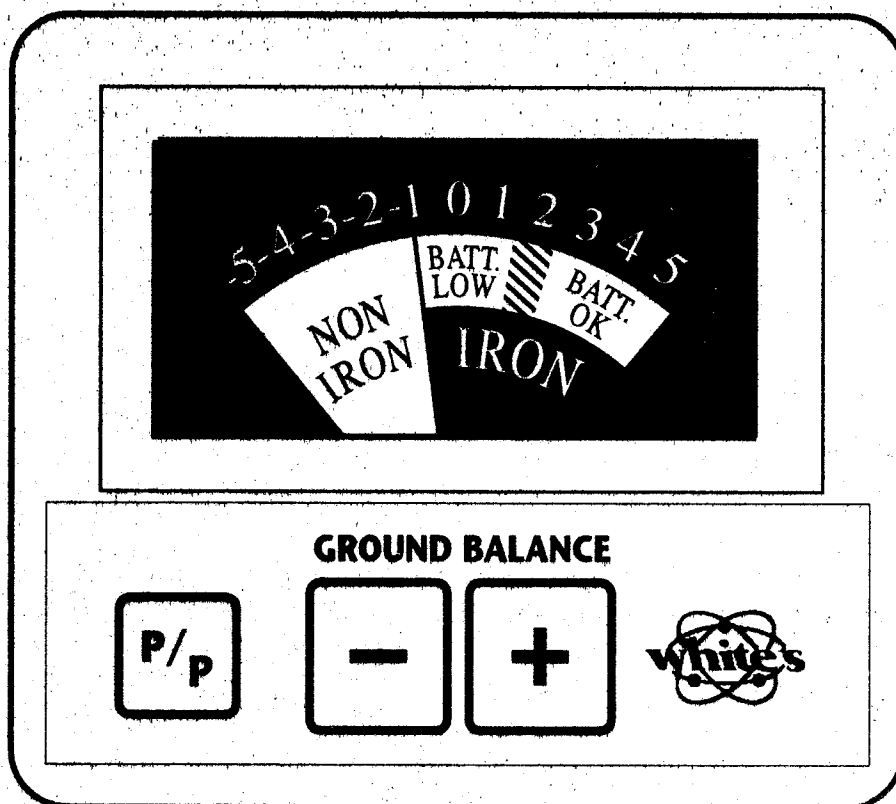




GM/4B GOLDMASTER

OPERATOR'S MANUAL



written by
Jimmy "Sierra" Normandi

INTRODUCTION

All White's ground canceling detectors are capable of finding gold nuggets in the ground. However, none will perform as efficiently as the line of Goldmasters created especially for nugget hunting. The new GM/4B is the culmination of a series of Goldmasters, refined and improved over the years.

The reason the Goldmaster stands above all other detectors in finding gold nuggets is the care taken to accommodate the particular conditions encountered while gold prospecting. Since gold is most often found in highly mineralized soil, it is necessary to design a ground balance circuit which has the range to cancel out both extremes (+) and (-) mineralization. The GM/4B has made it easier to achieve and monitor ground rejection. White's GM/4B, like its predecessors, still incorporates a unique overload-alert to assist in determining the maximum effective level of Gain to use when operating in extreme ground conditions. All of these refinements are enhanced by incorporating White's exclusive ground balance now using a "1000 to 1" resolution push button system. This system produces both improved accuracy and ease of use.

White's has added to the proven features of the previous Goldmasters, such as:

Iron I.D. Meter and Audio, for the identification of iron trash without loss in depth.

Variable SAT for adjusting the proper level of Self Adjusting Threshold necessary for controlling quickly changing or extreme ground conditions.

A precision 10-turn wire wound pot for adjusting the precise level of Audio Threshold needed to achieve the most sensitivity.

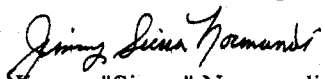
Signal Boost, engineers call this feature E.S.P. (Enhanced Signal Penetration). This feature provides three ranges of audio amplification (gain) either normal, 3X (three times normal) or 5X (five times normal). This feature will give a louder signal on those very tiny or deep targets when needed in certain operating conditions.

FREQ ADJ (frequency adjustment) so the operating frequency can be shifted allowing a number of Goldmasters to work side by side without interference.

In addition to these features the GM/4B has the exclusive "1000 to 1" ratio ground balance push button system, with a meter indication of the current setting. A new control box meter configuration that enhances the view of the IRON I.D. meter and incorporates the time proven drop in battery pack used on other White's top of the line models. And a convenient pinpoint mode for locating your nuggets.

All this adds up to make a great detector for doing what we all love best, finding gold!

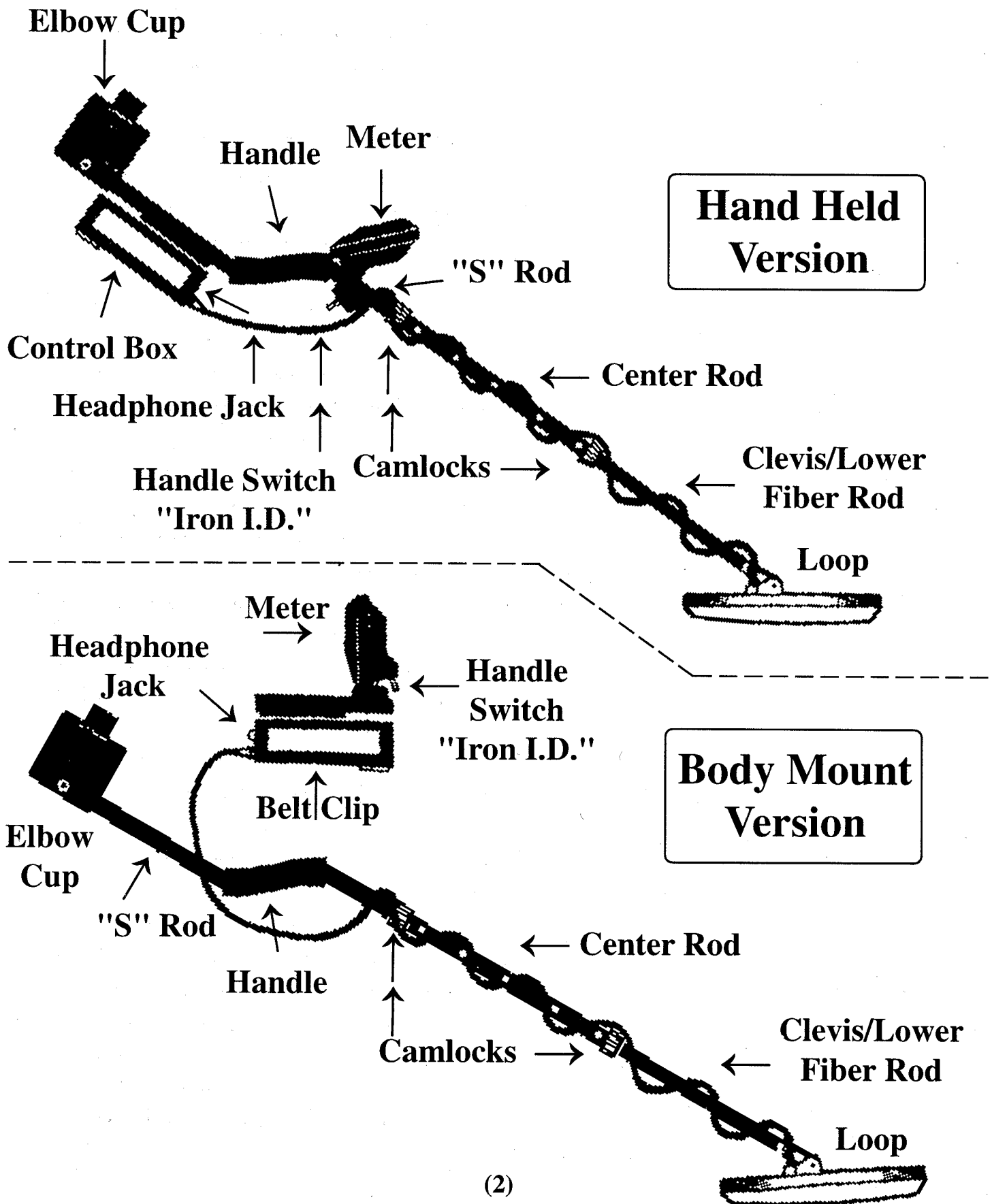
Good Luck and Good Prospecting!


Jimmy "Sierra" Normandi

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ASSEMBLY



ASSEMBLY continued...

