

GARRETTTM
METAL DETECTORS
www.garrett.com

**OWNER'S
MANUAL**

INFINIUMTM

Land & Sea



TO THE OWNER

Congratulations on your selection of the Garrett *Infinium LS* (land & sea) metal detector. This detector has been specially designed for optimum performance in any environment. You can be confident that your new detector will provide years of treasure hunting pleasure.

We encourage you to read this Owner's Manual carefully. The more metal detecting knowledge and experience you gain, the more successful you will be in finding treasure. This manual has been designed for you to keep in your pocket while hunting. It describes basic functions of the *Infinium LS* and explains how its Advanced Pulse Induction (API) technology will assist you in a variety of treasure-hunting applications.

Since 1964, Garrett Metal Detectors has been the leader in metal detecting technology. Our highly trained and knowledgeable service representatives are available to assist you in any way with your treasure hunting needs. Please feel free to contact us directly or call your authorized Garrett dealer with any of your concerns. We also invite you to visit our website at **www.garrett.com**.

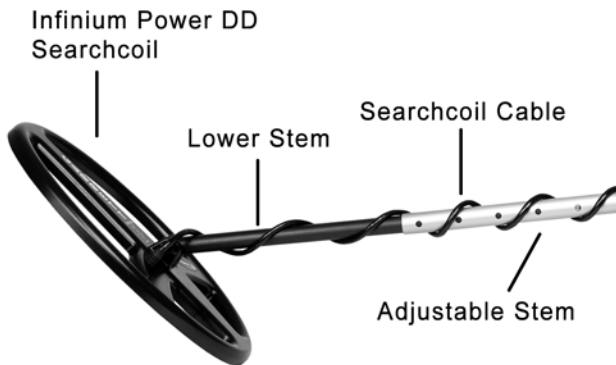
On behalf of the entire team at Garrett Metal Detectors, we wish you the best of luck in your treasure hunting experiences.

TABLE OF CONTENTS

To The Owner	2
Assembly	6
Searchcoils	12
Control Functions	13
Power On/Automatic Ground Track	13
(slow, lock or fast)	
Audio Threshold Adjustment	13
Discrimination Adjustment	14
Basic Operating Instructions	14
Turn On/Battery Test	14
Selecting Automatic Ground Track Setting	14
Setting Threshold	16
Setting Discrimination	16
Bench Testing and Understanding Audio Signals	17
Searchcoil Scanning Technique	18
Reverse Discrimination Technique	19
Pinpointing Tips	20
Adjusting Frequency	21
Hunting Applications	22
Search and Recovery Tips	23
Underwater Searches	24
Searching Shoreline and Shallow Surf	25
Land Searches	26
Prospecting	26
Detector Maintenance	28
Battery Replacement	29
Recommended Accessories	30
Specifications	31
Repair Service	32
Warning	33
Detecting Code of Ethics	34

INFINIUM™

Land & Sea





ASSEMBLY

Remove all pieces from the *Infinium LS* box. All assembly hardware is located in a clear plastic bag inside the bag containing the control housing pouch.



Figure 1

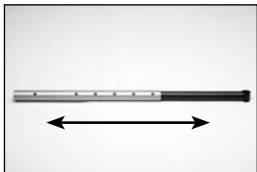


Figure 2

1. The cuff on the end of the s-handle has been factory installed. Test its placement by grasping the black-rubbered s-handle (Figure 1). If the cuff does not fit comfortably under your forearm, loosen the nut, remove the nut, bolt and washers, and reposition the cuff. Reinsert the bolt and washers, and tighten the nut.

2. Remove the black stem piece that has been telescoped into the silver stem (Figure 2). Insert the end of the silver stem piece, with the hole 2" from the top, over the bottom of the black stem at the end of the s-handle. Significant pressure needs to be applied to the silver stem in order to insert the bolt (Figure 3).



Figure 3



Figure 4



Figure 5

Tighten with bolt, washers and nut.

3. Insert spring clip into the black stem piece (Figure 4). Insert black stem piece into bottom of silver stem. (You may need to adjust the length of the stem after the searchcoil is attached to suit individual needs.)

4. Insert black rubber washers into the recessed grooves on the bottom of the black stem (Figure 5). Insert bottom of black stem between raised mounting holes on top of the Power DD searchcoil.



Figure 6



Figure 7

5. Insert black plastic bolt through the mounting holes of the searchcoil and the stem (Figure 6). Attach black cap to the threaded end of the screw and tighten (Figure 7). DO NOT use tools.



