

\$1.00



Understanding the PRO Series

*A practical guide to the
differences between the three
Pro Series detectors: 6000/Di PRO
SL, 5900/Di PRO SL, & 4900/DL*

TOLERANCES UNLESS NOTED XXX ± .005" XX ± .010" ANGLE ± 1/2°		WHITE'S ELECTRONICS, INC. © SWEET HOME, OREGON U.S.A. 1991 <small>The print is the property of, and contains proprietary design of White's Electronics, Inc. no part of this design may be used in any way without the written consent of White's Electronics, Inc. Sweet Home Oregon 97268.</small>			
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The 4900/DL differs from the 5900/Di SL and 6000/Di SL in several ways;

- The 4900/DL uses an eight inch concentric loop (coil). Accessory loops can be purchased in four, ten, and fifteen inch sizes to enhance searching for particular size metals.

- The 4900/DL does not have a meter. Detection, and discrimination against trash, is based solely on the sound from the speaker or headphones.

- The Sensitivity control is positioned in the electrical circuit after signal processing. This is significant, as will be explained regarding the 5900/Di SL and 6000/Di SL Signal Balance Control.

- Activation of the S.A.T. (Self-Adjusting Threshold) feature, which smooths and stabilizes searching in the All Metal GEB modes, is available on the Power Control of the 4900/DL. On 5900/Di SL and 6000/Di SL models, a Special GEB/S.A.T. mode is offered.

5900/Di PRO SL

The 5900/Di SL is also a fully manual controlled instrument therefore, ground rejection is also set by following a series of tuning steps.

- The 5900/Di SL has a meter which gives an indication of the probable identity of the target being detected. The meter will show trends which allows you to evaluate a metals likely I.D. prior to digging. In addition to this target identification feature, the meter also gives a depth indication. Knowing approximate target depth aids in pinpointing, and gives you another tool in evaluating a targets likely worth. Deeper targets are more likely to be valuable.

- The 5900/Di SL comes with a high performance nine-and-a-half-inch loop. This loop (the Blue Max® 950) provides deeper detection depth and more ground coverage per pass, compared to loops of similar size.

- In addition to the Blue Max® 950 loop, the 5900/Di SL has a Signal Balance Control which is similar to a Sensitivity control.

The Signal Balance controls input from the loop into the detector's circuitry. This results in a preamplifying effect for the signal coming from the loop before it enters the processing stage. This is very significant because bad ground typically overloads the signal processor, resulting in poor depth. By setting the Signal Balance Control for the maximum signal prior to the occurrence of overload, better signals and thus, increased detection depth is achieved.

6000/Di PRO SL

The 6000/Di SL has an automated ground rejection feature. Not only does this eliminate the need to follow manual balancing steps, it will also sample the ground during searching and automatically update the current ground rejection setting. This feature gives you more accurate rejection of the ground during searching, which results in better depth and stability.

- The 6000/Di SL comes with the Blue Max® 950 (nine-and-a-half-inch loop) for increased detection depth.

- Like the 5900/Di SL, the 6000/Di SL also has a meter which indicates the probable identity of targets as well as their approximate depth.

- The 6000/Di SL also has a Signal Balance control like that of the 5900/Di SL.

- Available only on the 6000/Di SL is the HOT ROCK REJECTION feature.

A hot rock is any rock of higher mineralization than the current ground rejection setting. (Hot rocks are common in areas that have significant mineralization.)

The 4900/DL will respond to such rocks in the GEB/DISC mode. Changing modes to pinpoint by squeezing and holding the push button on the handle will cause most hot rocks to no longer respond. The 5900/Di SL acts much like the 4900/DL SL in regards to hot rocks, but will also give a full scale meter indication on such rocks. Typically, they peg the meter fully left and or right. The 6000/Di SL has a position on the Power Control which rejects

such mineralized rocks in the GEB/DISC Mode, eliminating the need to investigate further, as is necessary with the 4900/DL and 5900/Di SL models.

