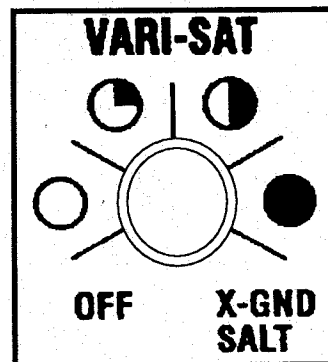
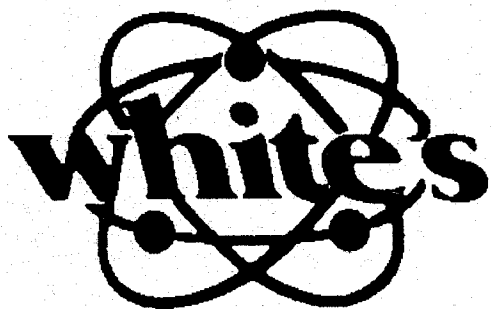
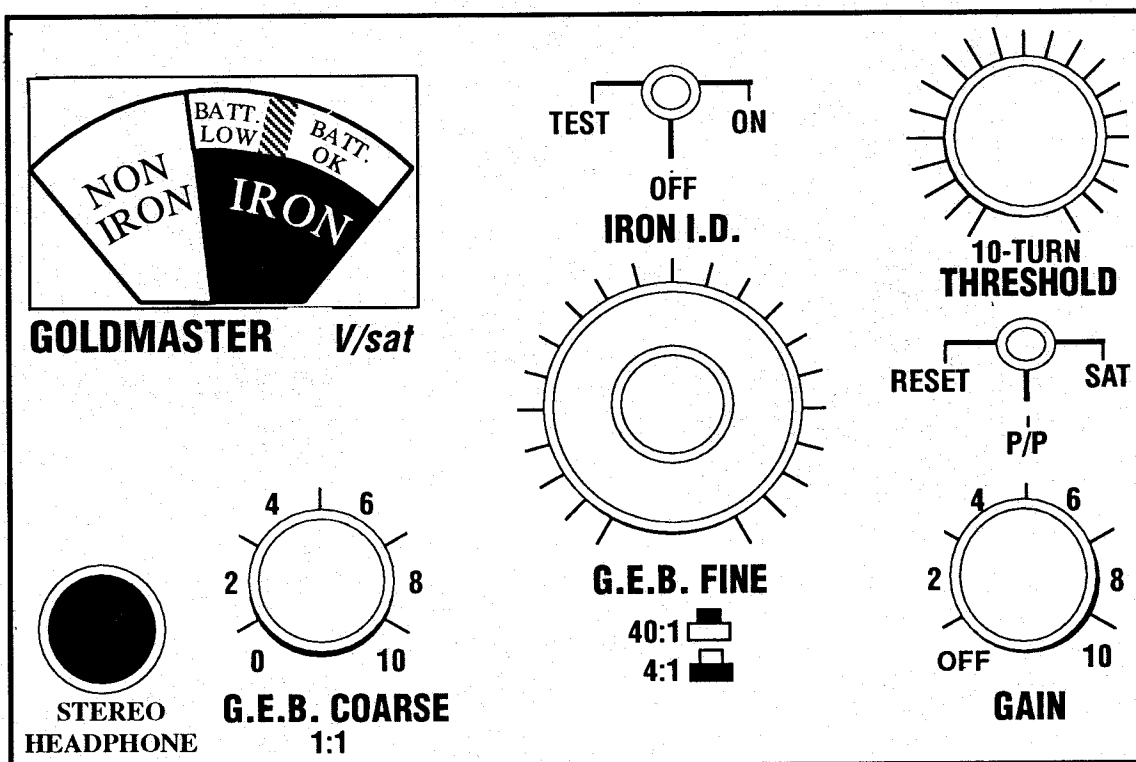


white's **GOLDMASTER V / SAT**

OPERATOR'S MANUAL

written by
Jimmy "Sierra" Normandi



INTRODUCTION

Although any metal detector capable of balancing or neutralizing the interference from ground mineralization is capable of detecting gold nuggets in the field, a detector specifically designed to accomplish this goal will always be the detector of choice. Therefore, even though all of White's G.E.B. units, such as the 4900, 5900, 6000, EAGLE, or SPECTRUM, can be set to find gold nuggets effectively, none of them will do it as simply or proficiently as the new GOLDMASTER V / SAT.

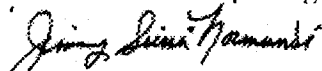
The reason for this is the care which was taken to accommodate the particular conditions encountered while gold prospecting. Since gold is usually found in terrain abundant with iron mineralization, it was necessary to design a ground balancing circuit which could indicate and then prevent overloading on the iron ground. This was accomplished by incorporating a new overload alert, 40:1 ratio ground balancing pots, and White's legendary patented G.E.B. (Ground Exclusion Balance) system. This combination alerts the user when ground overload takes place and then the operator can smoothly and simply balance the mineralization with high resolution controls. All of this allows the use of the maximum level of GAIN compatible with the ground mineralization. The GOLDMASTER V / SAT thus has power to spare when the conditions will permit its use.

The second factor to consider was that most of the nuggets available to the prospector were very small in size; some even in the sub-grain category. It is a fact that these very tiny targets were most easily detected by using a high transmitting frequency and so White's chose to transmit at 50 kHz. At this frequency, the GOLDMASTER V / SAT detects even the smallest nuggets while effectively cancelling ground mineralization.

The GOLDMASTER V / SAT elliptical Long-Scan loop enhances the high frequency detection of small nuggets by providing a large window of detection. This "stretched" center of the loop increases the area of detection for very tiny and very deep targets. These important features are topped off with the essential SAT mode of operation. This "Self-Adjusting Threshold" or "Auto-tune" is now variable and is at the heart of small nugget detection. Fast and extreme changes in ground mineralization require ultra-fast threshold maintenance in order to prevent the loss of the tiny signals produced by these small targets. Fast S.A.T. allows the signal to poke through the interference of heavy mineralization such as Hot Rocks and black sand. Slower speeds are recommended for less extreme grounds where mineralization and "Hot Rocks" do not interfere with the normal steady threshold.

