

# Troy Custom Detectors

## SHADOW X5

### Owner Instruction Manual



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*High-Performance Detecting ... Simplified!*

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Printed in the U.S.A.

**Troy Custom Detectors, Inc.**

**13015 Harkness Drive**

**Dallas, Texas 75243**

**(972) 690-5703**

Version 1.2 January 2003

A message from ...



**Troy Galloway, President of  
Troy Custom Detectors, Inc.**

Shadow X5'ers,

In this day and age it is not easy to start a new company with new products and compete successfully with the larger and well-established companies. This is the reason I want to express my sincere appreciation to you for becoming an owner of a Shadow X5 detector. This is currently my Top-Of-The-Line detector and you deserve V.I.P. Customer Service!

"Customer Satisfaction" is my top personal goal and objective. It is a simple deduction, if you are not happy with your Shadow X5 then I also cannot be happy. As the Owner of Troy Custom Detectors, Inc. and a fellow detectorist, I want you to contact me personally if you ever experience a problem with your Shadow X5 that is not resolved to your satisfaction with our normal Customer Service channels. I can be reached at 1-877-437-4345 (toll free).

I wish you the best of luck with the finds you make with your new Shadow X5 and hope to see you in the field.

Best regards,

A handwritten signature in cursive script that reads "Troy".

Troy Galloway

■ NOTES

Date Purchased: \_\_\_\_\_

Purchased From: \_\_\_\_\_

\_\_\_\_\_

Serial #: \_\_\_\_\_

**NOTES**

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**High-Performance Detecting ... Simplified!**

Team X5er's

Your new Troy Custom Detectors Shadow X5™ metal detector is built with the finest parts and workmanship available. It is designed from top to bottom to provide you with many happy hours of enjoyment in the most rewarding hobby I can think of – Treasure Hunting!

Ahead of you lie fascinating and exciting experiences as you step into the past, uncovering artifacts lost by past generations or as you take pleasure in the great outdoors with family and friends searching for precious metals. I only wish we could share these future experiences with each and every one of you.

Your Shadow X5 has the features and performance needed for you to become successful in virtually all land hunting applications and situations. As with any other metal detector, familiarity with this instrument is essential in determining how successful you can be. I recommend that you read this manual and fully understand how to operate this detector before attempting to use it in the field. As you become more familiar with your detector through practice, your rate of success will increase dramatically.

The Shadow X5 is an extremely sensitive, deep-seeking metal detector that may at times need to be operated at less than maximum settings. We feel it is important to have maximum detecting capability available when needed, but just like a high-performance sports car ... you can't always drive around at 200 miles-per-hour!

The Shadow X5 is a precision electronic – made in the U.S.A. – instrument that will last for years if properly cared for. Treat it right and it won't let you down.

Good Hunting!

Troy Galloway

## ■ WARRANTY

### LIMITED LIFETIME WARRANTY

Troy Custom Detectors believes in the products we produce and backs this belief with a limited lifetime warranty - the best in the industry - on all of our consumer detectors. Warranty may vary outside of the United States. See your dealer for details.

Troy Custom Detectors does not warrant suitability to specific use and shall in no event be liable for any direct, incidental, consequential or indirect damages.

***WARNING: The opening of the sealed control housing or any alteration and/or modification voids all warranty coverage by Troy Custom Detectors and Fisher Research Laboratory.***

Troy Custom Detectors is committed to providing you, our valued customer, with superior service. Each and every instrument is rigidly tested and carefully inspected during assembly and before shipment. Should you have any questions or problems - sales, company info' - contact:

Troy Custom Detectors, Inc.  
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email: [info@fisherlab.com](mailto:info@fisherlab.com)  
for a dealer near you 1-800-M-SCOPE-1 1-800-672-6731

Troy welcomes all calls to personally assist you with any questions, problems or tips. Please place calls between 10:00 AM and 6:00 PM Central Standard time. Prospective Dealers Welcome!

■ SPECIFICATIONS - continued

**Battery Life:** Approximately 25 hours for Alkaline and 50 hours for Lithium

**Battery Compartment:** Drop-In and Weatherproof (No Wires or Connectors)

**Battery Door:** Weatherproof with Positive Lock Fastener

**Battery Test:** On-Demand with Variable Audio Tone

**Control Housing:** Internal RFI Shielding and Weatherproof

**Pushbutton Pinpoint Switch:** Weatherproof

**Toggle Switches:** Weatherproof With Internal O-Ring in Actuator

**Control Knobs:** With O-ring & Tension Adjustable

**Optimum Temperature:** 20 to 110 degrees F

**Optimum Humidity:** 0 to 100% R. H.

**Rod Design:** 3-Piece with snap-button and camlock stabilizers

**Arm Cup:** Foam-Padded Adjustable – Forward & Backward and To Arm Size

**Warranty:** Limited Lifetime

■ FORWARD

Your Shadow X5 is a deep-seeking, extremely advanced metal detector expressly designed to excel at coin, jewelry, relic, prospecting, competition and cache searching. It is designed to have **High-performance; Extreme Comfort** and effortless **Ease-of-Use**.

We are very happy to say that all design goals have been achieved and are quite evident in the overall performance, versatility and packaging of the Troy Shadow X5 metal detector.

Yes, its performance is first-rate! Its comfort has to be experienced to be appreciated and its ease-of-use is the perfect complement to its wide-ranging versatility.

The Shadow X5's miniature, state-of-the-art electronic design, using ultra-miniature surface-mount electronic components, greatly contributes to a detector that is very compact, lightweight and comfortable to use ... even for those all-day hunts.

It features simple, front-panel operation, using 'real' knobs and switches. There are no complicated programs, layered menus to navigate or remember, and a user can immediately tell at a glance, exactly how the detector is tuned and operating.

Changing modes, pinpointing targets and 'fine-tuning' the X5's settings and operation could not be easier! The Shadow X5 is a very user-friendly metal detector!

Troy Custom Detectors has invested heavily in the design and development of the Shadow X5. We utilize the best design engineers available, incorporate leading-edge technology and make use of a first-class production, test and service facility.

Throughout the design and development of the Shadow X5, we gathered suggestions and comments from detectorists across the United States. All of this 'feedback', combined with very extensive pre-production field testing, gives you a metal detector unlike any you have owned or used before. With Troy Custom Detectors Shadow X5, your metal detecting experience, enjoyment and success is about to change forever!

■ FEATURES

The Troy Shadow X5 is a lightweight, powerful, extremely versatile metal detector that provides a unique combination of features, modes, functions and operator-control.

**Some Unique Shadow X5 Features Include:**

- ▶ **Ultra-Light Weatherproof Design – 2.5 lbs with Battery**
- ▶ **Single, Drop-in, 9-Volt Battery – Up to 25-Hours operation from a Alkaline type and 50 hours from a Lithium type battery**
- ▶ **Turn-On-and-Go Operation or Full Manual Control**
- ▶ **10-turn manual or preset ground balancing options**
- ▶ **3 Operating Modes – Discriminate, All-metal and Beach**
- ▶ **Tri-level Target-Check™ Function for Signal Comparison**
- ▶ **Auto-tuned Threshold-Dependent All-metal mode**
- ▶ **VCO, Disc-Mode or All-metal Pinpointing – Your Choice**
- ▶ **Deep, padded arm cup. Soft, comfortable hand grip. Built-In detector stand**
- ▶ **Strong, rigid ABS plastic search coil and control housings**
- ▶ **O-ringed controls for stability and weather protection.**
- ▶ **Interchangeable search coils**
- ▶ **Maximized-design. Ease-of-control and operation**
- ▶ **High-sensitivity 19 kHz operation**
- ▶ **Limited Lifetime Warranty – From Fisher Research Laboratory**

■ SPECIFICATIONS

**These specifications are subject to change without notice**

**Ultra-Light Weatherproof Design:** 2.5 lbs With Battery (May Vary Slightly)

**Turn-On-and-Go Operation:** Fixed Preset and Manual Ground Balance

**Silent Search Operation:** All Modes of Operation

**Adjustable Audio Threshold:** All-Metal Auto-Tune Operation

**VLF Fast Response:** All Modes of Operation

**Operating Modes:**

- **Normal Discrimination** Fixed-preset or Manual Ground Balance
- **Beach Discrimination** Fixed-preset or Manual Ground Balance
- **All-Metal Auto Tune (Motion)** Fixed-preset or Manual Ground Balance
- **Black Sand All-Metal Auto Tune (Motion)** Manual Ground Balance
- **Target Check** Fixed-preset or Manual Ground Balance
- **VCO Pinpoint (Non Motion)** Fixed-preset or Manual Ground Balance

