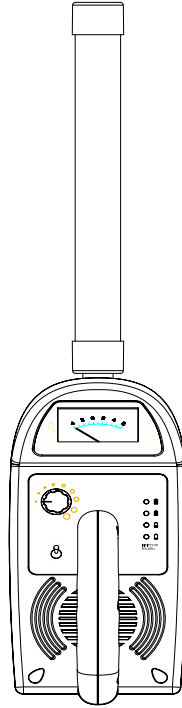


ANALOG 512Hz PIPE LOCATING

MODEL NO.: WPS-512R



Specifications

Frequency..... 512Hz
Power source.....6 AA Alkaline
Battery life..... 3-4 hours
Controls...On-off/Sensitivity, Near/Far toggle switch, battery test button
Outputs.....Signal strength meter, speaker, headphones
Dimensions.....520cm”x110cm”x110cm”
Weight..... (0.7kg)
Operating temperature..... -20 F to +130F
Do not leave in direct sunlight

Welcome To pipe Locating

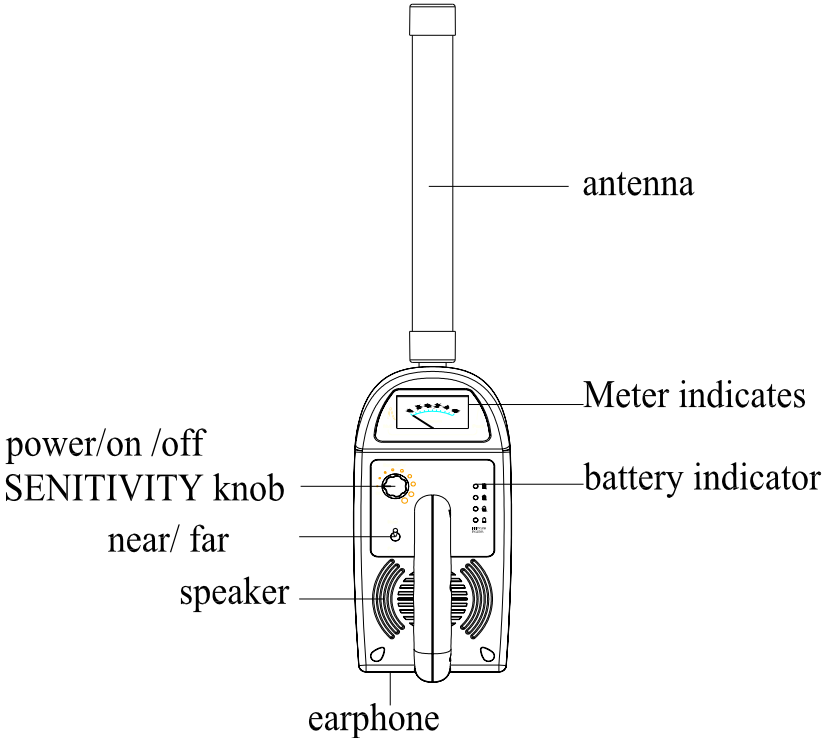
You have purchased some of the finest locating tools in the business, but they don't do magic. Your skill at handling these tools and recognizing their strengths and weaknesses is what makes a locating job successful. Before taking them out on their first job, make sure you understand how the system works.

The following pages will take you through all the steps necessary to use your equipment. We strongly recommend that you pay close attention to the section "Getting to know your Tools" , and come back to it whenever you are confused about the responses you are seeing on actual locating jobs.

This advice applies whether you're a rookie at pipe locating it's easy to outsmart yourself if you're used to more complicated equipment and procedures.

Please note: These instructions should be considered guidelines, not gospel. Every locating job presents unique challenges, and although most will yield to "textbook" procedures as described here, many will require a creative approach. We strongly advise that you familiarize yourself with the fundamentals of analog locating described in the "Getting to know your Tools " section. Armed with this knowledge, you will be able to reason your way through most locating challenges.