Finally, the extra plus the GOLDMASTER V / SAT provides is the inclusion of a visual and audio identification of probable iron trash. Productivity is increased when more good targets and fewer trash targets are dug and the only trash items that should be excluded are iron or "ferrous" targets. The Iron I.D. circuitry in the GOLDMASTER V / SAT is designed to only identify iron when it is sure that the target IS iron. If the target is too small or too deep to be sure of, the meter or audio alert will identify it as a good target and thus possibly a nugget. In this way, most iron trash will be eliminated without the loss of gold nuggets. When in doubt, the I.D. circuit will say to dig, and that is the way it should be. In cases of extreme mineralization, this feature may not be effective. In these instances, follow the rule of digging all signals as you would with other metal detector models.

Good Luck and Good Prospecting!



Jimmy "Sierra" Normandi

INDEX

PART IDENTIFICATION AND ASSEMBLY.....	2 - 3
BATTERIES.....	4
DESCRIPTION OF CONTROL PANEL	
Headphone Jack	5
G.E.B. Coarse and G.E.B. Fine Controls	5
GAIN Control	6
MODE Control.....	6
THRESHOLD Control	7
IRON I.D. Control.....	7
IRON I.D. Meter	8
VARI - SAT.....	8
PROCEDURES AND HINTS	8
SETTING UP THE CONTROLS	9
SETTING GAIN LEVEL	9
GROUND BALANCING PROCEDURE.....	9 - 10
VARI - SAT / GAIN.....	10 - 11
SEARCHING	11
IRON I.D. AUDIO & METER	11 - 12
SCIENTIFIC GOLD DESCRIPTION.....	13
RECOMMENDED READING.....	13
ACCESSORIES.....	13
OWNER NOTES.....	14
WARRANTY INFORMATION.....	15
OWNER INFORMATION.....	16
WHITE'S WARRANTY STATEMENT.....	INSIDE BACK COVER

NOTE:

Your GOLDMASTER V / SAT is so sensitive, powerful, and precise in frequency, that other GOLDMASTER detectors operating in close proximity to yours will result in interference.

Ideally GOLDMASTER models must be operated at least 30 feet apart to avoid interference between two models.

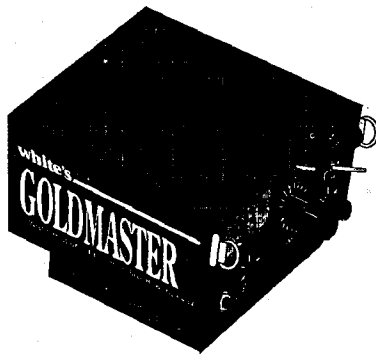
If detecting in close proximity, reduction of the GAIN control (counterclockwise) will reduce interference between detectors, operation in such conditions will be enhanced however, some reduction in overall detection depth can be expected.

PARTS IDENTIFICATION AND ASSEMBLY

The GOLDMASTER V / SAT can be used in three different configurations, hand-held, chest mounted, or hip-mounted. The manner decided upon is up to the personal preference of the user. There are advantages to each style. Some users like to be able to put the detector aside when they are recovering a target, and thus get it out of the way. Also, with this method, one hand is left free - all of the operation can be done with one hand. The forefinger is used to control the fine ground balance knob and operate the IRON I.D. toggle. The only disadvantage is obvious. The detector, although extremely lightweight and well balanced, is still more tiring than when used in the separated hip-mount or chest configuration. In the hand-held configuration, be sure that the cable is tightly wound around the rod sections as illustrated, in order that it not get in the way of the loop. A cable that flops around will cause false signalling when it gets near the loop. Allow the cable to be loose enough at the lower part of the rod (where it joins the loop) so that no strain occurs when the loop is paddled back and forth.

If the off the rod option is chosen, there are several ways to mount the control box on the side or chest, as there are two belt slots available, as well as camera strap hooks along the edges of the control panel. One belt slot is on the top of the control box on the bracket that connects the control box to the rod handle, and the other is a part of the detector stand and speaker grill protector. Choose the one that is most comfortable and convenient for you. Belts and camera straps are not provided by White's, although widely available from other sources. This hip or chest mount configuration ensures the least amount of arm fatigue during long periods of use. Again, coil the cable around the rod sections neatly and tightly and leave just enough extra cable from the rod to the control box to ensure ease of operation. Too much free cable will only cause tangling and tripping. Too little free cable will restrict the movement of the loop. Use the velcro straps provided to hold the cable secure. (Movement of the loop cable near the loop will cause a false response.)

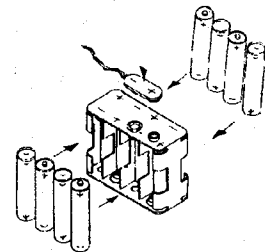
Remove all parts from the shipping carton, and make sure you have the following:



Control Box



Loop



Battery Pack



Straight Rod



Parts Bag



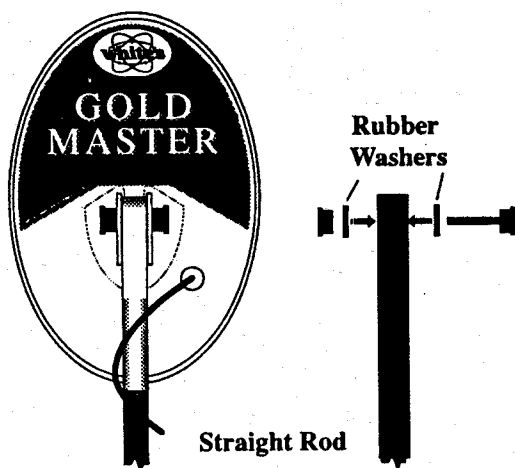
Arm Cup



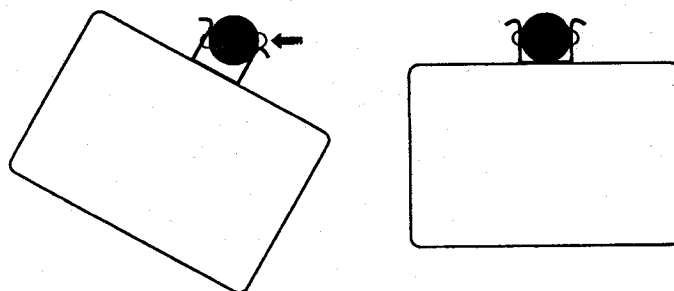
"S" Rod

Middle Rod

The GOLDMASTER V / SAT comes partially assembled. The Straight Rod will need to be attached to the loop as shown (be sure and place the two rubber washers on the clevis end of the Straight Rod as shown before sliding between the loop ears).

