

Instruction Manual

L1050
Portable Locator
Catalog No. 651050

Read this entire manual before operating.

Megger®

Valley Forge Corporate Center
2621 Van Buren Avenue
Norristown, PA 19403-2329
U.S.A.

610-676-8500

www.megger.com

**L1050
Portable Locator
Instruction Manual**

Copyright© 2006 by Megger. All rights reserved.

The information presented in this manual is believed to be adequate for the intended use of the product. If the product or its individual instruments are used for purposes other than those specified herein, confirmation of their validity and suitability must be obtained from Megger. Refer to the warranty information below. Specifications are subject to change without notice.

WARRANTY

Products supplied by Megger are warranted against defects in material and workmanship for a period of one year following shipment. Our liability is specifically limited to replacing or repairing, at our option, defective equipment. Equipment returned to the factory for repair must be shipped prepaid and insured. Contact your MEGGER representative for instructions and a return authorization (RA) number. Please indicate all pertinent information, including problem symptoms. Also specify the serial number and the catalog number of the unit. This warranty does not include batteries, lamps or other expendable items, where the original manufacturer's warranty shall apply. We make no other warranty. The warranty is void in the event of abuse (failure to follow recommended operating procedures) or failure by the customer to perform specific maintenance as indicated in this manual.

Megger.

Valley Forge Corporate Center
2621 Van Buren Ave
Norristown, PA 19403-2329

610-676-8500 (Telephone)
610-676-8610 (Fax)

www.megger.com

Table of Contents

1	.....	1
Introduction.....	.....	1
Receiving Instructions.....	.....	1
General Information .....	.....	1
2	.....	3
Safety.....	.....	3
Precautions.....	.....	3
3	.....	5
L1050 Specifications .....	.....	5
Receiver .....	.....	5
Transmitter.....	.....	5
4	.....	7
Transmitter Operation.....	.....	7
Controls and Indicators .....	.....	7
Direct Connection .....	.....	9
Coupler Connection.....	.....	10
Inductive Connection.....	.....	11
Blind Search .....	.....	12
Notes on Selecting the Tracing Signal.....	.....	13
5	.....	15
L1050 Receiver Operation .....	.....	15
Controls and Indicators .....	.....	15
Locating Cable or Pipe.....	.....	16
Null Mode Locating.....	.....	16
Depth Measurement 45° Angle Method (Nulling Unit).....	.....	17
Depth Measurement Straight Lift Method (Nulling Unit).....	.....	18
6	.....	19
Service.....	.....	19
Maintenance.....	.....	19
Repair.....	.....	19

Megger[®]

1

Introduction

Receiving Instructions

Check the equipment received against the packing list to ensure that all materials are present. Notify Megger of any shortage. Telephone 610-676-8500 and ask for the customer service department.

Examine the instrument for damage received in transit. If damage is discovered, file a claim with the carrier at once. Prepare a detailed description of the damage and notify Megger.

This instrument has been thoroughly tested and inspected to meet rigid specifications before being shipped. It is ready for use when set up as indicated in this manual.

General Information

Thanks for purchasing the Megger L1050 Portable Locator. The portable locator will help you locate and trace the routes of buried power cables, cable television cables, gas and water pipes, sewer lines, telephone cables, and fiber-optic cables.

The TRANSMITTER applies a tracing signal onto a cable or pipe. The RECEIVER detects the tracing signal. You can locate the relative position of the buried pipe or cable by following the tracing signal.

<p><i>NOTE: The L1050 is designed to detect the electromagnetic field emitted from buried metallic utilities. There are buried cables, pipes, and utilities this instrument cannot detect. LOCATING is not an exact science. The only way to be sure of the existence, location or depth of buried utilities is to expose the utility.</i></p>
--

Supplied Components

1. L1050 Receiver unit
2. 1-Watt Transmitter unit
3. Manual
4. Red/black test cord
5. Instruction Manual AVTM651050
6. Eight AA-size batteries
7. Eight C-size batteries
8. Ground rod

Options

1. Flexible coupler
2. Hard Clamp

Preparation for Use

Make sure there is no shipping damage and all the parts are included. Unpack your new L1050 locator.

