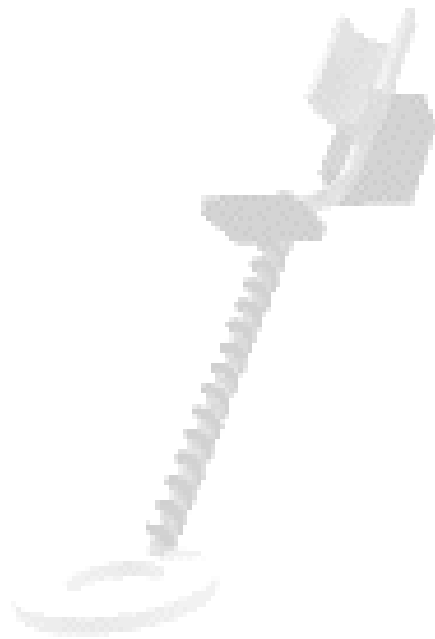


Before You Buy That Metal Detector Handbook



Metal Detecting Hobby Talk

<http://www.mdhtalk.org>

by: Lee Wiese

Introduction

The material in this handbook is a consolidation of seven articles from the MDHTALK.org website that cover a variety of detector purchases.

The first article addresses how much a new detectorist should consider spending for their first detector. There is a manufacturers pricing table by model to help with that purchase. The table high lights the seven top detector companies from the U.S. and Australia. You can get a good visual comparison between manufacturer models and their price.

The second article covers where to buy a detector.

The third article discusses ergonomics of metal detector handles and what you should consider in your detector purchase. Detector ergonomics is very important since swing a detector for many hours can put a great strain on one's back and shoulder.

The fourth article addresses metal detecting freshwater and saltwater beaches. This article takes a look at what detectors may be best for the two types of beaches plus what detectors may be best for dry sand, wet sand and the water. There are a number of detectors listed in a table with a ranking.

The fifth article centers on electronic probes, their strengths, weakness and contribution to locating a target. There is also a comparison table that lists most of the major electronic brands and some of their features.

The sixth article covers beach tools with some specific requirements for the best beach scoop.

The seventh article concerns the investment cost that a detectorist might encounter to participate in the different types of metal detecting. There is a table that lists the different types of detecting across the top with various categories of accessories along the side and a cost for each particular item under the different types of metal detecting. There is a summary of cost at the bottom of the table for each type of metal detecting.

The eighth article covers purchasing a competition detector.

Here is a link to a free MS Excel spread sheet to calculate your metal detecting investment cost.

<http://www.mdhtalk.org/articles/investment/metal-detecing-investment-blank.xls>

Summary: All detectorist should find this short handbook helpful in selecting a detector or in just understanding what it may cost you to participate in the metal detecting hobby.

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Article One:

I am new to the hobby. What Metal Detector should I purchase?

This is a question that most of us have asked ourselves and continue to be asked by others interested in joining the hobby. I like many of you have been metal detecting for a while but still find it hard to come up with the best detector for certain types of detecting (coins, jewelry, relics, beach, prospecting) in part because new detectors are constantly becoming available from manufactures.

So again, why is it so hard to answer this question? The detector companies have not made this question easily answered take a look at **TABLE ONE** on the next page. In table one there are 88 detectors from seven detector manufacturers. On the left side of the table a range of detector pricing in \$100 increments is shown for the three groups of detectors: *Multi-Function*, *Water* and *Prospecting*. Placed in each column next to a price range is a detector model (number or name). Also on the left side of the table next to the price range is a RED ARROW pointing downward with the words PRICE, FEATURES, and TECHNOLOGY. Keep in mind: **FEATURES** plus **TECHNOLOGY** equal **PRICE**. This is not a complete list of detectors in the market place but a good representation of what's available.

Why it is so hard to answer the question: "What metal detector should I purchase?"

By looking at **TABLE ONE** you can see there are **many** *Multi-Function* detectors available per given price range and in most cases they will have the same or similar features and capabilities. Also there is a good deal of price spread per detector company - as the price goes up for a given company's detectors so do the number of features and usually performance capability. Features certainly can add to overall performance but can also make the detector much more complex to setup, to operate, and to learn for the average person. *Multi-Function* detector enhancements come in the form of adding a display, more features by using software and hardware switches, and the ability to change to different size or functional coils. (Note: *Multi-Function* detectors can be any combination of coin, jewelry, relic beach, & prospecting detectors.

The criteria used to select your first *Multi-Function* detector may follow along this line of reasoning. You should first decide how frequent you will use the detector; don't spend big bucks and have an expensive detector in the closet.

- a) If you are going to use the detector for vacation plus an occasional weekend keep your decision focused on a price range of \$100-\$400 or lower and compare the feature sets between manufactures to find the best detector fit for you.
- b) If you are going to get into the hobby and use the detector more frequently you might place your attention on detectors in the \$500-\$800+ price ranges. Greater research on your part must take place by comparing feature sets between detectors and companies to identify a match for your detecting needs.
- c) If you are very serious about the hobby you may want to look at detectors in the \$800 - \$1,900 ranges. You will find a large number of technological driven detecting features. These detectors tend to be more complex, the learning curve much longer but over time the quality of targets recovered can be very good to excellent.

Water detectors are driven more by TECHNOLOGY (See RED ARROW) than features. There are detecting features but they tend to be limited to a certain feature set among the detector companies. The decision to purchase a *Water* detector is a bit easier since there are fewer available choices. The major decision factors for a *Water* detector are price, company, and whether you want a Pulse Induction (PI), Very Low Frequency (VLF) or a Multi-frequency technology detector.

Prospecting detectors are usually design specifically to look for Gold. The decision to purchase a *Prospecting* detector will hinge on frequency of use, performance required and price. Usually Gold *Prospecting* is the major and only reason to purchase this type of detector. Some of the Multi-function detectors have a prospecting mode and in with these *Multi-Function* detectors you get to try your hand at prospecting.

In summary give consideration to the following before laying out cash for your first detector. How frequently am I going to use the detector? What type of detecting (coins, jewelry, relics, water, prospecting) am I going to use the detector for? How much money should I plan to spend?

Once you have answered these questions move forward with your research. Compare detector specifications between companies, seek out a metal detecting club in your area and ask questions, ask a friend in the hobby, visit metal detecting forums on the web and ask questions, visit your local metal detector dealer and seek out their advice. Remember everyone you ask will be bias toward their specific detector and company. I hope this provides some insight into the complexity of answering the question: "What metal detector should I purchase?"

Due to space limitation not all detector-manufacturin

Table One		Hobby Metal Detectors					
Multi-Function *	Bounty Hunter 26 Models	Tesoro 12 Models	Teknetics 15 Models	Garrett 12 Models	White's 14 Models	Fisher 17 Models	Minelab 19 Models
List Price Range							
0\$ - \$99.99	P r i c e =						
\$100 - \$199.99	Gold Digger Junior - BHJS Prospector Fast Tracker Tracker II Tracker IV Quick Silver Commando Lone Star Lone Star PRO Discovery 1100 Pioneer® EX	Compadre	Digitek Eurotek Alpha 2000	ACE 150 ACETM 200	Coinmaster® XVenture	F11	Go-Find 20 Go-Find 40
\$200 - \$299.99	Quick Draw II Quick Draw PRO Gold Discovery 2200 Pioneer® 202	Silver Umax Mojave	Eurotek Pro Delta 4000 Minuteman	ACE 250 ACETM 300	Treasure Master	F-2 F22	
\$300 - \$399.99	Land Star Sharp Shooter II Titanium Discovery 3300 Pioneer® 505		Liberator	ACE 350 ACETM 400	Treasure Master Pro	F-44	Go-Find 60
\$400 - \$499.99	Land Ranger Pro	Cibola	Gamma 6000 Patriot			F-4	X-Terra 305
\$500 - \$599.99	Camo-LS	De Leon Golden Umax Vaguero	Omega 8500		M5 M6	F-5	
\$600 - \$699.99	Platinum Time Ranger	Outlaw -3 Coils Tejon	G2 Plus				X-Terra 505 Equinox 600
\$700 - \$799.99			T2			F-70	
\$800 - \$899.99		Cortes	T2 LTD		MXTM Pro	F19 Series	Equinox 800
\$900 - \$999.99				GTI 2500	Spectra VX3	CZ-3D	X-Terra 705
\$1,000 - \$1,099.99						F-75	
\$1,200 - \$1,299.00					Spectra V3i Std		
\$1,300 - \$1,399.00						F-75 LTD	Safari
\$1,400 - \$1,499.99					Spectra V3i Wireless		
\$1,600 - \$1,699.99							E-Trac
\$1,800 - \$1,899.99							CTX 3030
\$3,200 - \$3,299.99							
Water							
\$600 - \$699.99				AT PRO			
\$700 - \$799.99		Tiger Shark Sand Shark PI		Sea Hunter Mark II	MX Sport		
\$800 - \$899.99				AT MAX	Surf PI Dual Field	1280X-10"	
\$1,700 - \$1,799.99						CZ-21-10"	
\$1,900 - \$1,999.99							Excalibur II
Prospecting							
\$500 - \$599.99						Gold Bug	
\$600 - \$699.99						Gold Bug Pro	
\$700 - \$799.99		Lobo		AT Gold	GMT	Gold Bug DP	Gold Monster 1000
\$800 - \$899.99						Gold Bug II	
\$1,000 - \$1,099.99					TDITM SL 7.5 or 12		
\$1,100 - \$1,199.99							X-Terra 705 Gold Pack
\$1,200 - \$1,299.99							Eureka Gold
\$2,400 - \$2,499.99				ATX			
\$4,000 - \$4,999.99							SDC 2300
\$6,200 - \$6,299.99							GPX-4500
\$6,900 - \$6,999.99							GPX-5000
\$12,000 - \$13,000							GPZ 7000

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g companies have been listed in the above table. Data for this table came from manufacturer's web sites and select retailers.

