

TW-82P RECEIVER



TW-82P Receiver

CONTROL PANEL



1. Press-and-Hold to turn ON.
2. Press-and-Hold to turn OFF.
3. Choose Metric/Imperial unit of measure (see instruction p17).



VOL

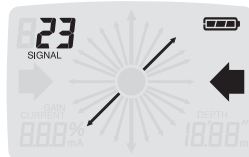
Press to select volume settings

- In Standard and Lateral Modes, tap the button to adjust volume:
 1. Mute
 2. Low Volume
 3. Medium Volume
 4. High Volume
- In Passive Power Mode, no mute is available. Only volume settings 2, 3 & 4 are available.

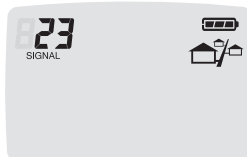


MODE

Press to select from any of 3 modes



Standard



Lateral



Passive Power



Adjust GAIN in Passive Power Mode
These keypads have no function in the Standard or Lateral Modes.

STANDARD MODE

In this default configuration, the TW82P Receiver requires no operator intervention to trace a line under most circumstances. Only the volume can be adjusted in this mode.

The following values & conditions are displayed on the LCD display in Standard Mode:

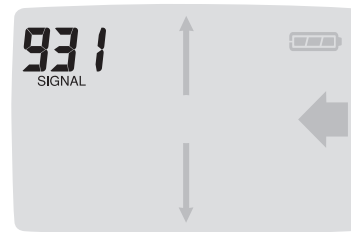
- Signal Strength
- Left/Right & Over-Target
- Azimuth
- Current Measure
- Depth
- Battery Strength

1. **Signal Strength:** Indicates your proximity to the center of the electromagnetic field emitted by the utility.

999: maximum value

0: minimum value

You may find different locations where the Signal Strength value is high. Use this reading as a relative indicator as to where the utility is located. Signal Strength is strongly influenced by the depth of the utility.



2. **Left/Right & Over-Target:** These indicators show your position relative to the center of the electromagnetic field.

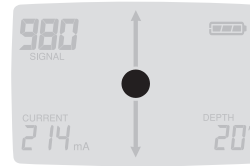
Move to
the left



Move to
the right



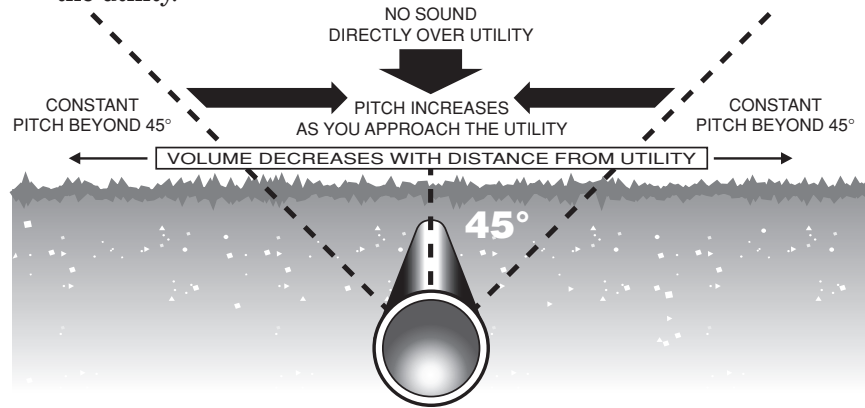
You are over
the target



STANDARD MODE *continued*

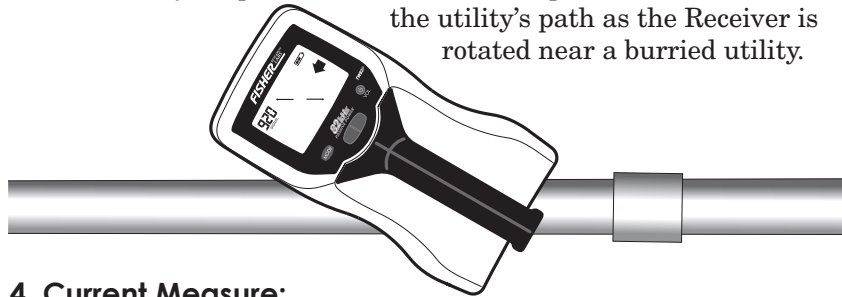
Audio: When you move within a 45° angle of the center of the electromagnetic field, the audio pitch will change; the pitch increases as you approach the utility. Outside the 45° zone, the pitch does not change.

