



HATHORN



OPERATOR'S MANUAL FOR HATHORN CL 2150 SONDE LOCATOR

For Safe and Effective Operation:
Before operation of your system, it is advised that
this manual be read carefully.

CONTENTS

PAGE 2	INTRODUCTION & LIABILITY DISCLAIMER
PAGE 4	GENERAL INFORMATION
PAGE 5	CONTROLS AND INDICATORS
PAGE 6	ATTACHING A SONDE TO A PUSH ROD
PAGE 7	LOCATING A SONDE
PAGE 8	DEPTH MEASUREMENT
PAGE 9	LOCATING A PIPE PATH & PEAK MODE
PAGE 10	SPECIFICATIONS
PAGE 11	SERVICE & WARRANTY

INTRODUCTION

The CL 2150 Locator is specially designed to detect camera systems and sondes and the unit is capable of detecting buried power cables, CATV cables, gas and water pipes, sewer lines, telephone cables, fiber optic cables with sheath.

The Transmitter/Sonde emits a signal. The Receiver detects the signal. You can locate the relative position of the buried pipe or camera by following the tracing signal.

For sonde locating & camera head locating a signal is generated by the sonde or camera head and the receiver detects the signal giving the user proximity cues to determine its location.

Unpack your new CL 2150 Camera and Sonde Locator. Make sure there is no shipping damage and all the parts are included.

▲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.**

Locate the battery compartment on the back of the “head” of the Receiver. Open the compartment using a Phillips screwdriver. Install the six Duracell® “C” batteries as marked. **NOTE:** For longer battery life and reliable operation under adverse conditions, use only Duracell® alkaline batteries

DISCLAIMER OF LIABILITY

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

ABSOLUTE SIGNAL STRENGTH

The CL 2150 Locator receiver provides the operator with a direct measurement of the receiver's signal strength. The measurement is displayed with three numerical digits (ex: 485) located at the bottom of the LCD display. The measurement range is from -100 to 999 indicating a very weak signal (-050) to a very strong signal (999) 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. Measuring Absolute Signal Strength at any time is done by reading the number at the top of the LCD display. The Absolute Signal Strength is displayed even when the meter reading is off scale (too high or too low).

GAIN CHANGE INDICATION

The GAIN up and down buttons are used to increase and decrease the gain in small amounts. If the meter reading is very low, pressing the GAIN UP button will center the meter reading to mid-scale. Likewise, if the meter reading is very high, pressing the GAIN DOWN button will center the meter reading to mid-scale.

DIGITAL DEPTH ESTIMATE

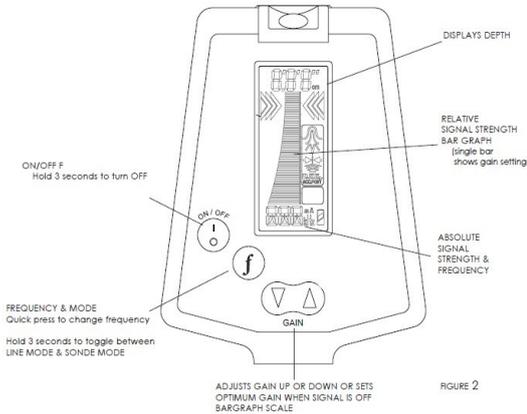
The CL 2150 Locator estimates the depth automatically. The depth is displayed at the top of the LCD display in feet or inches. Digital depth is useful in quickly determining the depth of the conductor during path locating.

To change the Depth Measurement from SONDE to LINE, hold the Frequency Key for three seconds and the next setting will appear. Caution must be exercised when using the digital depth feature, as tilted magnetic fields and adjacent conductors can significantly influence this measurement. The operator should periodically check for adjacent conductors and tilted magnetic fields when taking push button depth readings.

LOW BATTERY

The CL 2150 Locator will indicate low battery condition by displaying the low battery icon at the bottom right of the LCD screen.

