

Metal Detecting Class: MD 101 for Metal Detecting Clubs or Independent Detectorist

by Lee Wiese

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Metal Detecting Hobby Talk http://www.mdhtalk.org



Self-Certification Class Criteria Metal Detecting Class (MD 101)

The MD 101 class will start with an *Introduction* and discussion on:

- Metal Detector History
- Metal Detectors
- List of Metal Detector Manufacturers
- How a Basic Metal Detector Works
- Basic Components of a Metal Detector
- Metal Detector Designs
- > Types of Metal Detecting
- Metal Detectors are Designed for (coins, beach / water, jewelry, prospecting, relics. etc.)
- Equipment and Other Detecting Accessories
- Purchase <u>NEW</u> Detectors (local dealers, internet, etc.)
- Purchase <u>USED</u> Detectors (internet forums, clubs, dealer classifieds)
- > The Internet and Metal Detecting
- > National and State Metal Detecting Associations
- Metal Detecting Etiquette
- Responsible Metal Detecting

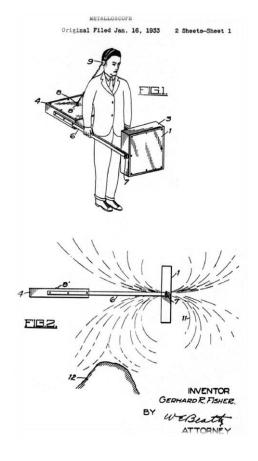


Metal Detector History

➤ Who invented the metal detector, and why? Alexander Graham Bell, he was trying to invent something to find the bullet contained by the body of President James Garfield.

Gerhard Fisher, Patented First Metal Detector in 1937

Patent Number: 2,066,561 METALLOSCOPE Gerhard R. Fisher, Palo Alto, Calif. Application January 16, 1933, Serial No. 651,974 Renewed August 6, 1936 <u>Complete Patent Web Link</u>





Metal Detectors

Multi-Purpose, Water, Gold, Relic, Pulse Induction, Two Coil or Box Detectors



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Metal Detecting Certification

Responsible Metal Detecting Self Certification METAL DETECTING CLASS (MD 101)

List of Metal Detector Manufacturers and Their Manufacturing Location

Past Manufacturers

Aqua Pro Tesoro Compass Tinytec D-Tex Treasure Ray Daytona Triple D Wilson-Neuman Discovery **Eric Foster's PI** Whites Gardiner Gold Mountain Heath Kit Jetco Metallascope Midas Touch Nautilus **Popular Mechanics** Raymaster Relco **Radio Shack**

Current Manufactures

Aurora Canada Bounty Hunter US **Detector Pro** US **Electro Scope** US Fisher US Garrett US GPL US J. W. Fishers US Minelab Australia MP Asia Teknetics US Asia Titan Treasure Commander Asia US Troy Viper Asia

Detector Table

European Manufacturers

Russia Aka UK Aquascan Blisstool Bulgaria C.Scope UK Cobra Germany DeepTech Bulgaria Laser UK Lorenz Germany Makro Turkey Nexus UK Nokta Turkey Okm Germany Pulse Star Germany ScanMaster UK Viking UK XP France



Basic Components of a Metal Detector

- > Control Electronics (analog, digital or micro-processor)
- Display System (meters, black/white & colored LCD displays)
- Search Coil (3" 18" or greater, mono, doubt "D", round or elliptical)
- Power Source (rechargeable, 9 volt, 1.5 AA batteries)
- ➢ Handle (straight "L" shape or "S" shape) Plus Arm Cup
- Hardware (coil, arm cup hardware, arm cult strap)
- Accessories (headphone, coil cover, tote bag or carrying case, pin-pointer, probe, recovery tool, scoop, finds & trash pouch)



Metal Detector Designs

> (VLF) Very Low Frequency

- + 3 to 70 KHz Operation
- + Single Frequency Detectors
- + Dual Frequency Detectors
- + Multi-Frequency Detectors

Est: 90-95% of the Detectors

> (PI) Pulse Induction

+ The PI metal detector's control electronics transmits pulse signals at a rate of 50 - 150 pulses per second. When the pulse encounters a metal object a counter field or current is generated by the metal object. This field is picked up by the receive coil and sent to the control electronics which provides a response to the operator.