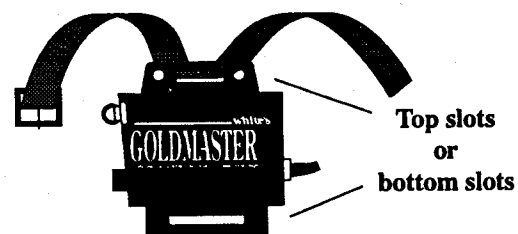
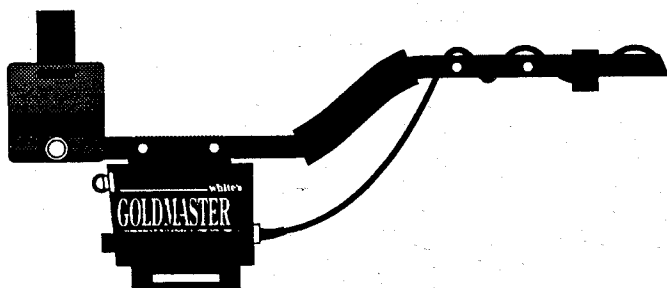


The Control Box snaps off and on the "S" rod by compressing the two spring clip buttons on one side and pivoting the Control Box.

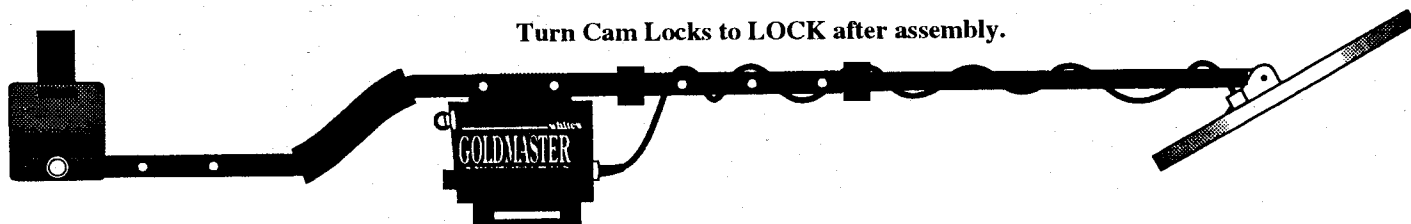


The GOLDMASTER V / SAT can be worn as a hip-mount or chest-mount. To hip-mount, simply remove the control box from the "S" Rod, adjust the length of cable wound around the rod, and weave your belt through the slots on the control box.

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



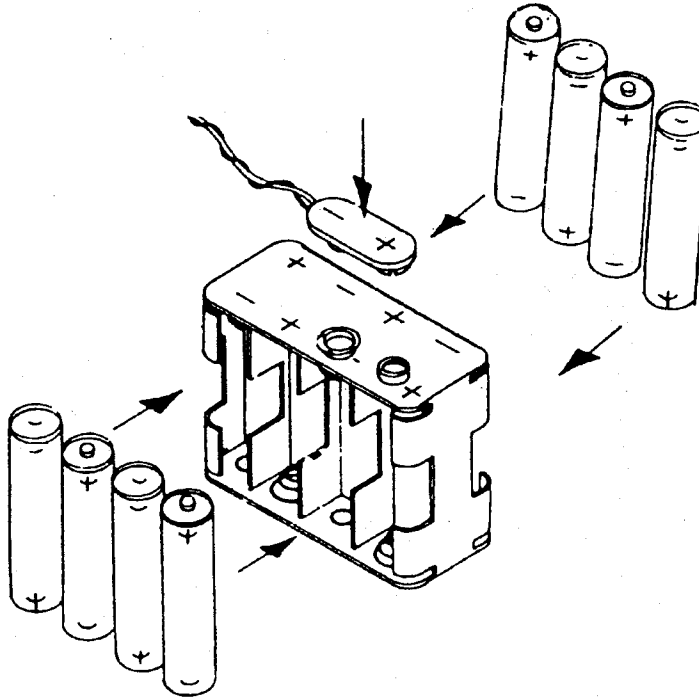
To use as a chest mount use a camera strap around your neck and attached to the "D" rings on the sides of the control panel. Use with belt through the detector stand bottom slot for more stability.



Square foam pad can be installed inside arm cup for added comfort, velcro cable retainers are used to secure loop cable around rods.

BATTERIES

The GOLDMASTER V / SAT is powered by eight 1 1/2 volt penlight batteries. Install these batteries in the battery holder as shown below. Note the flat side $\ominus$ of each battery rests against a spring and the bump side $\oplus$ rests against a solid contact.



Open the battery compartment by grasping the black plastic plunger and pulling. Note: The battery compartment door is located on the back of the control box opposite the control panel. Once the door is removed, attach the battery lead from the detector to the penlight battery holder. It will only fit one way. Install the battery pack into the battery compartment and close the door firmly. Note that the black plastic plunger (latch) has two positions; latched - when the door is pushed firmly closed and un-latched - when the door is to be pulled out. If out of alignment, it may be necessary to gently pull the plunger (un-latch) in order to allow it to latch when closing the door, thereby locking it in place.