The option of no hot rock rejection is also available on the 6000/Di SL SL for those who would rather manually identify such targets in the pinpointing mode.

To better understand the differences between these models, a review of ground rejection procedures follows:

4900/DL Pro

1. To set the 4900/DL Pro for ground rejection, place all controls at ∇ except Mode. Set Mode to GEB/NORM.

2. Squeeze and continue to hold the push button on the handle while adjusting the TUNER for a slight hum or "threshold".

3. Release the push button and lower the loop to the ground, listening for any change in the slight threshold hum.

4. If the threshold hum does not change as the loop is lowered to the ground, the ground rejection is already set and the instrument is ready to use.

5. If the slight threshold hum fades or decreases, lift the loop back to waist level, turn the GEB Control slightly clockwise. Squeeze and release the push button on the handle, and again lower the loop to the ground listening for any change in the slight threshold hum.

6. If the slight threshold hum gets louder or increases, lift the loop back to waist level. Turn the GEB Control slightly counter-clockwise, squeeze and release the push button. Lower the loop to the ground, listening for any change in the slight threshold hum.

7. Continue the above steps until little or no change in the slight threshold hum is noted when lowering the loop to the ground. This indicates the ground is being ignored. The instrument is then ready to be used, ignoring the ground thus detecting deeper and operating more predictably in mineralized soil.

5900/Di SL

The 5900/Di SL is set for ground rejection much the same as the 4900/DL. However, the 5900/Di SL features the Signal Balance control. The Signal Balance Control allows the amount of receive signal coming from the loop into the circuitry to be adjusted. This significantly effects the ground balance setting.

To ground balance the 5900/Di SL;

1. Set all controls to ∇ except Mode. Set Mode to GEB/NORM.
2. Squeeze and continue to hold the trigger on the handle while adjusting the Tuner for a slight hum or threshold.
3. Release the Trigger and lower the loop to the ground while listening for any change in the slight threshold hum.
4. If there is no dramatic change in the threshold, the ground balance is already set.
5. If the threshold fades or decreases, lift the loop to waist level. Turn the GEB control slightly clockwise, squeeze and release the trigger on the handle and lower the loop to the ground. Listen for any change in the threshold hum.
6. If the threshold gets louder or increases, lift the loop to waist level, turn the GEB Control clockwise slightly. Squeeze and release the Trigger on the handle and again lower the loop to the ground, listening for any change in the slight threshold hum.
7. Continue the above steps until little or no change in the threshold hum is heard as the loop is lowered to the ground.
8. Difficulties in finding the correct GEB setting can be caused by two different situations.

The first is metal in the ground under the loop. Move over a few feet and try again.

The second is severe ground mineralization which can overload the receive circuits. In this case, turn the Signal Balance Control slightly toward Bad Ground and again repeat the above ground balance steps.

9. If setting the ground balance is very easy, turn the Signal Balance Control clockwise slightly and repeat the above ground balancing steps. The furthest clockwise Signal Balance setting which allows ground balance and smooth stable operation should be used for optimum detection results. Clockwise or counter clockwise Signal Balance adjustments may increase detection depth, depending upon the ground mineralization.

6000/Di PRO SL

The 6000/Di SL has an automated ground balance system. To ground balance the 6000/Di SL;

