

PT-1

Pipe Tracker

OPERATION MANUAL

1010



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MAINTENANCE

Your PT-1 was designed to be maintenance free. It is constructed of corrosive resistant materials. However, as with most diving equipment, it is recommended that it be rinsed in fresh water after use and stored in a cool, dry place. The earphone and charger connectors do not need covers, they can be exposed to fresh/salt water.

LIMITED WARRANTY

Your detector underwent constant inspection during assembly to insure many years of trouble free performance. The Pipe Tracker is warranted for TWO FULL YEARS from the date of purchase. During this period, your detector will be repaired free of charge should a failure occur due to materials or workmanship. The warranty does not cover batteries, broken or cracked parts or assemblies, or damage due to dropping or general misuse.

Should service be required, write or phone us explaining the nature of the problem, and we will provide shipping instructions. All repairs are made at our factory. Repairs by unauthorized persons may void the warranty.

RETURNING DETECTOR FOR REPAIR

If your detector should need service, you can write, or e-mail: jwfishers@aol.com, phone (508) 822-7330, or fax (508) 880-8949 the factory for instructions. We do not require authorization for the return equipment. If you have a problem with your detector and would like to have it checked out at the factory, simply pack the detector well and return it with a brief note describing the problem. Be sure to include your return address and telephone number on the note. When returning equipment from outside of the US, contact the factory for specific instructions to avoid US Custom problems and extra charges.

CAUTIONS:

1. Do not allow your detector to be exposed to excessive heat by leaving it in direct sunlight or inside of a closed vehicle on a hot day. Excessive heat can damage the electronics and/or destroy the detector’s waterproof seals.
2. Do not overturn Control Knob (in either direction).
3. The operator must be magnetically clean (no steel toed shoes).
4. The probe should be held vertically for best sensitivity and to pinpoint a target.
5. The probe should be held vertically for maximum depth.
6. The audio output is much more sensitive than the Signal Strength Readout light bar.
7. Swinging and rotating the probe can produce false readings

SPECIFICATIONS

SENSITIVITY:

- 31/2" nail 19 in.
- 1/2" x 6" steel rod 22 in.
- 4" x 4" x 1/16" steel plate 25 in.
- 1 gal metal can 48 in.
- 55 gal drum 8-10 ft.
- 4" diameter iron pipeline 8-10 ft.
- Larger targets to a max 16 ft.

DIMENSIONS/WEIGHT:

in air/water

- PT-1 44" L 5 lbs/ 8oz.
- Probe only 36" x 1 1/4" dia
- Case 7 1/2" L x 5 1/2" W x 4" H
- Shipping Box 8" x 13" W x 50" L 14 lbs.

MATERIALS/COLOR:

