Surfmaster P.I.

ATTENTION:

To use your Surfmaster P.I. in average conditions:

- Rotate the PULSE DELAY control clockwise until it just clicks.
- Adjust the TUNER until you can hear a faint threshold tone.
- Adjust the length of the rod until the loop can be swept comfortably about one inch above the ground. Ground scrubbing the loop is not necessary.
- This model has fast Self-Adjusting Threshold. Sweep the loop from side-to-side, covering about three to five feet of ground per second. A metal object will produce a "beep" tone.
- Pinpoint by sweeping slowly over the target from at least two directions. The response will be strongest in the center of the loop. Stopping over the object will "tune it out".

For more detailed operating instructions, refer to the information inside this manual.

White's electronics, inc.

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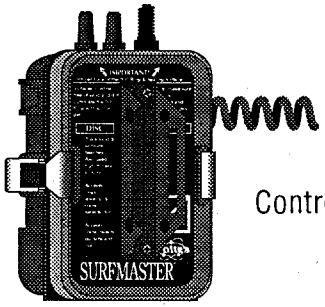
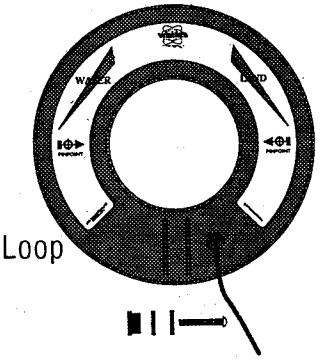
Assembly Instructions

Remove all parts from the shipping carton, and make sure you have the following:



Control Box

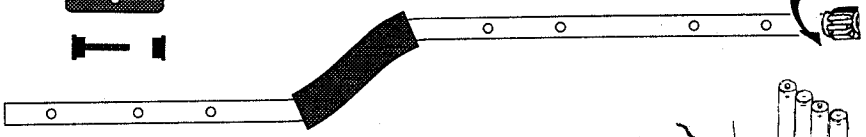


Loop

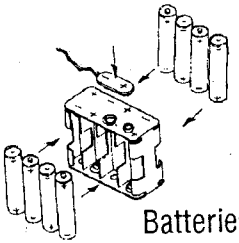
Arm Cup

"S" Rod

Unlock Camlock

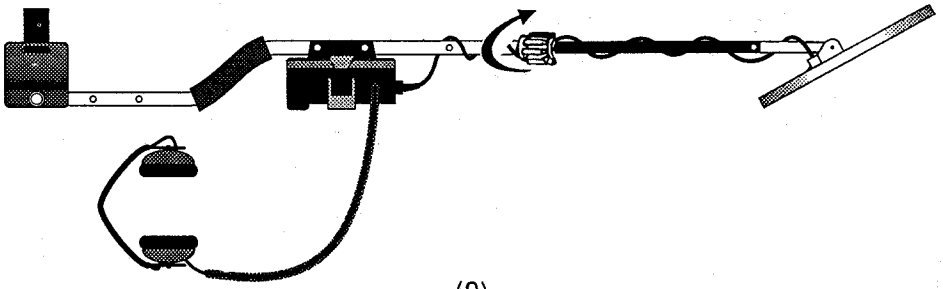


Straight Rod



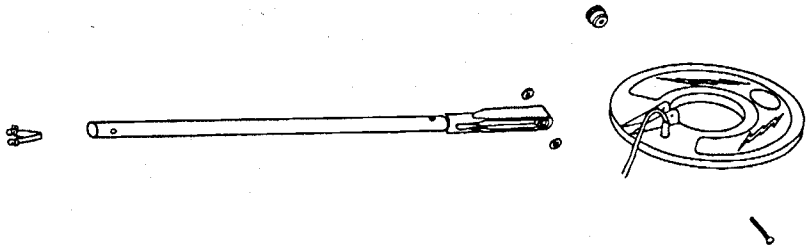
Batteries

Lock Camlock

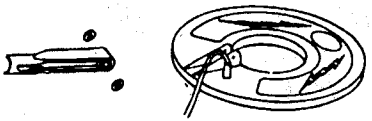


Assembly continued....

