Owner's Guide

TDI™ Pro

White's Electronics, Inc. -
Manufacturers of the World's Finest Metal Detectors

Although the new Pulsescan TDI Pro was designed with the Gold Prospector in mind, its features and performance will be just as valuable to Beach, Relic, and serious coin Hunters.

During the development of the Pulsescan TDI Pro, we kept in mind the comfort of the user, easy to operate, in addition to producing outstanding performance at an affordable price.

The Pulsescan TDI Pro is a deep searching, sensitive pulse induction metal detector which incorporates a user controlled manual ground balancing feature, a by product of which is the ability to produce an audio tone, for possible identification of the detected target.

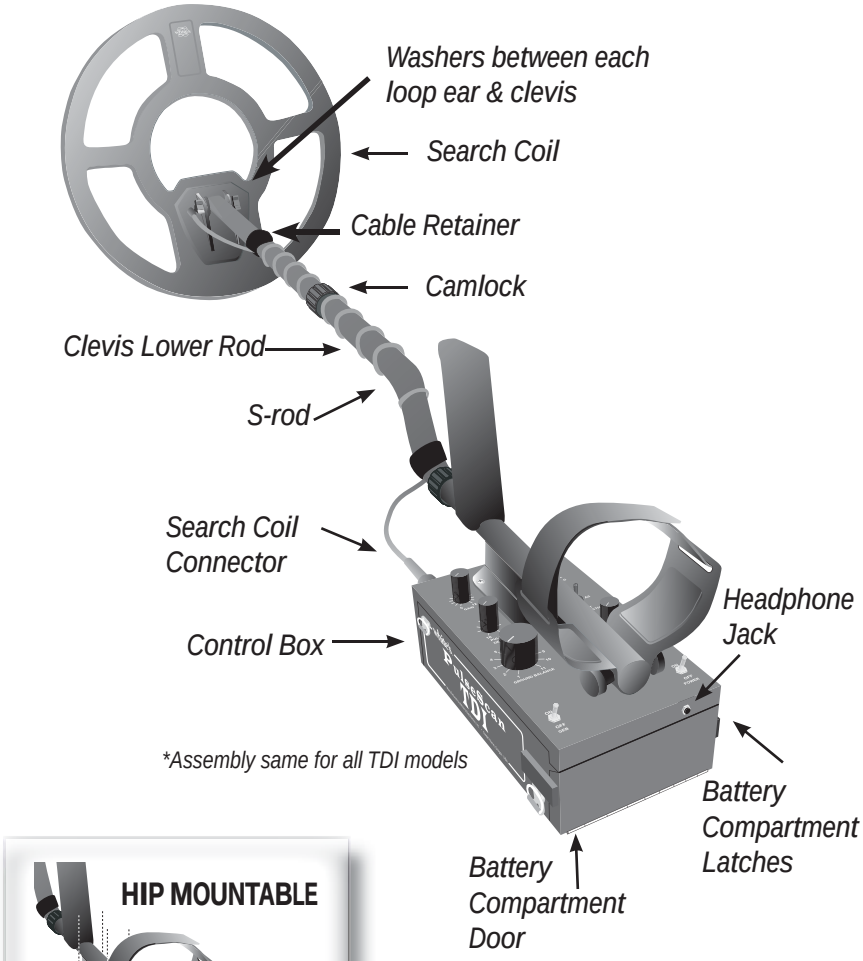
User controlled manual balancing of the ground has the additional benefit of giving the user the option of fine tweaking for different situations, thus increasing the probability of hearing the faint signals of small or deep targets.

The Manual Ground Balance feature of the Pulsescan TDI Pro can be turned off if the ground mineralization is not severe enough to require it, as the pulse circuitry itself is able to ignore most ground mineralization by its very nature. In this situation, with the FINE GEB off, there is no audio tone variation all metal targets will sound alike, and additional depth can be attained in low mineralized grounds.

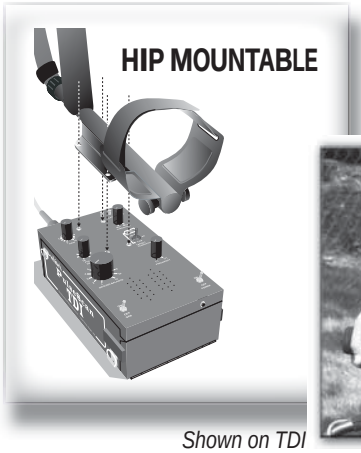
White's is proud to have been able to work with Eric Foster, of Oxford, England, who enjoys the worldwide reputation of being the "Father of Pulse Technology".

Contents -

ASSEMBLY -



*Assembly same for all TDI models



Shown on TDI

1. Remove all parts from the shipping carton and check assembly page to make sure all parts are present.

2. Install black rubber washers on fiber clevis/lower rod, insert lower rod onto loop ears. Use only nonmetallic washers, fiber bolt, and fiber thumb-nut to secure loop/search coil to clevis/lower rod.

3. Unlock "S" rod cam-lock and insert clevis/lower rod into curved "S" rod so that stainless steel spring clip buttons line up and lock into one of the adjustment holes in the curved "S" rod. Turn camlock to secure. The second or third adjustment holes are suitable for average sized adults. Individuals six feet or taller should use the fully extended position. Individuals well over six feet tall should purchase the optional Tall Man Rod accessory.

4. Unravel search coil 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, (10-16) revolutions. Use the black cable retainers, one near the search coil, and one near the top of the curved "S" rod, to hold the loop cable in place.