1. Remove parts from shipping carton and check the assembly page to make sure all parts are present.
2. Place the two black rubber washers onto clevis/lower rod and slide the clevis/lower rod into loop ears. Use only nonmetallic washers, and insert only fiber bolt and thumbnut provided, to secure loop to clevis/lower rod. Tighten firmly finger tight, do not use tools.
3. Unlock camlock on center rod and insert clevis/lower rod into center rod so that stainless steel spring clip buttons line up and lock into one of the adjustment holes. Unlock camlock on "S" rod and insert the center rod into the curved "S" rod so that stainless steel spring clip buttons line up and lock into the holes in the curved "S" rod. Turn both camlocks to secure. The second or third adjustment holes are suitable for average size adults. Children do not use the center rod section, use the clevis lower rod inserted directly into the control box rod. Individuals 6' or taller should use the fully extended position. Individuals well over 6' tall should purchase the optional *rod, 500-0242-1*.
4. Unravel loop cable and wind the cable around the clevis and rod assembly, first revolution over the top of the rod. Wind cable all the way to the top of the curved "S" rod, just before the grip. Use the black cable retainers, one near the loop, and one near the top of the curved "S" rod, to hold the loop cable in place. Plug loop connector into control box, screw lock ring to secure.
5. Grip the instrument by the handle, with your arm in the elbow cup, and sweep the loop over the floor. If the instrument fit feels uncomfortable, adjust the elbow cup by removing and repositioning the bolt/thumbnut and installing in one of the optional positions. If necessary, readjust clevis/lower rod/center rod position.
6. Remove the protective paper from the two black elbow cup foam pads. Carefully align pads on the inside of the elbow cup, one on each side of the control box rod, and press firmly into place.
7. Adjust the elbow cup strap so that it is loose enough for you to slide your arm in and out without loosening each time you want to set the detector down. The elbow cup strap provides extra leverage and control. However, some prefer not to use it.
8. Install battery as described in the next section, **decals facing down**, with plastic tab and steel contacts facing toward inside of battery compartment.
9. The Body Mount version control box mounts on a belt or harness, usually on the operators chest. Be sure to leave enough slack in the cable from the "S" rod to the control box to allow sweeping of the loop.
10. It should be noted at this point that the detector may not work as expected indoors due to the high degree of metals and electrical interference found in modern construction. It is best to tune and practice out-of-doors to ensure stable, predictable results. Additionally, freshly-buried targets will not produce the normal depth and Iron I.D. results of targets natural to the ground. Due to the abnormality caused by digging a hole in the ground matrix, and the sophistication of the ground rejection circuitry, it may take a number of years for freshly buried targets to respond at true depths and Iron I.D. accuracy. The best way to determine true detection depth is in real search conditions.

BATTERIES

The GM/4B is powered by eight "AA" 1.5 volt Alkaline batteries (penlights).

The non-rechargeable battery holder can use many different types of batteries, including rechargeable nicads and heavy duty cells. However, such cells (nicads or heavy duty) simply provide fewer hours of use before needing replaced or recharged compared to Alkalines. Some batteries however, are of a shortened length so that they will not work well in this holder. This holder is designed for standard size penlight "AA" batteries which should be 50 mm $\pm$.10mm. Battery lengths shorter than this will likely cause problems with this power supply.

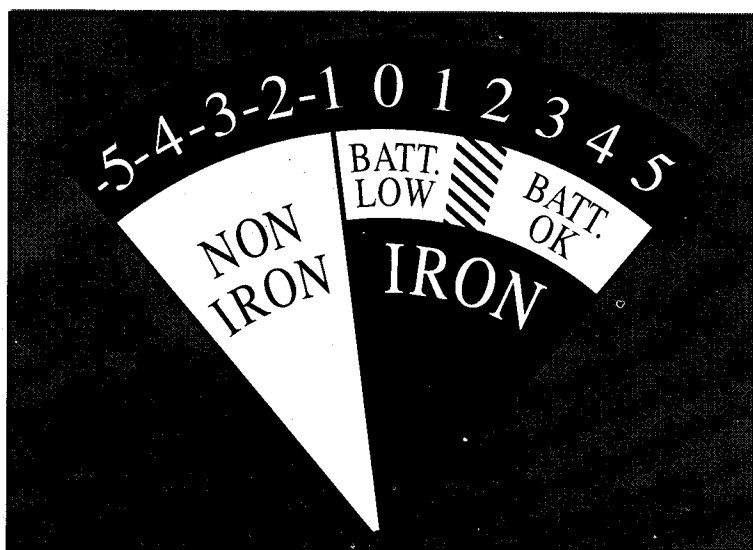
STANDARD EQUIPMENT BATTERY HOLDER

1. Slide open the battery pack lid (decalside of battery pack) by applying gentle upward pressure on the tab of the door so that it unlocks. Slide the door away from the battery box exposing the cell positions. The door will be retained by the base in the open position.
2. Remove any old cells from the pack. Note the (+) and (-) positions of each cell marked inside the cell tray. Replace them with new cells, "AA" alkalines recommended.

CAUTION: If cells are put in backwards, the electronics may be damaged. As such damage is considered neglect, it will not be covered under the warranty. Play close attention to the (+) and (-) markings inside the battery tray.

3. Slide the door closed so that it snaps securely.
4. Insert the battery pack into the detector so that the decal is facing down, with the door tab and metal contact points facing towards the inside of the battery compartment.

When the GAIN control is turned on the battery condition automatically shows on the meter for several seconds before the detector becomes operational. The GM/4B will operate fine when the batteries check in the BATT. OK area of the meter (9 - 12 Volts). After battery check, the meter needle will automatically return to the far left, and will not move during searching, unless the IRON I. D. or the Ground Balance features are used.



BATTERIES Continued

After extensive use the battery pack will check on the division line between BATT OK and BATT LOW. Caution should be used at this point and a new set of batteries should be kept on hand. Soon after checking on the division line between BATT OK and BATT LOW, the volume (beep) will become weak and shortly after that the detector will cease to respond to metal. Battery voltage drops more rapidly once the battery check indicates on the division line between BATT OK and BATT LOW.

A new set of Alkalines will provide approximately 40 to 50 hours of searching time. To check battery condition during searching the GAIN control has to be turned OFF and back ON again then the battery condition will momentarily show on the meter. The current Ground Balance setting will not hold during shut down, Ground Balance will have to be reset before searching.

To begin a new search new batteries should be installed anytime the meter indicates BAT LOW. A battery pack well under 8 volts may not have enough power to achieve an accurate battery check.

When the batteries get weak, the volume (beep) will be reduced. An operator will also notice a change in the tone of audio. Soon after this change in tone the detector will stop functioning (will not respond to metal). When searching, any significant change in the tone of the instrument indicates new batteries are needed immediately.

Eight extra "AA" 1.5 volt alkaline batteries are always a good idea when far from civilization. An extra penlight battery holder (White's Part #802-7150) is also a good idea when traveling far from home.

Headphones will increase battery life.

RECHARGEABLE BATTERIES

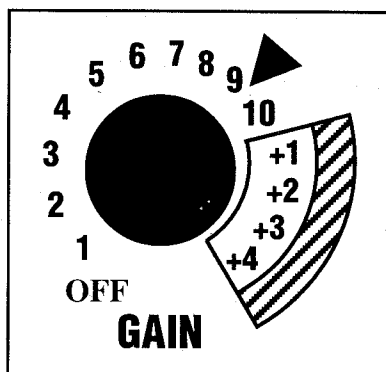
A rechargeable battery system is not standard equipment with your GM/4B. However, a high quality system is available from White's. This battery can be recharged hundreds of times as long as the battery hasn't been stored for extended periods of time or overcharged. Full charge can be achieved anytime during the discharge cycle (non-memory) using either the quick charge or overnight charge options available with this system. **White's rechargeable battery #802-5211, and charger #509-0022 are recommended for use with the GM/4B.**

Rechargeable batteries with spot welded internal contacts are typically more durable than individual cells placed in the penlight holder. Rechargeable batteries gradually deteriorate with the passing of time. As they age they do not provide the life per charge they did when new. This is expected, and not grounds for replacement under warranty. Additionally, a damaged initial cell, which is caused by over charging with the QUICK option, *is not replaced under warranty*. Only cell failure through normal use, or a defect due to a problem with a White's warranted charger, is covered.

Rechargeable batteries offer the same detection performance as Alkalines during use due to the detector's regulated power circuitry. However, rechargeables provide slightly reduced discharge (search) time per charge. Most rechargeable batteries last 30 to 35 hours per charge compared to 40 - 50 hours with Alkalines.

CONTROLS

GAIN



This knob turns the GM/4B ON and OFF and controls the GAIN (preamp). Starting from the ON/OFF position and going clockwise, the power is turned on and the dial increases the GAIN from a minimum level of "1" to a maximum level of "+4". When first turned on, the battery condition automatically shows on the meter and it takes a few seconds for the detector to be operational. This and the ground balance controls are probably the most important variable controls on any gold prospecting detector.

The first assumption of a novice might be that the greatest depth of detection is directly related to the amount of GAIN. The inaccuracy of this assumption is directly related to the amount of mineralization in the ground. In other words, it is very important to remember that reducing the GAIN of the detector can actually increase the detection depth if the ground is heavily mineralized. This control should be set to give the greatest amount of GAIN without **#1. Overloading** the loop and **#2. causing an erratic or unstable behavior** of the detector which masks the difference between the sound of the ground and that of a nugget. A special overload alarm is incorporated in the design of the GM/4B. If the loop is placed near ground and the audio emits a loud piercing squeal, the loop is overloading. Reduce the GAIN by turning the control counterclockwise (left) to eliminate this alarm and the loop will no longer be overloaded. The detector will not operate properly if the loop is overloaded. The GM/4B incorporates internal electronic features which result in a greater dynamic range before the detector overloads on strong mineralization or large targets. This is done without any loss in sensitivity.

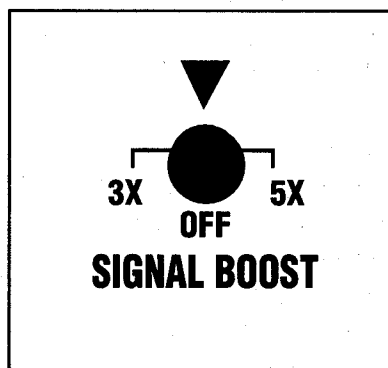
Unstable behavior will be evidenced by static, very uneven threshold or constant false signaling, making it impossible to search and hear (recognize) actual targets. Remember, there is a proper workable GAIN for every condition and choosing the proper level will insure the maximum depth that targets can be detected in that particular environment. This is the hardest concept to understand and accept, but once you learn to use the proper GAIN, you will increase your success in detecting in heavy mineralized areas and finding especially smaller nuggets. Even when searching ground that does not overload the loop and therefore the GM/4B could actually work at a level of +4 on the GAIN control, I still reduce my level to +2. This gives better separation of ground sounds and small nuggets, producing more nugget recoveries. In addition, reducing the GAIN is also a way of making the IRON I.D. system work more effectively. If the GAIN is set too high for the ground mineralization, the IRON I.D. meter and audio may chatter excessively, and may miss-identify a nugget as iron (nail). Reducing the GAIN, will make the IRON I.D. system more accurate.