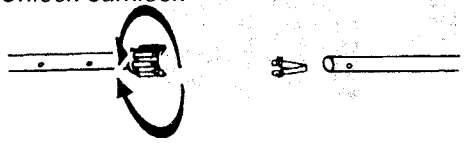
The SURFMASTER P.I. comes partially assembled. The Loop Isolator will need to be attached to the loop as shown:



Make sure washers are placed on the Loop Isolator before the isolator is slid onto the loop.

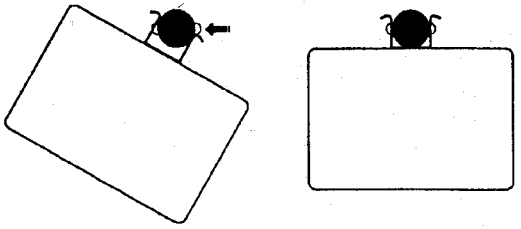


The straight rod connects to the "S" rod by unlocking camlock, lining up the two pushbuttons with holes in the "S" rod, and locking into place. Lock the camlock to avoid rattle.

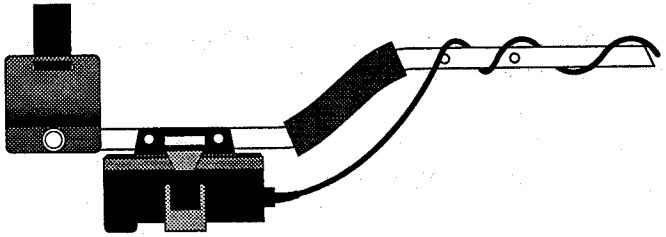


Assembly continued.....

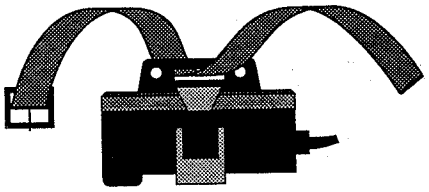
The control box snaps off and on the rod by compressing the two spring clips on one side and pivoting the control box:



Optional control box mountings are available on the "S" rod.

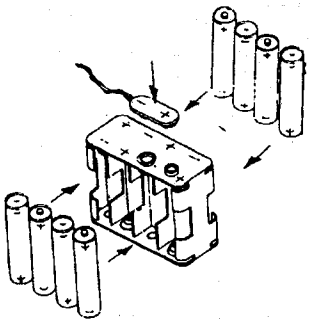


This model can also be worn as a hipmount simply by removing the control box from the "S" rod, adjusting the length of cable wound around the rod, and weaving a belt through the slots on the control box bracket.



Batteries

The Surfmaster P.I. is powered by eight AA Penlight batteries. Alkline cells are recommended.



Lift the latches on the sides of the case and remove the lid, using care not to lose or damage the "O" ring seal. Remove the battery holder and unsnap the connector. Replace the batteries in the holder. Connect the battery lead to the pack and put the pack into the case. Clean any dirt or sand from the "O" ring, case and lid. Replace the lid, being sure it is seated properly. Close the case latches. Look at the "O" ring to be sure it is compressed and seated properly on the lower case surface.

NOTE: Improper assembly of the case can cause it to leak and may damage the detector.

Standard carbon-zinc or heavy duty batteries will last for approximately 15 hours. Alkaline batteries are recommended and should provide 25 to 35 hours of continuous operation. Nickel-cadmium rechargeable batteries may also be used and will last approximately 10 hours per charge.

Batteries continued.....

A battery test can be performed with the TUNER control. When the TUNER is turned fully counterclockwise until it clicks, the audio battery tester is turned on. The condition of the batteries is indicated by the volume of the audio tone. When the batteries are new, the tone is very loud. The tone will become very faint when the batteries need to be replaced. (See Explanation of Controls - TUNER).