1. Place all controls to ∇ except Mode. Set to GEB/Norm.
2. With the loop at waist level, squeeze and continue to hold the Trigger on the handle while turning the Tuner control for a slight hum or threshold. Release the Trigger.
3. Push the AUTO GEB switch to the AIR position and hold it there until the detector beeps. Immediately lower the loop to the ground and pull the Auto GEB switch to the GND AUTO/TRAC position. Hold the loop steady until the detector again beeps. If the Air/GND switch doesn't cause a beep, the loop may be positioned over a metal. Move over a few feet and try again.
4. At this point, lift the loop from the ground listening for any change in the threshold. If there is no dramatic change in the threshold hum, the detector is ground balanced. Skip to step #6.
5. If there is a dramatic change in the threshold, turn the Signal Balance Control slightly toward bad ground. Repeat steps #3 and #4.
6. If there is no dramatic change in threshold as the loop is lifted with the Signal Balance at ∇ , then an operator may turn the Signal Balance slightly clockwise and again repeat steps #3 and #4. The furthest clockwise Signal Balance setting that allows no change in threshold as the loop is lifted will produce optimum detection. Detection depth may increase with either a clockwise or counter clockwise Signal Balance setting, depending upon the ground mineralization.

The 4900/DL, 5900/Di SL and 6000/Di SL all have a Discriminate Control which allows the degree of rejection of trash metals to be adjusted.

DISCRIMINATION

The Discrimination Control selects the amount of rejection against junk metals such as nails, tin or aluminum foil. The Discrimination Control only effects the GEB/DISC and TR/DISC modes.

GND REJ (Ground Reject) can be used when in TR/DISC to reject ground mineralization.

SALT indicates the DISC control must be set at this point or higher when used on a saltwater beach. Salt is conductive when combined with water, and tends to respond like a metal rather than a mineral. The DISC Control can cancel much of this salt response when set at salt or higher.

NAILS indicates the point on the dial that most iron is rejected.

▽ is the recommended setting for coins and general purpose searching. At the ▽ setting, most common junk is rejected and most valuables are detected. Settings further clockwise than ▽ may reject common gold jewelry. This exact point can be determined by finding the highest point on the dial that still responds to the U.S. nickel. When the DISC control is set to this point, the maximum rejection of junk is achieved with very little rejection of gold jewelry.

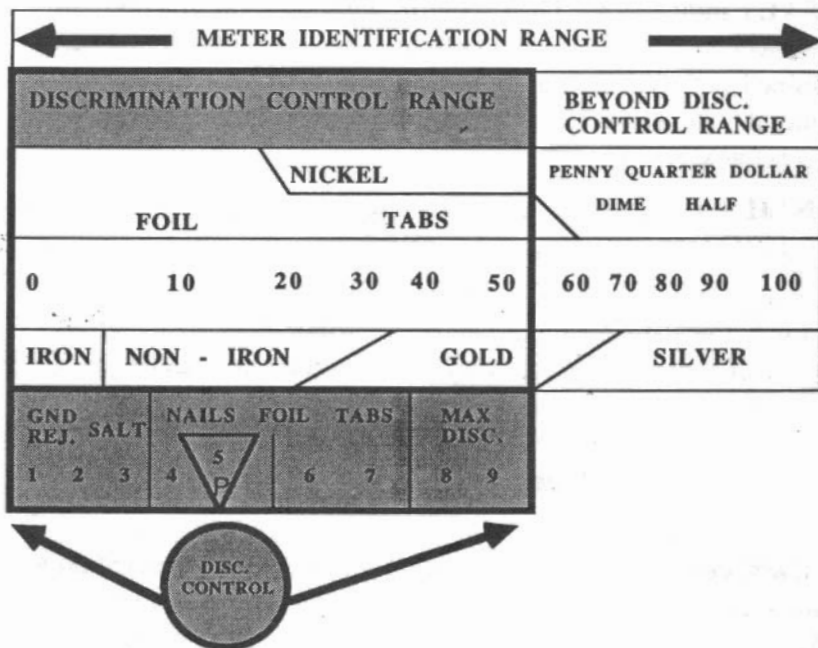
DISC control range from ▽ through Max is represented on the lower section of the meter. Small Foil is rejected prior to Nickels or ▽. Large Foil may not be rejected until after the Nickel and gold jewelry, clockwise from ▽. The ▽ setting on the Disc Control would represent between Foil and Nickel on the meter.