CONTROLS Continued

GAIN Continued

Another way of knowing if you have the proper amount of GAIN for the ground mineralization is to put the IRON I.D. toggle ON and bounce the loop slightly up and down over the ground. If you hear a clicking sound, you should lower the GAIN a bit and try again. The clicking is the iron content of the ground being detected by the IRON I.D. system. If you reduce the effect of the ground by reducing the GAIN, you will make the IRON I.D. more accurate. The GAIN control will make for better separation of ground noises and target signals even if you don't use the IRON I.D. system to eliminate nails etc. Another disadvantage of using too high a GAIN for the area is that you will hear gaps or pauses in your threshold hum while detecting. During this loss of threshold, you are losing gold nuggets. Move slower and keep your threshold with you at all times. Practice will be the best teacher here. Another improvement in the GAIN control on the GM/4B is that it is no longer necessary to re-ground balance the detector each time the GAIN level is changed. This is a very time saving device and is known as a "phase compensated gain control".

SIGNAL BOOST



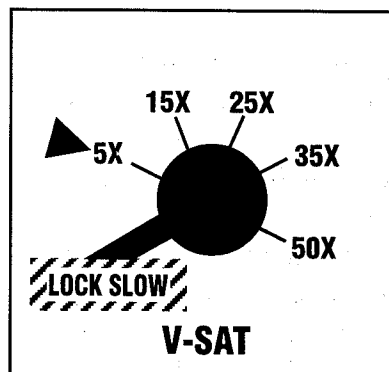
The GM/4B has a three position toggle which selects SIGNAL BOOST. I mentioned this feature in my introduction. Engineers call it Enhanced Signal Penetration or ESP. This feature provides two additional ranges of audio gain. The OFF position of the toggle offers normal audio gain. The 3X (normal audio gain times three) and 5X (normal audio gain times five) offer significant increases over normal. This GM/4B feature will increase the response to tiny and deeper targets. It will be a real boon to those hunting on bedrock for tiny flakes embedded in the cracks and for those hunting patches of very small and deep pieces, such as dry washes or tailings in the desert. The standard GAIN control knob is different. It is a "preamplifier" for the signal coming from the loop prior to processing by the electronics. The SIGNAL BOOST amplifies the signal after processing, thus doesn't affect loop overload.

It is normal to note a shift in the Threshold hum when switching between OFF, 3X, and 5X positions. If switching to check a possible target leave the threshold set for the Normal position. However, if using the 3X or 5X positions continuously, readjustment of the Threshold control, as well as the Ground Balance controls are recommended.

Experiment, I think you will enjoy it. In some conditions it may be difficult to use this feature in the 3X or 5X position during normal searching. Switching to 3X or 5X may be reserved for times when you feel you have found a target and wish to further clarify the signal. Some areas will allow use in 3X or 5X continuously so long as you can recognize a good signal, and adjust your headphones volume controls to a comfortable level. Readjustment of the Threshold, Ground Balance, and VARI SAT may be prudent once either 3X or 5X is selected and if it is going to be used continually.

CONTROLS Continued

V - SAT



The V-SAT (Variable Self Adjusting Threshold) control in its "LOCK SLOW" position, reverts to a very slow SAT speed for searching extremely mild soil conditions. When rotated clockwise a click indicates it is ON and it will progressively increase the recovery speed of the threshold. The V-SAT control allows the user to increase the speed of SAT from the standard factory speed up to 50 times faster.

SAT is the operational (search) mode of the GM/4B and is present at all times at one speed or another. As I mentioned under the section describing THRESHOLD, the hum or threshold should be audible at all times. This hum or threshold is designed to increase over a metal target as long as the loop is kept in motion. As you sweep the loop over the ground with the GAIN and GROUND BALANCE set properly, SAT will keep the threshold humming till it passes over a metal target. Hot rocks or changing ground can produce what are known as "false signals". For the most part small hot rocks can be eliminated with a fast SAT keeping the threshold humming and with the right Gain setting. The worse the ground conditions (quickly changing or extreme ground) the faster the SAT required to control it. So here we are with the loop moving over the ground and a target "gold nugget" is under the loop. The nugget will make a zip zip sound as the loop is passed back and forth over it. This sound requires the loop to be in motion over the nugget. If the loop is stopped over the target, the sound will go away and only the background threshold will be heard. The faster the SAT speed chosen, the faster the ground sounds will return to threshold, and the faster metal targets will disappear if the loop is stopped over them. This is why we use a slow SAT speed while pinpointing "PP" Pinpoint, or just crisscrossing over the target to eyeball its location.

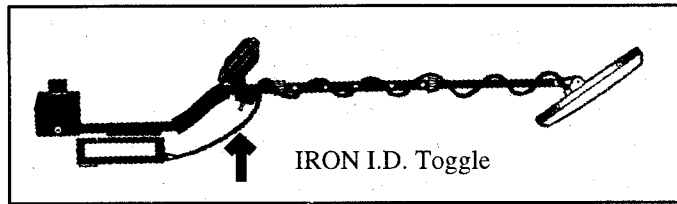
You will probably use the normal level of SAT speed "5X" for 80% of your detecting. You will have to experiment with the setting to find out where the optimum place would be for your particular application. Remember, overall depth will be diminished with a faster SAT speed, but if the ground is too noisy to separate a good target from a false signal, it is better to operate with a little more SAT than to lose a target altogether. This is the same logic that I use in describing the GAIN control, if you recall. Lowering the gain will reduce overall depth, but by doing so you can also improve your performance and find more nuggets in the long run. I can not give an absolute formula for where to set the V-SAT control as there is no set place that fits all situations, given the fact that ground conditions are different almost everywhere you might hunt.

You will soon be able to recognize when you have erratic behavior after having either recovered some tiny red "hot rocks" or chased after signals that just aren't there. When these "erratic or false signals" don't disappear by reducing the GAIN and ground balancing properly, experiment with the level of SAT. One way is to place a small test nugget or lead sinker in the ground in an area where you have had problems with false signals and start to increase the SAT speed slightly, all the time sweeping the loop over the ground comparing the sound of the nugget with the sound of the ground. When you reach a point of SAT speed which enhances the sound of the nugget and makes it sound different than the ground, then that is the place to leave it set for hunting that area. You may have to recheck and readjust this setting from time to time as your conditions change. You do not want to set the V-SAT speed higher than you need to smooth out the ground or to set your GAIN too low.

Hot rocks most commonly sound different than nuggets. They tend to go quiet when on top and beep after having passed the loop over them, beeping on either side and silent in the center. Nuggets tend to be more solid, repeatable, and zippy sounding, beeping when the loop is directly over the nugget.

CONTROLS Continued

IRON I.D. Control



The next control IRON I.D. is the toggle switch located on the handle which activates the iron identification function. There are three positions for this toggle. The center position is "OFF" and should be selected during all GAIN, THRESHOLD, and GEB tuning.

In the OFF position, the detector is functioning as any all-metal detector would. It gives a positive signal when passed over any metal target, regardless of the type of metal. This would be the normal position of the switch during the general operation of the detector. The squeezed and held position is "TEST" and is spring loaded. If the toggle is squeezed and held, the iron identification function will be activated and remain activated as long as the toggle is held in that position. When the toggle is released, it will spring back to the center "OFF" position. If the toggle is pressed forward "ON", the iron identification function will be activated constantly. The toggle will remain in this position until it is physically moved to the center or "OFF" position. If ground conditions will allow, the detector can be operated in the "ON" position continually. The user will know if this can be done only by experimenting to see if the detector can be operated smoothly and whether it will detect and correctly identify test targets.

This iron identification function is unique to White's Goldmasters. When activated, it is designed to modify the audio signal of iron targets, and produce an indication in the IRON area of the meter. This modification of the audio signal is evidenced by a chattering or breaking up of the target sound. Normally nuggets produce a clear or steady signal and do not cause the needle on the meter to move. The audio signal from iron can sometimes appear to "null out" or disappear. If the signal is not understood as Iron by the detector, the signal will remain normal or steady.

By design, if the identification circuitry is not able to determine if the signal is really an iron target, perhaps because it is either too small or too deep, it will not mute or modify the signal. In this case, the signal will remain good and the dubious target will be dug. This insures that no good target will be misunderstood as iron and ignored. A few pieces of iron dug is a worthwhile trade-off. With IRON I. D. a large amount of unwanted iron trash will be left behind and more valuable time spent on digging possible worthwhile targets. Using IRON I. D. in extreme ground conditions may cause all targets to produce the chattering sound with some meter movement toward IRON, in these areas the use of IRON I.D. is not recommended.

To function properly, IRON I. D. requires movement of the loop. Thus, it is ideally suited for use with the SAT feature and standard GM/4B operating mode.

Remember ... no system is perfect. There may be times when Iron I.D. is not practical, such as in extreme ground conditions. In these cases, do as you would with any other unit - "dig everything". But when it is practical, use it to increase your ratio of Gold Nugget to total signals dug.

Note again, audio chatter and meter movement on iron, only occurs when the IRON I. D. toggle is held in TEST or placed in the ON position.