* Multi-Function detectors can be any combination of (coin, jewelry, beach, prospecting and relic detectors)

Article Two:

Where to Purchase Your Detectors

Making a decision to purchase your first metal detector or even your second or third can be a significant financial decision. The following five steps may be helpful in coming to the right conclusion for that detector.

Many potentially new detectorist can spend hours finding information, reading field reports and getting input on specific detector models before making a decision to purchase a detector. This is no easy task since there are well over 100 different detector models to choose from and an ever increasing number of manufacturers. Plus the cost of the purchase can be a very large sum of money so taking one's time is financially important.

Decision Steps.

- 1) *Field of Interest.* First you must determine what your metal detecting interest is going to be: such as coin shooting, jewelry, relics, gold prospecting or beach metal detecting.
- 2) *Research.* Once you have chosen a specific metal detecting field of interest you must be willing to do some research on what are the best detectors for that chosen field of interest.
- 3) *Detector Decision.* Make two detector selections from your investigation: your primary choice and then a secondary choice as a backup.
- 4) *Money Decision.* The next step is to determine how much money you are willing to spend and match this amount with the detectors you have found to fit your field of interest.
- 5) *Where to Purchase.* The final step is to determine where you are going to purchase the metal detector.

Once the decision has been made as to how much to spend and what detector to purchase the very next issue is where does one make the purchase and why? This short article will try to provide some insight into where a metal detector can be purchased and some of the associated benefits and downside risk.

Manufacturers of metal detectors usually do not sell direct to the end consumer, rather manufactures work through distributors. The distributors in turn provide detectors and accessories to retailers where the end user can find the detector that best fit their requirements.

Metal detector retailers can take a number of forms; they can be a brick and mortar type of retailer in your local community, a retail hobbyist working out of their home or a detector retail business that is only found on the internet.

Metal detectors can be purchased new from a retailer but another avenue may be to purchase a good used metal detector. Used detectors can be found on metal detecting forum classifieds, some retailers, Craigslist and from members of a metal detecting club. Occasionally, a metal detector can be purchased though the local newspaper classifies.

Where to Find Retailers. One of the easiest ways is to perform a search on the internet for a local metal detector retailer; this can be done with little effort. Most retailers have a website and they usually list the brand and model of detectors that they stock and sell.

Joining a local metal detecting club is another good way to learn about local retailers and the manufacture brand of choice purchased by many of the club members. Another source of metal detector retailers can be found in hobby related magazine advertisements. Some examples of these hobbyist magazines are:

American Digger <http://americandigger.com/>

GPAA Gold Prospecting <http://www.goldprospectors.org/>

IMCJ Prospecting and Mining <http://www.icmj.com/>

Lost Treasure <http://www.losttreasure.com/>

Western and Eastern <http://www.wetreasures.com/>

Next let's explore the various retail or classified detector sources one can use to purchase a metal detector.

Retailers.

Brick and Mortar. This type of retailer is usually found in your local community. The retailer may support just one manufacture brand or occasionally several manufacture brands.

Benefits.

- Purchasing a detector though a local retail store provides you the opportunity to handle the detector, turn it on and potentially use it in a test garden.
- The local retailer may also provide a training session to the purchaser under actual operating condition in the field.
- The detector will be available to the purchaser as soon as it is paid for.
- After the detector purchase the purchaser can ask follow-up questions of the retailer when he is not clear on the detector's operation or the detector's setup.

Downside.

- A brick and mortar retailer has high fixed costs therefore may not be able to offer the lowest price.
- A local retailer may also need to charge for any local tax that is required with the detector purchase.

Hobbyist Retailers

A hobbyist retailer that operates out of their home has very low fixed cost and may be able to offer a lower overall price. All other *Brick and Mortar* benefits and downside issues apply to this type of retailer with the exception of potentially getting a lower price.

Internet Sources.

Retailers and Occasionally Distributors

Retailers that offer their metal detectors and accessories for sale though their website may provide the purchaser access to a larger number of manufacture brands. These internet retailers can be anywhere in the U.S. or in the world so doing some background investigation and independent analysis of the retailer's trust worthiness is essential before making a purchase.

Benefits.

- May provide the lowest price plus offer some free accessories with the purchase.
- May not need to charge for local and state taxes.
- The internet retailer's fixed cost is much lower.

Downside.

- The opportunity to have detector "hands on" before you purchase does not exist.
- There will be no local training available.
- Follow-up questions on the detector's operation may be much harder to accomplish if at all.
- The purchaser may need to pay for shipping.
- The detector is not instantly available to the purchaser.
- The creditability of the seller must be carefully checked out by the purchaser.

Forum Classifies

There is a wealth of information on the internet about metal detecting; with metal detecting forums being an important part of this information. Forums that deal with metal detecting usually have a sub-category forum

which offers detectorist a place to sell their excess detectors and accessories. This can be a good place to pick up a nice used detector.

Benefits.

- A used metal detector can usually be purchase for 30 - 40% below retail value.
- In these transactions everything is negotiable.

Downside.

- The creditability of the seller must be carefully checked out by the purchaser.
- The opportunity to have detector “hands on” before you purchase does not exist.
- There will be no local training available.
- Follow-up questions on the detector’s operation may be much harder to accomplish or not at all.
- The detector will need to be paid for before shipment takes place.
- The purchaser may need to pay for shipping cost.
- The detector is not instantly available to the purchaser.

Here are a few forums that offer metal detector classified sections:

Find’s Treasure <http://www.findmall.com/>

Friendly Metal Detecting <http://metaldetectingforum.com/index.php>

Treasure Depot <http://www.thetreasuredepot.com/>

Treasure Net <http://www.treasurenet.com/>

Treasure Quest <http://www.treasurequestxlt.com/community/index.php>

Treasure Spot <http://www.mytreasurespot.com/main/index.php>

Craigslist <http://www.craigslist.org/about/sites/>

Used and new metal detectors for sale can be found on Craigslist from across the country. All of the benefits and downside issues of *Forum Classifies* apply to Craigslist detector purchases. **I would put a much higher emphasis on checking the creditability of the seller. It is much harder on Craigslist to determine whether a seller is being honest with you about the detector’s condition and functionality or if even a detector exists.**

Hobby Related Clubs

Individual Members

Belonging to a hobby related club provides a great avenue for acquiring a detector from an individual club member. A Club Member’s creditability is usually very high and all the benefits of purchasing from a local retailer apply to this type of purchasing situation. Detectors purchased from club members are usually used but can also be new if the club member operates out of their home as a *Hobbyist Retailer*.

Club Classifies.

Many metal detecting clubs have a website and post their club newsletter on the site. Frequently in club newsletters you will find metal detectors for sale at very reasonable prices. This can be a very good way to find a detector at low cost and from a creditable source. In these transactions everything is negotiable. The same benefits and downside are similar to purchasing a detector from someone on one of the *Forum Classifies*.

Summary. Where to purchase your detector can be a difficult question to answer since there are different benefits and downside risk associated with the various purchasing sources. If this is your very first detector purchase the recommendation is to choose your detector source wisely with the least downside risk. A face to face retail transaction is usually the safest and offers the greatest benefit to the purchaser. Good Luck.

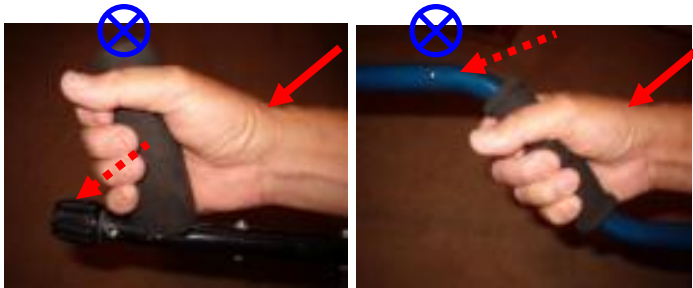
Article Three:

An Opinion on Metal Detector Ergonomics

In the U.S. metal detecting market there are six major manufacturers of detectors and these six manufacturers offer more than 59 different models. These multi-functional detector models start at a price of \$200 or less and go to a high of \$1,500 or more, so choosing the right detector can be a challenging task. The intent of this article is to provide guidance on one very important aspect of metal detectors - ergonomics. Ergonomics should be one of most important elements in any decision to purchase a detector since friendly ergonomics will result in the efficient use of the operator's energy and minimize the possibility of sore muscles or injury to the operator over time.

Ergonomics is defined as the science related to man and his work, embodying the anatomic, **physiologic, and mechanical principles affecting the efficient use of human energy.**

Detector ergonomics comes down to **THREE** major issues; the gripping of the detector with your hand, weight / balance of the detector and adjustability of the detector's handle length. Excellent ergonomic design will result in less strain put on the wrist, arm, shoulder, and/or back during the use of the detector.



“L” Shape Handle

“S” Shape Handle

First there are two types of handle designs used by detector manufactures: the “L” shaped handle and “S” shaped handle. In the two photos you can see an example of each of the designs and how they are gripped.

Take a look at the “L” shaped handle in the photo (at the **DOTTED RED ARROW**) and note that the remaining portion of the handle for coil attachment is designed to extend outward below the hand and wrist. This design feature helps to reduce the load on the wrist during the swing of the search coil. An additional feature of this handle's design is that the electronics is usually mounted on top of the “L” portion of the handle placing the electronics above the hand (see the **BLUE X**). Now take another look at the hand gripping the “L” shaped handle in the photo (at the **SOLID RED ARROW**) and you will see the angle on the hand and wrist is in a more natural position with little or no strain on the wrist. Take your own hand and hold it in that position, you will feel no strain.

