



SURFMASTER® II

ATTENTION:

To use your Surfmaster II, set SENS control at .

When operating in high minerals, such as black sand and other types of mineralization, set the DISC control to .

When searching dry or wet sand with little or no other types of minerals besides salt, set the DISC Control to  or slightly higher, (10:00 o'clock). Most nails will be rejected and most valuables detected at this setting.

When wanting to discriminate against junk, increase DISC Control toward . CAUTION: Most gold jewelry will be rejected at the  position.

The loop must be in continuous motion (moving from side to side) in order for this model to respond to metal.

Good metals produce smooth solid beeps, junk metals produce clicks or sputter sounding beeps.

Pinpoint metals exact location by "X-ing" area slowly.

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



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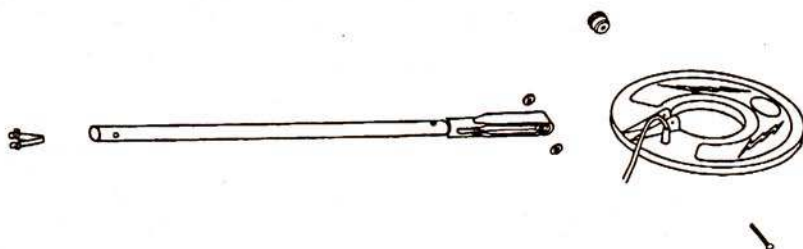


Remove all parts from the shipping carton, and make sure you have the following:



Assembly continued....

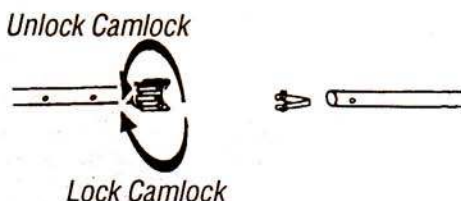
The SURFMASTER II comes partially assembled. The Loop Isolator will need to be attached to the loop as shown:



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

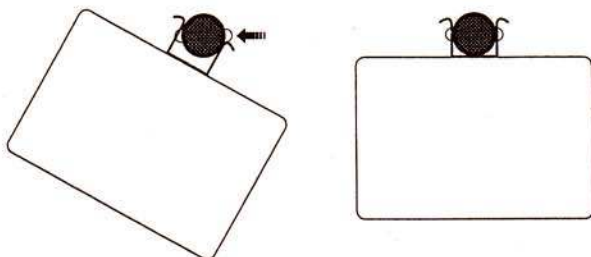


The straight rod connects to the "S" rod by unlocking camlock, lining up the two pushbuttons with holes in the "S" rod, and locking into place. Lock the camlock to avoid rattle.

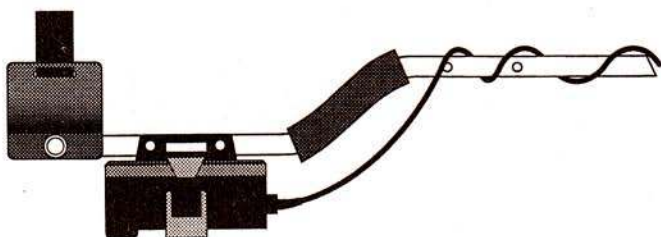


Assembly continued...

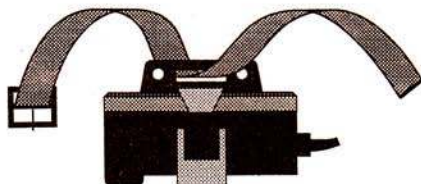
The control box snaps off and on the rod by compressing the two spring clip buttons on one side and pivoting the control box.



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



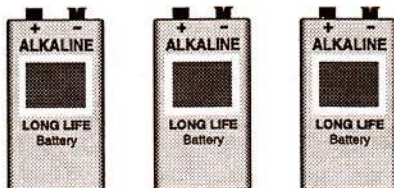
This model can also be worn as a hipmount simply by removing the control box from the "S" Rod, adjusting the length of cable wound around the rod, and weaving a belt through the slots on the control box.





Batteries

The Surfmaster II is powered by three TRANSISTOR 9 Volt batteries.