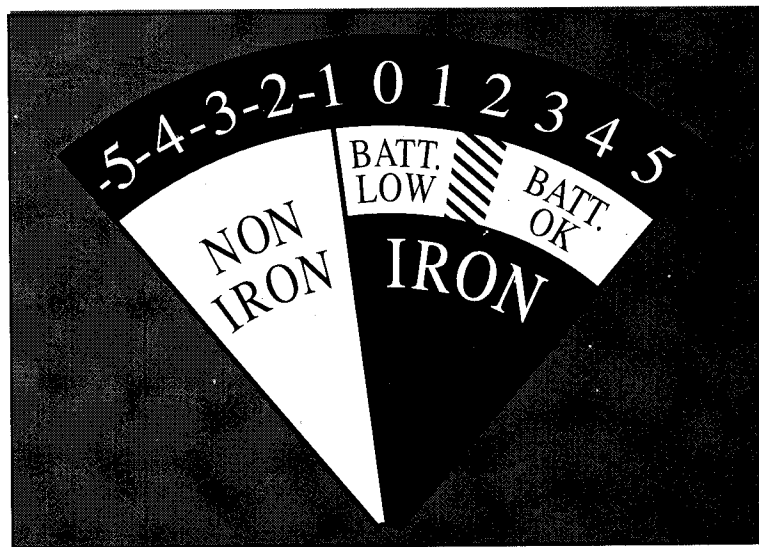
The GAIN control has a dramatic affect on the performance of the IRON I.D. feature. Once the detector is Ground Balanced pumping the loop over the ground, as you do during Ground Balance only with the IRON I.D. feature ON, a broken sounding Threshold indicates the GAIN is too high. Continue pumping the loop and adjust the GAIN. Find the highest GAIN setting that the IRON I.D. doesn't cause the Threshold hum to break up as the loop is pumped over the ground. This allows good IRON I.D. performance in that particular ground.

CONTROLS Continued

IRON I.D. Control Continued

I mentioned earlier under GAIN control, that a reduction in gain or the use of the PROPER gain for the existing ground conditions not only makes for better performance in the standard operating mode, but really pays off when using the IRON I.D. function of the GM/4B. Since iron mineralized ground as well as iron nails are seen as "iron" targets to the IRON I.D. system they can distort a gold signal if the GAIN is set too high. In other words, GAIN should be set "not to see more ground than it sees targets". The way to accomplish this is to operate at a reasonable level of GAIN. Ground chatter or loss of hunting threshold are symptoms of operating with too high a GAIN. I have covered much of this in the section on GAIN. I can't emphasize enough the importance of adjusting the GAIN level. I have been able to use my IRON I.D. system in some very mineralized areas since I started watching my GAIN control. You can always use a test nugget or lead sinker just under the surface to see if your IRON I.D. is operable. If you do use the IRON I.D. system, you can always rely on the fact that you are not losing any depth at all over the standard mode of operation (IRON I.D. OFF). The Goldmaster type of IRON I.D. is the only one that can make this statement because it is not a normal discriminator. Normal discriminate type circuits will lose depth in mineralized ground.

IRON I.D. Meter



The IRON I.D. Meter tests the batteries when the GAIN is first turned "ON", works in conjunction with the IRON I.D. audio when IRON I.D. is turned "ON", and indicates ground balance setting during ground balance adjustments.

The BATTERY CHECK. When the detector is turned on, the battery condition automatically shows on the meter for a few seconds. The GM/4B is not operational until the automatic battery check is completed, indicated by the meter needle returning to the far left.

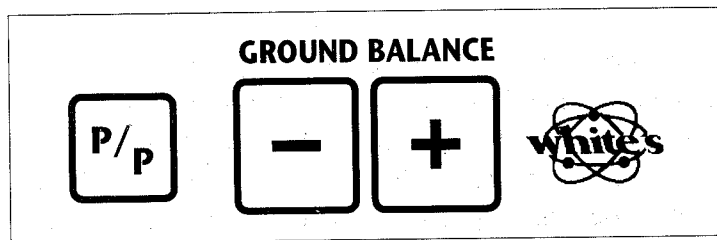
IRON I.D. The meter operates along with the audio signal activated by the IRON I.D.

toggle. When the signal is determined to be Iron by the GM/4B, the needle will move to the right. This movement of the needle will be accompanied by the chatter or nulling of the audio signal. Like the audio identification, the meter can become confused in extreme ground conditions. The meter, as well as IRON I.D. audio, should be relied upon only when testing shows it to be working well in a particular area with test targets. In many areas, between the audio and visual response of the GM/4B to a target signal with the Iron I.D. activated, the user should be able to accurately determine whether to dig a possible target or not.

GROUND BALANCE. During use of the (+), (-) ground balance adjustments the meter temporarily indicates the current ground rejection setting. (+) side of the meter is negative ground conditions such as iron (magnetic). (-) side of the meter is positive ground conditions or conductive (alkali) ground. Combinations of these ground components will indicate somewhere on the scale that represents the mixtures most prominent characteristics.

CONTROLS Continued

(-), (+) Buttons "Ground Balance"



The new ground balance control buttons are used to cancel out the interference from ground mineralization, allowing the detector signal to penetrate the ground and detect nuggets. The current setting is displayed on the meter during adjustment. Until the late 1970s, metal detectors were not very effective in detecting gold, because it is usually found in heavy mineralized areas and

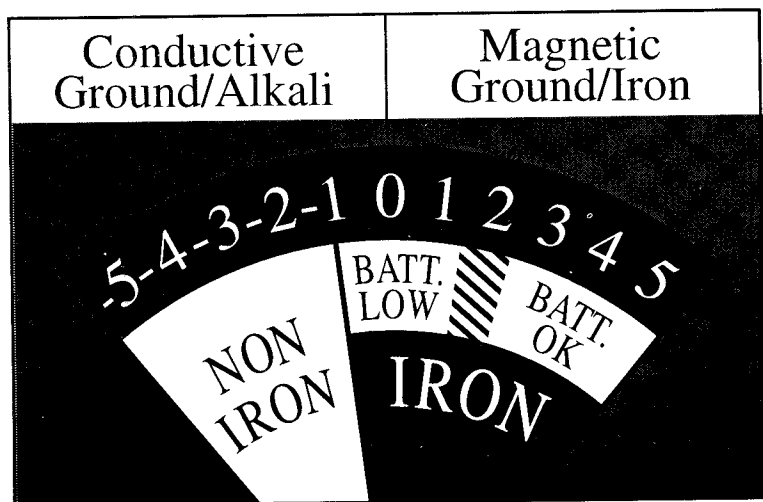
the old TR detectors were unable to cancel out such ground conditions. Only the larger or shallower nuggets were able to be located and only in ground that was mildly mineralized. White's employs an exclusive 1000:1 ground balance system which means that the resolution of one "tap" of the ground balance button actually gives the effectiveness of 1/1000 of the ground balance range. All this amounts to giving us better and smoother control (resolution) of bad ground conditions by first getting us into the ball park by holding the button, and then using single presses to be more precise.

Pressing the (+) Ground Balance button cancels out progressively larger amounts of iron "negative" mineralization. As the loop is pumped toward the ground if the threshold sound decreases, pressing the (+) button compensates. Think of it as a ground volume control in that if the sound gets quiet as the loop approaches the ground give it more volume (+).

Pressing the (-) button cancels out progressively larger quantities of alkaline or conductive "positive" mineralization. As the loop is lowered toward the ground if the threshold sound increases, pressing the (-) button will compensate. Again think of it as a ground volume in that if the sound gets loud as the loop approaches the ground turn it down (-).

The longer the button is held the greater the speed of adjustment (Coarse Control). Pressing, hesitating, and releasing travels more slowly through the range (Medium Control). Tapping travels 1/1000 of the range (Fine Control). It takes a little practice to use this new system. However, once you master the coarse, medium, and fine taps, you will find it easy to get the GM/4B ground balanced.

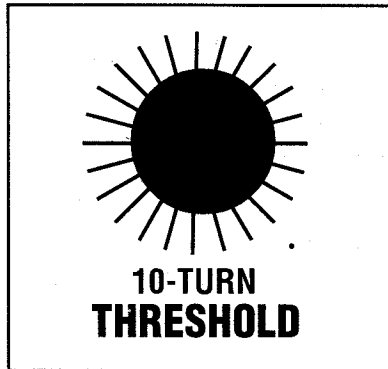
Ideally the loop is pumped up and down 2 to 4 inches from the ground and the push buttons are used to adjust until no change in sound (threshold) is noted as the loop approaches and is lifted away from the ground to be searched. Many prefer a very slight increase in sound as the loop approaches the ground for added sensitivity to small nuggets.



The Ground Balance setting is measured and indicated momentarily by the meter during adjustments. This is useful in gaining knowledge of the current ground conditions, as well as for future reference. Ground Balance to the right of 0 indicates iron type ground. Ground Balance to the left of 0 indicates conductive type ground. The ground balance setting will not hold during OFF periods. Once the GM/4B is turned OFF, everything returns to factory preset levels. The ground balance will have to be reset each time the Gain control is turned ON/OFF.

CONTROLS Continued

THRESHOLD Control



Next is the THRESHOLD control. This knob is a true precision ten turn wire wound pot.

The THRESHOLD control is used to set the level of the threshold hum, which must be maintained constantly while the detector is in operation. The threshold or background hum is set to the faintest comfortable level. This will allow the tiniest and deepest targets to be heard. Set the knob all the way to the left or counterclockwise and then rotate clockwise till the proper level of hum is attained. As previously stated, the threshold should be set to the EDGE of responding. This is usually described as a faint hum. It should be mentioned that there is usually some internal hum present which should not be confused with the threshold. This is most evident when using headphones.