5. Unlock control box cam-lock and insert curved "S" rod so that stainless steel spring clip buttons line up and lock into the rod on top the control box. The "S" rod is designed to curve up towards the display. However, those who prefer to sweep the search coil close to their feet may desire to assemble the "S" rod to curve down towards the ground. Turn cam-lock to secure. Plug search coil connector into control box (only fits one way), screw lock ring finger tight to secure.

6. Grip the instrument by the handle, with your arm in the elbow cup with strap and sweep the search coil over the floor. If the instrument fit feels uncomfortable, readjust clevis/lower rod length with spring clip button and cam-lock so that the loop/search coil can be held near the floor without requiring bending at your waist (stooping over).

7. Remove the protective paper from the two black arm cup foam pads. Carefully align pads on the inside of the elbow cup, one on each side of the center rod, and press firmly into place.

8. Adjust the elbow cup strap so that it is loose enough for you to slide your arm in and out of the arm-cup without lessening the strap each time you want to set the detector down to dig. The elbow cup strap provides extra leverage and control. However, some prefer not to use it.

9. Charge and install battery as described in the next section.

10. It should be noted at this point that the detector might not work as expected indoors due to the high degree of metal used in modern construction. It is best to tune and practice out-of-doors to ensure stable, predictable results. Additionally, freshly buried targets will rarely produce the typical depth and tone results of targets that have been naturally lost and settled in undisturbed ground. Due to the abnormalities caused by digging a hole in the ground matrix, and the lack of normal target to soil reactions, it may take a number of years for freshly buried targets to respond at true depths. The best way to determine true detection depth is in real search conditions.

11. Hip or Chest Mounting;

a) Disconnect the search coil cable from the control box. On top of the control box, the rod mounting plate has four Phillips head screws. Remove these four screws and remove the rod/loop/arm cup assembly from the top of the control box. To prevent moisture/dirt from entering the control box, replace the four screws on top the control box (sink all the way) without the rod or mounting plate.

b) Unravel enough loop cable from around the rod to allow slack to sweep the rod/search coil. Connect the rod/search coil cable to the control box. Use two black Velcro straps provided to secure loop/search

coil cable to rod, one near the search coil and one near the last revolution of the cable around the rod.

c) The control box can be worn on ones chest, hip, or waist based on personal preference and comfort. Belt hook provided on bottom of control box as well as four “D” rings to attach common camera/dog leash connector type straps.

BATTERY AND CHARGING SYSTEMS -

The Pulsescan TDI Pro uses a rechargeable Lithium Ion Battery pack as the power supply. This type of battery is required to supply the high current levels while weighing much less than other battery packs that have similar power characteristics. It supplies a nominal voltage of 14.4 volts and approximately 500 ma of current during use.

Lithium Ion Batteries require special handling during shipping and travel. UN #3481 & 3480, DOT09042901 (60.2 watt hours). It must be carried on passenger aircraft with contacts taped to prevent shorting. It Cannot be transported if physically damaged.

The GREEN Battery Light on the top right side of the control box indicates battery condition. When this Green Battery Light glows brightly, the batteries have enough voltage to operate the Pulsescan TDI Pro properly. Once the green light no longer shines, stop using the Pulsecan TDI Pro

and recharge the battery. Continuing to use a battery "without the green light shining" can damage the Lithium Ion Battery. Typically the Lithium Ion battery will operate the Pulsescan TDI Pro approximately 8 hours per charge.

Two battery chargers are supplied with the Pulsescan TDI Pro.

1. The Smart Charger *(Part Number 509-0040)* is used to recharge the Lithium Ion Battery from a household wall outlet. It has two internal LED lights that indicate the status of the battery charging cycle.

- **a.** Connect the battery pack to the charger first and then plug the charger into a household wall outlet.
- **b.** The LED lights in the charger will flash RED-GREEN-RED-GREEN. This is a self-check that indicates the charger and battery are operating correctly.
- **c.** The RED light then comes on steady to indicate the charger is charging and the battery is accepting a charge.
- **d.** When the battery reaches a full charge (a minimum of 7 hours), the red light fades and the green light comes on indicating the battery is fully charged and ready to use.
- **e.** If the battery is left connected to the charger for an excessive amount of time, the lights will return to the initial **RED-GREEN-RED-GREEN** cycle indicating the system is no longer charging. First unplug the charger from the wall, and then disconnect the battery from the charger.
- **f.** Only use the charger indoors, it is not weather proof.

g. Do not cover the charger.
h. Do not use the charger in an ambient temperature greater than 140 degrees Fahrenheit / 40 degrees Celsius.
i. Charger and/or battery may get very warm during charging. This is normal.
j. During recharging, position battery on the least combustible surface available.
k. All rechargeable batteries slowly loose their charge during storage, particularly if stored in the metal detector. After periods of storage, recharge the battery prior to use.
l. Lithium Ion batteries can be recharged regardless if a partial charge remains.

2. Optional 12 Volt *(Automobile Accessory Jack)* Battery Charger
a. Connect the 12 Volt charger to the 14.8 Volt Lithium-Ion Battery pack.
b. Connect the Charger to a 12-volt automobile accessory/cigarette lighter plug in.
c. The charger light will flash RED-GREEN-RED GREEN. This self-check cycle indicates the charger is working properly.
d. The RED light will turn on to indicate the battery is charging.
e. When the battery reaches full charge in about 3 hours, the GREEN light will turn on and the battery will be ready to use.
f. Disconnect the charger from the 12-volt automobile accessory /cigarette lighter plug in first, and then disconnect the battery from the charger.
g. It is normal for the charger and battery to get warm during the charging cycle. Position the battery on the least flammable surface available.
h. This is a fast charger (3 hours) compared to the standard wall charger that requires a minimum of 7 hours. Fast charging is not recommended as the sole means of battery charging.
i. Do not use the charger in an ambient temperature greater than 140 degrees Fahrenheit or 40 degrees Celsius.

