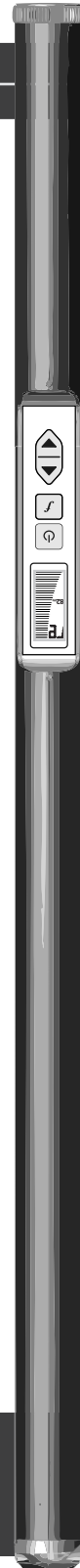
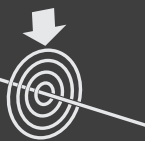


The Stick Cable & Pipe Locator

Powered By RYCOM Instruments' Pathfinder Locator Technology



ACCURATE
LOCATING
MADE SIMPLE



Manual Part # 030-00086-10

COPYRIGHT

Copyright © 2015 RYCOM Instruments, Inc. All rights reserved.

No part of this manual may be reproduced, copied, modified or adapted, without the prior written consent of the RYCOM Instruments, Inc.

Please feel free to contact RYCOM Instruments, Inc. to request permission for reproduction and use of this manual for training purposes.

Table of Contents


GENERAL INFORMATION

- Warranty 2
- Introduction 2
- Prepare for Use..... 2
- Transmitter Controls and Indicators 3
- Direct Connect 4
- Flexicoupler Connection..... 4
- Inductive Connection 5
- Blind Search 5
- Selecting the Tracing Signal 6
- Receiver Controls and Indicators 6
- Locating the Cable or Pipe 7
- Peak Locating Mode..... 7
- Depth Measurement 45 Degree Angle Method 8
- Tilted Magnetic Field Identification 8
- Ferrous Metal Detection 11
- Stick Receiver Specifications 12
- Stick Transmitter Specifications..... 13

Introduction Congratulations on the purchase of your new **Stick** Pathfinder Locator. The **Stick** Locator is specially designed to detect buried utilities. This device may detect buried power cables, CATV cables, gas and water pipes, sewer lines, telephone cables, fiber optic cables with sheath, sondes, inspection camera transmitters.

The TRANSMITTER emits a signal. The RECEIVER detects the signal. You can locate the relative position of the buried utility, sonde or camera by following the tracing signal.

⚠ WARNING



Electric shock hazard:

- Tool is designed to detect electromagnetic field emitted from Camera Sondes and buried metallic utilities. **There are buried cables, pipes, and utilities this instrument CANNOT detect.**
- LOCATING is not an exact science. **The only certain way to be sure of the existence, location, or depth of buried utilities is to carefully expose (dig up) the utility.**
- **De-energize any circuits in or around the work area.**
- Do not expose tool to rain or moisture.
- Use tool only for intended purpose as described in this manual

Failure to observe these warnings could result in severe injury or death.

DISCLAIMER OF LIABILITY

RYCOM INSTRUMENTS, INC SHALL NOT BE LIABLE TO DISTRIBUTOR, RESELLER, OR ANY OTHER PERSON FOR ANY INCIDENTAL, INDIRECT, SPECIAL, EXEMPLARY OR CONSEQUENTIAL DAMAGES, OR INJURY OF ANY TYPE WHATSOEVER, AND CAUSED DIRECTLY OR INDIRECTLY BY PRODUCTS SOLD OR SUPPLIED BY RYCOM INSTRUMENTS, INC.

Part Numbers

STICK Cable, Pipe Locator KIT	001 00482 00
Stick Receiver Specifications	100 00483 00
Stick Transmitter Specifications.....	100 00493 00
User Manual	030 00101 00
Red/Black Cord	151 00078 00
Ground Rod	211 00032 00

Prepare for Use

Unpack your new **Stick** Pathfinder Cable & Pipe Locator . Make sure there is no shipping damage and all the parts are included.

Locate the battery compartment on the top of the RECEIVER. Open the compartment by uncrewing the gray cap. Install the six Duracell® "AA" batteries as marked.

Locate the battery compartment inside the TRANSMITTER. Open the compartment using a phillips screwdriver. Install the eight Duracell "C" batteries as marked.

