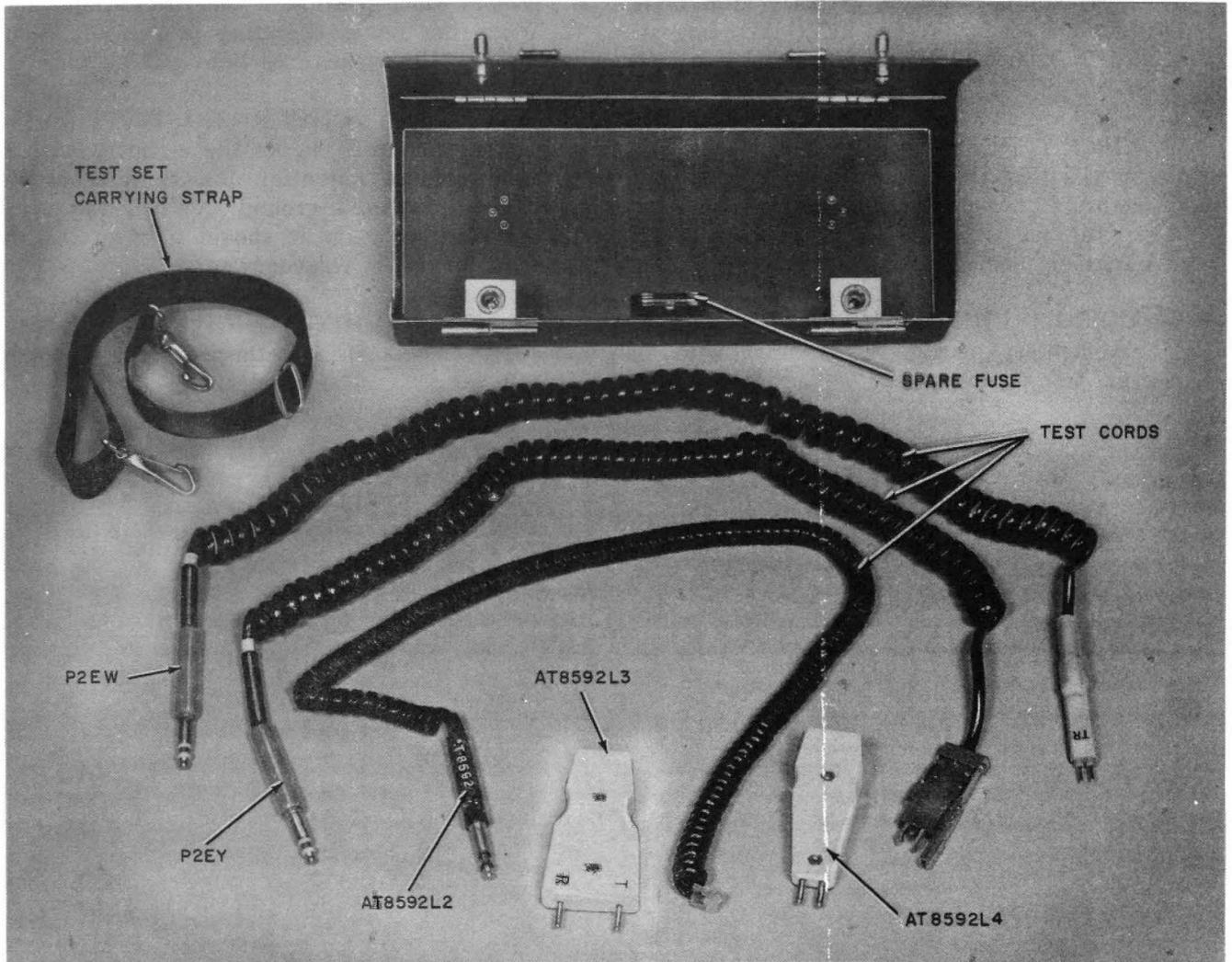


Fig. 2—▶Test Cords and Removable Cover◀

2.02 The following controls are located on the front panel of the set (Fig. 3)

- (a) ON-OFF button (push on—push off) applies power for normal operation.
- (b) ANA button (push on—push off) is not functional without an ANA adapter connected to the ANA input jack. This adapter will be available in the future as a separate test set item ▶(AT-8592 L1A only).◀
- (c) Monitor button (push on—push off) connects a cable pair to the speaker through a high impedance amplifier and is used when it is

necessary to get an indication of signal or noise on the pair.

- (d) DISABLE LENGTH TEST button (push on—push off) disables only the longer portion of the length test. All other tests—voltage, resistance, and capacitance balance are unaffected. When the button is pushed to the IN position, a good pair which is longer than the “set in” value gives a GREEN light and high frequency tone.
- (e) CIRCUIT CHECK—GO button (momentary) checks the circuitry with an internal test resistance of 1.3 MO across the tip and ring.

