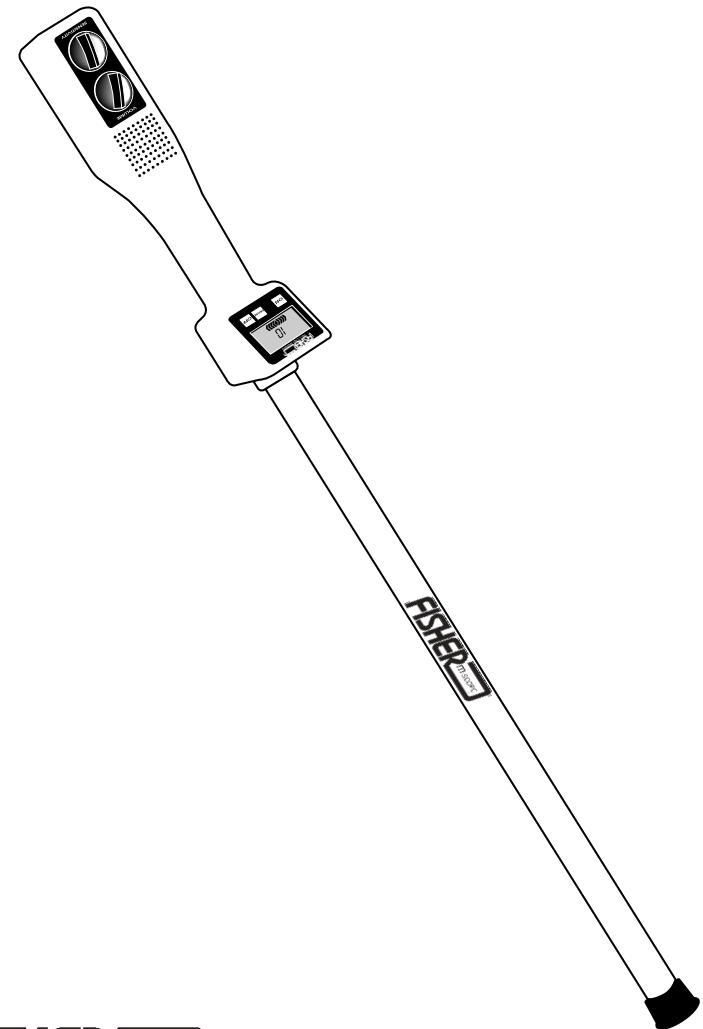


INSTRUCTION MANUAL

FP-10 Magnetic Locator



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FISHER m-SCOPE

10. TROUBLESHOOTING

1. Unit will not turn on.
 - A. Batteries are dead
 - B. Check battery contacts
 - C. Switch wet or bad
2. Unit does not turn off.
 - A. Switch is bad
 - B. Batteries are put in backwards
3. Unit has a high pitch squeal.
 - A. Sensitivity is too high
 - B. Wire for sensitivity broke
 - C. Sensor tube is unplugged
 - D. Sensor tube bad
 - E. Too many ferrous objects near
4. Unit has no sensitivity, doesn't respond.
 - A. Sensor tube is bad
 - B. Sensor control is broken (FP-10)
 - C. Reset button pushed or stuck
5. Unit has no sound.
 - A. Speaker bad
 - B. Speaker wire broken
6. Unit has sound but hard to hear.
 - A. Speaker cone inverted
7. Knob turns but nothing happens.
 - A. Set screw loose
- 8 Knob falls off.
 - A. Set screw loose

NOTE: If the rubber boot falls off, user must put the boot back on. This is to stop the sensor tube from getting damaged. To do this, use super glue or adhesive to hold it on. The sensor tube is one of the most expensive items in the locator. Warranty will not cover if the boot has fallen off.

Thank you for purchasing the FP-10 Magnetic Locator. Please read this manual thoroughly before operation.

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1. INTRODUCTION

The FP-10 magnetic locator is a flux-gate type of magnetometer which incorporates a unique patented technology that enables the factory to balance the magnetic sensing coils to a finite condition. This patented method of magnetic balancing is advanced in the state of the technology.

The FP-10 implements "peak response" over ferromagnetic objects by yielding an increasing audio signal as the object is approached and passed over.

This instrument is the product of many years of experience and service provided by Fisher to the industry.