Note: For longer battery life and reliable operation under adverse conditions, use only Duracell® alkaline batteries.

Changing Operating Modes & Frequency Sets


NOTE: THIS SETUP PROCEDURE IS NOT REQUIRED UNLESS THE USER DESIRES TO CHANGE FACTORY SETTINGS.

The STICK operating programs and frequency sets are user programmable and can be changed at anytime through a quick selection process.

To select the desired frequency set on the RECEIVER:

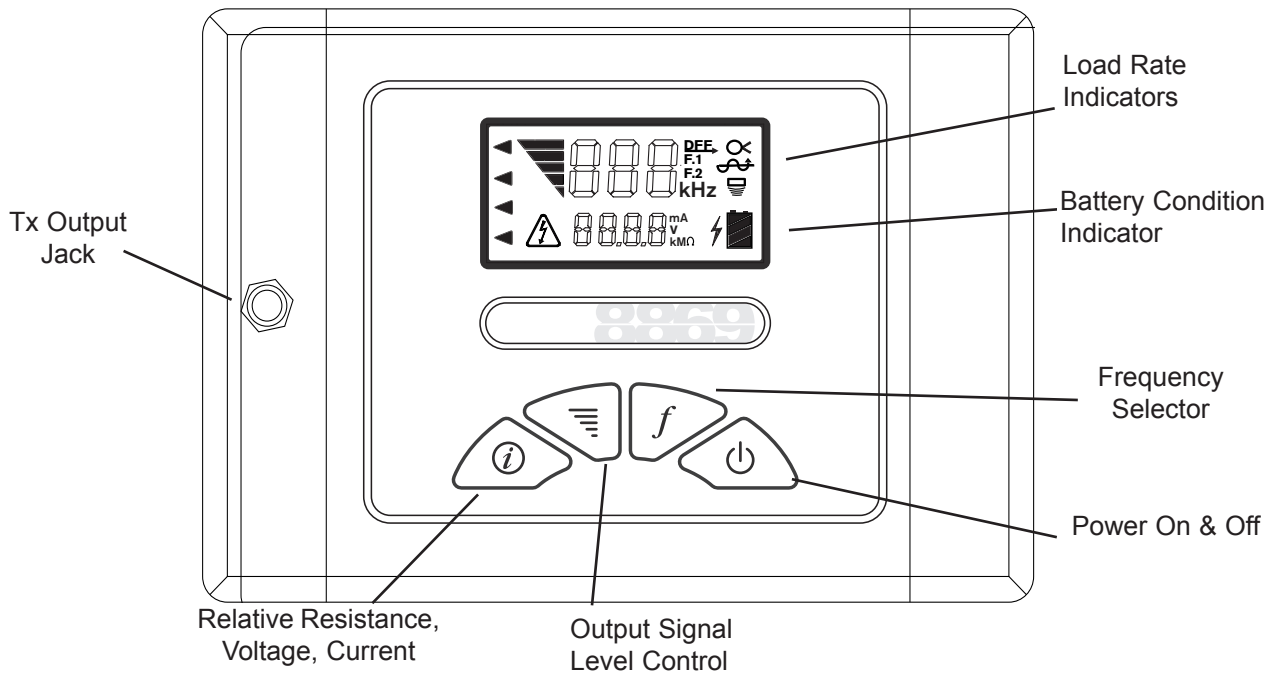
- Press, and hold depressed, the POWER ON BUTTON.
- Pressing the FREQUENCY BUTTON will toggle through available frequencies. PASSIVE 50Hz, 60Hz, CP50Hz, CP60Hz, 512Hz, 815 8kHz, 9kHz, 33kHz, 65kHz, 82kHz, 200kHz, 478kHz
- To select a frequency, press the MODE BUTTON toggle. At the top of the LCD the count of frequencies selected will tally up one each time a frequency is selected.
- Pressing the GAIN UP BUTTON will change the depth reading from inches/feet to centimeter.
- A long press of the MODE BUTTON will toggle on and off the optional ferrous locating feature (Fe).
- Releasing the POWER ON BUTTON will exit the setup menu and save the selected frequencies for availability during normal operation.