Est: 5-10% of the Detectors



How a Basic Metal Detector Works

The detector control electronics generates an electromagnetic field in the transmit winding of the search coil which in turn penetrates the earth. The receive winding of the search coil will pick-up any alteration in the electromagnetic field. Alteration in the electromagnetic field are caused by a metal object (target) in the earth. The information from the receive coil is sent to the control electronics which in turn provides the operator with an audible tone and / or also an indication on an display, or meter.

All metal detectors are based on one principle:

metal will react to a magnetic field.



Types of Metal Detecting

- Beach (Dry & Wet Sand)
- > Cache & Hoards
- > Coin
- Competition
- > Jewelry
- Prospecting
- > Relic
- > Treasure
- Underwater (good to 100+ feet)
- Wading (good to Six feet)



Metal Detector Designs are Usually for:

- Cache Detecting: Two Coils
- General or Multi-purpose Detecting (coins, jewelry, relics, prospecting)
- Ground Penetrating Locators
- > Prospecting
- Relic Detecting
- Water Detecting
- Pin Pointer (electronic hand held & detector integrated probes)
- Industrial Detectors
- Security Detectors (hand held & walk through)
- Treasure (specific underwater detecting)



Equipment and Other Detecting Accessories

- Battery Systems
- Coils (Small to Large) *
- Coil Covers *
- Detector How To Videos
- Digging Tool Kits *
- Display Case
- Electronic Pin-Pointers *
- Finds & Trash Pouch *

- Gold Test Kits
- > Headphones *
- Hard & Soft Carrying Case
- Knee Pads *
- > Pin Pointer Probe *
- **Rain & Dust Covers**
- Sand & Water Scoops *
- > Scales
- Water Boots*

* These are MUST Have Accessories



Purchase <u>NEW</u> Detectors from (local dealers, internet, etc.)

> Manufacturers do not sell directly to consumers, manufacturers generally sell through distributors, local merchants and internet retailers.

> Distributors and local merchants may sell through a standard brick & mortar business and also on the internet.

> Some dealers or merchants sell only on the internet.

+ Pros & - Cons

Internet Purchase:

- + Save the sales tax in most cases
- Pay shipping & insurance cost
- Can not have hands on before purchase
- + Price is sometimes cheaper (lower overhead)

Brick & Mortar Purchase:

- + Usually can demo detector before purchase
- + One on one contact with the merchants
- + Support for & from local merchants
- l) + Rapid availability



Purchase <u>USED</u> Detectors from (internet – classified forums, clubs, dealer classifieds, Craigslist)

✤ Internet Classified Forums:

- E-bay:

http://shop.ebay.com/i.html?_nkw=metal+detector&_armrs=1&_from=R14&_ipg=50&_sop=10

- Finds Treasure http://www.findmall.com/
- Friendly Metal Detecting Forum: <u>http://metaldetectingforum.com/</u>
- Treasure Net: <u>http://forum.treasurenet.com/</u>
- ✤ Metal Detecting Clubs may have a <u>USED</u> Classified page.
- **♦** Dealers on the Internet may have a <u>USED</u> Classified page.



The Internet and Metal Detecting

Many facets of metal detecting can be found on the internet and

below are examples:

> Metal Detecting Forums for general information, fresh water, relic, surf & sand, prospecting, specific manufacture or detector model, announcements, finds display, etc.

- Metal Detecting Club & Association Websites
- > Metal Detecting Classified Forum Websites
- Metal Detector Distributor & Dealer Websites
- Metal Detector Manufacturer Websites
- Metal Detecting Individual Websites
- Metal Detecting Blogs



National and State Metal Detecting Associations

National Associations

AMRA, American Mining Rights Association

https://americanminingrights.com

FMDAC, Federation of Metal Detector and Archaeological Clubs Inc.

http://www.fmdac.org

GPAA, Gold Prospectors Association of America

http://www.goldprospectors.org

PLP, Public Lands for the People

http://www.publiclandsforthepeople.org/

Western Mining Alliance

https://theminingalliance.com/

State Associations

MDAW, Metal Detecting Association of Washington

https://sites.google.com/site/metaldetectwa/home

TAMDC, Texas Council of Treasure Clubs

http://www.tamdc.org/



Responsible Metal Detecting Self Certification Metal Detecting Class (MD 101) Metal Detecting Etiquette

What might be the definition of metal detecting etiquette?