WARNING -

- Use only to recharge White's 14.8 Volt Lithium-Ion battery pack #510-0023.
- Do not expose the battery or charger to rain or severe humidity *(it is not weather resistant)*.
- Keep all charger and batteries out of reach of children.
- During charging, position battery and charger on least combustible surface available.
- Designed for use with negative ground 12 volt electrical systems only.

CONTROLS

ON/ OFF Gain -

What it does

The ON/OFF GAIN control turns the Pulsescan TDI Pro, ON (clockwise) and OFF (fully counterclockwise) and selects the range at which the detector will hear a given target. Gain increases or decreases the amplification of the receive signal determining both how deeply the Pulsescan TDI Pro will hear a target (in ideal conditions) combined with how it is influenced by ground and external interference (in less than ideal conditions).

How to use it

Ground mineralization gets in the way of hearing target signals. This so-called bad ground can be balanced out by a ground balance procedure (a form of filtering) so that targets can be heard clearly. This process can be accomplished more easily and effectively if the Gain is set at an appropriate level.

Never assume that the higher the Gain is set, the deeper the detector will go. Although environmental noise EMI (electromagnetic interference) can affect the level of Gain that can be used, the ground mineralization has the greatest influence on how high the Gain can be set for optimum performance.

By attempting to use more Gain than the ground minerals will allow, the detector circuit can go into overload and in that condition will not be able to perform properly. In that situation, reducing Gain will allow the detector to effectively balance the ground and operate with increased performance and improved penetration.

When operating the Pulsescan TDI Pro with a Threshold that is as smooth as possible, the clarity of a true target signal will not be confused or hidden by false signals, chatter, or blanking of the Threshold, often the result of too high a Gain setting. Keeping the detector ground balanced is very important, however, the best way to maintain smooth stable operation is to use the appropriate amount of Gain for the area conditions.

Inability to maintain a reasonable Threshold and/or Ground Balance, erratic operation, false signals, or noisy, are all signs the Gain is set to high for the area.

Volume -

What it does

The Volume control increases or decreases the loudness of the audio influencing both target responses and the Threshold level.

How to use it

Starting at the fully clockwise (maximum) position, anytime during searching select a volume level comfortable for your hearing. It is recommended to set volume to maximum prior to selecting a Threshold hum. Then, if target signals are too loud, reduce volume during searching. The Threshold level may need to be readjusted after significant Volume control changes. The Pulsescan TDI Pro requires a Threshold level higher than most metal detectors to exceed noise. By selecting this threshold above noise, and then reducing the Volume control, the Threshold level, and the overall loudness of a target response, can both be optimized to your hearing. When using headphones with separate built in volume controls, it may be best to leave the Pulsescan TDI Pro Volume control at maximum, reducing the volume with the headphone volume control.

THRESHOLD -

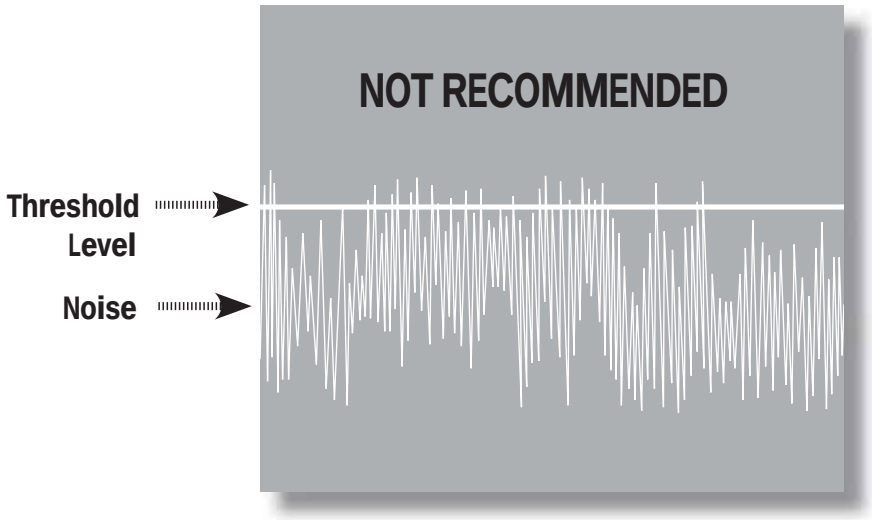
What it does

The Threshold adjusts the steady faint background hum heard continuously during searching. This is the edge of responding, providing the best overall sensitivity to targets as well as indicating what is occurring within the Pulsescan TDI Pro's electronics.