Now take a look at the “S” shaped handle in the photo (at the **DOTTED RED ARROW**) note that the remaining portion of the handle extends forward and outward above the hand and wrist where the coil and electronics (see the **BLUE X**) are attached. Now look at the gripping of the “S” shaped handle in the photo (see the **SOLID RED ARROW**) and you will note that the hand is tipped slightly downward. This slight downward tilt of the hand puts an unnatural strain on the wrist and forearm and will over time extend to the shoulder. Note: some “S” handles may have a greater vertical angle design that will bring the grip closer to the “L” design grip. The

mounting of the electronics after the grip will add weight to the swing of the search coil and increase the strain on the wrist. Take your own hand and hold it in that position, you will feel a slight strain in the wrist area.

The second ergonomic issue is the weight of the detector and how the weight is distributed on the detector's handle. One of the specifications of a detector is weight with and without the batteries installed but there is usually no discussion or specification on detector balance. A well balanced detector should have a fulcrum or balance point where the hand grips the handle. This is the point where there is equal weight before and after the grip, the best possible situation for swinging the search coil for a long period of time.

For the "L" shaped handle the electronics are ideally placed directly above the hand grip and usually the batteries are placed under the forearm for added balance to the overall assembly. This brings the balance point very close to the hand grip but still slightly forward of the grip point. This design is approaching the ideal situation.

The "S" shaped handle usually has the electronics placed on the handle after the hand grip position which puts more weight past the gripping position. The placement of the electronics after grip position toward the search coil end will result in a very un-balanced handle. This situation puts a greater load on the wrist and forearm because the balance point is much further forward of the grip position.

The third ergonomic issue of importance is the ability to extend the lower handle to the correct length for good upright posture while swinging the search coil. This adjustment will reduce the strain on the operators shoulder and back. Improper adjustment can cause the operator to bend over while swinging the coil and may result in a lower back stress during the hunt period.

There are a few more ergonomic issues one must be aware of with detectors. First the detector must have an audio volume control & a headphone jack. The audio output should be stereo and the volume control should cover a wide range for good operator comfort and target identification. Also if the detector has an LCD display, the display information should be very readable (Large Characters) in bright sun light and have an excellent back lighted display for night use.

The recommendation is that for new detector purchases there should be a review of the detector's ergonomics before hitting the BUY button. Make sure the detector is light, well balanced, and has a good grip design that will put less strain on the wrist, the arm, shoulder and back while swinging that search coil for the treasure find of a life time. A side note: some manufactures offer ultra light detector to enhance the ergonomics of their models and this certainly makes a huge difference during their usage. Also there are a number of after market manufactures that offer "L" shaped handles for many of the major manufacturers' detector models. Their products can be found on the web.

Article Four:

Critical Factors to Consider Before Selecting a Metal Detector for Fresh and Salt Water Beaches

Introduction. Metal Detecting beaches can be a challenge for any detectorist because of the ever changing beach conditions which can be encountered. This article will focus on beach condition changes and their affect on a metal detector's ability to operate correctly over the whole beach.

To start, there are major differences between fresh and salt water beaches and choosing a detector that can operate just fine on a freshwater beach may not be the right answer as a saltwater beach detector. That same freshwater beach detector may fail to operate properly or at all on a saltwater beach. This article will address the two different beach types, multi-function (VLF) detectors and pulse induction (PI) detectors.

Today, there are over 100 detector models offered by manufacturers. There in a table at the end of this article of some of those models. The table has just a few models listed for comparison purposes and note that some of the detectors have been given a ranking number. The ranking goes from one to five with one being the highest rank. The source of information for this table and ranking comes from personal beach detecting experience while using many different detectors and from comments concerning beach detecting and detectors on various hobby related forums.

The table has the manufacturers listed on the left side with various detector models below each of the manufactures' name. Listed across the top of the table are the two beach types fresh and saltwater and below each beach type are the three section of any beach (dry sand, wet sand, underwater).

Color codes (green, yellow, red) are used to show the capability of each model on the various sections of the beach. On the far right side of the table is the detector ranking scale (1 to 5) for freshwater and saltwater detectors. Only five detectors are ranked for each of the two beach types. The capability of a detector to handle a given beach situation determines its ranking in the list. If no rank exist for a given model it just means that the model isn't one of the top five best detectors for beach detecting.

This article does not recommend any specific detector to purchased for beach detecting even if a detector is ranked. The rankings are very subjective and should only be used as a guide to your detector purchasing decision. Before purchasing a detector you must always consider where the detector will be used. Will it be used for fresh or saltwater beaches and on what sections of the beach? The location of the saltwater beach can also be critical in any choice, since saltwater beach mineralization varies from coast to coast (east coast, west coast or on a southern U.S. beach coast). Also other countries may have specific beach detecting conditions that also could influence your detector decision. If you plan on traveling and detecting across the U.S. or in other countries, do your homework to determine the best detector or detectors for your metal detecting adventure.

Freshwater Beaches can be found anywhere there is a nice lake, stream or river bank that can be used for swimming. Freshwater beaches offer a couple of challenges to the detectorist both on the beach and in the water. Freshwater and saltwater beaches are usually divide into three major sections:

- dry sand,
- wet sand and

- underwater beach sand.

The major freshwater beach challenges that a multi-function detector must overcome:

Freshwater beaches are usually well established and have been in the same location for many years and in some cases for more than a 100 years. The greater the age of a freshwater beach the more metallic trash will be encountered by the detector. The major reason for more metallic trash at a freshwater beach is that there is no corrosive environment that exist like on a saltwater beach, so the metallic material does not corrode rapidly or in some cases not at all. This means metallic trash (bobby pins, pull tabs, bottle caps, nails, foil, etc.) cumulate over time on a freshwater beach. This also implies that much more trash will be found in the deeper layers of sand and clay or mud bottom of a freshwater beach.

One of the reasons to detect a beach is to find jewelry and if the trash content of the beach sand is very high, the trash may mask a jewelry target signal from the detector being used. When water detecting on a freshwater beach keep in mind that the underwater portion of the beach may have the same level of trash as the beach dry sand. If this is the situation, you will be digging and retrieving a lot of trash and that is not much fun in waist deep or deeper water. Hint: Try to always detect freshwater beaches in the fall when the water level is lowest. Low water levels expose more beach and target retrieval become a much a easier task.

Another reason that freshwater beaches have more trash is that there are no swells (except very large lakes). Large swells and surf action remove sand and also take trash off the beach to deeper water. This is usually **NOT** true for smaller inland lakes, rivers and streams.

Another thing to consider is that some detectors will operate correctly in dry sand but become unstable in wet sand or in the water. Always give consideration to the effects that wet sand and fresh water have on a metal detector's operation before purchasing a detector.

The detectors used on a freshwater beach and in the water should have the following:

Must have features in a multi-function detector -

- waterproof to some depth level (only if you plan on water detecting),
- extremely fast target response (aids in target signal separation),
- very good target discrimination adjustment capability,
- coil interchangeability is extremely important to aid in target separation (small coils: 5", 8", 3x6", 6x9", etc),
- light weight and ergonomically comfortable for the user.

Want to have features in a multi-function detector -

- tone I.D. and / or optional digital display I.D. capability,
- ground balance capability,
- capability to also be used on saltwater beaches and in saltwater.

In summary; use the list of features above and compare them to the detectors ranked for freshwater beaches. The best detector choice will have many these features. Always get other detectorists' opinions and input before buying. This article is just one input to your detector purchasing decision.

Keep in mind that using metal detector discrimination to mask out trash is **NEVER** the right thing to-do while beach detecting. For good and bad target separation changing the detectors coil to a smaller size this can be a very good alternative. Another detector specification to overcome target masking is how fast the detector responses to a given target signal, the faster the detector's response the better target signal separation between multiple targets for a given sweep of the coil.

Saltwater Beaches are heavily used by the public and therefore are considered an ideal place to metal detect. Saltwater beaches are usually divide into the same three major sections as freshwater beaches:

- dry sand,
- wet sand and
- underwater beach sand.

The Dry Sand portion of the beach can usually be detected by many of the median and higher priced detector models. But just turning on the detector and going for it will not always work, therefore, the detectorist needs to know their detector's capability and adjust it for correct operate at the beach.

Wet Sand detecting on a saltwater beach requires a detector designed to handle high concentrates of mineralization, black sand, all of which is mixed with saltwater. This type of detecting environment limits the number of detectors available. The detectors for use in this situation will frequently cost more than \$1,000 in price.

Underwater saltwater detecting has the same requirements as a saltwater wet sand detector in addition it must be completely waterproof.

The major challenges on a saltwater beach that a multi-function detector must overcome:

The greatest challenge to detecting a saltwater beach is the sand mineralization, black sand deposits and the saltwater itself. All of these components are conductive and will influence the detectors capabilities to operate correctly. These conditions cause many detectors to not ground balance and give false target signals due to the conductivity of the sand's mineralization content and saltwater.

Trash tends not to be a dominate factor for saltwater beach detecting. This is because there is a yearly beach cycle that takes place on a saltwater beach where in the winter months storm surf and swell action removes sand from the beach and along with the sand the trash is also removed. Another factor is the rapid decomposition of metallic materials on saltwater beaches. This decomposition is accelerated by the highly corrosive beach environment.

The depth of the sand can also be a factor on saltwater beaches. Saltwater beach sand can have a depth of may feet and this along with the corrosive and conductive sands can challenge most detecting equipment.

Must have features in a multi-function detector -

- waterproof to some depth level,
- capability to operate in a saltwater environment (no false target signals),
- coil interchangeability is extremely important to gain coverage & depth (large coils: 10", 112", 15", etc),
- tone I.D. and / or optional digital display I.D. capability.

Want to have features in a multi-function detector -

- very good target discrimination adjustment capability,
- light weight and ergonomically comfortable for the user,
- ground balance capability.

In summary if a detector works well in a saltwater environment it will be very compatible for most freshwater beach detecting providing the beach is light in trash. There is a tendency to use larger coils on a saltwater beach (10", 12", 15" and larger) since trash is not a dominate challenge to saltwater beach detecting. Larger coils also provide for greater coverage and depth. Rapid detector response is not required on a saltwater beach.