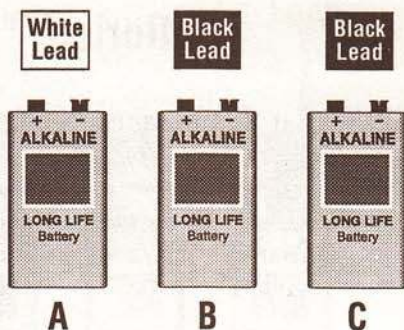
Open the battery compartment by pulling up on the two latches, one on each side of the control box, and disengaging the latch hooks from the top of the control box. Note that this procedure can be completed with the control box on or off the rod. Remove the top of the control box, note the position of the "O" ring, circuit board, and battery leads. CAUTION: Do not get sand or dirt on the "O" ring. Avoid unnecessary handling of the circuit board.

Attach the battery leads to the batteries. Note they will fit only one way. Note one of the battery leads is different than the other two. It may be a different color or be marked in such a way as to identify it from the other two. This battery runs the audio (beep). The batteries may or may not discharge at the same rate. It is recommended that the batteries be rotated occasionally to achieve maximum battery life.

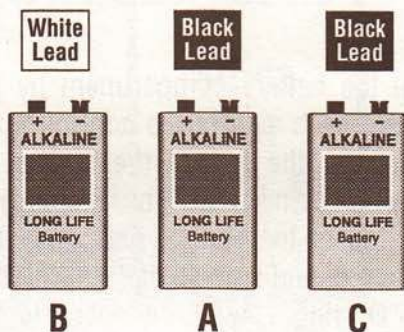
Alkaline 9 volt transistor batteries should last 20 to 30 hours if rotated from battery lead to battery lead. Battery rotation is suggested as follows:

Battery Rotation Schedule

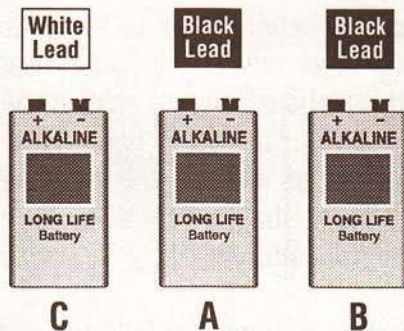
First



Second
(Switch A & B)



Third
(Switch B & C)



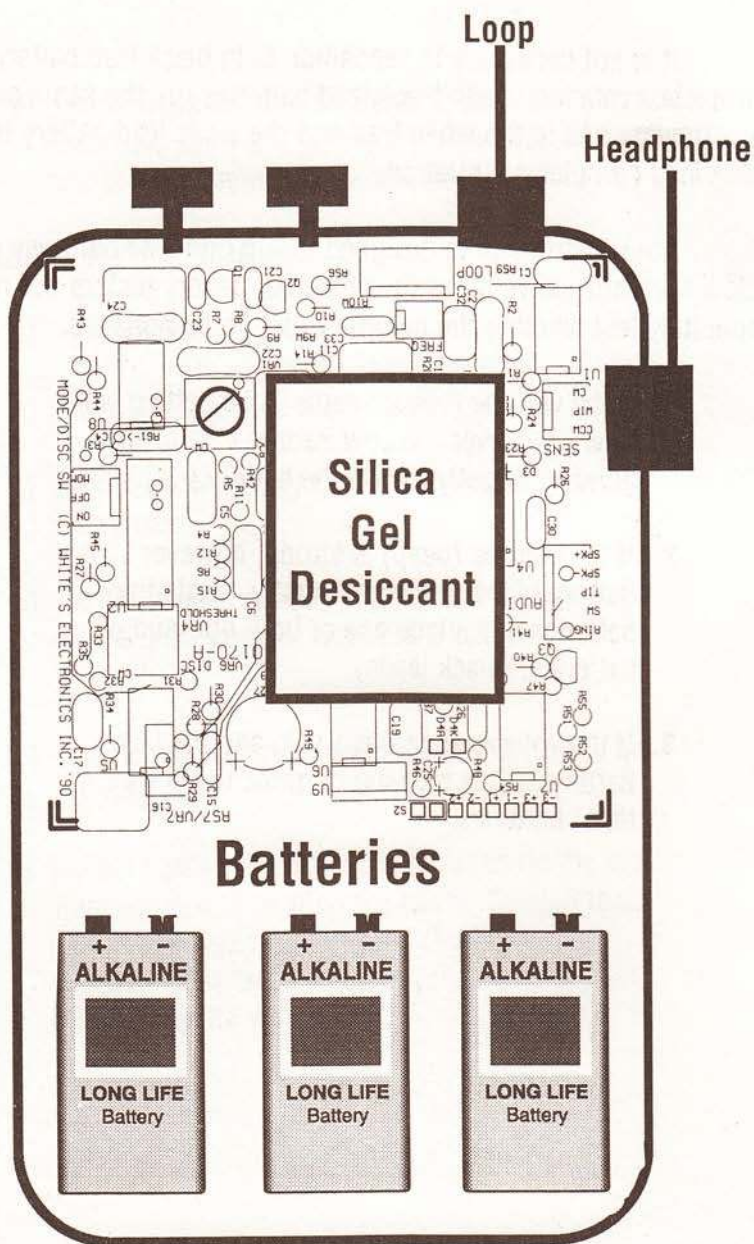
Batteries continued.....