Locate the battery compartment on the back of the “head” of the RECEIVER. Open the compartment using a phillips screwdriver. Install the eight “AA” batteries as marked.

Locate the battery compartment inside the TRANSMITTER. Remove the battery compartment door. Install the eight “C” batteries as marked.

<p><i>NOTE: Note: For longer battery life and reliable operation under adverse conditions, use only Duracell® alkaline batteries.</i></p>

2

Safety

Precautions

The L1050 Portable Locator and the recommended operating procedures have been designed with careful attention to safety; however, it is not possible to eliminate all hazards from electrical test equipment or to foresee every possible hazard that may occur. It is therefore essential that the user, in addition to following the safety rules in this manual, also carefully consider all safety aspects of the test before proceeding. Safety is the responsibility of the user.



WARNING!
Do NOT connect to live or energized power cable.

Use suitable barriers, barricades, and warnings to keep people not actually engaged in the test at a safe distance. Make sure that no one can make contact with energized parts of the test equipment and the specimen under test.

Treat all terminals of power equipment as a potential electric shock hazard. There is always the possibility of voltages being induced at these terminals because of proximity to energized high-voltage lines or equipment.

Always turn the transmitter power off before touching any terminals.

Always disconnect test leads from the cable under test before attempting to disconnect them from the portable locator.

Never connect the test leads to a cable that does not have a safety ground strap in place. Never disconnect the test leads from a cable that does not have a safety ground strap in place. The safety ground connection must be the first made and the last removed. Any interruption of the grounding connection can create an electric shock hazard.

Observe all safety warnings marked on the equipment. These warnings identify areas of immediate hazard which could result in personal injury or loss of life.

Do not operate the equipment with protective covers removed. Operation without the protective covers presents an electric shock hazard.

Use all practical safety precautions to prevent contact with energized parts of the equipment and related circuits.

Use the recommended grounding and connection procedures. Make sure that the equipment is grounded properly. Any interruption of the grounding connection can create an electric shock hazard.

Refer to IEEE 510-1983 "IEEE Recommended Practices for Safety in High-Voltage and High-Power Testing" for additional information.

Do not use the portable locator or its accessories with any device or for any purpose other than as specifically described in this manual. Misuse of this equipment can be extremely dangerous.

Never connect the portable locator to energized equipment.

Do not use in an explosive atmosphere.

If the portable locator is operated in accordance with the safety precautions described, and if all grounds are correctly made, rubber gloves are not necessary. As a routine safety procedure, however, some users require that rubber gloves be worn, not only when making connections to the high-voltage terminals but also when manipulating controls. Megger considers this an excellent safety practice.

Warning and Caution Notices

Warning and caution notices are used throughout this manual where applicable. These notices appear in the format shown below and are defined as follows:



WARNING!

Warning, as used in this manual, is defined as a condition or practice which could result in personal injury or loss of life.



CAUTION

Caution, as used in this manual, is defined as a condition or practice which could result in damage to or destruction of the equipment or apparatus under test.

3

L1050 Specifications

Receiver

Operating frequency:	85 kHz, 815 Hz
Antenna mode:	Null-responding vertical coil
Audio indication:	Variable pitch audio.
Operating & storage temperature range	-4°F to 133°F (-20°C to +55°C)
Battery type:	Eight "AA" Duracell alkaline batteries
Battery life:	80 hrs
Dimensions:	13 x 3.0 x 3.0 in. (33 x 7.6 x 7.6 cm) (L x W x H)
Weight:	1.7 lb (.77 kg)
Gain control:	126 dB minimum
Noise rejection:	116dB minimum

Transmitter

Operating frequency:	82 kHz, 815 Hz
Output power:	1 watt, Nominal
Battery type:	Eight "C" size alkaline batteries (Duracell® recommended)
Battery life:	Greater than 120 hours*
Operating and storage temperature range:	-4°F to +133°F (-20°C to +55°C).

