

WARNING SAFETY
SONDE SEWER CAMERA & CABLE LOCATOR

Any piece of equipment can be dangerous if not operated properly. **YOU** are responsible for the safe operation of this equipment. The operator must carefully read and follow any warnings, safety signs and instructions provided with or located on the equipment. Do not remove, defeat, deface or render inoperable any of the safety devices or warnings on this equipment. **IF** any safety devices or warnings have been removed, defeated, defaced or rendered inoperable, **DO NOT USE THIS EQUIPMENT!!!**

IMPORTANT INSTRUCTIONS and SAFETY RULES TO FOLLOW

GENERAL

Introduction

The XT512 default operation mode is the "sonde" mode, but it can also operate in "passive" mode. In the sonde mode the receiver searches for the signal transmitted by a small sonde (or camera with a built-in transmitter) that has been routed through a pipe. The sonde must emit a 512 Hz, unmodulated signal to be able to be detected by the receiver. In the passive mode the receiver searches for 60 Hz or 50 Hz signals (factory preset) present in power lines or other electrical cables underground. In addition, the receiver can determine the approximate depth of the target, and has the ability to operate in manual or automatic gain modes. The front panel is designed to be intuitive and require a minimum of training for effective use of the instrument. The controls and the information display area are large and easy to understand. Yet they include everything necessary to control the receiver with your thumb.

Control Buttons

ON/VOLUME - This switch powers up the receiver and automatically sets the volume to Maximum. Additional depressions of this switch will cycle the volume through Off (no sound), Medium, and Maximum settings.



OFF - This switch removes power from the instrument.



UP/DOWN Arrows - When the receiver is operating in manual gain mode, pressing the UP or DOWN arrows will increase or decrease the gain from its current setting. When the receiver is operating in the automatic gain mode, the first press of the UP or DOWN arrow will switch the receiver to the manual gain mode.



AUTO - When the receiver is operating in the manual gain mode, pressing the AUTO button will switch the receiver to operate in the Automatic gain mode. In this mode the receiver adjusts its sensitivity as a function of the strength of the detected signal.



SONDE - When the receiver is operating in Passive mode, pressing the SONDE switch will take the receiver to Sonde mode.



PASSIVE - When the receiver is operating in Sonde mode, pressing the PASSIVE switch will take the receiver to Passive mode.



DEPTH - To determine the depth of the target place the receiver directly over the target, then press the depth button. . There is a delay of 2.0 seconds between pressing the depth button and displaying the depth on the LCD. The measured depth will continue to be displayed on the LCD for as long as the button is depressed, otherwise (if the button is pressed and quickly released), the depth will show on the LCD momentarily, along with the word "DEPTH" on top of the LCD. Then the LCD will revert back to display signal strength. The XT512 can be factory set to display depth in feet and inches or in meters.



NOTE: The conditions and techniques to measure depth are different for the sonde mode and the passive mode. See SECTION III: OPERATION for further details.

LCD Display

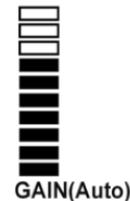
The LCD display has six general areas to display information to the user: a Battery Indicator, a Gain Indicator, a Mode Indicator, a Direction Indicator, a Numeric Display and a Volume Indicator.

BATTERY INDICATOR - The "Battery" symbol indicates the receiver's battery status as follows: when all 3 segments inside the battery symbol are present, the battery is fully charged. When only 2 segments are present the battery has a medium charge. A single segment present signals a low battery. Always replace the receiver battery when only the bottom segment is visible. If there are NO segments present the battery is extremely low and you should replace it immediately.



GAIN INDICATOR - The "(Auto)" legend next to the "GAIN" legend indicates that the gain is in the automatic mode. In this mode the receiver adjusts its sensitivity as a function of the strength of the detected signal. No bar graph is shown in this mode.

If the "(Auto)" legend is not visible the receiver is operating in the manual gain mode. The bar graph indicates the relative strength of the signal, with each bar roughly representing one tenth of the full scale available. It takes 2 presses of the UP arrow to add one bar to the graph, and 2 presses of the DOWN arrow to delete one bar from the graph.