PI (Pulse Induction) Detectors generally have the capability to ignore high mineralization beach environments while providing good sensitivity to most metallic targets. Performance is usually consistent on any type of beach but there are exceptions. When a beach has a very high concentration of black sand deposits, adjustments may be required even on a PI detector.

The PI detectors designed today have many different capabilities and features between the different manufacture models such as: ferrous and non-ferrous discrimination (two tone ID), ground balance, dual frequency operation, coil size and bouncy, pulse delay control, VCO mode, audio frequency control, ground tracking speed, threshold control, etc.

The basic PI is usually pretty much a turn-on and go detector with just a couple of adjustments and the learning curve is usually very short. Since the basic PI provides only a single target tone the user only needs to learn how the tone may be slightly altered with different shaped targets.

PI detectors are **not** a good choice for any type of freshwater beach detecting. The reason is that PI detectors **react to all metallic trash** as well as good targets. Since saltwater beaches have **LESS** trash (usually) the PI can be a good choice for wet sand and underwater detecting.

In some situations using a (PI) pulse induction detector can be very beneficial and the decision to invest and use a PI is very operator dependent. There are a number of PIs in the table but no ranking exist since there is a good deal of differences between the various models.

In summary there are some differences between the detector used on freshwater beaches vs. saltwater beaches. The differences can be compared in the must and wants section for each beach type. There is usually a few hundred dollars more in price making a saltwater beach detector more expensive.

Here is a comparison of the must and want features for a freshwater and saltwater detector.

Freshwater Detectors

Must have features in a multi-function detector -

- waterproof to some depth level (only if you plan on water detecting),
- extremely fast target response (aids in target signal separation),
- very good target discrimination adjustment capability,
- coil interchangeability is extremely important to aid in target separation (small coils: 5", 8", 3x6", 6x9", etc).
- light weight and ergonomically comfortable for the user.

Want to have features in a multi-function detector -

- tone I.D. and / or optional digital display I.D. capability,
- ground balance capability,
- capability to also be used on saltwater beaches and in saltwater.

Saltwater Detector

Must have features in a multi-function detector -

- waterproof to some depth level,
- capability to operate in a saltwater environment (no false target signals).
- coil interchangeability is extremely important to gain coverage & depth (large coils: 10", 112", 15", etc).
- tone I.D. and / or optional digital display I.D. capability.

Want to have features in a multi-function detector -

- light weight and ergonomically comfortable for the user,
- very good target discrimination adjustment capability,
- ground balance capability.

Finally, any detector that can operate without giving false target signals in a saltwater beach environment and needs no adjustment between the different beach sections (dry, wet and underwater) is an excellent choice. One way to choose a detector is to purchase it for saltwater use and it will be generally be suitable enough for freshwater beaches.

See the table color codes for a guide between fresh and saltwater detectors compare the green, yellow and red areas of the table. Hint: Compare the amount of color bars between freshwater and saltwater detectors.

Your Detector Input is very much appreciated on any detector that works or does not work on either freshwater or saltwater beaches. Just provide the detector model's name and give a brief description on how it performs on each beach type (fresh and salt) and beach section (dry, wet, and under water). [MDHTALK Email](#)

Detectors	Beach Metal Detecting						Fresh	Salt
	Fresh Water			Salt Water				
	Dry Sand	Wet Sand	Under Water	Dry Sand	Wet Sand	Under Water		
Minelab								
CTX 3030			Underwater		Special Program Requirements			5b
Excalibur (Old & New Models)			Underwater			Underwater	4	1
Explorer Series (XS to ET Models)			Wading			Wading	5	4
Eureka Gold				Sen. Reduction				
Sovereign Series (Old & New Models)			Wading			Wading	3	3
X-Terra Series			Wading	Sen. Reduction				
White's								
Beach Hunter & BHID			Underwater			Underwater		5a
DFX (Old & New Versions)			Wading			Wading		
MXT & MXT Pro			Wading	Sen. Reduction				
Surf Dual Field (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Surfinmaster (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Vision / v3i			Wading			Wading		
XLT Series (Old & New Versions)			Wading		Sen. Reduction	Wading		
Fisher								
CZ20 & CZ21			Underwater			Underwater	4	2
F2		Sen. Reduction		Sen. Reduction				
F75 Series		Sen. Reduction		Sen. Reduction	Falsing			
Goldbug Two				Sen. Reduction				
Gold Bug Pro				Sen. Reduction				
1280			Underwater	Sen. Reduction	High Level of Falsing			
Tesoro								
Cibola					Sen. Reduction			
Compadre								
Sand Shark (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Silver UMax								
Stingray			Underwater	Sen. Reduction			1b	
Tejon		Sen. Reduction						
Tiger Shark			Underwater	Sen. Reduction	Major Adjustment Required		1a	
Vaquero		Sen. Reduction		Sen. Reduction				
Garrett								
ACE 150								
ACE 250			Wading	Sen. Reduction				
ACE 350			Wading	Sen. Reduction				
AT PRO			Underwater		Beach and Coast Dependent		2	
Infinium (PI)	*****	Too Much Trash	Underwater	Adjustment Critical		Underwater		
Sea Hunter (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Detector Pro								
Head Hunter Pulse (PI)	*****	Too Much Trash	Underwater	Trash Issue		Underwater		
Headhunter Wader			Underwater		Unknown	Unknown		
	Good	Very Good to Excellent						
	Caution	May Need To Adjust Sensitivity or in the Case of a PI to Much Trash						
	Stop	Will Not Operate Correctly						
		Wadding Only						
		Metal Detecting Hobby Talk http://www.mdhtalk.org						

Article Five:

Electronic Hand Held and In-Line Probes

There have been major design and technology advances in detector hardware and software features. These advances have greatly increased a detector's capability to locate a target. Along with new detector designs, there are design enhancements to search coil construction which provide greater search coil performance. These performance improvements have greatly enhanced the metal detector's capability to identify a target more correctly and to improved the detector's ability to pin-point more precisely the target's location.

The old school method was to locate the target's ground position by using the pin-point capability of the detector and then taking a metallic probe shaped like a long blade screw driver to locate the target's exact position. The process would be to insert the metallic probe into the ground where the detector had pin-pointed the target's location in small incremental changes until the target was found with the probe. After the target was located the detectorist would create a divit and remove the target. This approach worked well for a target no greater that five to six inches deep. However, greater depths were a challenge to most detectorist resulting in the detectorist digging an ever expanding and deeper hole until the target was located.

To complement these new detector design and technology advancements are an array of new electronic pin-pointing probes. Thus, the target retrieval process now minimizes ground disturbance, damage to grass and other plant life because of the introduction of the electronic pin-pointer and the design advances made in detectors.

There are two types of electronic pin-pointers currently available:

- **Hand Held Electronic Probes**
- **In-Line Metal Detector Target Probe**

In Table ONE below - is a list of Hand Held and In-Line Probes by manufacture, list price and some of the other key and common attributes of these probes.

Table: 1		Tuning or									
List			Audio	On /Off	Sensitivity	LED					
Price	Battery	Vibration	Tone	Switch	Control	Indicator	Warranty	Notes			
Hand Held Electronic Probes											
DetectorPro Uniprobe All-in-One	\$350.00	9 Volt	No	Yes	Yes	Volume	No	2 yrs	Head phone frame, Frquency & Threashold Controls		
DetectorPro Pistol Probe	\$299.00	2-9 Volt	No	Yes	Yes	No	2-LEDS	2 yrs	Holster, Silent Mode, Frquency & Threashold Controls		
Cache Probe CP200	\$195.95	12 Volt	No	Yes	Yes	Yes	Yes	1 yr	VLF Technology, Light Indicator		
Minelab Pro-Find 25	\$195.00	9 Volt	No	Yes	Yes	Yes	Light	2yrs	VLF, Holster, Increase or Decrease Senitivity		
Tesoro Treasure Mate	\$171.00	9 Volt	Yes	Yes	Yes	Yes	Yes	Life Time	Ground balance & Tuning Control (No Longer Listed)		
Garrett Pro	\$149.95	9 Volt	Yes	Yes	Yes	No	Yes	2 yrs	Holster		
Vibra Probe 580	\$149.95	9 Volt	Yes	No	No	Auto-Off	No	1 yr	Water Proof,Tilt On / Off, Holster		
Kellyco Automax Precision V4	\$140.00	9 Volt	Yes	Yes	Yes	Yes	Yes	1 yr	Belt Clip		
White's Bullseye II	\$119.95	9 Volt	Yes	Yes	Yes	Yes	Yes	1 yr	Vibrate / Audio Selectable		
Merlin	\$79.00	9 Volt	Yes	Yes	Yes	Yes	Yes	Unk	Hole Light (No Longer Available)		
Bounty Hunter / Teknetics	\$69.00	9 Volt	Yes	Yes	Yes	Yes	No	1yr			
Fisher F-Pointer	\$69.00	9 Volt	Yes	Yes	Yes	Yes	No	1yr			
Harbor Tools Cen-Tech	\$16.99	9 Volt	No	Yes	Yes	Yes	Yes	90 Days	Holster		
In-Line Metal Detector Target Probes											
Sun Ray In-Line Probe	\$194.95	Detector Battery	No	Yes	Yes	No	No	1 yr	3 inch depth, waterproof probe, mounts on detector		
Metallic Probes											
Brass Shaft Probes	\$9.95								Metal Detecting Hobby Talk		
Steel Shaft with Brass Tip	\$9.95								http://www.mdhtalk.org		

Hand Held Electronic Probes. Hand held electronic probes are probes that operate independently of any metal detector used by the operator. The probes are designed around the (PI) Pulse Induction technology meaning that the probe will detect all metals that it comes in near contact with but does not have the capability to discriminate metal types. The hand held probes operate from a self contained nine volt battery with an on / off switch for probe control. Some hand held probes may have other controls.