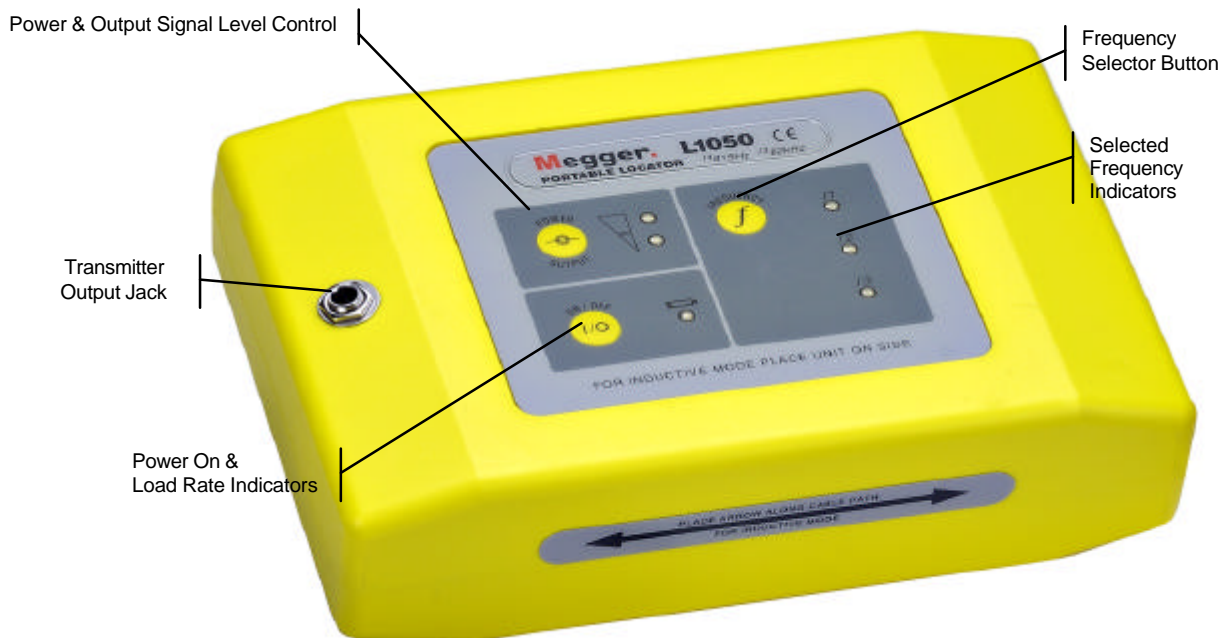
Hook-up Method:	Direct Connection Inductive Coupling (optional) Transmitter Induction
Max Open Voltage:	30 V PK-PK AC
Dimensions:	16 x 6.32 x (5)in. (40.6 x 16 x 12.7 cm) (L x W x H)
Weight:	2.1 lb (1.0 kg)

4

Transmitter Operation

Controls and Indicators

Follow all safety precautions in Section 2 of this manual.



TX OUTPUT (SIGNAL OUTPUT JACK)

The TX OUTPUT is the jack. The RED/BLACK CORD and the FLEXICOUPLER connects to create a circuit on the buried utility.

OUTPUT SIGNAL LEVEL CONTROL

The OUTPUT SIGNAL LEVEL CONTROL adjusts the power output from the TRANSMITTER. The two selections include: LOW (One LED) HIGH (Two LEDs).

LOAD RATE INDICATOR

The Frequency light flashes to indicate the output circuit impedance. When the indicator blinks 4 times per second, it is indicating a nearly short circuit. When the indicator blinks 1 time every 3 seconds, it is indicating a nearly open circuit.

Note: Holding down the Power Output button for 2 Seconds will Mute the Audio Load Rate indicator.

TX ON

The TX ON indicates the TRANSMITTER is on.

FREQUENCY CONTROL

The 82 kHz reading indicates that the 82 kHz frequency is in use. This frequency is the higher of the three. The 82 kHz frequency is often used to locate sharp corners in cables or pipes and is capable of jumping disconnected shield bonds or grounds. The 815 Hz reading indicates that the 815 Hz frequency is in use. The 815 Hz is the lower frequency. It is less susceptible to locating errors caused by adjacent cables or pipes. Also, by using the 815 Hz frequency, the locating range is greater.