It is not necessary to reposition both black lead batteries to complete a rotation. Both black lead batteries run the same circuit thus moving one to the white lead and the white lead battery to the black lead completes a rotation.

Your instrument is designed to run on these batteries well below their normal voltages thus external battery testers will not accurately test whether the batteries need to be replaced.

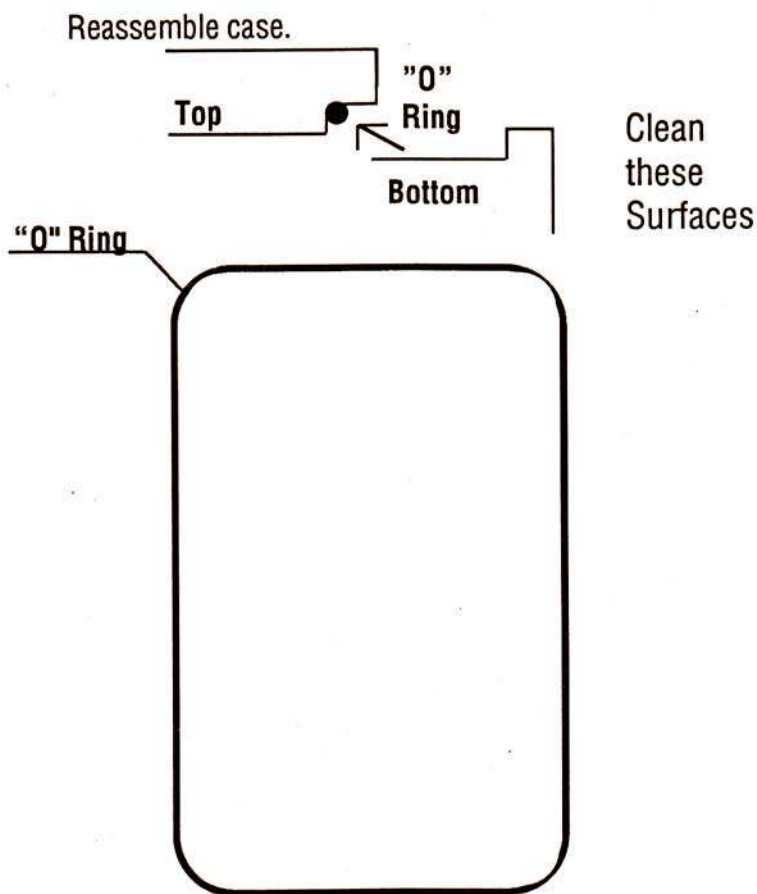
1. If the volume (beep) seems to be getting weak (low), however the Low Battery LED is not glowing brightly, rotate the battery positions.
2. If the volume (beep) is strong, however Low Battery LED is glowing brightly, rotate the batteries or replace one or both non-audio batteries, (black leads).
3. If the volume (beep) is weak, and the Low Battery LED is glowing brightly, replace all three batteries.

Batteries continued.....



Batteries continued.....

Once the batteries are connected and positioned in the case, (beside the circuit board) observe the "O" ring. Make sure it is positioned correctly, and is free of sand and dirt before reassembling case. Also make sure the Silica Gel Desiccant bag is positioned over the circuit board (not on top of the batteries), and that the batteries are positioned flat. The battery leads should not be on top of the batteries. They should be positioned beside the batteries.



Batteries continued.....

↖ IMPORTANT! ↗

Proper Care of the "O" Ring & Sealing Surface

Surfaces must be free of sand and dirt. "O" ring must be compressed and seated completely on lower case surface.

