

MURPHY JUMPER TRACER
MODEL JTT-R-2
DESCRIPTION AND USE

1. GENERAL

1.01 This section describes the Murphy jumper tracer and explains how it is used to locate unknown ends of distribution frame wires.

1.02 It is reissued to include the appropriate legend on Page 1 in accordance with AT&T's "Guidelines and Procedures for Safeguarding Information" and Pacific Company's System Instruction (SI) 178.

Note: Marginal arrows used to denote changes are omitted.

1.03 This tracer can also be used to:

- Locate switchboard jack multiples
- Locate switch bank multiples
- Locate intercepting loop troubles
- Verify jumpers on cable transfers.

1.04 The transmitter operates at a frequency which is inaudible to the subscriber, therefore, will not interfere with working lines.

2. DESCRIPTION

2.01 The jumper tracer consists of a storage case, transmitter, transmitter leads, receiver, and an induction probe.

2.02 The transmitter (JTT) uses a frequency modulated 'warble' in its 15 kHz output. It is powered by a 9-volt battery.

2.03 The receiver (JTR) has a high-gain tuned preamplifier that amplifies the picked-up signal to a useful level. The signal received from the transmitter is mixed with 14.2 kHz and the 0.8 kHz difference is applied through an audio amplifier to the speaker and meter. The preamplifier and audio amplifier are powered by a 9-volt battery.

2.04 The *induction probe* (current operated) is furnished with every set. It is designed for general use and can be used to trace most jumpers. (See Part 4, Step 7 for exception.)

Note: A *capacity probe* (voltage operated) for tracing jumpers that are not terminated may be ordered separately.

2.05 Later model jumper tracers are equipped with a push button in the handle of the probes. This button turns the receiver on (when operated). It is intended that the receiver be on only when in use tracing jumpers (to conserve battery life).

3. BATTERY TEST

3.01 Before the set is used for tracing jumpers, perform the following battery test:

STEP	PROCEDURE
1	Plug transmitter leads into transmitter.
2	Clip tip of red lead to tip of black lead, shorting them together.
3	Stretch shorted leads out on a flat surface.

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STEP	PROCEDURE
4	Plug induction probe into receiver.
5	Turn on transmitter.
6	Turn on receiver (operate push button on probe if equipped).
7	Hold the probe perpendicular to transmitter leads with induction coil (identified by ring near tip of probe) directly over one of the transmitter leads.
8	Set volume control to 2.5. A full scale reading (100) indicates set is working properly. <i>Note:</i> Moving the probe slightly in any direction to obtain a full scale reading is permissible.
9	If a full scale reading is not obtained, replace the batteries.
	BATTERY REPLACEMENT
	A. TRANSMITTER
10	To replace battery, loosen screws at each end of set and remove cover.
11	Replace with a 246 Eveready battery, or equivalent. <i>Note:</i> Any 9-volt transistor radio battery may be used. However, service life is considerably less when using ordinary batteries.
	B. RECEIVER
12	To replace battery, loosen screw at top of set and open the hinged panel.
13	Replace with Mallory TR 146X Mercury cell, or equivalent. <i>Note:</i> Any 9-volt transistor radio battery may be used. However, service life is considerably less with ordinary batteries than that expected when a mercury-type cell is used.
14	Repeat steps 1 through 8.
15	If proper level is not achieved, return set to distributing house for repairs.

4. JUMPER TRACING

4.01 Points to remember — When tracing jumpers, the tone decreases only when the probe is:



- Too distant from the jumper
- Passing an open end of the jumper
- Near a grounded end of the jumper
- Not perpendicular to the jumper
- Near a short in the jumper.

4.02 Locating the unknown end of a jumper:

STEP	PROCEDURE
1	Place transmitter near jumper to be traced. Ensure case is not shorting any working circuit and transmitter is secured in place. (An insulated hook is provided for this purpose.) Insert transmitter lead plug into jack at top of transmitter case.
2	Connect black lead to metal work of frame. Do not use the ground test terminals for this purpose. Ensure connection is not insulated from metal by paint. If necessary, scrape a small portion of paint to bare metal to ensure good contact is made.
3	Clip red lead to the ring side of jumper to be traced. Do not connect red lead to both tip and ring, or to a grounded conductor. Note: Tone is substantially reduced if conductor is grounded. When tone is inadequate for tracing, use the other conductor. If both conductors are grounded, other methods of tracing may have to be used.
4	Set transmitter switch to on position.
5	Connect probe to receiver and turn set on by moving switch to the on position. Note: If probe is equipped with optional push button, this must also be operated to turn on set. To conserve battery life, operate push button only while actually tracing jumper.
6	Hold probe perpendicular to jumper being traced.
7	Adjust volume control until meter reads approximately full scale. This setting should provide adequate volume level from the speaker to allow most jumpers to be traced to their termination without further adjustment. Note: In order to avoid an incorrect reading, make this adjustment 2 to 3-feet from the transmitter. This will ensure that the signal picked up is not from the red transmitter lead. If adequate volume level cannot be obtained, and batteries tested good, jumper may not be terminated. Change to a " capacity probe ".
8	Move probe along top or bottom of the bundle. Note: If the shelf is heavily loaded with jumpers, it may be necessary to insert the pick-up into the bundle to get a usable sound level and meter indication.
9	If the signal becomes weak, move the probe back and forth across the stack or through it. If the signal does not increase, turn the probe parallel to the shelf. An increase in level here indicates the jumper is running toward the terminal block.
10	If steps 8 and 9 do not provide an adequate signal level, adjust the volume control so a full scale reading is once again obtained.

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STEP	PROCEDURE
11	As the probe passes directly over the jumper, the tone will rise sharply and decreases as the probe is moved further away.
12	With the probe directly over and at right angles to the jumper, trace the wire to the point where the tone decreases in level.
13	Return to the point where the tone was last heard at the proper level. Note the vertical and shelf. If the jumper appears to go to the other side of the frame, go around to the other side. Pick up the trace at that point.
14	Move the probe in circles and continue tracing until the tone cannot be picked up further down the shelf or vertical. This is the approximate location of the other end of the jumper.
15	Using the metal tip of the probe, make a physical contact to various terminals in the area. When the terminal that is connected to the jumper being traced is touched, a high or off-scale reading will be indicated. Other terminals will produce only low or half-scale readings.
16	Note location of jumper end.
17	Turn receiver off.
18	Remove transmitter and turn it off.
19	Unplug probe and transmitter leads and place set in storage container.
20	If test set is to be stored for any length of time, remove the batteries.