MODE INDICATOR - When the receiver operates in the sonde mode the word "SONDE" is displayed. If the receiver is operating in the passive mode, the "Passive Arrow" is displayed instead.

SONDE



DIRECTION INDICATOR - The direction indicator works only in the passive mode. The purpose of the arrows and center bar in this indicator are to tell the operator in which direction to move the receiver in order to be directly over the target (see also "Alternate Directional Indication" Section).



Right Arrow - Receiver should be moved to the right to get closer to the target.

Left Arrow - Receiver should be moved to the left to get closer to the target.

Both Arrows and Bar - Receiver is placed directly over the target. This is also accompanied by a beeping sound.

NOTE: When all three elements of this indicator are OFF, the signal strength is not adequate to make a directional determination or you are not close to the cable being traced. Keep searching based on the signal strength indication (see below) and the audio feedback, until one of the arrows comes ON

NUMERIC DISPLAY - The numeric display consists of 3 ½ digits (the leftmost half-digit can only be a "1" or be off) and it is used to display signal strength and depth.

Signal Strength - This is an indication of the relative signal level detected by the receiver and is a function of the gain setting. See also Section III - OPERATION, for a better understanding on how to interpret the signal strength readings.

Depth Reading - When measuring depth the word DEPTH lights up above the numeric display. Then, after the calculation is done, the depth of the target in feet and inches (or meters) is displayed as shown below for as long as the button remains depressed, or just momentarily if the button was pressed and released:

12 4 Ft - in (factory set) or 4.10 m

VOLUME INDICATOR - The Volume indicator consists of a speaker symbol with 3 sound wave bars (as shown at right). If the volume is off, the speaker symbol with NO bars is shown (see below), for medium volume the speaker symbol with 2 bars is shown (see below) and for maximum volume the speaker symbol with 3 bars is shown (see below).



Volume OFF



Medium Volume



High Volume

Audio

The receiver produces an audible indication of signal strength. The pitch of the sound will increase with increasing signal strength. However, the volume is determined only by the VOLUME control, as explained above. See Section III - OPERATION, for additional hints on the effective use of the signal strength indicators (see also "Alternate Directional Indication" Section).

Alternate Directional Indication (ADI)

When operating in the passive line tracing mode (not in Sonde mode), the XT512 receiver can be configured to produce an alternative audio output. This is called ADI, and can be accessed at any time by simultaneously pressing the ON button and the UP arrow button.



When the receiver operates in ADI mode the sound emitted by the speaker is continuous when the Right Arrow is on, and interrupted or "beeping" when the Left Arrow is on. The pitch of the sound will change as described under "Audio". When both arrows and the center bar are on, the speaker is silent. The speaker is also silent when the signal is too weak to make an accurate directional indication.

The advantage of this mode is that the user can use the sound to know in what direction the instrument should be moved without looking at the display. A continuous tone means: "move to the right", a beeping tone means: "move to the left", and silence means: "you are right on the utility" (unless signal is too weak to make a determination).

The XT512 can be returned to the normal directional indication mode by simultaneously pressing the ON button and the Down arrow button.



OPERATION

Sonde/Camera Locator

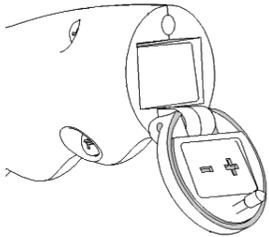
Your XT512 receiver supports the detection of any standard 512 Hz sonde or camera in the market. This type of sonde or camera is usually attached to devices that are sent through non-metallic sewer or water pipes. The emitted magnetic field easily passes through the walls of such pipes. Since the signal being traced by the receiver is produced by the sonde or camera, there are some differences in the way the receiver is used when compared with normal cable or pipe tracing. Due to the nature and strength of the sonde signal, it is necessary to have some idea of where the sonde is located. This is usually not much of a problem, since the sonde is "guided" by a device under control of the work crew, often with a camera attached to it. Once in the surroundings of the sonde, it is important to differentiate whether you are positioned along the axis of the sonde (the direction of the pipe) or off to either side. In the sonde mode the arrows are not functional, so the signal strength is the only indication available, and it will be "null" (very close to zero) if the receiver is placed on the axis of the sonde with the plane of the sensors perpendicular to it. Move away from the axis and follow the direction that results in increasing signal strength. Rotate the receiver back and forth and move in the direction that produces the maximum. As the receiver gets closer to the sonde the signal strength increases to a maximum when directly over the sonde if the plane of the sensors is parallel to the axis of the sonde (approaching from a direction that is perpendicular to the direction of the pipe). A rotation of 90 degrees from this position should produce a null. To measure depth, simply place the tip of the receiver, in the EXTENDED position, on the ground and press the DEPTH button when the signal strength is at a maximum. The digital display will indicate the approximate depth. The reading will be displayed as long as the button is depressed. See Controls section for more details. The receiver defaults to AUTO Gain in Sonde Mode. Here, the numeric indication is a measure of the absolute signal strength. By switching to MANUAL Gain (See Control Section) the operator can control the gain. The numeric indication is a measure of relative signal strength. It should be adjusted to 300 – 400 when over the target. A reading of 999 indicates the signal is saturating the amplifiers and the gain should be reduced.

