



**MT-91A TEST SET AND  
MT-147D, MT-101B, MT-105D EXPLORING COILS  
GENERAL DESCRIPTION, USE AND MAINTENANCE**

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**1. GENERAL**

1.01 The MT-91A Test Set is a kit consisting of an MT-147D Amplifier with carrying strap, an MT-723A Headset, a MT-513A Probe housed in a plastic, reinforced carrying case. (See Fig. 1)

1.02 The carrying case has space for other equipment such as a MT-101B Hand Exploring Coil, and for spare batteries.

1.03 The MT-147D is used for fault locating using exploring coils or other apparatus where an amplifier is required.

1.04 The MT-147D Amplifier when coupled with the MT-513A Probe may be used for identifying pairs in toll or exchange cables inductively. This method eliminates the necessity of opening the pair for metallic contact.

1.05 The MT-723A Headset permits the operator to monitor the audible output of the MT-147D.

1.06 A carrying strap is supplied for the MT-147D. In addition, a belt clip is also provided for the MT-147D.

1.07 The MT-147D Amplifier is a solid state amplifier intended to replace the W.E. CO. 147A or 147B and 147C. Its integrated circuitry provides excellent reliability and long battery life.

1.08 The normal application for fault finding work is with MT-105D, or MT-101B Exploring Coils using a MT-14103 L5 A/B Breakdown series Test Set or a MT-76D Test Set as a tone source.

**2. DESCRIPTION**

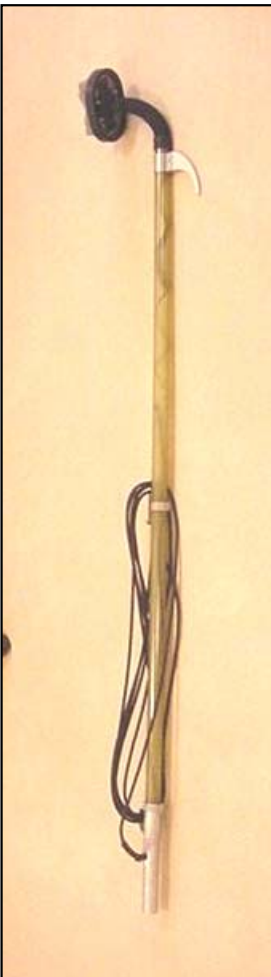
2.01 The MT-147D is a direct replacement for all 147 series amplifiers. It provides sufficient gain to raise the lowest signals to audible levels. It filters most unwanted frequencies, such as high level 60 Hz power line noise.



**FIG. 1**  
**MT-91A TEST SET**  
**INCLUDES:**  
MT-147D AMPLIFIER (PN: 86-100-017)  
MT-513A PROBE (P/N: 86-100-059)  
MT-723A HEADSET  
(P/N: 86-100-005)  
CARRYING STRAP (P/N: 82-48-069)



**FIG. 2**  
**MT-101B EXPLORING COIL**  
(P/N: 86-100-002)



**FIG. 3**  
**MT-105D**  
**EXPLORING COIL**  
(P/N: 86-100-001)

**2.02** The MT-147D has Input and Output jacks to accept the MT-723A Headset, MT-513A Probe, MT-101B, or MT-105D Exploring Coils.

**2.03** The MT-147D has a Mode switch (PROBE/COIL) for accepting corresponding devices.

**2.04** The MT-147D has a calibrated volume control for adjustment to the operator's needs.

**2.05** The MT-147D uses three standard "AA" batteries that are commonly available.

**2.06** The MT-723A is a headset used for monitoring the output of the MT-147D. The level of tones received may be adjusted by the volume control on the MT-147D for the operator's comfort. By interpreting the tones received, a fault (after breakdown) may be located. See OPERATION.

**2.07** The MT-513A Probe is plugged into the Input jack of the MT-147D amplifier, and is used for detection of tone on pairs without making metallic contact.

**2.08** The MT-101B (See Fig. 2) and the MT-105D (See Fig. 3) are magnetic coil assemblies used for tracing tones in cables by proximity induction. The coils are connected to the MT-147D amplifier through the Input jack.

**2.09** The MT-105D consists of a MT-101B Exploring coil mounted on a Rigid, six-foot fiberglass pole. The unit is highly insulated to withstand 10,000 volts RMS. A flexible top section permits positioning of the coils in relation to the cable being tested. The coil comes equipped

with a 25 foot cord terminated to a 347B plug. It also contains a hook for hanging the test set on a strand or cable.