To select the desired frequency set: on the TRANSMITTER

- Press and hold depressed the POWER ON BUTTON.
- Pressing the INFORMATION BUTTON will toggle through available configurations. Repeat pressing until  is displayed in the FREQUENCY INDICATOR section of the LCD.
- Press and hold depressed the POWER ON BUTTON.
- Without releasing the POWER ON BUTTON, press the FREQUENCY BUTTON to toggle through the available frequencies.
- To select and store the desired frequency press the INFORMATION BUTTON. The count of the selected frequency will be displayed on the LCD.
- Continue to toggle through and select the desired frequencies,
- Releasing the POWER ON BUTTON will save the selected frequencies for availability during normal operation.

The Stick Locator Series

Transmitter Controls and Indicators



TX OUTPUT JACK

The RED/BLACK CORD, Coupler and FLEXICOUPLER connects here to create a circuit on the buried utility.

FREQUENCY SELECTOR

Pressing the frequency button will toggle through the available frequencies. This model operates at 82 kHz and 8kHz.

The 82 kHz frequency is a high frequency and can be applied by direct connection, coupler induction and transmitter induction. High frequencies are capable of jumping disconnected shield bonds, faults, insulated couplings and other interruptions of the conductor. The 82 kHz may induce or couple (bleed off) onto non-target conductors within close proximity.

The 8 kHz is mid-range frequency that can be applied via direct connection. The 8kHz is less likely to couple to adjacent conductors.

LOAD INDICATOR

The Load Rate Indicator symbol flashes to indicate signal transmission and 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.

OUTPUT SIGNAL LEVEL CONTROL

The OUTPUT SIGNAL LEVEL CONTROL adjusts the power output from the TRANSMITTER. The three selections include: LOW, MEDIUM, HIGH.

RELATIVE RELATIVE RESISTANCE, VOLTAGE, CURRENT

The transmitter measures both the output of the frequency and the feed back from the transmitted frequency. Pressing the "i" button will toggle through the voltage, current and relative resistance displayed at the bottom of the LCD.

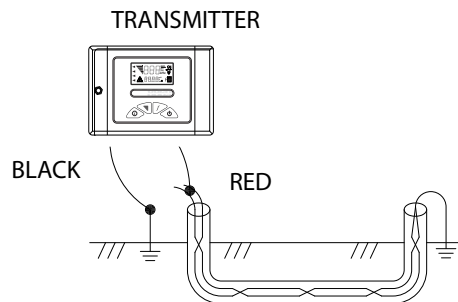
Direct Connection



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. All frequencies 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. Press the FREQUENCY Button for 82kHz or 8kHz. The Power Output Indicator and the Frequency Indicator of the chosen frequency is displayed.

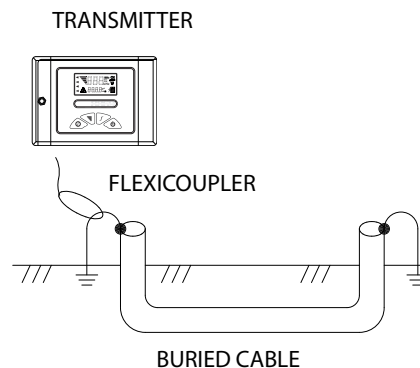


Coupler Connection

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 for DIRECT CONNECTION methods. 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.

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

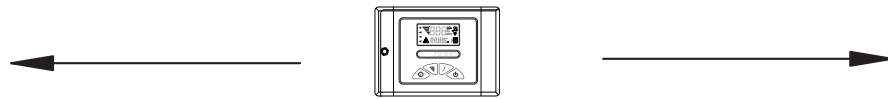


Inductive Connection

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.