A new set of recommended Alkaline batteries should provide approximately 40 hours of use. This will vary with the number of target responses, temperature and threshold level.

Headphones will increase battery life.

When the batteries get weak, the volume (beep) will be reduced. At a certain point, the detector will stop functioning (will not respond to metal).

When the detector is turned on, the battery condition automatically shows on the meter for several seconds before the detector becomes operational. After battery check the meter needle will automatically return to the far left of the meter, and will not move during searching, unless the IRON I. D. feature is used. The GOLDMASTER V / SAT will operate fine when the batteries check in the BATT. LOW area. However, caution should be used and a new set of batteries should be kept on hand. Sometime between checking in the BATT. Low area and/or to the left of the BATT. LOW portion of the meter, the volume (beep) will become weak and shortly after that the detector will cease to respond to metal.

Eight extra 1 1/2 penlight alkaline batteries are always a good idea when far from civilization. An extra penlight battery holder (White's Part #523-0006) is also a good idea when traveling far from home.

Although the GOLDMASTER V / SAT doesn't come standard with rechargeable batteries, high quality systems are available. White's #512-0012 ten cell nicad and #509-0012 ten cell charger are recommended. Contact your Dealer or telephone toll free 1-800-547-6911 for more information.

DESCRIPTION OF CONTROL PANEL

Starting from the lower left-hand corner of the control panel and proceeding counterclockwise, here is a description of each control in detail and explanation of what it does and why it is used.

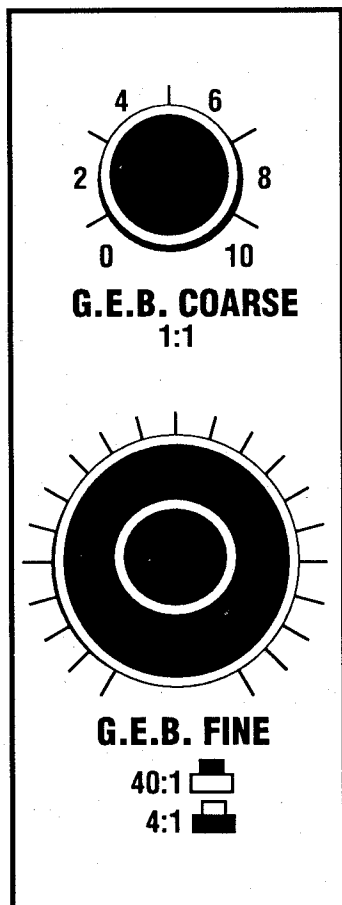
Headphone Jack

The headphone jack on the Goldmaster V / SAT 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. White's Pro Headphone is an example of this type. 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 Goldmaster V / SAT, 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.

GEB Coarse and GEB Fine Controls

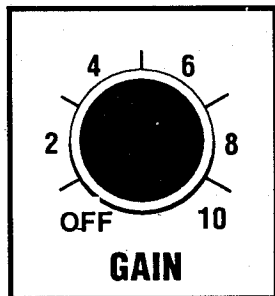


The next two control knobs are used in conjunction with each other and are designed to cancel or neutralize the iron or ground mineralization. Ground mineralization has always been the main stumbling block in the use of a metal detector for electronic prospecting. Years ago, very few nuggets were ever found with a metal detector unless they were quite large or very shallow. This is because the heavy mineralization present blocked out the old TR detectors. The advent of the GEB or ground cancelling detectors in the late 1970's opened the door to electronic prospecting.

The ground balance controls or "pots" are used to cancel this mineralization blocking. The farther clockwise they are adjusted, the more ground they will cancel. However, neither over or under ground balancing is desired, but achieving a proper balance of the ground is the desired goal.

The purpose of the two (2) ground balance pots is to achieve this balance in the smoothest and most complete way. The range of the ground balance control is very important and the Goldmaster V / SAT has a large range. By that we mean that it can balance a broad range of mineralization. The ease with which we can accomplish this balancing is directly related to the degree of resolution the pots have. This is usually measured by describing how many times the knob rotates in relation to a full turn of the pot itself. For example, if the knob rotates 10 times while the pot makes one full turn, it is referred to as a "ten-turn pot". The more times the knob can turn while the pot makes its revolution, the greater is the resolution of the control knob and the easier it will be to control the bad ground and accommodate its changes from place to place. By using two controls White's has expanded the "ten turn" capability of the GEB Fine Control to that of a "forty turn" pot. Therefore, each ten turns of the Fine GEB knob controls approximately 25% or 1/4 of the range of the Coarse GEB knob, giving us a 40:1 ratio. All of this amounts to giving us better and smoother control of bad ground conditions by first getting into the range with the Coarse control and then applying the resolution of the Fine control.

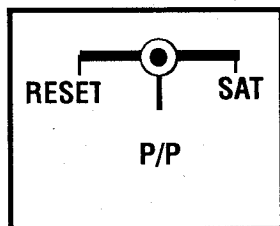
GAIN



This knob controls the GAIN of the Goldmaster V / SAT and functions as an ON and OFF switch as well. Starting from the ON/OFF position and going clockwise, the Goldmaster V / SAT power is turned on and the dial increases the GAIN from a level of "1" to a maximum level of "10". 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 any novice might be that the greatest depth of detection is directly related to the amount of GAIN. The inaccuracy of this assumption is indirectly proportioned 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 depth of detection 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. If the loop is overloading when placed near the ground, the audio threshold will emit a loud piercing squeal. Reducing the GAIN by turning the control counterclockwise will eliminate this. Unstable behavior will be evidenced by static, very uneven threshold or constant false signaling, making it impossible to search and hear actual targets. Thus 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.