When the Receiver is directly over the utility, it goes silent. The over-target indicator, ●, also appears when the Receiver is directly over the utility.



When you are standing to the right of the utility, you will hear a constant tone, and to the left, a pulsating sound.

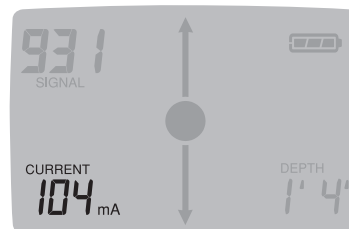
- 3. Azimuth:** These rotational arrows indicate the utility's path relative to your position. The arrows will point in the direction of the utility's path as the Receiver is rotated near a buried utility.



4. Current Measure:

mA (milliamperes) of current flowing on the conductor.

Use Current Measure as an aid for distinguishing utilities in close proximity. The Current Measure will generally be the highest on the utility you are connected directly to, regardless of the utility's depth.



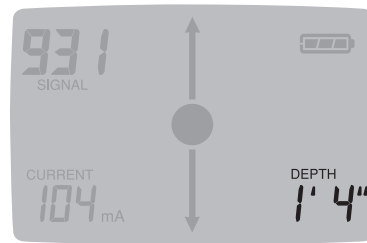
STANDARD MODE *continued*

5. Depth:

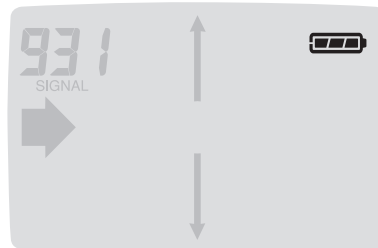
The depth reading is only accurate if the electromagnetic field is perfectly round.

The electromagnetic field must have enough energy for the Receiver to accurately calculate the depth. The weaker the signal strength, the less reliable the depth indicator. For this reason, depth readings for inductively located utilities will tend to be less accurate than conductively located ones. The depth reading is a measure of the distance between the tip of the Receiver blade and the *center* of the buried utility. When the device is directly over a buried utility, as indicated by the Over-Target indicator, depth will automatically be displayed in feet and inches (meters if metric).

In general, the accuracy of any depth measurement will be influenced by factors such as proper azimuth orientation of the device, field strength and the *roundness* of the field. The only 100% reliable method for determining the depth of any buried utility is to hand-excavate.



- 6. Battery Strength:** When battery life declines to less than one hour of operation, the battery indicator outline will be illuminated with no segments. When the batteries reach the end of their useful life, the screen will go blank and the battery icon will flash before the Receiver shuts off. Expect about 100 hours of battery life from a set of high quality D-cell alkaline batteries.



NOTE. Overhead Power Line

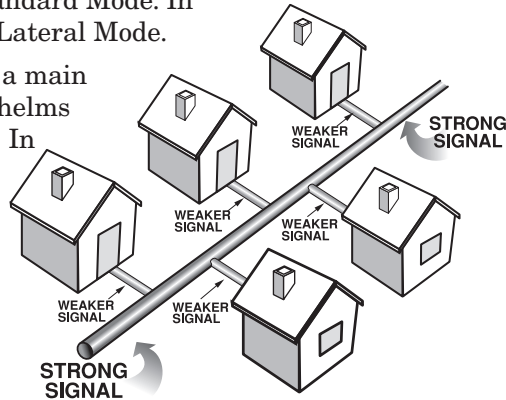
Interference: When the Receiver encounters an interfering overhead electrical field stronger than the field from an energized buried line, the Receiver will display zeros, "000", for the Depth and Current measurements.

In this case, the field from the overhead power line is interfering with the signal from the buried line you are trying to trace. You may still be able to trace the buried line, but the accuracy of your trace will be impaired by this interference.

LATERAL MODE

At some sites, utility lines branching off from a main line may be difficult to trace using the Standard Mode. In these circumstances, use the Lateral Mode.