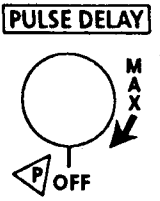
Background

The Surfmaster P.I. is a high-performance user-friendly metal detector which operates on the Pulse Induction principle. It is capable of extreme depth on coins and jewelry in salt water and mineralized ground. In the past, P.I. metal detectors had to be swept very slowly for maximum depth and they had very poor sensitivity to copper-nickel coins and gold. They had manual tuning which was critical to adjust and prone to drift. Most used a VCO or "fire siren" type of audio tone which changed from a low growl to a squeal when a target was detected.

The Surfmaster P.I. is different. It is the result of over eight years of research and development. Our goal was to develop a Pulse Induction metal detector which could match the sweep speed, sensitivity, stability and ease of use of an Induction Balance VLF without responding to wet salt or mineralized ground. The Surfmaster P.I. may be swept either quickly or slowly with virtually no loss in sensitivity. It was designed to be more sensitive to gold and copper-nickel alloys than to copper or silver. It features fully automatic tuning (S.A.T.) and the audio tone increases in volume, rather than pitch when a target is detected.

Explanation of Controls

Pulse Delay



What does it do?

The Pulse Delay control turns the detector ON and OFF and is used to select the level of non-ferrous trash rejection. It is similar to the discrimination control found on induction balance detectors. It cannot eliminate nails, but it can reject steel bottle caps. The control covers the range from all metal acceptance to pulltab rejection. High ground mineralization in the search area may cause a shift in the DISC setting. For example, a nickel that is rejected in air may be accepted in mineralized ground.

Why would I use it?

Under most circumstances, you should dig every signal. If you wish to reject some types of non-ferrous trash, you should use the lowest amount of pulse delay possible. P.I. detectors are not capable of the same degree of discrimination as VLF detectors. When you attempt to discriminate with a P.I., you will eliminate gold and low conductivity alloys, but you will still detect iron. Depth will be reduced by up to 50% at higher discrimination settings.

There are times when you might find yourself searching an area which is littered with aluminum foil or foil-lined catsup packages. You can advance the pulse delay to the point where the foil is

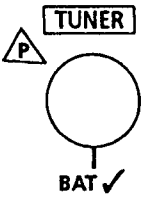
Pulse Delay continued.....

ignored, but shallow US nickel coins are accepted. You will lose the deeper nickels and some gold jewelry. At this setting, depth on other coins will be reduced by about ten percent.

If you are searching over very heavy black sand, you may notice some ground noise and false signals. You may be able to reduce some of this noise by advancing the pulse delay slightly. Black sand causes a change in the received signal which reduces the PULSE DELAY setting. Low levels of pulse delay can improve the stability in mineralized ground and salt water.

Explanation of Controls

Tuner and Battery Test



What does it do?

The TUNER is used to adjust the threshold tone. The threshold is the sound you hear when you are not detecting a target. The TUNER should be adjusted so that you can just barely hear a faint sound. Some sputtering or trembling in the tone is normal. If it is set too loud, it may mask some of the deeper targets. If it is set too soft, some of the deeper targets may not be heard. The TUNER also functions as a sensitivity control. Setting it for silent operation will reduce the depth of detection while eliminating noise from nearby detectors or other electrical sources.

Why would I use it?

We could have made the threshold "preset" at the factory. We chose not to because no two people hear things the same way. When you are hunting in dry sand in a quiet area, you can set the threshold very low. If you are near the surf or in a noisy area, you may have to turn it up slightly to hear it.