MODE Control



The next control is a toggle switch located just above the GAIN knob. This control is un-marked except for the functions of the three positions. These three positions designate the operational mode of the Goldmaster V / SAT. SAT (Self Adjusting Threshold) is the preferred mode of operation and is activated with the toggle moved to the position to the right marked SAT. With the toggle in this position, the Goldmaster V / SAT will emit an audible signal when passed over any metal object, but requires motion of the loop to generate the signal. If the loop is stopped over the metal target, the sound of the signal will stop and the threshold hum will return. This "Motion Mode" is the method used by serious prospectors and will accommodate most ground conditions even with increased levels of GAIN. When used in this mode of operation, the Goldmaster V / SAT will not drift from changes in ground mineralization.

SAT - Is the most used mode of operation on the Goldmaster V / SAT. It is used during tuning, and during searching. With some practice SAT can also be used for pinpointing thus, many Pros leave the mode toggle in SAT continuously. In the SAT mode the Goldmaster V / SAT is continually resetting its own threshold thus a fairly brisk sweep of the loop is required to respond to small gold nuggets. **Always use the SAT mode** when attempting to ground balance the Goldmaster V / SAT. This SAT position must also be used to activate the VARI SAT control used to custom tailor SAT Speed for a given condition. We will discuss the VARI SAT control later in this manual.

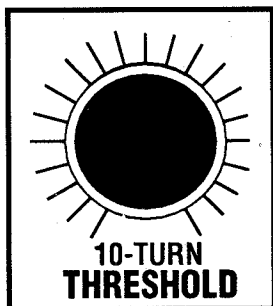
P/P - The center or P/P (pinpoint) position of the toggle will give a larger and broader signal when the loop is swept over a metal target, giving some indication as to the relative size of the target. Primarily a pinpointing mode, the P/P position will allow an operator to sweep the loop much slower than the SAT position and still respond to metal. If however, the loop is held stationary over a target for more than a few seconds, the instrument will cease to respond and the threshold hum will return. Some slight loop motion is needed for the P/P mode to continue to function. The PP position offers the slowest loop sweep speed available with the Goldmaster V / SAT. However, this mode is rarely used for searching (not generally recommended). In the PP mode ground variations, especially Hot Rocks, will be heard as broad changes in the threshold. Pressing to Reset and releasing will reset the threshold.

RESET - The RESET position is spring loaded and will return to PP if released. If searching in PP and the threshold varies (due to ground changes or hot rocks) simply press to RESET and release to reset the threshold. Hot Rocks may produce an excessively long audio response while operating in PP, which can be reduced by flipping to reset and releasing. It may be necessary to hold the toggle in RESET to search the area near a hot rock. If held in RESET a fast SAT Speed is activated however, not as fast as Variable SAT offers.

MODE CONTROL SUMMARY

Use the SAT position when setting the GAIN, THRESHOLD, and GEB controls, as well as for general searching conditions. Use PP if additional assistance is needed in pinpointing a target's precise location, as well as for searching areas of very minimal mineralization when a slow loop sweep speed is desired. **If the VARIABLE SAT control is to be used the toggle must be in the SAT position.**

THRESHOLD Control



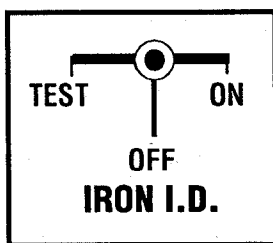
The next control is in the upper right hand corner of the control panel and is designated "THRESHOLD". It is used to set the level of the threshold hum which is maintained constantly while the detector is in operation. The threshold or background hum is set to the faintest comfortable level. This will allow the tiniest and deepest targets to be heard. Set the knob all the way to the left and rotate clockwise till the proper level of hum is attained.

As previously stated, the THRESHOLD should be set to the EDGE of RESPONSE. This is usually described as a faint hum, or threshold. 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, and particularly high impedance high quality headphones. If a faint internal hum is noticed when the THRESHOLD is at the full counterclockwise position (all the way to the left), then one should turn the THRESHOLD clockwise until this faint hum increases slightly. The THRESHOLD will then be on the

edge of sound. At this setting, the sensitivity of the detector is at its best. Be aware of this level of hum and keep the THRESHOLD tuned to it. If the hum drops below this edge, significant loss of depth will be experienced, particularly on very small targets.

The GOLDMASTER V / SAT utilizes a ten turn Threshold control. This means that the control turns ten full turns between minimum and maximum. Because of this it is not obvious where the level is set at any one time. Initially start by turning the THRESHOLD control fully counterclockwise. Then turn the THRESHOLD clockwise until the edge of sound is located, then fine tune the THRESHOLD by turning the THRESHOLD control in either direction until a very slight hum is achieved.

IRON I.D. Control



The next control IRON I.D. is located to the left of the THRESHOLD control, and is the toggle switch which activates the iron identification function. There are three positions for this toggle. The center position is marked as "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 left position is marked "TEST" and is a spring loaded position. If the toggle is pressed toward this position, 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 moved to the right position - marked "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 the Goldmaster V / SAT. When activated, it is designed to modify or eliminate 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.

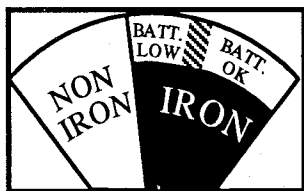
By design, if the identification circuitry is not able to determine if the signal is really an iron target, perhaps because it is either too small or too deep, it will not mute or modify the signal. In this case, the signal will remain good and the dubious target will be dug. This insures that no good 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 in the S.A.T. Motion 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 and increase your Gold Nugget to Dug-Signal ratio.

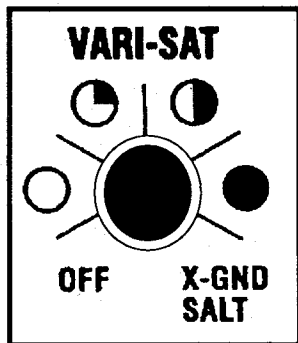
Note again, audio chatter, and meter movement on iron, only occurs when the IRON I. D. toggle is held in TEST or placed in the ON position.