**Audio Discriminator:** Full Range (All-Metal)

**Ground Balance:** User-selectable Fixed-preset or Manual 10-turn Precision Ground Balance Control

**Operating Frequency:** 19 kHz

**Frequency Shifter:** ±140 Hz Above and Below 19 kHz

**Standard Search Coil:** Waterproof 9-Inch Round Concentric Spider

**Search Coil Compatibility:** 7-Inch Accessory Round Concentric and Future Troy Custom Detectors Accessory Coils

**Coil Cable Length:** Approximately 3 ft 6 Inches (42 Inches)

**Audio Frequency:** Approximately 600 Hz Discrimination, 550 Hz All-Metal Auto-Tune

**Audio Output:** 1 kHz tone to a sealed 3-inch Mylar-coned front-panel-mounted speaker or weatherproof rear-mounted ¼ -inch stereo headphone jack

**Headphone Compatibility:** Standard ¼ -inch water-resistant stereo plug

**Battery Requirement:** Single 9-volt Alkaline or Lithium

## ■ GLOSSARY - continued

**Target Masking** - The affect of a discriminated target near a desirable target which prevents the desirable target from being sensed and heard. (see recovery speed also)

**Target Perception** - The ability to audibly determine the exact center of a small target prior to retrieval by listening to its audio signal. Head-phone usage markedly increases target perception by providing a balanced audio signal to each ear, thus making target 'centering' easier.

**Threshold** - The slight audio sound heard through the speaker or headphones when operating in the threshold-dependent all-metal mode or threshold discrimination mode. The threshold sound is set by the threshold control and can be kept constant by using auto-tuning.

**Threshold-Dependent All-Metal Mode** - An operating mode that responds to any metallic target. When adjusted properly, this mode always has a slight background audio tone, known as audio threshold, that 'informs' the operator that the detector is operating at its optimum peak threshold point.

**Tone** - The pitch (frequency) of the audio signal heard through the speaker or headphones when a metal target is sensed.

**Tweak** - A slight adjustment to a control. To fine-tune.

**VCO** - Voltage Controlled Oscillator. A method of audibly presenting target information by both frequency (tone) and amplitude (volume). As a target is approached, using VCO, the tone and volume begin to increase from a soft 'growl' to a louder, higher-pitched tone as the target center is passed directly beneath the search coil center. VCO is a momentary operating mode to aid in pinpointing and target recovery.

**VLF** - Very Low Frequency. A range of electromagnetic frequencies where ground-canceling metal detectors typically operate. This range extends from about 1 kHz to 50 kHz with most detectors operating in the 3 kHz to 30 kHz range.

**Zero Discrimination** - A motion discrimination setting that is activated by placing the discrimination control at its full counterclockwise number '1' position, thus accepting all metal targets. Search coil motion is required to detect targets.

## ■ ASSEMBLY

Assembling your Shadow X5 metal detector is a simple and easy task that should take only a few minutes to accomplish. – No special tools are required.

The search coil is shipped already attached to the lower stem (pole). All that is required to complete assembly is to attach the lower stem to the upper S-pole/control box assembly.

Carefully unpack and save the shipping box for storage or future shipment. Your box should contain:

1. **SEARCH COIL** - With coil-mounting hardware – bolt, nut and two rubber friction washers - Factory assembled.
2. **POLE** - The pole assembly consists of a lower and upper half.
3. **BATTERY** - One 9-volt Alkaline type - Factory installed.

If any of these items are missing, immediately contact the Troy Authorized Dealer where your detector was purchased.

### ► ASSEMBLY

Unscrew the silver-metal coil connector locking collar (turn counterclockwise) and temporarily disconnect - by gently pulling outwards - the coil connector from the rear of the control-box housing.

Loosen (turn counterclockwise - as viewed from the operating position) both plastic camlocks on the upper and lower poles.

Insert the lower stem with attached coil into the upper pole assembly by pressing and holding the silver snap-button. As you slide the pole into the upper pole, guide it to drop the snap-button through the fourth (middle position) snap-button hole.

Hold the detector as you would while using it and adjust the shaft length to match your height and stance by pressing-in on the snap-button and moving the lower pole to the most suitable hole position for you.

■ **ASSEMBLY - continued**

Slightly loosen the coil mounting wing-nut and adjust the coil angle to be parallel to the ground while holding the detector in its operating position.

Tighten the wing-nut to lock and hold the coil position firmly in place. Take care to not over tighten the wing-nut.

Tighten both pole camlocks by turning fully clockwise - as viewed from the operating position.

Leave an inch or two of slack cable, just above the search coil strain relief bushing entry point. You will need enough slack cable to enable the search coil to be moved throughout its entire (tilt) adjustment range.

Carefully begin to firmly wrap the search coil cable around and up the shaft of the pole assembly leaving enough 'free' cable to insert the coil connector plug into the search coil connector jack on the back side of the control-box housing. Tighten (turn clockwise) the silver-metal connector locking collar until firmly seated. **DO NOT OVER-TIGHTEN!**

See the '**CARE AND STORAGE**' section of this manual for additional information.

■ **GLOSSARY - continued**

**Set Point** - An electrical and/or mechanical reference or operational point determined to be an optimum setting to achieve a particular result.

**Shape Tracing** - A method of audibly tracing a buried target to determine its size and shape. This is usually accomplished using the threshold-dependent, non-motion, all-metal mode. The target is slowly scanned and the length and width of the detector's audio signal is monitored listening for the 'drop out' points. This audio 'signature' directly equates to the target's shape.

**Signal Strength** - The strength and volume that a target produces as it is scanned and sensed by the search coil.

**Sweep** - The movement of the search coil over the ground.

**Sweep Speed** - The speed at which the search coil is swept back and forth.

**Target Acquisition** - Troy Custom Detectors search coils are of a unique proprietary design-configuration that enables the coil's electromagnetic field to cover a broad area of ground, somewhat like a wide-scan design, but maintains the exact pinpointing ability of a concentric design. Targets are acquired and heard more easily, even if not scanned directly on center. This equates to more ground coverage and total finds!

**Target Check™** - A unique user-selectable feature of Troy Custom Detectors used to compare target signals against factory-calibrated discrimination set-points to aid in identifying a target's conductivity. A valuable 'tool' to help identify trash from treasure before retrieval.

**Target Halo** - Usually associated with iron (ferrous) targets. The 'halo' is the result of the rusting and decomposition of the target, which leaches into the surrounding soil matrix making the target appear larger and more conductive than it actually is. Non ferrous targets can also build up a halo, depending on the soil conditions and length of time buried.

Any signal that 'disappears' during retrieval and no ferrous item can be found, should be carefully investigated. It could possibly be a coin or other desirable item that had its halo broken-up upon retrieval. Use the ALL-METAL mode to scan the hole very thoroughly before moving on.



## ■ GLOSSARY - continued

**Non-Motion** - A search mode that does not require search coil motion to sense a target.

**Null** - The 'drop-out' in audio threshold or signal when the search coil is passed across a rejected target.

**Operating Frequency** - The RF (radio frequency) search coil-transmitted and received frequency that the metal detector is designed to operate at.

**Overlap** - The amount of search coil ground-sweep that overlaps the previous sweep.

**Overload** - This results when a large object or too strong signal overloads the detector's circuitry and cannot be analyzed properly. Raising the search coil away from the target will eliminate the overload signal and an accurate 'reading' can then be achieved.

**Pinpoint** - The act of determining the exact center of a target so that it may be quickly and easily retrieved with minimal effort and no damage.

**Positive Ground** - Sand or soil that contains positive, conductive salt.

**Preset** - A predetermined or recommended setting that is indicated on the detector's front panel by a unique color, graphic symbol or marking. It can also refer to an internal control or setting that is factory-adjusted to a certain value or position.

**Recovery Speed** - The speed at which the detector recovers or is able to respond to a good target immediately after it has rejected a bad target. (see target-masking also)

**Rejection** - Total elimination of a particular target or range of targets.

**Search Coil** - A mechanical and electrical component, consisting of wire coils and tuned circuits that transmit and receive the R.F. electro-magnetic signal from the metal detector, to the target and then back again for the purpose of sensing buried metallic objects.