Know your Analog Receiver



The ROD contains the antenna that picks up the signal from the camera with 512hz transmitter. It also points you in the direction of the line. Never use the rod as a probe or lever-it will break the ferrite core and reduce the receiver's sensitivity considerably.

"X marks the spot! When you have found a peak or null, it's right below the center of the rod."

The SENSITIVITY knob allows you to control the amount of signal you see on the meter and hear through the speaker. It is also the on/off switch.

The METER indicates the strength of the peak signal(to the right) and the null signal (to the left).

The NEAR/FAR switch controls overall sensitivity. The "Far" position is the most sensitive, useful for beginning a locate. As you close in on the transmitter and the meter goes to full scale and you can't reduce the sensitivity any further, switch to "Near" to pinpoint its precise location.

The PHONE JACK accepts standard stereo headphones.

The SPEAKER allows you to hear the transmitter's signal-beeping or continuous, depending on the transmitter used.

The BATTERY compartment holds 6 "AA" alkaline cells. Rechargeable batteries will not perform as well, nor last as long. Cheap carbon-zinc batteries can leak and damage the inside of your receiver.

Getting to Know your Tools

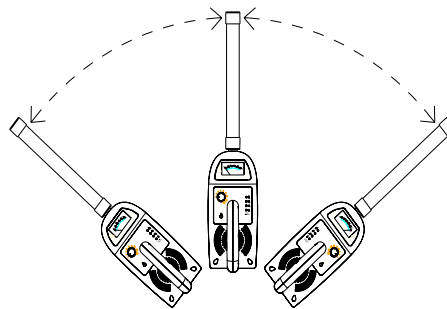
The best place to practice is above ground where you can see how the receiver responds to the location and position of the transmitter. You may be surprised at what you see. Better to be surprised when you have plenty of time to learn and nothing is at stake!

Do your practicing in a place where you have plenty of room to move around –inside in a large room, or outside on the ground. Turn on a transmitter and toss it on the ground. Walk away from it further than its range and turn on the receiver. Set the switch to "Far" and turn the sensitivity up all the way clockwise. You may hear some noise but the meter should sit at the far left with no distinct signal.

First let's take a look at the battery indicator.

Now walk around randomly, **holding the receiver level**, at waist height, toward the general direction of the transmitter, slowly sweeping the receiver back and forth. As you point toward the direction of the transmitter, the signal will get louder and the meter will begin to rise. Try to maintain a meter reading in the center of the scale. Turn the sensitivity down as needed to keep it in this range as you get closer. When you're unable to keep the meter below full scale, flip the switch

to "Near" .keep moving in the direction that makes the signal stronger. When you have reached the point that the signal seems to be strongest, and any direction you



move makes it weaker,

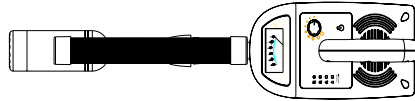
mark that spot) directly below the center of the antenna rod). Move to another place and seek this peak signal again and see if you always come back to the same spot. You should find yourself right over the transmitter each time. If you don't, keep practicing until you get consistent results.

I keep finding "dead" spots!

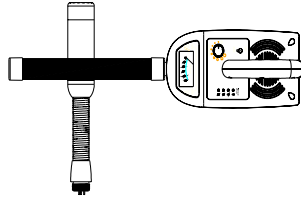
That's good news! And if you haven't notice any "dead spots" , let's go look for some. These dead spots are known as "nulls" , and they are the key to accurate, precise locating.

As we find nulls, notice that they happen at very sharp and precise places, unlike "peak signals" which are much more generalized. Let's look at a clear demonstration of a "peak" and a "null" . Be sure to do all these tests with the receiver held level, at waist height.