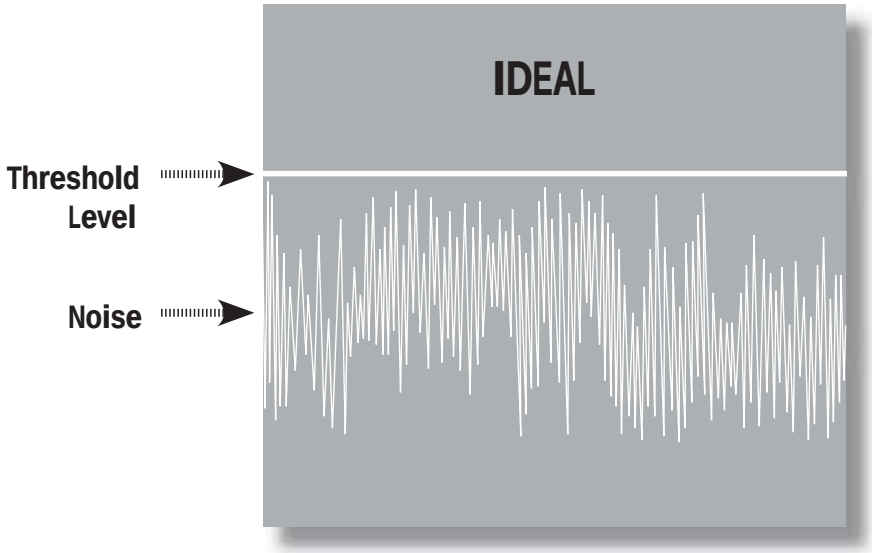
How to use it

In most detectors, including the Pulsescan TDI Pro, the Threshold is adjusted to a faintly audible level, edge of responding. Unique to the Pulsescan TDI units, it is best to adjust the Threshold past the chatter point so that the sound is reasonably steady and continuous. After selecting a Threshold level above the noise level, the Volume control can be reduced to further reduce Threshold to a minimum audible level while still taking into consideration adequate target response volume for your hearing. Again, when using headphones with built in volume controls leave Pulsescan TDI Pro Volume at maximum and reduce volume with headphone control.

THRESHOLD LEVELS ...



Chatter can be heard in Threshold



Threshold set above chatter so chatter is not heard. Reduce volume with headphones

TARGET CONDUCTIVITY-

What it does

This control allows the user to select whether to hear only low- conductive targets, only high-conductive targets, or both types of targets. Low-conductive targets, like small-to-medium sized gold nuggets will make a high-tone sound. High-conductive targets like coins, except nickels, will make a low-tone sound. This feature only works if the FINE Ground Balance control is clockwise from the OFF position. When FINE ground balance control is OFF, the Target Conductivity switch *must* be set to ALL or LOW and all signals will sound the same.

How to use it

Set FINE GEB clockwise from OFF, Set TARGET CONDUCTIVITY to low for low-conductive metals only, including small to medium-sized gold nuggets, most small to large specimen gold in quartz, small gold rings, very small silver rings and small gold coins, nickels, small thin hammered silver coins, small bronze Roman coins, small boot tacks, lead bird shot, tiny broken bits of iron, small to medium aluminum & pull-tabs, foil and bits and tips of small nails, etc.

Set FINE GEB clockwise from OFF, Set TARGET CONDUCTIVITY to high for high-conductive metals only, including all USA coins (except nickels), most silver rings, silver U.S. coins, very large gold rings, large gold nug-

gets, very high content gold nuggets (not common), U.S. gold coins above 2.5 dollars, 24K gold bullion (e.g. Canadian Maple leaf), small to large nails when laying flat in the ground and large pieces of iron, large pieces of lead, lead mini balls, lead musket balls, lead loom weights, bronze buckles, bronze weights, bronze artifacts, etc.

IMPORTANT – TARGET CONDUCTIVITY Toggle only functions when the FINE GEB is ON (clockwise from OFF). If the FINE GEB is in the OFF position, you must set the CONDUCTIVITY TOGGLE to either ALL or LOW

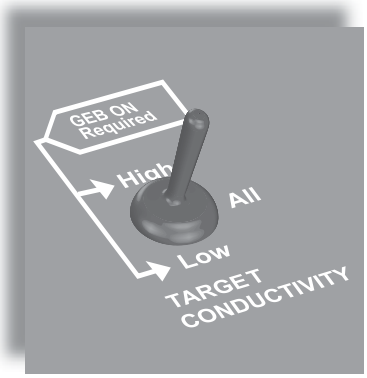
If the TARGET CONDUCTIVITY toggle is set to HIGH with FINE GEB OFF, there will be NO SOUND on any metal target.

ALL

Both
High and Low Conductivity
Targets
RESPOND

HIGH

Only
High Conductivity Targets
RESPOND



LOW

Only
Low Conductivity Targets
RESPOND

NOTE: *Ground mineralization coil size, and ground balance settings can also influence or even reverse the readings. Some low-conductive metals could make a low tone, and/or some high-conductive metals could make a high tone. Set to ALL for both high and low-conductive metals. As long as FINE GEB control is ON, Variable Audio will be heard.*

When prospecting for gold, it is possible to reject a large nugget when selecting to only hear low-conductive metals. The size where a nugget can be classified as large is not exact as its shape and configuration can also be a factor. However, most all small-to-medium sized gold nuggets will fall in the low-conductive category. *Prospectors should possibly opt to search while hearing both high and low-conductive metals until a determination is made as to how targets, including trash, are responding.* If the gold in the area being searched is predominately small to medium sized, then searching in low conductivity only will find most gold, and eliminate most iron trash. Coin hunters can avoid digging small/medium aluminum, foil and small bits of iron trash by using high conductive only. Relic and beach hunters will ultimately find a way to make use of this innovative feature. There is much to be learned by extensive field use, but the possibilities appear to be endless.

MORE about Target Conductivity is listed under VARIABLE AUDIO on page 27 of this guide.

Frequency-

What it does

This control makes small adjustments up or down to the transmitter pulse frequency or rate. This is used to counteract any interference which might be due to outside electromagnetic sources, such as radio stations, microwave, short wave, electric fences, power lines, lightening, electrical storms, or other metal detectors being used nearby. This interference is recognized by a warbling or pulsing of the audio threshold in a repetitive way, and can mask target signals. The Pulsescan TDI Pro has a frequency range of 3.25 kHz to 3.37 kHz pulses per second.