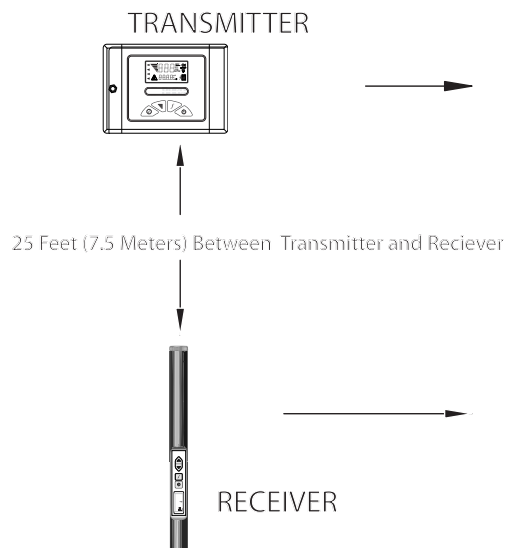
Turn the TRANSMITTER ON. Press the 82 kHz button. Place TRANSMITTER ON ITS SIDE as close as possible to the path of the cable or pipe. Align the ARROWS on the SIDE OF THE TRANSMITTER in line with the cable or pipe. First, locate the broad TRANSMITTER Null, then move toward the expected cable path while 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 above. 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.

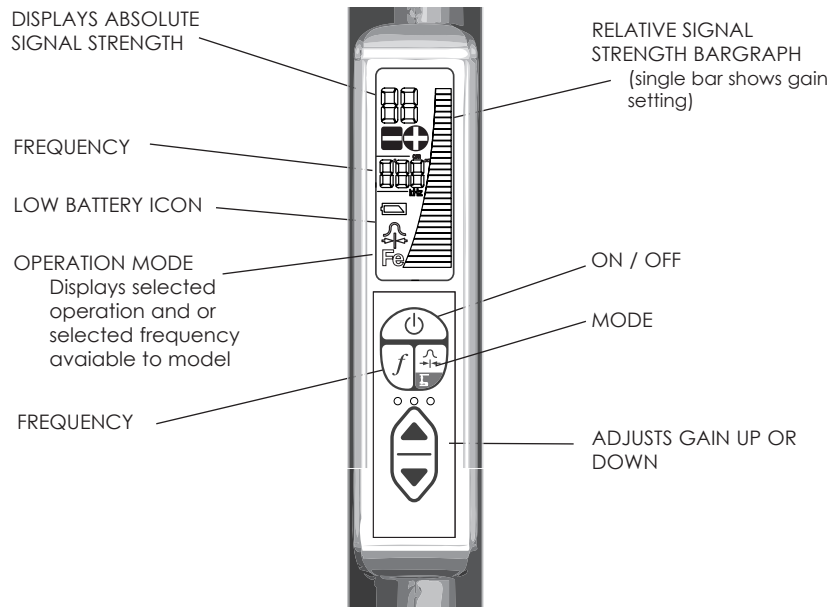


Blind Search

The Blind Search locating techniques 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 Held 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.



The Stick Receiver Controls and Indicators



ON/OFF Button
The unit will load settings from previous usage.

FREQUENCY Button
Toggles through available frequencies (model specific) 8kHz, 33kHz & 82kHz.

MODE Button & **DEPTH** Button
Mode selects between 3 modes, peak locating mode, left-right guidance mode and ferrous metal detection mode. Depress and hold for 3 seconds for depth reading.

GAIN Button (Up or Down)
Adjusts the gain up or down. Gain level displayed as solid or missing bar on bar graph.

Absolute Signal Strength

The Stick Locator RECEIVER provides the operator with a direct measurement of the RECEIVER's signal strength. The measurement is displayed with two numerical digits (ex: 85) located at the top of the LCD display. The measurement range is from 0 to 99 indicating a very weak signal (0) to a very strong signal (99). Absolute Signal Strength is independent of the GAIN setting or meter reading. It gives the operator information about the actual amount of signal being radiated from the conductor and received by the RECEIVER.

The Absolute Signal Strength will not be displayed if the gain is too high or too low. Adjust the GAIN to move the meter reading to mid-scale. The numerical display will change from '--' to a valid measurement.

Gain Change Indication

The GAIN up and down buttons are used to increase and decrease the gain in small amounts.

