VORTEX

User Manual

VX5 VX7 VX9

THE WORLD'S FIRST FULLY TRANSFORMABLE DETECTOR SERIES

Powered by MD-MF
MULTI-DIMENSIONAL – MULTI-FREQUENCY
Technology

Contents

Quick Start Steps

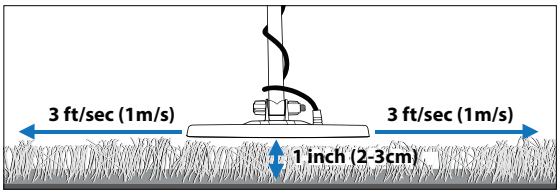
1 Power ON.
Press and release the Mode/ Power button. *Vortex* powers on in the last mode used and is ready to search.

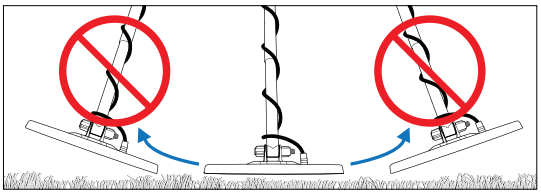
2 Select Mode.
Tap the Mode button to select a different detection mode, if desired. Scroll through the Mode choices using the ▲ and ▼ arrows and the Plus (+) or Minus (-) buttons. Tap Mode again to exit, or wait twenty (20) seconds.

3 Adjust settings.
Press Menu Button to access all settings. Scroll up and down using the ▲ and ▼ arrows. Tap Plus (+) or Minus (-) button to adjust the selected setting.

4 Ground Balance ***(if necessary)*****.**
Press and hold Ground Balance button while bouncing coil above the ground until ground response disappears or becomes as small as possible.

5 Begin scanning.
Lower the searchcoil to about one inch (2.5cm) above the ground and scan the coil left and right at approximately 3 feet/second (1 meter/second). The coil must be in motion for target detection, but can remain stationary during Pinpoint. Keep the coil parallel to the ground for best results.





Vortex Carton Contents

The *Vortex* is packaged with the following parts, some partially assembled. If any part is missing, please contact Garrett Customer Service.

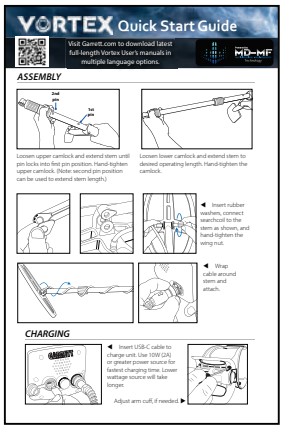
Arm cuff with strap

Straight stem assembly with mounted control box

Upper and lower stem (connected)

