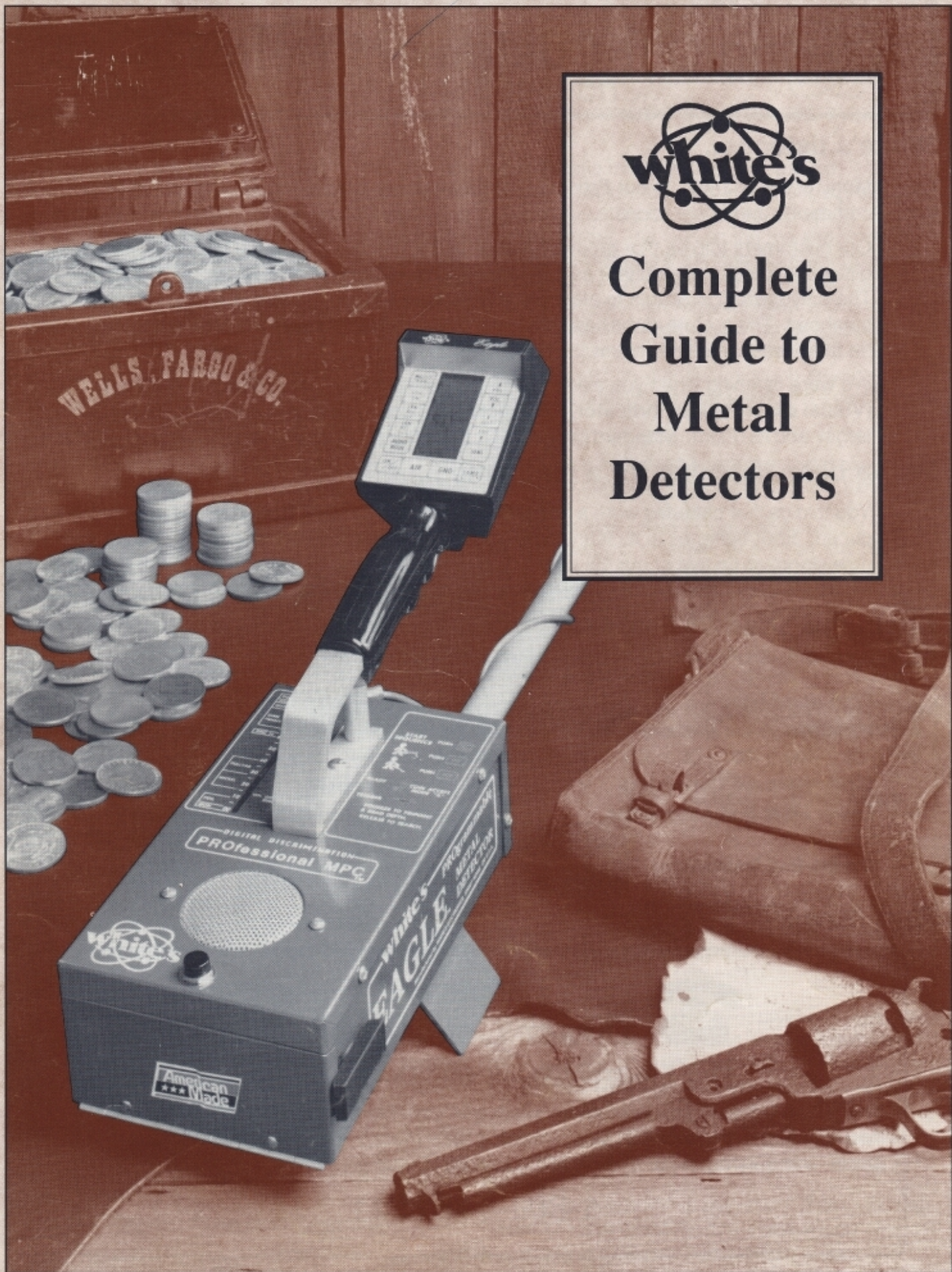




# Complete Guide to Metal Detectors



# Serving Our Customers Better in '88!

## White's listens ...

Many of the changes in our Product Line came about by listening to our Customer's comments and suggestions.

Our customers told us that ground balance was a hassle. Difficult to learn to use, and difficult to keep in adjustment as you hunted. We listened and gave you **AUTOTRAC®**. The only system available to electronically monitor the ground and keep the detector balanced. This feature alone has meant more treasure recovered because the detector was "in tune" with the environment.

We were listening when you asked for target identification. The solution: White's **V. D. I. (Visual Discriminate Indicator)**. A simple and sure system that indicates the probable target and its depth. Standard on the EAGLE II, 6000/Di PRO Plus and 5900/Di PRO Plus.

## We've been listening for a long time ...

You told us that batteries were a headache. White's **4 "C" Cell Battery System** was introduced. Four batteries in a clean, simple pack that drops into the back of the detector are now standard on five of our '88 units. Top-of-the-line units come with the **Rechargeable Nicad Battery System with Charger**, which is available as an option for other detectors.

## Again this year we listened,

and our 1988 Product Line reflects what our customers wanted.

**Chip-Proof Paint**

To keep your detector looking new longer

**Stainless Steel Hardware**

Greatly reduces corrosion even when used around saltwater

**Strain-Relieved Connectors**

For improved reliability

**Lower Fiber Rod Assemblies**

Lightweight and non-metallic from the upper rod assembly to the new BLUE MAX 950 loop!

**On-the-Box Instructions**

High-tech sophistication does not need to be difficult

## And now ...



White's

**DIRECT CONNECTION**



**Our Electronic Link with Our Customers!**

One phone call puts you instantly in touch with your regional White's office. Need an instruction manual, technical help, a catalog for a friend? What about your nearest dealer, warranty repair, or tips on where to hunt in your area?

**1-800-547-6911**



# METAL DETECTORS -

## An Introduction ...



Since you are reading this I presume that you are interested in metal detectors and their uses either as an owner or a prospective owner. An understanding of how they work will help you get the most from your machine or make an informed decision when choosing a new one. We will explore how they find buried metal, what's inside them, and some of the different methods they use to help you both find metal, and determine if you should dig it up.

### The Big Five

Metal detectors have two main components; a search head or loop, and a package of electronics connected to it. They are used to find metal buried in the ground. In general we call the buried metal a "target". Let's look carefully at these four players: the loop, target, ground, and electronics. After that we will look at the fifth big player: you, the user.

### The Loop

The search head (called a loop because it consists mainly of loops of wire) is like the lens of a camera. It "sees" a metal object by generating a magnetic field which is affected by metal. Inside the loop a specially configured receive coil responds to the change caused by the metal

and produces a signal with two electrical characteristics, phase and amplitude, which are determined by the metal object. Usually the loops are interchangeable to allow you to match the

loop size to the task at hand. Small loops detect close small targets while large loops detect large distant targets.

Targets are best detected when they pass under the center of the loop. The larger the loop, the bigger an area that a target can occupy and still be detected. This allows you to search an area faster. The down side of this is that many areas are "trashy" and your loop sweep will cover one or more trash items along with that gold ring you were after in the first place. Although the detectors can do a good job of telling trash from desirable targets, they will get confused if they see both at once. In this case a smaller loop would allow you to sniff out those good targets, but it's

going to take longer to cover the ground.

A common question is "why doesn't the loop detect the rod and mounting screw?" Well, it does. However, it doesn't matter. As long as the rod and screw don't move in relationship to the loop, the electronics is able to completely ignore them. In practice a little flexure may occur, so a nonmagnetic screw is used and the rod is mounted with a plastic "clevis". Our newest loop, the Blue Max 950 is so sensitive that the regular clevis doesn't provide quite enough spacing so it is usually mounted to the instrument with a plastic lower rod.

### The Target

Now we get to find out how the detector can identify coins and help you leave most of those nails in the ground.

When the loop's field hits a metal object it may be either absorbed, reflected, or bent by the target. If none of these three occur, then by definition you don't have a target. Since things like paper and plastic do not affect the field they are "invisible" to the metal detector.

The following chart shows how these effects relate to the metal detector response and various targets.

Cause	Bending				Absorbing			Reflecting	
VDI #	-96	-80	-40	-20	00	20	40	60	80 95
Targets	nails iron steel				foil	nickels		other coins	
Soil	strong				weak				
Beaches	dry..... wet		..... saltwater						

\* **Note:** The VDI# is displayed on several instruments and related to the discriminator knob setting on most of the rest. It is discussed in some detail in the Electronics section.

Metals that lack iron in their alloy only produce positive VDI numbers. This includes all of the current U.S. coinage and anything made out of aluminum, copper, gold, silver, etc. Their response depends upon the ratio of reflection to absorption which in turn depends upon their size, thickness, shape and composition. In general, thin items absorb energy while thicker ones tend to reflect it.

In addition to absorbing and reflecting the field, iron alloys can also bend it. The effect will be different

## **Metal Detectors—An Introduction cont. . .**

readings depending on how the target lies in the ground. Since the orientation of the target and loop field change for these targets as the loop is swept over them they often produce a "broken up sound" or erratic VDI meter reading.

### **The Ground**

Unfortunately in addition to detecting metals, the detectors also tend to respond to the ground. This is caused by two effects. Most grounds have "ferromagnetic" minerals in them that cause a bending of the field. The other effect is conductivity due to moisture and various salts, this tends to cause some field absorption. We will see in the next section how metal detectors deal with these effects.

### **The Electronics**

Here we are at last at the heart of the machine. The electronics system takes the target signal from the loop and massages it into a form suitable for consumption by you, the user. We will look at how the electronics does these things: ground rejection, discrimination, depth reading, pinpointing, user interface and power supply.

#### **Electronics: Ground Rejection**

As discussed earlier the ground is not totally transparent to the loop field. Two methods are currently in use to reduce the effect of the ground: balancing and filtering. Most instruments use one or both.

Balancing assumes that the phase of the ground signal is relatively constant in a particular search area and thus if you can adjust it out initially then you can go about your merry way. The advantage of this method is that when balanced you may vary the height of the loop with no change from the ground.

Several methods are used to accomplish this. The simplest is to factory set the balance. It has the advantage of being cheap and not having any user adjustments. Unfortunately it is seldom correct and limits performance.

A better solution is to have a knob for the user to adjust. This method can produce good results especially with a multi-turn knob and an experienced user. Beginners often have difficulty learning to set it because it takes several tries to get it right.

The best method we know of is fully automatic ground balance. This system also requires the user to do an initial balance but all he/she has to do is hold the loop away from the ground and press a button, then place the loop on the ground and press another. Another advantage of the automatic systems is that they often include a tracking system to automatically keep the ground balanced while you search.

We have looked at the advantages of balancing out the ground and several systems for achieving it. One

disadvantage remains. If the detector only uses balancing, it will be able to detect buried targets but will be unable to identify them and discriminate against "junk". To achieve the latter filtering is used.

Filtering assumes that the ground signal changes more slowly than a target when the loop is swept across it. For this system to work the ground must be relatively uniform, the loop must be in motion, and the user needs to avoid sudden vertical movements of the loop. In practice all of these conditions are fairly easy to achieve allowing the detector to use the change in the field as the loop is swept over a target to determine the target's characteristics. Machines differ somewhat in the design of their filters and how they are read and the data used. Whatever machine you use, it will train you how to use it. As you use your machine and watch or listen to its responses, you will naturally try sweeping faster and slower and observe the effect.

#### **Electronics: Discrimination**

Discrimination is the process of deciding whether or not a detected target is worth the effort of digging up. As we have seen, different targets affect the loop field in different ways. The electrical result is a signal from the loop with a particular phase angle associated with each target. (The phase is most directly available to the user as the VDI number.) Before exploring how these systems work, I need to point out that there is a catch.

Let's assume that a particular gold ring reads +34 on the VDI scale. Does that mean that every reading of 34 indicates a gold ring? Unfortunately no. Many pulltabs or pieces of pulltabs will read exactly the same thing. In addition, gold rings vary widely in their readings depending upon their exact alloy, size, and shape. A detector with discrimination will greatly increase your overall treasure yield, but the only way to get EVERYTHING is to dig everything, trash and all. You might like to refer to Figure 1 during this discussion. VDI stands for Visual Discrimination Indication. If you use an instrument with this system, you will be able to see either on a meter or display, an indication of the target's phase angle. Usually there will also be markings showing the typical ranges for coins and other common targets. From this information you must decide whether to dig or not.