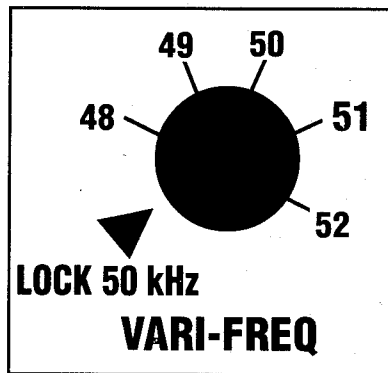
I will mention again that using headphones while prospecting is highly recommended for the best performance. The lower the threshold setting, the more sensitive the detector becomes and headphones will permit a lower threshold level than can be heard through the external speaker. If a hum can be heard with the THRESHOLD control fully counterclockwise, rotate the knob to the right (clockwise) till you can hear a definite increase in the hum. The setting where it starts to increase is the EDGE of threshold you want. This threshold may sound a little shaky or static like, but that is okay. This faint hum should be present at all times for the best results. The GM/4B threshold is a ten turn control as I stated and the knob will turn 10 times before it has made one full turn of the pot. This allows an accurate and precise position which will vary somewhat with temperature. Since we usually only have to set this one time at the beginning of each hunt, we have positioned this control to the back of the control box near the loop connector.

The action of the SAT (Self Adjusting Threshold) system maintains the threshold during use. If it disappears for any reason (other than bumping the control) you may be either swinging the loop too rapidly or running your GAIN control too high. As my buddy, Greg Moscini, always cautions: "Don't get ahead of your threshold". Good advice. A crackle or fading of the threshold while using the IRON I.D. function however, is a sign of passing over an iron target or extreme iron mineralization in the ground. This is okay and is what it is supposed to do.

If searching in 3X or 5X continuously, readjustment of the Threshold as well as the Ground Balance, is recommended.

CONTROLS Continued

FREQ ADJ (Frequency Adjustment)



The FREQ ADJ control is used to avoid interference from other metal detectors. This solves the problem of operating several Goldmasters near each other. Since the GM/4B normally operates at a crystal controlled frequency of 50 kHz, people trying to use Goldmasters side by side experience interference or cross talk. Because of the high gain and crystal controlled frequency, two detectors or more will talk to each other. This cross talk becomes a problem when more than one user chooses to search for gold nuggets near by.

The ability to modify the frequency was the answer and now we have this incorporated into the GM/4B. The standard 50 kHz frequency is operating with the control turned completely counterclockwise and clicked LOCK 50

kHz (the recommended operating frequency). When it is clicked ON, the frequency will proceed from a low of 48 kHz progressively through 50 kHz at the center of the range on to 52 kHz at the full clockwise position. When operating near other detectors and experiencing interference, click on the FREQ ADJ control and proceed turning it clockwise till the interference maximizes. This will be the center or 50 kHz position. Then proceed either clockwise or counterclockwise finding the point the interference is best eliminated.

Many Goldmaster users can hunt near each other by each selecting a different FREQ ADJ setting.

Each and every time the frequency is changed always RE-GROUND BALANCE your detector.

It is normal to note the instrument's threshold hum is more stable when operating on the LOCK 50 kHz position. The quartz crystal is more stable than any component oscillator one must switch to in order to get off the standard 50 kHz operating frequency. Whenever possible, it is recommended to use the LOCK 50 kHz position for the best stability.

P/P (PINPOINT BUTTON)



The P/P (Pinpoint Button) is used to narrow down the search area to more precisely locate the spot to dig. The pinpoint button offers some help in centering the nugget. Press and hold in the P/P button while slowly sweeping the loop over a known target, something on top of the ground that you can see. You will note the loop can be swept more slowly due to the sharp reduction in SAT speed the P/P button provides.

Due to the wide scan nature of elliptical loops it can be difficult to locate, particularly small targets, under the physical center of the loop. However, "X marks the spot" can be used to get an accurate idea of the targets location. Sweep over the target moving side to side noting that you are finding the side to side center. Now turn 90 degrees and sweep the loop over the side to side center, centering from the other direction "X". Practice makes perfect so use a small piece of lead or gold on top of the ground to become acquainted with this feature, and good pinpointing methods.

The pinpoint mode activated by pressing and holding the P/P button is not intended as a search mode. It is designed for temporary use for better location of the nugget.

HEADPHONE JACK

There is a button looking dust cover that must be pulled loose prior to using the headphone jack. The headphone jack on the GM/4B is wired to receive a stereo plug from a headphone. Since most high quality headphones preferred by prospectors are wired with stereo plugs, White's has chosen this method of wiring. If you already have a set of headphones which you prefer, merely be sure that the plug is either wired stereo or you have a switch on the headphone which can be used to go from mono to stereo. If you have a mono headphone with no switch, an adapter plug can be purchased which will do the job. Use of improper wiring will merely prevent the sound from coming out of one earphone.



Another important consideration in choosing a headphone is to get one that has a volume control on it. Since there is no volume control on the GM/4B, it is essential for hearing comfort and safety to utilize a headphone with these controls. It is important to set the headphone volume to accept a very faint threshold hum from the detector (set with the THRESHOLD CONTROL) and yet produce a strong but comfortable signal when a target is detected.

The use of headphones is highly recommended. First of all, they keep the external sounds out of the way. Other people talking, wind blowing, and various sounds distract the prospector from the immediate task of detecting the tiny signals from either small or deep targets. Most true professional prospectors and treasure hunters use headphones. The beeping of a detector can also be very distracting to those around you.

Headphones also allow the detector to be operated at a lower threshold making it more sensitive to smaller signals. Faint signals are better heard with headphones than without. Use of headphones also increases battery life.

White's has several types of quality headphones available. Full ear enclosures are best for high noise areas such as near rushing water or in cold weather. Lightweight summer styles are best for snake country and hot weather.

TUNING & FIELD USE

At this point, you should be familiar with the various controls on the GM/4B, what they are used for, and why they are important. If you are not sure, go back and read the first part of the manual again. You must understand what the controls do and not just how to set them. This understanding will allow you to control the various conditions you will encounter while prospecting. No two sites are identical and new challenges will always arise.

You will notice that the controls are few and the settings limited. There are no bells and whistles on this unit, all the various knobs and toggles are necessary for the operation of the detector.

I will lead you through the starting procedure for prospecting with the new GM/4B. You will recognize the similarity with most other ground-balancing detectors.

SETTING THE CONTROLS

1. Set the FREQ ADJ (Frequency Adjustment) fully counterclockwise (LOCK 50 kHz).
2. Set the Signal Boost to the center (OFF) position.
3. Set the IRON I.D. toggle (located on the handle) to the center Iron I.D. OFF position.
4. Set the V-SAT to "P",
5. Turn the GAIN control clockwise till it clicks "ON". Look at the meter to make sure the battery condition shows in the "BATT OK" area of the meter. It takes several seconds to check the battery condition.
6. While holding the detector with the loop in the air, rotate the GAIN control clockwise to "+4" on the scale.
7. Starting with the THRESHOLD control fully counterclockwise, then turn the THRESHOLD clockwise 4 - 5 revolutions until you hear a soft threshold hum. This hum may be slightly uneven, this is normal. The level of hum will be determined by whether or not you are using headphones. We strongly recommend headphones for all of the reasons stated in the earlier section on controls. This level should not be too loud nor too faint. Practicing will be the best way to establish the most effective level of sound.

TUNING & FIELD USE Continued

8. SETTING GAIN LEVEL

Lower the loop of the detector to the ground. We will now determine what level of GAIN will be allowed by the ground mineralization. If you can actually place the loop on the ground without hearing the high pitch squeal of the detector, which indicates loop overload, you can operate with a GAIN of "+4". However, a GAIN of 9 or 10 may produce better results while still providing ample detection depth. If you hear a high pitched squeal, back the GAIN knob off to the left or counterclockwise until the squeal disappears. Since you will rarely use the loop flat on the ground, you can carry out this process an inch above the ground. Just make sure you do not lower the loop close enough to the ground to create the high pitch squeal while you are searching. In other words, you are trying to establish at which level of GAIN you should set the detector to prevent loop overload. You should set the GAIN at the level above the ground where you will be sweeping the loop of the detector, giving yourself some leeway for a comfortable swing.

9. GROUND BALANCING PROCEDURE

Once the GAIN is set you are ready to Ground Balance the GM/4B. Ground Balance is accomplished by pumping the loop up and down (near the ground) as if you were making butter in the old fashion way, except that the loop need only be moved a few inches up and down. As you pump the loop toward and away from the ground, try to determine whether the sound gets louder as the loop is lifted away from the ground or lowered toward the ground. This will take some practice, but you will soon realize the sound increases in just one of these directions.

Ground Balance is achieved by pressing the (+) button if the sound increases as the loop is lifted away from the ground, or pressing the (-) button if the sound increases when the loop is lowered toward the ground. This process is continued until very little or no change in sound is heard as the loop is pumped (raised and lowered) near the ground. Initially, if the detector is far out of balance, this sound will be quite loud. As the process continues and the detector gets closer to being balanced, the noise will progressively decrease until ONLY the threshold hum will be heard as the loop is pumped up and down near the ground. At this point the detector is perfectly balanced to ignore the common minerals in that ground.

If either the (+) or (-) button is tapped lightly, a very small change in ground balance will be made (Fine Control). The longer the button is depressed the greater the adjustment will be (Coarse Control). In addition, the longer the button is held, the faster the adjustment occurs. In other words, adjustment accelerates the longer the button is held down. Coarse adjustments are used to get the Ground Balance "in the ballpark" and then taps are used to fine tune.

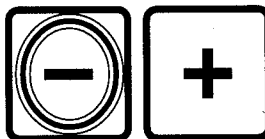
If the sound gets louder as the loop is lifted away from the ground, press the (+) push button lightly.

GROUND BALANCE



If the sound gets louder as the loop is pumped toward the ground, press the (-) push button lightly.