**Sensitivity** - A term used to indicate how well a metal detector responds to small targets. Also, a variable control to adjust the detector's response to all targets, especially small, low-conductive ones.

## ■ CONTROLS

### The Shadow X5 Control Panel



■ **BATTERY**

Your Shadow X5 requires a single 9-volt Alkaline or Lithium battery for its operation. It is recommended that only name-brand, high-quality Alkaline or Lithium types be used to insure proper fit, maximum operating time and dependability. A unique 'drop-in' battery-compartment design eliminates any possibility of fragile wire and/or battery-snap breakage and field down time!

Battery life will vary, but you can expect about 25 hours for the Alkaline type and 50 hours for the Lithium type of 9-volt battery.

To replace or install a battery, set the **SENS** control to the **POWER OFF** position. Unlatch the battery compartment door by pressing down and out on the door latch. Carefully remove the old battery.

Insert a new battery with the contact end going in first, making certain to match the battery polarity with the markings indicated.

If you are not going to be using your detector for several weeks or longer, remove the battery. Acid damage caused by a leaking battery can void your warranty. For best protection, remove the battery after each detecting outing.

The Shadow X5 is equipped with an on-demand battery test circuit. The battery should be checked after the detector has been on for a few minutes by placing the **DISC** control to the **BATT TEST** position.

The **BATT TEST** produces a high-pitched tone to the speaker for a fully charged battery, a medium tone for a half-charged battery and a low tone for a weak battery.

The X5 never loses depth or produces weak audio until the battery condition 'hits' approximately 6.0 volts – There is no need to replace the battery until this condition occurs. Some detectors lose depth and audio volume as the battery loses voltage ... The Shadow X5 will not!

■ **GLOSSARY** - continued

order to sense targets buried within.

**Hot Ground** - Severely mineralized ground that produces many false signals as it is swept. Coal cinders and iron-laden slag soil are but two examples of 'hot ground'.

**Hot Rock** - A rock or piece of mineralization that is different in its mineralization content than the surrounding ground matrix. Hot rocks can produce false signals in some operating modes and no response in others.

**Interference** - Usually an affect of R.F. (radio frequency) and electromagnetic pulse-type signals. These can be from power lines, transmitters, electric fences, automobiles, other metal detectors and/or almost any device that produces electromagnetic radiated energy. These types of interference usually produce false, random, erratic signals that produce unexpected audio 'blips' from a metal detector.

**Mineralized** - Soil, sand or ground matrix that contains varying amounts of negative iron oxide.

**Mode** - An operational arrangement and/or selection of specific metal detector features and settings to match a specific type of detecting or target acceptance or rejection.

**Modulated Audio** - An audio signal produced by the metal detector (when a target is sensed) to the speaker or headphones that is very loud for surface targets and gradually gets softer as the distance is increased between the target and the search coil. Modulated audio is very useful in determining a target's depth and size, based on the strength of audio signal heard.

**Motion Mode** - A metal detector operating mode that requires the search coil be kept in motion to respond to metal targets.

**Neutral Ground** - Ground or soil matrix that contains neither positive nor negative mineralization.

**Negative Ground** - Sand or soil that contains negative iron minerals.

**Non Ferrous** - A metal item that does not contain iron.

■ GLOSSARY - continued

positively-conductive salts. These can produce positive, false responses to a metal detector, depending on its design and mode of operation.

**De-tune** - An operating method used to minimize a target's signal (response) while operating in a non-auto-tuned all-metal or pinpoint mode; Making the target 'appear' smaller in size and easier to find and retrieve.

To de-tune a target, pinpoint the target's center. Hold the detector still over that point and momentarily 'tap' , release, then hold the VCO PP pushbutton. This may be repeated as often as needed.

**Discrimination** - An operating mode that enables a user to 'dial-in' the types of targets to be discriminated or rejected by the metal detector, so that they will not produce an audio response signal when passed over by the search coil. The amount of discrimination is set by the Discrimination control while operating in the motion Discrimination mode.

**False Signal** - An erroneous signal produced by an undesirable or discriminated target such as a large piece of iron, hot-rock or by electrical pulse-type electromagnetic interference.

**Ferrous** - A metal item made of or primarily containing iron.

**Frequency** - A unit of measure of the number of times a periodic waveform repeats itself in a given unit of time (generally seconds) with the result expressed in Hertz or some multiple thereof.

**Frequency Shift** - A selective shift of frequency above or below the center, normal operating frequency of a metal detector for the purpose of eliminating coincidental outside frequency-related interference.

**Fringe Target** - A very weak, barely discernible target very near the point of being no longer sensed or detected. This can occur for many reasons including depth, size, composition, mineralization, ground moisture, coil size, detector settings, etc.

**Ground Balance** - A control, circuit and method of balancing-out mineralized ground so that it does not affect the 'pickup' of desirable targets.

**Ground Matrix** – The combined composition of soil, mineralization, moisture and salts that a metal detector must radiate a signal through in

■ QUICK-SET DETECTING

Your Troy Shadow X5 metal detector is very easy to operate!

As you become accustomed to its various controls, options and search modes, your knowledge will improve of which features and settings perform best for different types of detecting, search and soil conditions encountered and locales.

To simplify getting started, you may want to make use of the '**Quick-Set**' settings below for each type of detecting situation encountered.

We have constructed a list of recommended, '**Quick-Set**' settings for each type of detecting: Coin; Relic; Beach; Prospecting and Competition. These settings will enable you to quickly adjust your Shadow X5 and begin searching with a minimum of effort or knowledge about the various controls, settings and operating modes.

Keep in mind that these are general, average settings and may not always provide optimum results.

As your knowledge, experience and proficiency expand, you will likely want to experiment somewhat and 'fine tune' the X5's operation to suit your particular style of detecting and the search site's soil and trash conditions. Do not be afraid to experiment ... It's part of how you learn!

SHADOW X5 QUICK-SET CHART

| Type of Detecting | MODE   | SENS. | DISC. | GB     | FREQ.     |
|-------------------|--------|-------|-------|--------|-----------|
| COIN              | DISC.  | 8     | 3     | FIXED  | NORM.     |
| RELIC             | DISC.  | 8     | 3     | FIXED  | NORM.     |
| BEACH             | BEACH  | 8     | 3     | FIXED  | NORM.     |
| PROSPECTING       | ALL M. | 8     | NA    | MANUAL | NORM.     |
| COMPETITION       | DISC.  | 8     | 3     | FIXED  | AS NEEDED |
| CACHE             | ALL M. | 8     | NA    | MANUAL | NORM.     |

■ HEADPHONES

Your Shadow X5 is equipped with a water-resistant rear-mounted ¼-inch (6.3mm) stereo headphone jack.

Located on the back side of the control box, the jack accepts most stereo and mono headphones with an impedance rating of 8 ohms or more. Upon use, the internal speaker is automatically disconnected.

The use of high-quality, high-sensitivity headphones – like the **Troy-PRO™** headphones – is strongly encouraged and recommended.

Headphones block-out background noise while detecting and enable deep, low-volume signals to be heard more easily. They also help with 'target perception', thus making pinpointing much easier.

Headphone-use increases battery life. All-in-all, headphones should always be used while metal detecting!

To produce the strongest and best audio signal possible for deep, weak, targets, the Shadow X5's audio circuit is designed to produce full-gain audio. The Shadow X5 does not have an external, adjustable volume control. Thus, it is capable of producing a very loud audio signal in response to surface or large-mass metal targets.



To protect your hearing while using headphones, it is strongly recommended that you use properly adjusted, volume-control-equipped headphones – like the **Troy PRO™** headphones - available soon!

***Care must be taken when using headphones to protect your hearing from loud and/or continual audio-tone blasts.***

For best results, rotate your headphone volume controls to their minimum, full-counterclockwise position. Gradually increase each control to a comfortable, well-balanced listening level as you scan back and forth – a few inches away – from a U.S. Quarter placed directly on top of the ground. Once adjusted, leave the volume controls set to this optimum setting while detecting.

■ GLOSSARY

**10-Turn** - A very precise, high-resolution electronic potentiometer (control) that divides its total resistance over ten physical 360-degree rotations of its control shaft. Usually used for ground balancing.