IRON I.D. Meter



The last position on the control panel is occupied by the IRON I.D. Meter. This meter actually operates along with the audio signal activated by the IRON I.D. toggle. When the signal is determined to be Iron by the Goldmaster V / SAT, 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 Goldmaster V / SAT 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. The meter also serves as a battery check. When the detector is turned on, the battery condition automatically shows on the meter for a few seconds. The Goldmaster V / SAT is not operational until the automatic battery check is completed, indicated by the meter needle returning to the far left.

VARIABLE - SAT



The VARI - SAT control is located on the back of the control box (the side with the battery compartment door and loop connection). The VARI - SAT control allows the user to increase the speed of SAT (Self Adjusting Threshold) from the preset factory speed, faster, up to 50 times faster than the standard MODE TOGGLE SAT setting.

As you recall, under the description of SAT, we learned that SAT (Self Adjusting Threshold) re-adjusts the threshold as the loop passes over quickly changing ground mineralization. The normal SAT speed will be adequate for most ground conditions. This is the speed activated when the MODE TOGGLE is in the SAT position and the VARI - SAT is in the "OFF" position (fully counterclockwise).

However, if the ground mineralization is changing from place to place very fast, or the ground contains extreme amounts of iron mineralization or dissolved salt, the detector will become erratic in its behavior, giving false signals or chattering. This interruption in the smoothness of the threshold can obscure the sound of small or deep nuggets. In such conditions it is desirable to activate the VARI - SAT

control. With the MODE TOGGLE set to SAT, turn the VARI - SAT control slowly clockwise until it clicks indicating "ON". Turning the VARI - SAT control clockwise increases the SAT speed. Advance the VARI - SAT control slowly, stopping often to sweep the loop over the ground listening for smoothness of operation. Continue turning clockwise and sweeping the loop over the ground till the threshold smooths out and the GOLDMASTER V / SAT operates stably. Then resume searching.

Earlier GOLDMASTER models had a MODE TOGGLE position labeled XGnd / Salt (extreme ground / salt). If the ground was extreme the only option was to select this XGnd/Salt position which activated the fastest SAT speed. In this way erratic behavior was eliminated. However, it may not have been necessary to advance all the way to the fastest SAT speed to achieve the best performance. Some point between the standard SAT position and the fastest may have been more desirable. This position can now be achieved by utilizing the VARI - SAT control. The reason for using only the amount of SAT speed necessary to smooth operation is that slower speeds tend to detect smaller or deeper nuggets better than quick speeds. By the same token, if SAT is not fast enough to smooth the threshold, ground minerals will obscure the sounds of small and or deep nuggets.

The bottom line is that you can operate the GOLDMASTER V / SAT in areas of extreme ground conditions (alkali salt flats found in the desert areas and black sand or red dirt areas of high iron mineralization) more efficiently by being able to accurately adjust SAT speed. Over 95% of the ground conditions will be adequately served by operating in the standard MODE TOGGLE SAT position (VARI - SAT OFF). As you become more familiar with your GOLDMASTER V / SAT, and learn to recognize when the ground mineralization is becoming a problem, you can experiment with increasing the speed of SAT to overcome ground interference.

PROCEDURES AND HINTS

At this point, you should be familiar with the various controls on the Goldmaster V / SAT, 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 Goldmaster V / SAT, you will recognize the similarity with most other ground-balancing detectors.

SETTING UP THE CONTROLS

Set the G.E.B. COARSE knob midway "5" on the scale.

Set the G.E.B. FINE with the large knob pointing to the midway position - straight up at 12 o'clock.

Set the IRON I.D. toggle to the center Iron I.D. Off position.

Set the MODE TOGGLE to the right SAT position.

Set the VARI - SAT to OFF.

Set the THRESHOLD fully counterclockwise, it may need to be turned a number of revolutions as this is a ten turn control.

Now 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.

While holding the detector with the loop in the air, rotate the GAIN control clockwise to full sensitivity "10" on the scale.

Now 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.

SETTING GAIN LEVEL

Lower the loop of the detector toward 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 "10". If you hear the high squeal, back the GAIN knob off to the left or counterclockwise till 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.

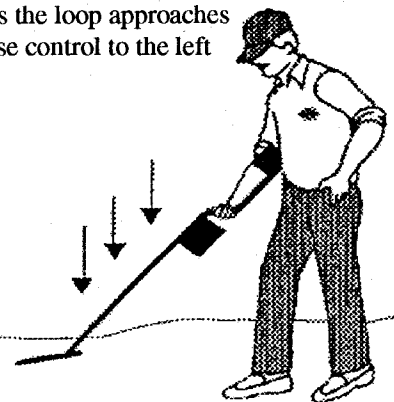
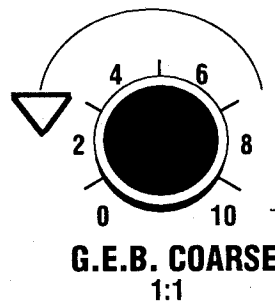
GROUND BALANCING PROCEDURE

Once the GAIN is set, you are ready to go through the ground-balancing procedure. By the way, if you should ever change the GAIN level, you must ground balance again. The SAT MODE TOGGLE position is required during the ground balance procedure. The GOLDMASTER V / SAT is ground balanced in the motion or pumping fashion.

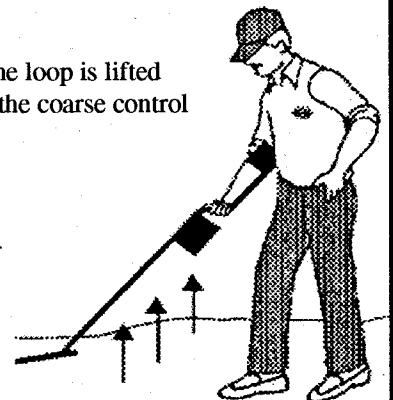
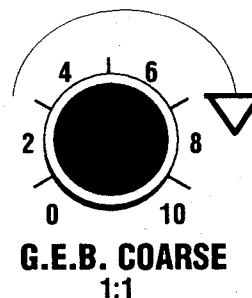
It is important to note that the Iron I.D. toggle should be kept in the OFF or center position during the initial ground balancing procedure. Once this is accomplished, you may switch the Iron I.D. toggle to the ON position if desired. Small corrections in ground adjustment can be made with the Fine Tune control during the process of prospecting even if the Iron I.D. toggle is in the ON position.