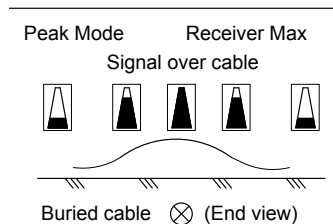
Low Battery

The **Stick** Locator will indicate low battery condition by displaying the low battery icon on the LCD screen.

Locating the Cable or Pipe

Make sure the TRANSMITTER is connected and in the ON position. Then move approximately 15 feet (4.5 meters) away from the TRANSMITTER along the path. (Move about 25 feet (7.5 meters) for the Inductive search mode.)

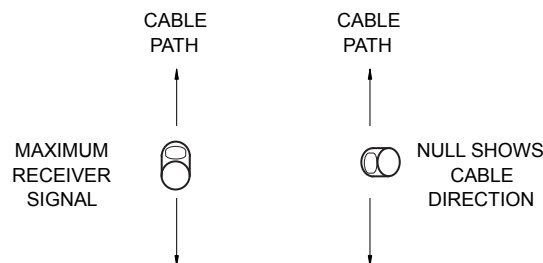
Hold the RECEIVER so that you can see the LCD bargraph and controls easily. Make sure the RECEIVER and the TRANSMITTER FREQUENCY are both set for the same FREQUENCY, 8kHz, 33kHz or 82kHz.



Peak Mode Locating

Keep the RECEIVER in a vertical position. Move the RECEIVER left to right across the path. When the RECEIVER is directly above the cable or pipe, rotate the RECEIVER for a maximum signal. As you move the RECEIVER away from the cable path, the meter reading (and audio frequency response) will drop off.

If you rotate the RECEIVER while over the cable, a sharp NULL will identify the cable's direction. It is aligned with the flat side of the RECEIVER.



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

As you trace the path, the PEAK meter reading may slowly fade as you move away from the TRANSMITTER. Press and release the GAIN buttons as needed to compensate for changes in level (higher or lower). One of the following may occur:

- a) a junction where the signal divides and goes several directions.
- b) a break in the cable or shield.
- c) a change in the depth of the cable or pipe.
- d) an insulated pipe fitting.
- e) a slack loop of cable.

If you can no longer trace the path, even with the GAIN set to maximum, connect the TRANSMITTER to the far end of the path and trace back to the point where you lost the signal.

Mark the straight sections of the path every few feet. Mark sharp curves, loops, and cable bundles every few inches. Sharp changes in the path cause the RECEIVER PEAK and NULL indications 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 you to recognize the conditions within the field.

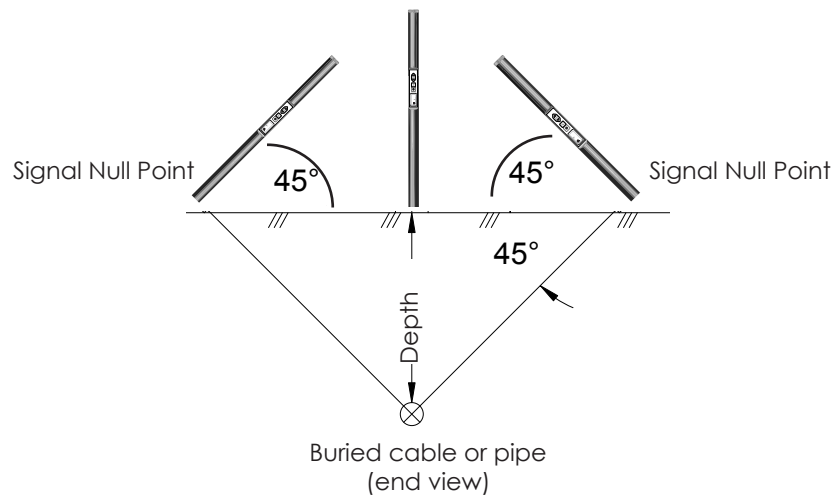
Depth Measurement 45° Angle Method

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. Mark the path on the ground as precisely as possible.