8.5″ x 11″ DD Raider searchcoil with coil cover installed

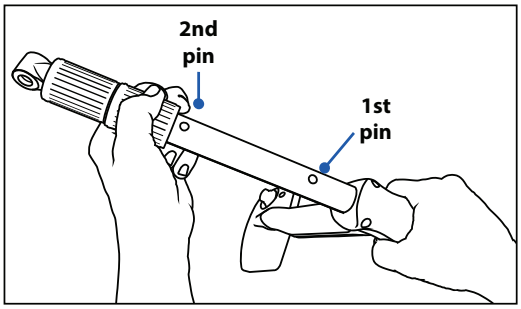
USB-C charging cable



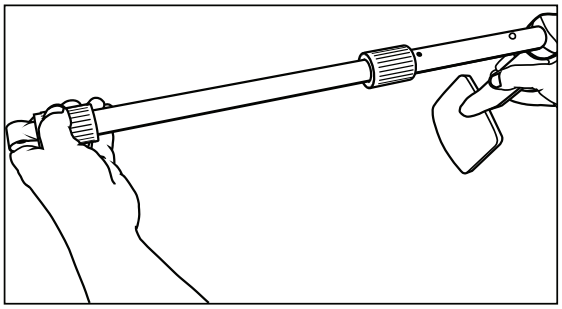
Quick-Start Guide

Nut, bolt, mounting washers

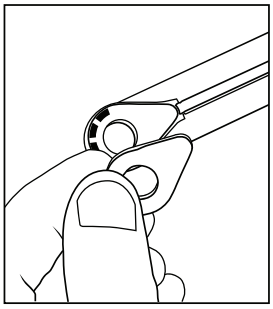
Assembly

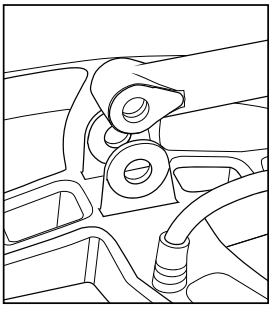


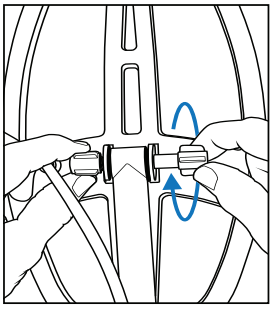
Loosen upper camlock and extend stem until pin locks into first pin position. Hand-tighten upper camlock. (Note: second pin position can be used to extend stem length.)



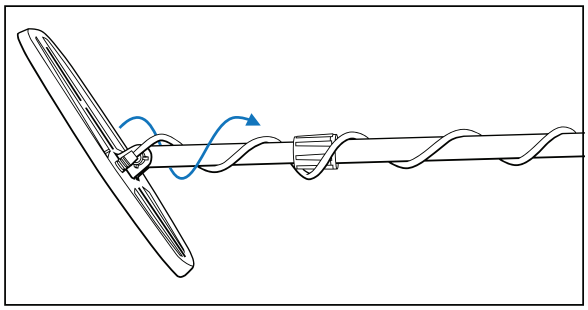
Loosen lower camlock and extend stem to desired operating length. Hand-tighten the camlock. (Note: do not tighten the camlocks without a stem inserted into them.)

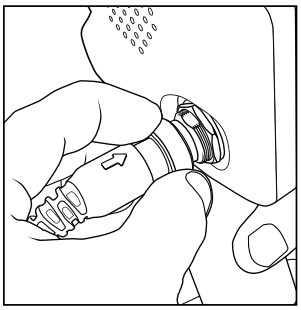






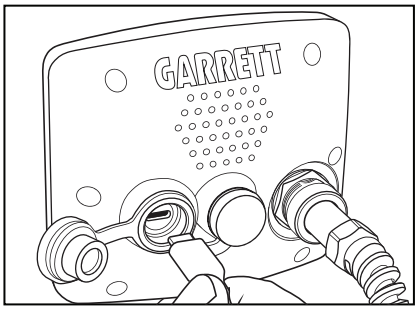
◀ Insert rubber washers, connect searchcoil to the stem as shown, and hand-tighten the wing nut.





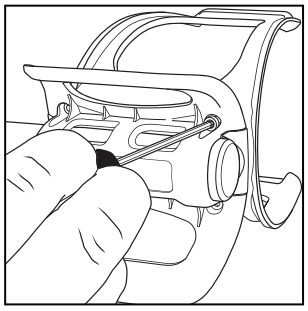
◀ Wrap cable around stem and attach.

CHARGING



◀ Insert USB-C to charge unit. Use 10W (2A) or greater power source for fastest charging time. Lower wattage source will take longer. It is recommended to fully charge your new Vortex before first use.

Adjust arm cuff, if needed. ▶



Assembled Detector

Battery Information

Basic Information

Battery Type:	Internal Lithium-Ion
Battery Life:	15 hrs typical, depending on settings
Battery Scale:	25% per pixel, bottom pixel flashes at 5% remaining
Recharge Time:	Use 10W (2A) or greater power source for fastest charging time. Charging is faster with detector OFF, longer if ON. Lower wattage source will take longer.
Charging Status:	Battery pixels blink while charging, solid when charged
Battery Life Cycle:	Batteries will last for many years. Recharge at least once a year.
Charging Note:	Detector should be switched off during charging to speed the charging process.