Direct Connection



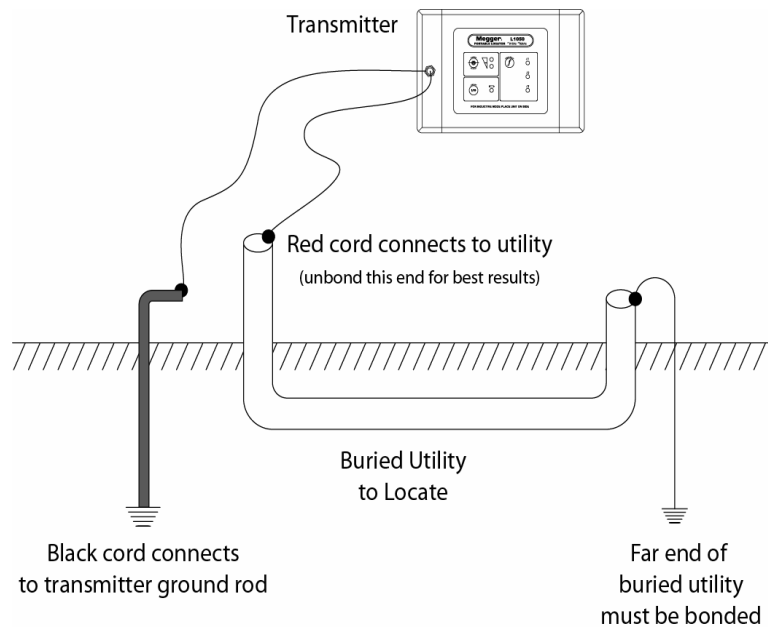
WARNING

DO NOT CONNECT TO LIVE OR ENERGIZED POWER CABLES!

Direct Connection is the most reliable method of signal application. This method is relatively free of interference. The greatest amount of signal strength can be achieved by this method. Low or high frequency may be used. The far end of the utility must be grounded.

Connect the RED TEST CORD to an existing ground point or an exposed metallic section of the utility. Place the GROUND ROD approximately 10 feet from this point, at an angle of 90° to the buried cable or pipe. Push the GROUND ROD into the ground 8 to 10 inches. Connect the BLACK TEST CORD to the GROUND ROD.

Plug the RED/BLACK TEST CORD into the TX OUTPUT JACK. Set the FREQUENCY switch to the 815 Hz or 82 kHz. The TX ON indicator will light up.



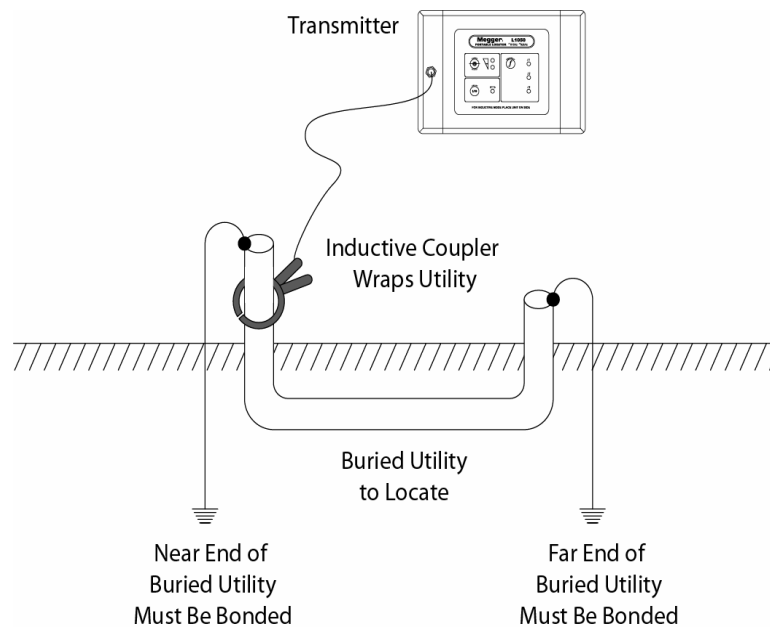
Coupler Connection

The optional FLEXICOUPLER and HARD COUPLER are very easy to use, and services do not have to be interrupted. The operation range is shorter than the Direct Connection method. The tracing signal can be affected by neighboring cables and pipes. The RED/BLACK TEST CORD or the GROUND ROD are not needed for this method.