Etiquette for metal detecting can be defined as a form of ethical behavior regarding metal detectorist responsibility, the actions of detectorist in their dealings with each other, the use of land, abiding by the law, practicing correct and acceptable social behavior in the field and by adhering to the Metal Detecting Code of Ethics.

- Detectorist actions and dealings with each other.
- Detectorist use of lands. (Public and Private)
- Detectorist being law abiding.
- Detectorist social behavior.
- Detectorist Adhere to Code of Ethics.

Article: Metal Detecting Etiquette <u>http://www.mdhtalk.org/ethics/md-etiquette.htm</u>



Responsible Metal Detecting

Responsible Metal Detecting is to Know and Follow the Law.

Responsible Metal Detecting is to Gain Permission.

Responsible Metal Detecting is to Apply the Metal Detecting Code of Ethics and Detecting Etiquette.

Responsible Metal Detecting is to Join a Metal Detecting Club and National Metal Detecting Association.

Responsible Metal Detecting is to Understand the Potential Cultural Value of Your Find.

Responsible Metal Detecting is to **Volunteer** Your Services to the Hobby.



Responsible Metal Detecting is to Know and Follow the Law.

Know and Follow the Law means that one should read and understand the American Antiquities Act of 1906, National Historic Preservation Act of 1966 As amended through 2000, Archaeological Resources Protection Act of 1979, Native American Graves Protection and Repatriation Act of 1990. Archaeological resources are part of our Nation's heritage and these **four acts** cover archaeological resources and their recovery on public and Indian lands.

The four acts cover all national Public / Indian lands and in many cases also these acts have been adopted either wholly or in part by many states to cover state lands. There are also additional regulations that have been developed by the USDA Forest Service, Bureau of Land Management (BLM) and the National Parks Service.

Most states also have laws that cover just state parks, beaches and recreation areas. States usually have a specific web-site where you can find out almost everything you need to know. Some states do not allow metal detecting under any situations, while most states require either verbal, written permission or a permit.

Then there are the county, city and school district laws. Each of these entities may also have laws regulation metal detecting on their specific lands. Contacting the authorities for these public entities should yield the information you need.

A good rule of thumb is if it is national, Indian land or is a historical site it is off limits to metal detecting and all other lands usually require permission.



Responsible Metal Detecting is to Gain Permission.

Gain Permission to search private land.

Permission should be acquired in writing when ever possible and cover the following: owner's name, property address (Street, City, State, Zip) with description of the area on the property to be searched, purpose of access to the land, liability wavier, ownership of items found, property conditions after the search, start / end date and time of the search with signatures of all parties.

Otherwise gain verbal permission by contacting a private property owner in person and obtaining verbal permission to enter the property. This form of obtaining permission should cover the same terms as outlined in the written permission section above.

Liability Waiver:

Please note the following concerning a liability waiver. Waivers maybe used between individual, however, if there is an injury or other issue that may arise insurance companies could get involved from either party. Insurance Companies will probably not honor any previously agreement made between the parties either oral or in writing.



Responsible Metal Detecting is to Apply the Metal Detecting Code of Ethics.

Apply the Metal Detecting Code of Ethics.

The metal detecting code of ethics is meant to re-enforce the national, state, county and city laws. The code of ethics covers gaining permission, property damage, tampering with structures, equipment, gates and being an ambassador for the hobby. These are important ethics statements and following them may be difficult but very important in meeting the public's perception of how the hobby must and should be practiced



Responsible Metal Detecting is to Join a Metal Detecting Club and National Metal Detecting Association.

Join a Metal Detecting Club and / or National Metal Detecting Association, is a commitment to metal detecting excellences. By joining you are committing your time to learn more about the hobby or to contribute your expertise / knowledge to others who may be less senior in the hobby.

By joining a club and getting involved generates hobby centralism. This centralism can impact many laws that have been implemented in states and cities in the past there has been no strong voice from those in the metal detecting hobby. If there is no voice or involvement from people in the hobby many laws are created - most times with a negative hobby impact.