Another, even more common system is Audio discrimination, usually just referred to as discrimination or Disc. Typically you are able to pick a phase angle that becomes a sort of toggle point for target responses. Targets with a higher phase increase the volume while ones below it decrease the volume. This allows you to ignore whole classes of targets without even looking at your meter (if your instrument has a meter). Usually people set the point just below nickels

## **Metal Detectors - An Introduction cont. . .**

if hunting in an area without lots of pulltabs and screwcaps, or just below penny if the area has too much trash.

Other systems are possible. The EAGLE allows the audio response of each target to be set independently offering the possibility of hearing most of the rings while eliminating most of the junk.

### **Electronics: Depth Reading**

The amplitude of the target signal decreases rapidly with distance. With proper processing this can be used as an indication of depth. The size and shape of the target also affect the amplitude so the depth indications will only be useful on coins or things that are "coin sized". On units without depth indicators about all you can do is lift up the loop while sweeping and see where the signal quits.

### **Electronics: Pinpointing**

Pinpointing is the metal detector term for finding out exactly where a target is before you start to dig it up. For instance a coin lying flat will have the strongest response when it is centered under a circular loop ( a coin on edge won't). Since most coins do lie flat, the job involves moving the loop around to find the strongest signal. The dynamic range (the span from minimum to maximum) of targets is a great deal larger than the range of comfortable audio levels so just directly coupling the signal to the audio will create a circle of confusion where you can move the loop around, but the audio doesn't change.

The most common solution is to equip the detector with a push-button or trigger that when activated "retunes" the instrument causing it to cancel the current signal. Now your audio is responsive again and you can home in on the target, repeating the process each time the audio quits changing (saturates). When only a small area produces a tone, you are finished and the target is now centered.

Instruments equipped with a depth meter are easy to pinpoint with. Just move the loop around until the depth meter indicates minimum depth. The compression in the depth meter circuit takes care of the dynamic range.

The EAGLE also provides "ratchet pinpointing" which forces the maximum audio to lock to the maximum signal strength allowing audio pinpointing without clicking the trigger repeatedly.

### **Electronics: User Interface**

You will notice that detectors vary greatly in the number of controls. Their visual displays also cover the field from none to meters to LCD's.

Every metal detector has some form of audio output, usually a speaker and a connector for fitting a pair of headphones. Once the target is detected the audio

may be used to pinpoint.

Information that is more quantitative such as depth and phase require a visual display. Meters are nice because trends are easy to see but LCD's display much more information simultaneously.

It used to be possible to judge a detector by the number of knobs. The more the better.

The trend is to reduce the number of knobs by automating functions and using displays and keypads for input.

For example, consider the Liberty Di and the EAGLE. The Liberty Di delivers outstanding performance with just two knobs and the EAGLE, the most versatile metal detector ever, doesn't have ANY knobs! They also happen to be two of the easiest detectors to operate on the market.

### **Electronics: Power Supply**

The electronic package includes a battery operated power supply. Sometimes the batteries are not actually mounted within the package but the electronics determines the sort of batteries required.

In metal detectors past it was common to find great numbers of AA cells to get the required power. Now it is possible to use just a few cells and derive the required voltages from them with efficient "boost" regulators. This allows use of cells with higher power density and makes it practical to mount them in a removable pack. This desirable feature makes it easy to snap in a spare pack while the other is charging, and makes recharging easy.

Primary cells are the sort that you buy, use and throw away. While most machines still accept them, their use is on the wane. They cost much more ultimately than rechargeable ni-cads and do not deliver the smooth, constant voltage that the ni-cads do.

### **The User**

You now have a background that should put you in good stead for becoming an expert user.

The better a workman understands his tools, the finer the job he can do. Obviously this is just an introduction, not the final word on metal detectors. However, no amount of reading can compare with informed experience. If you don't have a detector yet, select one and get started. No matter how much effort we put into designing detectors, the single most important element to successful treasure hunting is you, the user.

*written by*

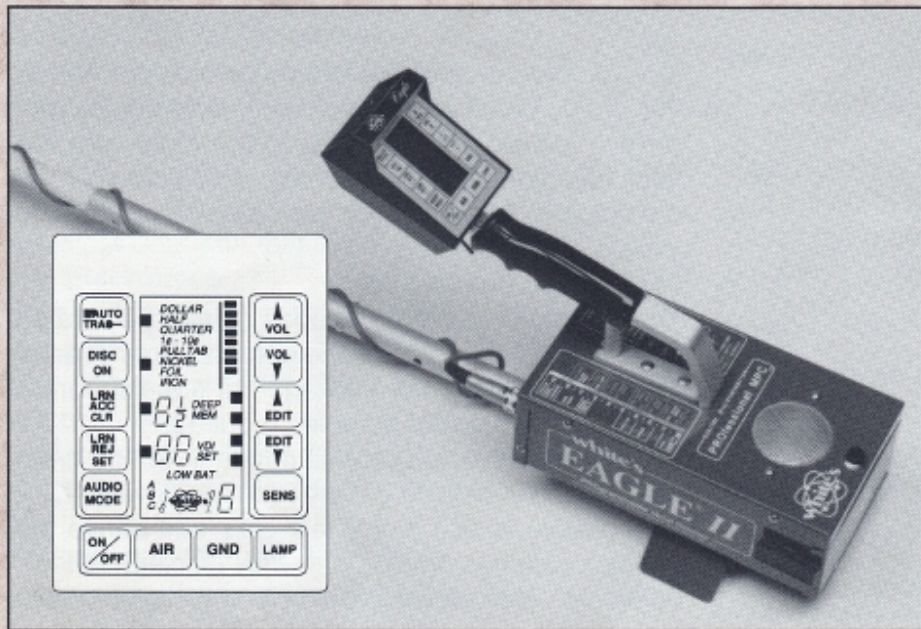
*Rick Maulding*

*Senior Project Engineer*

white's

# EAGLE® II

PROgrammable Metal Detector



(Lower rod and loop not shown.)

## Introduction

The EAGLE II® is a micro-processor controlled metal detector with a Liquid Crystal Display (LCD) and a keypad user interface. It features extreme flexibility along with instant presets for easy use. Second generation, performance oriented software mated to a refined, low noise hardware platform and high sensitivity loop make this instrument the one of choice for experienced professionals and novices alike.

## History

Over the years, metal detectors grew more capable (and more knobs) while on another front computers proved to be very effective for signal processing and automation. The EAGLE combined the two. Its dual single chip computers (micro-processors) allowed it to be easier to run than its predecessors while offering more performance and versatility.

## Differences

The EAGLE II includes new software, a new loop and some revised

circuitry. Its case is finished with the latest paint and hardware for improved durability and it uses a new rod set.

EAGLE owners may purchase a version of the new software for their instruments that will give them all of the new features and much of the improved performance.

## The Features

Many new features have been added to the original EAGLE and all of the old ones retained and in most cases enhanced.

## Features Common to the EAGLE & EAGLE II.

### Automatic Ground Balance—

Using just two buttons and an easy two step procedure the instrument is adjusted to ignore the soil.

### Expanded Ground Balance Range—

The added stability of digital circuitry allows seven times more range than other instruments to balance all soils and beaches.

**Audio Modes**—A variety of audio presentations are available including a unique one that combines

motion discrimination and all metal response into a single format.

**Lamp**—An extended life lamp is mounted to shine upon the loop, keypad and display for night hunting.

**Ratchet Pinpointing**—Another unique feature, this one lets you pinpoint the target quickly using the audio in a very intuitive method.

**Package**—All of the controls and displays are grouped right in front of your hand. The main controls can be operated with the thumb of the hand holding the unit.

**Start Up**—You don't lose your adjustments when you switch off the detector. Simply squeeze the trigger when you turn it back on and away you go.

## New EAGLE II Features

**Presets**—EAGLE II owners may choose one of three distinct preset conditions or, as with the EAGLE, return to the instruments turn off state. Each preset is aimed at a particular use as shown:

## PRESET Intended Use

- A** Coin & Jewelry Hunting
- B** Prospecting
- C** Beach Hunting

These settings were determined by expert users to be the way THEY would set up the instrument for these uses. This system is included to help novices get started easily and make it quicker for experienced users to switch between uses. Absolutely everything that the preset system adjusts, you may also adjust from the keypad. Whether you end up customizing everything or never use anything but the presets I think you will find them handy, rather like having three instruments available at the tap of a button.

**S.A.T.**—Self Adjusting Threshold is a new feature for the EAGLE. It is essentially a high pass filter for use when detecting in what is normally the no motion "all metal"

## **EAGLE II continued. . .**

mode. It is typically used for cancelling minor ground and instrument variations. At faster speeds it aids in prospecting and relic hunting allowing precise user control of speed and operation. It utilizes two merged systems that make it optimum for either purpose. As an added bonus, it can be used with Audio Mode "C" to create an effective motion/non-motion machine.

**Audio**—Several additions have been made to the audio system for improved flexibility. The **Threshold** (minimum audio level) and **Volume** (maximum audio level) are now independently adjustable. Each can be adjusted over a wider range than before, and with 1 dB resolution (1 dB is the smallest change in level that a normal person can hear under the best conditions). A 10 dB gap is provided between the two so that no matter how you adjust them, targets will not be missed.

Three **Audio Frequencies** are available, the normal 412 Hz, and an octave either direction (206 and 824 Hz). These are handy if you are tone deaf at 412 Hz or just get tired of it and want a change.

**Sensitivity Adjustments**—The DC (all metal, no-motion) sensitivity adjustment is now totally independent of the AC (discriminate, VDI) sensitivity. Both of them now have wider ranges and greater available sensitivity. An eighth level of the A.C. sensitivity is available that may be set freely by the user. Now if you need a special extra hot or numb setting you can easily get it.

**DC Sensitivity**—The EAGLE II extracts four times the DC sensitivity of the EAGLE, producing remarkable performance for prospectors and relic hunters. This high sensitivity level is especially effective when used with the new SAT system. Even if you are a coin

hunter you might try this combination in old parks as you will be able to detect old coins such as dimes far deeper than in the discriminate modes.

**Discrimination**—The EAGLE discrimination system, can be programmed to accept or reject particular targets. An accepted target produces a particular audio response that the rejected target does not. Programming is done by the preset system and can be altered by the user by EDITing the settings from the keypad or using the LEARN system to program it by example. It is often used to indicate coins while ignoring iron items and most pulltabs and screwcaps. This system is the most capable one on the market today.

It has now been expanded to include the ferrous quadrant (quadrant II) so that you can selectively reject iron targets rather than all or nothing. This can be handy if you are searching for things that come in near the junction of the quadrants, like gold nuggets. It is also nice if the ground you are searching in is irregular and highly mineralized and you need to turn down the discrimination below foil.

**Visual Discrimination**—Just as the audio system tells you what the discriminator has decided by either changing levels or pitch, the LCD can now tell you by blanking the VDI numbers and labels of rejected targets. This is useful if seeing reject targets bothers you and is now on by default when you use the presets but it is easy to turn off if you prefer to see everything.

**Two Quadrant VDI**—This capability is unique to the EAGLE and it allows you to read the phase of iron targets. It works just the same on the EAGLE II as the EAGLE but is easier to turn on and off.

**Tracking (AUTO TRAC®)**—Automatically adjusts the ground balance while the instrument is in use. The EAGLE II provides more accu-

rate tracking and extends the range to the full 90 degree ground balance capability of the instrument. An adjustment is even provided so that you can control its aggressiveness. This improved system should prove a real boon to all users simply because it will usually provide a better ground balance even in tricky conditions.

**Two Search Speeds**—New faster response option for competition treasure hunts and junky areas.

**AutoSens**—Reduces the chatter (false gating) that may occur when searching over uneven ground at high AC sensitivities. The result is that you can run more sensitivity than you could otherwise. Its effect is adjustable.