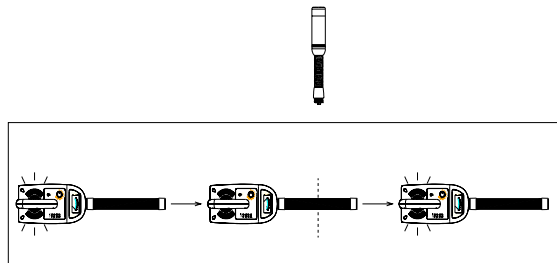
Hold the receiver directly above the transmitter, parallel to the long axis of the transmitter. The speaker is loud and the needle goes all the way to the right. This is a peak signal



Now turn the receiver to be perpendicular to the transmitter. The signal suddenly drops to almost nothing! This is a null. Move the receiver around a little to see how sharp and precise this null point is and how dependent it is on being exactly perpendicular.



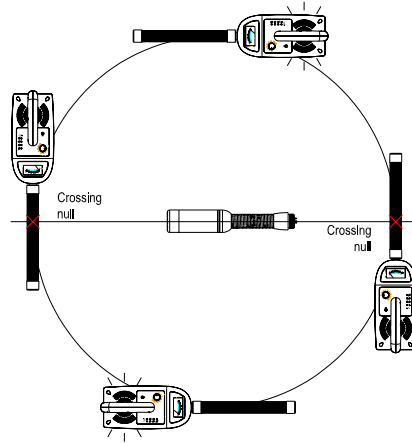
Now let's look at some other places to find nulls. Back away from the transmitter and walk past it off the end, like this:



There was a null just as you crossed the axis of the transmitter, just like before! This is called a "crossing null" and it is a very good thing to know about. Walk around and see that the crossing null is detected any time you cross either end of the transmitter, no matter how far away you are as long as you

are within range.

Now for the real beauty of crossing nulls. Walk in a 5 foot circle around the transmitter with the receiver rod held straight in front of you and notice that you get a crossing null at two points of the circle, directly across from each other and on a line that runs right through the center of the transmitter, parallel with its long dimension.



What's so special about this? Well, imagine that you can't see the transmitter, which is just like a real locating situation. In fact, have someone put the transmitter under a box or newspaper and orient it in a way you can't see. Using the circle method, you can quickly determine which way the transmitter is lying. And in a real pipe, almost always that means that the pipe lies along that line, too. That can be very useful information when trying to locate in; unknown lines, but it has even more usefulness for the next step in precision locating : determining depth.

At the jobsite

Before starting any locating job, please follow these simple steps. An ounce of preparation here can prevent tons of embarrassment and lost time.

Survey the area –before turning on any transmitter turn your receiver on, flip the switch to “Far”, and turn the sensitivity all the way up .Walk around the area where you will be locating and check for source of noise or electrical sources can all cause the receiver to respond as though there is transmitter in the area .mark any of these “hot spots” so you won’t be fooled by them when you’re locating.

Test your equipment

Put the battery over transmitter [or turn it on] and throw it on the ground, then turn on the receiver and turn up the sensitivity .be sure you are getting full range out of your equipment .you should be able to walk 12feet away from a flushable transmitter ,15 feet from a -10 transmitter or 25 feet away from a 20 transmitter and get a signal on the meter (at maximum sensitivity). Anything less than this requires fresh batteries and another run through this test .if this doesn’t solve it, there may be a problem with the transmitter or receiver (see the Troubleshooting section).

You’ll be glad you took the time!

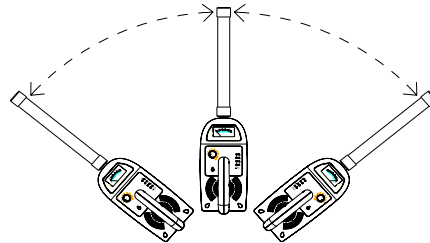
Sonde Locating

Your best locating success will involve moving the transmitter in small increments. Push it 5 to 10 feet, locate it using all the steps, then repeat this about the route of a line when you can't see it, and you can waste a lot of time retracing your steps if you lose track of the transmitter.