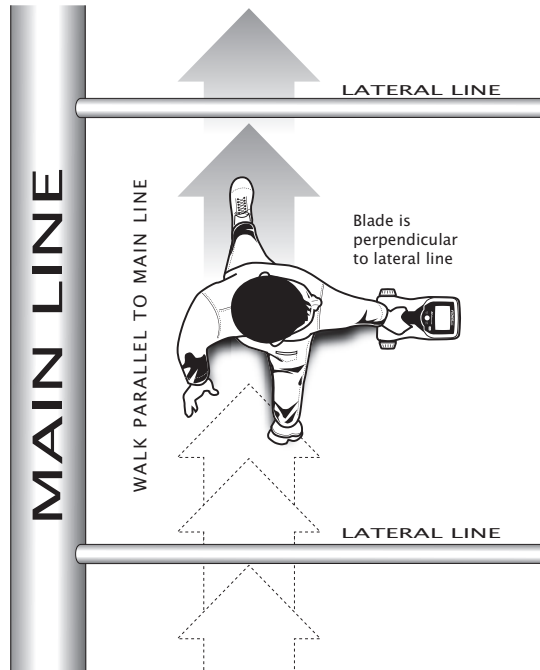
At such sites, the signal from a main line is so strong that it overwhelms the single from a lateral line. In this illustration, gas service lines connecting to homes from a main gas line may carry far less current than the main line. This weaker current could be the result of a lateral line that is shorter than the main line, or a lateral that is not well grounded.



When conducting a trace of the Lateral line, select LATERAL Mode and walk parallel to the main line (as in the illustration below). You must use Lateral Mode in this situation because in the Regular Mode, you may detect the signal from the main line all of the way up to the house, even with the blade of the Receiver parallel to the main line.

The Lateral Mode is configured to ignore the signal coming from the parallel main line and detect signals coming from the perpendicular lateral lines. The Lateral Mode may still detect the main line in very close proximity, even though the Receiver blade is parallel to it. So maintain a minimum distance of 6 to 12 feet from the main line when tracing lateral lines.

Walk parallel to the main line, holding the blade of the Receiver perpendicular to the lateral lines.



LATERAL MODE *continued*

Press **MODE** to enter Lateral Mode.

 will appear on the LCD display.

LATERAL TRACING OPERATION

While tracing a line using the Lateral Mode, the display will appear as illustrated below. The SIGNAL number indicates the strength of the field emitted by the buried line. The buried line is located at the spot where the maximum SIGNAL number is indicated. If you move left or right of the spot where the maximum SIGNAL number is found, the value displayed will fall.

Walk across the location of the lateral line with the blade perpendicular to the lateral line.



Programming:

While in Lateral Mode, press-and-hold **MODE** to program:

- To exit Lateral programming, press-and-hold **MODE** again.
- To set the upper limit of the signal range, press **MODE**.

Each press of **MODE** toggles through the program choices:
50, 100, 150, 200, 250 or 300

Set this upper limit just above the maximum SIGNAL strength number that appears during your lateral trace.

The correct setting will make it easier to hear the peak in the signal as you pass over the lateral line.

Set the number just above the highest SIGNAL number.

Examples:

If the highest lateral
SIGNAL number is:

137
159
310

Set to:

150
200
300 (300 is the maximum possible)

Changes to this upper limit of the SIGNAL RANGE are saved to memory. Changing this upper limit is similar to the gain adjustment on other line tracers which use a peak mode of operation. Set the number just above the highest SIGNAL number, as described above.



PASSIVE POWER MODE

While the Standard and Lateral Modes use the 82kHz signal injected by the Transmitter, in some cases it is desirable to locate buried utilities by tracing electric power currents running through them. Buried utilities may be energized by the electric power currents running directly through them, current coupling into them as a result of leakage from power cable faults, defective electrical loads that leak AC power into ground connections or from cathodic protection on metal pipelines.

The Passive Power Mode detects both 50Hz and 60Hz electric currents as well as harmonics of these frequencies resulting from distortions caused by electrical loads being served by the utility. Cathodic Protection (at 100Hz or 120Hz) is also detected. This mode will usually, but not always, detect underground AC power lines. It does not detect voltage and will usually not detect a power line which is not delivering current, i.e. one that is not under a load. The operator must use his knowledge of infrastructure and each specific area being located to interpret the character of each underground utility.