**Modulated Audio**—Controls the loudness of the discriminator response in audio mode "A" based upon the strength of the target signal. Thus weaker signals are softer than stronger ones. This can reduce the effect of electrical noise and ground chatter or even help to draw your attention to deep targets. The normal option yields the same volume regardless of the strength of the target response, guaranteeing that you will hear the deep ones, but not giving you any depth clues from the sound.

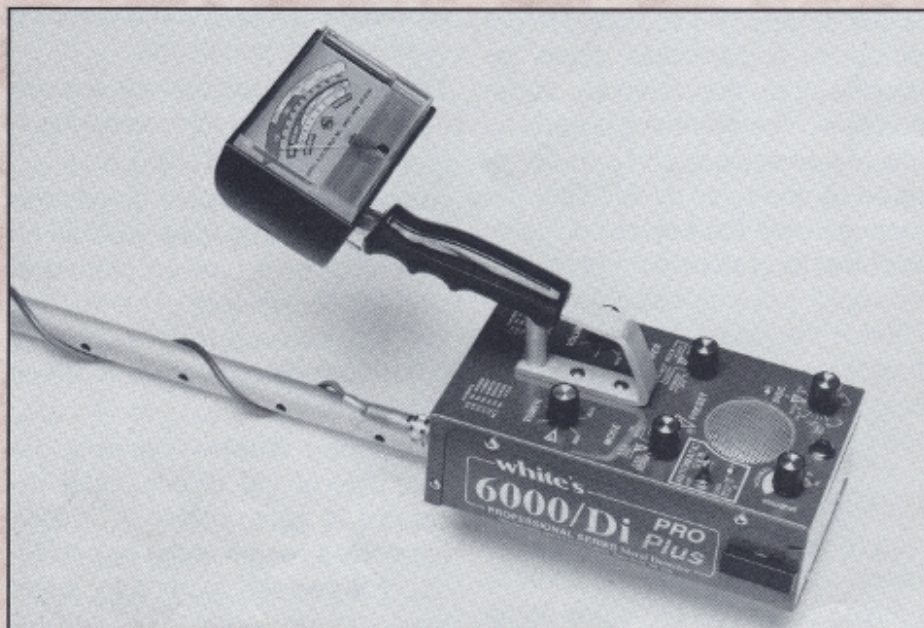
**Extended Audio**—Maps the DC (all metal) signal to the audio in a special way that uses both frequency and level. The result is about four times the normal audio dynamic range without saturation. Try it on the beach sometime in the all metal mode.

If you want to know more about the EAGLE II you really need to experience it rather than just reading about it. If you are a new user I would like to encourage you that the EAGLE II is very easy to use. You can even start searching without opening the manual. Just follow the few simple steps printed on the case and the prompting of the display.

*written by  
Rick Maulding*

# white's 6000/Di PRO Plus

PROFESSIONAL SERIES Metal Detector



(Lower rod and loop not shown.)

## Introduction:

The successor of the 6000/Di Pro, the Pro Plus is the first metal detector with true automatic ground balance. Now improved to increase depth, sensitivity, and ease of operation. The 6000/Di Pro Plus includes the Blue Max Wide Scan 950 Loop and the HR (hot rocks) mode. This HR circuitry allows the operator to automatically tune out the audio signals often made by hot rocks. All of these features together with the **new paint**, which is more abrasion, scratch and chip resistant than before, all **new stainless steel hardware** to protect against the elements, and include **precision fitted rods** to eliminate the "rod rattle". The end result is the White's 6000/Di Pro Plus!

## Explanation of Controls:

**POWER**—Turns detector on and off, selects the Hot Rock circuitry and battery check.

**HOT ROCKS CIRCUIT**—By turning to the Hot Rocks Reject, the instrument will not give an audio signal or the threshold tone will fade or null out and the I.D. meter will peg either left or to the right when Hot Rocks are present. If the instrument is on the Accept

mode, most Hot Rocks (rocks very high in mineralization) will produce a "ping" tone, and the I.D. meter will peg left or right. In choosing the proper mode the operator must analyze the area. If hot rocks are not a problem, set the tuner on Accept, in some areas the Accept mode will give better sensitivity, the more experienced operator will be able to distinguish the hot rocks signal characteristics.

**VOLUME**—Regulates the level of audio tone, it is recommended for best results at maximum level. This will allow the operator to hear the quiet whispers of a deeply buried target.

**TUNER**—The Tuner Control sets the desired level of threshold sound. The threshold (audio tone) should be set so it is barely heard. This indicates the detector's maximum operating sensitivity. When the tuner control is turned below the threshold level it will produce what is known as Silent Search Operation, where the detector will only make a sound when metal is detected. In the GEB/DISC mode, no significant change in sensitivity will be noticed.

**MODE**—The mode switch allows for the selection of the instruments 4 audio

modes of operation; GEB/NORM, GEB/MAX, GEB/DISC and TR/DISC.

**GEB/NORM**: The standard all metal mode which locates all metals while cancelling out the effects of ground mineralization. This mode is ground balanced with the Automatic GEB switch. The GEB/NORM mode is best used for prospecting and relic hunting.

**GEB/MAX**: Similar in operation of the GEB/NORM mode, the GEB/MAX has about a 30% increase in depth and sensitivity. It may have a rougher (less stable) tone than GEB/NORM. This mode is excellent for relic hunting in areas where there is light trash.

**GEB/DISC**: This slow sweep motion discriminate mode will distinguish between good and bad targets while cancelling out the effects of ground mineralization. **When in this mode, with the Automatic GEB switch in the GND (tracking) position, the instruments ground balance will adjust automatically with each sweep of the loop.** In the GEB/DISC mode the loop must be in motion to detect. When the loop passes over a good target the instrument will give an audio response. However, if the loop is stopped over the target, the signal will disappear. In order to pinpoint the target, move the loop away from the target then squeeze and hold the trigger. This puts the detector in the GEB/NORM mode, then proceed to pinpoint the target, the loudest audio response will indicate the depth in inches on the meter. This mode is best used for coin and beach hunting in areas of moderate or heavy trash.

**TR/DISC**: This non-motion discriminate mode will distinguish between desirable and undesirable targets but will not cancel the effects of ground mineralization at the same time. This mode gets excellent depth if tuned properly. However, if the ground is mineralized, the detector may give false signals. This mode can be used for coin hunting in areas where motion of the loop is restricted by obstructions and saltwater beach hunting where ground mineralization is beyond the range of the Automatic GEB control.

**AUTOMATIC GEB**—The GEB (Ground Exclusion Balance) control is used in all 3 GEB modes to cancel the effects of ground mineralization. It is



simple to use. Hold loop at waist level away from all metals, set the controls to Preset and set to GEB/NORM and push the GEB switch forward to the Air position and release. A beep indicates air balance procedure is complete. Place the loop flat on the ground and pull the automatic GEB switch into the GND position and listen for a beep. The instrument is balanced!! What an improvement on the old way! With the GEB switch remaining in the GND Trac position, the instrument will automatically adjust as the loop is swept in the GEB/DISC mode, the tracking system makes tiny adjustments to compensate for changes in ground mineralization.

**DISC**—Allows operator to select and interpret targets. For example, if DISC control is set to the Preset position, nickels and all other U.S. coins will produce a solid tone while nails and other iron objects will produce a broken tone or a negative (quiet) response. The DISC control only effects the audio signal, not the V.D.I. meter. The DISC control will operate only while mode selection is set to the GEB/DISC or TR/DISC.

**SENS**—The Sensitivity control either increases or decreases sensitivity in the GEB/DISC mode only. If Sensitivity control is set too high the instrument may operate erratically due to the outside interference caused by highly mineralized ground or national radio signals. To find the maximum level of sensitivity, turn to the GEB/DISC mode and sweep loop over the ground. As this is being done, turn the Sensitivity control up until the instrument reacts to the ground conditions. Back off Sensitivity just below the position where the interference began. This will give the maximum sensitivity for the area being hunted.

**TRIGGER SWITCH**—Changes the detector's mode of operation. When Trigger Switch is squeezed and held the VDI changes to Depth Indication.

**FULLVDI METER**—Lets the operator see what has been detected then indicates depth in inches on coin sized targets. In order for VDI Indicator to function, loop must be in motion.

## TRIGGER FUNCTIONS

MODE SWITCH	TRIGGER (Center)		TRIGGER (Squeezed)	
	OPR MODE	METER	OPR MODE	METER
GEB/NORM	GEB/NORM	VDI	GEB/DISC	Depth
GEB/DISC	GEB/DISC	VDI	GEB/NORM	Depth
TR/DISC	TR/DISC	VDI	GEB/MAX	Depth
GEB/MAX	GEB/MAX	VDI	GEB/DISC	Depth

### Specific Applications & Operating Tips:

**SET-UP and TUNING**—Set Automatic GEB to Lock, all controls Preset except Power Switch, Power Switch to Battery Check and verify battery power. Continue turning Power Switch to the Hot Rocks Accept position.

If the Threshold tone is too soft or loud, adjust Tuner control. There should always be the presence of a faint hum. Set the ground balance. Push the Automatic GEB toggle to the Air position (a slight beep will occur), then release the toggle. Now lower the loop to the ground and pull toggle switch down to the GND/TRAC position, you will hear another beep. This indicates that the ground has been cancelled, and the detector is ready for operation.

**COIN HUNTING**—It is recommended that the Mode control be set to the GEB/DISC (preset) position. With moderate or heavy trash (pull tabs, bottle caps and tin foil) analyze positive signals with the aid of the VDI meter. Wherever possible, adjust your Sensitivity control to the highest possible setting. Undesirable targets (iron) will cause the VDI meter to go left and right, but you will not hear them. Watch your over-lapping loop sweeps to insure no area is missed. When an audio response is heard, then consult your VDI meter to analyze target identification. Not all coins will give the same audio response. The shallower and larger coins will give a loud audio response, deeper coins and coins on edge will give a "whispery" tone. To verify these whispers, sweep loop over target with more speed. This will result in a solid tone (good target) or a broken tone (ferrous target).

**BEACH HUNTING**—While searching freshwater beaches and the dry sand of ocean beaches the set-up and tun-

ing procedures are the same as for Coinshooting. In beach hunting the operator will be locating coins plus the presence of lost jewelry. The VDI meter plays a very important role. Gold jewelry, depending on weight, karat rating, and whether white, gold or yellow gold will register anywhere from 10 thru 80 on the VDI meter. It is recommended that all solid audio responses that register from 10 to 100 be recovered. If the beach area is littered with an abundance of pull tabs, find the exact number on the VDI meter face to record this reading. Disregard these targets. You may still recover some tabs, but the possibility of missing most gold rings will decrease dramatically.

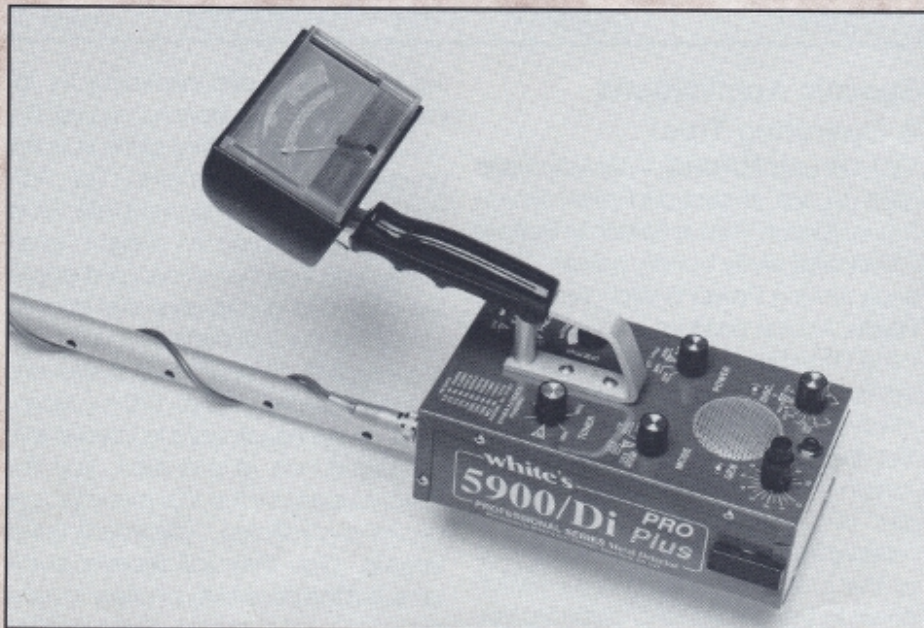
### PROSPECTING & RELIC HUNTING

It is recommended that the operator set Mode switch to either GEB/NORM or GEB/MAX. Depending on the experience of the operator, GEB/NORM is much easier to operate for the novice and the GEB/MAX mode, which is a highly sensitive all-metal mode can be used once the operator has become familiar with the detector's operating procedure. If instead, the GEB/DISC mode is being used, the SENS control should be increased only to the point where a smooth operation exists. The SENS control is activated in this mode only - one of the main differences is maintaining an accurate ground balance. In areas where gold nuggets are found, the presence of highly mineralized ground exists and changes dramatically from one area to the next in most cases. Maximum ground penetration is important due to the size of small nuggets, sometimes less than one-half grain. When Relic hunting, even though the ground is highly mineralized in some areas, the recovery of relics rarely are smaller than a boot nail.