- Case High impact urethane/gray
- Probe High impact PVC, aluminum/black

OPTIONS

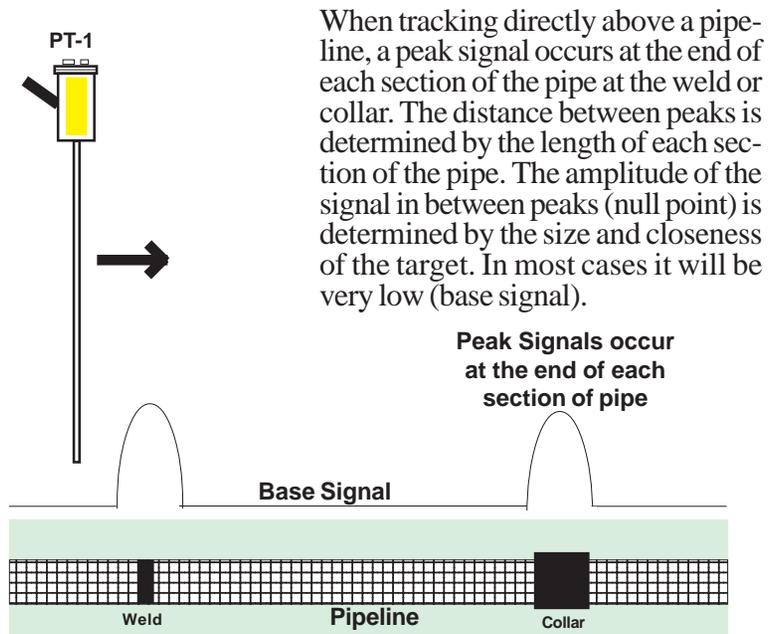
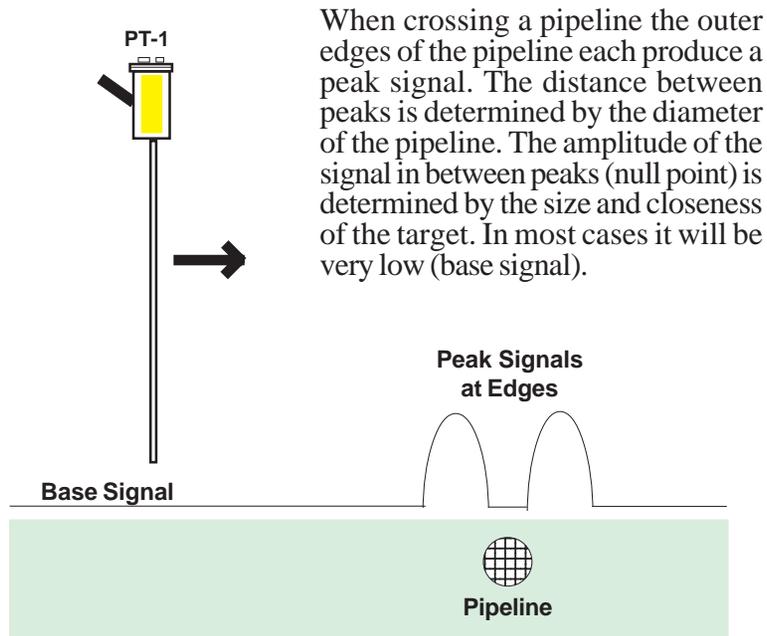
- Carry and storage case
- 220vac charger transformer (Europe)
- Dual underwater earphones

PT-1 Pipe Tracker Standard Package



When tracking pipelines, the probe is held vertically. It is recommended that as you move forward along the length of the pipe, the probe is moved left and right. That movement will produce a peak signal, followed by a null point (directly over pipe), followed by a peak signal. That sequence assures the operator that he is still detecting the pipeline as he is walking forward.

While tracking the pipeline, if the null point (base signal) disappears and only a single peak signal is heard, the operator knows he is over the end of a section of pipe and at the weld point or collar which connects to the next section of pipe.



INTRODUCTION

The PT-1 pipe tracker is a very sensitive, pinpointing magnetometer. It works equally well on land, and in fresh or salt water. It not only tracks pipelines and armored cables, but it will also locate anchors, chains, dredge heads, weapons, explosive devices, and any other ferrous metal object within its detection range. It will locate targets buried in or under any kind of material, including concrete, with no loss in detection range.

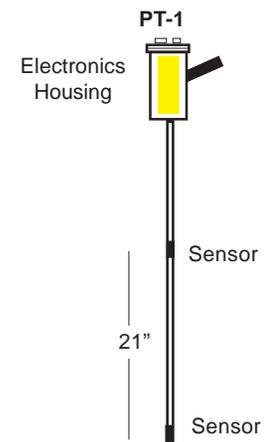
Though it does not have the long detection range of more powerful magnetometers, like our Proton 4 and Diver Mag 1, the highly directional PT-1 can pinpoint and track pipelines located near steel bridges and metal bulkheads which could be a problem for other magnetometers.