Figure 8

6. Wrap cable around the stem and secure it according to your operating configuration. For hip-mount or under the cuff configurations, use the adjustable velcro strap to

secure the cable to the upper stem (Figure 8).

7. Choose desired control housing configuration (Figure 9). For ease of use, under the cuff or belt mount configurations are recommended.

Under the cuff, above or under the stem (mounting brackets located in clear plastic bag):

A. Holding the control housing with "instructions" side



Under Cuff



Under Stem



Above Stem



Belt Mount

Figure 9

facing you (instructions should be upside down, battery compartment side up, control buttons down), slip the left bracket lip under the slot on the left hand side of the control housing (Figure 10). Do the same with the right bracket on the right side of the control housing (Figure 11).

B. Hold the brackets firmly in place and slide them over the stem, lining up the holes in the stem. Insert the remaining bolts, washers and nuts through the



Figure 10



Figure 11



Figure 12

left bracket, stem and right bracket (Figure 12). Tighten both nuts. NOTE: keep pouch and belt in a safe place in case you decide to use the pouch configuration at a later date.

Belt Mount:

A. Unfasten velcro strap on pouch. Slide control housing, control buttons up, into the pouch. Refasten velcro strip.

B. Unwind belt strap and adjust to fit around your waist. Slip one side of the strap through the loop in the back of the pouch (Figure 13) and snap belt together around your waist (Figure 14). NOTE: keep control housing brackets and extra hardware in a safe place in case you decide to use a mounted configuration at a later date.

8. Ensure the searchcoil connector at the rear of the control housing is clean and the o-ring at the end of the cable is well lubricated; add a little silicon grease or petroleum jelly if necessary. DO NOT coat connector pins with lubricant. Insert searchcoil cable connector and gently tighten by hand; DO NOT over tighten.



Figure 13

9. Repeat Step 8 when inserting the head-phone connector at the front of the control housing.



Figure 14

10. Perform a battery test by switching the detector on. Note the number of beeps that occur. Four beeps indicate the batteries are full. One beep indicates they need to be replaced/recharged.

SEARCHCOILS

The *Infinium LS* comes standard with a 10" x 14" Power DD searchcoil. The DD coil configuration couples with the API technology of the *Infinium LS* make it the most powerful detector in mineralized soil.

In areas where the ground is low in mineralization, the optional 10" x 14" mono searchcoil is recommended. In these ground conditions, the mono coil will outperform the Power DD.

For smaller targets in low mineralized soil, choose the optional 8" mono searchcoil. It provides easier maneuverability than the 10" x 14" mono.

For underwater hunting, choose your searchcoil using the same criteria as land hunting. Consider the level or mineralization of the water and/or the soil at the bottom of the body of water. For example, in saltwater, the Power DD is the best choice. In freshwater, however, the mono searchcoils will perform better. Another criteria would be the size of the target. Generally speaking, the smaller the target, the smaller the searchcoil should be.

CONTROL FUNCTIONS



Figure 15

Power

Used to turn on the detector and to choose *slow*, *lock* or *fast* *Automatic Ground Track*. A battery check occurs automatically each time the power is switched on. (Figure 15.)

Audio Threshold Adjustment

Used to set the base audio level according to an individual's hearing requirements. The *Threshold Adjustment* may also be used to help mask outside noise. Typically, the sound is set no louder than necessary; just above silent is recommended. (Figure 15.)

Discrimination Adjustment

Used to set the desired level of discrimination.
(Figure 15.)

The following procedure shows how easy it is to operate the *Infinium LS*.

BASIC OPERATING INSTRUCTIONS

1. Turn On/Battery Test:

Turn the detector on and note the results of the battery test represented by a range of one to four beeps. Four beeps indicate the batteries are full. One beep indicates they need to be replaced within one to two hours. However, because of internal voltage regulation circuitry, the detector will maintain total operating power and performance until the batteries are fully depleted.

Scan a metal object to confirm detection. If the detector fails to operate, verify that the battery pack and batteries are aligned properly.

2. Selecting Automatic Ground Track Setting:

Knowing the conditions of your search area will help you choose the Automatic Ground Track setting that will best suit your needs.

Initially select the *Lock* position using the rotary power switch. Operating in the *Lock* position is

recommended for maximum detection depth unless:
A. The detector is not properly ground balanced, or
B. You are hunting in changing ground mineralization conditions that require continuous ground tracking.