Position the unit so that the sight lines on the lower tube are straight up and down thus orienting the unit at a 45° angle. Pull the RECEIVER away from the cable path (at 90° to the cable path) keeping the unit at 45°. 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 and railroad tracks or from signal conducting on multiple lines. 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 a skewed electromagnetic field caused by the presence of additional buried cables, pipes or other objects.



Tilted Magnetic Field Identification

When adjacent cables or pipes are present, they will sometimes create locating errors. Some of the TRANSMITTER signal is picked up by the adjacent conductors and is redirected so that it combines with the original signal. The result is a Tilted Magnetic Field. This is often the reason that numeric depth readouts are sometimes created in error.

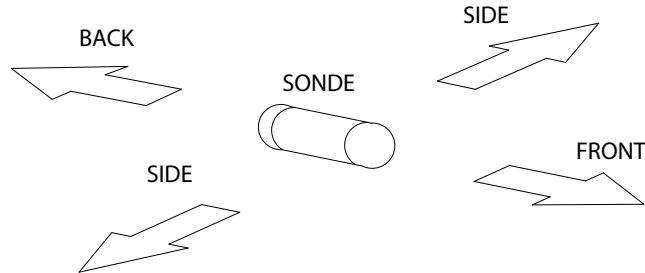
The operator can verify the accuracy of path locate by performing the 45° Angle Method locate on both sides of the cable path. If the right and left side depth readings agree to within 5 inches, the path locate is accurate. If the two depth readings do not agree, then **dig with care**. A closer locate would be halfway between the two outside depth locate marks.

This is an important technique that should be used to ensure the most accurate location possible.

Locating a Sonde or Camera Head Using the Stick

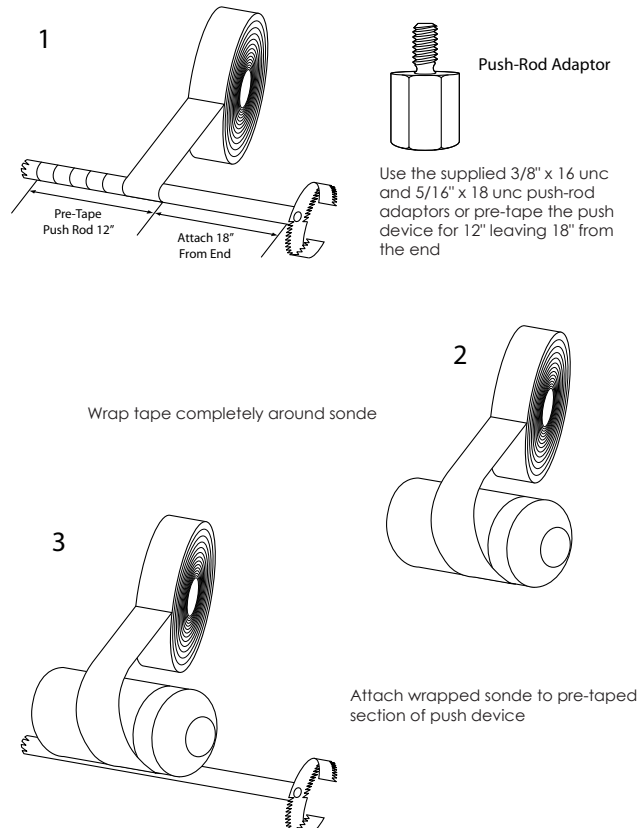
Before you begin, you must choose a SONDE OR CAMERA HEAD that will match the same frequency as the RECEIVER. You will need a SONDE with a frequency of 512kHz to use with the **Stick** Receiver.

The key to SONDE locating success is practice and patience. Before going out on your first locate, it is a good idea to take your RECEIVER and SONDE out and try locating the SONDE and calculating the depth.