Passive (60/50 Hz) Cable Locator

Start searching for the conductor by turning the receiver ON and placing it in the passive mode. As you move toward the buried target, one of the arrows will indicate in which direction to move. If you move beyond the target, the other arrow will indicate that you should reverse direction. When you are right over the target the tone will reach maximum pitch and the digital reading will reach a maximum. Both arrows and the center bar on the display will be ON, and the receiver will start beeping (see also "Alternate Directional Indication" Section). To measure depth, simply place the tip of the receiver, in the EXTENDED position, on the ground and press the DEPTH button when the signal strength is at a maximum, and you are right over the target, as explained above. The digital display will indicate the depth. The reading will be displayed as long as the button is depressed. See Controls section for more details. The receiver defaults to AUTO Gain in Passive Mode. Here, the numeric indication is a measure of the absolute signal strength. By switching to MANUAL Gain (See Control Section) the operator can control the gain. The numeric indication is a measure of relative signal strength. It should be adjusted to 300 – 400 when over the target. A reading of 999 indicates the signal is saturating the amplifiers and the gain should be reduced.

BATTERY INSTALLATION

The XT 512 is powered by one 9-volt battery. The battery is located in the handle of the instrument and can be accessed by turning the screw counterclockwise by hand or with the use of a screwdriver or coin. To remove the battery, simply tilt the receiver so that the handle is pointing down, and the battery will slide out. When replacing the battery, look at the inside of the battery door for the proper battery orientation. (The positive terminal should be on the right on the inside of the receiver) As a safety measure the receiver has been "Keyed" so that the battery will only make contact when in the correct orientation. For this reason you should never have to force the battery door closed. If the battery does not seem to be going in all the way, remove, reverse and then replace.



Technical Support

Schonstedt offers technical support and sales. For any reason regarding usage and application please contact our technical support team at 888-32-TRACE (888-328-7223).

Important FCC Notice

This unit has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This unit generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this unit does cause harmful interference to radio or television reception the user is encouraged to try to correct the interference by reorienting or relocating the receiving antenna, or by increasing the separation between the equipment and the receiver.

SPECIFICATIONS

(Specifications are subject to change without notice)

Common:

Battery: 9 V Alkaline single battery. Battery Life: 12 hours intermittent use

Audio Output: 10 - 1400 Hz determined by signal strength

0 - 70 db SPL (Sound Pressure Level), volume controlled

Weight (incl. batteries): Under 2.8 lbs

Sensors: Split angled sensors to derive peak and null signals

Sonde/Camera Locator

Operating Frequency: 512 Hz Modulation: None

Max. Depth Capability: Typical 5-8' dependent on signal level emitted by sonde

Passive Cable Locator

Operating Frequency: 60 or 50 Hz, factory set

Modulation: None

Max. Depth Capability: Typical 10-12' dependent on signal level present on cable

If the person receiving this handout will not be the user of the equipment, forward these instructions to the operator. **IF** there is any doubt as to the operation or safety of the equipment, **DO NOT USE!!! CALL A TOOL SHED IMMEDIATELY!!!**
FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN INJURY OR DEATH