

# TW-82

DIGITAL LINE TRACER



# Operating Manual

FISHER RESEARCH LABORATORY

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# INTRODUCTION

The TW-82 Digital Line Tracer components include a Transmitter, Receiver, ground-rod assembly, carrying case (soft or optional hard case) and an operator's manual. The TW-82 is a single frequency line tracer.

The TW82 is an active locating line tracer. There are three locating methods that an operator can use to trace a utility.

- 1. The **conductive** method is the preferred method, as a strong signal is transmitted directly through the intended target.
- 2. The **inductive** method is the easiest method to use, but may not yield the best results. When a direct connection is not available, but the operator has some knowledge of where one point of the utility may be, the operator can place the Transmitter on the ground over the utility.
- 3. The third method of active locating involves using the **coupling clamp**; the **coupling clamp** is an optional accessory. The coupling clamp is only to be used on electrical or communication lines that are in service, not pipes or tracer wires. The coupling clamp is used when the utility is exposed, but a direct connection is not available. The clamp jaws are opened and placed around the utility. The clamp does not make a direct connection to the utility.

# **TW-82 TRANSMITTER**



The Transmitter has two controls: & POWER MODE

The POWER Button has a dual function:

- 1. When the Transmitter is powered on, woth switches the device between normal (1/4 watt) and high (1.0 watt) output.
- 2. With the Transmitter powered off:
  - A. Press-and-hold POWER to program the Auto Power-Down feature.

Successive presses of **b** will show a flashing battery indicator, followed by a blank screen or the illuminated battery indicator.

- An illuminated battery indicator means that **Auto Power-Down** is activated.
- A blank screen means that **Auto Power-Down** is deactivated.
- B. After you release POWER nobe, the transmitter power will turn on.

With the **Auto Power-Down** feature activated, the Transmitter will automatically turn off 60 minutes after the last key-pad press by the user. This is a battery saving feature.

#### **Accessory Output**

- 1. Flip up the black protective cover to expose the Accessory Output.
- 2. Plug in the Cable Jack for conductive tracing.

When the conductive tracing cable is connected, Signal Current will be displayed. The Signal Current Bar Graph shows the quality of the connection.

Automatic Load Impedance Matching adjusts output to provide full rated power over a wide range of loads (e.g. utility types and conditions). It is tolerant of both dry (high resistance) and shunted (low resistance) ground connections.

The Transmitter has a built-in antenna for inductive locating. When the Cable Jack is not connected, the inductive antenna automatically engages and begins transmitting. When locating inductively, the Signal Current Bar Graph will not be displayed, as there is no conductive trace load to be measured.



**WARNING:** Do not handle output leads unless power is off. **ELECTRIC SHOCK HAZARD:** Servicing to be performed by qualified personnel only.

**NEVER** connect conductive cables to an energized power line.

# **TW-82 RECEIVER**



### SINGLE BUTTON OPERATION

• Power-Up: Press Button to turn ON

• Volume Control: Tap the Button to adjust volume

1. Mute

2. Very Low

3. Low

4. Medium

5. High

Continued presses of the button cycles

back to setting #1.

• Power-Down: Press-and-Hold Button to turn OFF

### **DISPLAY**

**1. Signal Strength:** Indicates your proximity to the center of the electromagnetic field emitted by the utility.

999: maximum value0: minimum value

You may find different locations where the Signal Strength value is high. Use this reading as a relative indicator as to where the utility is located. Signal Strength is strongly influenced by the depth of the utility.



#### **Display - Continued**

2. Battery Strength: When battery life declines to less than 1 hour (estimated) of operation the indicator will flash. Expect about 40 hours of battery life from a set of two D-cell alkaline batteries.



#### 3. Left/Right

**& Over-Target:** These indicators show your position relative to the center of the electromagnetic field.

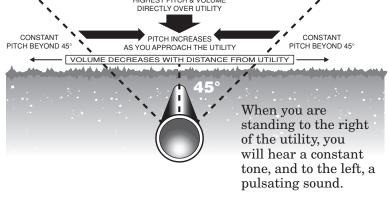


Audio: When you move within a 45° angle of the center of the electromagnetic field, the audio pitch will change.

The pitch increases as you approach the utility and is highest over the top of the utility. Outside the 45° zone,

highest over the top of the utility. Outside the 45° zone, the pitch and volume do not change.

HIGHEST PITCH & VOLUME



**4. Azimuth:** These arrows indicate the utility's path relative to your position. When you are close to, or over, the suspected target, rotate the device and notice the arrows.



#### 5. Current Measure:

mA (miliAmperes) of current flowing on the conductor.

Use Current
Measure as an aid
for distinguishing
utilities in close
proximity. The
Current Measure
will generally be the
highest on the utility you are connected
directly to, regardless of the utility's
depth.



#### 6. Depth

Depth reading is only accurate if the electromagnetic field is perfectly round.

The electromagnetic field must have enough energy for the device to accurately calculate the depth.



The weaker the signal strength, the less reliable the depth indicator. For this reason, depth readings for inductively located utilities will tend to be less accurate than conductively located ones.

The depth reading is the distance between the tip of Receiver blade and the *center of* the electromagnetic field. The center of the electromagnetic field is generally the *center of the utility*. The only 100% reliable method for determining depth is to hand-excavate.