Successful COUPLER operation requires an insulated conductor that is grounded on both near and far ends.

Loop the FLEXICOUPLER around the cable and connect the two ends, or clamp the HARD COUPLER around the cable. It is important to connect the COUPLER around the cable needing to be traced. Connect the COUPLER around the wire closer to the outgoing cable, not near the system ground. The result will be a stronger signal. By connecting near the grounding, the range will also be shorter, and difficulty may arise determining one cable from another.

Plug the COUPLER TEST CORD into the TX OUTPUT JACK. Always use the 82 kHz FREQUENCY on the RECEIVER and the TRANSMITTER.

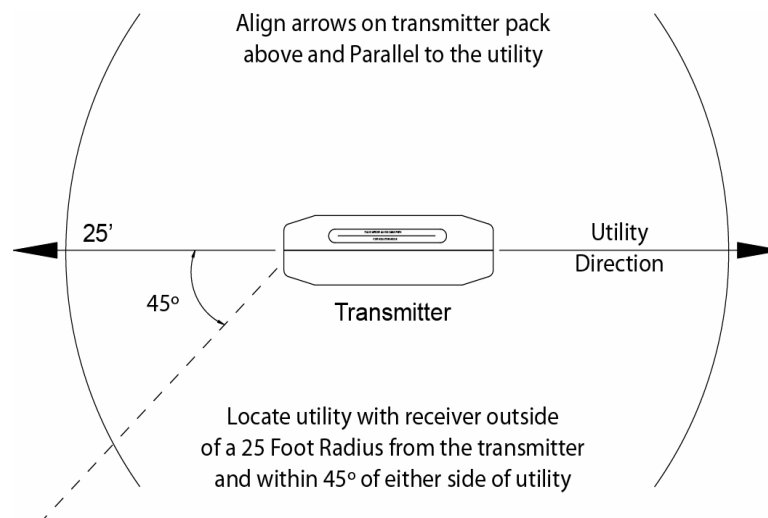


Inductive Connection

This method is convenient to use, and services are not interrupted. No test cords or connections are needed. The cable or pipe must have good insulation or non-conductive coating, or the operating range will be short.

Place the TRANSMITTER on the ground, as close as possible to the path of the cable or pipe. Align the ARROWS on the TRANSMITTER CONTROL PANEL at a moderate angle to the cable or pipe. Set the FREQUENCY to the 82 kHz position. First, locate the broad TRANSMITTER Null, then move toward the expected cable path while looking for the signal carried by the cable.

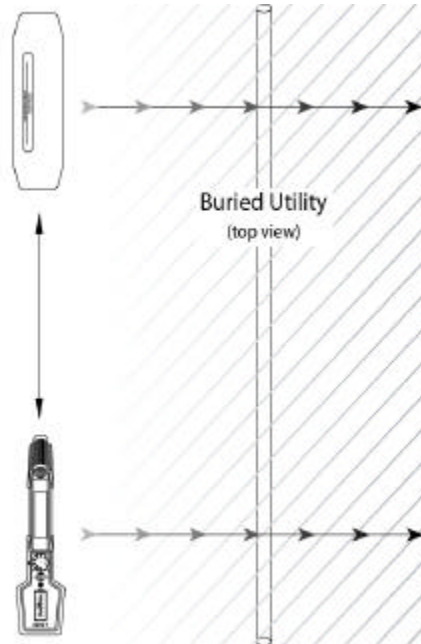
Start tracing the path with the RECEIVER 25 feet from the TRANSMITTER. Search in the 90° zone as shown. Locate the cable or pipe, and follow the path. If the signal becomes weak, move the TRANSMITTER to a point 25 feet behind the last strong signal, and continue searching.