If you are locating a septic tank using a flushable transmitter, follow our flushing guidelines. If the tank is close to the building you should find it pretty quickly. If you suspect it is farther away, and its direction is uncertain, it can be helpful to tie a string or fishing line to the transmitter before flushing it, letting it go only 3 to 8 feet on each flush so you can follow it better.

Find the Peak Spot

Take the receiver in your hand and turn the sensitivity knob all the way up and flip the toggle switch to "Far". hold the receiver parallel to the ground at waist height. Walk around the area you expect the transmitter to be in, moving the receiver in an arc, back and forth.



Listen to the strength of the signal and look at the right half of the meter. Try to maintain a meter reading in the middle of the scale (between 0 and peak 4). When it reaches full scale and you are unable to turn it down any further,

flip the toggle switch to “Near”. As you move close to the transmitter, continue to maintain a meter reading in the middle of the scale. When you reach what seems to be the maximum signal, and every direction you move from there has a lower signal, you have reached the Peak Spot.

Mark this spot, then move off in another direction and repeat the locating procedure. Keep doing this until you always return to the same spot. You should be able to narrow this rough-in area to within a few inches.

If you’re just locating a septic tank, and knowing its depth is not critical, you are ready to dig. The Peak Spot you have marked is directly above the transmitter, near the inlet baffle. Also be aware that if the transmitter is turning in the tank, it is virtually impossible to determine its depth.

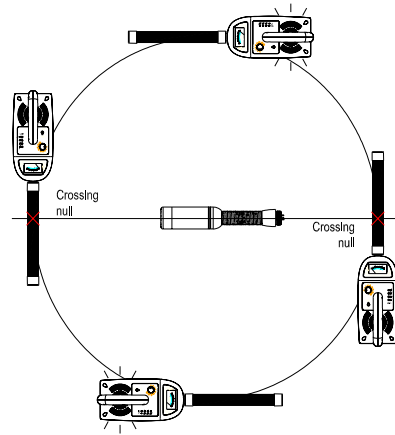
If you need to know the lay of the line or the dept of the line, read on.

Determine the Lay of the line

Before you can determine the depth of your transmitter, you mast establish the lay of line. **Do not skip this step!**

Step 4or 5 feet away from the Peak Spot you marked. Hold the receiver level straight in front of you at waist height, as before, but don’t wave it back and forth, just hold it straight. Adjust the sensitivity so that the meter reads about the middle of the scale. Walk in a circle around the Peak Spot, keeping your inside shoulder pointing at the Peak Spot. This would be called a “pylon turn” if you were flying an airplane.

As you walk the circle slowly, watch the meter and listen to the sound. At two distinct points in the circle, the signal strength will suddenly drop, then come back up as you move further. These are “null” points. Take the time to precisely determine these points. And mark them (the point is directly below the center of the rod). you will find that they are directly across the circle from each other, and describe a line that passes right through the peak area.



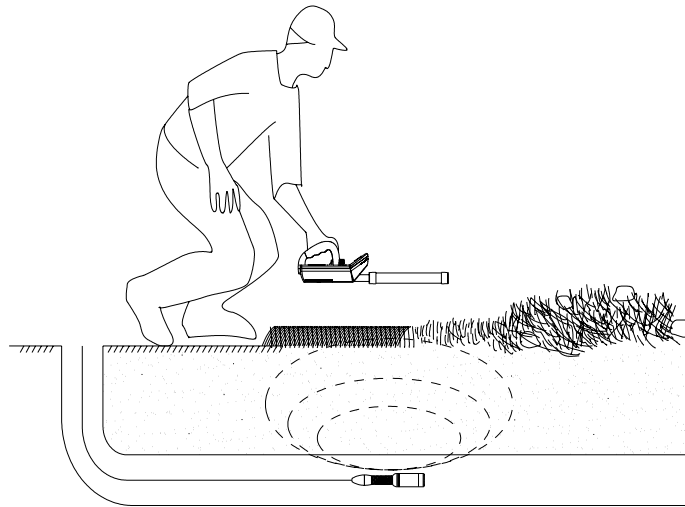
You have just identified the two “Crossing Nulls”, and the line between them indicates the lay of the line is parallel to the axis of the transmitter, and we will assume for the moment that line is running straight through that point, along the line of the Crossing Nulls. If you are in the middle of pushing the transmitter 5 or 10 feet and don’t need to know the depth yet, it’s time to push it another 5 or 10 feet, with a good general idea of which direction it is heading. If it takes a bend, you’ll still have a good idea of where to look for it.