How to use it

Electrical interference is not exclusive to urban areas, where power line harmonics, local radio transmissions, or microwave transmissions can raise havoc with the audio threshold. Getting too close to another metal detectors being operated, or electric fences, or invisible pet fences, will also cause this problem. A slight adjustment of the frequency control can help make the audio more stable.

Pulse Delay-

What it does

The Pulsescan TDI Pro transmits a pulse and then after a time delay, samples the received signal. This is the control knob for adjusting the sample pulse delay. It alters the time between the end of each transmitter pulse, and the start of the receiver-sampling period.

How to use it

PULSE DELAY is measured in microseconds (uS). 10 uS is the lowest setting, which samples as close as possible to end of the transmitter pulse. This setting gives the highest sensitivity to all objects regardless of conductivity. However, raising the pulse delay toward 25 uS can minimize ground mineralization signals and maximize the signal to high-conductive metals such as silver or larger targets by suppressing the signal from low conductivity targets. This setting can be set anywhere between 10 uS and 25 uS depending on the circumstances to enhance performance.

If you wish to concentrate on *detecting low-conductive targets* for maximum sensitivity, you would want to set your Pulse Delay as close to 10 uS as possible for the ground being searched. Low-conductive targets would include small to medium gold nuggets, small or thin gold rings, and chains as well as very thin, small hammered silver coins. If you were detecting for thin gold rings at a beach, this would also be the proper setting to achieve the most sensitivity.

Of course, at 10 uS you will also hear small bits of iron trash, bits of foil, boot tacks and bits of nails, and very small pieces of lead like bird shot. You may hear nails when swept across the broadside, but not when sweeping from tip to tip. Aluminum & pull-tabs will also be heard. Very low pulse delays can also result in the detection of conductive salt water when detecting along beaches. Typically 17.5 uS is the best Pulse Delay when searching wet salt.

If you were primarily looking for *high conductive metals*, such as silver, *increase the Pulse Delay toward the maximum setting of 25 uSeconds,* thus reducing the signals from very small trash items such as small iron and foil. Large iron usually falls into the category of silver, and gives a stronger signal at higher Pulse Delays as well. One important thing to remember is that whenever you change your Pulse Delay, you should check and readjust your ground balance as necessary.

MORE about Target Conductivity is listed under VARIABLE AUDIO on page 27 of this guide.

GEB, Fine & Coarse (Ground Exclusion Balance)-

What it does

These two GEB controls FINE & COARSE adjust or balance the interference from ground mineralization. FINE makes minor adjustments, COARSE major adjustments. They are only operative when the FINE control is set clockwise from the OFF position.

When FINE GEB is in the OFF position, the Pulsescan TDI Pro reverts to a straight pulse induction detector which hears all metal targets without Variable Audio, has no TARGET CONDUCTIVITY option, and no COARSE or FINE manual ground balance control.

Again, FINE is used to make minor adjustments. COARSE is used to make major adjustments. In any FINE ON (clockwise from off) position, the Manual Ground Balance and the Audio Tone features are functional.

How to use it

Ground Balance must be done with the Target Conductivity control set to All.

To ground balance Pulsescan TDI Pro, the search coil is pumped slowly up and down from 1 inch near the ground to 6 inches above the ground while listening for a change in sound.

Start this process with both the FINE and COARSE Controls at the center

of their range (12 O' clock). Begin pumping the search coil slowly up and down 1-6 inches from the ground. You will hear the high tone of low-conductive metal as you approach the ground. Start turning the COARSE knob slowly clockwise as you continue this pumping process. The high tone will usually continue with each pump toward the ground for a short period of time, and then start to fade to no tone other than the threshold hum.

Continue the process of pumping slowly, turning the knob clockwise past the quiet zone. You will begin to hear the low tone as you approach the ground. If the ground has moderate mineralization you may not hear the low tone.

At this point, continue with the pumping process (1-6 inches from the ground), and start turning the COARSE knob back counter clockwise until you near the quiet zone again. NOW switch to the FINE control and fine tune for as little change in Threshold as possible while pumping the search coil 1-6 inches over the ground.

This area of quiet, where you hear only the faint hum of the threshold, is where the Pulsescan TDI Pro is balanced to ignore the ground. You will have to turn the knobs very slowly in very small increments to reach the most exacting point for eliminating ground minerals. Once close, switching to the FINE control eases this process most obviously in extreme ground mineralization. At this point, you will most typically notice that the COARSE knob is between 8 and 9 on the scale. However, the position is not important. What is important is being able to pump the search coil 1-6 inches over the ground with no change in Threshold, indicating the Pulsescan TDI Pro doesn't see the ground.

If you change the Gain or Pulse Delay, you should re-check and re-adjust the Ground Balance setting as needed. Often only FINE control adjustments are necessary after the initial COARSE setting. In addition, if you begin to hear ground noises (false signals) you should also re-adjust the

Ground Balance. Ground Balancing is more difficult at higher GAIN settings. If it appears impossible, reduce GAIN and try again.

If the Pulsescan TDI Pro does not require ground balancing, there is another option. When pumping the search coil 1-6 inches over the ground and turning the COARSE GEB control, if the COARSE position makes no difference, there isn't any change in the Threshold regardless of the COARSE control position, the Pulsescan TDI Pro can be operated as a standard pulse detector with no variable audio, by turning the FINE control fully counter clockwise to off. All targets will now sound the same. The upside the detector may detect deeper in such low mineral grounds. Downside is you dig everything.