When the set is operating properly, (LENGTH INDICATOR set for 000 and ZERO ADJ correct) a GREEN lamp and HIGH frequency tone will be activated.

(f) CIRCUIT CHECK—LOW-R button (momentary) checks the circuitry with an internal test resistance of 0.75 MO across the tip and ring. When the set is operating properly it should give both tip and ring RED lights and no tone.

(g) CIRCUIT CHECK—CAP UNBAL button (momentary) checks the circuitry with an internal test capacitance of 0.01 μ F from tip to

ground which provides a capacitance unbalance. When the set is operating properly it should give a RED capacitance light and no tone.

(h) CIRCUIT CHECK—CO BATT button (momentary) checks the circuitry with an internal test potential of -35 volts applied between tip and ground. When the set is operating properly it should give an AMBER light and LOW frequency tone.

(i) CIRCUIT CHECK—HIGH VOLTAGE button (momentary) checks the neon light by applying 110 Vac between tip and ring.

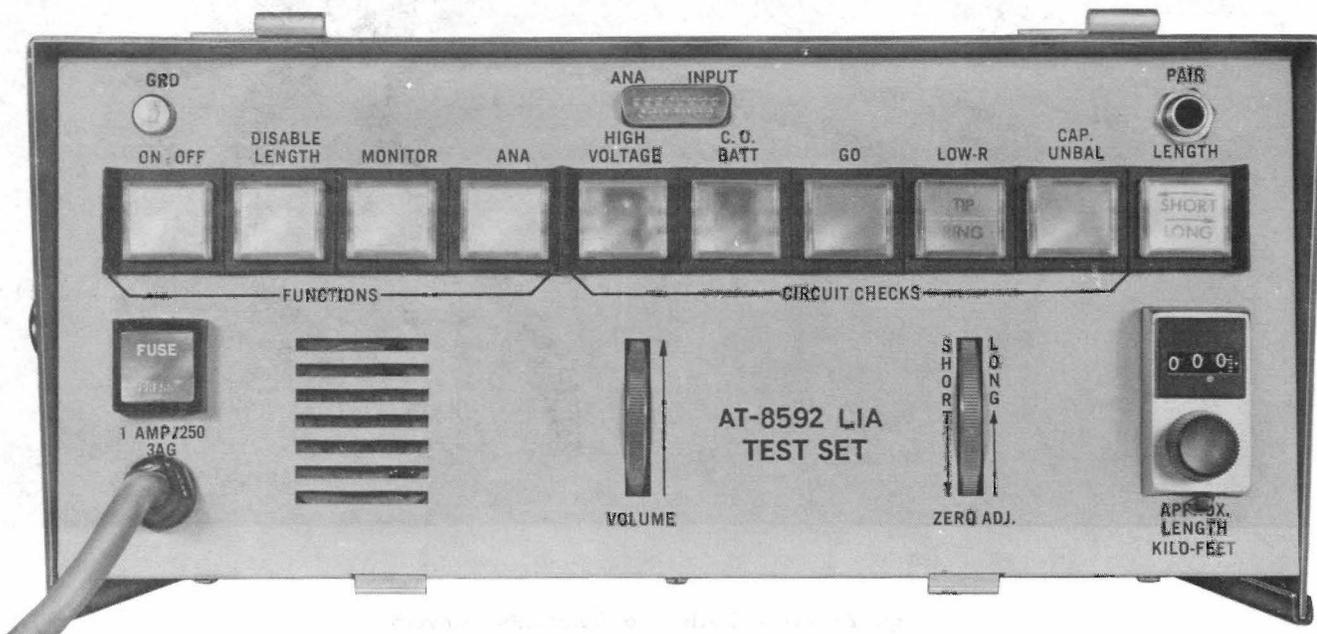


Fig. 3—Front Panel AT-8592 L1B4

3. TEST SET CALIBRATION AND CHECKS

3.01 Prior to testing pairs on the main frame, check the test set as follows:

- (a) Connect ground wire from test set to main frame ground.
- (b) Push ON-OFF button in (power on). If the ON-OFF lamp does not light, check fuse

and replace if necessary with a 1 amp/250 3AG fuse.

(c) Set LENGTH INDICATOR for 000.

(d) With no connection to the TEST CORD rotate the ZERO ADJ up until SHORT lamp comes on, then rotate slowly down until GREEN just comes on.

(e) To check the set, operate the 6 CIRCUIT check buttons in sequence and observe the following:

- (1) HIGH VOLTAGE—Neon lamp should light, green "GO" lamp and tone will remain on.
- (2) CO BATT—Amber light and low frequency tone.
- (3) GO—Green light and high frequency tone.
- (4) LOW-R—Both red (TIP and RING) resistance fault lamps on and no tone.

(5) CAP UNBAL—Red capacitance fault lamp on and no tone.