HOW THE PT-1 PIPE TRACKER WORKS

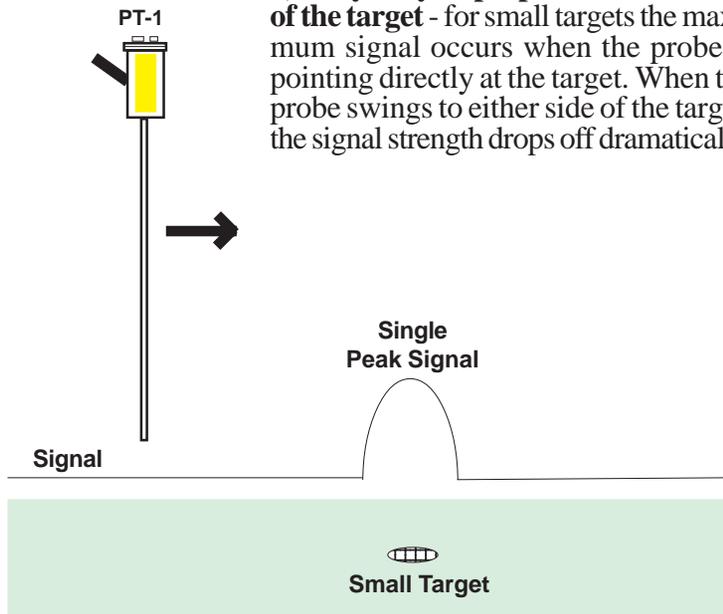
The PT-1 uses modified magnetometer technology. It has two sensors mounted 21" apart inside a 3 foot long probe. One sensor is in the tip, and the second sensor is mounted 21" up the probe.

Each sensor independently measures the earth's magnetic field. Iron and steel objects create a distortion in the earth's magnetic field. The larger the object, the greater the field change.

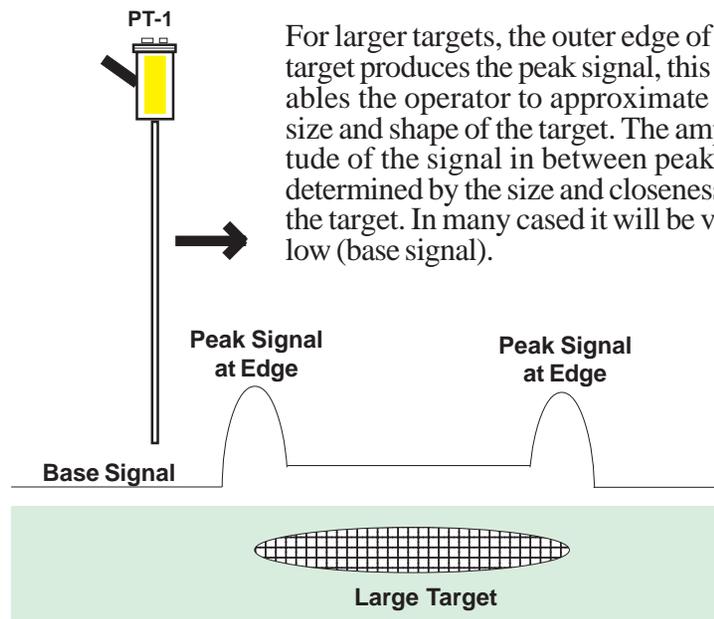
When the PT-1 approaches an iron or steel target, one sensor is closer to the target than the other, which creates a difference in the sensor outputs. This difference is converted into a signal which is displayed on the light bar and heard in the earphones. The advantages of the PT-1 with it's two sensor configuration are significant:



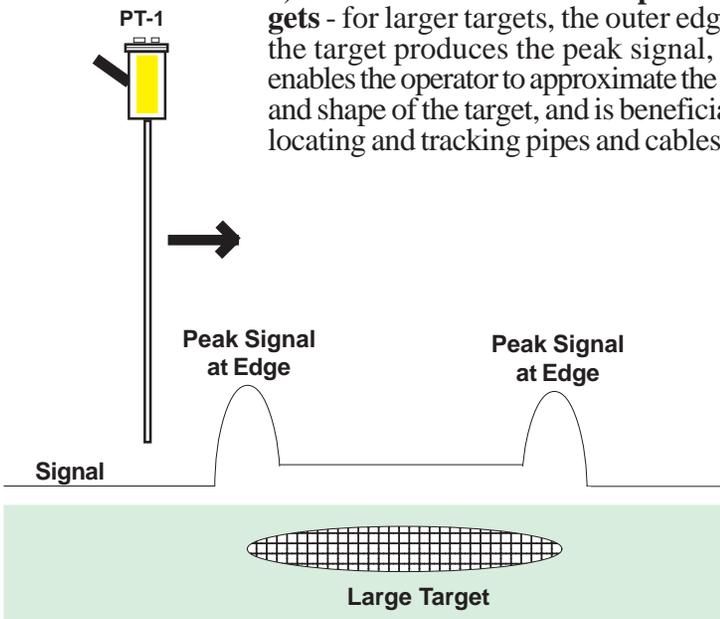
1) **Very easy to pinpoint the location of the target** - for small targets the maximum signal occurs when the probe is pointing directly at the target. When the probe swings to either side of the target, the signal strength drops off dramatically.