*written by  
Mike Brighty*

# white's 5900/Di PRO Plus

PROFESSIONAL SERIES Metal Detector



(Lower rod and loop not shown.)

## Description And Uses:

Designed for an emphasis on **Coin & Ring Hunting** with special features for **Prospecting** and **Relic Hunting**, the 5900 offers the user TOTAL versatility and full control for stability in all types of ground environments at an affordable price.

The 5900 Pro Plus - an enhanced model of the 5900 was first introduced in 1984 as the 6000/Di 3; was noted for its slower sweep and loud signal response on deep targets.

The new 1988 5900 Pro Plus adds a totally new front end circuit mated to a highly sensitive yet stable Blue Max 950 Coil design which is a leap ahead of the original circuit and standard 8" Loop.

For 1988, the new 5900 offers the following additions resulting in increased performance and sensitivity without sacrificing stability. . .

- \* NEW 9 1/2" ULTRA Sensitive Blue Max 950 Open Center Loop
- \* NEW Increased Front End Maximum Sensitivity Circuit (Transmit Boost)
- \* NEW All Range SENS. Adjustment Control

- \* NEW Rapid Recovery S.A.T.
- \* 30% Increased Detection Depth
- \* Extended Range Ground Balance Control with Double Stacked 10 Turn Fine & Single Turn Coarse Adjustment

## Explanation of Controls:

**TUNER**—The 5900 as with most detectors, locates the target by means of an audible response which increases from the faint threshold hum. The Tuner control adjusts this hum up or down as needed.

Threshold also is useful in listening to rejection characteristics in which the 5900 will NULL or go QUIET for a split second over an undesirable target like a rusty nail, OR in pushing up the discrimination to classify the target by where it Falls Out or Nulls the threshold. . . so as you see, the Tuner control gives one an edged edge in tailoring and optimizing the threshold hum.

**SENSITIVITY**—This control is one of the most important functions on the 5900. Too many beginners and even some hobbyists that should know better tend to turn the Sensitivity control to **High** or **Maximum** everytime they go

out detecting. Turning the Sensitivity too high for ground conditions which are adverse (i.e. Wet Salt Sand, Black Sand, High Mineral, High Electrical Interference) will cause instability of threshold resulting in constant nulling and falsing. Its kind of like trying to drive your automobile in a dense tulle fog with your head lights on HIGH BEAM mode, resulting in a blinding reflection. Your LOW BEAM on the otherhand will allow you to see farther into the fog. So to does the Sensitivity control allow you to turn your detectors Transmit power down in an adverse environment.

**MODE**—This control allows you to set the 5900 to one of four PRIMARY operation modes.

**GEB/NORM**: Detector responds to all metals, both FERROUS (Iron) and NON-FERROUS (not containing iron i.e. Gold, Aluminum, Nickel, Brass, Silver, Copper etc.). In this mode, the 5900 electronically cancels out the iron mineral matrix allowing increased depth of detection.

**GEB/DISC** (Ground Exclusion Balance Discrimination): This discriminate mode will distinguish between good and bad targets while cancelling out the effects of ground mineralization. In this mode, the search coil must be kept in motion in order for the 5900 to discriminate good targets from bad ones AND cancel out the effects of mineralization at the same time.

**TR/DISC** (Transmit-Receive Discrimination): This mode will allow discrimination against targets in a static position. Commonly referred to as the TR mode, it offers excellent discrimination characteristics or cleaner elimination of iron targets than the GEB/DISC mode. Depth of detection in this mode is affected by the amount of ground mineral present. Since it doesn't contain a ground elimination circuit, in heavier mineral the TR mode loses a significant amount of depth. The TR mode is also utilized in tight areas where swinging the search coil back and forth as required in the GEB/DISC motion mode is limited or impossible.

**GEB/MAX** (Ground Exclusion Balance Maximum Gain): Same as the GEB/NORM mode BUT with a 30% increase in gain. This mode is preferred by prospectors as it provides the

## 5900/Di Pro Plus continued.

greatest response on tiny grain gold nuggets. This mode is also recommended for maximum depth of detection in areas where the targets are down beyond the detection depth of the other three modes.

**POWER**—4 way adjustment control.

**OFF:** Turns detector's power off.

**VDI - MIN:** Slows response to VDI meter.

**VDI - MAX:** Allows the Sensitivity Control to adjust VDI sensitivity in the GEB/DISC mode.

**S. A. T. (Self-Adjusting Threshold):** Also called Auto Tune. Where ground mineral or conditions can change rapidly causing BLARING or NULLING of optimized threshold resulting in significant loss of depth of detection, S.A.T. electronically keeps the detector at its OPTIMIZED THRESHOLD.

S.A.T. can also be used to PINPOINT surface targets (detunes or shrinks target signal down to a small blip with very slow cross sweeping).

**GEB (Ground Exclusion Balance):** This control electronically balances out the ground mineral conditions. Used in conjunction with the GEB/NORM or GEB/MAX mode.

**DISC (Discrimination):** This control is used to accept or reject certain types of targets. At its user friendly PRESET position, the detector will REJECT most iron targets commonly found at the parks and beaches as well as smaller pieces of aluminum foil. Some thin band or lower conductivity rings may also be eliminated. Accepted will be nickels, clad and silver coins, brass targets, most gold rings and aluminum pull tabs, newer lift tabs and screw caps.

## Field Application Tips:

**PROSPECTING**—The search coil of the 5900 like all of White's search coils can be submersed in water for shallow creek nugget hunting. Most of the successful prospectors we have talked to in the West hunt in the higher elevations and desert regions of known gold producing areas.

After one has turned on the 5900 Pro Plus, find a spot that has an absence of metal and Ground Balance. Once the

5900 Plus has been ground balanced, start searching in the GEB/MAX mode. Sweep the coil very slowly paying attention to any deviation in the threshold hum. If the threshold is unstable, reduce the sensitivity down to where the operation is smooth.

When one is prospecting in the all metal mode, your going to come across a lot of targets. Where mankind has tread he leaves unfortunately a lot of junk. Square nails, Boot Tacks, Bird Shot, Bullets etc. are only a small portion of the types of metals encountered while prospecting.

**PARKS & BALL FIELDS**—Junk targets may outnumber good targets 20 to one or more. One will go crazy listening to every piece of metal in the ground (foil, gum wrappers, bottle caps, screw caps, pull tabs, iron nails, iron wire etc. etc.). Primary mode of operation will be the GEB/DISC (Discrimination) mode. The 5900 Plus while set at the PRESET level will eliminate approximately 60 to 70% of the undesirable targets. Certain pieces of foil, tabs and miscellaneous junk will by their particular shape and alloy NOT be rejected. Where the 4900 Plus discriminates with Audio only, the 5900 Plus in addition utilizes a Visual Discrimination Identifying Meter which sports a Depth Reading Scale, Reference Scale and Visual Zones i.e. (iron) (foil) (nickel) (tabs) (penny/dime) (quarter) (half) (dollar). This meter will provide the operator with a lot of information to assist in determining its probable target identity. On determining nickels, dimes, quarters, halves, and dollars, the 5900 Plus, like other target ID detectors, will identify them with a high degree of accuracy. The challenge is in the other types of targets. .Keys, Pendants, Rings, Tokens, Gold Chains etc. which can fall out virtually anywhere on the meter depending on the metal and shape. For instance, a significant amount of gold rings can fall out in the (TAB) zone. On the lower side of the (TAB) zone, one will encounter the older ring pull tabs. Most medium gold bands tend to fall out with the older ring pull tabs. Class Rings and higher carat rings fall out usually much higher that the (TAB) zone. By learning the subtle differences in the response of the questionable targets in both the GEB/

DISC and GEB All Metal modes, you can save lots of unnecessary digging in the parks and successfully find those elusive gold rings.

**BEACH**—I enjoy beach hunting because the targets can be extracted so easily with a sand scoop. Since the wave action does away with most of the light foil etc. I will set my discrimination to a point where I can reject most iron and still accept lower conductivity thin gold band rings. Any target giving me a repeatable or partially repeatable signal I will scoop up. The VDI Meter will tend to **Lock On** most good targets whereas bad targets will cause the VDI Meter to bounce around indecisively. Desirable but deep fringe targets may sound broken in the mineral environment kick off a few layers of sand and sweep over the target area again. A more repeatable solid response means that it is probably a non-ferrous target.

Remember pick up all your trash, don't leave holes in the parks, beaches or out prospecting. Try to keep the environment the way you found it.

An additional word on target response characteristics:

With the 5900 Plus, most of the desirable targets encountered will have a smoother search coil size response to them in the all metal mode GEB mode. Likewise, with experience you can learn to hear a smoother repeatable response in the GEB Discrimination mode over these good targets. Bad or junk targets tend to chatter or Null out in the discrimination mode. These bad targets have a louder generally much broader and irregular shape to them. Through investigating these targets initially and listening to their response characteristics in the various operational modes you will learn to identify them through experience. Again, good targets tend to **Lock On** the meter!!

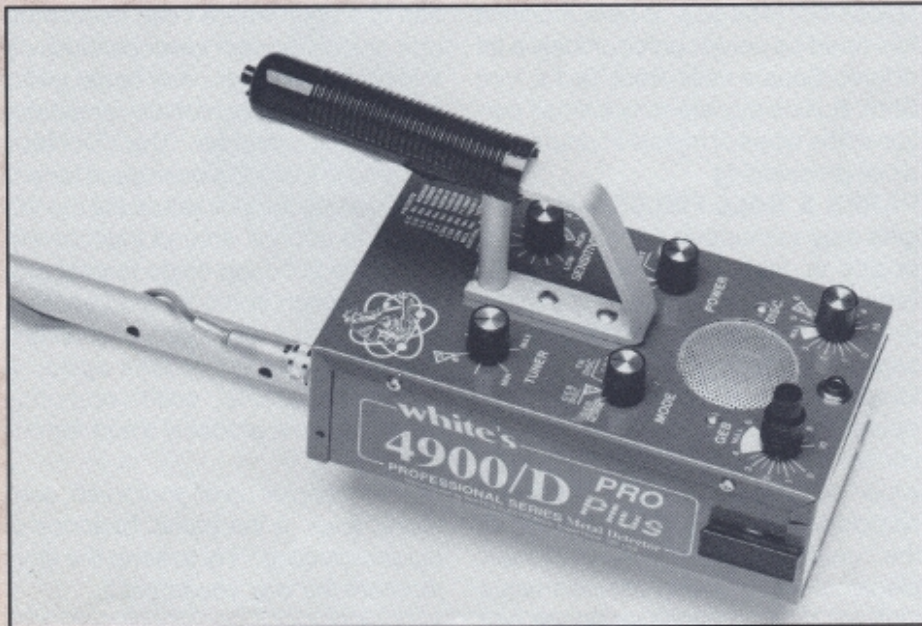
Happy Hunting

*written by  
Greg Moscini*



# white's 4900/D PRO Plus

PROFESSIONAL SERIES Metal Detector



(Lower rod and loop not shown.)