Ground balance is done by pumping the loop up and down near the ground as if you were making butter in an old fashioned butter churn, except the loop need only move a few inches up and down. As you push the loop toward the ground a few inches and then pull it away from the ground a few inches, try to determine whether or not the threshold hum gets louder as you pump it on the down-stroke or whether it gets louder as you pull away from the ground (this would indicate that the sound was actually getting softer as the loop approached the ground). Once you have decided whether the sound increases going toward the ground or coming up from the ground, you can make the first correction of ground mineralization by using the G.E.B. Coarse control.

If the sound gets louder as the loop approaches the ground, turn the Coarse control to the left (counterclockwise).



If the sound gets louder as the loop is lifted away from the ground, turn the coarse control to the right (clockwise).



GROUND BALANCE PROCEDURE - Continued

If the sound was getting louder as you approached the ground, begin turning the Coarse control to the left or counterclockwise. If the sound was getting louder as you came up from the ground, begin turning the Coarse control to the right or clockwise. As you pump the loop and turn the control in the appropriate direction, you will ultimately find that the sound will not appear to change much in either direction. At this point, the ground balance has been achieved in a rough sort of way.

Actually, you will note that if you continue to turn the Coarse control, you will over shoot the point of balance (no sound change), and start to create an increase in the opposite direction. The trick is to stop just short of balance and go on to the Fine control. This Coarse control is really just intended to get the ground balance in the ball-park. It will probably only need to be adjusted once for a particular area. That is, unless the ground mineralization changes dramatically from one spot to another.

You will now go to the G.E.B. Fine control and roll the small dial with the side of your forefinger, either right or left (clockwise or counterclockwise) to correct the sound just as you did with the Coarse control. Remember, if the sound increased as you approached the ground, roll the Fine control knob to the left or counterclockwise. If the sound seems to increase as you pull the loop up from the ground, just roll the knob to the right or clockwise. You will soon get used to this pumping action and become quite adept at quickly determining whether or not the sound is increasing on the up or the down pump. Ultimately, you will find that the sound will not appear to change in either direction. At this point the detector is tuned. However, I recommend that a very slight increase should be maintained when the loop approaches the ground. This slight over-tuning for the ground will actually enhance the signal from tiny or deep nuggets. On the other hand, often small BB size hot rocks, which tend to mimic the way small nuggets sound, can often be eliminated by under ground balancing.

Note that the G.E.B. Fine control is a double stacked knob. The larger knob is intermediate, neither coarse nor fine. This intermediate knob follows automatically any adjustment of the smaller Fine knob. You will probably use this Fine control very often during the process of prospecting. The frequency of its use will be determined by how much the ground changes from place to place while you search. You will soon get used to the level of hum that is achieved when you get to a proper ground balance, and when it begins to vary you will automatically make small corrections with the Fine control.

The SAT mode will actually correct the minor variances in the threshold hum caused by the changes in the ground mineralization. These changes may be more dramatic in some areas making the VARI - SAT desirable. Very large changes in the ground must be corrected by adjusting the G.E.B. Coarse or G.E.B. Fine controls. In extreme ground the G.E.B. Coarse control will often be used, instead of the G.E.B. Fine, to update the ground balance during searching. However, in most areas the G.E.B. Fine control is used to periodically update the ground balance setting.

GROUND BALANCE

(Low Mineral Conditions)

The Goldmaster V / SAT is designed to work in an environment of heavy iron mineralization. In some instances however, there may be so little iron mineralization that the loop will never go null or blank when it is lowered to the ground. In other words, there always seems to be a faint hum when the loop is lowered to the ground. Turning the Coarse Ground Balance control fully counterclockwise doesn't change the picture. In this instance, merely set the ground balance knobs to the midpoint or at 12 o'clock and hunt. Any slight changes should be able to be corrected with the Fine Tune control.

VARI - SAT / GAIN

If the threshold becomes too erratic or noisy, it might be necessary to use the VARI - 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 VARI - SAT and GAIN which produces the desired results in your area. 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 VARI - SAT settings or reduced levels of GAIN, or both, to handle such very extreme conditions. Remember, whenever you change the level of GAIN, correct the ground balance. Wet alkali washes can be extremely difficult to work due to the sensitivity of high frequency gold detectors to dissolved salt.

VARI - SAT / GAIN Continued

In some instances, pinpointing is easily performed by merely "X"ing or crisscrossing. 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 target. Some prefer to pass the handful of dirt across the loop directly. Caution must be exercised if this is done. The GOLDMASTER V / SAT 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 SAT mode, you can switch the mode toggle to PP and locate the loudest sound, thus indicating the center of the target. Remember to switch the toggle back to SAT mode when you continue to search.

SEARCHING

Once you have achieved the initial ground balance, you are ready to start searching. As I mentioned before, I recommend using the SAT mode of 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 depth. This is the part that I cannot help you much with. 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 switch to the PP setting and try to pinpoint it. Don't forget to put the toggle back to the SAT setting before resuming searching. 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.

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. 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. Thus, used properly, it will eliminate the need to dig much of the iron trash without the loss of gold nuggets. Conversely, 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 the Goldmaster V / SAT 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 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.

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 Goldmaster V / SAT 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.

Some final tips on the operation of the Goldmaster V / SAT in reference to the interpretation of the audio and visual iron identification function. As I mentioned earlier, I prefer to operate with the IRON I.D. toggle OFF, 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 "10", you might experience some false signals operating at this high level and you will best reduce GAIN to smooth out the performance. The GOLDMASTER V / SAT 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 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 placing 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 GOLDMASTER V / SAT 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!

A handwritten signature in cursive script that reads "Jimmy 'Sierra' Normandi". The signature is written in dark ink and is positioned above the printed name.