Determine the Precise Depth

When you have reached the final point of your transmitter’s travel and have carefully established the Crossing Nulls and marked them, as above, you are ready to determine the depth. Walk away from the transmitter along the line that goes through the Crossing Nulls. Walk from the center out to the maximum range of the transmitter, with the sensitivity all the way up in the

“far” position. When in doubt, walk further away. Hold the receiver level straight in front of you, at waist height, heading toward the Peak Spot, and increase the sensitivity until you have a signal around center scale on the meter.

Bend down so that the receiver is close to and parallel to the ground, and walk slowly toward the Peak Spot along the line between the Crossing Nulls. Adjust the sensitivity as you go so that the meter stays around center scale (switch between “Far” and “Near” positions as needed). At some point before you reach the Peak Spot, you will notice a sudden signal drop-off. This is called the “Front Null”, and you should mark it carefully. Confirm it by backing up a few feet and approaching the spot again.



Continue walking, with the receiver straight in front of you and close

to the ground, toward the other Crossing Null marker. As you pass over the Peak Spot on your way there, you will encounter the peak signal. Keep moving in the same direction (adjust the sensitivity to keep the meter needle in the center), and you will find another sudden signal drop-off. This is the "Back Null", and it should be about the same distance from the Peak Spot as the Front Null was. Mark this spot also.

Troubleshooting

Two things to always check before you start a locate, and again if you have trouble:

- Make sure the batteries in both your transmitter and receiver are fresh. If any doubt, throw them out! A weak transmitter battery reduces its range, weak batteries in a receiver can make it act brain-damaged, as well as reducing the range.
- Always test your transmitter and receiver above ground, for operation and range, before sending the transmitter down the line. **Every time.**

The signal from my transmitter suddenly quit. I was following it fine, then it disappeared.

Aside from checking batteries, 512 Hz equipment will penetrate cast iron, but not steel, ductile iron or other metal.

A sudden loss of signal may also mean you have encountered a null, which is a normal part of locating. If the signal drop-off is at a particular spot, and the signal returns when you move a little ways away, then it is a null.

My transmitter and receiver seem to work, but I can't get further than about 3 feet away before the signal dies.

A big reduction in range often means a broken antenna, on an Ardy or a Ferris receiver. It won't look broken, but even a hairline crack in the ferrite core inside the antenna tube can destroy its sensitivity. It's easy for us to fix, but you have to send it in. A word to the wise: never use the antenna rod for prying or digging or anything but locating. A hard case is a good investment for preventing antenna damage.

My system doesn't seem to be working, but I don't know how to tell if the problem is the transmitter or the receiver.

One obvious thing to try is a different receiver, or a different transmitter, but

this is often not an available option if you don't own a lot of equipment. Replace the batteries in both before you go further.

An Ardy flushable transmitter can be tested by holding it near an AM radio tuned to a dead spot (no station) on the dial. If the transmitter is working, you'll hear its raspy "beep-beep" from the radio.

A receiver can be tested in a rudimentary way by turning it up and holding it near sources of electronic radiation-like a computer, a cell phone, a dimmer switch. You should hear some noise. If it remains silent, the receiver is probably malfunctioning.

We'll play a 512 Hz tone over the phone, which you hold up to the receiver's antenna. If the receiver is working, the signal strength shown on the receiver will be strong. Please note that this test cannot be done with a cell phone, it must be an indoor land-line phone. Sadly, there is no phone test possible for an the receiver.