Improper ground balance or changing ground mineralization are identified by erratic audio signals caused by the ground. If you experience these signals, you will need to switch the rotary dial to *fast* or *slow*. It is recommended that you ground balance the machine before continuing.

To ground balance the detector, turn the Automatic Ground Track switch to either *fast* or *slow*, and bob the coil up and down approximately one to six inches above the ground. When the detector's audio signal smooths out, move the Automatic Ground Track rotary switch to *lock* and the unit will lock the ground track setting at that value.

If erratic audio signals continue, you may need to turn the Automatic Ground Track to *slow* or *fast* and hunt in one of those modes.

Use *Slow* when:

- A. Operating over slowly changing ground mineralization, or
- B. When small ground balancing adjustments are needed.

Use *Fast* when:

- A. Hunting over extreme or quickly changing ground mineralization, or
- B. When large ground balancing adjustments are needed.

Improper ground balance will degrade detection depth and audio stability. It should not be necessary to re-ground-balance every time you turn the machine on. It will continue to operate with the same ground-balance level before the machine was turned off.

In the rare event that extreme ground conditions continue to produce audio signals, increase discrimination in small increments until the detector becomes stable. To ensure maximum possible detection depth, only increase discrimination enough to achieve detector stability (this should never exceed the 3 setting on the dial).

3. Setting Threshold:

Set the base audio level according to your individual hearing requirements. The Threshold Adjustment may also be used to help mask outside noise. Typically, the sound is set no louder than necessary; just above silent is recommended.

4. Setting Discrimination:

Set the Discrimination control to zero or a low level until you are familiar with the conditions of

your search area and determine the kinds of metal items you want eliminated from detection. With zero discrimination, you will achieve maximum detection depth and will detect all metals including foil and pull-tabs, but you won't miss any desirable targets. Once you are familiar with the hunting area, then re-adjust the discrimination setting to a level that will eliminate unwanted items.

Be aware that high concentrations of saltwater may require increasing the Discrimination up to a value of three or less (see tips on Searching Shorelines and Shallow Surf on page 25).

5. Bench Testing and Understanding

Audio Signals:

Bench testing is recommended to familiarize yourself with the detection capabilities and audio responses of the detector. This will help you determine if a target is treasure or trash. Since Pulse Induction machines only give audible clues to the identity of detected targets, it's important to learn these different signals.

Tests should be performed (Figure 16) with the searchcoil perpendicular to a bench, floor or other non-metallic surface and several feet away from any large metallic object. Pass various metallic targets from side-to-side across the bottom of the searchcoil at a distance of about three inches. Listen carefully



Figure 16

to the audio tones, noting which targets produce high and low tones and how the target response changes with discrimination.

As a general rule, poor conductors (small nuggets, most rings, pull-tabs, nickels, etc.) should produce

a high tone followed by a low-tone echo. Good conductors such as large nuggets, pennies, dimes, quarters, etc. should produce a low tone followed by a high-tone echo. In addition, most iron will produce a low tone followed by a high-tone echo, since to a PI machine, iron behaves like a good conductor.

6. Searchcoil Scanning Technique:

Methodically sweep the searchcoil from side to side keeping it at a constant height of one to two inches above the ground. Restrict your sweeping speed to about 1/2 to two feet per second. Overlap each sweep by about 1/4 the diameter of the searchcoil. Try to scan in a straight line (not a wide arc); it helps keep the searchcoil level, reduces the likelihood of lifting the searchcoil at the end of each sweep and ensures the overlap sweeps remain uniform.

7. Reverse Discrimination Technique:

When a target has been discovered while operating at minimum discrimination, you may use the reverse discrimination technique to help determine possible target identification.

A. Once a target is found, increase discrimination to maximum level (Iron Check).

B. If the target still produces a substantial signal there is a good chance it is iron. If the target has disappeared or produces only a faint signal then it's probably a desirable target and not iron. Be aware, however, that some small iron may behave like a desirable target, and some desirable targets such as large nuggets and coins may behave like iron.

C. As with all PI detectors, eliminating the detection of iron is difficult if not impossible; however, the reverse discrimination technique is effective at identifying most iron. In addition, attaching a magnet to the inside of your digging tool can help separate bits of iron and other debris from your treasure finds.

D. Finally, it is important to remember that any detection signal, no matter how loud or faint, represents the sound of metal and its source should always be determined.