For larger targets, the outer edge of the target produces the peak signal, this enables the operator to approximate the size and shape of the target. The amplitude of the signal in between peaks is determined by the size and closeness of the target. In many cases it will be very low (base signal).



2) **Defines the size and shape of targets** - for larger targets, the outer edge of the target produces the peak signal, this enables the operator to approximate the size and shape of the target, and is beneficial in locating and tracking pipes and cables.



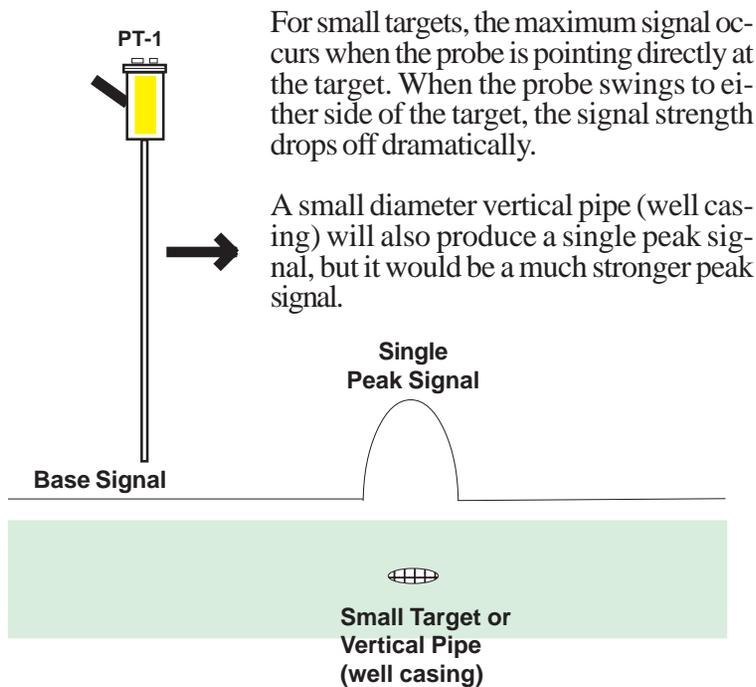
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SIGNALS FOR DIFFERENT TARGETS

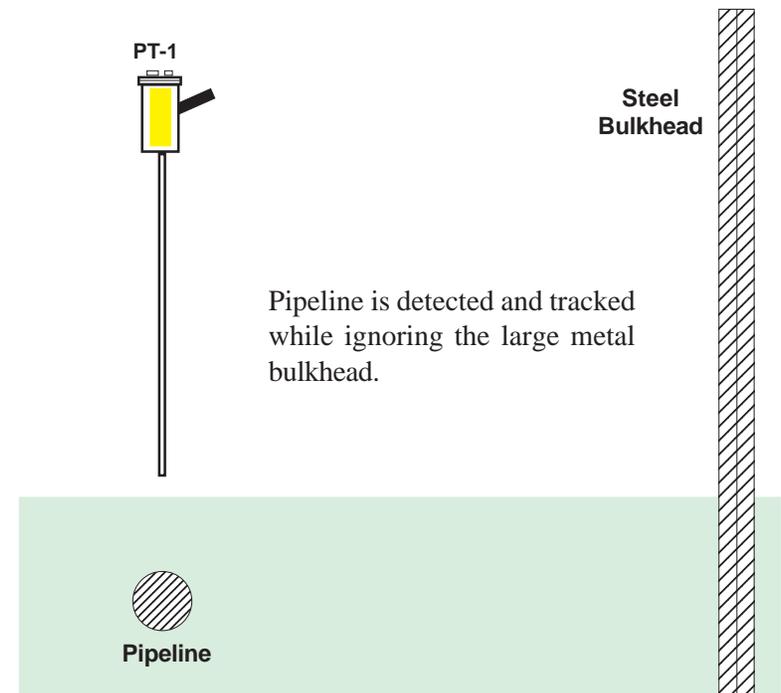
The size and orientation of the target effects the signal received. Generally speaking, a target that is buried vertically will give a stronger signal (can be detected deeper) than a target that is lying flat. For example: a nail that is driven into the ground can located deeper (stronger signal) than the same nail lying flat. A steel pipe that is vertical in the ground (a drilled well pipe) will give a stronger signal than if it was buried lying flat.