MAX DISC would represent a setting on the meter just below Penny. Penny indication is a copper 1 cent. Pennies made after 1982 are mainly zinc and will indicate just below the Penny on the meter.

A General Rule: Use ∇P or lower Disc Control settings. Then use the meter to further decide if a target is worth digging. Only when the amount of trash dug becomes unbearable should the Disc Control be set higher than ∇P . Both meter identification and depth indication are important factors to consider.

When the Disc control is set to a particular position, all targets which fall to the left will be rejected. They will not respond with an acceptable, smooth, solid sound. Typically, either no sound or a broken cut-short sound will be produced by rejected targets.

Everything to the right of the Disc Control setting will be accepted. Accepted targets produce noticeably smoother, solid sounding responses.



MODE

The Mode control on the 4900/DL varies slightly from that of the 5900/Di SL and 6000/Di SL, featuring GEB/MAX. The 4900/DL needs this maximum all-metal detection mode because it does not have a Signal Balance Control. The S.A.T. feature is accessed

on the Power control of the 4900/DL to smooth and stabilize performance in the all-metal detection modes; GEB/NORM and GEB/MAX. These modes typically need such stabilization for continuous use. Because the 5900/Di SL and 6000/Di SL have Signal Balance Controls, all metal detection with S.A.T. is offered on the Mode Control.

The mode control selects the manner in which the detector operates. Either the detection of all types of metals, or rejection of some metals, or the rejection of ground minerals. Mode selection has the greatest impact on how the detector operates and performs.

•**GEB/NORM** responds to all types of metals while rejecting ground mineralization. It is best used for tuning and pinpointing. This is a true non-motion mode. The loop can be held stationary over a metal target and the detector will continue to respond. This makes GEB/NORM an excellent mode to pinpoint a targets exact location. If the trigger is squeezed and released several times as the loop is passed over the target area, more precise pinpoint can be achieved. This is called de-tuning. Before continuing to search, lift the loop to waist level and squeeze and release the trigger once more to clear for wide scan searching.

•**GEB/DISC** rejects some metals based on the Disc Control setting and rejects ground mineralization. It is best used for coin, beach, and general purpose searching. It is a true motion mode, which indicates that the loop must be continuously swept for metal targets to continue to respond. GEB/DISC is the most commonly used mode. It rejects junk and ground minerals, while operating smooth and efficiently. Squeezing and holding the trigger on the handle will temporarily access the GEB/NORM mode for pinpointing. Before continuing to search, squeeze and release the trigger once more with the loop at waist level to clear for wide scan searching.

•**TR/DISC** rejects some metals based on the Disc. Control setting. It will not reject ground minerals when set for discrimination. It is only recommended for very low mineralized areas such as tan or white sand or areas which allow extremely high Signal Balance settings. TR/DISC has superior rejection against junk and

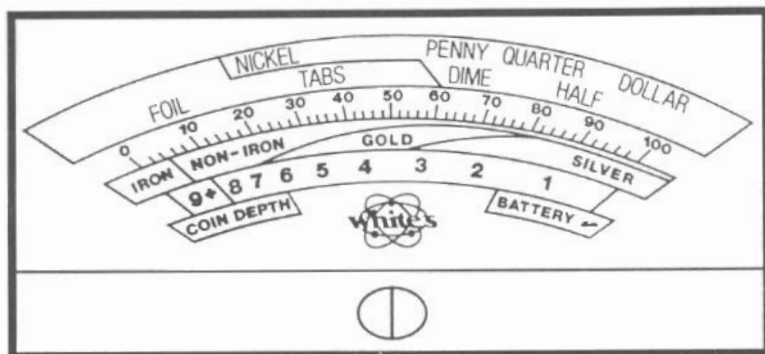
is a true non-motion mode. However, it will not penetrate mineralized ground while at the same time rejecting junk. The TR/DISC mode would pinpoint well. Holding the trigger temporarily switches to GEB/NORM and depth reading if extra help is needed for pinpointing targets exact location.