ABSENCE OF A DETECTABLE POWER SIGNAL DOES NOT GUARANTEE THAT NO POWER IS PRESENT.

Among the important uses of the Passive Power Mode is to check ground connections being considered for use as a transmitter connection to do a conductive trace. **Many “grounds” are in fact improperly grounded and/or have substantial AC power flowing through them** due to defective installation or defective loads. Ground connections should always be treated as though they have dangerous voltage or current on them. If the Passive Power Mode detects power current flowing in a proposed ground connection, it is usually advisable to use some other ground connection if available. REMINDER: This mode does not detect voltage. A floating ground with power voltage on it will probably not be detected. A high-impedance AC voltmeter can be used to detect voltage provided that another ground is available to measure the voltage differential. Floating grounds with full line voltage on them can usually be detected with a neon bulb line tester without the need for a second ground connection; follow the instructions provided by the manufacturer.



PASSIVE POWER MODE *continued*

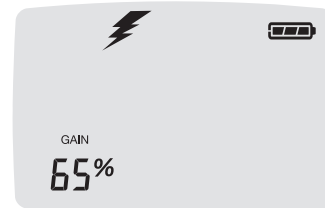
Operating Controls

Press **(MODE)** to enter Passive Power Mode
The display will appear as illustrated to the right.

Press **(+)** to increase gain.

Press **(-)** to decrease gain.

Press **(MODE)** again to exit Passive Power Mode.



Locating Procedure

1. Enter Passive Power mode.
2. Set gain at maximum, 100%.
3. If necessary, reduce the gain so that the Receiver is silent when not over a detectable power line.
4. Walk forward, swinging the Receiver from side to side.
5. When a line is located, the Receiver will emit a raspy/buzzing sound.

Note: Audible-search only. No visual indicators.

Passive Power detection relies only on audio feedback to locate the utility. No indicators will appear on the LCD display.

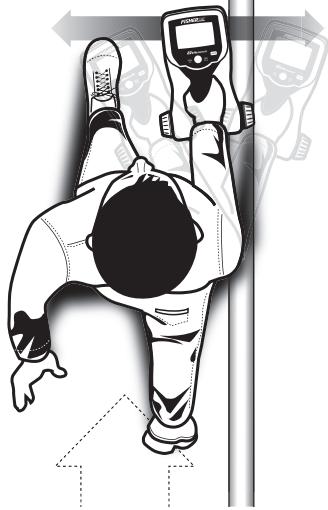
Azimuth, depth and left/right guidance will not be provided.

6. When an audible signal indicates the detection of a utility:
 - a. Move left and right, sweeping beyond the range of the signal each time as you sweep the Receiver.
 - b. Determine the approximate center of the signal, midway between the right-most and left-most edges of the audible signal.
 - c. Lower the gain as you sweep left and right of the approximate center. This will narrow the search.
 - d. Continue to lower the gain to the minimum possible while still detecting the buried utility with an audible alert.
7. With the utility pinpointed at one spot, move both forward and backward to verify the direction of the utility.
8. If possible, follow the signal to a known access point, or origin, to find a connection point visible above ground.
9. If appropriate, use inductive or conductive modes to locate the utility and verify the location of the utility.

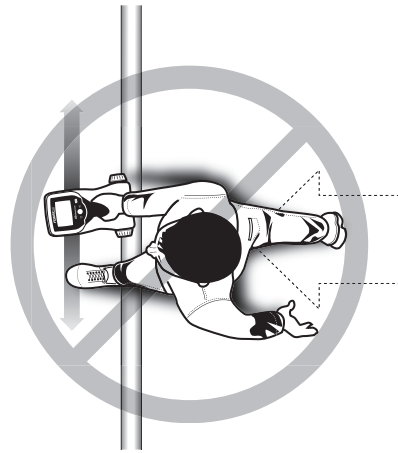
PASSIVE POWER MODE *continued*

Grid Search: To ensure complete coverage of the area, map out a grid of intersecting lines covering the search area. Walk the grid at intersecting right-angles. Power lines will be detected when the blade of the Receiver is perpendicular to the utility. You will not detect the line when crossing over parallel to a utility.