BATTERY TEST

The TUNER is also used to test the condition of the battery pack. With the power turned on, rotate the TUNER fully

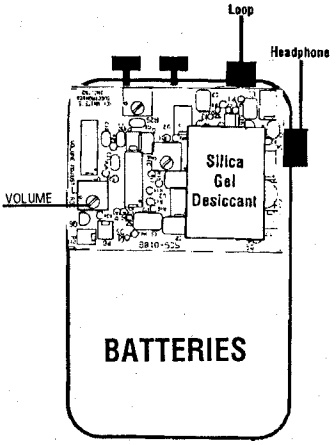
Tuner and Battery continued....

counterclockwise until it clicks and you will hear a tone. When the batteries are fresh, the tone will be very loud. When the tone is very faint, the batteries are nearly exhausted and should be replaced. Weak batteries will cause erratic signals, instability and noise in the detector.

The battery test is calibrated for "standard" or "alkaline" batteries. If you substitute eight rechargeable nickel-cadmium AA cells, the battery test will still be valid. The pack should be charged when the tone is weak, but still audible. If you use the optional 10 cell nicad pack, it should be recharged after each 10 or 12 hours of use. THE AUDIO BATTERY TEST WILL NOT WORK WITH THE TEN CELL NICAD PACK. If you continue to use the 10 cell nicad pack until the battery test gives no sound, you will discharge it below the recommended level. That may damage or destroy one or more cells in the pack.

Internal Controls

Volume Preset



The circuit board contains three variable resistors. Two are used by the factory for calibration purposes and should not be tampered with. Doing so will seriously degrade the performance of the detector. The third variable resistor is used to set the maximum volume in the headphones. To adjust this control, put on your headphones. Remove the case lid and install a set of fresh (or fully charged) batteries. Switch the power on. Wave a large metal target such as an alumminum screw cap, close to the loop and adjust the volume control until the sound is loud, but not intolerable.

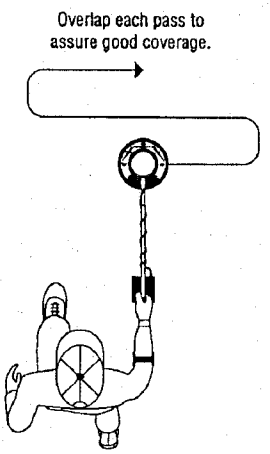
The volume will diminish slightly as the battery pack weakens. In general, the volume should be set so that deep targets can be heard while surface targets don't sound so loud that you are uncomfortable. Remember that more volume will be required to overcome wind and surf noise. The volume setting has no effect on the useful life of the battery pack.

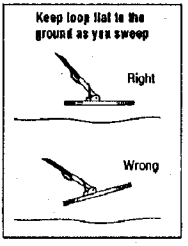
Dry Sand Search Methods

The Surfmaster P.I. operates on the Pulse Induction principle. Unlike an induction balance detector, it does not require any complicated ground balance adjustments. Most P.I. instruments must be swept very slowly in order to achieve maximum depth, but the Surfmaster P.I., does not. It was designed to have a fast target response, so it can be swept almost as quickly as an Induction Balance (VLF) detector.

When you lower the loop to the ground, you should not hear any change in the threshold tone. Mineralized ground might cause a slight response, but the S.A.T. circuit will compensate for it. Sweep the loop from side-to-side and listen for any increase in the threshold tone. Try to keep the loop level about one inch above the ground. Any repeatable signal, no matter how faint, should be investigated.

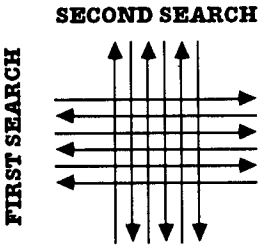
The Surfmaster P.I. loop field is shaped somewhat like a half-circle rather than the more familiar "V" or funnel. For maximum coverage, you should overlap your sweeps by at least 50%. Targets can also be detected outside the edge of the loop depending upon their depth and position with relation to the coil plane.





Dry Sand Searching continued. . . . .

If you are searching an area that has produced valuables, or has the potential for producing valuables, cover the area at least twice. Search first in one direction and then again at a different angle 90 degrees from the first. Some targets, such as coins on edge, may only respond from one direction.