The advantages of a hand held probe are:

- Probe is independent of the detector being used
- Audio indicator for target ID
- Vibration indicator for target ID
- Light weight and can be wore in a belt mounted holster
- Vibration target identification is preferred - since the target's audio tone is not transmitted to the headphones
- Probes have 1.25 inches to 2.25 inches of detection range (ground condition and target size will have an effect on range)

The disadvantages of a hand held probe are:

- Switches and controls can easily malfunction and stop working due to dirt and moisture
- Turning controls do not have detent stops, they are easily moved by accident
- Hand held probes are not waterproof (There is an exception - Vibra Probe 580)
- Hand held probes do not discriminate metal types (There is an exception - Cache Probe CP200)
- Hand held probes have an independent power source (must carry spare batteries)
- Some hand held probes are not good at detecting small metallic targets (small gold items)
- Hand held probes also can experience battery contact issues

When using a hand held probe it is a good idea to rotate the pin-pointer in and around the hole since targets in the ground can be at any angle or shape and often these attributes can have an effect on the hand held probe's detection range. Most of the hand held probes can indicate target location by either an audio signal, vibration in the handle and in some cases by an LED light on the probe grip.

In-Line Metal Detector Target Probe. The in-line detector probe is mounted on the detector's shaft and are ready to use at any time while detecting. The detector's battery system is the power source for the inline probe so no additions batteries are required. Since the probe is attached to the detector there will be an increase in the detector's weight, therefore, the additional weight may effect one's ability to swing the detector for long periods of time.

The in-line detector probe can be switched on or off by a toggle switch attached to the probe's control electronics. The switch either puts the detector in it's standard mode of operation with its own search coil or the switch turns on the probe's small coil and turns off the detector's search coil. This makes the probe usable to pinpoint a target after detection by the detector. Once the probe is switched on and the target is located the target's ID is transmitted to the detectors control electronics. The target information will either be displayed on the detector's screen or transmitted though the detector's headphone to the operator just as if the detector's standard coil was being used.

The advantages of an in-line probe are:

- No additional battery is required
- Probe is mounted on the detector and always available to the operator
- The probe itself is waterproof
- The probe has about 3-4 inches of detecting depth
- A probe design is available for many different detector brands and models
- The probe has all the same functions as the detector it is mounted on
- Based on the detectors setting the probe can discriminate metal types

The disadvantages of an in-line probe are:

- Adds to the detector's weight
- Must move the probe to achieve a target signal (probe is a motion detector)
- The probe design is dedicated to a specific detector brand and model series

Table: 2	
	Author's Ranking
Hand Held Electronic Probes	
DetectorPro Uniprobe All-in-One	
DetectorPro Pistol Probe	3
Cache Probe CP200	
Minelab Pro-Find 25	
Tesoro Treasure Mate	
Garrett Pro	2
Vibra Probe 580	4
Kellyco Automax Precision V4	
White's Bullseye II	5
Merlin	
Bounty Hunter / Teknetics	
Fisher F-Pointer	
Harbor Tools Cen-Tech	
In-Line Metal Detector Target Probes	
Sun Ray In-Line Prob	1
Metallic Probes	
Brass Shaft Probes	
Steel Shaft with Brass Tip	1a
http://www.mdhtalk.org	

In Summary. While reviewing the selection criteria to purchase an electronic probe there are a few important items to consider besides just price.

The first point is how many detectors do you own or are planning to own? If you own multiple detectors then selecting an in-line probe may not be the best choice since most detector brands require a different model of in-line probe. In this situation it may be best to choose a hand held probe since they are not detector depended.

The second point is that hand held probes tend not to be as reliable as in-line probes since the probe controls are exposed to dirt and moisture each time that they are used. This can easily cause switches and controls to completely fail or become intermittent with use. Hand held probes also can experience battery contact issues since each probe has a minimum of one battery.

The third point is the detection range capability of the probe. In-line probes tend to have the greatest detection range while hand held probes have a detection range of 1.25 inches to 2.5 inches depended on the brand.

In Table TWO on the left is the authors ranking for a few of the probes. A rank of ONE is best and a rank of FIVE is the lowest. As with any ranking the results are based on a subjective analysis of the key attributes, in field use and the review of comments made by other detectorists on various metal detecting forum.

Here is a list of the manufacture's websites and a link to their electronic probe webpage.

In-Line Metal Detector Target Probe

Sun Ray Detector Electronics <http://www.sunraydetector.com/>

Hand Held Electronic Probes

Bounty Hunter Metal Detectors <http://www.detecting.com/bounty-hunter-accessories.htm>

DetectorPro Metal Detectors <http://www.detectorpro.com/pistolprobe.htm>

Fisher Metal Detectors <http://www.fisherlab.com/hobby/detector-accessories.htm>

Garrett Metal Detectors http://www.garrett.com/hobbysite/hbby_pro-pointer_main.aspx

Harbor Tools <http://www.harborfreight.com/catalogsearch/result?q=Cen-Tech+metal+detector>

Intex Systems Corp <http://www.intexsystemscorp.com/index.htm>

Kellyco Super Store <http://www.kellycodetectors.com/accessories/pinpointers.htm>

Minelab <http://www.minelab.com/usa/consumer/knowledge-base/news?article=101787>

Teknetics Metal Detectors <http://www.tekneticst2.com/teknetics-accessories.htm>

Treasure Products <http://www.treasureproducts.com/vibraprobe.html>

White's Metal Detectors <http://whiteselectronics.com/products/accessories/miscellaneous.html>

Article Six:

Metal Detecting Sand and Water Scoops

Introduction. Metal detecting at a swim beach or in the beach water is one of the major detecting attractions in the hobby. Generally, there are very specific detector requirements for metal detecting on freshwater and saltwater beaches, however, target recovery scoops can be used on either type of beach and in fresh or salt water.



Fig. A - Short Handle Sand Scoops



Fig. B - Straight Handle Sand Scoops



Fig. C - 20 Degree Angle Handle Sand

A common target recovery tool used at the beach is a sand or water scoop. The scoop will have a basket or bucket with holes in the basket to filter the sand, a cutting edge and a handle to grip the scoop. There are many different types of scoops and each type will have some positive and negative attributes. Scoop price can also be a very important factor in purchasing a scoop; however, getting the right scoop regardless of price is very important since recovering targets from the beach or in the water can at times be very difficult.

There are two basic types of scoops.

Scoops used in the beach dry sand and occasionally in the wet sand usually have short handles, wire mesh screen for the basket and a steel cutting lip wedged to the mesh basket. The basket size for a sand scoop can be from four to five inches in diameter and may hold one to two quarts of sand.

Scoops used in wet sand and the water are usually constructed of stainless steel or aluminum with a handle length of 42 to 48 inches. The bucket size will range from five to six inches in diameter and nine to twelve in depth.

Keep in mind that one quart of wet sand weights 4.3 lbs and the larger the scoop you have the greater weight you will be lifting. Sand weight is an especially important attribute to consider before purchasing a very large bucket (6x12 or larger) water scoop.

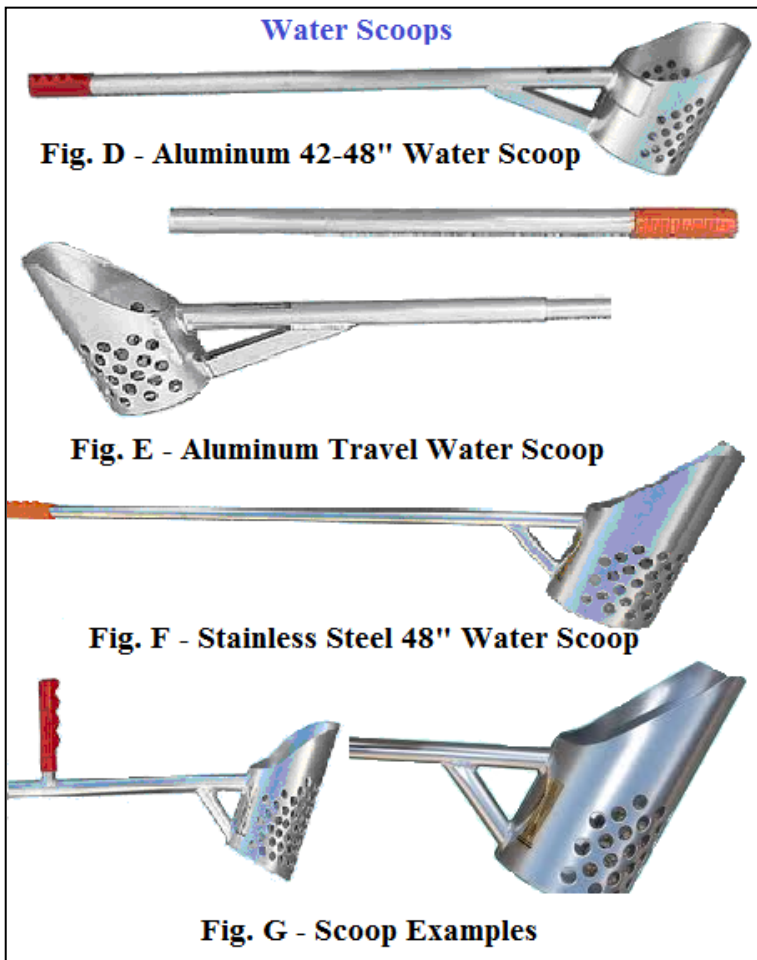
Sand Scoops. This type of scoop can be constructed of plastic, galvanized steel, aluminum or stainless steel. The basket size will usually range from four to five inches in diameter with holes for filtering out the sand of one / half inch in diameter. The holes in the basket can be either square or circular.

Sand scoops will usually range in price from \$20 to \$40 depending on the design of the basket, material used and length of the handle.

In Fig. A there are four sand scoops, each of these scoops has a handle directly mounted to the scoop basket. The four scoops in the figure are either plastic, galvanized steel or stainless steel. The issue with these scoops is that they should only be used in dry sand. There is just no leverage of your swinging power since the handle is mounted directly to the basket. Another issue is that all of the sand's resistances against the scoop's basket are transmitted to the detectorist wrist and lower arm. Over a period of time the wrist and lower arm can become sore.