Attaching a Push Device to the Sonde

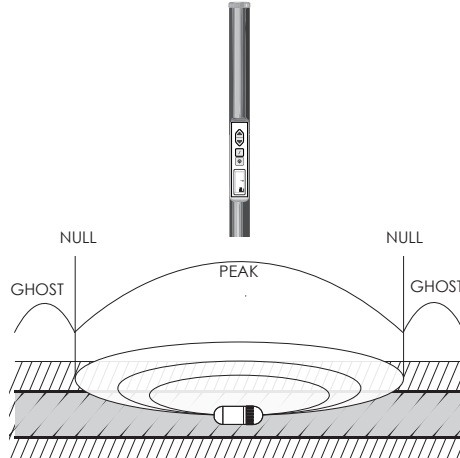
Attaching a push rod to the SONDE can be accomplished by using the coupling on the end of the SONDE. A spring coupling is recommended to allow the SONDE to move easier. Or, if you need to attach the SONDE to a sewer auger, it is recommended you use duct tape and apply as the shown in the figure below. If taping the SONDE on a metal pushing device, it is recommended to place the battery side of the SONDE closest to the device. This will allow for the best performance. Wrap the snake for approximately 1 foot in the location where the SONDE is going to be attached. Also attaching the SONDE 18 inches behind the cutting head is recommended. First, wrap the SONDE in the duct tape and then attach the SONDE to the snake using the duct tape.



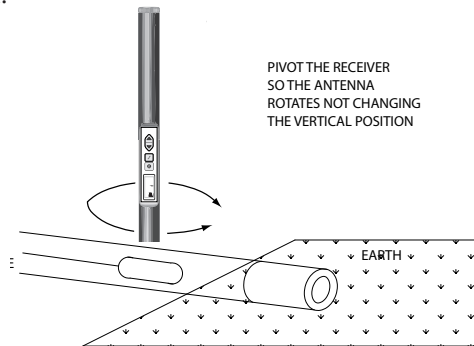
Locating a Sonde

Hold the RECEIVER antenna directly above and in line with the SONDE, as shown below with the RECEIVER sensitivity adjusted for a meter reading within scale.

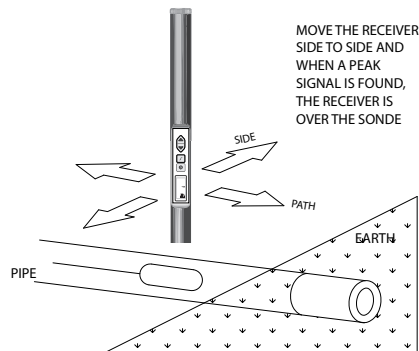
The radiation pattern of the SONDE is shown below. The PEAK signal is when the RECEIVER is held directly over the SONDE with the antenna in line with the SONDE. Both Ghost signals can be located behind and in front of the SONDE. By locating the ghost signals, the user is confirming the accuracy of the locate.



Start by following the suspected path of the pipe and use the **Stick** Locator to locate the SONDE. Stop locating when the PEAK reading is found. Then rotate the RECEIVER as shown in the figure below. When pivoting the RECEIVER, do not change the vertical position. The RECEIVER will indicate a PEAK when the RECEIVER antenna is in line with the SONDE.



Now move the RECEIVER side to side (across the path of the pipe) as shown below. When the PEAK is found, the RECEIVER is directly over the SONDE. Mark this location. Next, check for ghost signals in front of and in back of the SONDE to confirm the location.



Ferrous Metal Detection

The STICK offers a ferrous metal detection capability. To select this mode press the Mode key until the **Fe** is shown on the LCD. The gain controls will adjust the sensitivity. This mode will only detect ferrous metals; metals containing iron.

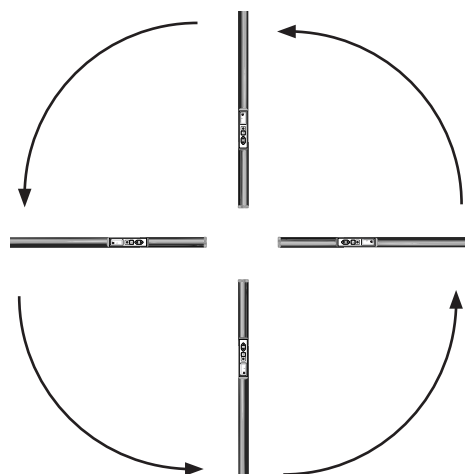
This mode may need to be calibrated after shipment from the factory due to the change in the earth's magnetic field.