So joining a club at the local level provides a local hobby voice and joining and getting involved with a national organizations starts to generate the necessary centralism for national support of the hobby.



Responsible Metal Detecting is to **Understand** the Potential Cultural Value of Your Find.

Understand a Potential Cultural Value of Your Find is practiced in England but not practiced well in the U.S. at least not in an acceptable method for most hobbyists.

The reason to characterize your find for its culture value is to understand if it may be part of out American Heritage. If one is following the law and not detecting on historical, national lands or Indian lands there should not be a problem in getting advice on cultural value.

However, having said that one must use caution by including others for their opinion / expertise since this could cause a litigation situation.

In the end it is everyone's responsibility who metal detects to ensure whether or not a find may be part of our American Heritage and should be treated as such.



Responsible Metal Detecting is to **Volunteer** Your Services to the Hobby.

Volunteer Your Services to the Hobby. This could be in the form of starting a metal detecting club in your area, volunteering to be a club officer or a specific club chairperson.

Today more than ever clubs need volunteers to handle officer duties / responsibilities, chairmanships for membership, hunt masters, club involvement projects, evident recovery teams, public relations, newsletters, etc. Many of these chairmanships are important and without them the club will not grow or become an involved part of the community.

As the local club needs volunteer support and expertise so does a national detecting organization. People who have been with the hobby for a while should look in the national leadership direction and move their experience to the next level.



Support Slides

Gold Facts

Glossary of Metal Detecting Terms
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Gold Facts

	Karat	Fineness	Percent
Gold	24K	1.00	100 %
	22K	.916	91.6 %
	18K	.750	75 %
	14K	.583	58.3 %
	10K	.416	41.6 %
	9K	.375	37.5 %



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Air Test: A test performed by moving various sized metal samples beneath the metal detector searchcoil to check the detector's features and target response. This test is not an accurate indicator of ground depth penetration capability. Alkaline: A type of battery able to sustain longer periods of current drain with greater storage life when compared to the standard carbon-zinc type.

All Metal: Any operating mode or control setting which allows total acceptance of any type of metal targets. Usually associated with the Ground Balance mode.

Audio ID: See Tone ID

Audio Response: See Target Response

Auto Tune: Circuitry which continuously retunes the detector's threshold to the initial manually tuned audio level. The retuning rate following target rejection or drift can be preset or variable.

Back Reading: A false signal, when operating in the discriminate mode, caused by a rejected target coming within one inch of or contacting the searchcoil bottom.

Bench Test: An air test to determine at what approximate discriminate settings various metal samples are rejected or accepted. The test is conducted in a non-metallic area.

Black Sand: One of the most extreme components of nonconductive, negative ground minerals. Also called magnetite (Fe3O4) or magnetic iron oxide.

Body Mount: A configuration whereby the control housing is separated from the control shaft and fastened to the operator's body lessening arm fatigue and expanding usability for shallow water hunting. Also known as hip mount. **Cache:** Any intentionally buried or secret hoard of valuables.

Carbon-Zinc: The most common standard dry cell battery type.

Coil: See Searchcoil



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Coin Depth Indicator: A visual indicator used in conjunction with calibrated circuitry to indicate depth of buried coins in inches or millimeters.

Concentric: A searchcoil configuration using one or more transmit and one receive windings having unequal diameters aligned on a common center; most recently arranged on the same plane and called coplanar concentric.

Conductive Salts: One of the major mineral types which make up the positive ground matrix. Wet, ocean-salt sand produces a positive rise or metallic type response on an air tuned threshold.

Conductivity: The measure of a metal target's ability to allow eddy current generation on its surface.

Control Housing: A metal or plastic box which holds circuit boards, indicators, meter, controls and power supply.

Convertible/Combination: A metal detector configuration allowing versatility in operator handling i.e. hand held to body mount. **Coplanar:** Any searchcoil configuration in which transmit and receive windings occupy the same level or plane.

Crystal Controlled Oscillator: A transmit oscillator employing a crystal to maintain stable output frequency.