2. THEORY OF OPERATION

The FP-10 locator finds ferromagnetic objects by sensing the magnetic field radiated by the object. The locator contains two sensor coil assemblies that are precisely spaced and electronically balanced to achieve a near magnetically-balanced operating condition. In a uniform magnetic field, such as the earth's field, the two sensor coils maintain a magnetically-balanced status, because both of the coils experience the same magnetic lines of force. However, when a ferromagnetic object is approached, the field strength and angle of the magnetic lines upon each sensor is different. This difference, although minute, is enough to offset the critical balance and produce an audible indicating signal (*Fig. 1*).

When no ferromagnetic objects are present, the speaker emits a steady low frequency tone. As the object is approached, the audio frequency increases until the center of the object is directly beneath the locator's lower tip sensor. The frequency peaks and then decreases as the object is passed. The peak indicates the exact location of the object.

Nonferrous objects do not affect the locator. Objects made of brass, aluminum, copper, etc. are ignored.

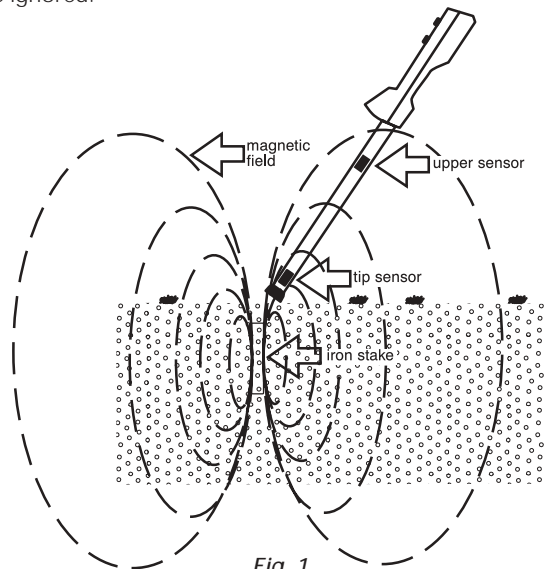


Fig. 1

Sensor coils unbalanced by magnetic field of iron stake.

8. SPECIFICATIONS

Power: Six "AA" (1½ volt) batteries

Battery life: ±100 hours of intermittent operation (alkaline batteries)

Output: Powerful magnetic speaker with waterproof Mylar cone

LCD Display: Numeric digital, analog Bar-graph, power line indicator and low battery indicator feature

Weight: Approximately 3 lbs. (1.3kg) with batteries

Operating temperature: 0°F to 120°F (-18°C to 49°C)

Length: 42¾ inches (108.6 cm)

Construction: High-impact water resistant plastic, epoxy painted. Aluminum sensor tube waterproof to just under the plastic case.

Patent: United States #4,439,732.

Nominal Sensor: 20 inches (50.8 cm)

Specifications subject to change without notice.

9. WARRANTY

The FP-10 magnetic locator is warranted to be free from defects in materials and workmanship for a period of two years after the delivery of the product to the original user. Our liability under this warranty is limited to replacing any defective parts, adjusting and servicing any instrument or, at the company's option, replacement of the instrument returned by the original user, transportation charges prepaid, to the company. If the malfunction has been caused by misuse or abnormal conditions of operation, repairs will be billed to the user, with a cost estimate submitted prior to commencing repair work.

Batteries and the battery holder are not covered by this warranty.

7.1 Typical Signal Responses

The metal handles on the septic tank cover will provide a usable signal to determine the location of the actual cover (Fig. 8).

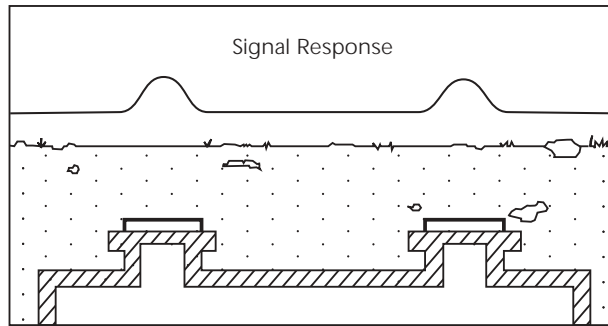


Fig. 8

Large metal objects may cause double signals as indicated (Fig. 9).

The center of the cover is found by sweeping the locator back and forth to create a ring pattern response. The center null will designate the cover's center.