## Description and Uses:

Designed for an emphasis on **Prospecting** with the added versatility of **Coin & Ring Hunting** as well as **Relic Hunting**. The 4900 offers the user TOTAL versatility and full control for stability in all types of ground environments at an affordable price.

The 4900 Pro Plus is an enhanced model of the 4900 which was introduced in 1985. The 4900 or 49'er was developed primarily as a gold prospecting unit and relic hunter. What gave the 4900 the added edge in prospecting was an additional front end sensitivity control, extended ground balance range with Fine/Coarse Double Stacked adjustment knob and S.A.T.

To satisfy the needs of those prospectors who also like to hunt for coins, rings and other valuables, the 4900 also has two discrimination modes. GEB/DISC and TR/DISC.

## Explanation of Controls:

**TUNER** - The 4900 as with most detectors, locates the target by means of an audible response which increases from the faint threshold hum. The Tuner control adjusts this hum up or

down as needed. If the threshold is set too loud, a masking effect on a deep target will occur. Concurrently, if the threshold is set to low or actually silent (null), a deeper or smaller target will not be heard as it doesn't have enough **Signal Response** to drive the threshold **Back Up** to the zone of audibility. The Tuner allows the individual user to adjust the threshold according to his hearing capabilities. Threshold also is useful in listening to rejection characteristics in which the 4900 will **Null** or go **Quiet** for a split second over an undesirable target like a rusty nail. . .so as you see, the Tuner control gives one an added edge in tailoring and optimizing the threshold hum.

**SENSITIVITY** - This control is one of the most important functions on the 4900. Too many beginners and even some pro's that should know better tend to turn the Sensitivity control to **High** or **Maximum** everytime they go out detecting. Turning the Sensitivity too high for ground conditions which are adverse (i.e. Wet Salt Sand, Black Sand, High Mineral, High Electrical Interference) will cause instability of threshold resulting in constant nulling

and falsing. Its kind of like trying to drive your automobile in a dense fog with your headlights on High Beam mode, resulting in a blinding reflection. Your Low Beam on the other hand will allow you to see farther into the fog. So does the **Sensitivity control** allow you to turn your detectors Transmit power down in an adverse environment.

**MODE** - This control allows you to set the 4900 to one of four **Primary** operation modes:

**GEB/NORM**: Detector responds to all metals, both **Ferrous** (iron) and **Non-Ferrous** (not containing iron i.e. Gold, Aluminum, Nickel, Brass, Silver, Copper etc.). In this mode, the 4900 electronically cancels out the iron mineral matrix allowing increased depth of detection.

**GEB/DISC** (Ground Exclusion Balance Discrimination): Unlike the GEB/NORM mode in which the search coil can be held in a static or stationary position over the target, in this mode, the search coil must be kept in motion in order for the 4900 to discriminate good targets from bad ones and cancel out the effects of mineralization at the same time.

**TR/DISC** (Transmit-Receive Discrimination): Like the GEB/NORM mode, this mode will allow discrimination against targets in a static position. Commonly referred to as the TR mode, it offers excellent discrimination characteristics or cleaner elimination of iron targets than the GEB/DISC mode. Depth of detection in this mode is affected by the amount of ground mineral present. Since it doesn't contain a ground elimination circuit, in heavier mineral the TR mode loses a significant amount of depth. The TR mode is also utilized in tight areas where swinging the search coil back and forth as required in the GEB/DISC motion mode is limited or impossible.

**GEB/MAX** (Ground Exclusion Balance Maximum Gain): Same as the GEB/NORM mode but with a 30% increase in gain. This mode is preferred by prospectors as it provides the greatest response on tiny grain gold nuggets. This mode is also recommended for maximum depth of detection in areas where the targets are down beyond the detection depth of the other three modes. (Note: Some

## 4900 Pro Plus cont. . .

sandy beaches can contain several feet of sand thus allowing the targets to gradually sink out of range).

**POWER:** 4 way adjustment control:

**OFF:** Turns detector's power off.

**ON:** Turns detector's power on.

**S.A.T.:** Turns detector to S.A.T. (Self Adjusting Threshold) also called Auto Tune. Where ground mineral or conditions can change rapidly causing Blaring or Nulling of optimized threshold resulting in significant loss of depth of detection, S.A.T. electronically keeps the detector at its Optimized Threshold. The search coil however, must be kept in motion (not as fast as GEB/DISC) or else the response of a deeper target would be tuned out and missed.

S.A.T. can also be used to Pinpoint surface targets (detunes or shrinks target signal down to a small blip with very slow cross sweeping).

**G.E.B.**—(Ground Exclusion Balance) This control electronically balances out the ground mineral conditions. Used in conjunction with the GEB/NORM or GEB/MAX mode. Fine / Coarse Double Stacked control knob makes adjustment exact.

**DISC**—(Discrimination) This control is used to set the detector to accept or reject certain types of targets. At its user friendly PRESET position, the detector will REJECT most iron targets commonly found at the parks and beaches as well as smaller pieces of aluminum foil. Accepted will be nickels, clad and silver coins, brass targets, most gold rings and some pull tabs, and screw caps.

### Field Application Tips:

**PROSPECTING**—After one has turned on the 4900 Pro Plus, find a spot that has an absence of metal for Ground Balancing purposes. Once the 4900 Pro Plus has been ground balanced, start searching in the GEB/MAX mode. Sweep the coil very slowly paying attention to any deviation in the threshold hum. If the threshold is to unstable, reduce the sensitivity down to where the operation is smooth. You might try playing with the sensitivity by raising it all the way up and scanning the same ground. Adjust your **Sensitivity** control as **High** as possible but

remember, **Stability** (smooth threshold hum) is important.

When one is prospecting in the all metal mode, you are going to come across a lot of targets. Where mankind has tread he leaves unfortunately a lot of junk. Square nails, Boot Tacks, Bird Shot, bullets etc. are only a small portion of the types of metals encountered while prospecting.

**PARKS AND BALL FIELDS**—Junk targets may outnumber good targets 20 to one or more. One will go crazy listening to every piece of metal in the ground (foil, gum wrappers, bottle caps, screw caps, pull tabs, iron nails, iron wire etc.). Primary mode of operation will be the GEB/DISC (Discrimination) mode. The 4900 Plus while set at the PRESET level will eliminate approximately 70% of the undesirable targets. Certain pieces of foil, tabs and miscellaneous junk will by their particular shape and alloy NOT be rejected and one can raise the DISC control and see where the target falls out. Usually most junk targets stay near the first 3 inches of ground where as older coins and rings lost some time ago tend to sink and are found at 4 inches or more. Of course, one has to bear in mind that a surface sounding target (loud response) could very well be a recently lost gold ring, clad coin (s), silver ring, watch etc. If the target has a desirable response (coin size width and smooth) and is deep, I advise pinpointing the target and extracting it immediately. If it is a shallow target then I would advise lifting the coil 4 + inches off the target and listen to its width and intensity. If it is smooth and soft sounding, extract it. If it is loud and sharp ignore it. In the beginning however, even if you dismiss it as an undesirable target, I would extract it out anyway to confirm it in your mind. This helps you to learn. Understand and recognize your detector's response to the various targets.

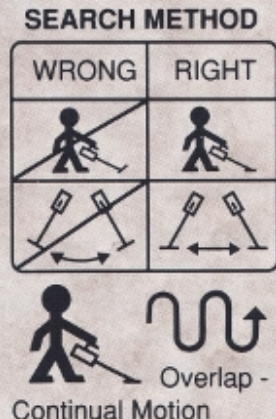
**BEACH**—I enjoy beach hunting! The targets can be extracted so easily with a scoop. Since the wave action does away with a lot of light foil etc. I will set my discrimination to a point where I can reject most iron and still accept lower conductivity thin gold band rings. Any target giving me a repeatable or partially repeatable signal I will scoop up. Desirable but deep fringe targets may

sound broken in the mineral environment, kick off a few layers of sand and sweep over the target area again. A more repeatable solid response means that it is probably a non-ferrous target.

I prefer the GEB/DISC mode as it insures stability of the threshold tone while sweeping back and forth across the wet sand. Up higher in the beach where the sand is deep, I prefer to switch to the All Metal GEB/MAX mode.

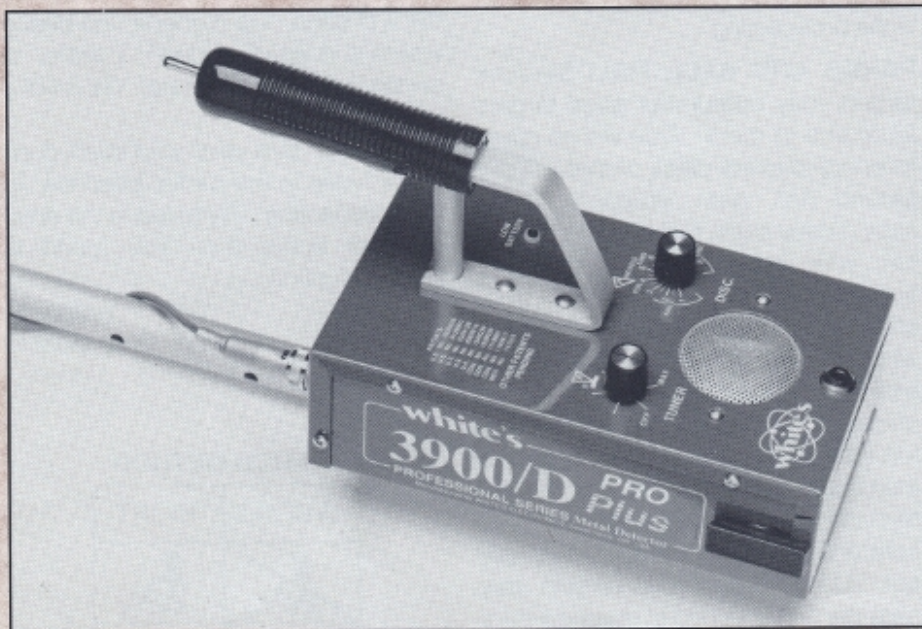
Remember, pick up all your trash, don't leave holes in the parks, beaches or out prospecting. Try to leave the environment better than you found it. Happy Hunting.

*written by  
Greg Mascini*



# white's 3900/D PRO Plus

PROFESSIONAL SERIES Metal Detector



(Lower rod and loop not shown.)

**The 3900/D Pro Plus**—Simplified operation, lighter weight, powerful updated circuit, an excellent machine for the beginning Treasure Hunter.

### Explanation of Controls:

**TUNER**—The Tuner turns the instrument on and sets the threshold tone. The lowest audible threshold tone represents the detector's maximum operating sensitivity. **Threshold** is set by holding the detector horizontal at waist height, away from any metal objects, and turning the **Tuner** knob to the right until a tone is heard. **Tuner** knob is then adjusted left and right until lowest threshold tone is obtained.

**NOTE:** The **Threshold** must be reset whenever the **DISC** control is adjusted. This is accomplished by raising the loop waist high and squeezing and releasing the **Trigger Switch** on the handle.

**DISC**—The **DISC** (Discrimination) control enables the operator to determine where the separation point between rejected (trash) and accepted (treasure) targets falls on the chart below. Targets below the **DISC** set point will give soft or broken-up tones or no response at all.

**EXAMPLES:** At beaches the probability of finding gold rings and jewelry is good and the digging is easy, therefore you would set the **DISC** knob at the **PRESET** mark, accepting pulltabs but not missing any jewelry.

In parks, the probability of finding gold rings and jewelry is much lower than at a beach, if you were digging a lot of pulltabs you could increase the **DISC** setting to reject pulltabs. You would then reject pulltabs, nickels and some gold rings but accept all other coins, silver jewelry and some gold rings.

**TRIGGER SWITCH**—The 3900 Pro Plus has two modes of operation, controlled by the three position Trigger Switch on the handle.

**MODE "A"** is **GEB/DISC** - Ground Exclusion Balance Discrimination. This is the normal operating mode, trigger switch in the center position. The loop must be in motion to detect in this mode.