Depth Penetration: The greatest measure of metal detector's ability to transmit an electromagnetic field into the soil matrix and produce a target signal.

Detection Pattern: The densest or strongest region of the searchcoil's electromagnetic field where detection occurs. Its shape is balloon and changes in size directly proportional to target surface area.

Detuning: Adjusting the audio threshold into the null or less sensitivity tuning zone. Also a method of narrowing a target signal width manually for precise pinpointing. This is accomplished by retuning to audio threshold over the target response area. **DISC:** See Discrimination

Discrimination: Adjustable circuitry which ignores or nulls audio responses from a specific conductivity range allowing positive responses to be heard from metals higher in conductivity above the discriminate control setting. Designed primarily to eliminate audio response from trash metals. See also Motion Discriminator.



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Double Blip: A signal characteristic common to elongated ferrous targets such as nails or coins lying close to the surface detected in the All Metal no-motion mode.

Double D or 2 D: See Wide Scan.

Drift: A loss of threshold tuning stability caused by temperature change, battery condition, ground mineral content or detector design.

Eddy Currents: Small circulating currents produced on the surface of metal by the transmitted electromagnetic field. These currents then produce a secondary electromagnetic field which is then detected by the searchcoil receiver windings resulting in inductive imbalance between the windings.

Electromagnetic Field: An invisible force extending from top and bottom of the searchcoil created by the flow of alternating oscillator frequency current around the transmit winding. See also Detection Pattern.

Electronic Pinpointing: An automated detuning feature which narrows signal response for the purpose of target pinpointing. **Elliptical Coil:** A searchcoil with an ellipse shape. This coil can be either concentric or wide scan type.

Faint Signal: A sound characteristic of targets that are sometimes deeply buried or very small in size.

False Signal: An erroneous signal created by over shoot, ground voids or highly mineralized hot rocks. See also Back Reading **Faraday-Shield:** A metal foil wrapping of the searchcoil windings or metallically painted searchcoil housing interior for the purpose of eliminating electrostatic interference caused by wet vegetation.

Ferrous: Descriptive of any iron or iron bearing material.

Ferrous Oxide: An oxidized particle of iron which generally becomes nonconductive and makes up the natural negative ground mineral matrix. Hematite, which is also and iron oxide (Fe2O3), will respond as positive or metallic. See also Black Sand. **Frequency:** The number of complete alternating current cycles produced by the transmit oscillator per second. Measured in cycles per second.



Glossary of Metal Detecting Terms Reprinted From Western & Eastern Buyers Guide

VLF- Very Low Frequency = 3 to 30 kHz

LF- Low Frequency = 30 to 300 kHz

MF- Medium Frequency = 300 to 3000 kHz

HF- High Frequency = 3 to 30 MHz

Frequency Shift: A feature which suppresses the audio interference (cross-talk) between two detectors using identical transmit frequencies in close proximity.

Ground Balance: A state of operation using specialized circuitry to ignore the masking effect that iron ground minerals have over metal targets.

Ground Balance - Factory Preset: A feature which eliminates the manual ground balance control and its adjustment from the operator's setup procedure. This adjustment is performed internally by the factory to optimize operation over an average range on nonconductive soils.

Ground Balance - Manual Adjusted: A feature requiring a manual control adjustment procedure to neutralize the effects of negative minerals in the search matrix.

Ground Balance - Self Adjusting: A feature which senses change in ground mineral content and continuously readjusts the ground balance while in operation. Sometimes called Ground Tracking or Automatic Ground Balance.

Ground Filter: Complex circuitry found in motion-type detectors which separates mineral signal from the metal signal allowing it to be further processed by the discrimination circuitry.

Hand Held: A metal detector configuration whereby the operator holds a shaft or handle which supports the searchcoil and control housing. Also called pole mount.

Head: See Searchcoil

Hz or Hertz: Cycles per second. See also Frequency.

Hip Mount: See Body Mount.



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Hot Rock: A rock which contains a higher concentration of nonconductive ground minerals than the surrounding matrix to which the detector is balanced. A metallic (positive) response will be heard in the motion and non-motion modes and a null or negative drop in threshold is heard in the all-metal, ground balance mode over these rocks.