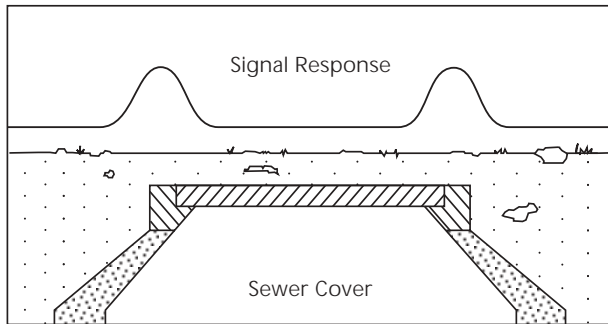


Fig. 9

The joints, elbows and ends of iron pipes will create the strongest signals (Fig. 10). Hold the locator in a vertical position while searching to produce the best results.

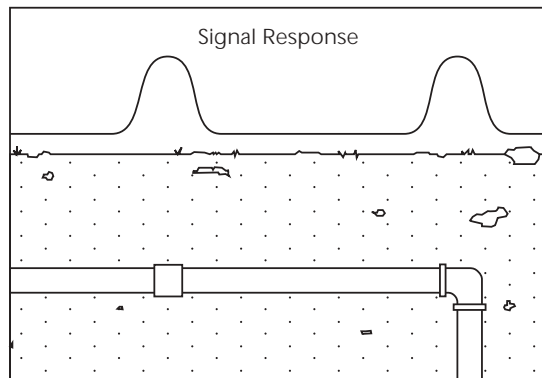


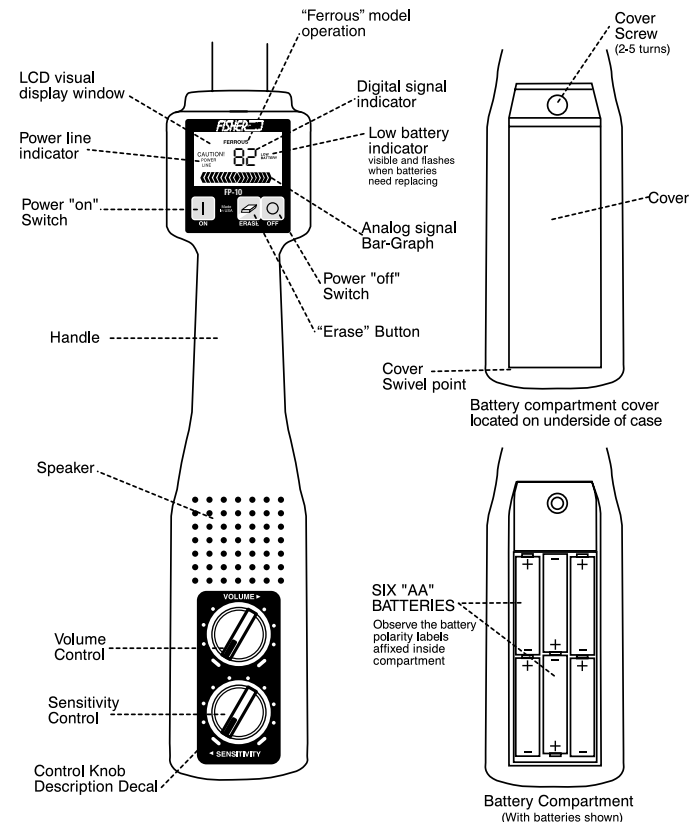
Fig. 10

3. FEATURES

- Rugged high-impact plastic enclosure with aluminum sensor pole
- Powerful magnetic speaker with waterproof Mylar cone
- Lightweight, comfortably balanced for easy handling
- Six "AA" (1½ volt) battery operation; ±100 hour battery life
- Quick-access battery compartment
- Adjustable sensitivity dial and volume with power ON/OFF dial
- Deep tone audio under search conditions; signals "peak" over magnetic objects
- Full depth capability
- Includes padded carrying case with shoulder strap or hard case
- **Instrument Control Panel** features LCD visual display and water-repellant push button switch operation:

LCD Visual Display includes a two-digit numeric signal indicator, an expanding analog bar graph signal indicator, "Low Battery" alert flashing indicator, and "Caution: Power Line" alert flashing indicator. Displays "ferrous" model operation.

"ERASE" button – Interferences such as a nearby fence are virtually erased allowing the signal to return to the normal audio tone



4. BASIC OPERATION AND DESCRIPTION

4.1 Power On/Off Switches

Press "ON" once to activate the locator circuitry. Press "OFF" once to turn the battery power off.