Detecting with a Power Bank

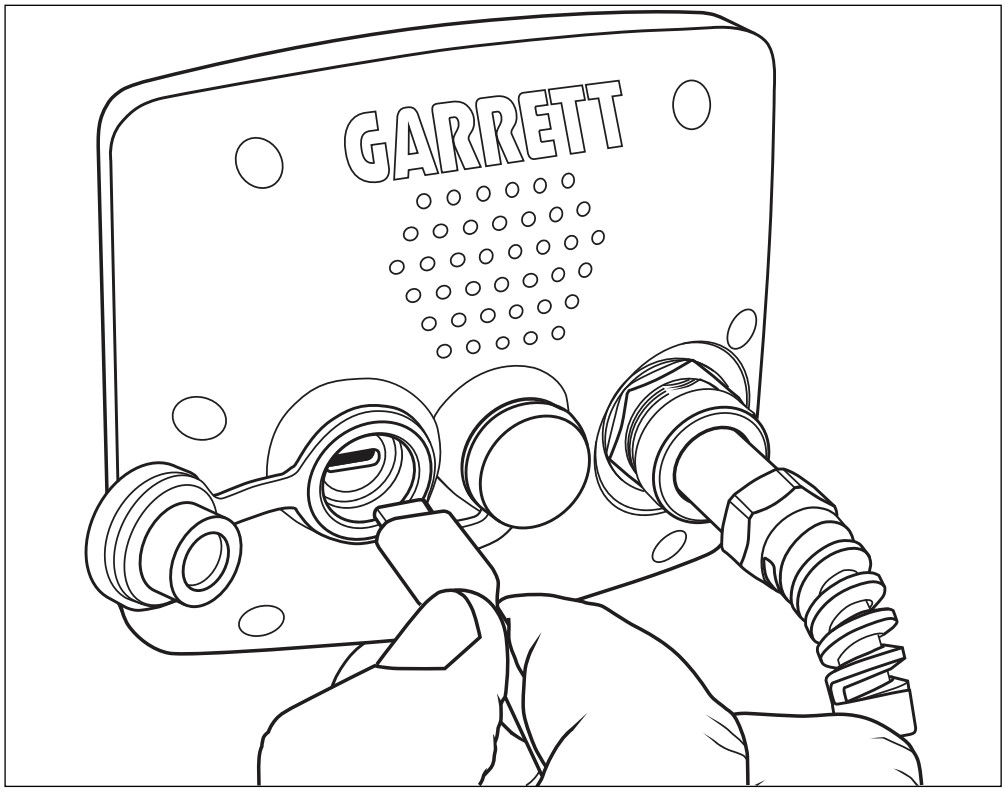
In the event of a depleted battery in the field, *Vortex* can be operated while plugged into any external 5V USB power pack via USB cable. Recommend attaching power pack to arm cuff.

Note on Battery Life

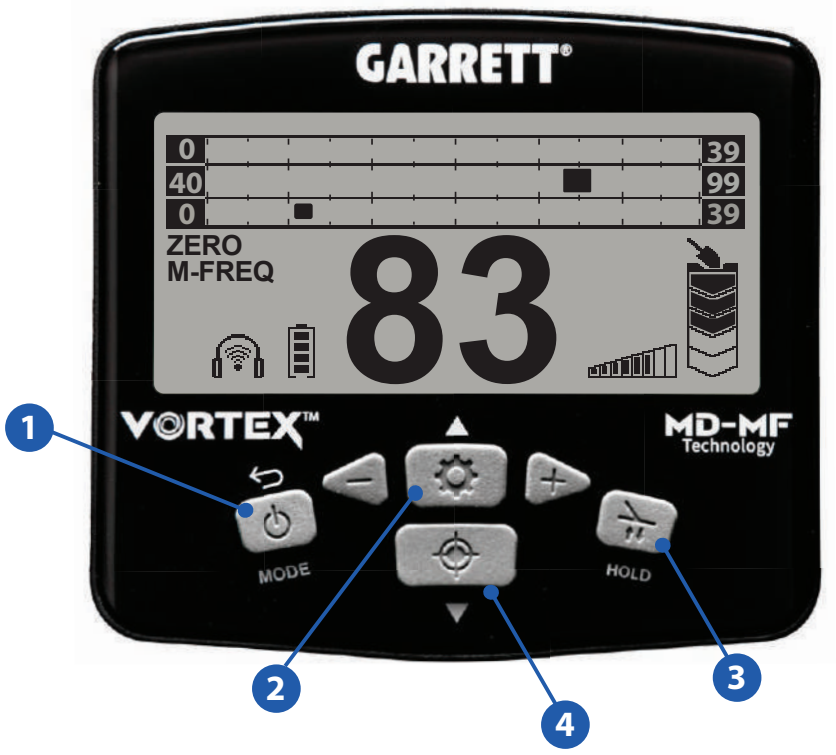
To extend the life of your detector's internal battery, it should be charged prior to storage for extended periods and recharged at least once per year. It is not necessary to fully discharge the *Vortex* battery prior to charging.