# **OPERATING INSTRUCTIONS**

### INDUCTIVE LOCATING

Inductive locating is most effective with the Transmitter straddling the utility as illustrated, with the utility perpendicular to the Transmitter's batteries.

If the utility direction is unknown, place Transmitter on the ground, power on, and sweep the Receiver a complete 360° around the Transmitter, keeping at least a 25-foot (8-meter) distance between the Transmitter and Receiver. If unsuccessful, move the Transmitter to another location. When located, the Receiver's azimuth indicator will show the direction of the utility.

In inductive mode, the Transmitter's LCD will not display Signal Current. When the ground rod is plugged in, the Signal Current display will illuminate.



- 1. Connect the Ground Rod assembly to the Transmitter.
- 2. Push the Ground Rod into the earth at a 90° angle to the direction of the utility.
- 3. Connect the red clip to the non-energized utility.
- 4. Connect the black clip to the Ground Rod.
  - Be sure not to place the wires over any other utility.
- 5. Move at least 25 feet (8 meters) away from the connection point.
- 6. Sweep the Receiver in a circle around the connection point.
- 7. Using information provided on the display, find the areas that need to be traced and analyze the situation in more detail to find the buried utility.



# **SPECIFICATIONS**

#### **RECEIVER**

Frequency	. 82.175 kHz
Left/Right Guidance	. Audible and visual
Azimuth Indicator	. Audible and visual
Over-Target Indicator	. Visual and audible
Battery Status	. Visual
Signal Strength Indicator	. Numeric display & audible
Signal Current Measurement	. Numeric display, automatic
Depth Measurement	. Numeric display, automatic
Battery Type	. Two D-cell batteries (included)
Battery Life	. 40 hours
Weight, with batteries	. 3.60 lbs

#### **TRANSMITTER**

Output Frequency	82.175 kHz
Output Power (nominal)	Normal Setting = 0.25 watt
	High Setting = 1.0 watt
Conductive Tracing	2 to 3,000 ohms, normal power-6dB 2 to 8,000 ohms, high power-6dB
Magnetic Strength	2 to 8,000 ohms, high power-6dB
Inductive Tracing	T 15 Vm², normal power 25 Vm², high power
Magnetic Strength	25 Vm², high power
Battery Type	Four D-cell batteries (included)
Battery Life	160 hours in normal power mode
Weight, with batteries	4 lbs

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# **ENVIRONMENTAL**

Ingress Protection Rating	IP65 (stands up to water jets)
Operating Temperature Range	4°F to 140°F (-20°C to +60°C)
Relative Humidity	0 to 95% noncondensing
Shipping Weight (packaged)	17.5 lbs
Field Carry Weight, w/accessories15.5 lbs*	

<sup>\*</sup>Includes Carry Case, Batteries, Ground Rod and Conductive Tracing Cables

Fisher Research Laboratory does not warrant suitability to specific use. Fisher Research Laboratory shall in no event be liable for any direct, incidental, consequential or indirect damages.



# QUALITY

Fisher detectors are renowned for their quality. Each detector is hand crafted in the USA with pride

## PERFORMANCE

The worldwide underground utility industry relies on Fisher. Our instruments are durable, dependable and locate deeper.

## REPUTATION

Fisher produced the first patented metal detector in 1931. For over 80 years, the Fisher logo has been a mark of excellence.

### 2 - YEAR LIMITED WARRANTY

Proof of purchase is required to make a claim under this warranty.

#### NOTE TO CUSTOMERS OUTSIDE THE U.S.A.

This warranty may vary in other countries, check with your distributor for details.

Factory warranty follows the channel of distribution. Warranty does not cover shipping costs.

# SERVICE

Should you have any questions or problems, contact:

### FISHER RESEARCH LABORATORY

1465-H Henry Brennan, El Paso, Texas 79936 Tel 1800-685-5050 Fax 915-225-0336 www.fisherlab.com email: info@fisherlab.com

According to FCC part 15.21 Changes or Modifications made to this device not expressly approved by the party responsible for compliance could void the users authority to operate this equipment.

# **TW-82 ACCESSORIES**







## 3 Inch **Coupling Clamp**

- CCLAMP-3

Useful for in-service and electrical power line tracing when a metal-to-metal hookup is not possible

#### 5 Inch **Coupling Clamp** - CCLAMP-5

Useful for in-service and electrical power line tracing when a metal-to-metal hookup is not possible

#### **Hard Carry Case** - 1802050000

Shock absorbent protective hard carrying case with contoured foam insert custom made to house the TW82. 35" x 7" x 16"

### Fisher Sonde Signal Transmitter 82kHz

- SONDE-82.175

Small transmitter used to trace the path of non-metallic pipes and locate blockage in lines. Sonde is inserted into a pipe or duct by means of a push rod and located using a Fisher receiver.

- Rugged Design
- Long Battery Life
- Outstanding Distance & Depth Locate up to 15' deep
- Operating Frequency: 82 kHz
- Weight 6.4 oz
- Length 6"
- Diameter 2"
- Battery Life: 70 hrs
- Operating Temperature -20 to +60 C (4° to 140°F)
- End Cap Thread 3/8"-16 x 3/4"

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