In Fig. B you will find photos of two 90 degree straight handle sand scoops. The first scoop has a handle extension while the second scoop has a short handle. Straight handle scoops can be used in dry sand but using them in wet sand requires much more swing power from the detectorist arm since the handle mounting angle is 90 degrees to the basket. 90 degree handle scoops do not have the same leverage from the detectorist swing as does a 20 degree handle scoop. The scoop with the extension does not have a kick plate on the basket. This scoop should not be used by applying pressure from one's foot to force the basket into the sand as doing so will damage or crush the basket in a short period of time.

In Fig. C is the ideal sand scoop for target recovery in beach dry sand. The handle is welded to the scoop basket at 20 degrees and is eight to fourteen inches long; the basket diameter is five inches with 1/2 inch holes in the screen mesh. This scoop will provide the best swinging leverage in soft sand and can also be used in wet sand by drawing the scoop across the sand toward the detectorist. The ideal material for this scoop would be galvanized steel for the handle, basket and cutting lip. Using galvanized steel will provide for light weight, a smooth travel though the sand and be somewhat resistant to corrosion.



Water Scoops. The two main materials used in water scoop construction are stainless steel and aluminum. There are water scoops made of galvanized steel but the durability of the scoop may not be as good or long lasting. The typical scoop (bucket) size is five or six inches with either 1/2 inch or 5/8 inch holes.

The hole size you choose should be determined by the type of lake or ocean bottom you will be detecting and recovering targets. I would suggest using 1/2 inch holes since smaller objects will not as easily pass though the 1/2 holes in the scoop.

Tip: Cover the inside bottom of the scoop with 1/4 inch mesh galvanized screen and secure it with small tie wraps, both screen and tie wraps can be purchased from your local hardware store. This will keep the small earrings and other small items inside the scoop rather than flow though the larger 1/2 inch holes back into the water as you shake the scoop.

All scoops made from stainless steel or aluminum can be forced into the beach bottom or sand by applying pressure to the back of the bucket with your foot. These scoops have very rugged construction.

Aluminum scoops will weight from three 1/2 to four lbs, while a stainless steel scoop will weight from six to six 1/2 lbs. The price for aluminum scoops will range from \$120 to \$150 while the price for a stainless steel scoop will range from \$145 to \$190.

In Fig. D is a 48 inch length handle aluminum water scoop. The handle is welded to the scoop bucket (basket) at an angle. The ideal angle of the handle to the scoop is 20 to 35 degrees. You will also note that there is a support piece welded between the handle and the bucket. This particular scoop bracket is square. A better choice would be a round piece of aluminum tubing. The reason for a round support piece of tubing is that this is the area you will grip to shake the scoop for sand removal. A round metal support is much easier on the hand while gripping and shaking the scoop.

Fig. H		
Sand and Water Scoops Summary		
Attributes	Sand Scoop	Water Scoop
Basket Size	4 to 5 Inches	NA
Bucket Size	5 Inches	5 to 6 Inches
Handle Length	8 to 14 Inch or Longer	42 to 48 Inches
Handle Angle	90 or 20 Degree	20 to 35 Degree
Hole Size		
<i>Round Hole Size</i>	1/2 to 5/8 Inches	1/2 to 5/8 Inches
<i>Screen Square Hole Size</i>	1/2 Inch	NA
Weight		
<i>Aluminum</i>	1 to 1.5 lbs	3 to 3.5 lbs
<i>Stainless Steel</i>	.75 lbs to 2.5 lb	6 to 6.5 lbs
<i>Galvanized</i>	.75lbs to 2.5 lbs	NA
<i>Plastic</i>	.5 lbs	NA
Scoop Depth	7 Inches	9 to 12 Inches
Price		
<i>Aluminum</i>	\$40 to \$45	\$120 to \$145
<i>Stainless Steel</i>	NA	\$145 to \$190
<i>Galvanized</i>	\$35 to \$40	NA
<i>Plastic</i>	\$12 to 20	NA
Scoop Recommendation		
<i>Material</i>	Galvanized	Stainless Steel
<i>Basket or Bucket Size</i>	Five Inch	Five Inch
<i>Handle Length</i>	8 to 14 Inches	Travel 48 Inches
<i>Basket Depth</i>	Seven Inches	NA
<i>Bucket Depth</i>	NA	Nine Inches
<i>Basket or Bucket Hole Size</i>	1/2 inch Diameter	1/2 inch Diameter
<i>Price</i>	\$35	\$155
Metal Detecting Hobby Talk	http://www.mdhtalk.org	

scoop attributes.

In Fig. E you see an aluminum scoop with a travel handle. The handle comes apart in the middle for easy transportation in your car or on an airplane. A travel water scoop can be obtained in either stainless steel or aluminum construction materials.

In Fig. F you will see a stainless steel scoop. The ideal stainless steel scoop will have a 48 inch handle welded at 20 to 35 degrees to the bucket with a round support piece from the handle to the bucket. The bucket should be five inches in diameter, nine inches deep and the hole size should be 1/2 inch in diameter. This scoop should also have a travel handle.

Fig. G has two images. One image has a grip welded to the handle. The grip is there to made it much easier to lift the scoop once it is full of material from the beach bottom of a lake or ocean. This type of grip can be purchased and added to any aluminum or stainless steel handled scoop. It does not need to be welded to the handle.

The other image is of a stainless steel scoop bucket. Note the bill on the scoop bucket is long. This long scoop bill helps in penetrating deeper into the beach bottom and adds to the amount of sand that can be removed with each bucket dig.

In Summary. Selecting the right scoop for beach and water target recovery is very important. You must be prepared to spend money, since a cheap scoop will probably not last long or produce the desired target recovery result.

In Fig. H is a summary table of sand and water

The most important attributes are handle angle, basket or bucket size and material used to construct the scoop.

There is a Scoop Recommendation list of attributes for both sand and water scoops at the end on Fig. H. Take some time to review the complete table before purchasing your next scoop.

In conclusion you will probably be purchasing both a sand scoop and a water scoop. These scoops can usually be used on either freshwater or saltwater beaches.

The major reason for stainless steel water scoop is the durability of the stainless steel in saltwater and hardness of the stainless steel for digging in freshwater rock bottom beaches.

Article Seven:

What is the Investment Cost to Participate in Metal Detecting?

Disclaimer. The investment cost for detectors and accessories are high lighted in this article's investment cost table and are based on prices found on the internet. The detector brand, detector model and accessories you chose may reflex a different price than what is shown in the investment cost table and this would be normal. The dollars amounts in the investment cost table should only be considered a benchmark for you to follow; your final dollar investment may be either greater or less than the value shown in the cost table. No specific detector brand or model are high lighted since this article is not trying to provide direction on any specific detector or accessory to purchase just hobby investment cost.

Introduction. *Have you every wanted to know what it cost to enter the metal detecting hobby and start detecting?* The following article and investment cost table will provide you with some insight to this question with cost benchmarks associated with each of the different areas of metal detecting. The investment cost table should provide you with a two column analysis (good and best) for an area, however, for some areas there will be just one cost analysis column. One column will define a good investment and the other column a best investment each column has dollar figures for comparison.

Before getting involved in metal detecting you should do some up front research rather than just go out and purchase a metal detector. Your first detector need not be expensive but should be purchased for a specific type of detecting. The various areas and sub-areas of detecting are high lighted below and are used for the column headings in the investment cost table at the end of the article.

Metal Detecting Areas

- **Coinshooting**
- **Jewelry**
- **Beach and Water**
 - ✓ **Freshwater Beach & Water**
 - ✓ **Saltwater Beach**
 - ✓ **Saltwater** (Scuba Dive Detecting is not Covered in the Investment Table but Discussed in the Article)
- **Relic**
 - ✓ **Relics and Old Coins**
 - ✓ **DIV**
 - ✓ **Cache** (Cache Detecting is not Covered in the Investment Table but Discussed in the Article)
- **Gold Prospecting**
- **Competition** (Competition Detecting is not Covered in the Investment Table but Discussed in the Article)

You may make a decision to start the hobby by *Coinshooting* for newer clad coins. Newer clad coins are usually found near the surface and therefore it probably would not make sense to purchase a detector from \$1,700 to \$2,300 dollars. A detector with a much lower price could do the job just as good if not better with a shorter and faster learning curve for you.

One mistake that people make entering the hobby is that their first purchased detector is too complicated and they rapidly get discouraged. Thus, after a very short period of time they exit the hobby. The decision to exit the hobby leaves you with a large investment just gathering dust in a closet. So keep your first detector purchase cost low.

In this article you will find an investment cost table that lists a summary cost for each one of the various areas of metal detecting. Across the top of the table you will find the eight different areas of metal detecting and along the left side of the table a list of generic detectors and accessories.

Listed for each detector and accessory is a price found on the internet for that particular item. I suggest you study this table to gain a better understanding of metal detecting cost for each of the areas and you will find that there is no universal detector that fits all areas of detecting. Also take note that each area of metal detecting may require different accessories. The investment cost can vary either up or down based on the detector brand and model you choose.

Coinshooting for the newer clad coins is an entry level position into the hobby. Coinshooting should not be confused with metal detecting for very old coins and relics. The detector and accessories used for this level of metal detecting have the lowest investment cost making this area a very good starting point for the novice. In the attached investment cost table you will find two columns of potential cost for *coinshooting*. The two columns (good & best) provide a range of investment dollars that you could expect to spend for metal detecting clad coins.

Jewelry metal detecting is a step up from coinshooting. Jewelry can be found while coinshooting but to be very good in this area of the hobby a greater dollar investment is required from the detectorist.

Gold jewelry requires a very good detector that is sensitive to very small jewelry items like a one gram ladies gold ring, small gold earrings that are usually less than one gram and gold chains the most difficult of all to detect. Getting involved in jewelry metal detecting can be financially rewarding to the detectorist and helpful to those that have lost personal jewelry items.