GROUND BALANCE



TUNING & FIELD USE Continued

GROUND BALANCE PROCEDURE - Continued

At first you will overcorrect the Ground Balance. For example, if the sound increases as the loop is lifted away from the ground pressing the (+) button compensates. At some point the increase in sound as the loop is lifted away from the ground will diminish and then the sound will shift and begin increasing as the loop is lowered toward the ground. This overcorrection is expected and you can now switch to the (-) button to find the point little or no change in threshold is noted as the loop is pumped. You may overcorrect again with the (-) button indicated by the sound shifting back to increasing as the loop is lifted away from the ground and indicating you need to return to the (+) button to compensate. With practice overshooting will be minimal and by jockeying back and forth from (+) to (-) buttons you will be able to quickly hone in on perfect balance.

Perfect Ground Balance is the point where there is literally no change in sound when the loop is pumped over the ground. However, I recommend that a very slight increase should be maintained when the loop approaches the ground. By maintaining a slight increase as the loop approaches the ground the very tiniest nuggets (flakes of gold) will be visible to the detector. It might be noted, however, that if small red hot rocks (positive mineralization) appear to be a problem in that area, a perfect Ground Balance will reduce the interference of these little pests. The trade off is that sensitivity to the very tiniest nuggets is reduced.

You will quickly get the hang of this and spend little time achieving and maintaining good balance against the ground conditions. Remember, large changes are made by holding the buttons down longer and finer corrections by short taps. This takes full advantage of the virtual 1000:1 resolution.

I find the above method the easiest to use. However, I would like to clarify a small point. Larry Sallee in his book "ZIP ZIP" instructs to only determine whether the sound gets softer or louder as the loop approaches the ground. If the sound decreases as the loop approaches the ground, press the (+) button and if the sound increases as the loop approaches the ground, press the (-) button. The fact is whenever the sound increases on the up stroke it will always decrease on the down stroke and vice versa. I merely feel it is easier to hear an increase in sound rather than a decrease in sound. There is nothing wrong with Larry's method and the end results are identical. Use whichever method is easiest for you. Larry is a real pro and his books are an invaluable tool in learning the fine art of electronic prospecting.

If you change the GAIN level at any time after you have Ground Balanced, as long as the detector has not been turned OFF in the interim, you do not need to re-ground balance.

Checking the Ground Balance (by pumping the loop up and down over the ground and listening for any threshold change) is periodically necessary during searching. Ground mineralization changes from place to place and fine tuning the Ground Balance is required for optimum performance. After a while you will automatically pump up and down a few times ever so often as you prospect, noting whether you are still maintaining the slight increase in threshold as you pump the loop toward the ground, making fine adjustments by tapping the (+), or (-) buttons. In most areas, once the detector is ground balanced, the (+) & (-) controls are used only occasionally to update the ground balance setting. Old workings and outcroppings, however, can produce large ground mineral variations that make detecting such areas a little more challenging.

GROUND BALANCE (Low Mineral Conditions)

The GM/4B is designed to work in an environment of heavy iron mineralization. In some instances there may be so little mineralization that the loop will never go quiet as the loop approaches the ground or the Ground Balance buttons seem to have little effect. In other words, there always seems to be no change or a faint increase in hum as the loop is lowered toward the ground regardless of the Ground Balance setting. In this instance, merely set the ground balance buttons (+) & (-) so that the meter indicates to the midpoint on the meter (0), and hunt.

TUNING & FIELD USE Continued

10. V-SAT / GAIN

The (+) and (-) Ground Balance buttons compensate for common ground minerals in the area. The V-SAT control compensates for the consistency of that ground mineralization. The greater the degree of inconsistencies, the more SAT is needed to quiet such ground noise.

If the threshold becomes too erratic or noisy, it might be necessary to use the V-SAT feature and/or reduce the GAIN control. This noisy behavior will make it difficult to recognize a true target (possible nugget) from pieces of mineral, commonly referred to as "hot rocks". It is not wise to keep a high level of GAIN if the detector will not operate smoothly. This is a false sense of security. Recognizing a real target is the most important part of detecting. This is an example of when less GAIN will produce more nuggets. You must be the best judge of just how much noise you can tolerate and still identify nuggets, as well as the combination of V-SAT and GAIN which produces the desired results in your area. Planting test nuggets or small pieces of lead in the ground and adjusting GAIN and V-SAT for the best response ignoring the surrounding ground is the best guide. Some real Pro's can work at levels intolerable to the rest of us, because they have trained their ears over the years. Tiny hot rocks are not the only culprits. Alkali salt flats in the desert can also cause erratic behavior and require faster V-SAT settings or reduced levels of GAIN, or both, to handle such very extreme conditions. Wet alkali washes can be extremely difficult to work due to the sensitivity of high frequency gold detectors to conductive dissolved salts and the similarities with the responses of small gold.

11. SEARCHING

Once you have achieved the initial ground balance, you are ready to start searching. Move the loop just over the ground and listen for the distinct zip-zip sound produced by a target. It is wise to plant a nugget just under the soil to practice on in order to learn to recognize what it will sound like. If you don't have a nugget, use a nickel or piece of lead (sinker or bullet). You can practice with different sized nuggets and at different depths. It will take practice to determine the proper search speed and technique. Do not go too fast. Try to overlap your sweep path so that you won't miss the tiny and deeper nuggets. When you hear the zip-zip, make an X over the loudest portion and eyeball the center. If you have a hard time finding the center, you can hold the P/P button and "X".

At first, I recommend that you dig all targets, until you get used to the sound of various items. As with other G.E.B. detectors, a nail or oblong piece of iron laying horizontally will produce a double beep. You will learn to recognize this. Remember now, a "good target" is considered anything that is not IRON. You want to detect lead, brass, copper, aluminum and silver. Any of these metals can simulate the sound of a gold nugget and must be dug. Keep a particular lookout for the tiny lead bird-shot so common in mining areas. If you are detecting these tiny targets, you are doing everything right and will eventually find gold if you pass the loop over it.

TUNING & FIELD USE Continued

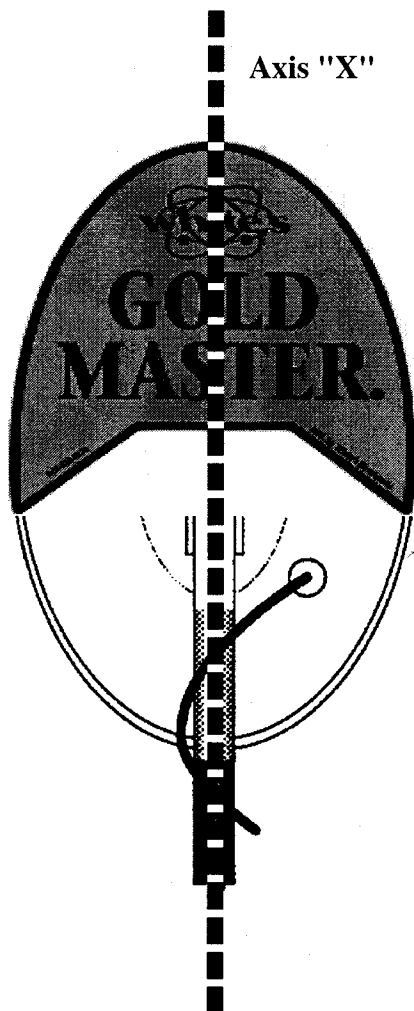
12. P/P Pinpointing

In most cases, pinpointing is easily performed by merely "X-ing" or crisscrossing. This can be completed with the P/P button held. However, P/P is not usually necessary for experienced operators. The loudest part of the target will be under the center of the loop, just as with any detector. After the approximate location of the target is determined, take a handful of soil and check the hole again. Continue this process until the target is no longer in the hole, but in the hand.

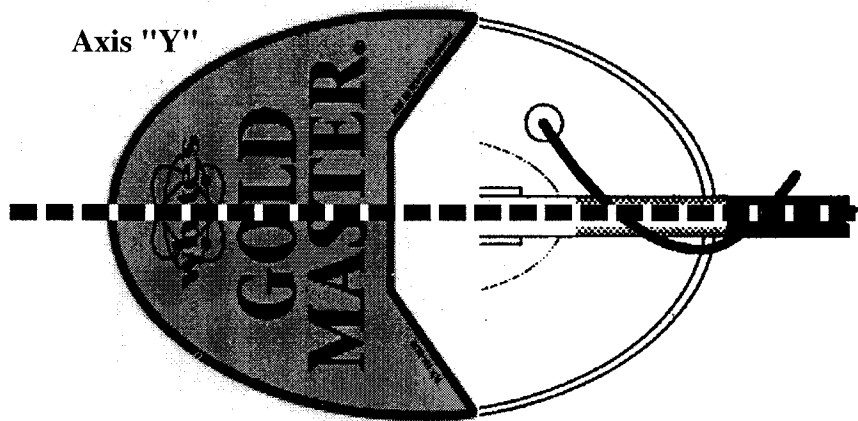
I prefer putting the handful of soil in a plastic container (pan, tray, cup, or scoop). Passing the container over the loop will determine if the target is really in it. If so, a series of separations will quickly expose the nugget.

Some prefer to pass the handful of dirt across the loop directly. Caution must be exercised if this is done. The GM/4B is sensitive enough to pick up the salt in your hand and respond with a signal. Try this with nothing in your hand and you will see how close you can come to the loop using this method. One way around this salt sensitivity is to pinch the soil in small amounts and wave only the fingers over the loop. You will find the way best suited to your needs. The condition of the soil - dry, wet, fine, coarse, etc. will have a lot to do with the best method for you. Until you get good at eye-balling the target in the search mode you can hold the P/P button (pinpoint) position and "X" the area slowly.

Center nugget from side to side.