**MODE "B"** is **GEB/NORM, SAT** - Ground Exclusion Balance Normal. The detector switches to this mode when the trigger is squeezed and held or locked forward. If the trigger is squeezed and released the detector momentarily switches to the **GEB/NORM** mode, adjusts the threshold, then returns to the **GEB/DISC** mode. A slight motion is needed for detection in this mode.

**S.A.T.** (Self Adjusting Threshold)—Automatically and continuously resets the threshold to compensate for changing ground conditions. Also aids in pinpointing target location.

### Applications:

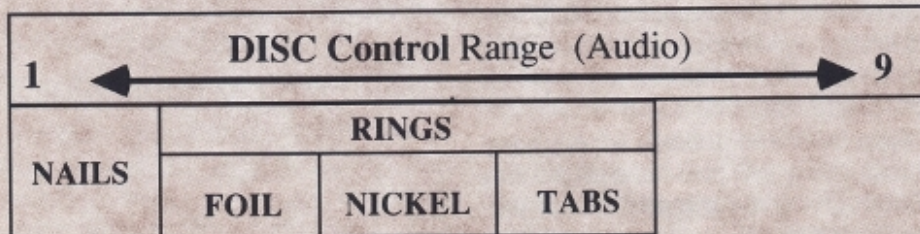
A good all-around detector, can be used for everything except prospecting and everywhere except on highly mineralized soil. Ease of operation along with the ability to lock the detector in the **GEB/NORM** all metal (zero discriminate) mode make this an excellent detector for contractors who need to locate manhole covers and valve shutoffs.

### Search Methods:

1. Always keep the loop flat and as close to the ground as possible.
2. Swing the loop in an arc in front of you in smooth, even sweeps.
3. Use a search pattern rather than random wandering and overlap your sweeps.
4. When a target is detected, pinpoint location by the following method:

Squeeze and hold or push forward and lock the **TRIGGER** as you move the loop over the target area. The Self-Adjusting Threshold feature will automatically narrow the detector's response to the target so it will be easier to know when the center of the loop is directly over the target. The target will be at the center of the "X" (see illustration). Maintain a slow sweep when pinpointing. Accurate Pinpointing makes recovering objects easier; it minimizes the possibility of damaging the object; and it minimizes damage to the area.

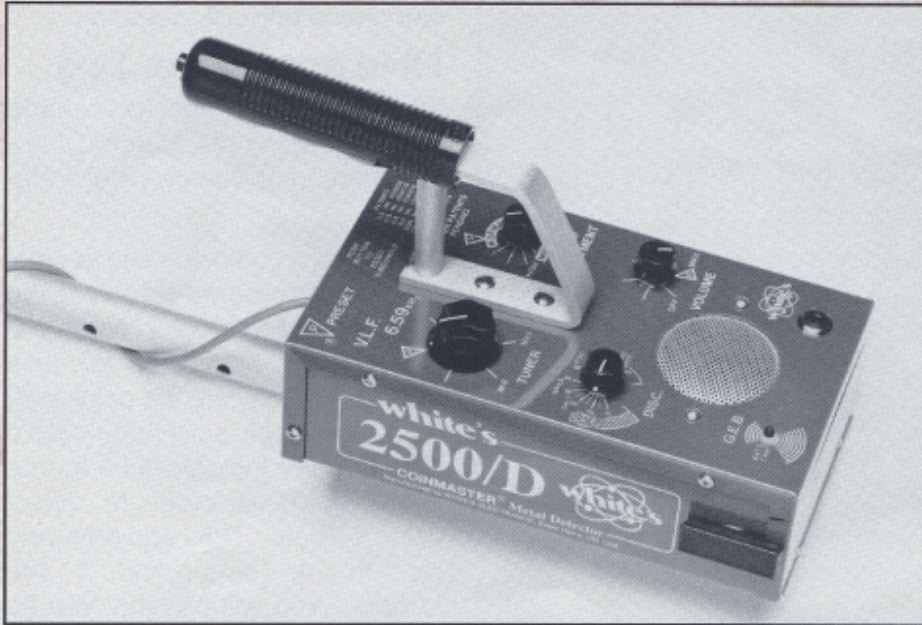
5. Treat any area you hunt as if it is your own front lawn - fill in your holes and remove any trash that you unearth!




# white's 2500/D



COINMASTER Metal Detector



(Lower rod and loop not shown.)


DISC, Ground Adjustment and Push Button Tuning make the 2500/D a real value. Easy operation with —just set controls and go!

## Explanation of Controls:

**POWER/VOLUME**—The **Volume** control turns the instrument ON/OFF and selects the maximum level of the audio tone, (speaker sound).

**TUNER**—The **Tuner** sets the detector's **Threshold**. The Threshold is indicated by an audio tone that is barely heard. It represents the detector's maximum operating sensitivity.

To set the Threshold:

1. Set all controls to .
2. Hold the detector so that its loop is in the air, straight out in front of you, waist high.
3. Press and hold the **Push Button** and turn the **Tuner** to the right until the tone is barely heard. Release the **Push Button**.

**TR/DISCRIMINATE**—TR/Discriminate has two functions—It will **Distinguish between desirable and undesirable** targets, but **will not neutralize** the effects of ground mineralization at

the same time. It is excellent for coin-hunting, relic hunting, and beachcombing. The DISC control is adjusted to distinguish between desirable and undesirable targets. To tune the detector in this mode, proceed as follows:

1. Tune to **Threshold** as described above.
2. Lower the loop to approximately 1" above the ground.
3. Press and release the **Push Button** to re-set **Threshold**.

Search with the loop level to the ground and as close to the ground as possible. NOTE: If the loop is tilted or lifted, the tone may change due to variations of the ground. When searching, the loop does not have to be in motion.

**PUSH BUTTON**—The Push Button retunes the instrument to threshold. To regain threshold, press and release the Push Button.

**DISC** (Discrimination)—The DISC control helps to distinguish between desirable and undesirable targets. The user sets the discrimination point with the knob slightly below the desired targets. The audio response of the targets ABOVE the DISC set point

produce louder tones. Targets below the set point make the tone go quiet, fade, or produce a short broken tone.

EXAMPLE: With the DISC control set @ "5", nickels and all other U.S. coins will produce a louder, solid tone. Nails and other junk will cause the tone to go away.

1. Desirable targets may include such things as coins, rings, gold, etc.
2. Undesirable targets may include such things as pop tops, pull tabs, nails and etc.

**GROUND ADJUSTMENT**—The Ground Adjustment controls the detector's sensitivity to ground mineralization. In mineralized ground, decrease the Ground Adjustment (turn the control counter-clockwise. In ground with very little mineralization, increase the Ground Adjustment (turn the control clockwise.) As the Ground Adjustment is increased, the detector becomes more sensitive to metals and ground mineralization.

**LOW BATTERY ALERT**—The Low Battery Alert light emits a soft, constant glow when the detector is ON. When batteries need replacing, the light will glow noticeably stronger and brighter.

**1/4" HEADPHONE JACK**—This allows the user to listen to the audio signal on mono headphones. It also disconnects the speaker output, reduces battery drain and eliminates background noise like automobile traffic, surf, etc..

The 2500/D can be tuned to ignore ground minerals thereby producing an all metal mode with extended depth capability. This is done by using the DISC control to achieve no change in threshold tone between holding the loop at waist level and flat on the ground.

See the  
complete line of  
White's detectors !  
Call Toll-Free  
1-800-547-6911  
for your  
nearest dealer!

# white's LIBERTY Di

LIBERTY Series Metal Detector



(Lower rod and loop not shown.)

The Liberty Di is designed to offer 6000/Di Pro performance in an easy to operate comfortable package. Primarily a GEB/DISC (motion discriminate) instrument the Liberty Di features a unique "front-end-attenuated" sensitivity control which provides an added edge on saltwater beaches and other high mineral conditions. V.D.I. (Visual Discriminator Indicator) and depth reading combine with Automatic Ground Balance, Ground Trac and Audio Discrimination to make the Liberty Di compete with other top of the line models and remain easy to use.

## Explanation of Controls:

**ON/OFF SENS**—This control turns the instrument On and Off and selects the degree of sensitivity or attenuation ideal for each area.  $\nabla$ <sup>P</sup> works well for most conditions.

**AGEB**—Air and ground balance are completed by pushing this three position toggle switch to AIR

while holding the loop in the air, then placing the loop on the ground and pulling this switch to the GND (ground) position. The instrument is then ground balanced. If left in the GND TRAC position, the instrument will monitor the ground and make corrections to the ground setting to compensate for changing mineralization. If pushed to the LOCK position, the ground setting will remain as originally set.

**DISC** (Discriminate)—The Discriminate control is used to accept or reject certain types of targets. At  $\nabla$ <sup>P</sup> most iron targets produce a broken tone while most valuables will produce a smooth solid tone. Turning this control clockwise increases rejection. Turning this control counterclockwise decreases rejection.

**TRIGGER**—The Trigger should be in the center position during searching. Squeeze and hold in the Trigger to change to an all metal zero motion mode for pin-

pointing. Locking the Trigger forward locks the instrument in the all metal zero motion mode.

**T-HOLD**—When the T-HOLD button is pushed **IN** the instrument will produce a steady hum or threshold tone. When pushed to the **OUT** position the instrument will be silent until a target is detected.

## Field Application Tips:

Two common mistakes made while operating the Liberty Di are loop motion and target interpretation.

Place a nail, bottle cap and several coins on the ground and sweep the loop over each target. Note that the nail and bottle cap produce broken tones, while the coins produce a smooth solid tone. Also note that the loop must be in motion (swept) in order to detect these targets. Now squeeze and hold in the Trigger and "X" the targets. You will find that you no longer have to sweep the loop to detect these targets. You can "X" each target and easily pinpoint by noting that the loudest sound and shallowest depth reading indicate target center.

When using the Liberty Di in the field, ignore the meter and concentrate on locating smooth solid audio tones. Once a smooth tone is heard, "X" the target and watch the meter. If the meter is locking in the yellow areas squeeze and hold the Trigger for pinpointing and recovering the target. If the meter jumps around a lot, sweep the target from a different direction. If the tone breaks up and the meter continues to jump around the target is probably junk. If the tone is smooth and stable, and/or the meter is locking in, squeeze the trigger to pinpoint and recover the target.

written by  
Colin Wydon



white's

# PI 2000

Pulse Induction UW Metal Detector



(Lower rod and loop not shown.)

The PI 2000. Pulse Induction technology simplified by a smooth steady threshold and continuous tuning. Designed for deep or shallow water, where shifting sand and easy digging demand the added depth of all metal sensitivity. Package includes Hipmount or handheld conversion. Visual and audible indication of metal and an eleven inch search coil.

The PI 2000 is an enhanced version of the PI 1000, first introduced in 1982 and one of White's longest produced models. With a well proven track record of durability and performance, the Pulse Induction design is capable of handling salt or fresh water, as well as mineralized and non-mineralized conditions.

The PI 2000 is the easiest to operate deep scanning instrument in White's line. Target interpretation is simplified by a smooth threshold audio tone, and the need to reset eliminated by a continuous mode of operation.

## Explanation of Controls:

**TUNER**—One control turns the instrument ON, checks the six 1 1/2 volt penlight batteries, tunes for salt and mineralization, and selects either operate or continuous tune mode of detection.

## Field Application Tips:

The continuous tune mode should be used over inconsistent mineralization. Such areas in most cases show visible signs of inconsistencies such as different colors of sand; red, white, black etc. or different sizes of material; sand, rock, boulders, etc. The continuous tune mode can also be used to simplify pinpointing. Switch to tune and slowly "X" the target. The response will be reduced in size. If you hold the loop slightly further away from the target and "X" it, the target will be even further reduced to respond only when the physical center of the loop is directly over the target.

Screening or sifting tools are a

valuable accessory for sand and silt and are readily available from most dealers.

Handheld or hipmount is a matter of personal preference. If extended land or shallow water searching is intended you will find the hipmount an advantage.