**Acceptance** - Any metallic target that is not eliminated (rejected) by the discrimination control and/or Target Check and produces a signal (audio tone) when scanned by the search coil is considered to be accepted.

**Air Test** - The process of sampling a target with the search coil elevated in the air and away from any other interfering metal target, except the one being sampled.

Air testing is a valid and useful method to determine maximum potential detector depth capability, discrimination-points of various targets and their audio characteristics. It is to be used for 'guideline' results only, as air-test results can vary for targets buried in the actual soil matrix.

**All-Metal Mode** - An operating mode that responds to any metallic item thus producing an audio tone from the detector's speaker or headphones.

**Amplitude** - The strength or 'volume' of a signal.

**Auto-Tuning** - An electronic automatic tuning method of keeping the threshold signal constant and unwavering.

**Auto-Tuning Speed** - The speed at which the auto-tune circuit updates or refreshes the threshold tuning to keep it at a constant audio level.

**Back Reading** - A strong, reflected signal from a target that is very near the search coil. These false target responses can be eliminated by raising the search coil away from the offending item.

**Black Sand** - Sand that contains a high-percentage of magnetic negative iron oxide.

**Conductivity** - The property of an object that deals with how easily an electric current can pass through it. Gold, copper and silver are highly conductive. Iron is not. All-metal objects have conductive properties that depend on their metal type, alloy, size, etc.

**Conductive Salts** - Water, moist or wet sand or soil that contain

## ■ CARE AND STORAGE

Your Troy Shadow X5 metal detector is a high-quality, precision-engineered and constructed electronic device. Properly cared for, it will provide many years of trouble-free service.

Common sense and reasonable care are the keys to keeping your Shadow X5 in good working order – insuring a long trouble-free life.

Avoid temperature and humidity extremes. The X5 will work well in a range of temperatures from about 20 to 110 degrees Fahrenheit and 0 to 100% relative humidity. Do not leave or store the detector in extremely hot, cold or humid areas. Never submerge the control box in water and always protect it from heavy rain or blowing surf spray.

When being stored, or not used for extended periods of time, remove the battery to eliminate any possible chance of leakage damage.

A coil cover is highly recommended to protect the search coil from abrasion and possible pinhole punctures that can eventually result in water intrusion and destruction of the search coil. The search coil is waterproof, but needs to be taken care of and protected.

While searching, avoid hitting the search coil against rocks, trees or other hard surfaces. Keep your search coil slightly elevated above the ground. Especially when searching sand, gravel or hard, rocky ground.

Periodically, wipe any accumulated dirt from the control box, knobs, switches, shaft and search coil with a soft cloth. Also, remove the coil cover occasionally and clean any accumulated dirt buildup, which could affect operation.

Do not over-tighten the search coil cable connector (at the control box) and keep the coil cord neatly wrapped and secured to the pole assembly. Leave enough slack in the cable, just above where it enters the coil, so that the coil is easily adjustable through its entire 'tilt' range without stressing the cable or its entry point into the search coil.

Treat your Troy Shadow X5 metal detector with care and you will be assured of many trouble-free years of operating enjoyment.

## ■ AUDIO SOUNDS

**SURFACE ITEM** - is typically loud! Depending on the site being searched, you may or may not want to retrieve these items.

In soft, loamy soil, where previous targets have been located deep, you will most likely find loud targets to be surface trash or new coin drops.

When searching old, wooded sites or somewhat barren hillsides where gravel and stone are in abundance, you should retrieve all targets, as even old coins and artifacts can be found laying exposed on the surface or only a few inches deep!

**DEEP ITEM** - This type of target has a smooth, consistent, weak audio response.

If searching in the **DISC**rimination mode, switching to the threshold-dependent all-metal mode or when using **VCO PP** (pinpoint) mode will also produce a weak, but repeatable response. These are often the types of signals that produce the deepest, oldest and best finds.

**TRASH** - Can oftentimes be recognized by its loud, irregular or 'scratchy' audio response.

If searching an area where items are consistently located deep, you can usually ignore the loud (usually trash) surface targets.

Using the 'shape-tracing' and 'deep item' information and techniques presented herein can also help identify trash versus good targets.

**IRON** - Can often sound like a good target, but a few operating techniques can be used to determine if the target is worth digging or not.

Increasing your sweep speed from slow, to moderate, to fast, will usually cause the detector's audio response to breakup or completely disappear if the target is made of small iron. On the other hand, desirable targets will usually be heard – sometimes even better – with a faster sweep speed.

Another approach to determining if a target is made of iron or not is to sweep the target from different directions. Usually, worthwhile items will sound the same regardless of the direction that they are swept, unless the target is tilted or next to a trash item. Iron however, will usually change its audio response, as it is swept from different directions. It may

## ■ AUDIO SOUNDS - continued

sound good one way, but breakup or totally disappear when swept from another direction.

You can also measure the target's width, or size, using the threshold-dependent all-metal mode or **VCO PP** mode. Iron targets will often 'measure' larger (wider) than the coil's overall diameter. Coins and other nonferrous items will usually measure as a small, concentrated signal, that is much smaller in size than the coil's overall width.

**BAD GROUND** - Is characterized by a random, intermittent, 'popping', 'static' type of audio sound. Reducing the sensitivity setting, using the **BEACH DISC** mode and/or reground balancing will often help. Also make certain that the threshold control is properly set.

**SHAPE-TRACING** - Using the threshold-dependent all-metal mode or **VCO PP** mode, you can usually determine the shape of a target by slowly 'tracing it', listening for where the audio sound drops out.

Small items, such as coins, buttons and rings will produce small, consistent, 'round sounds'.

Long, narrow items, such as iron nails and wire, will produce long, narrow signals in all-metal and will often 'double beep' audio in the discrimination mode.

Large items will produce a signal over a large area of ground.

Audio 'shape-tracing' can be a useful tool in determining if the target is desirable or not, but it does take some practice to master.

**WHAT TO LISTEN FOR** - When operating in the discrimination mode, desirable signals generally sound smooth, consistent and repeatable from any sweep direction.

Ferrous (iron) signals are usually random and non-repeatable, unless the item is very large in size or heavily-rusted into its surrounding soil matrix.

With practice, you will eventually come to recognize the 'sweet,' 'small' sound of a good target, versus the harsh, inconsistent, often too-loud or broad sound of a trash target.

## ■ RESPONSIBLE DETECTING

Permission to access property, search, retrieve and keep found items should always be obtained whenever possible. This necessary prerequisite will prevent any problems that may arise (if you search without permission) and will give you complete peace-of-mind while detecting.

Some remote, wooded, abandoned or forgotten sites are nearly impossible to get prior permission to search, as the property owner is unknown and/or difficult to locate. It is often a good idea to question local residents near the site to see if the owner can be identified and permission obtained. Make certain that you respect all property no matter how remote, secluded or 'forgotten' it may be.

**Fill all holes!** Never leave an unfilled hole! It is the mark of an uncaring amateur; It does not look good and it gives all detectorists a bad name and image.

**Do No Damage!** This is just common sense! Respect all property as if it were your own!

**Leave No Trash!** If you dig it, take it with you! All small, retrieved trash items should be placed in your detecting pouch to be disposed of properly. Besides, you do not want to have to dig the same piece of trash over and over again! Large trash items – which cannot be easily carried – are best piled in one spot and then reburied before you leave the site.

**Create a Positive Image** while detecting. You may be observed directly or indirectly. A landowner may have a good or bad experience with a detectorist, which he then passes on to others. You never know where the 'trail' may lead or end. Always present a good image ... it is the best policy.

As a detectorist, you may be requested at times to search for a lost item. Maybe a landowner needs a property marker located or perhaps someone lost a ring or set of keys. Perhaps the police or other agency may need assistance in locating evidence from a crime scene. Always, willingly lend assistance where needed. Not only will you feel good in doing so, but it serves a very useful purpose and presents metal detecting and detectorists in a very positive manner.

■ TYPES OF DETECTING - continued

**COMPETITION** - If you have never been to a competition treasure hunt, you're missing out on a lot of fun!

Most hunts have thousands of silver coins, clad coins, Indian Head cents, prize-tokens and other items buried and it's usually a 30 to 60 minute 'free-for-all' to see who can find and uncover the most or best items. Many great coins and prizes can be had at treasure hunts!