The size and shape of the target determines the kind of return signals you will receive.

What follows is some examples that show different size and shaped targets and the resultant signal produced. The amplitude of the peak signal determines the frequency heard in the earphones and the number of LEDs lit in the Signal Strength bar.

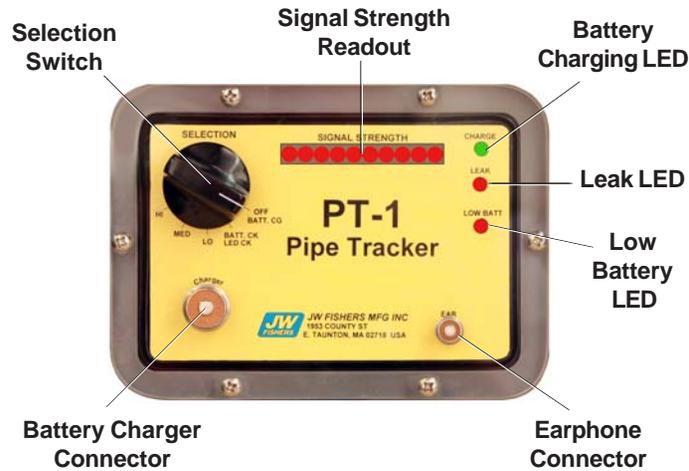


3) **It can locate and track pipelines, or other targets, even when they are located very close to bridges or other larger metal objects** - conventional magnetometers detect the bridge or other large object, making it extremely difficult to pinpoint the location of a smaller target. The dual sensors in the PT-1 cancel out targets located to the side of the probe.



The PT-1 Pipe Tracker is powered by internal rechargeable batteries that power the system for approximately 15 hours per charge. Off-the-shelf alkaline batteries can also be used if needed (do not attempt to recharge alkaline batteries). The battery condition is displayed on the meter and a low battery indicator flashes when batteries need recharging. Underwater earphone, land earphone, AC and DC battery chargers are included. Batteries are easily recharged without removing them from the housing, eliminating any concern over proper resealing.

Front Faceplate with Controls and Indicators



SWITCH, CONTROLS & CONNECTORS

Selection Switch - A five position switch is used to control the operation of the Pipe Tracker.

Pos. 1) OFF - All power is disconnected from the electronics. Batteries are charged in this position.

Pos. 2) BATTERY CHECK/LEAK CHECK - In the battery check position the Signal Strength Readout light bar becomes a meter showing battery condition from 0 to 10 LEDs illuminated (10 LEDs is a full charge). The detector will work from 10 to 0 LEDs. When only 6 LEDs are lit, the Low Battery LED starts blinking, less than 3 hours of use remains (out of 15 hours total). When only 3 LEDs are illuminated the audio “beeps” repeatedly, less than 1 hour of use remains. Battery discharge is nonlinear.

In pos 2, the Leak detection circuitry is also tested (red Leak LED will light) to ensure it is working.

Note: there is no need to bury targets, the detection range does not change if the target is buried or not.

- Once you are comfortable operating the unit, select MED or HIGH sensitivity and continue practicing. The MED position is the normal position for pipe tracking (large target). The High position is used for very small targets or when you are getting a very weak return signal.

CAUTION - Do Not Overturn Control Knob.

BALLAST WEIGHT

When operating underwater, a 2 lb ballast weight is installed over the end of the probe and held in place against the case by an retaining o-ring. Without this weight, the PT-1 is positively buoyant in the water. With the weight in place, the unit is a few ounces negatively buoyant which makes for easier underwater operation.



CHARGING BATTERY

The PT-1 comes with both a 12 vdc and a 120 vac wall charger. Turn the PT-1 off and connect the charger to Charger jack on the PT-1 Faceplate. The green Charge light will light. Allow 12-14 hours for charging a dead battery.