CL 2150 RECEIVER CONTROLS AND INDICATOR



ON/OFF BUTTON

Press the ON/OFF button to turn the receiver on. Note: Unit will automatically shut off if no keys are pressed within a 10-minute period.

FREQUENCY & MODE BUTTON

The configuration of the unit (See page 3), will determine the functional-

ity of the Frequency & Mode button. If configured to 512, the unit will only operate in 512Hz Sonde locating mode and the Frequency Button will be functionless.

If configured to U3, the unit will only offer multiple sonde locating frequencies. Press the frequency button to toggle through available frequencies. Press and hold the frequency button for 3 seconds to toggle between line mode and sonde locating modes.

SONDE MODE: 512HZ, 640HZ, 8KHZ, 33KHZ.

The unit may be configured to the following line mode frequencies: passive 50hz & 60hz, passive rF, 512hz, 640hz, 8khz, 9khz, 33khz, 65khz, 82khz, 200khz, 478khz

GAIN BUTTON (UP OR DOWN)

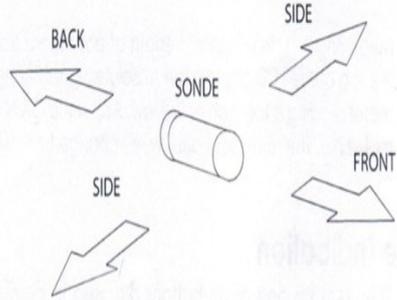
Used to adjust the gain level for the receiver. When the gain button is pressed, The receiver will adjust the gain up or down. If the bar graph is off scale, pressing the GAIN up or down key will automatically adjust to 85% on the scale display.

NOTE:

WHILE HOLDING “POWER” BUTTON, PRESS THE “DEPTH” BUTTON TO NAVIGATE THROUGH FREQUENCY OPTIONS. CHOOSE “512 Hz” FOR HATHORN SYSTEMS.

LOCATING A SONDE OR CAMERA HEAD USING THE CL 2150

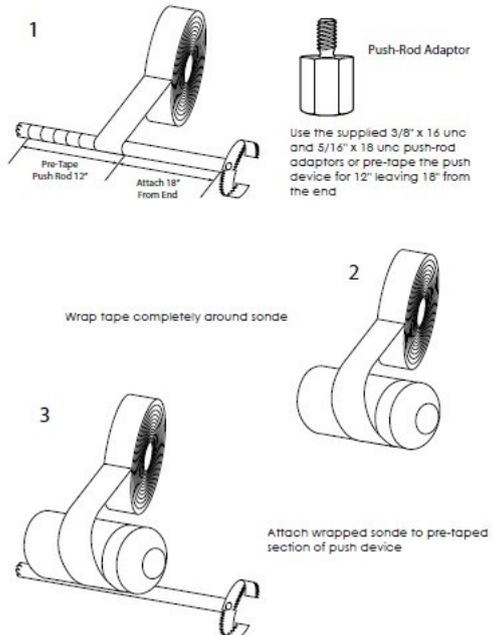
Before you begin, you must choose a Sonde that will match the same frequency as the receiver. You will need a Sonde with a frequency of **512HZ, 640HZ, 8KHZ, or 33KHZ** to use with the CL 2150 Locator Receiver.



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

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.

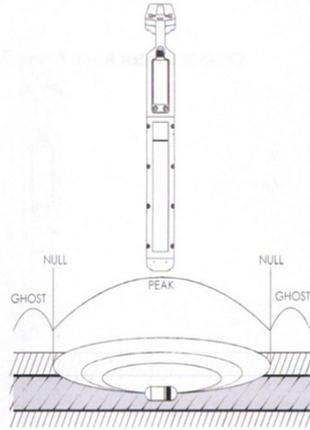


LOCATING A SONDE

Hold the Receiver antenna directly above and in line with the Sonde, as shown below. The Receiver sensitivity needs to be adjusted for a meter reading indication between 60% to 80%.