**2.10** The MT-101B is used for tracing tones in cables when an extension pole is not required. The MT-101B consists of a low impedance exploring coil enclosed in a cast resin block. It has a six-foot insulation cord terminated to a 347B plug. The cord is molded permanently into the coil.

### **3. OPERATION WITH MT-105D OR MT-101B.**

**3.01 FAULT FINDING:** After the suspected pair has been "broken down" using a MT-14103 L5 A/B Breakdown Test Set, it is assumed a short circuit or weld exists where a leakage path had been. When this condition is established, a tone may be placed on the "broken down" pair and traced to the weld in the following way.

**3.02** Using an MT-14103 L5 A/B Breakdown series Test Set or a MT-76D to place a 500 Hz tone on the defective pair, the operator can determine where the tone "disappears".

**3.03** Connect the MT-101B or MT-105D coil to the "Input jack" of the MT-147D Amplifier.

**3.04** Connect the MT-723A Headset to the "Output jack" on the MT-147D. This action switches on the battery power in the MT-147D through the interlocking jack.

**3.05** The operator may then attach the MT-147D with the belt clip or use the nylon carrying strap and position the headset for comfortable listening.

3.06 The operator can test the system by turning on the tone source; i.e., an MT-14103 L5 A/B or MT-76D and placing the MT-101B or MT-105D next to the output cords of the tone source. Tone should be heard in the headset. The operator should then adjust the volume control to a comfortable listening level.

3.07 The output cords of the tone source are then connected to the defective pair.

**NOTE:** The MT-147D Amplifier must be in the "Coil" mode when using the MT-101B or MT-105D magnetic pickup coils.

3.08 In using the MT-105D, the operator should position the unit as close as practical to the tone source and begin moving in the direction of the trouble. As the operator moves away from the tone source, audible levels will be reduced due to cable resistance, other faults or load coils.

3.09 The operator should anticipate audible losses by familiarity with the cable type, splits, and/or load coil location. The operator may then overlook any audible level decrease.

3.10 As the audible level decreases, the operator should continue moving away from the tone source and maintain adequate levels by adjusting the volume.

3.11 If the tone level decreases sharply or suddenly stops, it is likely the "broken down" fault is at this location, since the tone cannot go beyond a short circuit.

3.12 If a wet section is found, the audible level decrease will extend over several feet of cable instead as in paragraph 3.11 .

3.13 In high resistance faults, occasionally, the tone will extend beyond the fault. A wet section can produce high to relatively low resistance faults, depending on the length and gauge of the wet section.

3.14 The conditions described in paragraph 3.13 may indicate the has not been completely "broken down", suggesting another attempt to weld the pair should be made with the MT-14103 L5 A/B Breakdown Test Sets.

3.15 Since multiple faults can occur in the same pair, audible decreases in tones should be investigated, as the breakdown set may have welded only one of the faults.

3.16 When the fault has been located, the tone source should be disconnected and the 91A returned to its carrying case.

**CAUTION:** ALWAYS REMOVE THE HEADSET PLUG FROM THE MT-147D AFTER USE, SINCE THIS DISCONNECTS THE BATTERIES FROM THE CIRCUIT.

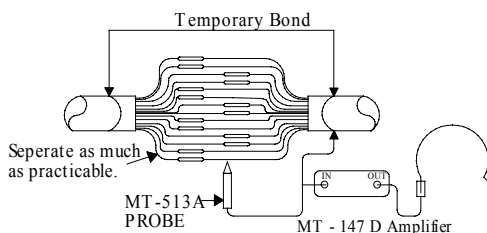
3.17 The MT-147D should be kept upside down during inclement weather to prevent rain from entering the jack openings.

#### 4. OPERATION WITH MT-513A PROBE

4.01 WIRE TRACING: The intended use of the MT-513A Probe is to identify pairs in a cable WITHOUT metallic contact. The typical arrangement of equipment is similar to paragraphs 3.04 through 3.08, except that the MT-513A Probe is placed into the "Input jack" of the MT-147D and the alligator clip should be connected to ground. The MT-147D mode control must be switched to "PROBE".

4.02 When a tone is applied to a pair, the MT-147D will begin to receive it as the probe nears the conductor. The tone level will reach a peak when the probe is placed in contact with the insulation of the pair with tone. (See Fig. 6).

Fig. 6 Typical arrangement at a splice.



4.03 Care should be exercised since the MT-147D is grounded with the alligator clip on the MT-513A Probe. A hazard may exist when higher than normal telco voltages are encountered.