If the Pulsescan TDI Pro does achieve ground balance (COARSE control position DOES influence Threshold as the search coil is pumped 1-6 inches over the ground), the FINE control must be used Clockwise of OFF. The Ground Balance, Variable Audio, and TARGET CONDUCTIVITY feature will be active. This situation indicates that there is enough iron mineralization to balance. Again, *the FINE control must be in the ON position (clockwise from OFF) when the COARSE GEB makes a difference in Threshold as the search coil is pumped 1-6 inches over the ground*, and you must select a target conductivity option.

If you are not able to find a ground balance point (Threshold remains steady, COARSE makes no difference) there are two options –

Option #1

You may search with the GEB FINE control OFF (fully counter clockwise). This eliminates the Ground Balance, Variable Audio Tone feature, and the selectable target conductivity feature. The Pulsescan TDI Pro circuitry handles the ground mineralization with its inherent Pulse Induction capabilities. All targets will sound alike, however, greater detection depth may be noted when searching low mineralized grounds.

Option #2

Turn GEB FINE control clockwise On. This activates the Ground Balance, Audio Tone, and selectable TARGET CONDUCTIVITY feature.

Chart A

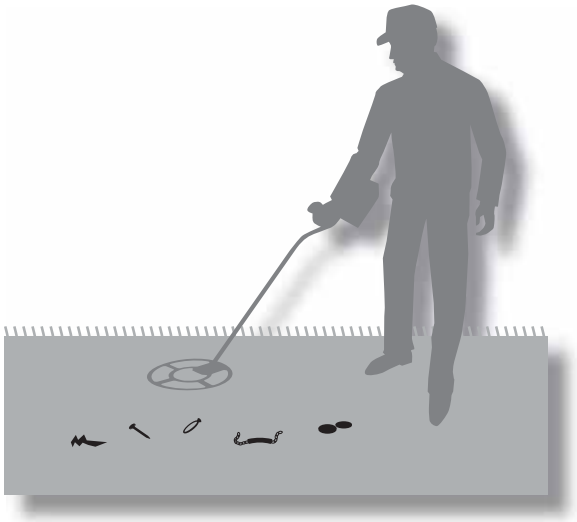
Mandatory settings if you cannot find the ground balance point, and wish to activate the variable Audio Feature.

#1 - If you have set the Pulse Delay at 10 uS, which is recommended for average size gold, set the Ground Balance control at approximately 8.

#2 - If you have set the Pulse Delay midway, set the Ground Balance at approximately 6.

#3 - If you have set the Pulse Delay at 25 uS, which is suggested for beaches, relics, or very large targets, set the Ground Balance at approximately 2.

INITIAL SET-UP -



To get started, set the controls to a mid-range position. For now, the main concern is setting the threshold, and adjusting the settings for the other controls.

#1 - Set the controls to center-range as follows -

GEB Fine	12 noon
GEB Course	"6" or 12 noon
Target Conductivity	ALL
Frequency	12 noon
Pulse Delay	10 uS
Gain	Clockwise to 6
Volume	Fully Clockwise

Check your Battery LED for charge level

2. Adjust Threshold -

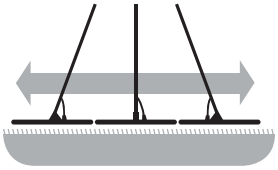
Adjust THRESHOLD control to a faint hum, as noted under "Description of Controls". The threshold hum should be set just above the chatter point so that the hum is reasonably continuous faint, but steady.

3. Get Familiar with a Target Sound-

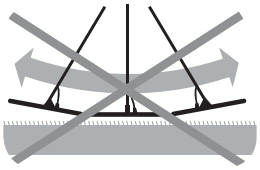
Put a target on the ground to become familiar with the response of the detector. Use a nickel or a gold nugget. Please note that the Pulsescan TDI Pro is a motion detector which means that as the search coil passes over the target you hear a response only when the search coil is kept in motion. Stopping over the target, the signal will disappear and you only hear the threshold hum.

Be sure to use a reasonably sized target, so that you can get a better idea of what a target sounds like. Note that the target audio will get louder, and

Sweep the search coil from side-to-side overlapping each



Keep the search coil flat to the ground as you are sweeping from side-to-side.



the pitch will rise as the search coil passes over the target. Now is a good time to adjust the volume to a comfortable level and so that you can hear a good response

from the target while being able to hear the continuous hum of the threshold when no target is present. If using headphones with volume controls, use Pulsescan TDI Volume fully clockwise, and reduce volume with headphone volume controls.

4. Determine if Ground Balance is necessary-

At this point it is important to find out if there is enough mineralization in the ground to require the Ground Balancing.

1. Set the FINE GEB to OFF and Pump the search coil 1-6 inches over the ground;

a) If there is no change in the Threshold as the search coil is pumped 1-6 inches over the ground, you may leave the FINE GEB in the Off position and operate the Pulsescan TDI with no Variable Audio as a straight pulse detector, and dig all targets, or..

b) If you wish to detect with Variable Audio active, you may turn FINE GEB slightly clockwise from OFF to activate this capability, and set Coarse GEB and Pulse Delay according to Chart under Ground Balance Chart "A" on page 23.

2. If there is a change in threshold as the search coil is pumped 1-6 inches over the ground, continue pumping the search coil while adjusting first the COARSE GEB for no change in Threshold, then the FINE to fine tune for no change in Threshold as the search coil is pumped 1-6 inches over the ground. Inability to balance requires a slight reduction in GAIN and try again.