Beach and Water metal detecting is divided into three separate areas of metal detecting (Freshwater, Saltwater Beach and Saltwater Water itself). On beaches you will be metal detecting for coins and jewelry and therefore the previous comments about *coinshooting* and *jewelry* detecting generally apply here.

- ✓ **Freshwater Beach & Water** metal detecting requires the least investment cost for detecting on a beach. The conditions at a fresh water beach are usually compatible with many lower cost detectors. Detecting in the water will require an additional investment for a waterproof detector. The investment cost table takes this into consideration in the cost for *freshwater beaches* but additional accessories will also be required for *freshwater beach and water* detecting. Due to heavy trash conditions on freshwater beaches (PI) pulse induction detector purchases are discouraged.
- ✓ **Saltwater Beach** metal detecting has some additional requirements to overcome to be a successful detectorist. The dry sand can usually be detected by most detectors in the \$500 to \$800 dollar range. However, detecting the saltwater beach wet sand will require a detector that can handle the mineralized sand of the beach mixed with saltwater. If you are thinking about detecting saltwater beaches purchase the detector that can handle the wet sand. This decision will provide you with the best *saltwater beach* metal detecting solution.

- ✓ **Saltwater** metal detecting will require one last investment. To move into saltwater you will need a very good waterproof detector that can operate almost flawlessly underwater without causing false target signals to be transmitted. Saltwater is very hard on equipment so always rinse your equipment off with freshwater after being in saltwater.
 - ❖ **Scuba dive** metal detecting will require an additional investment for air tanks, regulators, mask, fins, wet or dry suit, detector dive handle and dive school for Scuba Certification. This cost is not cover in the investment cost table. Never Scuba dive without prior Scuba Certification.

Relic metal detecting covers three major aspects of detecting: *Relics and Coins*, *DIV hunts* and *Cache detecting*. Each of these three areas will be expanded upon below. To be very successful in old site *relic metal detecting* the equipment and accessory investment cost is not the only investment you must consider.

Please Note. All National Parks, Monuments, Recreational Areas, Historical sites / Archaeology (National, State, City) sites and other National Lands are off limits to metal detecting. Also many but not all state parks lands and city / county parks / school areas may not be open to metal detecting.

A key aspect of *relic detecting* is to first research historical documents, old newspapers, etc to locate sites that should provide relic targets for you. Research requires personal time and in some cases developing an extensive library of books and research materials. Books and research material cost are not covered in the investment cost table. Research is especially important for *cache detecting*. Without research there is no *cache hunting*.

- ✓ **Relic and Old Coin** metal detecting is a very popular area of detecting. The investment cost, the expertise in operating a detector and the learning curve is much greater for this aspect of detecting. The detectorist must have a very good understanding of their detector's capabilities and how to adjust the detector to gain the greatest return from any relic site. Knowing your detector and it's capability's is extremely important to be successful in finding those very old coins and relics. *Relic detecting* is usually done at old town sites, mission sites, home / farm sites, fairground & drive-in sites, school sites, railroad sites and etc, the list of potential sites can be endless.

The detector should be capable of very good depth, provide good target separation from iron masking, have audio and display target ID and have a good variety of coils available for changing ground conditions.

- ✓ **DIV** metal detecting is usually associated with a fee based sponsor hunt limited to a select number of detectorist on leased land. *DIV hunts* may be for Revolutionary and Civil war relics and are held on private land; never on public lands. The detectors used for these type of hunts can be a high quality VLF detector or medium price PI detector or a very high quality gold prospecting detector. Gold prospecting detectors will usually provide for greater depth and sensitivity. In the investment cost table there is a PI detected of medium to high price listed for *DIV* hunts. Note: If greater depth and sensitivity is required look at investing in a high quality gold prospecting detector.
- ✓ **Cache** metal detecting is not included in the investment cost table, however it is a very important aspect of metal detecting. You will also need to provide a lot of your personal time for research and then spend a good deal of time in the field to locate the cache. Detectors for *Cache detecting* can be a very high quality VLF detector, a high quality (PI) Pulse Induction detector and / or Ground Penetrating Imaging Radar.

Robbery Caches (Gold and Silver) of the 1700 and 1800 hundreds can be buried very shallow in the ground especially if the cache was buried while thieves were on the run from authorities. Other caches buried by individuals can be several feet deep and may require a much greater dollar investment to locate the cache. If you are going for cache hunting I would suggest purchasing the best detectors that money can buy because the dollar return on finding a cache can be huge.

Caches can be buried in a metal, wood, glass and / or a cloth container so you may be detecting for the container and not necessarily for the gold or silver it self which would be inside the container. Each cache will probably be hidden differently.

Gold Prospecting with a metal detector is an alternate approach to mining for Gold. The investment cost table list two columns - good and best. The investment for Gold detecting can range from \$1,300 to \$6,900 but the return to the detectorist should track the investment cost plus more. Investing greater dollars should be based on one's commitment to locating Gold with a detector or to a prospector the investment cost may be just an extension to their mining quest for Gold.

Competition metal detecting is not listed in the investment cost table since many detectorist just use their personal detector to participate in these events. If you really want to be highly successful in *competition* metal detecting you should have a detector that is dedicated to this aspect of detecting. A detector that:

- is simple to use,
- is an extremely fast responder,
- has good EMI (Electro Magnetic Interference) rejection,
- is light weight.

A Second, Third, Fourth, Fifth Detectors or MORE. Once the decision has been made to try metal detecting a decision point will present itself some time in the future.

Either you will drop out of the hobby because there is a lack of interest on your part or you will drop out because you can not gain the proper understanding / knowledge to master your detector.

The other side of the decision point is that you have become very interested and successful in metal detecting and want to advance to other aspects of detecting. This is where the investment cost in the hobby now becomes greater and can grow fairly extensive over time. The result may be that you could now own two or more detectors and all their related accessory gear. This decision to own more detectors will make you heavily invested in the hobby.

A detectorist must be very careful not to have too much money invested in the hobby. Please note that there will always be a new detector with new capabilities and features, so take your time before buying that next new detector and have a plan to downsize what you already own.

The suggestion is to try and make some of your detecting gear purchases as (used gear) from metal detecting classified forums or to purchase used gear from club members. Using the metal detecting classified forums also provides an avenue to sell older gear before purchasing more new detecting gear.

Target Recovery is another very important investment that a new detectorist must make and master. This investment takes the form of gaining the expertise to remove targets in the proper manner from the ground. The detectorist must take the time and make the effort to practice, practice, and practice target recovery. The goal should be to leave no target recovery footprint in the soil or tuff once the target has been removed.

Summary: If you are thinking about investing in the hobby or are new to the hobby take the time to study the investment cost table. This investment cost table will provide you with an understanding of what your out of pocket expense dollars will be to participate in any given area of metal detecting.

There are no cost in the investment table for fuel, auto expense, batteries, permit fees and other indirect variable cost associated with the hobby.

Table	Metal Detecting Investment Dollar Cost													
	Coinshooting				Jewelry			Beach and Water			Relic		Gold	
	Good	Best	Good	Best	Fresh Water	Salt Water	Salt Water	DIV	+ Coins	Good	Best			
Investment Level	Good	Best	Good	Best	(Beach & Water)	(Beach)	(Beach & Water)	War Relics	Old Sites	Good	Best			
Metal Detector & Std Coil -VLF	\$200.00	\$700.00												
Metal Detector & Std Coil -VLF			\$700.00	\$1,500.00										
Metal Detector & Std Coil -VLF					\$600.00	\$1,100.00	\$1,400.00							
Metal Detector & Std Coil -VLF									\$2,100.00					
Metal Detector & Std Coil - PI								\$1,500.00						
Metal Detector & Std Coil										\$700.00	\$5,800.00			
Alkaline Battery Pack		\$35.00		\$35.00		\$35.00	\$35.00	\$35.00	\$25.00					
Rechargeable Battery Pack		\$90.00		\$90.00		\$90.00	\$90.00	\$90.00	\$90.00					
Large Coil w/cover > 18"						\$300.00		\$300.00	\$300.00		\$650.00			
Large Coil w/cover > 15"						\$190.00	\$190.00	\$190.00	\$190.00	\$150.00				
Large Coil w/cover > 12"						\$180.00	\$180.00	\$180.00	\$180.00					
Small Coil w/cover < 9"		\$125.00	\$125.00	\$125.00	\$125.00									
Small Coil w/cover < 6"		\$125.00	\$125.00	\$125.00	\$125.00									
Metal Probe	\$10.00	\$10.00	\$10.00	\$10.00				\$10.00	\$10.00					
Electronics Probe	\$60.00	\$200.00	\$145.00	\$200.00				\$200.00	\$145.00					
Headphones, Standard	\$50.00	\$50.00	\$90.00	\$125.00		\$125.00		\$125.00	\$125.00	\$90.00	\$125.00			
Headphones, Waterproof					\$100.00		\$175.00							
Findings Pouch, Standard	\$15.00	\$15.00	\$15.00	\$15.00		\$15.00		\$15.00	\$15.00					
Findings Pouch, Water					\$20.00		\$20.00							
Gloves	\$4.00	\$4.00	\$4.00	\$4.00		\$4.00								
Black Web Belt	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00	\$10.00			
Under Arm Shafts							\$150.00							
Knee Pads	\$10.00	\$10.00	\$10.00	\$10.00				\$15.00	\$15.00	\$15.00	\$15.00			
Detector Dust & Water Covers		\$20.00		\$20.00		\$20.00		\$20.00	\$20.00					
Recovery Tools	\$60.00	\$60.00	\$60.00	\$60.00										
Recovery Towel	\$15.00	\$15.00	\$15.00	\$15.00					\$15.00					
Picks										\$70.00	\$100.00			
Shovels								\$60.00		\$75.00	\$75.00			
Wet Suit					\$125.00		\$150.00							
Water Gloves					\$30.00		\$30.00							
Dive Boots					\$40.00	\$40.00	\$40.00							
Snorkel Gear					\$20.00		\$20.00							
Water Scoop					\$65.00		\$140.00							
Sand Scoop					\$40.00	\$40.00	\$40.00							
Equipment Total	\$434.00	\$1,469.00	\$1,309.00	\$2,344.00	\$1,300.00	\$2,149.00	\$2,670.00	\$2,750.00	\$3,240.00	\$1,110.00	\$6,775.00			
Optional Accessories														
Detector Soft Carry Case		\$50.00		\$50.00	\$50.00	\$50.00	\$50.00	\$60.00	\$60.00	\$80.00	\$80.00			
Caps		\$20.00		\$20.00	\$20.00	\$20.00	\$30.00	\$30.00	\$30.00	\$30.00	\$30.00			
Coin Tumbler		\$80.00	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00		\$80.00					
Magnifying Glass	\$77.00	\$7.00	\$7.00	\$7.00	\$7.00	\$7.00	\$7.00	\$7.00	\$7.00	\$7.00	\$7.00			
Coil Supports		\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00	\$15.00			
Harness				\$60.00				\$60.00	\$60.00	\$60.00	\$60.00			
Books	\$3.00	\$13.00	\$10.00	\$10.00	\$17.00	\$25.00	\$25.00	\$30.00	\$20.00	\$30.00	\$30.00			
Optional Accessories Total	\$80.00	\$185.00	\$112.00	\$242.00	\$189.00	\$197.00	\$207.00	\$202.00	\$272.00	\$222.00	\$222.00			
Summary	\$514.00	\$1,654.00	\$1,421.00	\$2,586.00	\$1,489.00	\$2,346.00	\$2,877.00	\$2,952.00	\$3,512.00	\$1,332.00	\$6,997.00			
									Metal Detecting Hobby Talk		http://www.mdhtalk.org			