Turn 90 degrees and center nugget from front to back. "X" marks the spot.



TUNING & FIELD USE Continued

13. IRON I.D. Audio and Visual Meter

Once you have the technique down pat and feel confident you can identify a real target, you can start to experiment with the IRON I.D. toggle (located on the handle). I feel it is best to use this in the IRON I.D. Off (center) position and then move the toggle to the TEST position in order to attempt to identify the target. Thus, search with the I.D. off and test each dubious target. Remember, this I.D. function is designed to identify a target as Iron if it is sure it is. An iron target will chatter or null out when the loop is passed over it. At the same time, the Iron meter will deflect to the right. If the I.D. circuitry cannot tell whether the target is truly iron (too small or too deep) it will not distort the audio signal and the meter will not deflect. This was designed to avoid the possibility of rejecting gold nuggets and help to identify most iron trash. It should eliminate a large percentage of unnecessary digging.

Remember that even the best systems can be thwarted in very extreme situations. It is always best to test the system in each location to see if the ground mineralization will allow it to function properly. Used properly, it will eliminate the need to dig much of the iron trash without the loss of gold nuggets. There will be many locations where the iron mineralization is not extreme and the Iron I.D. toggle can be put in the ON position. In this position, the I.D. function will be active at all times during the searching process. Iron targets (not too small or too deep) will distort the signal (chatter or break up) and deflect the meter needle to the right. All nuggets and unidentifiable pieces of iron will give the same "good" zip-zip response, and NON - IRON meter indication (no meter needle deflection).

Care must be taken when attempting to identify small targets in heavily mineralized ground. Even though IRON I.D. is designed to give a clear audio signal with no deflection of the meter when it passes over gold or any non-iron metal, it can give a confused reading, slight chatter and slight deflection of the meter caused by a combination of a target and mineralization. If the loop is extremely close to the target, a tiny nugget on top of the ground could indicate iron. When testing a small target, lift the loop a little off the ground while still keeping the target within detection range, and test it. It should then give a good reading. It is wise to carry a test nugget or lead sinker with you and place it just under the soil to see how the IRON I. D. Circuit reacts. In this way, you can determine the reliability of IRON I. D. in the ground you are searching.

A key to allowing IRON I.D. to work well is the GAIN control. Too high a GAIN setting will interfere with good IRON I.D. accuracy. With the GM/4B ground balanced so that the loop can be pumped over the ground with little or no change in sound. Then turn on the IRON I.D. Pump the loop up and down over the ground to be searched just as you do when ground balancing. If the ground causes the threshold hum to break up, reduce the GAIN to a level where the loop can be pumped up and down over the ground without the threshold breaking up. This will provide for accurate IRON I.D. in that ground. For more information on the use of IRON I.D. see the description of the IRON I.D. control earlier in this manual.

TUNING & FIELD USE Continued

14. HOT ROCKS

Hot rocks are defined as a rock which contains more or less mineral content than the surrounding ground matrix. Therefore it can act as a target to the detector and can confuse the detectorist by creating either a signal or chatter (erratic behavior). This can reduce the ability to differentiate tiny nuggets from inconsistencies in the ground (hot rocks).

Negative hot rocks are ones which balance out on the ground balance control to the right (usually +2 or greater on the meter). They actually produce a null or no sound when directly under the loop, making a sound once the loop passes them. This sometimes sounds like a "boing" when the ground mineral and the rock mineral are far apart in intensity. That is when the ground might be set at +1 on the meter and the rock at +3. At any rate, these are usually black in color and usually magnetic. They can often be tuned out by ground balancing right over them and then proceed to search with the GM/4B "over tuned" to the ground. When using this procedure, be sure to search slowly and keep the loop close to the ground and level. This will eliminate the bother of such "hot rocks". Author of "Zip- Zip" Larry Saltee calls these "cold rocks". They are usually easy to identify.

The toughest "hot rocks" are the ironstone or positive rocks. They are usually red or various shades of red to almost black. They ground balance on the (-) side of the meter. They are sometimes as small as BB's and sound just like nuggets. These positive "hot rocks" are almost impossible to tune out and can tune as low as -4 or -5 on the meter, near salt. They actually are in the range of gold nuggets and that is why they are so hard to differentiate. Reducing the GAIN and tuning with a neutral or slight reduction in sound on the down stroke of the loop during ground balancing can soften their sound and help to make them less visible.

The ever-present "hot rock" will always present problems and must be contended with. It is my belief that they should be recognized and thus avoided. Most large ones are on the surface and can be kicked aside when identified. You will soon learn what they sound like. The "overshoot" or "boing" sound will soon become familiar. You can stop and balance each one out, but I find this unnecessary. In some cases, over-ground balancing will reduce their interference. I find it best to tune to the majority of the ground matrix and learn what a "hot rock" sounds like. The fast SAT of the GM/4B will recover quickly upon leaving the vicinity of a "hot rock" and will remain sensitive to gold nuggets. Since there are different kinds of "hot rocks", it is almost impossible to eliminate all of them with one setting. Some will be identified by the I.D. system as if they were iron. In every instance, practice makes perfect.

TUNING & FIELD USE Continued

15. FINAL TIPS

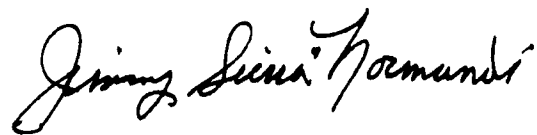
Some final tips on the operation of the GM/4B in reference to the interpretation of the audio and visual IRON I.D. function. As I mentioned earlier, I prefer to operate with the IRON I.D. toggle OFF in areas of low trash, and to activate it when a target is detected. This seems to be a more efficient way to operate. It is less confusing and easier to determine a real target (good or bad) from a false target. Less confusing sounds and less distraction during the searching process makes it less likely to miss a target altogether. It might be good to mention at this time, however, that after becoming more experienced with the IRON I.D. function, you might prefer to operate with the IRON I.D. toggle set in the ON position. I found that I really preferred this after I got used to it. Operate in the way you feel most confident.

I would also like to mention that caution must be exercised when using the GAIN control at the upper limits. Even though the ground does not overload the loop at full GAIN "+4", you might experience some false signals operating at this high level and you will best reduce GAIN to smooth out the performance. The GM/4B has much more power than most detectors you have probably been accustomed to and I have found that lower levels of GAIN have given excellent depth in most areas.

In most cases, a definite iron target will bang the needle half to full scale and the audio will be distorted. However, in some instances, a good audio might be heard in conjunction with a partial movement of the needle. This can be due to a fringe response. Iron or mineral contamination can cause this meter response and thus, in cases where the audio and meter disagree, GO WITH THE AUDIO. You will soon learn to interpret the audio and meter and how they relate by digging everything for awhile. It should also be understood that once a target is located, sweeping the loop directly over the center will produce the most accurate IRON I.D. indication. Locating a target, pinpointing it, then squeezing and holding the IRON I.D. in TEST, and sweeping directly over the center will actually save time when you consider the time one could spend digging iron targets. No system is perfect, but this one will greatly reduce the amount of time wasted digging iron trash in moderately mineralized areas if used properly, and will not miss the gold.

It should be understood that IRON I. D. is not a traditional discriminator. The detection depth of the GM/4B is not reduced by operating in the IRON I. D. mode. All targets within range of the detector will be heard by the operator. In both IRON I. D. ON or OFF positions, only the type of audio response changes. ZIP - ZIP sound for good targets, BROKEN for iron with meter movement. No depth is ever lost by utilizing IRON I. D., the only danger could be in misunderstanding the identification of a target. Reducing the GAIN control, and slowing the loop sweep speed, directly over the center of the target, will increase the accuracy of IRON I. D. audio and visual indications. Remember, when in doubt - DIG!

Good Luck and Good Prospecting!



Jimmy "Sierra" Normandi

GOLD CHEMISTRY

Chemistry;	Au.
System;	Cubic symmetry.
Habit;	Crystals rare, usually as grains, or dendritic (treelike structure) shapes and rounded nuggets.
Colour;	Yellowish - golden, with increasing silver content becomes much paler.
Streak;	Yellow - gold.
Cleavage;	None, (unpredictable shapes).
Fracture;	Rough, malleable.
Hardness;	Gold = 2.5 to 3.0 depending on purity. Finger nail = 2.5. Coin = 3.5 (harder than gold). Steel knife blade = 5.5.
Specific Gravity;	Gold = 15.5 - 19.3 (relative density), depending upon purity. Quartz = 2.65. Pyrite = 4.8 to 5.2.
Luster;	Metallic.
Special Features;	Colour, very high Specific Gravity, non-tarnishing, malleable, insoluble in single acids.
Formation;	Often with quartz in hydrothermal veins. Also frequently in placers and consolidated sands and conglomerates.
Distribution;	Largest quantities from South Africa, India, Brazil, Bolivia, U.S.A., Mexico, Australia, Austria, The Urals (USSR), Leadhills (Scotland), North Wales, East Sutherland, and Cornwall (UK).

RECOMMENDED READING

FINDING GOLD NUGGETS II.....	James "Jimmy Sierra" Normandi
ZIP ZIP MASTERING YOUR NUGGET DETECTOR.....	Larry Sallee
ZIP ZIP THE ADVANCED COURSE.....	Larry Sallee
FOLLOW THE DRYWASHERS, THE NUGGET SHOOTERS BIBLE.....	James Straight
WHERE TO FIND GOLD.....	Jim Klein & Jerry Keene
WHERE TO FIND GOLD	Delos Toole's
NUGGET SHOOTING	James McCulloch
GOLD PROSPECTORS DIGEST	Jerry Keene
GOLD DIGGERS ATLAS.....	Robert Johnson
FIELD GUIDE TO ROCKS AND MINERALS.....	Frederick H. Pough
MINING LAW.....	Terry Maley

ACCESSORIES

These accessories are highly recommended for use with your GM/4B;

Loop Cover - Protects the bottom of the loop from abrasion/wear. Is left on the loop during searching.