The Shadow X5 makes a perfect competition hunt detector. It is small and lightweight. It can be swept fast and yet still responds well to targets, and the Frequency switch helps eliminate interference from other metal detectors nearby.

Fast target pinpointing (necessary for competition hunts) can easily be accomplished with the X5 in either the **VCO PP**, **ALL-METAL** or motion **DISCrimination** mode. The Target Check™ feature is also very useful as it can (depending on the prize tokens used) provide valuable information about a target's conductivity and rejection/acceptance point.



**Troy Galloway searches avidly during a recent competition hunt.**

**TIP** - Any signal that 'disappears' during retrieval and no ferrous item can be found, should be carefully investigated. It could possibly be a coin or other desirable item that had its 'halo' broken-up upon retrieval. Use the ALL-METAL mode to scan the hole very thoroughly before moving on.

■ AUDIO SOUNDS - continued

Interpreting your X5's various audio sounds may at first seem a daunting task (if you have not used a metal detector previously). All targets may at first sound the same to you, but you will soon learn, with practice and use, that the X5 provides a lot of target information through the unique sounds and audio responses of its various operating modes, controls and functions.

You will eventually come to know the 'language' of your Shadow X5, and your success will show it!

After retrieving each target, try to remember the sound that it made.

A good way to learn target sounds is to build a 'test garden' where you bury known targets at various depths.

By knowing beforehand what and where the targets are, you can practice scanning and listening to them. This practice can really help you to learn, know and understand the various sounds that your detector makes as it scans over different types of targets at various depths.

Try to always use the same headphones too. Different phones can and will sound different. Once you get used to a good pair of headphones, it's difficult to change to another pair, as it will affect the sounds you are accustomed to hearing.

Keep in mind too that all good signals will not always 'come through' 'crystal clear'.

Many of the extremely deep or small items will not produce loud, strong signals. Typically, they produce 'whispers', and it is often this kind of slight, but mostly repeatable signal, that indicates a worthwhile item.

Items next to rejected or trash items can produce broken, non-repeatable signals. Again, this is where practice comes into play and all of the 'test garden' time you spent learning the sounds that your Shadow X5 makes.

With continued practice and a desire to learn and improve, you will become very familiar with your Shadow X5. It is a detector that speaks its language through the sounds it makes. Learn them well and your success is just about guaranteed!

## ■ MODE

The three-position **MODE** switch is used to select the desired primary search mode. One of three operating modes can be selected: **ALL-METAL**; **DISC**; **BEACH DISC**.



**ALL-METAL** - The All-Metal mode is a threshold-dependent auto-tuned operating mode that will respond with an audio tone to any and all items made of metal. This mode works in conjunction with the Threshold control, which sets the operating threshold level. (See Threshold Control)

The X5 has the following all-metal modes:

- ❶ A fast auto-tune all-metal motion search mode.
- ❷ A static non-motion all-metal pinpoint mode with VCO.
- ❸ An all-metal black sand motion auto-tune search mode. In this mode, the search coil must be moving, at least slightly, to detect a target.
- ❹ An all-metal motion disc mode when the disc control is set for minimum discrimination.

**DISC** - The **DISC** (Discrimination) mode is a silent-search, motion mode with the ability to selectively 'dial-in', with the **DISC** control, any amount

## ■ TYPES OF DETECTING

**COIN** - Most who purchase a metal detector use it to search for new and old coins. This aspect of metal detecting – known as 'Coinshooting' – is very popular.

To be successful at 'Coinshooting', try searching locations that have attracted people to them over many years ... the more, the better!

Old coins are usually associated with old locations! So, you must seek-out old sites, usually, to find old coins. Old home sites, parks, schools, beaches, ghost towns, etc., are often the best places to search for old coins.

**RELIC** - This type of detecting is most often associated with Civil War artifacts, but any type of old, non-coin artifact is generically considered to be a relic.

Whether it be from the Civil War, American Revolution or 20th century, a relic can be a button, bullet, tool, buckle or any of thousands of different items recovered while metal detecting. The varieties and possibilities are staggering, unpredictable and endless!

As with coin hunting, the oldest and sometimes best finds come from the oldest places.

History and research are the true 'keys' to successful relic hunting. But, the right metal detector – such as the Shadow X5 – proper equipment, knowledge and experience also help considerably.

**BEACH** - GOLD! This is the magic word for a beach hunter! Gold, for the most part, is what they seek. Gold rings, gold chains and gold jewelry can often be found in abundance at the right beach or swimming location.

Most successful beach hunters dig it all. They use very little, if any discrimination, as small gold rings, chains and jewelry 'tune out' very easily if too much discrimination is used.

**PROSPECTING** - This type of detecting is usually in search of gold nuggets in the ALL-METAL or B. SAND MGB ALL-METAL mode. The Shadow X5's high operating frequency, high gain and 10-turn ground balance control all contribute to making it 'hot' on gold.



■ PLACES TO SEARCH

Metal detecting **IS NOT** permitted in Federal parks and on battlefields, historically marked lands or sites!

State, county, city or town property, parks, schools, beaches, etc. vary with each locale. You **MUST** contact the appropriate office or authority beforehand to inquire if metal detecting is permitted and what (if any) regulations or constraints apply.

For private property, permission is usually required and it is best to have permission in writing if possible.

Some remote, wooded, abandoned or forgotten sites are nearly impossible to obtain prior permission to search, as the property owner is unknown and/or difficult to locate. It is often a good idea to question local residents near the site to see if the owner can be identified and permission obtained. If not, and the property is not posted, you may want to take your chances, but make certain to do no damage. Respect the property no matter how remote or secluded it may be.

The 'bottom line' is: Observe all laws, whether national, state or local.

There are plenty of good places to search, but you must do some research to find them. 'Read-up' on your local history. Talk to some older residents and family members. Inquire as to where the 'old' places were ... Old home sites, schools, parks, fair grounds, picnic groves, swimming holes, lookouts, camp grounds, etc. The list is almost endless. It's up to you! Locate the sites and you will make the finds!

If you have a metal detecting club nearby, join it! Being with others involved in the hobby can help immensely.

Start a library of metal detecting books and also subscribe to some metal detecting and historical magazines. You will amass a lot of information in doing so and it will contribute to making you a much better detectorist overall.



*Observe all signs ... Always!*

■ MODE - continued

of target rejection from zero (none) to screw cap. In this mode, the search coil must be moving, at least slightly, to detect a target.

**BEACH DISC** - An optimized motion discrimination search mode for detecting and searching saltwater beaches for coins and jewelry. In this mode, the search coil must be moving, at least slightly, to detect a target. **Fixed GB** (ground balance) is recommended.

**Note:** The **BEACH** mode can be successfully used for coin, relic and jewelry searching at locations where severe ground mineralization, high trash conditions or high electrical interference may be too extreme for the standard **DISC** mode.

If you find the **DISC** mode too 'hot' and/or the detector is unstable and producing too many false signals - even at reduced sensitivity (control) settings ... try the **BEACH DISC** mode!

**BEACH DISC** mode is usually the best mode to use when in a high-electrical interference location or high-trash area.

Remember that the **ALL-METAL** mode can also be used for pinpointing. In fact, many detectorists prefer all-metal pinpointing to any other type.

So for example, if you are searching in the **DISC** mode and want to pinpoint a target you have three choices and methods available:

- 1) Pinpoint in the motion **DISC** mode
- 2) Push and hold the **VCO PP** pushbutton.
- 3) 'Flip' the **MODE** switch to **ALL-METAL** and pinpoint using the all-metal auto-tuned mode.

The **ALL-METAL** 'pinpoint' mode is an auto-tuned mode, so slight motion is required. Otherwise, the target will tune out and not be heard.

Just a slight amount of search coil motion is required in any pinpointing mode selected (except **VCO**). The motion required is slow enough to enable easy pinpointing and fast target centering.

## ■ THRESHOLD

Located at the bottom left-side of the control box, beneath the **DISC** control, the **THRESHOLD** control works in conjunction with the threshold-dependent **ALL-METAL** mode.

To correctly set the **THRESHOLD** level, place the detector's **MODE** switch in the threshold-dependent **ALL-METAL** position. While holding the detector a few feet above ground and away from any metal object, slowly turn the **THRESHOLD** control until you hear a very slight audio tone through the speaker or headphones. This is the optimum set-point for the **THRESHOLD** control. Periodic 'touchup' adjustment is recommended to insure optimum depth and maximum performance.