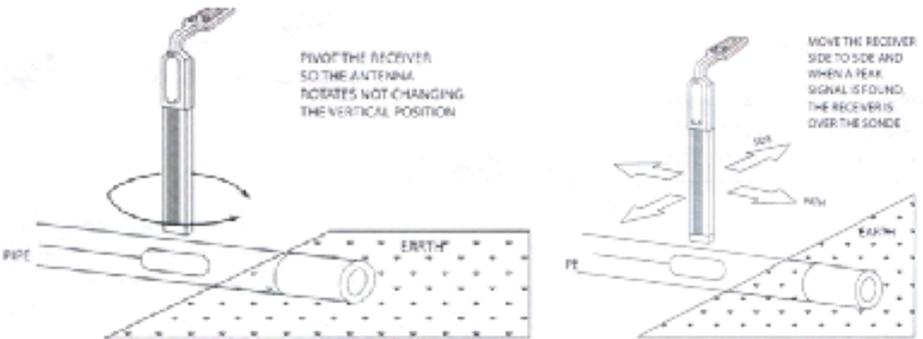
The radiation pattern of the Sonde is shown below. The PEAK signal is when the Receiver is held directly over the Sonde with the antenna in line with the Sonde.

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.



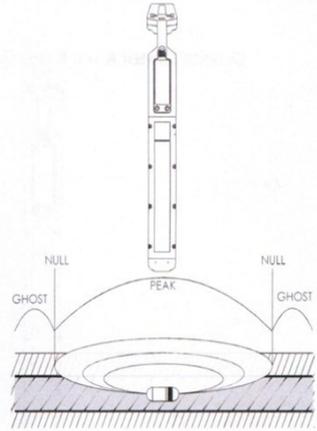
Start by following the suspected path of the pipe and use the CL 2150 Locator to locate the *SONDE*. Stop locating when the *PEAK* reading is found. Then rotate the *RECEIVER* as shown in the figure below. When pivoting the *RECEIVER*, **do not** change the vertical position. The *RECEIVER* will indicate 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 and in back of the *SONDE* to confirm the location.



DEPTH MEASUREMENT OF CAMERA HEAD OR SONDE

Once the *SONDE* has been located, the depth can then be found. Refer to the figure below for a reference. Start by moving the *RECEIVER* along the path behind the *SONDE* with the antenna in line with the *SONDE* and find a *NULL* between the *PEAK* ghost signals. Mark this point (A). Then move the *RECEIVER* along the path in front of the *SONDE* and find another *NULL*. Mark this point (B). Next, measure the distance between these two points. The depth of the pipe is 0.7 times the distance between the two points.



PUSH BUTTON DEPTH

The CL 2150 Locator is specially designed to measure the *SONDE* depth digitally.

To use this feature, the *RECEIVER* must be placed in the position shown in the diagram above. The *RECEIVER* antenna must be in line with the *SONDE*.

The *RECEIVER* must also be in the *SONDE* mode (holding the Depth for a long press of three seconds switches depth mode). Locate the *SONDE* as described previously.

When the *SONDE* has been located, press the *DEPTH* button. The LCD display will indicate *dEP*, *SON* and display the depth of the *SONDE* in feet or meters.

The only way to be sure of the depth of a utility is to expose the utility. At any time, the depth readout may be inaccurate as it may be affected by metallic objects in the ground.

Caution must be exercised when using the push button depth feature, as tilted magnetic fields and adjacent conductors can significantly influence this measurement. The operator should periodically check for adjacent conductors and tilted magnetic fields when taking push button depth readings.