DISC

- 1 Black sand & beaches.
Also used in high mineral ground.
- 2 Saltwater beaches.
Accepts rings, jewelry, & coins.
Rejects iron.
- 3 Accepts coins, rejects pulltabs and iron.

SENS

Operate at ∇ P or higher.

SALT WATER OPERATION

If unit becomes noisy or unstable, lower SENS and/or increase DISC clockwise from ∇ 2 until smooth operation returns.

BATT
CHECK



SURFMASTER® II



Operating Instructions

1. Turn the SENS (Sensitivity) Knob clockwise, click indicates ON, set to the ∇P .

2. The DISC (Discriminate) Knob has three ∇ settings.

a) If searching black sand or other types of high mineralization, set the DISC (Discriminate) control to $\nabla 1$. This model will respond to all types of metals at this setting. If the instrument doesn't operate smoothly at this setting, switch to the $\nabla 2$.

b) If searching in fresh water, or salt water beaches with little or no other types of ground minerals besides salt, set the DISC control to $\nabla 2$. This model will reject most nails and small iron at this setting, and respond to most jewelry. A setting slightly higher than $\nabla 2$ (10:00 o'clock) rejects most nails and accepts most valuables.

c) If more rejection against junk metals is desired, turning the DISC (Discriminate) Knob clockwise toward $\nabla 3$ increases discrimination. **Caution:** At or before the $\nabla 3$, many jewelry items are rejected. At $\nabla 3$, pulltabs are rejected as is nickels, and most small jewelry items. The $\nabla 3$ is mostly for detecting silver and copper coins only. The $\nabla 3$ setting may not perform well in wet saltwater, black sand or other highly mineralized ground conditions.

3. Sweep the loop close to the sand, silt, or ground passing from side to side. Walk, wade, or swim forward slowly while sweeping, and make sure each pass of the loop overlaps the last. Each pass of the loop from right to left should take approximately two seconds. If the loop is swept very very slow, or the loop is stopped, the detector may not respond to metal.

Operating Instructions continued.....

4. At this point, it is a good idea to find an area free of metal to practice. Place a quarter or dime on the ground. Pass the loop over the target. **Note:** If you sweep the loop over the coin it is detected. If you stop the loop over the coin or sweep too slowly, the instrument doesn't respond. Thus, loop movement is required for proper performance.

5. With the DISC control at $\nabla/2$, place a nail on the ground and pass the loop over it. Note the way the detector clicks or produces a flutter sound. Now pass the loop over the coin and note the difference in sound. An operator will soon learn to ignore the clicks or flutters junk produces, and listen for the smooth beep coins and good metals produce.

6. Once a smooth beep has been located, pinpoint exactly where to dig by slowly X-ing the area.

7. If searching the beach, and wind causes a howling sound in the headphones, plug the drain holes in the headphones if so equipped, to eliminate such wind noise. Black electrical tape over these holes works fine. Be sure to unplug or take tape off before entering the water.



Explanation of Controls

SENS (Sensitivity)



What does it do?

The **SENS** control turns the detector ON and OFF, and is used to select the (Sensitivity) or degree to which this instrument responds.

Why would I use it?

The ∇ works well in most areas, however there are two reasons an operator may wish to change the sensitivity setting:

1. If when using this model with the **SENS** control at ∇ it makes a lot of noise, beeping or clicking, when you sweep the loop, or continues even when the loop is away from the ground, the **SENS** control should be turned counter clockwise thus reducing the sensitivity, and allowing smooth stable operation.
2. If when operating this detector with the **SENS** control at ∇ it works well, quiet and smooth, increasing the **SENS** control clockwise will increase sensitivity and detection depth, but may produce unstable audio responses.

Experience and personal preference will dictate how stable you prefer your instrument to perform. The **SENS** control allows for this adjustment.

SENS (Sensitivity) continued.....

CAUTION: An incorrect DISC setting for the ground conditions (minerals/salts) can simulate having the SENS too high. Try the 10:00 o'clock DISC setting as well as the . If noise continues, then try a reduced SENS setting.



Explanation of Controls

DISC (Discrimination)



What does it do?

The **DISC** control selects the amount of rejection against junk metals. At **MIN** (minimum) most everything is detected. At **MAX** (Maximum), most junk is rejected.

Why would I use it?