Too low of a threshold setting may cause very weak signals to not be heard. Too high of a threshold setting may cause operating instability in the **DISC** mode and very weak signals to not be heard in the **ALL-METAL** mode.



**TIP** - For best results when searching in the **DISC** mode, set the **GB** control slightly positive — about  $\frac{1}{4}$  to  $\frac{1}{2}$  turn clockwise — after correctly ground balancing.

## ■ TARGET RECOVERY

Target recovery is a very important aspect of metal detecting.

**The culmination of the search ... is the retrieval of the find!** — Recovery actually begins with pinpointing!

To know precisely where to dig, to retrieve a target, you must first find the target's exact center point.

With three types of pinpointing available — VCO, All-metal and DISC mode — the Shadow X5 makes pinpointing a quick and easy task.

Once you determine the target's center, a small digging trowel, hunting knife or specialized metal detecting retrieval tool is all that is needed to quickly and safely find and remove a detected target from the soil.

Careful pinpointing and retrieval will greatly minimize the chance of accidentally scratching or damaging your find. Proper retrieval does minimal or no damage to the soil and well-maintained areas. In fact, 99% of the time, if you know the proper way to retrieve a target, no one can even tell that a small hole was dug!

Of course, any dug hole **MUST** be back-filled after the target has been retrieved. No exceptions! Get into the habit of doing so.

In grassy areas, most detectorists cut a hinged plug for fast, easy and neat target retrieval. Once the target is 'pulled out', fill the hole back in and then step on the hinged plug a few times to seat it back into the ground.

For wooded or loose soil areas, use a trowel or long-bladed hunting knife to displace the soil until the target is found. As above, fill the hole back in and step on it a few times to compact it.

Make sure you take the time to learn correct pinpointing, retrieval and 'clean up' methods while detecting. Not only will it help you, but it will insure that no visible 'damage' is done and it creates a good image for all metal detector users.

Remember to take your trash home too for proper disposal!

Please see **RESPONSIBLE DETECTING** for additional information

## ■ TARGET DEPTH

**AUDIO DEPTH READING** - with practice, you will begin to learn and recognize that a fairly accurate determination of target depth can be made by analyzing the volume and frequency of the VCO pinpoint signal and/or the intensity (modulation) of the threshold-dependent **ALL-METAL** and/or **DISC** mode signal.

The **VCO PP** switch is a momentary type and must be held in to enter and stay in the VCO pinpoint mode. Once the pushbutton is released, the detector returns to the primary operating mode selected.

If necessary, targets can be detuned by quick, repeated pressings of the **VCO PP** pushbutton. De-tuning is a method of 'shrinking' the target signal so that its location beneath the search coil is confined to a very small area, making pinpointing and retrieval easier and much more accurate.

To de-tune a target signal, first find its approximate center by pressing and holding the **VCO PP** pushbutton. Once at the target center, quickly release and again press the **VCO PP** pushbutton. You will notice that the target is smaller and not as pronounced. Sometimes, the target may disappear when de-tuning. If so, try again.

In the **ALL-METAL** mode, built-in auto-tuning will automatically de-tune and 'shrink' the target, making pinpointing fast and easy.

Remember to keep the search coil moving slightly when pinpointing in **ALL-METAL**, or the target will tune out and not be heard.

## ■ GROUND BALANCE

Your Shadow X5 has several options available to cancel the affects of mineralized ground.

Basically, the **GB** control and circuit is a low-range discrimination system that 'tunes out' and prevents the ground mineralization signal from interfering with the target signal and from producing an audible sound. Without the ability to cancel ground mineralization, a metal detector could respond to mineralization as if it were a good target.



The ground balance **SELECT** switch has a **MANUAL GB** position (that works in conjunction with the 10-turn **GB** control); A **FIXED GB** position (set by an internal factory-calibrated control) and **B. SAND MGB** (manual ground balance) position, that also works with the 10-turn **GB** control.

► **NOTE:** The **MODE** switch **MUST** be in the **ALL-METAL** position and the **SELECT** switch in the **B. SAND MGB** position to make use of the **B. SAND MGB** mode.

Under most conditions, the preset, factory-calibrated **FIXED GB** position is the 'quick-and-easy' way to operate and will provide very good performance when searching low or moderately mineralized soil.

To make use of the fixed preset ground balance, simply set the ground balance **SELECT** switch to the **FIXED GB** position. In this position, the manual 10-turn **GB** control has no affect.

## ■ GROUND BALANCE - continued

**Fixed GB** is recommended when searching in wet salt sand.

For areas where the mineralization is more extreme, such as when prospecting for gold, the high-resolution, 10-turn manual **GB** adjustment provides a very precise and effective way to cancel ground mineralization.

For low to moderately mineralized soil, the **FIXED** (preset) ground balance position may be all that is needed for stable operation and good performance.

However, for sites with extreme mineralization, such as in prospecting or relic hunting, the Shadow X5 provides a manually-adjustable 10-turn ground balance (**GB**) control. – Precise adjustment of the **GB** control is critical for optimum performance.

► **STANDARD** method to adjust the manual ground balance **GB** control:

1. Place the **SELECT** switch to the **MANUAL GB** setting. For black sand beaches, select **B. SAND MGB** and the **ALL-METAL** mode position.
2. Set the **MODE** switch to the **ALL-METAL** position.
3. Search for and select a clear piece of ground or sand that does not contain any metallic targets.
4. With the coil elevated at least waist high and away from any metallic target, slowly adjust the **THRESHOLD** control until a very faint audio threshold signal is heard.
5. Lower the search coil to within one-inch of the ground surface while listening to the threshold audio signal. If the threshold volume increases, the **GB** control needs to be decreased (rotate counterclockwise). If the threshold volume decreases, the **GB** control needs to be increased (rotate clockwise). Keep repeating this step until the volume of the threshold signal is the same within one-inch of the ground as it is in the air. Once this is accomplished, the detector is properly ground balanced for the ALL-METAL modes.

*NOTE: Under some severe mineral conditions ground balancing may not be possible.*

## ■ TARGET CHECK™ - continued

is held in the **NICKEL** position, it indicates that the target has less conductivity than a nickel and should be thoroughly 'checked out', as it could be a small Gold or Platinum ring, Gold jewelry item, small Gold coin, Nickel Three-Cent Piece or other worthwhile and valuable low-conductivity metal item.

This also holds true for the **ZINC** position of the **TARGET CHECK™** switch.

At some older locations, targets that 'drop out' when the switch is held to the **ZINC** position could be coins, rings or artifacts.

Indian Head Cents for example can 'read' exactly like a Screw Cap, which also 'reads' the same as a Zinc cent.

At older locations, it will pay to investigate signals that drop out through the **ZINC** range and lower as well as all of the good 'above Zinc' coin sounds.

## ■ TARGET CHECK™

**TARGET CHECK™** is a unique operating feature of Troy Custom Detectors used to quickly and accurately compare target signals to factory-calibrated preset discrimination (rejection) set-points.



This method of quick-comparison informs the operator as to whether a buried, unidentified target is conductively above or below the **TARGET CHECK™** and **DISC** discrimination set-points.

The **TARGET CHECK™** switch is a three-position spring-return toggle switch that when released from the **ZINC** or **NICKEL** position always returns to its center (**NORMAL**) position.

The **NORMAL** position engages the **DISC** control on the front panel.

**ZINC** - This setting 'switches in' enough preset discrimination to eliminate all targets including most aluminum screw caps, Zinc Cents, Indian Head Cents and certain Wheat Cents on down through the pull tab, nickel, foil and small and medium iron conductivity ranges.

Keep in mind that the **ZINC** selection can eliminate Indian Head cents, nickels and other desirable coins as well as most gold rings and many desirable relics.

**NICKEL** - This setting 'switches in' enough preset discrimination to eliminate all targets below round pull tabs including Nickels on through foil and small iron conductivity ranges.

**TARGET CHECK™** can be used as a form of 'reverse discrimination'. That is, if a target does not produce a signal while **TARGET CHECK™**

## ■ GROUND BALANCE - continued

### The following is an in-depth outline on the X5 ground balance procedure and tips as presented by Troy Galloway

There are several controls that if not adjusted correctly can and will cause excessive noise when searching in the **DISC** mode. Let me run through a quick check with you on how to best set up the X5.