4.2 Volume and Sensitivity Control Knobs

Rotate the volume knob clockwise to turn the unit on and set to the desired audio volume level. Full volume is achieved when the knob is turned fully clockwise. Power off position is fully counterclockwise.

The sensitivity or depth range can be varied using the sensitivity knob. Maximum range is provided at full clockwise rotation. The optimal setting is determined by each particular application. Areas crowded with various undesired ferrous objects may require a reduced sensitivity level. Deeply buried objects being searched will require a higher sensitivity level.

A decal with markings for both the sensitivity and volume control knobs is provided as a reference for future settings or comparisons.

4.3 Speaker

When no ferrous metal is present, the audio sound heard will be a low frequency tone. As ferrous metals are approached, the audio tone will increase.

4.4 LCD Visual Display

Several visual display functions, provided for ease of operation, are defined below:

"Ferrous"

Defines the basic function of the locator as a ferrous locator (fixed indicator).

Digital Signal Indicator

A two digit numeric display shows the signal level as related to the audio signal response being heard from the speaker. At the lowest signal level, when no ferrous metal is present, a small number will be viewed (between "0" and "5"). As metal is approached, the numbers will increase, reaching "99" at its maximum peak. Deeply buried objects or lower sensitivity levels will yield a lower peak number to aid in pinpointing the object.

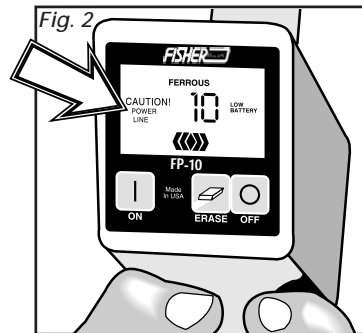
Analog Bar-Graph Signal Indicator

The bar graph display expands outward from the center "diamond" as related to the audio signal response being heard from the speaker.

Power Line Indicator Feature

The electromagnetic fields radiated from buried or overhead power lines are picked up by the sensitive electronic circuitry and internally transformed into a visually flashing indicator in the display window as shown at right (Fig. 2).

The distance or detection range from the cables where the locator responds depends on the energy being carried by the electrical conductors. The higher the energy, the greater the distance the locator will respond to it. If the cables are



7. SIGNAL RESPONSE

Figure 7 shows audio and LCD visual signal response to:

- 1: no object,
- 2: one small deeper metal target, and
- 3: a second larger and shallower metal object.

The LCD display indicates both the numeric digital and analog bar-graph response as the locator passes over the ground.