Blind Search

The Blind Search locating technique is used if the operator is not aware if a buried utility exists. Two people are needed for this technique. The TRANSMITTER and the RECEIVER are placed 25 feet away from each other. Each operator walks at the same speed keeping a distance of 25 feet from each other. When the receiver gives an audio response, then a buried utility is present between the RECEIVER and the TRANSMITTER.

Align Transmitter so that arrow is parrallel to the suspected path of utility.



Maintain 25 feet between the transmitter and receiver while moving together until the utility is indentified

Align receiver so that antenae points to transmitter

Notes on Selecting the Tracing Signal

The choice of 815 Hz or 82 kHz frequency is dependent on the conditions of the locator. The 815 Hz and 82 kHz signals each have their advantages. It is recommended to begin by using the 815 Hz signal, and continue as long as you are confident in the results. If the signal is very weak try to adjust the connection or grounding. Repeat adjustments of ground and connection point again before switching to 82 kHz.

815 Hz (lower frequency) signal is the preferred frequency signal because it is much less susceptible to locating errors such as bleed-off or undesired coupling. The 815 Hz locating range is greater than the 82 kHz signal on well insulated cables. The 815 Hz signal will not travel well through disconnected shield bonds or insulated pipe bushing.

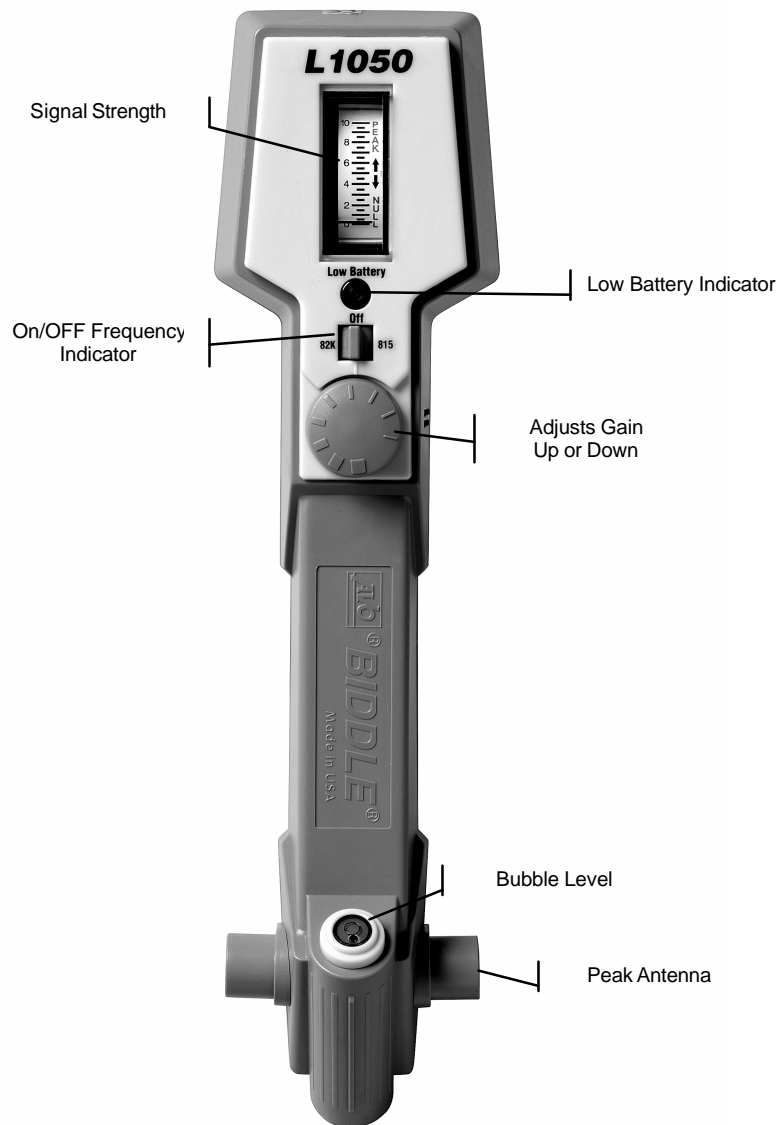
The 82 kHz (higher frequency) may perform better on conductors in direct contact with soil, for locating around sharp corners in cables and pipes, or for “jumping” disconnected shield bonds. The locating range is shorter for the 82 kHz signal so the TRANSMITTER must be repositioned more often during the tracing operation. This FREQUENCY is also useful for applying a signal using the FLEXICOUPLER OR THE HARD COUPLER.