Caution: After use in any body of water, ensure that your *Vortex* connectors are thoroughly dry before connecting to a power source for charging.

USB-C charging port is located behind a protective cap on the back of the *Vortex* control box.



Basic Controls



1 **Power, Mode, Exit, and Factory Reset**—

- Hold this button for 1 second for power ON or OFF.
- Quick-press to change Modes, using Plus (+) and Minus (-) and ▲ and ▼ arrows.
- Quick-press Mode button to exit MENU settings, or simply wait twenty (20) seconds for auto-exit.
- Press and hold 5 seconds to restore default Factory Settings.

2 **MENU/Settings**— Press once to enter Menu items. Use ▲ and ▼ arrows to scroll up or down through different settings. Use the Plus (+) or Minus (-) buttons to change setting. See "Menu Settings" for details on each *Vortex* setting.

3 **Ground Balance**—Hold this button down while bouncing the searchcoil above the ground until ground response disappears or becomes as small as possible. See "Ground Balance" section for more details. This button is also used for Notch Discrimination adjustments.

4 **Pinpoint**—Hold for pinpointing function to precisely locate targets.

Vortex features and specifications subject to change without notice.
Go to garrett.com/sport/vortex to check for the latest software updates.

Menu Settings

Press the Menu button once to enter the Menu item selection area. Then use the ▲ or ▼ arrows to scroll up or down through the different settings. Use the Plus (+) or Minus (-) buttons to change the setting or turn the feature on or off. Note that some Modes and Menu settings are only available on select Vortex models.

Sensitivity
Eight (8) levels. Use increased sensitivity when searching for very small or very deep targets. User lower sensitivity levels when the detector is behaving erratically (due to excessive metallic trash, highly mineralized soils, electrical interference or the presence of other metal detectors) and the erratic operation cannot be resolved with ground balance, discrimination or by changing channel or frequency.

Volume
Eight (8) levels. This is an overall volume control for both the built-in speaker and headphones.

Iron Volume
Eight (8) levels. Iron Volume allows you to decrease the volume of ferrous targets, while the volume of non-ferrous targets remains at normal level. Experienced treasure hunters, who often like hearing all targets, have the advantage with Iron Volume to decrease the volume of undesired items.

Frequency Options

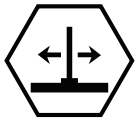
VX5: Multi-Frequency (Multi-Freq.) and 13kHz

VX7: Multi-Freq., Multi-Salt, 5kHz, and 13kHz

VX9: Multi-Freq., Multi-Salt, 5kHz, 9kHz, 13kHz, 18kHz, 25kHz

(See "Vortex Frequency Options" section for more details.)

Channel (EMI Elimination)
Eight (8) channels, or independent frequency shifts, are available for each single and multi-frequency. Adjust the channel to eliminate interference from other detectors at crowded field events and to overcome other electrical interference (EMI).



Recovery Speed
Adjusts the speed of target response, allowing for more separation between multiple targets in close proximity. Higher recovery speeds help in areas with high volumes of metallic targets in close proximity, but may increase audible chatter and susceptibility to EMI. Select from 1- 3 on *VX9*. Two recovery speeds available on *VX7*. Fixed recovery speed on *VX5*.

Menu Settings

Backlight

Use the (+) or (–) buttons to switch on or off the LCD backlight, for searching at night or in low-light areas. *Note*: As a convenience, the backlight will automatically activate when scrolling through the menu, regardless of the backlight setting. It will return to its selected setting once the menu is exited.