1) Place the mode switch to **ALL-METAL**. With the coil up in the air adjust the **SENS** control to approximately '8' and adjust the **THRESH-OLD** control to a very slight audio tone. Note: The higher you set the Threshold tone volume, the more dominant the noise will be in the **DISC** mode.

2) Find a spot of ground that has no metal targets and go through the manual ground balance (MGB) procedure. After the ground balance point has been found, adjust the **GB** control  $\frac{1}{4}$  to  $\frac{1}{2}$  turn clockwise (positive).

This last GB step is very important to reduce ground noise pick-up. Note: During the GB procedure, if you do not find the point where the threshold tone goes silent when lowering the coil to the ground, then you do not have the X5 ground balanced correctly. This is the NUMBER ONE cause for ground chatter and **FIXED GB** should be used.

3) With the **DISC** control set to '3.5' to '4', place the mode switch to **DISC** and with the coil up in the air adjust the **SENS** control clockwise until slight chirping starts, then back-off counterclockwise until the chirping becomes quiet. This setting should be between '8' to '9' depending on the electrical activity in the area.

If chirping is still present at '8' or less ('7', '6' or '5') then you are in a very high electrical activity area. This can be verified by holding the coil up in the air while in the **ALL-METAL** mode and listening to the Threshold Tone. If the Threshold Tone is not stable and is fluctuating or motor boating, then you are in an area with high electrical interference. To help this situation, you should select the **BEACH DISC** mode of operation, which is the fall-back mode any time excessive noise is experienced.

#### ► Chirping - Positive or Negative Ground Balance

Chirping, when swinging the coil over the ground, is very typical of any detector having the Ground Balance adjusted too negative.

■ **GROUND BALANCE** - continued

Ground balance is a critical adjustment in that, if it is adjusted too negative, then the result will be excessive ground noise. If adjusted too positive then it will lose depth.

The key issue is to be sure you have "first" found the ground balance point. It is very important to "first" find the point where the threshold tone makes a "change" (disappears or becomes louder) when lowering the coil within an inch or two from the ground. At this point you are very close to the ground balance point.

A slight adjustment clockwise or counterclockwise will then find the balance point.

Another important step is that it is also very critical to adjust the **GB** control slightly positive (about 1/8 to 1/4 turn clockwise) after finding the ground balance point, then switch to the **DISC** mode.

This is standard practice with most manual ground balance detectors to reduce ground noise. There are two other things that you may find helpful.

**Be absolutely sure there is no metal in the ground near the place you are ground balancing** and you will get better results if the Threshold volume is set very low, just to barely audible when ground balancing.

Once you get the 'hang' of manual ground balancing, it becomes as easy and natural as walking.

Now, there are occasions where the ground balance point can not be found due to specific ground conditions. When this happens, it is best to switch to **FIXED GB** to search.

With ground that has very little or no mineralization, it is better to start off with the **GB** control fully clockwise and then start the coarse adjustment by turning it counterclockwise while pumping the coil slowly from approximately 12-inches to 2-inches above the ground. By starting fully clockwise you will always have a tone when lowering the coil to the ground.

The most important point in this process is to adjust the **GB** Control counterclockwise until the threshold tone disappears. If the threshold

■ **DISC** - continued

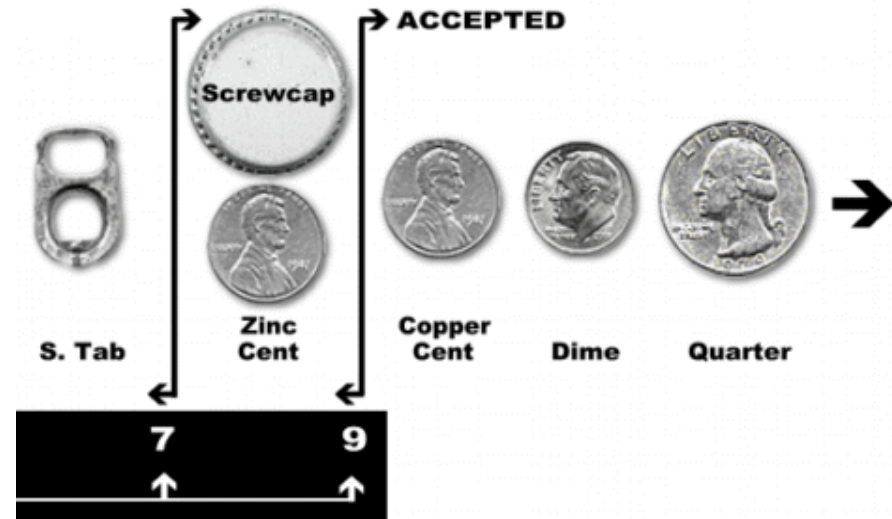
At a setting of '3', most small iron targets will be rejected and everything from foil on up will be accepted – As shown in the illustration below.

**BATT TEST** - A battery test is performed when the **DISC** control is set to the **BATT TEST** position. (see Battery page)

Always use the least amount of discrimination possible. High discrimination settings can eliminate many desirable targets, increase target masking and decrease detection depth.

The illustration below shows the approximate discrimination points – where items are rejected and/or accepted in relation to the **DISC**rimination control setting while operating in the **DISC** mode. Your settings may vary slightly.

These are approximate settings only. You will need to determine the exact points on your detector by sampling various targets and then noting at what **DISC** control number they are rejected.



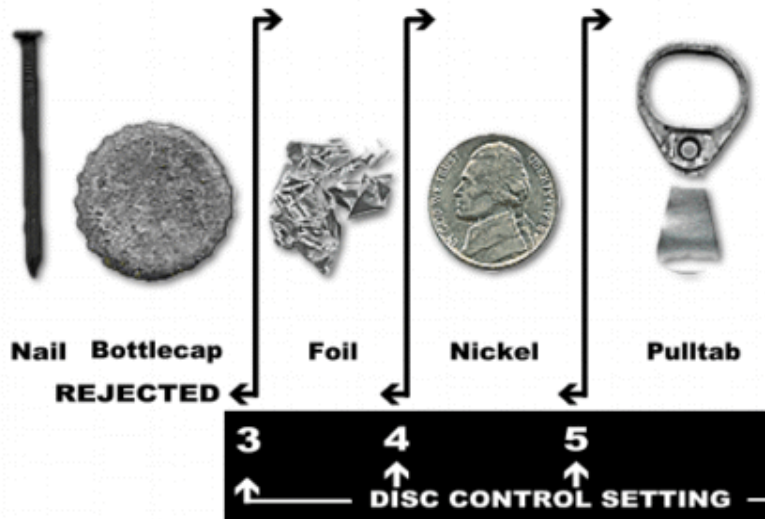
■ **DISC**

The **DISC** (Discrimination) control is enabled when the detector is operated in the **DISC** (Discrimination) mode.

Discrimination is used to eliminate any target that you do not want the detector to audibly respond to. The **DISC** control has an adjustment range of from 1 to 10. The lowest setting at which an object is rejected (eliminated) is considered to be the object's discrimination point.



The **DISC** control is marked with a preset setting of '3'. This is the recommended beginning setting for most types of detecting. As site and search conditions warrant, the **DISC** control may need to be adjusted 'up' or 'down' to accept or eliminate specific targets.



■ **GROUND BALANCE** - continued

tone does not disappear, then it is not possible to manually ground balance properly and **FIXED GB** should be used!

When the tone does disappear during the coarse adjustment, then you know that manual GB is possible and you are very close to the ground balance point.

The fine tuning process is to continue pumping the coil and adjust the GB control clockwise slightly until the tone volume is the same when lowering and raising the coil.

At this point your detector is perfectly ground balanced, BUT, searching at this ground balance setting will cause a great deal of ground noise when in the discrimination mode. So to overcome this problem you should adjust the **GB** control clockwise about another 1/4 to 1/2 turn.

Now you are ready to switch to the **DISC** Mode, adjust the **SENS & DISC** controls and start searching.

The process seems to be very complicated, but in reality it is simple, quick and easy. The two main things to remember are:

- 1) You must first find the point where the threshold tone changes from positive to negative (tone disappears).
- 2) You must operate with a slightly more positive GB setting than normal otherwise ground noise will be bothersome.

► **CIVIL WAR CAMPSITES**

One of the most extreme conditions you can put a metal detector in is red (Iron Oxide) dirt at Civil War camp sites.