8. Pinpointing Tips

Whenever your detector locates a target, locating it precisely will enable you to recover it by digging the smallest hole possible. This is accomplished by pinpointing. Note that pinpointing with a DD searchcoil is somewhat different than pinpointing with a mono searchcoil. The instructions for each are below.

Pinpointing with Power DD Searchcoil

The Power DD coil has a narrow detection field pattern that runs front-to-back underneath the center section of the coil, so always detect by sweeping the coil in a side-to-side motion.

First, slowly scan the searchcoil from side-to-side over the target area, noting the location where the loudest signal occurs. Once the area with the loudest signal has been identified, position yourself 90° from the target area and again scan side-to-side to pinpoint the target's exact location.

For targets on or close to the surface, start behind the target's suspected location and scan the area using short side-to-side sweeps while moving forward until the target is exactly pinpointed underneath the tip of the coil.

Pinpointing with Mono Searchcoils

First, slowly scan the searchcoil from side-to-side over the target area, noting the location where the loudest signal occurs. Then draw an imaginary "X" on the ground by scanning the searchcoil front-to-back and again noting the location of the loudest signal. The center of the "X" is the location of your target.

Note: the *Infinium LS* is a motion-mode-only detector; the searchcoil must be moving slightly in order to maintain detection sound.

9. Adjusting Frequency

You can subtly adjust the operating frequency to reduce interference caused by other detectors or power lines if needed. To adjust frequency:

Turn the Threshold dial beyond "MAX" to "Freq. Adjust" and you'll notice that the audio threshold was increasing and then abruptly dropped back to a lower level. The detector is now in a "Frequency Adjustment Mode".

You can now adjust the operating frequency using the Discrimination knob. Incrementally adjust the Discrimination knob, pausing after each adjustment to listen, until you obtain minimum interference. Note that there are 32 different frequencies to choose from so turn the dial in very small steps.

Once you obtain the quietest frequency, return the Threshold knob to your normal setting and the frequency will lock at the chosen value. You can then return the Discrimination knob back to your normal setting. When the detector is turned OFF/ON, it will always return to its factory default operating frequency.

HUNTING APPLICATIONS

Garrett's *Infinium LS* has been designed to hunt everywhere, especially in mineralized areas, where the performance of conventional detectors suffers. A few examples of these are:

- Prospecting—gold is usually found in highly mineralized soil.
- Relic hunting—most U.S. Civil War battles took place in mineralized soil.
- Beach/diving—any salt water is considered a mineralized environment (Underwater headphones are required for diving application. See accessories on page 30.)
- Mine detecting—environmental-proof package is rugged, and will operate anywhere.

SEARCH AND RECOVERY TIPS

Do research.

The first rule of successful treasure hunting, whether on land or in the sea is to do your homework. Learn as much as you can about the areas you wish to search, the kind of treasure you want to find and the best ways to recover it. The better prepared you are the greater your chances for success.

The following books by Charles Garrett, which are available from Garrett Metal Detectors or your authorized dealer, offer invaluable research advice and detailed information on search and recovery techniques for hobbyists: *How to Search Sand and Surf*; *Treasure Hunting for Fun and Profit*; *Ghost Town Treasures*; and *Treasure Caches Can Be Found*.

Study surf and weather patterns.

Pay attention to storm, wind and tide activity. Treasures from deepwater vaults are often transferred to shallower locations like tidal pools and water-filled depressions near the shoreline.

A beach considered unproductive can suddenly yield riches. Heavy storm waves often unearth treasures like rings caught in exposed rock and gravel areas.

Use the right recovery tools.

Use the right tool for the job and you'll recover treasure in no time. Knowing what you're digging for and the kind of surface you're digging into will help you choose the proper digging tool.

Double-check your holes.

After you dig a target, re-scan the hole to make sure you have retrieved everything in and around it; corroded and coral-encrusted desirable items can be easily mistaken for undesirable ones.

Underwater searches

The *Infinium LS* can locate both ferrous and non-ferrous metals concealed within and below aquatic growth, bottom soil and rocks, wood and other non-metallic materials. Large items such as boats, motors and safes can be located several feet below the searchcoil. (Underwater headphones are required for underwater searches. See accessories on page 30.)

Underwater Safety Tips

1. To avoid acid damage you should install high-quality batteries such as alkaline or nickel-metal-hydride (NiMh) and always remove them prior to storing the detector.
2. If the battery compartment becomes flooded,

remove the batteries immediately, rinse the compartment with fresh water and allow to air dry. The electronics compartment is factory sealed and should never be opened.