**CAUTION:** The operator **MUST** avoid power voltages. If any doubt exists as to what kind of current is to be examined, consult your supervisor.

4.04 Proximity to power lines results in an audible, very low pitch hum.

#### 5. MAINTENANCE AND TESTING

5.01 Normal maintenance should consist of physical inspection, operation, and battery condition.

5.02 If a unit has physical damage, it should be sent to Metro Tel Corp.

5.03 Operation tests should be units performed as in paragraphs 3.02 through 3.06 .

5.04 Batteries should be tested occasionally. Normal battery voltage is 1.5 to 1.6 volts from each battery, without a device in the jack of the MT-147D.

5.05 Replace batteries when voltage reaches 1.1 volts or less.

**CAUTION:** Dead batteries may leak. METRO TEL CORP. is not responsible for damage to the set caused by such a leakage.

5.06 Battery replacement may be done in the field. To change the batteries in the MT-147D, turn the quick release screw 1/2 turn CCW and lift the front panel with internal parts from the outer housing. Remove the batteries from the holder. Observe polarity in replacing batteries. The battery holder shows (+) and (-).

(See Fig. 4)

5.07 To Assemble the MT-147D, reverse the procedure in paragraph 5.06 .

5.08 Other repairs to the MT-91A, MT-101B, or MT-105D are **NOT** recommended, and units should be sent to METRO TEL CORP. for repair.

5.09 The MT-105D should be tested annually to assure that the integrity of its high voltage insulation is intact. The unit may be returned to METRO TEL CORP. for these tests.

## 6. SPECIFICATIONS

### 6.01 MT-147D AMPLIFIER

- (a) Gain: + 45 dB at 540 Hz.
- (b) Center Frequency: 540 Hz  
(Accepts 500 to 577 Hz)
- (c) Battery Life: 6,000 Hrs.
- (d) Max. Output: - 8 dB.
- (e) Noise: Shorted Input: - 42 db

(f) Weight: 1.3 lbs. (Less Battery)

(g) Size: W= 4.5" x D= 4.5" x H= 2"

(h) Battery Type: Size "AA"  
(Eveready type 1015)

(i) Battery Qty: Three Each.

### 6.02 MT-723A HEADSET

- (a) Impedance: 130 Ohms + 3 uF at 500 Hz.
- (b) Output Level: + 90 dB spl. with + 7 dB Input.
- (c) Cord Set: W2Ft. with 310 plug (Retractable) (4 Ft. Long)
- (d) Weight: 7 oz.
- (e) Size: 3" x 2"

### 6.03 MT-513A PROBE

- (a) Cord Set: W2BJ 6 Ft. with 347B plug.
- (b) Weight: 4 oz.
- (c) Size: 7" x .5"

### 6.04 MT-91A TEST SET COMPLETE

- (a) Size: 13" x 11" x 5.5"
- (b) Carrying Case: Heavy Duty Plastic
- (c) Weight: 4 Lbs.

**6.05 MT-101B EXPLORING COIL**

- (a) Dual Coil Type
- (b) Weight: 9 oz.
- (c) Size: 4.38" x 1.88" x 1.44"
- (d) Construction: Molded Resin
- (e) Cord: 6 Ft. with 347B Plug

**6.06 MT-105D EXPLORING COIL**

- (a) Dual Coil Type
- (b) Weight: 5.5 Lbs.
- (c) Size: 6.5" x 5" x 6'
- (d) Construction: Molded resin coil on a fiber glass pole with a flexible neck.
- (e) Cordset: 24' with 347B plug.

**7.03 LIMITED WARRANTY:**

The manufacturer guarantees that if any part proves to be defective in workmanship or in material within a period of Ninety Days, the defect will be repaired or replaced without charge at the option of the manufacturer.

This Limited Warranty is not saleable or transferable. This Limited Warranty shall not apply to any which has been subject to alterations or modifications, abuse, negligence, accident or used in any manner contrary to instructions given by the manufacturer. This Limited Warranty is void if service is performed by other than the manufacturer or his authorized agent.

**7. ADDITIONAL INFORMATION**

**7.01 Spare Parts and Technical Assistance are available from METRO TEL CORP.  
Call : (402) 498-2964.**

**7.02 Send Repairs and Returns To:  
METRO TEL CORP.  
11422 Miracle Hills Drive  
Omaha, NE 68154**

**Email: [sales@metrotelcorp.com](mailto:sales@metrotelcorp.com)  
Web: <http://www.metrotelcorp.com>**

**Attn: Repair Dept.**

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Omaha, NE 68154**

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