Note: If lamps should not light, replace with Chicago Miniature Lamp #367 (high voltage lamp number is GE A1H). To replace lamps, remove snap on lense cover on the front panel (Fig. 4). When replacing snap-on cover, press firmly until cover snaps in place.

3.02 If the lamps do not light, even after replacing, or no audible tone is heard, the test set should be returned for repair in accordance with local instructions.

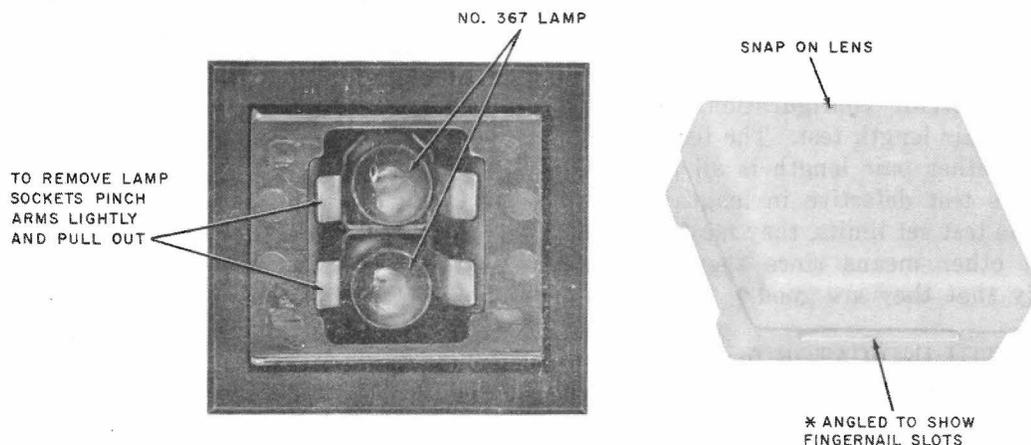


Fig. 4—Replacing Miniature Lamp

4. USE

4.01 Type of Test

(a) **Main Frame Record Purification**—Operate DISABLE LENGTH test button and set length control for length to first access point. All pairs good, and at least this long, will give a green light and high frequency tone.

(b) **Metallic Defect Testing (made on pairs recorded as having metallic faults)**—Operate DISABLE LENGTH test button and set length indicator to any convenient short length. (Make sure the length is sufficient to

be out of the central office.) All pairs that test good will be longer than the length set, only pairs with metallic defects will show up as defective.

(c) **Completion Testing**—The AT-8592 L1A Test Set must be recalibrated for each group of pairs that has a different physical length or circuit configuration. For example, two calibrations would be required when testing a construction job that left the central office as a single cable and then branched into two cables of different lengths. To calibrate the test set, select five pairs from the group of pairs to be tested. The group of pairs must all have the same physical

length and circuit configuration. Proceed as follows:

- (1) Warm up the test set for one hour and then calibrate per Part 3.
- (2) Measure the five pairs per paragraph 2.01(d). If any of the five pairs are obviously faulty as indicated by a large length difference, substitute another pair.
- (3) Calculate the five pair average.
- (4) Take 97 percent of (3).
- (5) Subtract 500 feet from (4).
- (6) Set the length indicator to the value calculated in (5).
- (7) Proceed to test all pairs in the group which have the same intended physical length and circuit configuration. Do not disable the pair length test. The test set will indicate whether pair length is all right. If a few pairs test defective in length but are close to the test set limits, they may be tested again by other means since there is some possibility that they are good.

4.02 Set LENGTH INDICATOR for desired pair length in accordance with test to be made, select test cord and then run main frame. Select cords as follows:

FRAME	CORD	CONNECTOR
303 CONNECTOR	P2EW	
444 JACK	P2EY	
C-50 PROTECTOR	AT-8592 L2	AT 8592 L3
300 CONNECTOR	AT-8592 L2	AT 8592 L4

Note: AT 8592 L2 cord is used with both L3 and L4 connectors.

4.03 Pair condition will be indicated as follows:

GOOD SPARE PAIR—Green (GO) and high frequency tone.

CO BATT—Amber and low frequency tone.

HIGH VOLTAGE—Neon lamp, this usually denotes a “special” circuit, other lamps may be on and low or high frequency tone may be heard.

LOW RESISTANCE TIP TO GROUND—Red tip fault indicator and no tone.

LOW RESISTANCE RING TO GROUND—Red ring fault indicator and no tone.

LOW RESISTANCE TIP TO RING—Both red resistance fault indicators light and no tone.

CAPACITANCE UNBALANCE—No tone and RED Cap-Unbal fault indicator. Occasionally, the Cap-Unbal light and one or both of the LOW-R lights will indicate faults simultaneously. This indicates Cap-Unbal—which may be caused by a low resistance (less than 200 K ohms) fault.

INCORRECT LENGTH—No tone and one of the two length indicator lights will show whether the pair is longer or shorter than the “set in” value provided other tests are within limits.