- 1 Improves performance in extreme conditions, high mineralization such as black sand. Responds to all types of metals.
- 2 Works well in dry or wet salt or fresh water which doesn't contain high degrees of other types of mineralization. Rejects nails and most small iron, accepts most valuables.
- 3 Heavy discrimination, rejects iron, foil and pulltabs. **Caution:** Also rejects nickels, and most small jewelry. Doesn't work well in extreme ground conditions.

Use the DISC control to select the discrimination level that works smoothly for the area as well as providing the desired rejection against junk.

DISC (Discrimination) continued....

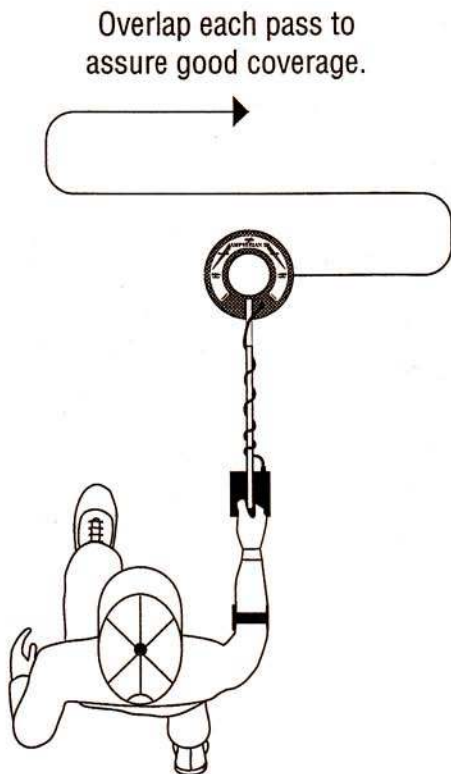
Again, experience and personal preference will be a factor in selecting this setting. An operator must consider the likeliness of jewelry in the area to be searched, and how much digging of junk metals is acceptable in the area; and to the operator personally, how hard do you want to work the area. The ground mineralization of an area must also be considered. The DISC setting can smooth operation in some conditions.

If you want to find nickels and jewelry with this model, you are going to have to dig your share of the junk metals that respond similarly such as aluminum.



Search Methods

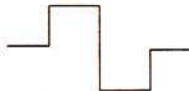
Because the loop of this model must be moving in order to respond to metal, the sweep of the loop is critical to performance. Sweep the loop close to the ground, keep it close and flat throughout the sweep. (See examples.)



Good targets sound smooth



Bad targets sound rough

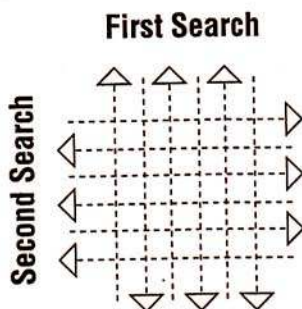


Keep loop flat to the ground as you sweep

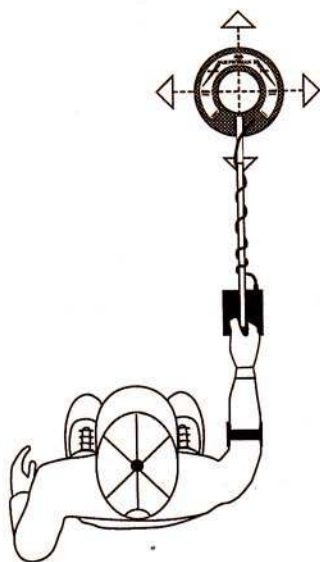


Search Methods continued...

If you have an area that has produced valuables, or has the potential for producing valuables, cover the area twice. First in one direction, then again at a 90° angle from the first.



Once a good metal is located, "X" the area to pinpoint the target. Listen for the loudest beep as you sweep the loop, then stop and sweep in the other direction and listen for the loudest beep. The point where the two loudest beeps intersect is the center point of the target.





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 **SENS** 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 rotate or replace 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, White's Part Number 527-0033, 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 advisable.

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)** It is not necessary to use waterproof grease on "O" ring.
- f)** 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.



Advanced Operators/Dealers

Ground Rejection

The ground rejection of the Surfmaster II is factory preset at a level slightly positive of a ferrite mineral sample. This setting should provide good performance in most conditions.

If you notice false targeting, and/or you notice target response "beep" as the loop is abruptly lowered to and/or lifted from the ground, performance can be improved by readjusting the ground rejection.

Open the control box and look at the circuit board. You will see a small adjustment trimmer used to adjust ground rejection. (See diagram, page 24.)