•**GEB/S.A.T.** responds to all types of metals while rejecting ground minerals. Unlike GEB/NORM, the GEB/S.A.T. mode has a feature which smooths operation over varied ground (self-adjusting threshold). This feature makes GEB/S.A.T. a better choice for general all metal searching. Although it is not a true motion mode, loop motion is required in order for GEB/S.A.T. to continuously respond to a metal target. To pinpoint, slow the loop sweep in an "X" pattern over the target area and hold the trigger and "X" the area using the meter with no audio sound. Or, switch to GEB/NORM and pinpoint as described for that mode.

METER

The following meter information applies only to the 5900/Di SL and 6000/Di SL.

The meter indicates the probable I.D. of a metal target based on a comparison of common targets. It also reads depth based on a coin-sized metal. Both of these measurements are designed to provide valuable information about the target before it is dug.



Probable Identification is listed on the meter in three scales.

Foil through Dollar, 0 - 100, and Iron through Silver. Only those indications which are fairly consistent are of value.

Foil - Dollar scale gives an indication as compared to common USA type metal targets. Nickels, Tabs (pull tabs), Penny, Dime, Quarter, Half, and Dollar. Some overlapping occurs due to varying amounts of the alloys used in such coins over years of production. The Tab and Nickel are particularly challenging. Only a complete tab, not bent in an unusual shape, will indicate Tab. Often when the tail of the tab is not attached, a Nickel indication results. Any indication from Nickel up to Penny could possibly be valuable jewelry. The Dollar indication can pose some problems. A deeply buried aluminum can will indicate Dollar. The Depth meter can provide some help. Deep aluminum cans will give shallow depth indications. Another clue is that cans tend to produce wider pinpointing responses - not as small and isolated as a coin or jewelry response.

0 - 100 is often used for referencing targets not listed on the scale, or those which do not seem to indicate where expected. This is of particular assistance when trying to limit the number of troublesome undesirable targets. See what number they usually indicate and start passing up targets which indicate that particular number.

Iron - Silver scale indicates where natural and man made alloys of Gold and Silver may indicate. The overlapping effect gold alloys have over Nickel, Tab, and Penny areas is apparent. Two 14 Kt gold rings, both of the same size and weight, may indicate differently on the meter. 14 Kt is only fourteen parts pure gold, and is ten parts alloy. This alloy significantly effects the meter indication. Copper will give a higher meter reading, while nickel reads lower. Jewelers use many different alloys with gold to harden it for better wear, and tailor the exact shade or color of a piece of jewelry. Pinning all jewelry down to exact meter indications is not possible. Similarly, natural gold nuggets are not pure 24 Kt gold. They are, in fact, alloys of gold mixed with other metals. The exact mixture will effect where they fall on the meter.

Size and shape will effect the meter indications as well. For

example, large pieces of foil tend to indicate higher on scale than small pieces. The surface area has more of an effect than actual size. A spread out, flat piece of foil will indicate high on the scale. Foil that is actually the same size, but crumpled into a ball, will tend to indicate low on the scale. Similarly, depth indications are effected. The highest degree of accuracy can be expected on coin-sized targets laying flat. Less accuracy will result from coins on edge, and even less accuracy from metals larger or smaller than the average USA coin.

Probable meter identification is not tied directly to the audio sound, or "beep" of the detector. The meter indication and audio discriminator may not agree that a metal is valuable. The meter operates independent of the audio discriminator. It offers a second opinion about whether a target should be dug. Peculiar ground conditions can make the meter indications more or less accurate than the audio discriminate sounds.

Practical application means an operator will consult the audio discrimination and meter indications simply as measurements, comparisons to known metals, and opinions, about digging a target. Ultimately, it is the individual who must decide, through experience and interpretation, what types of indications mean good metal targets in the area being searched.



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