Isolator: A nonmetal stem which attaches the searchcoil to the control shaft eliminating metallic interference in the detection pattern. On some detectors, the entire lower shaft is made of a nonmetal substance.

kHz or Kilohertz: 1000 cycles per second. See also Frequency.

LCD or Liquid Crystal Display: Used on a metal detector as a graphic visual indicator same as a meter/needle indicator. **LED or Light Emitting Diode:** A semi-conductor which produces an illuminated visual response.

Loop: See Searchcoil

Matrix: Refers to the total volume of ground penetrated by the transmitted electromagnetic field--which may contain varying amounts and combinations of minerals, metals, salts and moisture.

Metal: Metallic substances such as iron, foil, nickel, aluminum, gold, brass, lead, copper, silver, etc.

Metal Detectorist: A person operating a metal detector in the field. This name is preferred by many over Treasure Hunter. **Meter:** A detector component that provides visual information to aid in target identification. Meters feature either an LCD or needle indicator which may display intensity of signal, target depth, target identification, type of metal, or battery condition.

Mineral-Free Discriminator: Any metal detector that can reject or ignore trash metals while simultaneously balancing ground mineralization.

Mineralized Ground: Any soil that contains conductive or nonconductive components.

Mode: A condition of operation, selected by the operator, for specific desired function(s).

Motion Discriminator: A detector type that requires searchcoil motion to activate its simultaneous ground balance and discriminate functions. Se also Mineral-Free Discriminator and VLF/TR

Narrow Response: a target that produces an audio response so short that pinpointing is almost not needed.



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Negative Ground: Soil that contains nonconductive minerals which have a negative or nulling effect on an air-tuned threshold. **Neutral Ground:** Soil that has no nonconductive or conductive mineral properties. Lacks mineralization.

Ni-Cad or Nickel-Cadmium: A rechargeable type of battery cell.

NIMH or Nickel Metal Hydride: A rechargeable type of battery cell that doesn't have to be completely discharged before recharging (like Ni-Cads do)---otherwise known as memory.

Non-Ferrous: Not of iron. Metals of the precious class (i.e., gold, silver, copper, etc.)

No-Motion: Refers to any mode of operation that does not require searchcoil motion to trigger target response. Also called non-motion.

Notch Accept: Operation whereby all target responses are "tuned-out" except those the instrument is adjusted to accept in the notch "window".

Notch Discrimination: Filtering circuitry which allows a "window" of desirable targets to be accepted within the entire rejection range of unaccepted targets, i.e.. rejecting nails, foil and pulltabs while accepting nickels and gold rings of the same conductivity. This circuitry can also be adjusted to reject all metal targets while accepting only a specific conductivity range.

Notch Level: a control used to select the target level or target conductivity which the notch filter will act upon.

Notch Reject: Operation whereby all targets within the notch width at chosen notch level will be "tuned-out".

Notch Width: a finite discrimination range of target conductivities ("window") at the chosen notch level.

Null: The zone just below audible threshold in metal detector tuning. This also refers to the momentary drop or quiet response of threshold sound as the searchcoil passes over a discriminated or rejected target.

Overlap: The amount of searchcoil swing advance not greater than the searchcoil's physical diameter.

Overshoot: A common false signal heard as the searchcoil passes over a rejected target when using a no-motion All Metal mode in conjunction with automatic retuning. excessive tuning restoration pushes the audio above threshold level creating a positive response at the edges of target detection periphery.



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Phase Response: The length of time between eddy current generation sustained on a metal's surface and the resultant secondary electromagnetic field effect on the searchcoil's receive winding. Related to target conductivity.

Pinpointing: Finding the exact target location with respect to a searchcoil's designated center. Accomplished by interpreting the centers of audio response width in perpendicular direction or scans. See also Detuning.

Positive Ground: Soil which contains conductive minerals or moist salts which have a positive or upward effect on an air-tuned threshold.

PI or Pulse Induction: A mode of operation where the transmitter circuit pulses and electrical current into the ground before it quickly shuts down. The eddy currents dissipate immediately from poor conductors such as wet salt sand and ground minerals. Metals hold eddy currents because they are better conductors. When the receiver circuit comes on, it picks up the returning signal from metal; the eddy currents in the ground minerals have already disappeared.