Use a very small thin regular screwdriver to adjust ground rejection. Counterclockwise sets this model for higher ground mineral. Clockwise sets this model for lower ground mineral. When set properly, the loop can be abruptly lowered to and lifted from the ground without a target response "beep". The proper ground rejection setting provides good detection depth with a minimum of false targeting.

Regardless of proper ground rejection setting, the best performance in extreme conditions will still be achieved with the DISC control at the  position.

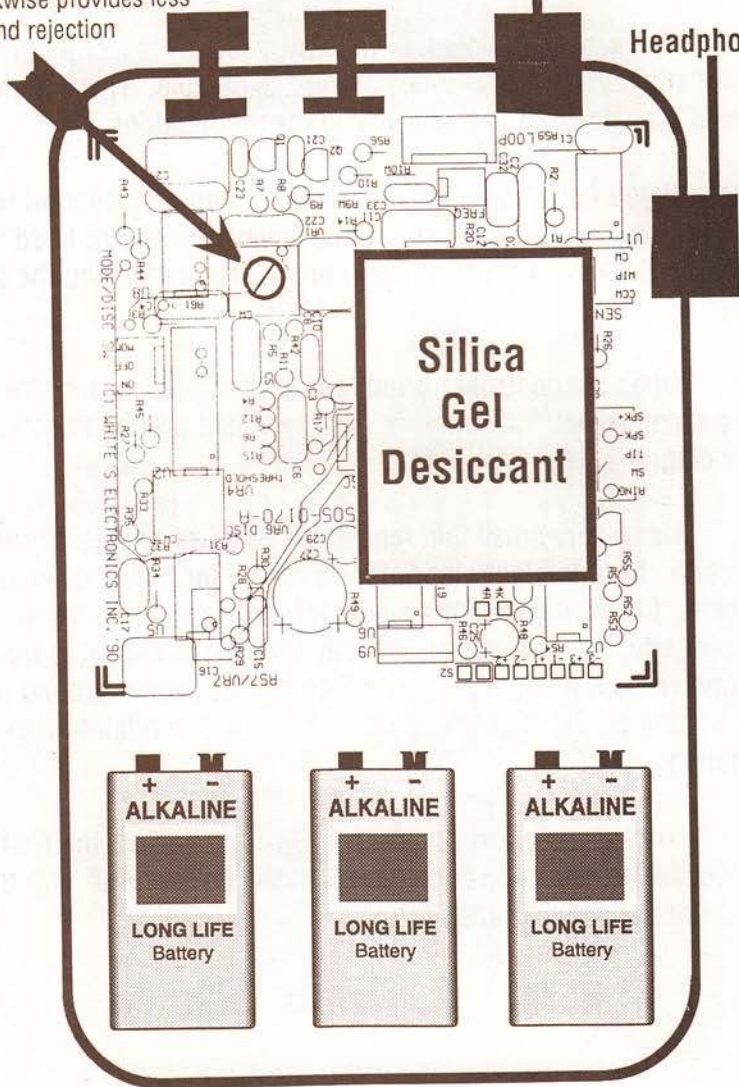
Advanced Operators/Dealers

Ground Rejection Trimmer

Counterclockwise provides more ground rejection. Clockwise provides less ground rejection

Loop

Headphone





Glossary of Terms

Abruptly: Quickly, without hesitation.

Alkaline Battery: Type of non-rechargeable battery that can be purchased. It has the ability to sustain longer periods of current drain, and greater storage life than the carbon-zinc type batteries.

Black Sand: Granular material consisting mostly of magnetite.

Control Box: Body of instrument (case).

Detect: Respond by "beep".

Discrimination: The ability to accept or reject (distinguish) metals of different characteristics, nails, bottle caps, coins, etc.

Frequency: Current cycles produced by the transmit oscillator per second. (Cycles per second.)

G.E.B.: (Ground Exclusion Balance) Ground Rejection.

Good Metals: Metals determined by the position of the **DISC** control to be acceptable. Desirable metals.

Ground: Dirt or the surface of the earth.

Ground Rejection: The cancellation of ground mineralization to ignore the masking effect ground minerals have over metals.

Indicate: Advice, proclaim, or point out.

Glossary continued.....

Junk Targets: Metals determined to be trash or rejects, iron, foil, pulltabs, etc.

Max: The most or highest possible.