Headphones - Allows finer tuning, reduces distraction from external noises, and increases battery life.

Sierra Gold Max (Large 7.5" X 13.5" Accessory Loop) - Increases detection depth (approximately 20% *NOT LINEAR*) over the standard 5" X 10" loop. Especially designed to increase depth on medium to large nuggets, and increase coverage per each pass of the loop. Higher Gain settings can often be used (depending on ground conditions) resulting in even greater depths. Some loss of very small targets is expected. However, for a loop of its size the Sierra Gold Max still retains impressive sensitivity to small targets. Retains the same "*zip-zip and boing-boing*" basic sounds between nuggets and hot rocks.

These accessories offer added convenience;

Carry Case - Available in soft and shockproof versions, for travel and storage.

Extra Battery Holder - # 802-7150 If you travel far from home always carry an extra battery system, holder & batteries.

Rechargeable Battery System - #802-5211 Non- Memory Nicad & #509-0022 Overnight / Fast Charger, allows reuse if 110 Volt USA outlet or adapter is available.

Taller Lower Rod - #500-0242-1 If an individual is well over six feet tall, this extended length lower fiber rod will increase comfort during use.

As a result of the Goldmaster's popularity, a wide range of additional "after market" accessories are available that will compliment your nugget shooting adventures, digging tools with built-in magnets, special separating cups and more. Check with your Dealer or telephone, within the U.S.A. toll free 1-800-547-6911, for more information.

PROPER CARE

I. Cleaning

- A. Both the loop and rod are waterproof and can be cleaned with fresh water and mild soap. The control box is not water proof and must be kept dry. Never lift a wet loop above the height of the control box as water can run down the inside of the rod damaging the electronics. A damp cotton cloth can be used to wipe off a dirty control box.

II. Weather

- A. Do not expose your detector to the conditions of a car trunk during winter and/or summer extremes.
- B. Protect it from direct sunlight during storage.
- C. The control box is rain resistant. However, it must be protected from heavy rain.

III. Saltwater

- A. Salt/alkali is very corrosive! After your detector has been exposed to salt, rinse the loop and rods in fresh water. Wipe down the control box with a damp cotton cloth. Do not allow water inside the control box and avoid lifting the loop above the height of the control box.

IV. Storage

- A. When the instrument is not in use, make sure the GAIN knob is turned fully counter clockwise, to the OFF position.
- B. If you plan on storing your detector for long, remove the battery holder from the instrument and remove the battery cells from the holder.
- C. Store the instrument indoors, in an area where it will be protected from abuse. Over the years White's has noted more service repairs and physical damage, on units in storage than those experiencing daily use.

V. Additional Precautions

- A. Avoid dropping your detector while attempting to set it down to dig.
- B. Avoid using your detector for leverage when standing up from a dig.
- C. Do not use any lubricants, such as WD-40, on any part of your detector.
- D. Do not modify your instrument during its warranty period.

SERVICE

White's reputation has been built on quality products backed by quality service. Our Factory Authorized Service Centers are factory trained and equipped. They offer the same quality service as the factory. Service before and after the sale is the cornerstone of our customer relations.

I. Before shipping detectors for service:

- A. Contact your Dealer. There may be a quick, simple fix or explanation that will prevent having to send the detector in for service.
- B. Double check the obvious, such as batteries, and try the detector in another area to be sure there is not interference.
- C. Be sure to send all necessary parts with your detector, such as batteries and holders, as these items can result in symptoms.
- D. Always include a letter of explanation about your concerns, even if you have talked to the Service Center by telephone.
- E. Take care in packaging instruments for shipping.
- F. Always insure your package.

1. White's Electronics

1011 Pleasant Valley Rd.
Sweet Home, OR 97386
(541) 367-6121
FAX (541) 367-2968

2. Electronic Exploration

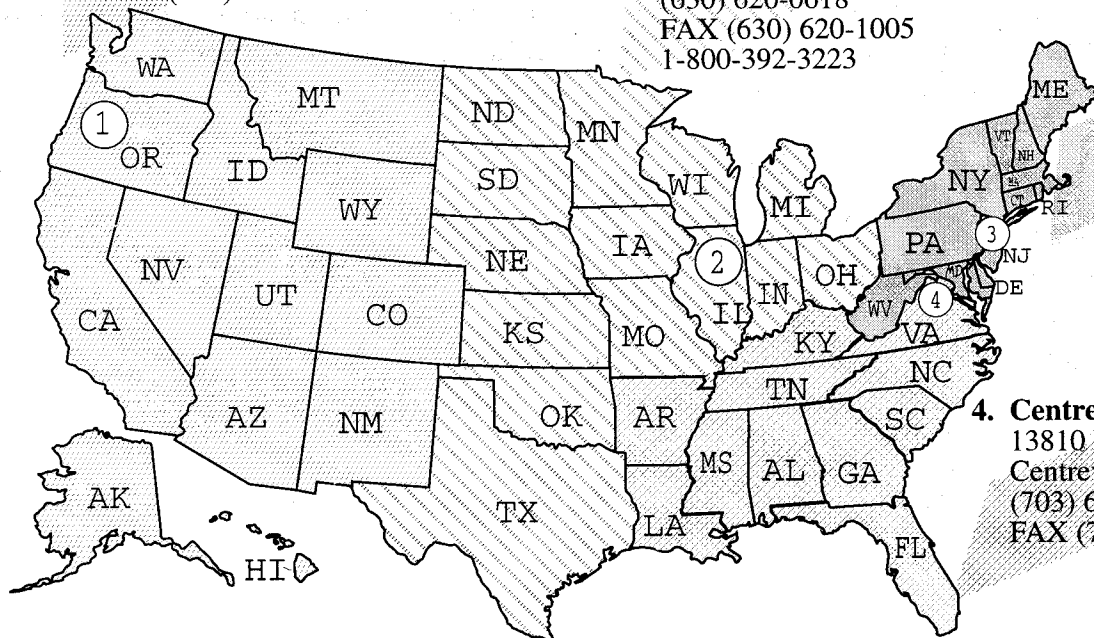
700 South Main
Lombard, IL 60148
(630) 620-0618
FAX (630) 620-1005
1-800-392-3223

Geoquest

106 US Hwy 46
Saddlebrook, NJ 07663
(973) 772-7443
FAX (973) 772-7773

4. Centreville Electronics

13810 B Braddock Rd.
Centreville, VA 20121
(703) 631-0202
FAX (703) 222-8625

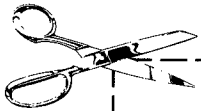


WARRANTY INFORMATION

Should for any reason you sell your White's instrument prior to the warranty described on the following page expiring, the remaining warranty is transferable. **This transfer is authorized by calling 1-800-547-6911, and getting an Authorization Number.**

Simply fill out the following information, including the Authorization Number, seal it in a stamped envelope, and send it to **White's Electronics, 1011 Pleasant Valley Road, Sweet Home, Oregon 97386.** The remaining warranty period will then be available to the new owner.

The Warranty Statement (on inside back cover) applies to both the original owner as well as the second owner.



Warranty Transfer

Original Owner:

Name: _____

Address (Which appears on the original warranty card):

Instrument Serial Number: _____

New Owner:

Name: _____

Address: _____

Comments: _____

Distributor Authorization Code: _____

OWNER INFORMATION

Serial Number: _____ (*number inside battery compartment door*)

Purchase Date: _____ (*The date on the sales receipt*)

Dealer Name: _____

Address: _____

Telephone #: _____

Payment method: _____

Personal markings: _____



White's Electronics, Inc.



Limited Warranty

If within two years (24 months) from the original date of purchase, your White's detector fails due to defects in either material or workmanship, White's will repair or replace at its option, all necessary parts without charge for parts or labor.

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

This is a transferable manufacturer warranty, which covers the instrument two years from the original purchase date, regardless of the owner.

Items excluded from the warranty are non-rechargeable batteries, accessories that are not standard equipment, shipping / handling costs outside the continental USA, Special Delivery costs (Air Freight, Next Day, 2nd Day, Packaging Services, etc.) and all shipping / handling costs inside the continental USA 90 days after purchase.

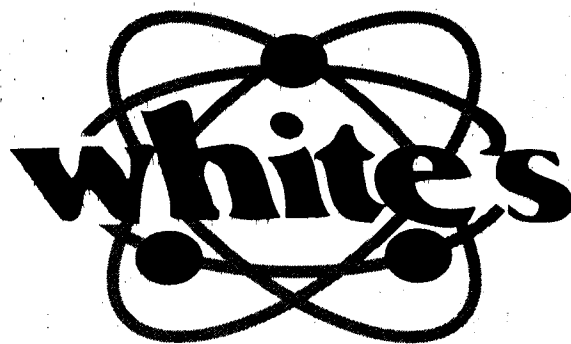
White's registers your purchase only if the Sales Registration Card is filled out and returned to the factory address soon after original purchase for the purpose of recording this information, and keeping you up-to-date regarding White's ongoing research & development.

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

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

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

The foregoing is the only warranty provided by White's as the manufacturer of your metal detector. Any "extended warranty" period beyond two years, which may be provided by a Dealer or other third party on your detector, may be without White's authority involvement and consent, and might not be honored by White's.



White's Electronics, Inc.
1011 Pleasant Valley Road
Sweet Home, OR 97386 USA

Distribution: 1-800-547-6911
Factory: 1-541-367-6121
FAX: 1-541-367-2968
E-Mail: whites@halcyon.com

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