FINAL ADJUSTMENTS AND YOU ARE ON YOUR WAY

If all has gone well to this point, you might see if you can increase the Gain in small stages. An increase in Gain is desirable in order to increase depth of detection. Never increase Gain at the expense of the inability to handle ground minerals or environmental interference. As with the operation of all metal detectors, too much Gain may not increase depth nor the ability to hear targets. It will be up to you to find the proper setting.

If you change the Pulse Delay or the Gain, and you are operating with FINE GEB ON (clockwise from OFF), you must re-adjust the Ground Balance.

MORE ON VARIABLE AUDIO (low/high tone)

Only if the GEB FINE is ON (clockwise from OFF) will the Variable Audio feature be active. You may then select the type of conductivity feature you wish to use. Either low, high or both low and high. Dependability varies with the size, shape, conductivity, and metal content of the target as well as the type of ground mineralization. In prospecting even the form of the gold (placer, sponge, crystalline etc.) varies, and can make the ability to identify the target difficult as well.

When used for beach hunting and relic hunting, where the occurrence of target types and alloys are more predictable, the value of this feature might be greater. In any case the user should experiment in different locations or applications to determine the level of predictability to be expected.

With some prospecting units on the market, this function is touted as an IRON ID feature. This is not a true description of what is happening, and is why we will call this feature Variable Audio, as that more correctly describes it. The audio responses heard are due to the ground balancing system, and are actually responding to the speed at which the signal from the target decays as the search coil passes over it.

Having tuned out the ground signal, the decay from metallic targets is either faster or slower and does not balance out. Where it falls depends on its size, shape, and conductivity not just whether it is gold or iron. Small to medium gold and nickel coins (which decay faster) can react with a high-pitch tone, while large gold, most silver and copper coins, and most iron (which decay slower) can react with a low pitch. If you depend on this feature to always tell you that the target is gold or iron, you could go wrong. The majority of smaller gold reacts in a predictable way (high-pitch tone), but very large gold can react like iron. In addition, very small nails can react like a small nugget.

The Variable Audio feature can be further interpreted by the tone which it produces when sweeping over a target. As the search coil passes over a detected target, the signal will get louder as it gets closer to the center of the search coil. After the center of the search coil the tone will rise or fall depending on the decay speed.

Therefore, on a low-conductive target (small to medium gold, nickel coins, and small iron) the pitch of the audio tone might rise after passing the center of the search coil.

When the search coil goes over a high-conductive target (large gold, most silver and copper coins and most large iron) the pitch of the audio tone might fall after passing the center of the search coil.

The low tone heard over large non-iron targets (large gold, silver, copper) is usually smoother than the low tone heard over iron targets which can be irregular. In addition, flat iron or steel objects, such as tin lids and flat sided cans can give a mixed response. Mixed responses sound like low tone, high tone, low tone as coil passes over the target. The sweep will have to be slower to notice this mixed response. The high-tone response is usually stronger and longer, but with time and practice this can be helpful to identify flat iron.

With practice, you will be better able to use your low tone and high tone to help you get an idea of what kind of target you are detecting and help to eliminate some trash items. However, it is always better in a new area to dig everything until you get an idea of what you are likely to find. Keep in mind that no system is perfect, and when in doubt DIG!

MORE ON PULSE DELAY

Sampling as close as possible to the end of the transmitted pulse gives the highest sensitivity to all metal targets regardless of their content or conductivity. The best signal from all targets is obtained when using a short (10 uS) delay. However, increasing the Pulse Delay beyond 10 uS toward 25 uS will minimize or eliminate the signal from low-conductive targets, so that high-conductors stand out more even though they are giving out less of a signal because they are sampled further down the decay curve. For maximum sensitivity to all targets, you would want to set the Pulse Delay as close to 10 uS as possible for the area ground conditions

As you would expect, a nickel would fall into the same category as gold and will be heard at 10 uS as a high tone. Larger silver and clad coins will produce the low tone. With alloyed gold, the conductivity can vary, so the optimum pulse delay can vary as well. Generally speaking, alloyed gold will be seen as low conductive (high pitched tone), so will be seen best at a lower pulse delay (10 uS). 10k or 14k rings will usually react as low conductive, whereas a purer gold ring, (22k and 24k), may react as high conductive (low pitched tone). This can also be the case with very pure or large gold coins and gold nuggets. A solid US $5, $10 or $20 gold coin will usually read as high conductive, whereas, a $2 1/2 gold coin will read low conductive. Pure gold Bullion (24k) like a one ounce Canadian Maple Leaf will read as high conductive as well. This can be the case with a very large gold nugget or a very pure or high gold content nugget, Fortunately, most gold nuggets are of mixed alloy and fall into the low conductive category. Most U.S. gold nuggets read as low conductive, thus producing the familiar high tone. However, most Alaska and Australian gold which is over 90% gold will read as high conductive with a low sound.

The size and shape (surface area) of the target has a bearing on the optimum setting for the Pulse Delay. It is recommended to experiment with different targets at different Pulse Delay settings. This is best done with the FINE GEB off, so that all targets sound the same, and the sensitivity to

the target can be observed The Pulse Delay can be changed to optimize sensitivity to desired targets. After you have seen how the Delay affects the signal, you can try the same tests with the FINE GEB on (clockwise from OFF) and the Conductivity Toggle to all. At this time you can observe whether the target produces a high tone or a low tone. You can then choose either the low or high settings to observe how the Conductivity Toggle setting can eliminate or accept a target.