Metal: Metallic substances iron, foil, nickel, aluminum, gold, brass, lead, zinc, copper, silver, etc.

Mineral: Ferric oxide (iron) or other such non-organic substances naturally occurring.

Min: Minimum, the least possible.

Mode: An operation selection for specific operating characteristics.

Motion: Movement or sweep.

Ordinary: Common, average or not unusual.

Performance: Efficiency, the manner in which an instrument responds.

Pinpoint: Finding the metals exact location with respect to the loops physical center.

Preset:  Control position determined to be ideal for average search conditions.

Range: A sequence, series, or scale between limits. (calibration)

Glossary continued.....

Reject: Discriminate, cancel response or effect.

Sensitivity: (SENS) Capacity or degree to which an instrument responds.

Stable: Ability of a metal detector to maintain smooth predictable operation.

Sweep: Loop movement from side-to-side.

Trimmer: Small component used for adjustment.

"X": Cross the target from two different sides 90° from each other.

NOTES

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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NOTICE



Surfmaster Owners

In line with White's ongoing efforts to design and build the best possible metal detectors, your enclosed Surfmaster has the latest improvements.

Unfortunately the new instruction manual is not quite ready. Therefore the enclosed instruction manual will vary somewhat from your actual instrument.

Everything still applies except for the following differences.

I. The headphone of your instrument has a twist lock connector, where the headphone cable enters the control box. The headphones can be removed from the control box during periods of storage or travel. This is a waterproof connector.

II. (Surfmaster PI only), has an additional twist lock connector on the loop. The loop can be removed during periods of storage or travel, and accessory weighted or beach loops can easily be installed by the user.

A. The Headphone Connector is closest to the lid, has a male type connector on cable, and a female type connector on control box.

B. The Loop Connector is furthest away from the lid, has a female type connector on the cable, and a male type connector on the control box.

C. This prevents incorrect connections for the PI Headphone and Loop.

III. The new case is functionally and cosmetically improved over earlier designs.

A. Batteries have a separate and contained area.

B. "O" ring seal is self contained within the one piece lid.

C. Circuitry is covered with only the adjustment trimmer accessible.

1. The adjustment trimmer controls ground rejection on Surfmaster II units.

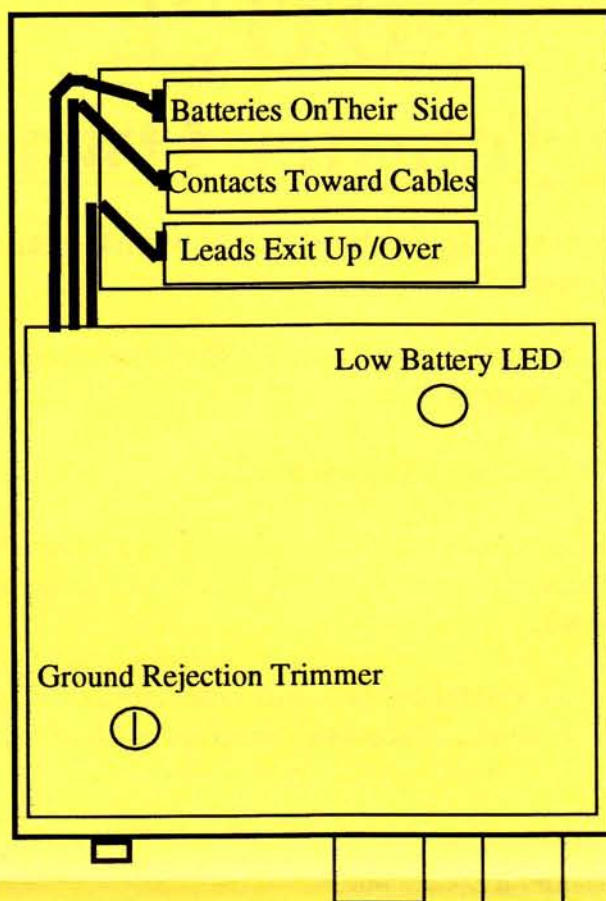
2. The adjustment trimmer controls the volume level on Surfmaster PI units.

VI. The Surfmaster is warranted to an underwater depth of 60 feet.

V. Please see reverse of this page for proper battery installation.

VI. Please note on your warranty card, "need new manual", and the new instruction manual will be mailed to you as soon as it is available.

I. Surfmaster II Battery Configuration



II. Surfmaster PI Battery Configuration