The Surfmaster P.I. has fast Self-Adjusting Threshold. Once the threshold tone has been adjusted, the S.A.T. system will maintain it. If you stop the loop over a metal target, the S.A.T. will tune it out and return the detector to threshold. If you move off the target, then back on, the detector will retune giving a response. For this reason, the loop must be kept in motion while detecting or pinpointing a target.

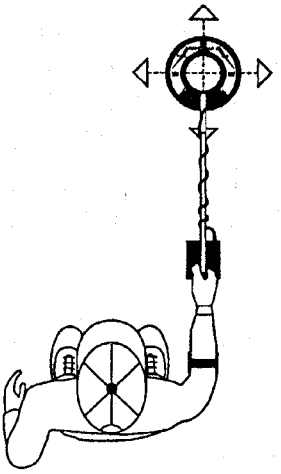
The sweep speed affects the performance capability of the detector. If you sweep too slowly, the S.A.T. will attempt to tune out a detected target. The result will be a loss in depth. If you sweep too quickly, the detector may not respond to a detected target also resulting in a loss in depth. The optimum sweep speed is three to five feet per second. In other words, if you sweep the loop in a five foot swath in front of you, you should be able to count "one-hundred-and-one".

Dry Sand Searching continued. . . . .

You may wish to ground scrub the loop for maximum depth. Ground scrubbing is not really necessary and may cause false signals over highly mineralized ground. Ground scrubbing also causes wear on the bottom of the coil and puts added stress on the coil connecting hardware. If you wish to ground scrub, you should purchase a protective loop cover. Be sure to remove the cover at regular intervals and clean out any sand or water.

Pinpointing a Target

The search coil has a very wide scanning area. When you hear a target, sweep slowly over it until the response is equal as you move the loop back and forth. Pinpoint by sweeping it from two directions, from back-to-back and side-to-side until the response is equal in all directions. If you slow the sweep, you can pinpoint with a good degree of accuracy. The most sensitive area of the loop is in the center.



Shallow targets can be difficult to pinpoint if they overload the coil. Simply raise the loop while "x-ing'" the target area. Coins lying flat will usually respond best in the exact center of the loop. Coins on edge, nails and irregularly shaped objects may tend to pinpoint near the outer edge of the loop. If you have trouble locating the target, turn the loop 90 degrees and pinpoint with the edge.

Advanced Search Techniques

Hipmounting

The Surfmaster P.I. can be used with the box mounted to the "S" rod. The most comfortable way to use it is in the hipmount configuration. The box is designed to be worn on the hip, slightly behind you. It was designed to be a "turn on and go" instrument, so the controls do not have to be within easy reach. The rod and loop assembly is very light for effortless searching.

When hipmounting, be sure to allow enough coil cable so it won't be pulled or jerked as you sweep the loop from side-to-side. You can use some Velcro fasteners, electrical tape, etc., to fasten the cable to the rod just below the handle. It is a good idea to run the coil cable under your belt to minimize stress on the waterproof fitting. Your body also acts as a "ground" and helps to eliminate electrostatic noise.

Searching in Salt Water

Pulse Induction insturments do not need to be adjusted to ignore the effects of wet salt or ground mineralization. When you plunge the loop into salt water, it will take a second or two for the S.A.T. to stabilize the detector. If you lift the loop out of the water, you will hear a brief tone. This is a normal function of the S.A.T. system.

If you are hunting at the surf line, simply lift the loop just above the water as the wave comes in. This will minimize false

signals, plus it is easier to sweep the loop in air than in water. If the loop is dunked in salt water, then pulled out and swept on dry land some false signals may be heard. They are caused by the water droplets moving around on the loop case. You can minimize these noises by treating the loop case with Armor All, silicone spray, or spray wax. This makes it easier to shake off the sand and excess water.

We purposely designed the Surfmaster P.I. loop to be as light as possible. This provides for effortless searching over dry sand and in and out of the surf, but the loop will tend to float when used in deeper water.