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FALSE SIGNALS

Before proceeding to the operation of the Pipe Tracker, a word or two about movement of the probe and false signals that are generated.

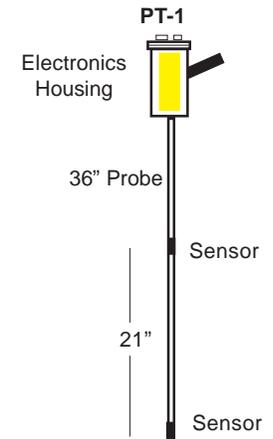
Keep in mind that the PT-1 does not detect metal directly as a conventional metal detector. The PT-1's sensors are measuring the earth's magnet field at two different points in the probe. If for any reason, the magnet field changes in one sensor more than in the other sensor, the PT-1 will produce an output reading.

If the probe is swung or rotated around, you can expect some output signal to be generated even without ferrous metal in the area. If you are moving in one direction, and sharply change direction, you can expect to hear a change in output.

For best results move the probe at a slow to moderate speed while maintaining the same probe angles and rotation.

When a target is detected, move the probe to the target from different directions to precisely pinpoint the target. When pinpointing a target, the probe should be held in a vertical position as shown above. The vertical position is also the probe's most sensitive position.

Probe movement and orientation is very important when looking for small targets. However, when tracking pipelines, or looking for large targets, the signals are so strong that probe movement and orientation plays only a minor role.



OPERATION

1. Take the PT-1 outside to familiarize yourself with its operation. Position it so the probe end is up off the ground, and away from all metals. Be sure you do not have any iron or steel on you (you are magnetically clean)

Note: If you are going to spend anytime operating the unit out of water, it is suggested that you remove the black ballast weight (roll the retaining o-ring down the probe shaft); it will reduce the weight of the unit by 2 lbs.

2. Turn the unit on by turning the Selection Switch to BATT CHECK position. The light bar will show all 10 LEDs lit if the battery is fully charged. If less than 4 LEDs are lit then recharge the batteries before proceeding.

The LEAK LED should also be lit indicating the leak detection circuitry is working.

3. Turn the Selection Switch to LOW position. You are ready to start detection. Without iron/steel in the immediate area the detector will emit a low frequency tone (Base Signal). When metal is brought into the area, the frequency of the tone will increase. The LOW position is used to pinpoint when you are getting a very large return in the MED and High position.

4. Locate a “clean area” of ground (no readings) and place different sizes of iron or steel objects on the ground and practice detecting and pinpointing them.

Hold the Pipe Tracker so the probe is close to vertical; sweep back and forth to pinpoint the location of the targets. For general searching, the probe can be held at a 45 degree angle and sweep back and forth to find the general area of the targets. Change probe to vertical for pinpointing.

Pos. 3,4,5) LO/MED/HI - Three different sensitivity settings. Normal operation is in MED position with LO used to pinpoint targets that give a very strong reading in the MED position. HI is used for very small targets or very weak signals.

Signal Strength Readout - Indicates the strength of the received signal. A strong signal will light all 10 LEDs.

Also displays battery condition when Selection Switch is in Pos 2. A fully charged battery will light all 10 LEDs.

Battery Charging LED - Illuminates when batteries are being charged. Full charge will occur in 12 to 14 hours. The light may go out when batteries are fully charged from the 12 vdc charger.

Leak LED - Illuminates if water has leaked into the electronics housing. When the Selection Switch is in the Pos 2, the LED is forced on for test. Actual sensing for leak occurs in the Low, Medium, and High settings.

Low Battery LED - Illuminates (blinks) when there is less than 3 hours of use left in the batteries.

Earphone Connector - Provides the audio output to the underwater and land earphones. An audio signal will track the Signal Strength Readout LED bar. The frequency (tone) of the signal shifts with a change in the signal strength. This audio output is much more sensitive than the signal Strength Readout light bar. The earphone can be connected to the detector in or out of water. The single underwater earphone is used by sliding it under the mask strap or into the hood, on or near the ear. An optional dual underwater headset is also available. It is not necessary to cover this connector when not in use.

Battery Charger Connector - The battery chargers are connected to this connector. The Selection Switch must be in the OFF position for charging to take place. It is not necessary to cover this connector when diving.