Article Eight:

What are the Attributes of a Competition Metal Detector?

Competition metal detecting is a term given to annual detecting hunts that are usually sponsored by a club or private individuals. These competition metal detecting events are held in public parks, at ocean beaches and on privately held grounds. The hunt events are fee based and will have pre-planted fields with coin and token targets. The exception is a relic: they are usually held in open private terrain, there are no pre-planted targets and can also be fee based.

Competition: Is the act of competing between individuals using one's skill, ability and metal detector to seek a prize or prizes. In a competition event rules are necessary so that all participants in the event have an equal opportunity to seek and recover the prizes. These type of hunts usually have a theme for each hunt and are held for a specific period of time (45minutes to one hour.) To participate the detectorist must pre-register and pay a fee for each of the hunts in the event.

A competition hunt is just that, you are competing against the other detectorists on the hunt field. So keep in mind that every second counts and the fastest detectorist takes homes the greatest numbers of targets and prizes. To be a fast detectorist takes detecting skill and a detector and equipment that matches the needs of a competition hunt. The detector along will not make the detectorist successful one must practice, practice and practice their detecting and recovery techniques.

Open Hunts: You need not be a club member to participate in the hunt. An open hunt is for any one who is willing to pay the entrance fees and follow the hunt rules.

Closed Hunts: You must be a club member to participate in the hunt and be able to show a current club membership card at registration. A closed hunt is for club members only.

Terrain. The detecting environment in a competition hunts can consist of a saltwater beach, a public park grass area or an open plowed field, usually found on private lands. The coin or token target depth can be slightly different for the three hunt environments. A detectors depth - sensitivity is only important if you are a detectorist that swings their coil far above the surface of the ground during the hunt.

- *Beaches.* The target depth at a saltwater dry sand beach can vary from one to three inches.
- *Parks.* In public parks the target depth is usually controlled by the length of the grass which conceals the target. The grass may be two to three inches long.
- *Plowed Field.* Target depth in a plowed field with no ground cover can vary from being on the surface to four inches deep and sometimes greater. There are clubs that have special tools to plant targets at one to five inches that leave no marks on the ground surface. These type of competition hunts can be much more challenging.
- Relic hunts which are focused toward recovering artifacts will not be covered in this *article since they do require* detectors with very good sensitivity, depth discrimination and many other important features.

Equipment. The metal detecting equipment used in competition events may not be the same as what is used for detecting on beaches, in parks and fields for coins, jewelry and relics. In competition hunts *there is no need* to have a very high end detector model with many features and adjustments, instead keep the detector very simple. There are a number of important reasons to purchase a metal detector just for competition hunts since having a detector with specific attributes may be much more productive for the detectorist. This is especially true if the detectorist goes to a high number of these competition events throughout the year.

We can probably agree that the most important piece of gear for a competition hunt is the metal detector. So lets explore the important characteristic or attributes of a competition hunt detector.

Detector Characteristics. The most important metal detector attributes for a competition hunt are that the detector should have a very fast target response time, light weight, frequency shift capability, tone ID, narrow discrimination notch adjustments and reasonable cost. The detector depth capability should not be of primary concern since most targets are not going to be at a great depth.

- Audio Output. A good sharp and crisps audio output.
- Coil size. A good all around coil size for a competition hunt is eight to eleven inches. Having the capability to swap coils is very beneficial since hunt terrain and hunt type may require a larger or smaller coil.
- Fast Target Response. This means that the detector should respond instantly to any target that the coil is swung over by providing instant audio feedback by way of the headphones to the operator.
- Frequency Shift Capability. There can be a large number of detectorist participating in a competition hunt with many different detector models. Each detector model may operate at a different frequency and these different frequencies can cause (EMI- Electro Magnetic Interference) or crosstalk between detectors on the competition hunt field. By having the capability to rapidly shift the detector's frequency under use without any impact on detecting speed is an important detector attribute.
- Light Weight. The lighter the detector the faster and easier it is to swing the coil.
- Low Cost. Keeping the cost down will ensure the simplest detector possible for competition detecting.
- Narrow Discrimination Notch Adjustments. A narrow notch discrimination capability may be a plus in competition detecting if there is a certain type of target and / or if there is a lot of trash on the hunt field.
- Simple to Use and Adjust. keep the detector's adjustment features to a minimum.
- Tone ID. This is the ability to differentiate target type by audio tone, this can be very desirable in a competition hunt. Knowing what the target might be before recovery can be very important.

Competition Hunt Characteristics Summary Table				
Importance Rank	Terrain	Saltwater Beach	Public Park	Plowed Field
	Terrain Attributes	Sand Salt	Grass Trash No Digging	Bare Earth
	Target Depth	2 - 4 Inches	Grass Height	2 - 5 inches
	Detector Attributes			
	Detector Must Have Features			
#1	Fast Target Response	Yes	Yes	Yes
#2	Light Weight	3 - 4 lbs	3 lbs	3 - lbs
#3	Frequency Shifting Capability	Yes	Yes	Yes
#4	Tone ID	Yes	Yes	Yes
	Detector Should Have Features			
#1	Coil size	11 - 12 Inch	8 Inch	11 - 12 Inch
#2	Audio Output (Sharp and Crisp)	Yes	Yes	Yes
#3	Simple to Use and Adjust	Medium	Yes	Yes
#4	Cost	< \$ 500	< \$350	< \$350
	Other Support Equipment			
#1	Head Phones (Median to High Quality)	Yes	Yes	Yes
#2	Recovery Tool	Sand Scoop	Fingers Only	Scratch Tool
#3	Finds Pouch	Sand Basket	Pouch	Pouch
#4	Electronic Pin-Pointer	No	Yes	Yes

The table on the left list the three types of terrains across the top with various attributes on the left side.

Take time to study the table before buying any competition equipment.

Probably the most popular detector manufacturers at competition hunts are Fisher, Garrett, Tesoro, and White's, however, other manufacturers' detectors such as Minelab, Teknetics, Bounty Hunter can also be found at a hunt.

Generally, the fastest detectors at a hunt are Tesoro, Fisher, Garret and White's and usually in that

order.

There are detector models that are more popular than other models but this short article will not try to pick one model over another.

Just a reminder: PI- Pulse Induction Detectors are not allowed in most competition hunts since they transmit a good deal of EMI-Electro Magnetic Interference to other detectors.

Other Important Competition Attributes.

The better you understand your detector and other equipment the more productive you will become in a competition hunt.

Learn to recover and retrieve targets without knelling down. This will improve your speed and provide you more time to detect for more targets.

Your starting position on the hunt field may also provide an advantage. Always try to start the hunt from a center field position and stay away from the corners at startup. There will be an overlap of participants at the corners with detectorist coming onto the hunt field from two directions.

Observe how other detectorist hunt and recover their targets during a competition hunt. After the hunt try to find detectorist that have recovered many target during the last hunt and observe their detecting techniques in the next hunt. Practice at home what you learn from observing others on the competition hunt field.

Current Detectors. Here is a short list of current detector models available from manufactures. Many of these detectors may fit the attributes of a competition detector. If you are in the market for a competition detector this list would be a good starting point. Or do some research and you may find that a discontinued detector would be a better fit. Check the used classified section available on many of the web based equipment forums.

- Fisher F2 w/2 coil package
- Garrett Ace 250 & 350 w/2 coil package
- Minelab 305
- Teknetics Delta 2000 & 4000 w/2 coil package
- Tesoro Compadre
- Tesoro Cibola
- Tesoro Silver Umax
- Troy Shadow X2, X3 and X5
- White's Coinmaster Pro & GT Series

A Couple of Discontinued Models Just for Reference.

- White's IDX-PRO
- Fisher 1235X
- Fisher 1266, etc---
- Plus there are many older discontinued manufacture models that would make a very good competition detector.

Summary. Competition metal detecting can be fun and also a great husband and wife outdoor activity. If two are going to a competition event them both should use the same model detector with one other detector as a backup. This will keep the learning curve low if one of the detectors should happen to fail and you need to substitute another detector. Above all have fun, find targets and make friends.