Proper Care of your Detector

CLEANING:

Both the loop and rod are waterproof, and can be cleaned with fresh water and a mild soap. After cleaning, dry the instrument thoroughly.

WEATHER CONDITIONS:

Protect your detector from excessively cold weather. Freezing can damage the electronic components, the case and/or the battery. Excessive heat can also damage the instrument. Never leave it in the sun. It's best to lay it in the shade when not in use. If it's left in a car on a hot day, cover it to protect it from the direct rays of the sun, and then leave the windows slightly open to permit ventilation.

SALTWATER:

Saltwater is very corrosive! After your detector has been exposed to saltwater, rinse the loop and rods in fresh water. Then wipe it with a cloth dampened with fresh water, and dry it thoroughly.

STORAGE:

If you plan to store your instrument for any length of time, unsnap the batteries and remove from the instrument. Whenever your instrument is not in use, turn the ON/OFF **PULSE DELAY** Knob all the way to the left until it clicks off.

Proper Care continued.....

OPENING CONTROL BOX:

When opening the control box, first make sure the instrument is dry. Water, if allowed to contact the circuit board, will damage it.

When opening the control box to replace the batteries, always make sure the "O" ring is free of dirt or sand, and is properly positioned before the case is closed. If this "O" ring shows any signs of wear, replace it before using this instrument in the water. This "O" ring 3/32 I.D., White's Part Number 527-0013 can be ordered from your White's Dealer or Service Center. Failure to maintain the "O" ring properly will result in extensive damage to the instrument, and will not be covered under warranty. If traveling abroad or using this model extensively, ordering additional "O" rings is highly adviseable.

TRAVEL:

If traveling and expecting large variations in altitude, such as traveling through mountain passes, disengage control box latches to allow equalization of pressure.

SILICA GEL BAG:

Your detector contains a silica gel bag to protect the circuit board from moisture due to condensation in the control box. Periodically, dry out this bag in a warm oven in which the maximum temperature must not exceed 120° C/248° F. This bag is located in the battery compartment. It is a good idea to let the inside of the control box dry out by leaving the control box open periodically in a warm dry place.

Proper Care continued.....

Always position bag on top of the circuit board, not on top of the batteries.

If the worst happens and your control box fills with saltwater, the following steps will avoid additional problems:

1) Immediately disconnect and remove the battery pack, and silica gel bag.

2) Flush the inside of your control box, including the circuit board, repeatedly with fresh tap water to remove all traces of saltwater.

3) Rinse the gel bag and allow to dry.

4) Remove and discard the batteries.

5) Allow all components to completely dry.

6) Inspect the "O" ring to see if it was the cause of the leak. If so, replace.

7) Re-assemble the instrument with new batteries; often it will work fine.

8) If no obvious reason is found for the leak, or if the unit is not operating at this point, return the instrument for servicing.

Proper Care continued....

9) These steps will avoid extensive saltwater corrosion. Extensive saltwater corrosion is considered neglect and is not covered by the warranty.

ADDITIONAL PRECAUTIONS:

a) Avoid dropping your detector.

b) Avoid sharp jars to the loop.

c) Do not allow battery to corrode inside the instrument.

d) Do not alter or modify your instrument during its warranty period. Alterations will void the warranty.

e) Do not tighten the black plastic bolts on the loop, loop cable, and headphone cable. Special tools are used to set these bolts at their optimum waterproof setting. Although they may appear loose, they are waterproof.

Questions and Answers

Q: Why won't the PULSE DELAY control eliminate nails and iron?
A: Pulse Induction instruments by their very design are more sensitive to iron than to non-ferrous metals. They operate by measuring the change in the duration of the transmitted pulse caused by nearby metal objects. Gold causes a very slight change in width, but iron causes a very great change. If the sampling time is set so that iron would not be detected, all other metals would be rejected as well. Some attempts have been made to identify iron on a P.I. detector, however the results are not very consistent or reliable due to mineralized ground and other factors.