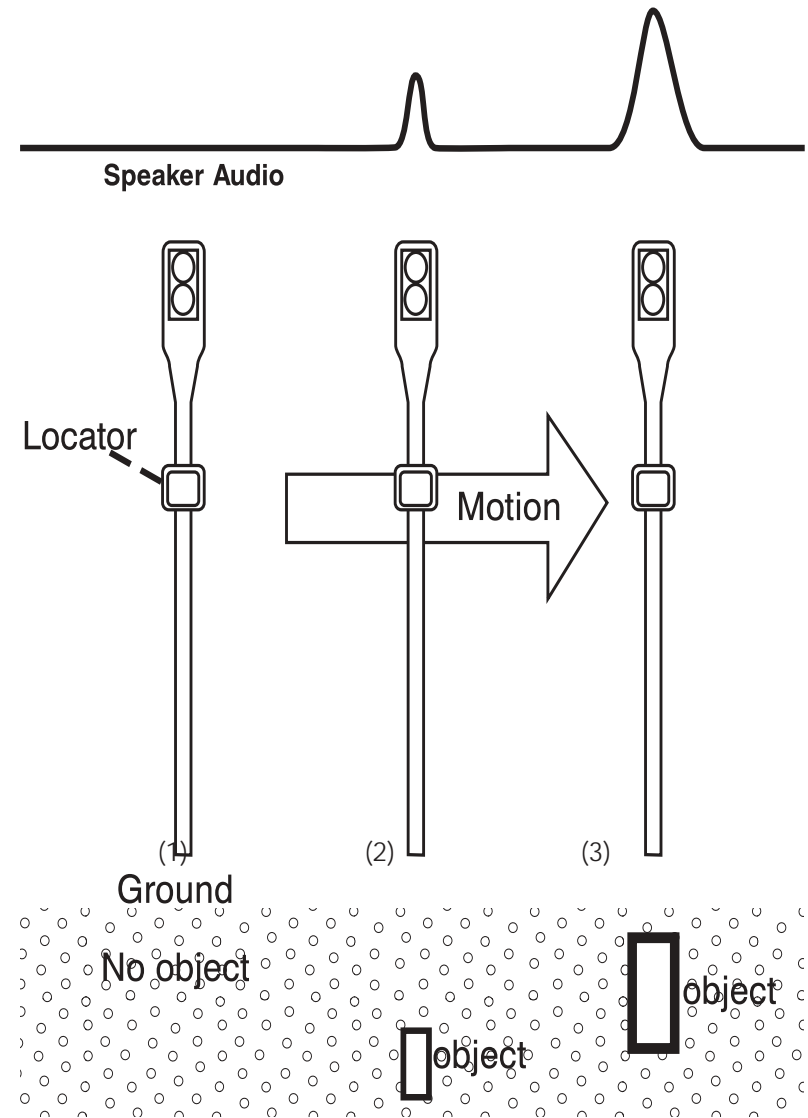


Fig. 7

6.1 Water Locations

The pole section of the locator can be submerged into water, up to just under the plastic case (Fig. 5).

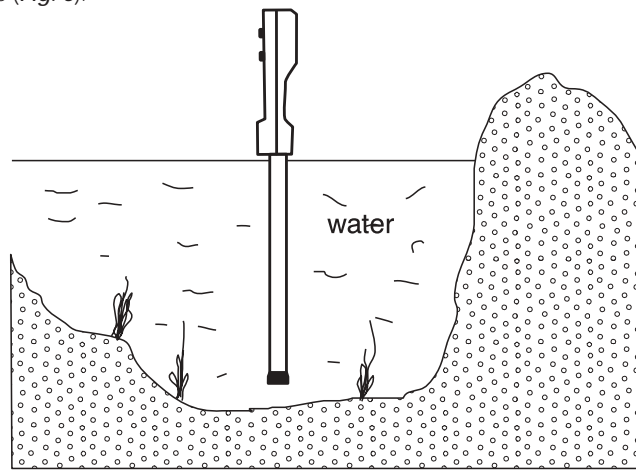


Fig. 5

6.2 Locating Near a Steel Fence

Approach the fence and stop at the distance at which you wish to begin your search. While holding the locator in a vertical position (Fig. 6), press and release the "erase" button on the membrane panel. Begin sweeping the locator side to side parallel to the fence. As you move toward or away from the fence during the sweeping motion, at some point you may have to press the "erase" button again.

Continue this process throughout the search. The need to reactivate the "erase" circuitry depends on the proximity from the fence and the magnetism of the fence itself.

6.3 Searching Under an Unattended Vehicle

In the event you must search under an parked vehicle that is unattended, you can simply slide the sensor pole under the vehicle and activate the "erase" feature. Slide the sensor pole side to side until you locate the target.

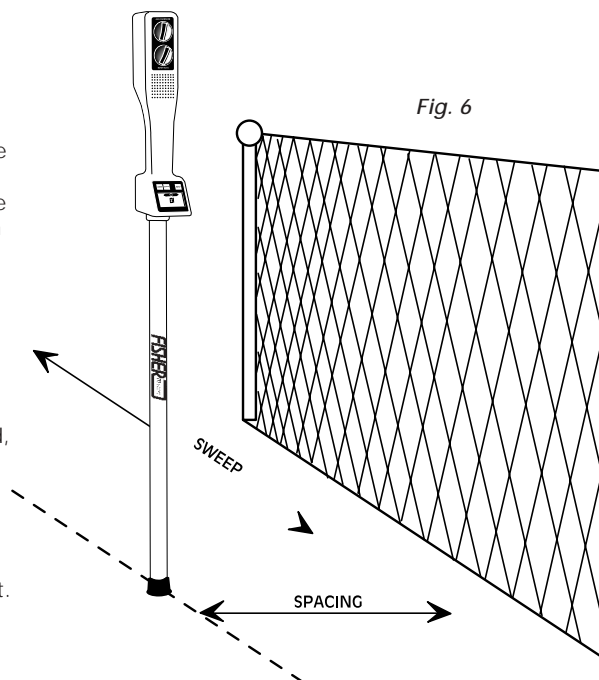


Fig. 6

dead (no electrical connection or energy transfer), then no visual indication will appear.