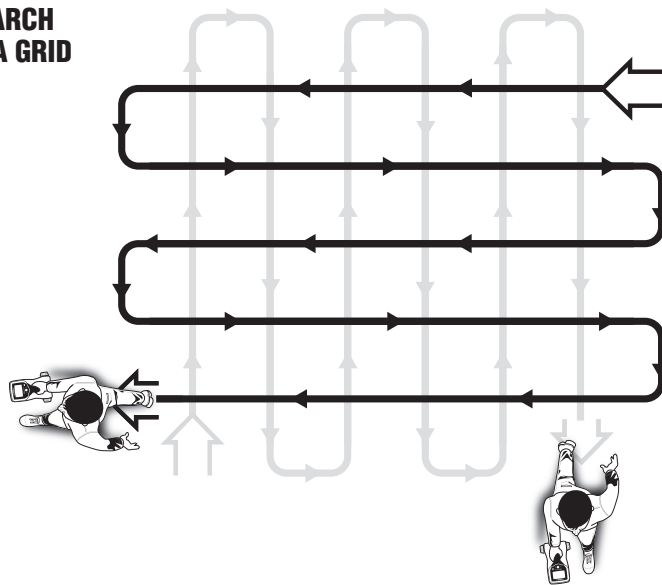
WALK WITH BLADE
PERPENDICULAR
TO THE UTILITY



UTILITY **WILL NOT**
BE DETECTED WHEN
THE RECEIVER
BLADE PASSES PARALLEL



**SEARCH
IN A GRID**



AUTO POWER-DOWN, RECEIVER




When 90 minutes have passed without the operator pressing any control buttons, the Receiver will automatically power down.

- Lower left of the display will indicate “OFF”.
- Lower right of the display will count down from 10 to 0.
- The Receiver will then turn off.

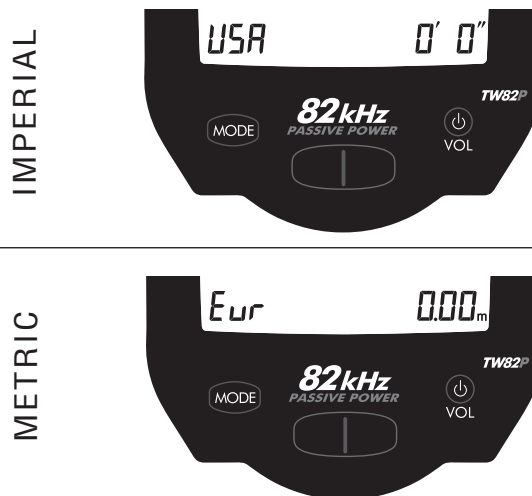
To stop Auto Power-Down, press any button once.

METRIC / IMPERIAL UNIT OF MEASURE

To change the Receiver unit of measure, follow this procedure:

1. Start with the Receiver OFF.
2. Press-and-Hold  for 6 seconds.
 - a. The Receiver will turn on in Standard mode.
 - b. After 6 seconds, the new unit of measure will indicate at the bottom of the display.
 - c. If you continue to hold , the alternate unit of measure will be displayed.
 - d. When you see the desired unit of measure, release . The Receiver will commence operation using the last displayed unit of measure.

Display during Programming



SPECIFICATIONS

RECEIVER

| | |
|----------------------------------|--|
| Frequency | 82.175 kHz |
| Standard Mode | Automatic response |
| Lateral Mode | Programmable |
| Left/Right Guidance | Audible and visual |
| Azimuth Indicator | Visual |
| Over-Target Indicator | Visual and audible |
| Battery Status | Visual |
| Signal Strength Indicator | Numeric display & audible |
| Signal Current Measurement | Numeric display, automatic |
| Depth Measurement | Numeric display, automatic |
| Battery Type | Two D-cell batteries (included) |
| Battery Life | From 80 to 130 hours, depending on the volume setting |
| Weight, with batteries | 3.60 lbs |
| Passive Power | 50Hz and 60Hz detection. Cathodic Protection detection. |