Not only do some locations have a very high Iron Oxide content to contend with, but these sites can also be full of negative hot rocks, plus an abundance of rusty iron items of all kinds found in typical C.W. winter camps.

This combination makes detecting with any detector extremely difficult for either All-Metal or Discrimination modes.

In the All-Metal mode, detectors can 'cut through' the iron mineralization

■ **GROUND BALANCE** - continued

and negative hot rocks fairly well, but then all the rusty iron trash presents a problem.

In the Discrimination mode, detectors see the severe iron mineralization as one big target and then the problem is compounded with negative hot rocks.

Now, there are a couple of things you can do with the X5 to help overcome these bad conditions, but please don't expect the relics to just start jumping out of the ground or to see great depth. You still have to hunt hard and pay more attention to marginal signals in these adverse conditions.

1) Coil size becomes very important in these conditions. The-smaller-the-better is the rule. Larger coils see too much of the iron mineralization in respect to the small targets you are looking for.

2) Unless you want to dig a lot of the iron trash, then it is best to search in the Discrimination mode and to tune-out the hot rocks with the Ground balance control.

Find one or two of the pesky hot rocks and place them in a trash free spot on the ground. While in the Discrimination mode and the **DISC** set to approximately '4', adjust the **GB** control by swinging the coil back and forth within an inch or two above the hot rocks and adjust the **GB** until the hot rock signal disappears.

In most cases the hot rock signal will disappear about 1 to 1.5 turns clockwise from the normal ground balance point, depending on the hot rock. Now you are ready to hunt in these conditions.

3) Remember that the ground conditions are really bad with mineralized ground, hot rocks and iron trash, so your sweep speed must be reduced for best results.

► **MORE GROUND BALANCING TIPS**

Fixed or preset ground balance is set for the maximum performance from your detector.

I look at it like this, when manual ground balance is used in iron mineralized soil, to some degree, you are actually trying to over compensate

■ **PINPOINT**

Pinpointing targets with the Shadow X5 can be accomplished in one of three ways:



- 1) **VCO Pinpointing** - Push and hold the **VCO PP** pushbutton.
- 2) **ALL-METAL Mode Pinpointing (auto-tuned)** - Place the mode switch to ALL-METAL. (coil motion required or the target will tune out).
- 3) **DISC Motion Mode** - Place the mode switch to the **DISC** position. (search coil motion required).

The **VCO PP** (voltage-controlled-oscillator pinpoint) pushbutton switch is used to pinpoint and help visually determine the center of a target before and during retrieval by providing a VCO audio tone to the user.

This tone varies and increases in both amplitude (strength) and frequency (tone) as the target-center is approached.

When no additional increase in signal strength and frequency is heard, the target will be located directly beneath the search coil center.

To de-tune a target, pinpoint the target's center. Hold the detector still over that point and momentarily 'tap' , release, then hold the VCO pushbutton. This may be repeated as often as needed.

Learning to de-tune targets does require some practice to master – practice often and you will master it quickly!

See 'De-tune' in the Glossary section for additional information



■ SEARCH COIL

The Shadow X5 is equipped with a 9-inch, waterproof, open-center concentric 'Spider' search coil.

Troy Custom Detectors Shadow X5 search coils are completely compatible and interchangeable. In fact, the X5 coils are designed to have minimal effect to the detector's ground balance when changing to any size accessory coil.

Troy Shadow X5 search coils are electrostatic shielded and 100% waterproof. Their unique mechanical and electrical design insures a large 'footprint' of ground coverage, excellent depth, precise pinpointing and super stability.

Future Shadow X5 accessory search coils will most likely be a 9-inch elliptical widescan 'Double D' ; An 11-inch concentric 'Spider' and a 5-inch solid concentric. Accessory coil (scuff) covers will also be available.

The standard 9-inch concentric 'Spider' coil is a good 'all around' coil for use in all types of detecting. It provides outstanding depth and a large electromagnetic 'footprint' that provides full, deep, ground coverage.

The 7-inch coil is an excellent lightweight choice for trashy sites, fast competition hunting and quick, easy pinpointing.

For maximum depth and ground coverage, select Troy's 11-inch concentric Spider search coil

*Note: Check with your Troy Custom Detectors authorized dealer for search coil availability and additional information.*

■ GROUND BALANCE - continued

what the detector normally sees as a target. This can actually be viewed as mis-tuning the detector from its optimum state to try to improve bad conditions.

The analogy you have heard many times is true. Ground Balancing in heavy iron mineralized soil is very similar to driving an auto at night in heavy fog. To improve a bad situation it is best to use your low beam headlights instead of the high beams. High beams are preset for maximum performance just as fixed or preset ground balance is set for maximum or optimum performance for your detector.

There are two very good reasons to have both Fixed and Manual Ground Balance on the X5. First, some people just prefer to use Fixed GB as their hunting conditions do not require the benefits MGB can provide, but the main reason is for my own use! I don't like to guess where I should set the MGB control when I can not adjust it correctly.

The Ground Balance adjustment is simply too critical. So my advice is, to always use Fixed Ground Balance when you find yourself in a situation that does not allow Manual Ground Balance to be adjusted correctly.

Now here is a tip that is unique to ground balancing the X5. It operates at 19 kHz and is much more sensitive to small and low conductive items as opposed to most other detectors when hunting in the Discrimination Mode.

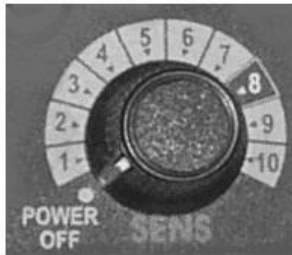
With the power of the X5 (depth and footprint), it is seeing much more ground area than normal. When this type of power is combined with 19 kHz type of sensitivity, it is best to adjust your Ground Balance control slightly more positive than normal to tune-out or reduce low conductive ground noise.

This is very important and you'll find with a little experimenting, your X5 will operate much smoother and still maintain superior depth.

■ SENS

The **SENS** (Sensitivity) control is one of the most important controls on your Shadow X5.

Its setting, to a large degree, will determine the detector's depth ability, sensitivity to small objects, degree of smooth or erratic operation, coil surface-area pickup (detection pattern), target acquisition, sensitivity to outside interference and other operating parameters.



A general 'rule-of-thumb' is to set the **SENSITIVITY** control as high as possible while maintaining smooth, stable operation.

The **SENS** control has a range of from '1' to '10', with a preset setting of '8". This is the recommended beginning setting for most types of detecting. As search and site conditions warrant, the **SENS** control may need to be adjusted 'up' or 'down'.

A too-high sensitivity setting can result in unstable operation, that produces false signals, 'pops' and 'static'. This can make detecting very difficult!

Unless you are detecting over extremely 'hot', mineralized ground with many hot-rocks, your Shadow X5 should be relatively smooth sounding – Responding only to targets accepted by the discrimination setting or all-metal mode. If you are constantly hearing false, random and intermittent signals, decrease the sensitivity setting. This will usually correct the problem. You may also need to ground-balance and adjust the threshold control (mode dependent). You should also try the **BEACH** mode.

**POWER OFF** - This control position is used to power the detector on or off. A slight, tactile 'click' will be felt when entering or exiting this position. At the full counterclockwise position of the **SENS** control, the detector is powered off.

■ FREQ

The three-position **FREQ** (Frequency) switch sets the operating frequency of the Shadow X5.



It should be set to the **NORM** (19.0 kHz) position unless interference is received from a nearby metal detector, such as in a competition hunt or when searching near someone who is also using a Shadow X5 or X3.

If interference is received, the **FREQ** switch should be moved to the **HI** (19.2 kHz) or **LO** (18.8 kHz) setting, whichever best eliminates or minimizes the offending interference.

Certain types of 'broadband' pulse noise, such as electric fence, car ignition, motor brush arcing, a distant electric storm, high-voltage or power line arcing noise may not be eliminated by the **FREQ** control. **That is not its intended purpose!**

The **FREQ**uency circuit was designed to eliminate coincidental R.F. frequency interference mainly in competition hunting or when searching in close proximity to another Shadow X5 or X3 user or metal detector operating at or near the 19 kHz operating frequency. Under these conditions, it will perform as designed.

| FREQ. SETTING | FREQUENCY |
|---------------|-----------|
| HI            | 19.2 kHz  |
| NORM          | 19.0 kHz  |
| LO            | 18.8 kHz  |