When the locator is turned ON, this feature is activated immediately. This feature only responds to 50 or 60Hz power line frequencies and not to telephone or TV cables. **This feature is intended as an aid only and not to be used for locating or pinpointing electrical cables.**

The magnetic detection operation and performance of the magnetic locator are completely independent from the power line indicator feature.

4.5 Erase Button

This is an optional button that is primarily used in locations where large metal objects normally interfere with the desired operation of magnetic locators. Cyclone fences, metal buildings, vehicles and other large magnetic objects can be electronically erased with this button.

The operation of this feature is best defined by explaining the typical locator without this feature. For example, typical magnetic locators will normally yield a screaming audio tone when they are being operated in close proximity to a metal fence. The magnetic field from this fence will usually override the signal being sought from the buried object in search of. The only option is to reduce the sensitivity until the interference from the fence is minimized. However, the locator's sensitivity to the buried object is also minimized and usually undetectable.

The FP-10 and its "Erase" feature solves this problem by providing an Erase button; simply press this button when the interference is annoying and the metal structure is electronically erased. The audio tone returns to the "no metal" tone; the search continues and the buried object is located.

This erasing action is functional within a reasonable circular area around the position of the locator in which the erase button was pressed. This circular area, referred to as the erase zone (Fig. 3), may be affected by the magnitude of the magnetic field of the fence and the distance from the fence when the button was pressed. In extreme cases, there may be a point where you may have to press the Erase button again as you approach the fence.

If you inadvertently erase the object you are directly over, simply move the locator to one side and activate the Erase button and return to a normal search procedure.

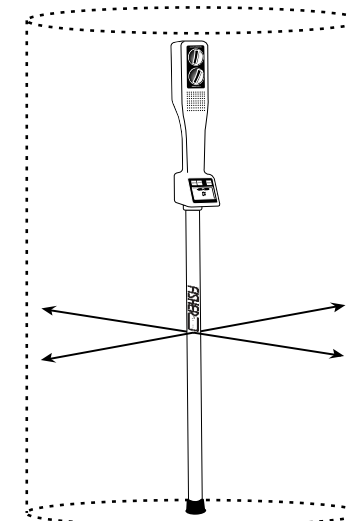


Fig. 3

5. BATTERY REPLACEMENT

The LCD will display a flashing "Low Battery" warning when the batteries fall below a predetermined voltage level, alerting you to replace the batteries soon. Several hours of battery life remain; however, in cold temperatures, this time may be shorter.

Replace the batteries as follows:

- 1:
Turn the power off.
 - 2:
Unscrew the thumb screw on the battery cover (2-5 turns) and lift the cover off until the tab at the rear of the cover clears the slot it is located in.
 - 3:
Remove the batteries by raising the batteries at the contact point of each pair. Dispose of used batteries properly.
 - 4:
Insert new batteries, observing the polarity labels located inside the battery well.
- NOTE: Do not mix old and new batteries. Replace all batteries at the same time with new batteries. Also, do not replace the batteries under wet or rainy conditions, allowing water to enter the battery compartment.**
- 5:
Reinstall the cover in the reverse manner, being careful not to overtighten the thumb screw.

In the event the "Low Battery" indicator is not displayed, no visual indications appear on the LCD window and no sound is heard after pressing the power ON switch, the batteries may be dead; check the battery compartment immediately. Dead batteries should be removed immediately as they are prone to leakage and can cause permanent damage.

Always remove batteries before storing your locator.

6. FIELD OPERATION

The recommended search position is a 45° angle from the earth's surface. Scan the locator pole from side-to-side in a slow sweeping motion while walking in a steady direction. Maintain a consistent height above the ground during the side-to-side sweeping motion.

Once the object being searched is located, pinpointing the object's location can be accomplished by holding the locator vertically and sweeping it in an "X" pattern until the absolute signal peak is found (*Fig. 4*). The audio sound and visual LCD display will provide the pinpointing results.

Please note that your magnetic locator is not only sensitive to buried ferrous objects, but also to items in your possession. Ferrous objects such as steel tipped shoes, a pocket knife, some wrist watches, key chains or other objects containing ferrous material can cause false signals during your search.

The locator is not affected by the presence of nonferrous objects, such as copper, aluminum pull tabs or foil, and other forms of trash that may be present in the ground. Snow, ice, water, wood, plastic, concrete, stones, and the ground itself have no effect on the performance of the locator.