3. Before diving always examine the searchcoil and headphone connectors, the battery cap and verify the battery strength.

4. Dive with extreme caution. Observe safety practices to lessen the risk of becoming entangled with the headphones or coil cables. Ensure that the underwater headphones' vent holes are open prior to diving.

5. When using the hip mount configuration, ensure that the belt will not interfere with diving equipment removal in the event of an emergency.

Searching Shoreline and Shallow Surf

The *Infinium LS* is a highly sensitive detector and has the capability to detect metals with only the slightest conductivity. As a result, the *Infinium LS* may also detect high concentrations of saltwater due to its conductivity. This effect is most noticeable when operating at the sea's shoreline and in the shallow surf where the searchcoil is continually encountering passing waves.

Increase the Discrimination setting only as needed in order to reduce saltwater detection. Typically, a setting of three or less is sufficient. Do not be concerned about missing targets due to the increased Discrimination. Rather, the stable operation achieved with this slight increase in Discrimination will ensure the best possible target detection for this saltwater environment.

Land searches

When searching near wire fences, metal buildings, etc., make sure that you scan the searchcoil parallel to the structure. This will minimize the interfering responses caused by the metal structure.

Prospecting

Gold and other precious metals can be found in various forms with the *Infinium LS*. You will most likely be searching for nuggets, but gold can also be found as lode or hard rock deposits in a vein, usually mixed with other minerals. The *Infinium LS* can also be used to locate placer deposits in streams or dry sand.

Since working vein or lode gold can require expensive tools or technology and placer deposits must be panned for recovery, these forms are sometimes unsatisfactory for metal detector hobbyists. Recovering a nugget, however, is as simple as putting it in a treasure pouch.

Gold is generally found in rock formations along with a great many other conductive/ferrous minerals. A high quality detector, such as the *Infinium LS* with its Advanced Pulse Induction technology that cancels out mineralization, can be used to find this gold or any other precious metal.

It must be emphasized that the *Infinium LS* or any other quality detector is usually operated with zero discrimination and very precise ground balance if gold is to be found. This is particularly important when searching for tiny gold nuggets. Furthermore, when prospecting, all targets must be located and carefully inspected. It is only in this manner that you can be successful in using a metal detector to discover precious metal nuggets and ores.

Hard work, patience and research are three of the keys to success in electronic prospecting. Research is important because it is vital that gold always be sought in areas where it is known to exist.

Hot rocks are a problem for any electronic prospector, whether veteran or weekend adventurer. A "hot rock" can be described as a concentration of iron mineral that causes a detector to recognize it as metal when the instrument is operating with zero discrimination. Fortunately, the advanced technology of the *Infinium LS* allows it to ignore nearly all hot rocks; only the most extreme hot rocks will produce a response.

DETECTOR MAINTENANCE

Your Garrett detector is a sensitive electronic instrument. It is built to withstand rugged treatment in the outdoors. Use the *Infinium LS* to the fullest extent possible, and never feel that you have to baby it. Yet, always handle it with reasonable care.

Try to avoid temperature extremes as much as possible, such as storing the detector in an automobile trunk during hot summer months or outdoors in sub-freezing weather.

Keep your detector clean. Always wipe the housing after use, and wash the coil when necessary. Protect your detector from dust and sand as much as possible.

Disassemble the stem and wipe it clean after use in sandy areas. When storing longer than about one month, remove batteries from the detector.

Take advantage of Garrett's preventative maintenance program. For a small fee, the factory will inspect the entire detector, replace its seals and pressure test it. Contact the factory for more details.

BATTERY REPLACEMENT



Figure 17



Figure 18

To access the battery pack, unscrew the battery cap at the rear of the detector housing by hand; **DO NOT** use tools. The o-ring should remain in the control housing while the battery pack slides out. When installing batteries ensure that they are aligned with the correct polarity (plus and minus) markings. Re-install the battery pack by placing the contact end of the housing inside first and pointing downwards. (Figure 17.) Verify that the o-ring is well-lubricated and free from debris. Add a little silicon grease or petroleum jelly if necessary. Re-install the battery cap, hand tightening it until it is flush with the housing and the two index marks are aligned as shown. **DO NOT** over rotate. (Figure 18.)