All metal sensitivity means two things, you can detect very deep and not miss those gold rings. At the same time some unwanted trash can be expected.

Fortunately it is very easy to recover targets in sand and silt especially with a screening or sifting tool.

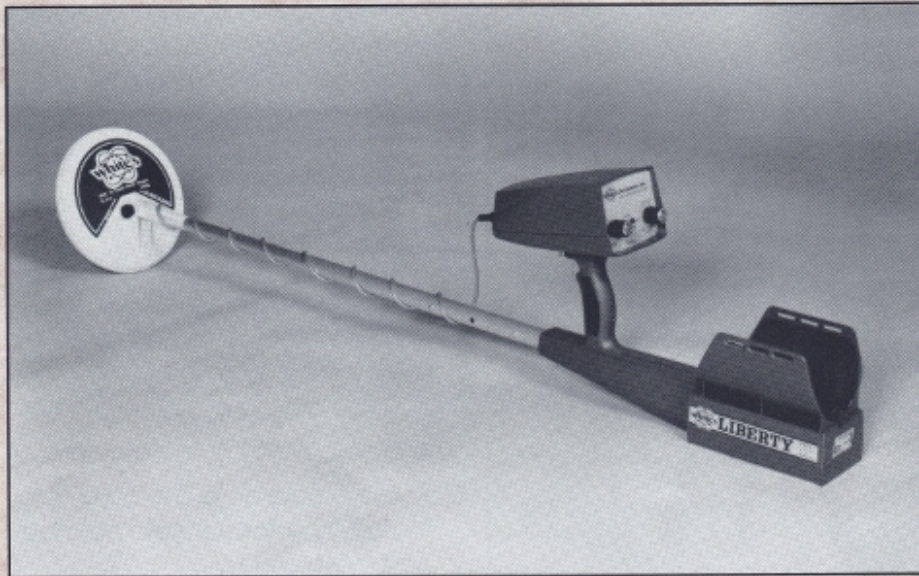
Dual earcup Piezo Transducer headphones provide plenty of volume underwater or in the surf.

- Pulse Induction technology for superior performance in both salt and fresh water.
- Detects all metals while tuning out ground minerals.
- Performance capability down to 200 feet. Circuit stability does not drift with changes in depth or temperature.
- L.E.D. glows brightly for visible target detection even in murky water.
- Adjustable rod from 21" to 31". Thirteen-inch extension rod lets you adapt for land use.
- Single control turns detector on and off, tests batteries, tunes to ignore salt and mineralization. TUNE position can be used to automatically maintain threshold and ground balance over changing ground conditions.
- 11" wide search coil with open design allows water to freely pass through .
- Optional rechargeable battery system.
- Weight: 4 lbs. 6 oz.
- Operating frequency: 21 Khz

written by  
Steve Howard

# white's LIBERTY II

LIBERTY Series Metal Detector



## INTRODUCTION:

The Liberty II offers a lightweight, easy to operate unit with the depth of GEB/DISC "motion discriminate" at a moderate price.

## Explanation of Controls:

**ON/OFF SENSITIVITY**—The SENS (Sensitivity) control turns the instrument ON and selects the sensitivity.  $\nabla P^{\circledR}$  works well for most conditions.

**DISC** (Discrimination)—This control is used to accept or reject certain types of targets. At  $\nabla P^{\circledR}$  most iron targets produce a broken or cut short tone, while most valuables will produce a smooth solid tone.

**TRIGGER**—The Trigger Switch located on the handle may be pushed forward to lock the instrument into an all metal mode. Squeeze and hold in the Trigger and "X" the target for pinpointing.

## Field Application Tips:

With the two controls at  $\nabla P^{\circledR}$  and the Trigger neither pushed forward nor squeezed, sweep the loop over a nail, bottle cap, and coin. Note the difference in sound. It is the smooth coin sound which you will listen for. Ignore all other chatter from junk.

The loop must always be in motion to respond to metals.

Once a smooth tone is heard, squeeze and hold in the TRIGGER and slowly "X" the target. The loudest sound indicates target center.



## WHITE'S LOOP GUIDE



Series 2, Series 3, PROFESSIONAL Series, LIBERTY Series, 3900/D PRO Plus and 4900/D PRO Plus will accept the following loops:

Part #	Description	Suggested Retail
801-3118	Four Inch	\$59.95
801-3114-2	Eight Inch	\$59.95
801-3178	Ten Inch	\$69.95
801-3117	Fifteen Inch	\$79.95
801-3183	BLUE MAX 256 (10")	\$99.95
801-3185	BLUE MAX 256 (8' Cable)	\$99.95

LIBERTY Series require Loop Adaptor 802-7074. Models without loop connectors cannot interchange loops. Above models will not accept BLUE MAX 950 and subsequent loops.

PRO Plus models - 5900/Di, 6000/Di and EAGLE II will accept only BLUE MAX 950 and subsequent BLUE MAX loops.

The **LIBERTY I** and the **Coinmaster 1000**—Both excellent values.

#### EXPLANATION OF CONTROLS:

**TUNER**—Only one control is needed to operate these detectors.

The **TUNER** performs all of the following functions, with a single turn:

- Turns the detector on and off
- Sets the detector's Threshold

The Threshold is indicated by an audio tone that is barely heard. It represents the detector's maximum operating sensitivity.

The **Tuner** tunes the detector for the area in which you search. To tune the instrument, proceed as follows:

- Hold the detector so its loop is about 1/2" - 1" above the ground.
- Turn the **TUNER** to the right until the tone is barely heard.
- Detector is now ready for metal detecting.

The **Tuner** automatically sets maximum audio level and automatically neutralizes the effects of ground mineralization.

**TRANSMIT RECEIVE**—The detector has a Transmit-Receive mode of operation that **DETECTS ALL METALS**. It may be used for coin hunting, prospecting, relic hunting, beachcombing and treasure hunting.

Search with the loop level to the ground and as close to the ground as possible. The loop does not have to be in motion to detect a metal object.

**LOW BATTERY ALERT**—The Low Battery Alert is a light that glows when the battery is low and needs replacing.

**HEADPHONE JACK**—Use 1/4" JACK for the 1000 and use 1/8" JACK for the Liberty I. These JACKS allow the user to listen to the audio signal on mono headphones. They also disconnect the speaker output and reduce battery drain.

*written by  
Steve Howard*

## LIBERTY I



*(Lower rod and loop not shown.)*

## COINMASTER 1000



*(Lower rod and loop not shown.)*



## Specialty Instruments

white's

### PCL 400

### Pipe/Cable Locator

White's PIPE/CABLE LOCATOR 400 is specifically designed for industrial work. It will locate the presence of pipes and cables in the ground, whether they are near the surface or at a depth of several feet. Once a pipe or cable has been located, it can be accurately traced with this unit. One of the PCL 400's major features is that its transmit coil can be separated from the unit and used to induce a signal into a pipe or cable. This unit is not affected by ground mineralization, so it can be used in a wide range of ground conditions. It can quickly and easily indicate pipe/cable depth, and its push button allows for automatic re-tuning to preset calibrations. The unit is well balanced for ease of operation. The search coils can be detached for storage and transportation.

#### Theory of Operation

The PCL 400 S2 operates on the principle of an electromagnetic field either produced or detected by the instrument.

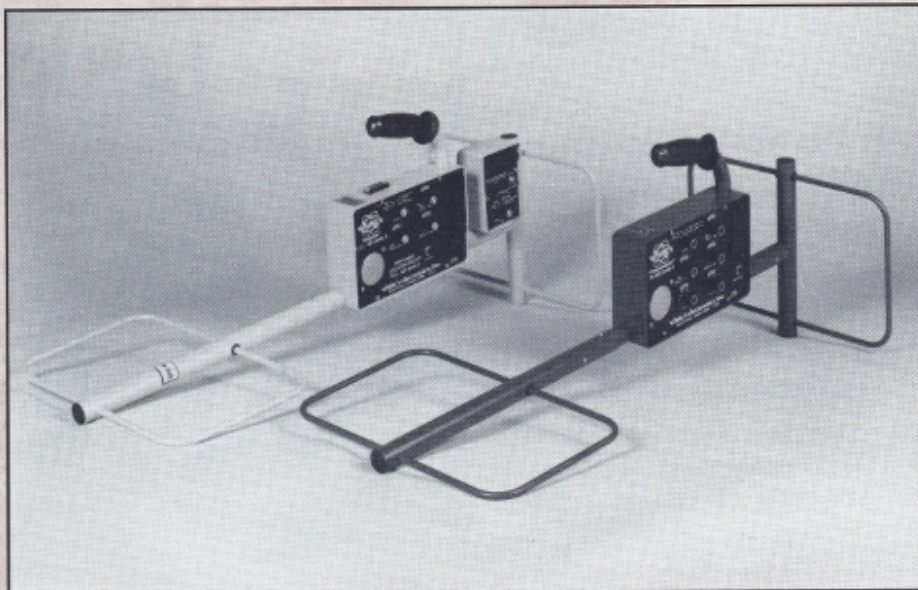
The PCL 400 S2 consists of two main sections, the RECEIVER (referred to as the front section) and the TRANSMITTER (referred to as the rear section).

The two main requirements that a pipe or cable must have to be located are:

- It must be made of metal, or have a metallic tracer strip buried with it.
- It must be buried.

It will also "detect" large metal objects such as manhole covers, valve boxes, re-bar in concrete, etc. However, it does so at a reduced efficiency because it was designed specifically to locate buried pipes or cables. It was NOT designed to locate small objects such as coins or rings.

**CLIP ON/ACCESSORY:** This jack is used in the TRACE mode only. The



clip-on adapter is plugged into this jack and is energized when either Clip On Mode is selected by the mode switch. By clipping onto a pipe or cable it can be isolated from others in the area and can be traced below reinforced concrete. These two functions are only possible with the special pipe and locating instruments.

## white's TM 600

White's TREASUREMASTER 600 metal detector is designed for locating larger than coinsized metal objects at maximum depths, (greater than two feet). It is not affected by mineralized ground, so it can locate all metals in a wide range of ground conditions. It can be used in a nonground reject mode to locate changes in ground density such as: holes, caves, voids, graves, covered mine tunnels, caverns, and old wells. The TM 600 is ideal for locating large amounts of deeply buried treasure, like coin caches, treasure chests and hoards of gold or silver, in either coin or bullion form. It can also be used to locate septic tanks, tools, equipment buried under slides; and relics such as cannonballs, guns, and swords. It is well balanced, has an extra-sensitive meter located on top of the case for easy viewing, and push button re-tuning. Search coils detach from the unit for

easy storage and transportation.

#### FEATURES:

**GROUND REJECT CIRCUIT**—In the ground reject mode signals are processed to extract only those coming from the metallic targets. Signals coming from other sources are greatly reduced or eliminated.

Examples of other sources fall in two main categories:

- Mineralized or conductive ground which in turn acts like a large piece of metal.
- External sources of interference such as high voltage power lines, industrial electrical noise, radio and television transmitters, automobile ignition noise, etc.

**GROUND REJECT MODE:** This position is selected when the instrument is to be used for the location of all metallic targets with little or no "false" responses from mineralized ground. Ground to instrument distance changes cause little or no effect while using this mode of operation.

**NON-GROUND REJECT MODE:** This position is selected when the instrument is to be used for the location of ground density changes, or to determine the type of metal being detected.

**NULL 1 and 2 CONTROLS**—These controls are used to ignore all signals not coming from either the target or ground. They are usually set once and need not be changed unless the operator wishes to change the type of response to various target metal types or soil density changes.

## What About Electronic Prospecting?

Electronic Prospecting can be defined as the art of locating precious metals, such as gold or silver, in the ground, with the aid of an electronic metal detector. Since "Metal" detectors are designed to find "Metal", this should not be asking too much. However, both Mother Nature and History have contrived to put two very formidable stumbling blocks in the path of the modern 49er or Electronic Prospector.