Wireless Headphones

Use the (+) or (–) buttons to switch on or off the built-in Z-Lynk wireless operation. Press (+) to pair Garrett Z-Lynk enabled wireless headphones and press (-) to unpair headphones. This icon flashes when the detector is attempting to pair with headphones, and is solid when properly paired. Absence of the icon indicates that *Vortex's* wireless transmitter is switched off.

Pairing: To pair with a new set of headphones/receiver, simply switch the headphone/receiver on first, hold within 2 feet (0.6 meters) of the *Vortex*. Next, power on *Vortex*. Repeatedly press the MENU button until the wireless icon is highlighted. Press the (+) button to pair the headphones.

Once paired, if the headphone/receiver is switched off or moved out of range, *Vortex* will search and attempt to reconnect to the receiver for 5 minutes, indicated by a flashing icon. If the connection is not reestablished during this time, *Vortex* will switch off its wireless transmitter. To reconnect, simply switch the *Vortex* off and then on again. To un-pair (forget) a set of headphones, simply press the Menu button to select the wireless icon and then use the (-) button to un-pair.

Use of optional wired headphones: *Vortex* can also be operated with any wired headphones that have a 1/8" (3mm) plug. For headphones with a 1/4" plug, an optional adaptor is available from Garrett.

Button Lock

Use to lock buttons for diving below 6 feet (2m). Simultaneously press Plus (+) and Minus (-) buttons 3 times, quickly. This can be done from the Button Lock menu item, or from the normal operating screen. Repeat this process to unlock buttons. This icon appears on the LCD when *Vortex* buttons are locked.

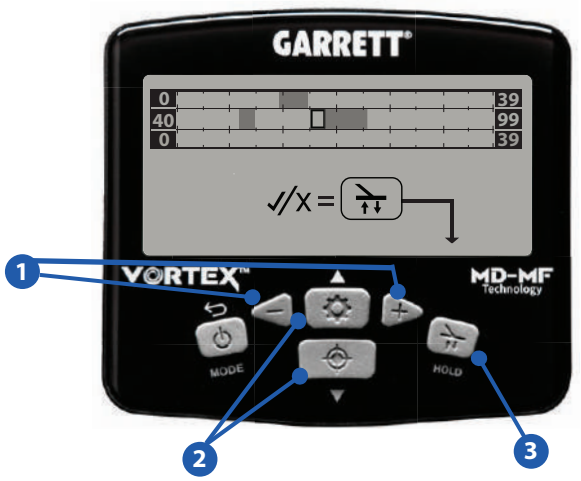
Number of Tones *(available on VX7 and VX9 models)*

Use the Plus (+) and Minus (-) buttons to toggle between either 3-Tone setting or 5-Tone setting. The *Vortex VX5* model operates with three fixed audio tones.

Menu Settings

Notch Discrim

Use to eliminate targets from audible detection. For *VX7* and *VX9* models where multiple Target ID scales are present in Multi-Frequency operation, use ▲ and ▼ arrows to move between Target ID scales. Use the Plus (+) or Minus (-) buttons to move cursor left and right along the Target ID scale. Tap the Ground Balance button to accept or reject a notch.

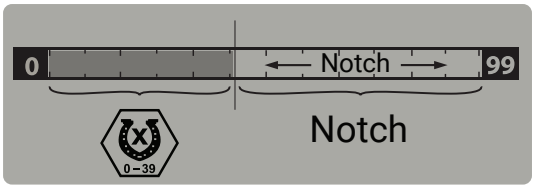


Notch Discrim menu screen shown with a VX9 in Multi-Frequency operation.

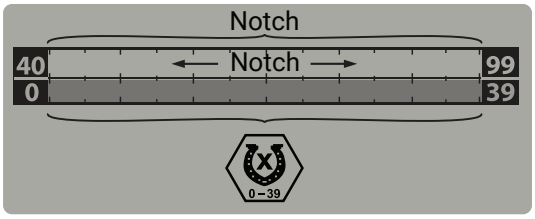
1. **Use Plus (+) or Minus (-) button**— to move cursor along the Target ID scale.