Quick Response: A short time period between metal sensing and peak audio/visual indicator indication usually associated with all frequency ranges of TR detectors.

Rejection: an indication of target non-acceptance by a null in threshold or broken sound while operating in a discriminate mode. **RF-Two Box:** A radio frequency detector having its own transmit and receive winding separate and in an orthogonal

configuration. This detector is capable of deep large object detection while naturally ignoring small targets such as nails and individual coins.

Scan: Refers to 1) the effective searchcoil detection width or 2) searchcoil movement over the ground.

Scrubbing: The searchcoil is pressed and held in contact with the ground while searching to maintain even audio threshold. With newer detectors, this technique is used to gain depth.

Searchcoil: A circular (or other shaped) plastic housing containing single or multiple transmit and receive windings (wire coils) in a specific configuration. A searchcoil emits and receives signals from the ground and metal targets. Also called loop, coil or head.



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Searchcoil Cable: An electrostatically shielded cable of conductors (wires) which convey signals to and from the search coil and control housing.

Sensitivity: The capacity of a metal detector to perceive changes in conductivity within the detection pattern. Generally, the more sensitivity a detector can smoothly provide, the more depth it will achieve in sensing targets.

Signal: An audio response or visual indication alerting the operator that a target has been detected.

Signal Width: The total distance of ground an audio signal is sustained during searchcoil travel or scan.

Silent Search: Refers to detectors capable of producing a target signal while operating below the threshold audio. Also called silent operation.

Scuff Cover: A protective cover for the searchcoil bottom. Also called coil cover or skid plate.

Slow Motion: A description of searchcoil speed required to operate the motion discriminate mode.

Stability: The ability of a metal detector to maintain manually adjusted tuning threshold under the effects of outside interference. See also Drift.

Surface Area: Refers to the area of a target closest to the searchcoil where eddy current generation can take place.

Surface Mount: The art of mounting electronic components on the surface of a printed circuit board rather than using the "through board" method. This allows more technology in a much smaller space and with much higher tolerances.

Sweep: The motion employed in moving the searchcoil across the ground.

Target: Refers to any object that causes an audio or visual response in a detector.

Target Masking: When large sizes or high concentrations of trash metals drive the threshold into the null zone suppressing weaker, positive responses from deeper or smaller targets.

Target Response: See Signal.

Ten-Turn: A control which can be manually rotated ten times to cover the full electrical range of the function. Usually associated with tuning or ground balance function.

Test Garden: A mapped plot of buried targets at various depths to aid in learning characteristic target responses and in comparing metal detector performances under a given ground mineral content. Also called test plot or test bed.



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TH, **TH'ing:** Universal word contractions for treasure hunter and treasure hunting. Also know as Metal Detectorist.

Threshold: Continuous tone that establishes a reference point for tuning the detector to ground balance it. The threshold tone also establishes the minimum sound level for deep targets in the discriminate mode.

Tone ID: Circuitry producing different audio tones for each target's conductivity range, i.e., low tone for nickel, high tone for coins.

TR or Transmitter-Receiver: Term describing method of operation of early detectors. Some manufacturers still product this type of detector. Electromagnetic field distortion caused by mineralized ground interferes with depth penetration as this type of detector does not ground compensate. It does balance conductive salt water effects so, it is primarily used in salt water and on low mineral salt water beaches or low mineral inland locations.

Visual ID: A feature in which a visual indication is produced to help identify the target.

Visual Indicator: A meter, LCD or LED that signals a target's presence.

VLF or Very Low Frequency: See Frequency.

VLF/DISC: Term associated with detectors capable of mineral-free operation in both Discriminate and All Metal modes.

VLF/TR: A class of detector that can operate in both the All Metal, Ground Balance mode and the No-Motion Discriminate, Non-Ground Balance mode.

Wide Response: A target that produces an audio signal over an area wider than the searchcoil diameter.

Wide Scan: A coplanar searchcoil with two "D" shaped transmit and receive windings positioned back to back and overlapping. This searchcoil type is capable of detecting a target across at least its full diameter. Also called Double-D or 2-D.

Zero Discrimination: Used to describe detectors whose discrimination control allows the acceptance of all metals at zero setting