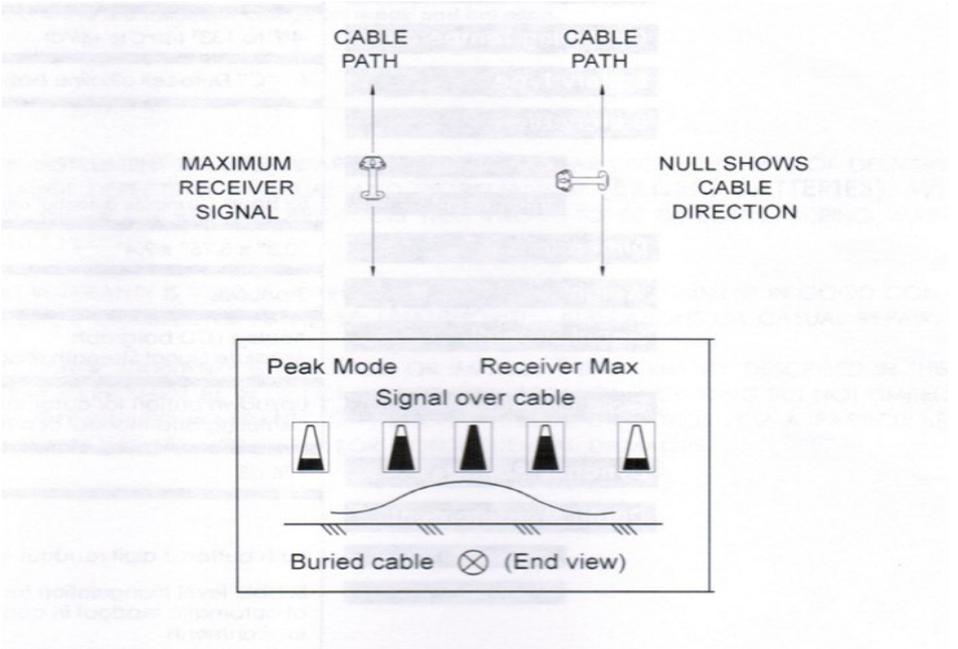
LOCATING A CABLE OR PIPE PATH

Using either a Line Transmitter or Passive locate mode a user may be able to locate a buried utility. Hold the RECEIVER so that you can see the LCD bar graph and controls easily. Make sure the RECEIVER and the TRANSMITTER FREQUENCY are both set the same, 512Hz.

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 cables' direction. It is aligned with the flat side of the RECEIVER.



CL 2150 LOCATOR SPECIFICATIONS

Operating Frequency	512 Hz
Antenna Mode	Peak (horizontal coil)
Audio Indication	Variable pitch audio
Operating Temperature	-4°F to 133° (-20°C to +55°C)
Battery Type	6 - "C" Duracell alkaline batteries
Battery Life	
Continuous	40 hours
Intermittent	82 hours (10 minute auto shut off)
Dimensions	30.3" x 3.75" x 9.4"
Weight	3 pounds
Signal Strength	Analog LCD bargraph Absolute Signal Strength readout 0 - 999
Gain Control	Up/down button for automatic centering and manual control
Dynamic Range	126 dB
Depth Measurement	
Automatic	Push button 3 digit readout to 6 feet
Manual	Bubble level triangulation for verification of automatic readout in congested environments

FACTORY SERVICE

If your CL 2150 Locator is not working properly, call Hathorn Corporation Support at 905-604-7040 for assistance. If the locator is in need of repair, Hathorn Corporation will provide instructions and a Return Merchandise 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 advised if the instrument is un-repairable.

SEND UNIT PREPAID TO:

**Hathorn Corporation
ATTN. Repair (Include RMA#)
255 Shields Ct. Unit C. DOCK 2
Markham, ON Canada L3R8V2
+1-905-604-7040**



WARRANTY

THIS INSTRUMENT IS UNDER WARRANTY FOR ONE YEAR FROM THE DATE OF DELIVERY AGAINST DEFECTS IN MATERIAL AND WORKMANSHIP (Excluding 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 OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WE ARE NOT LIABLE FOR CONSEQUENTIAL DAMAGES.



HATHORN

Hathorn Canada

**255 Shields Court, Unit C
Markham, Ontario, Canada
L3R 8V2
+1 (866) HATHORN**

Hathorn USA

**739 North Wilson Road
Columbus, Ohio, USA
43204**

+1 (855) 863-9226