2. **Use ▲ Menu or ▼ Pinpoint button**— to move cursor between Target ID scales when multiple scales are present.

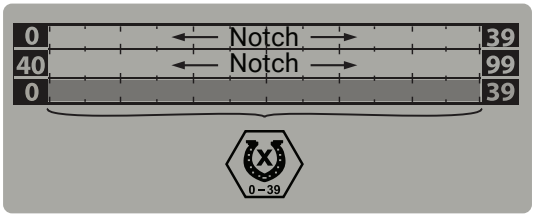
3. **Ground Balance**—Tap this button to accept or reject a notch.



VX5 and Single Frequency Notch Discrim.



VX7 Notch Discrim in Multi-Frequency operation.



VX9 Notch Discrim in Multi-Frequency operation.

VX5 and Single Frequency Operation: *Vortex* has 20 notches of discrimination, shown along a single Target ID scale. The first eight (8) notches of iron resolution are controlled with High Res Iron Discrim settings. In Notch Discrim menu, use the Plus (+) or Minus (-) buttons to move the cursor along the twelve (12) available notches; tap the Ground Balance button to accept or reject a notch.

VX7 Multi-Frequency Operation: The lower ferrous scale is controlled with High Res Iron Discrim settings. Use Notch Discrim process *(as described above)* to accept or reject a notch within the upper non-ferrous Target ID scale.

VX9 Multi-Frequency Operation: The lower ferrous scale is controlled with High Res Iron Discrim settings. In Notch Discrim menu, use the Plus (+) or Minus (-) buttons to move the cursor along the available notches; tap the Ground Balance button to accept or reject a notch. Use the ▲ and ▼ arrows to move between the top two Target ID scales.

Menu Settings

High-Resolution Iron Discrim
Use Plus (+) and Minus (-) buttons to increase or decrease the amount of iron (ferrous) discrimination that is applied. The discrim level can be adjusted from zero (no iron discrimination) to 39 (maximum iron discrimination).

Bottlecap Reject control *(available on VX7 and VX9 models)*
This feature is used to help discriminate out bottlecaps and similar undesired, flat, tricky iron items while in Multi-Frequency operation only. A higher setting level allows bottlecaps to be identified as iron but could result in some coins being misidentified as iron, so only use as much as needed. Select setting from 1 - 5. Fixed on VX5.

Iron Boundary control *(available on VX7 and VX9 models)*
This feature is used to help discriminate out undesired chunky iron items while in Multi-Frequency operation only. A higher setting level allows such ferrous items to be identified as iron but could result in some coins being misidentified as iron, so only use as much as needed. Select setting from 1 - 5. Fixed on VX5.

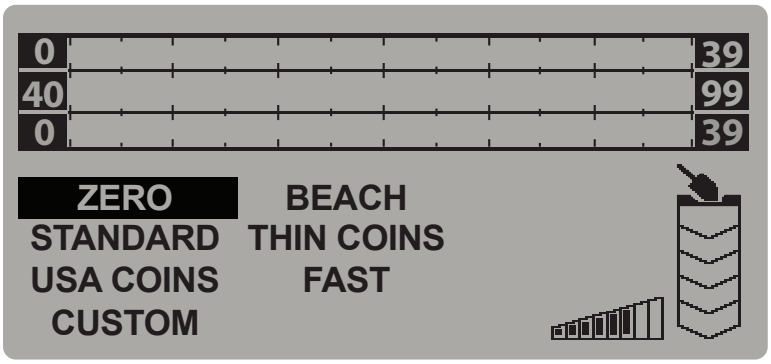
Iron Audio
Iron Audio allows the user to hear discriminated iron that is normally silenced in order to avoid being tricked into digging iron "ghost signals" that appear to be good. It also adjusts the low iron-tone boundary to match the Iron Discrim setting to audibly separate good targets from iron. Iron Audio provides distinctive responses for iron and steel targets.
(See "Iron Audio" section for more information)

FACTORY DEFAULT SETTINGS

Mode:	Standard	Button Lock:	OFF
Sensitivity:	6	Number of Tones: *	5
Volume:	8	Bottlecap Reject: *	0
Iron Volume:	4	Iron Boundary: *	2
Frequency:	Multi-Freq.	Iron Audio:	OFF
Channel:	4		
Recovery Speed:	1		
Backlight:	OFF		
Wireless: *	OFF		

* Available only on VX7 and VX9.