The first of these comes from the fact that Gold and Silver are most always found in a matrix of soil which is moderately to highly mineralized with iron ore. This iron ore or mineralization tends to obscure the precious metal from the view of the metal detector. Up until about ten years ago, metal detectors were next to worthless in efficiently hunting for gold and silver, because they were unable to penetrate the highly mineralized ground to any appreciable depth. With the invention of G.E.B. or ground exclusion balance by White's, this obstacle was overcome. Now all metal detectors used for prospecting utilize this feature for overcoming nature's barrier.

The second stumbling block comes from the fact that the best place to hunt for gold and silver today are the same places where they were found over 130 years ago ... At first this may sound like it should present no particular problem. After all, the early 49'ers have merely shown us the way to the elusive gold nuggets. This might be considered a blessing in disguise as our forefathers from the 1850's and later left behind a legacy of iron trash ... from nails and tin cans to horseshoes and barbed wire. Sprinkled amongst all of this is a vast assortment of brass, copper and lead in the form of bullets and shell casings. The brass copper and lead are all potential nuggets, but the iron trash is not.

It is the job of a good prospecting metal detector to be able to cancel ground mineralization efficiently as well as be able to identify the probable identity of the target detected. By eliminating the mineralized hot rocks and the iron trash, the modern prospector can increase the odds of detecting a gold or silver nugget ... there are only so many hours of prospecting available in a day, and the more potentially good targets dug, the better the odds of finding a nugget.

White's has designed a number of units which fulfill the particular needs of prospecting. The least expensive is the 4900 at \$299.95. The "49'er" utilizes fine tune manual ground balancing to cancel mineralization and a system of audio discrimination to identify hot rocks and iron trash. The 5900/Di PRO Plus has the same fine tune ground balancing, but adds a VDI meter which identifies the iron or mineralized rocks and separates them from potential nuggets, and sells for \$495.95. The next upgrade is the 6000/Di PRO Plus. The Di Pro introduced AUTOMATIC GROUND BALANCING to metal detector industry. This unit also utilizes the VDI meter which identifies iron trash and mineralized hot rocks and sells for \$659.95.

The flagship of White's line of detectors is the revolutionary EAGLE II ... the first computerized, microprocessor controlled, fully programmable metal detector. This detector is truly a space age instrument and a tool worthy of the modern gold miner. Not only does it cancel ground mineralization with the touch of a pad, but contains a computer program specifically designed to identify probable nuggets while at the same time separating iron trash and hot rocks. The EAGLE II retails for \$789.95. All of White's units are as comfortable searching for nuggets as for coins, jewelry or relics. Treasure is truly where you find it ... only the method of hunting differs.

*Jimmy "Sierra" Normandi*

# Questions & Answers

**Q: How are different sized search coils or loops used?**

A: The size of the search coil dramatically effects detector sensitivity. In general, if you wish to detect very small targets like tiny gold nuggets, a small loop (the 4" loop) should be used. Another use of a small loop would be a high trash area where the small loop will allow better separation of targets. The larger loops (8, 9 1/2, & 10") detect deeper and are primarily used for coin and relic sized targets. Fifteen inch and larger loops detect very deep, however, are not very sensitive to small targets such as individual coins. These larger loops are best used when searching for larger, deeply buried targets.

**Q: Will it find gold?**

A: Most metal detectors will respond to processed gold that is used in jewelry as long as the discriminator is not set too high. High discrimination settings will reject many gold items. Mother nature, however, rarely produces natural gold in pure 25K or even semi-pure 18K or 14K form. Therefore, prospecting for natural gold is more difficult than searching the beaches for the processed gold rings. In order to find natural gold, you need an instrument with Ground Balance and you need to tune and use it in the mode that responds to all types of metals. Yes, this means you will dig some junk. But more importantly you will also find GOLD!

**Q: I read something about a "two filter instrument" going deeper. What about it?**

A: As we learned from Metal Detectors - An Introduction, filters have to do with ground balance, or the rejection of ground mineralization in the GEB/DISC (motion discriminate) mode.

There have been many misleading articles written regarding the differences between what is known as the two filter and four filter instruments. There are advantages and disadvantages to each design.

The advantages of a two filter design: They are less expensive, slightly quicker at responding, and slightly more sensitive in medium to low mineralized ground. The disadvantages: They are significantly less sensitive in moderate to high mineralized ground.

The advantages of a four filter design: They are able to handle medium to high mineralized ground with increased depth over a two filter and are still competitive in medium to low mineralization. The disadvantages: Four filter

models are generally more expensive and have a slightly slower response time.

White's specializes in four filter models. We feel they are more versatile. The LIBERTY II is White's only two filter model. All other motion discriminate models in White's line are considered four filter designs. Recent advancements in the BLUE MAX loop make the four filter models more sensitive in all types of ground mineralization.

**Q: With all controls set at the  $\nabla P$  PRESET position, will I lose depth when compared to fine tuning?**

A: When using most models, fine tuning the GEB control in particular, will result in added depth over  $\nabla P$  PRESET. The ground mineralization in your area will effect these results dramatically. More advanced models with AUTO-TRAC® will tune automatically to differences between PRESET and the actual correct ground balance setting as you search. PRESET was designed as a reference point. Once you become familiar with your model, the optimal hunting results are obtained through fine tuning.

**Q: How does White's Two Year Warranty compare with the lifetime warranties offer by some metal detector manufacturers?**

A: White's warranty covers parts and labor for two years from the purchase date. It is clear, precise, and most important - easy to understand! Some manufacturers offer warranties that sound attractive at first glance, with for example, lifetime or extended years of coverage.

In most cases, you will find the limited lifetime warranties cover only certain things for specific lengths of time. For example, "labor for a year, specific parts for two years and other parts for the life of the the detector". Labor is the most expensive aspect of most repairs. Labor and major components are almost always excluded from such warranties after a specific length of time. White's feels our two year warranty provides more coverage and is a better value. If in doubt, compare various warranty statements and read the fine print carefully.

## GLOSSARY OF TERMS

**ACCEPT:** To detect; Discrimination is clear so as to respond to a target.

**ALL METAL:** Mode or function that responds to all types of metal, iron foil, nickel, copper, silver, gold, etc.

**AUDIO:** Volume or tone produced by a speaker or other sound emitting device.

**AUTOTRAC, AUTO TRAC®:** A feature that monitors GND (ground) balance and makes corrections to it as ground mineralization changes.

**DISCRIMINATOR:** A circuit that can be adjusted to accept or reject signals or targets of different characteristics.

**FALSE SIGNALS:** Erratic or unstable tones, beeps and/or display indications that are not caused by the detection of metal. Interference.

**FERRITE SAMPLE:** Mineral sample consisting essentially of an iron oxide.

**FILTER:** Electrical circuit which processes signals, suppressing or minimizing waves or oscillations of certain frequencies.

**GROUND BALANCE:** The cancellation of ground mineralization to ignore the masking effect ground minerals have over metal.

**JUNK TARGETS:** Metals determined to be trash or rejects; iron, foil, pulltabs etc.

**LOOP:** (Search Coil) Circular plastic housing containing multiple windings.


**MINERAL:** Ferric oxide (iron) or other such non-organic substance, naturally occurring in the ground.

**MOTION MODE:** An AUDIO MODE that requires loop motion to respond to metal targets.

**NON-MOTION:** Mode that does not require loop motion to respond to metal.

**OPTIONS:** Adjustments or selections.

**PINPOINT:** Finding the targets exact location with respect to the loops physical center.

**PRESET:**  (Pre-selected)

**PROBABLE I.D.:** Most likely identification.

**REJECT:** Discriminate or cancel response to a metal.

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

**SLOW MOTION:** A description of loop speed required to operate a motion mode.

**TARGET:** Any object buried in the ground or used in an AIR TEST that causes a metal detector to respond.

**V.D.I.:** (VISUAL DISCRIMINATION INDICATION) Display that indicates probable target identity or conductivity. Visual discrimination.

## ACCESSORIZE with White's!

Just a sampling from our lineup of hundreds of useful items ...

### CLOTHES

Baseball Jacket (light gray) S, M, L, XL, XXL

Crewneck Sweatshirt (navy) S, M, L, XL

Treasure Hunter T-shirt (red or turquoise) S, M, L, XL

Baseball Cap - A White's classic in red, white and blue.

### CARRYING CASES

**New!** Trailblazer Bag - Oversized, nylon, a must for all-day detecting trips. Converts from a suitcase to a backpack. Holds extra loop, batteries, headphones, your fully assembled detector - even your lunch - with room to spare!

Cordura Case - Rugged Cordura. Compact yet sturdy. Room for detector and headphones. Detachable shoulder strap.

Hard Case - Compact. Hard plastic for the best protection available. Holds detector and headphones.

*(Not all cases are available for all models.)*

### BATTERIES

Drop-in C cell Pack - No muss, no fuss. Sealed pack slides right in!

Nicad Rechargeable Pack - Recharge up to 1000 times.

Nicad Charger - Use with Rechargeable Pack.

**RAINSLICKER** - Rain and moisture protection. Tough, clear polyvinyl fits snugly, yet still allows fine tuning.

**LOWER FIBER ROD ASSEMBLY** - Totally non-metallic, includes isolator.

**PRO HEADPHONES** - Quality. Coiled cord, oversized padded cups, volume control. 1/8" or 1/4" jack.

**HIPMOUNT KIT** - New-style stainless side bracket. Shoulder strap, waist belt, comfortable, easy to install.

For more information on accessories,  
service and repairs, replacement parts ...

**White's DIRECT CONNECTION**

U. S. 1-800-547-6911 CAN



Comparison  
of  
Features

	EAGLE II	6000/DI PRO	5900/DI PRO	4900/D PRO	3900/D PRO	2500D	1000	LIBERTY DI	LIBERTY II	LIBERTY I	PI 2000	
SEARCH MODES	GEB/NORM	•	•	•	•	•	•	•	•	•	SF	
	GEB/DISC	•	•	•	•	•		•	•			
	TR/DISC		•	•	•		•					
	GEB/MAX	•	•	•	•							
	TONE I.D.	•										
	PULSE INDUCTION											•
CONTROLS	AUTOMATIC GEB	•	•					•			•	
	AUTO TRAC <sup>®</sup>	•	•					•			•	
	MANUAL GEB		OPT	•	•		OPT					
	TEN-TURN GEB			•	•							
	VARIABLE DISC	SF	•	•	•	•	•	•	•			
	SENSITIVITY CONTROL	SF	•	•	•		•		•	•		
	VOLUME CONTROL	•	•				•					
	TRIGGER/BUTTON RETUNING	•	•	•	•	•	•	•	•			
SPECIAL FEATURES	VISUAL DISCRIMINATION (V.D.I.)	•	•	•				•				
	METER	SF	•	•				•			SF	
	PRESET $\nabla$	SF	•	•	•	•	•	•	•			
	DEPTH INDICATION	•	•	•				•				
	PROGRAMMABLE DISC.	•										
	TONE ADJUST	•										
	SELF ADJUSTING THRESHOLD	•		•	•	•			•		•	
HIPMOUNT CONVERSION	OPT	OPT	OPT	OPT	OPT	OPT					ST	
BATTERIES	LEADLESS BATTERY PACK	•	•	•	•	•		•				
	LOW BATTERY ALERT L.E.D.	SF			•	•	•	•	•	•		
	BATTERY CHECK	•	•	•	•						•	
	RECHARGEABLE BATTERIES	•	•	OPT	OPT	OPT	OPT	OPT	•	OPT	OPT	OPT
LOOPS	BLUE MAX 950	•	•	•								
	INTERCHANGEABLE LOOPS	•	•	•	•	•		•	•			
SPECS	OPERATING FREQUENCY (KHZ)	6.59	6.59	6.59	6.59	6.59	6.59	12.5	6.59	6.59	12.5	3.37
	HEADPHONE JACK	1/4	1/4	1/4	1/4	1/4	1/4	1/4	1/8	1/8	1/8	N/A
	WEIGHT W/BATTS. (Lbs. - Oz.)	4.14	5.4	5.3	4.6	3.4	3.9	3.2	4.8	3	2.12	5.12

(SF) Special Feature (OP) Optional (ST) Standard Equipment



1011 Pleasant Valley Rd.  
Sweet Home, OR 97386

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U. S. Postage  
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White's Electronics, Inc.