Megger

5

L1050 Receiver Operation

Controls and Indicators



Locating Cable or Pipe

Make sure the TRANSMITTER is connected and in the ON position. Then move approximately 15 feet away from the TRANSMITTER along the path. (Move about 25 feet for the Inductive search mode.)

Hold the RECEIVER so that you can see the meter and controls easily. Make sure the RECEIVER and the TRANSMITTER FREQUENCY are both set for the same FREQUENCY, either 815 Hz (low) or 82 kHz (high).

Null Mode Locating

Move the RECEIVER left to right across the cable path. When the RECEIVER is directly above the cable or pipe, a NULL (lowest meter reading and lowest audio tone) will occur. When moving the RECEIVER to left or right of the NULL point, the meter reading will rise to a maximum point (PEAK). The audio tone will also be at its highest pitch. When the RECEIVER is moved beyond the PEAK, the meter will begin to fade.

Trace the path by walking away from the TRANSMITTER at a moderate pace. Move the RECEIVER to the left and right when walking, following the NULL indications.

As you trace the path, the PEAK meter reading may slowly fade as you move away from the TRANSMITTER. Increase the sensitivity using the GAIN knob to compensate for changes in signal level. If the PEAK meter readings suddenly changes in level (higher or lower), one of the following may have occurred:

1. a junction where the signal divides and goes several directions.
2. a break in the cable or shield.
3. a change in the depth of the cable or pipe.
4. an insulated pipe fitting.
5. a slack loop of cable.

If you can no longer trace the path, even with the GAIN control set to maximum, connect the TRANSMITTER to the far end of the path, and begin tracing the path back. Mark the straight section of the path every few feet.

Mark sharp curves, loops, and cable bundles every few inches. Sharp changes in the path causes the RECEIVER PEAK and NULL indicators to behave differently than when tracing a straight path. Practice on the path that you know has turns and laterals in it. This will help in recognizing the conditions within the field.

Depth Measurement 45° Angle Method (Nulling Unit)

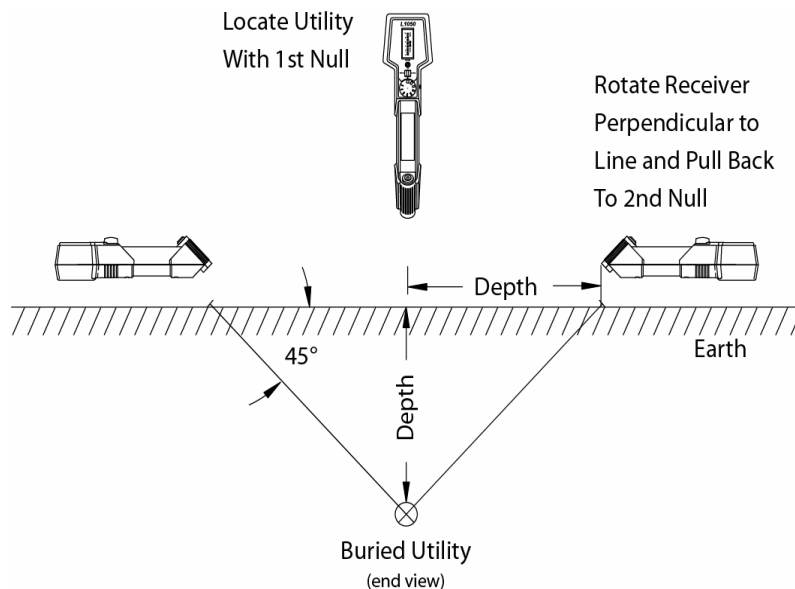
The only way to be sure of the depth of a utility is to expose the utility.