Jimmy "Sierra" Normandi

GOLD

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, New South Wales, & Queensland Australia, Austria, The Urals (USSR), Leadhills (Scotland), North Wales, East Sutherland, and Cornwall (UK).

RECOMMENDED READING

FINDING GOLD NUGGETS WITH A METAL DETECTOR.....	James "Jimmy Sierra"Normandi
ZIP ZIP MASTERING YOUR NUGGETDETECTOR.....	LarrySallee
SUCCESSFUL NUGGET HUNTING.....	Pieter Heydelaar
FOLLOW THE DRYWASHERS.....	James Straight
WHERE TO FIND GOLD IN THE DESERT.....	Jim Klein
WHERE TO FIND GOLD IN THE MOTHERLODE.....	Jim Klein
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 GOLDMASTER V / SAT;

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.

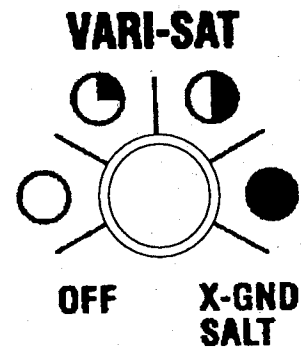
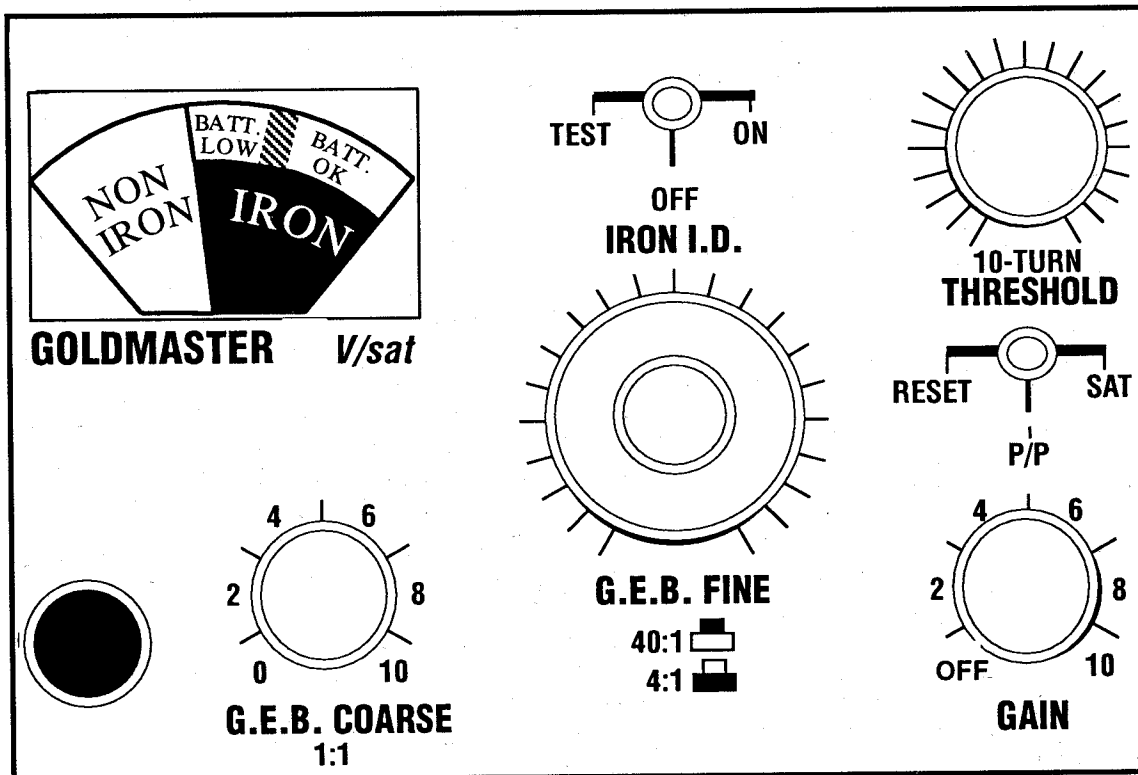
Extra Battery Holder - # 523-0006 If you travel far from home always carry an extra battery system, holder & batteries.

Rechargeable Battery System - #512-0023 Non- Memory Nicad, & #509-0024 Overnight / Fast Charger, allows reuse if 110 Volt outlet is available.

Goldmaster Video - 60 minute VCR instructions regarding use of the Goldmaster.

As a result of the GOLDMASTER V/sat's popularity, a wide range of additional "after market" accessories are available to fit your Goldmaster V / sat, that will compliment your nugget shooting adventures. Hip-mount and chest mount pouches and harnesses, 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.

NOTES

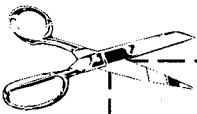


■ Warranty Information

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: _____

Date Code: _____

New Owner:

Name: _____

Address: _____

Comments: _____

Distributor Authorization Code: _____

Owner Information

Serial Number: _____ (6 digits on inside of battery compartment)

Date Code: _____
(6 digits on inside of battery compartment, next to the serial number)

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.

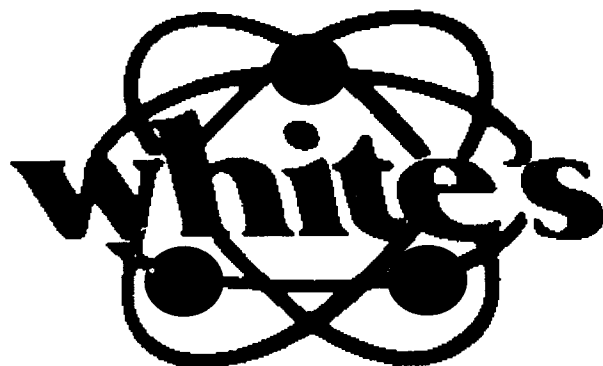
White's registers your purchase only if the Sales Registration Card is filled out and returned to the factory address soon after original purchase for the purpose of recording this information, and keeping you up-to-date regarding White's ongoing research & development.

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
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