The important thing is that you do have control over the Pulse Delay, and therefore over the optimization of the sensitivity of the detector to certain desired targets. The rule of thumb would be to set the Pulse Delay at 10 uS when prospecting for small to moderate gold nuggets, and set it closer to 25 uS when hunting on beaches for coins or relic hunting for iron and more conductive metals such as brass.

Since the Pulse Delay setting does affect the Ground Balance process, you must re-adjust GEB (ground balance) after changing the level of pulse delay. Most typically only minor adjustments to FINE GEB are necessary after minor Pulse Delay adjustments. In addition, the level of Pulse Delay will have an affect on the ability to reject the ground, particularly wet salt type soils.

During TDI field-testing, an extreme black sand and salt water beach was selected as the toughest ground we could find. The Pulse Delay was initially set at 10 uS. At once we found that we had trouble achieving a clear ground balance point as the extreme negative black sand and conductive salt were reacting. The audio was too noisy to allow recognition of real targets. Lowering the Gain helped a little, however increasing the Pulse Delay to mid-range (around 17.5 uS) rendered the Threshold smooth, and we could then achieve a clear Ground Balance point.

Even though a Pulse Delay of 10 uS would have been ideal for the types of low conductive gold jewelry we hoped to find, the higher Pulse Delay allowed for improved Ground Balance, Gain, and stability, resulting in

better overall performance. Our first target was a nickel coin over 12 inches, which has the low conductivity just like most jewelry.

WHITE'S WARRANTY SERVICE CENTERS

At your nearest White's Service Center, everything is carried out just as if you returned your metal detector to our factory in Oregon. White's Service Centers are factory trained and equipped, and provide high levels of metal detector service with fast turn-around times. Constant communication with the factory keeps them up-to-date with the latest manufacturing and technological details. Your area service center offers many advantages. We encourage you to take advantage of the local option, and use them for all of your White's service needs.

1. White's West Service Center
White's Electronics
1011 Pleasant Valley Rd.
Sweet Home, OR 97386
(541) 367-6121
(541) 367-6629 FAX
service@whiteselectronics.com

2. White's Midwest Service Center
Electronic Exploration
575 West Harrison
Lombard, IL 60148
(800) 392-3223
(630) 620-0618
(630) 620-1005 FAX
tony@ee-il.com

3. White's Southeast Service Center
Centreville Electronics
10063 Wellington Rd.
Manassas, VA 20110
(888) 645-0202
(703) 367-7999
(703) 367-0868 FAX
bob@cwrelics.com

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www.goldsearchaustralia.com

WHITE'S USA 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 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 by your dealer soon after original purchase. The purpose of recording this information is to keep 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 nor 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 Electronics, Inc.

WHITE'S USA WARRANTY TRANSFER -

If for any reason you should sell your Pulsescan TDI Pro prior to the date the warranty expires, 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 applies to both the original owner as well as any secondary owners.

FOR USA

ORIGINAL OWNER -

Name: _____

Address: (Which appears on the original warranty card):

_____

_____

_____

Instrument Serial #: _____

Original Purchase Date:_____

NEW OWNER -

Name: _____

Address: _____

_____

_____

Comments: _____

_____

_____

WHITE'S ELECTRONICS (UK) LTD.
After Sales Service - Limited Warranty

The serial number which is unique to your unit is on a white label inside the battery compartment. Please quote this number on any correspondence regarding your detector.

White's Electronics has always been concerned with the absolute quality of their mineral/metal detectors. Service after the sales is of extreme importance to us and we always do our utmost to ensure that customers are satisfied with our units. If your unit should require servicing or repair, simply return it to us at the factory in Inverness, and we shall carry out the necessary work for you.

ANY WORK CARRIED OUT BY UNAUTHORIZED PERSONS WILL AUTOMATICALLY NULLIFY THE 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 Electronics (UK) Ltd. will repair or replace at its option, all necessary parts without charge for parts or labor.

Simply return the detector to our factory in Inverness, Scotland, giving details of the faults.

Items excluded from the warranty are non-rechargeable batteries and other accessories.

The warranty is not valid unless the Warranty Registration Card is returned to the factory address within 10 days of the original purchase for the purpose of recording that date, which is the actual commencement date of the warranty. This warranty does not cover damage to the detector caused by accident, misuse, neglect, alterations, modifications or

unauthorized service. Duration of any implied warranties (e.g., merchantability and fitness for a particular purpose) shall not be longer than the stated warranty. Neither the manufacturer nor the retailer shall be liable for any incidental or consequential damages resulting from defects or failures of the instrument to perform. This warranty does not affect your statutory legal rights.

White's Electronics (UK) Ltd.
35 J Harbour Road - Inverness, Scotland - IV1 1UA
Telephone: (01463) 223456 - Fax: (01463) 224048
E-mail: sales@whites.co.uk
Web site: www.whites.co.uk

To comply with European Legislation (Directive WEEE) this unit must not be disposed of, at the end of its useful life, in any waste bin or landfill site but must be returned to any White's Dealer/Distributor for proper disposal under the legislation.

Please contact White's Inverness for the details of the nearest dealer/distributor.

WHITE'S (UK) LTD WARRANTY TRANSFER

If for any reason you should sell your Pulsescan TDI Pro prior to the date the warranty expires, the remaining warranty is transferable. Simply fill out the following information, including the Authorization Number, seal it in a stamped envelope, and send it to; White's Electronics, (UK) Ltd.

FOR SCOTLAND

ORIGINAL OWNER -

Name: _____
Address: (Which appears on the original warranty card):
_____
_____
_____
Instrument Serial # _____
Original Purchase Date:_____

NEW OWNER -

Name: _____
Address: _____
_____
_____
Comments: _____
_____
_____

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