To calibrate first move a location free of any metal and select the **Fe** mode. Then press and hold the Frequency button until CAL appears on the LCD. Turn the gain to about half scale on the bar graph. With the STICK held at a 45degree angle to the ground rotate in a circle. Pause every quarter turn and press the Frequency key, continue around the full circle. Do one additional sweep pressing the frequency one more time at any points of high signal. Now turn the unit off, the calibration procedures is finished and the unit is ready to locate.

Fe Calibration
Side View



Fe Calibration
Overhead View



Press the Frequency Button every quarter turn to calibrate.

Stickv3 Specifications

Receiver

Operating Frequency	476kHz • 200kHz • 82kHz • 65kHz • 33kHz • 8kHz •
Antenna Mode	Peak (horizontal coil) Null (Left/Right)
Audio Indication	Variable pitch audio
Operating Temperature	-4°F to 133° (-20°C to +55°C)
Battery Type	6 - "AA" Duracell alkaline batteries
Battery Life Continuous Intermittent	40 hours 82 hours (10 minute auto shut off)
Dimensions	Tube 33.0" x 1.38" Tee 1.38" X 3.25"
Weight	1.62 pounds (0.734 kg)
Signal Strength	LCD bar graph Absolute Signal Strength readout 0-99
Gain Control	up/down button for manual control
Dynamic Range	126 dB
Depth Measurement	Digital Depth Estimate Manual Triangulation

STICKv3 Pathfinder Specifications

Transmitter

Operating Frequency	476kHz • 200kHz • 82kHz • 65kHz • 33kHz • 8kHz
Operating Temperature	-4°F to 133° (-20°C to +55°C)
Hook-up Method	Direct Connection Inductive Coupling (with optional coupler) Transmitter Induction
Load Matching	automatic from 5 Ω to 20,000 Ω
Output Power	3 Watt (High) 500 Milliwatts (Low)
Battery Types	8 - "C" Duracell alkaline batteries
Battery Life	greater than 30 hours*
Dimensions	8.4" x 5.57" x 2.6"
Weight	2.2 lbs (2.8kg)

*depending on load, frequency and power setting

Factory Service

If your **Stick** Locator is not working properly, first call RYCOM Instruments, Inc. Support at 800-851-7347 for assistance. If the locator is in need of repair, RYCOM will provide instructions and a Return Material Authorization (RMA) for returning your locator to the service center. The instrument will be repaired and shipped back with an invoice or you will be advise if the instrument is unrepairable.

Send it prepaid to:

RYCOM Instruments, inc.
Attn: Repair (include RMA #)
9351 East 59th Street
Raytown, MO 64133

800-857-7347

Note: There is a minimum charge for repair and handling.

Warranty

THIS INSTRUMENT IS UNDER WARRANTY FOR ONE YEAR FROM THE DATE OF DELIVERY AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP **(EXCEPT BATTERIES)**. WE WILL REPAIR OR REPLACE PRODUCTS THAT PROVE TO BE DEFECTIVE DURING WARRANTY PERIOD.

THIS WARRANTY IS VOID IF, AFTER HAVING RECEIVED THE INSTRUMENT IN GOOD CONDITION, IT IS SUBJECTED TO ABUSE, UNAUTHORIZED ALTERATIONS OR CASUAL REPAIR.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. THE WARRANTY DESCRIBED IN THIS PARAGRAPH SHALL BE IN LIEU OF ANY OTHER WARRANTY, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WE ARE NOT LIABLE FOR CONSEQUENTIAL DAMAGES.

Parts List

STICK Cable, Pipe Locator KIT	001 00482 00
Stick Receiver Specifications	100 00483 00
Stick Transmitter Specifications.	100 00493 00
User Manual	030 00101 00
Red/Black Cord	151 00078 00
Ground Rod	211 00032 00