Move to the location you want to measure depth. Stay at least 15 feet away from the TRANSMITTER. Move the RECEIVER left to right across the path until the cable is located and mark the path on the ground as precisely as possible.

When placed on the ground with the meter facing up the RECEIVER antennae will be at the correct angle for accurate depth measurement. Pull the RECEIVER away from the cable path perpendicular (90°) to the cable path. When the RECEIVER indicates a NULL reading, mark the location of the receiver's foot. The distance between the RECEIVER and the cable path is the depth of the pipe or cable.

A false depth reading may be caused by nearby buried metallic objects, such as a second cable, pipe, sewer, fence or railroad track. Confirm the depth measurement by repeating the above steps on the opposite side of the pipe or cable.

A variance greater than 5 inches in depth measurement may indicate the presence of additional buried cables, pipes or other objects.

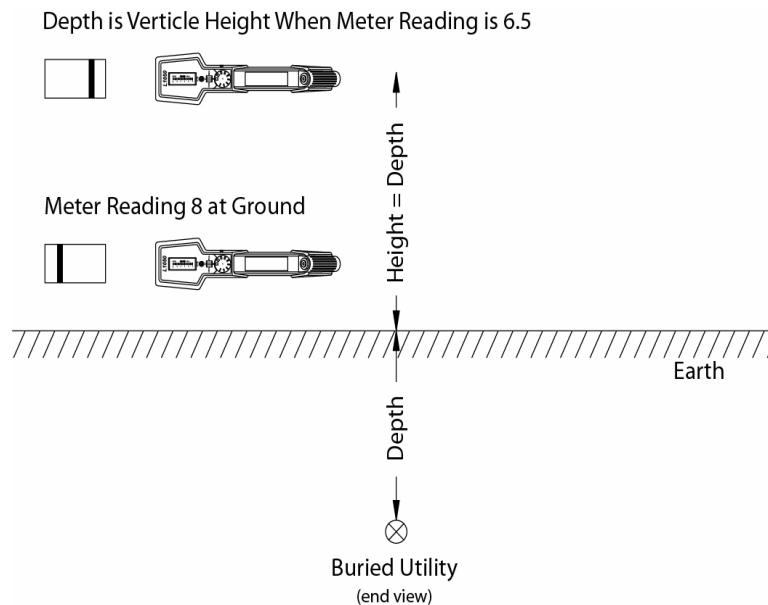


Depth Measurement Straight Lift Method (Nulling Unit)

Move to the location where you want to measure the depth of the buried cable or pipe. You must stay at least 15 ft away from the TRANSMITTER. Next, place the RECEIVER on it's side on the ground.

Without moving the RECEIVER, adjust the SENSITIVITY control for a METER READING of 8.

Lift the RECEIVER straight up without twisting, turning, or drifting to the left or right of the path. Continue to lift the RECEIVER until a new METER READING of 6.5 is found. The height of the heel of the RECEIVER above the ground is the depth of the cable. If you are unable to reach a METER READING of 6.5 by using the straight lift method, use the 45° triangular method to determine the depth measurement of the utility.



6

Service

Maintenance

The portable locator is a rugged, durable instrument built to withstand the rigors of day-to-day field use. It requires no periodic adjustments or calibration. It is however an electronic instrument and should be treated as such.

- When not in use, keep the portable locator in its carrying case and store in a safe, dry place, away from extremes in weather conditions.
- Should the unit become dirty, wipe it down with a damp cloth. Do not use cleaning compounds on the transmitter or receiver.
- Periodically inspect the test cord to ensure that it is in good condition.

Repair

If your portable locator is not working properly, please call:
1-800-723-2861 ext. 8578 *or* 610-676-8500 ext. 8578 for return authorization and shipping instructions.

Megger[®]