RECOMMENDED ACCESSORIES

Accessories to assist you in your treasure hunting adventures with the *Infinium LS*:

- **#2216900**-The 10" x 14" Mono searchcoil should be used to increase detection depth and sensitivity in light to moderately mineralized soil and is ideal for detecting larger items on land and/or underwater.
- **#2217000**-The 8" Mono searchcoil, like the 10" x 14" Mono, should be used in light to moderately mineralized soil, and will help detect smaller items and provide more maneuverability than the 10" x 14".
- **#2202100**-Underwater headphones (required for diving).
- **#1600971**-Plastic scoop is useful for dry sand and shallow water recovery up to two feet deep.
- **#1600970**-Metal scoop.
- **#1600900**-Stainless steel scoop.
- **#1606000**-Trowel is best for recovering items in clay or gravel areas.

SPECIFICATIONS

Circuit type: Advanced Pulse Induction (API) technology, automatic cancellation of salt/ground mineralization

Frequency: 730 pulses per second.

Submersion depth: Up to 200 feet (65 meters) or seven atmospheres.

Buoyancy: Near neutral.

Batteries: Eight (8) AA

Battery life: Approximately 10-15 hours.

Control housing weight: 31 oz.

Headphones: 16 oz.

REPAIR SERVICE

If you have difficulty operating the *Infinium LS*, take a few minutes to re-read this Manual and check the batteries, settings and connectors.

If your *Infinium LS* needs repair, you should return it to the factory accompanied by a detailed letter describing the problem(s). Carefully pack the detector in its shipping carton or other sturdy box, using packing material or appropriate insulation to protect the parts. DO NOT include the stems or headphones unless they are part of the problem. Return all coils, unless the problem is mechanical.

NOTE: Remember to include your name, address and daytime phone number with your shipment.

Return the detector to:
Garrett Metal Detectors
1881 W. State Street
Garland, Texas 75042

Please allow approximately one week for Garrett technicians to examine and service your detector after receiving it, plus another week for return shipping. Garrett will automatically return the detector via UPS or Parcel Post unless you provide a written authorization that instructs otherwise.

WARNING

The following measures must be observed at all times:

- DO NOT hunt in areas where electric lines, gas/water pipelines, bombs or other explosives may be buried.
- NEVER trespass or hunt on private property without permission.
- NATIONAL and STATE parks, monuments, military sites, etc., are absolutely "off limits".
- ALWAYS exercise caution when digging toward a target where the underground conditions are unknown.

DETECTING CODE OF ETHICS

Filling holes and obeying no trespassing signs are but two requirements of a dedicated metal detector hobbyist. A sincere request that Charles Garrett makes to every user of one of his detectors is that each place searched be left in a better condition than it was found. Thousands of individuals and organizations have adopted this formal Metal Detector Operators Code of Ethics:

- I will respect private and public property, all historical and archaeological sites and will do no metal detecting on these lands without proper permission.
- I will keep informed on and obey all laws, regulations and rules governing federal, state and local public lands.
- I will aid law enforcement officials whenever possible.
- I will cause no willful damage to property of any kind, including fences, signs and buildings and will always fill holes I dig.

- I will not destroy property, buildings or the remains of ghost towns and other deserted structures.
- I will not leave litter or uncovered items lying around.
- I will carry all trash and dug targets with me when I leave each search area.
- I will observe the Golden Rule, using good outdoor manners and conducting myself at all times in a manner which will add to the stature and public image of all people engaged in the field of metal detection.

Trademarks: *Infinium LS*, Advanced Pulse Induction (API)

Patent Protection: Garrett's high tech instruments are protected by one or more of the following United States Patents and other Patents Pending: 4,398,104; 4,423,377; 4,303,879; 4,334,191; 3,662,225; 4,162,969; 4,334,192; 4,488,115; 4,700,139; 4,709,213; 5,148,151; 5,138,262; 5,721,489; 5,786,696; 5,969,528; Design 274,704; 297,221; 333,990; G.B. Design 2,011,852; Australia Design 111,674. Other patents pending.

All Garrett detectors are manufactured in the United States of America.

GARRETTTM
METAL DETECTORS

www.garrett.com

Garrett Metal Detectors
1881 W. State St.
Garland, TX 75042-6797 USA
972-494-6151 (Voice)
972-494-1881 (Fax)
1-800-527-4011
sales@garrett.com
www.garrett.com

©2008 Garrett Metal Detectors. All Rights Reserved

1525800.B 0608