Q: Can I use the PULSE DELAY control to identify targets?
A: Yes, but there are some disadvantages. If you increase the delay and the target drops out, it could be gold or aluiminum. If it stays, it may be iron. This method is not very reliable because a large, shallow coin may not drop out indicating iron. A deep nail might be rejected indicating a good target because the depth is reduced up to 50 percent at high levels of trash rejection.

Q: Can I use the Surfmaster P.I. for coinshooting?
A: Yes, but it is not well suited for urban areas. It may pick up electrical noise from power lines, automotive ignition systems, traffic lights, etc. It does not discriminate iron and the high sensitivity would require digging deep holes. This is unsuitable in a well-manicured lawn. A better choice would be one of the Classic, Di, or Eagle models.

Questions and Answers continued . . . . .

Q: Can I use the Surfmaster P.I. for relic hunting?
A: Yes. It has been designed to be extremely sensitive to gold and copper-nickel alloys. It is also very sensitive to lead and should be able to locate Musket and Minie balls at great depths. Relics are often recovered in rural areas where digging a hole is possible without worrying about damaging a lawn. It is very sensitive to small bits of iron and may be difficult to use in trashy areas.

Q: Can I use the Surfmaster P.I. for gold nugget hunting?
A: While it is not capable of locating the very tiny nuggets, it can detect shallow nuggets as small as 1/5 of a pennyweight. Larger nuggets can be detected at very great depths in black sand and heavily mineralized ground. It ignores most hot rocks, but cannot reject small bits of iron. The Goldmaster II has greater sensitivity to very small nuggets and is a better choice for nugget hunting and prospecting.

Q: Can I use the Surfmaster P.I. in a competition hunt?
A: It should work fairly well in a beach hunt, but it does not pinpoint quickly or accurately enough for lawn hunts. It may pick up interference from other detectors, but this can be minimized by turning the tuner down. It may also cause interference in other detectors and make you unpopular with nearby contestants. It is capable of extreme depth which is not needed to recover shallow coins and tokens. The Classic III is a better choice for competition hunting.

White's Electronics, Inc.
Limited Warranty

If within one year (12 months) from the original date of purchase, your White's detector fails due to defects in either material or workmanship, White's Electronics will repair or replace at its option, all necessary parts without charge for parts or labor.

Simply return the complete detector to the dealer where you purchased it, or to your nearest Authorized Service Center. The unit must be accompanied by a detailed explanation of the symptoms of the failure. You must provide proof of date-of-purchase before the unit is serviced.

Items excluded from this warranty are non-rechargeable batteries, and other accessories.

The warranty is not transferable. Nor is it registered unless the Warranty Registration Card is returned to the factory address below within ten (10) days of original purchase for the purpose of recording that date.

The warranty does not cover damage caused by accident, misuse, neglect, alterations, modifications, unauthorized service, or prolonged exposure to corrosive compounds, including saltwater.

Duration of any implied warranties (e.g., merchantability and fitness for a particular purpose) shall not be longer than the stated warranty. Neither the manufacturer or retailer shall be liable for any incidental or consequential damages. Some states, however, do not allow limitations on length of implied warranties, or the exclusion of incidental or consequential damages. Therefore, the above limitations and exclusions may not apply to you.

In addition, the stated warranty gives you specific legal rights, and you may also have other rights which vary from state-to-state.

THE FOREGOING IS THE ONLY WARRANTY PROVIDED BY WHITE'S AS THE MANUFACTURER OF YOUR METAL DETECTOR. ANY "EXTENDED WARRANTY" PERIOD BEYOND ONE YEAR, WHICH MAY BE PROVIDED BY A DEALER OR OTHER THIRD PARTY, ON YOUR DETECTOR, IS WITHOUT WHITE'S AUTHORITY, INVOLVEMENT, AND CONSENT AND WILL NOT BE HONORED BY WHITE'S.

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