Search Modes



This illustration depicts your Mode choices on the Vortex VX9 model while operating in Multi-Frequency.

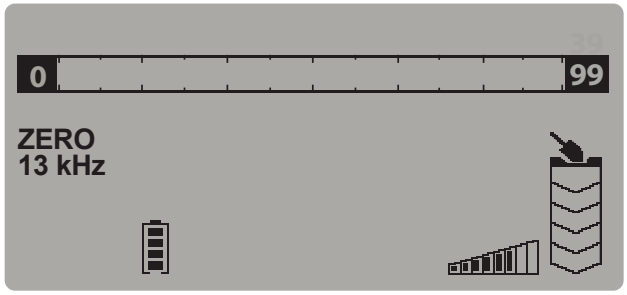
Each Garrett *Vortex* detector includes a number of pre-set search modes, based on your desired targets (i.e. United States Coins) or your search area (i.e. Beach).

Choose the mode that is best for your particular detecting needs, or select Custom Mode to create and save your own favorite detection settings. Simply tap the Mode button and scroll through the Mode options, using the ▲ and ▼ arrows and the Plus (+) or Minus (-) buttons. Tap Mode again to exit, or wait twenty (20) seconds. You can further refine your detecting experience by selecting from different frequency settings within each of the optional modes.

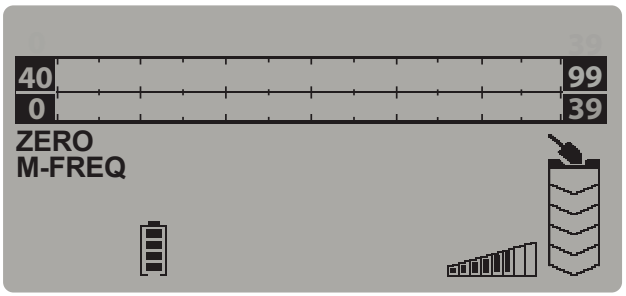
Zero Discrimination Mode

Detects every type of metal. All detection pixels are switched on. No targets have been notched out (eliminated or shown on the LCD as a darkened pixel). Zero Mode is available in any frequency. Recovery Speed is set to default speed. Use this mode to find all metal items or when the desired object material is unknown, or to aid in locating a target when its signal is inconsistent. Such signals could mean a trash target is close to a good target.

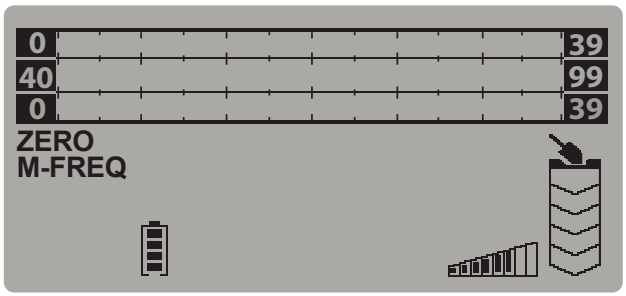
Zero Mode is available on VX5, VX7, and VX9 models.



Zero Mode as it appears on a *VX5* with single-tier Target ID scale or on *VX7* and *VX9* when operating in a Single Frequency.



Zero Mode as it appears on a *VX7* with two-tier Target ID scales in Multi-Frequency operation.



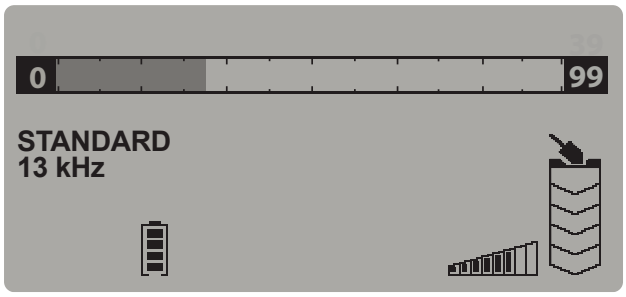
Zero Mode as it appears on a *VX9* with three-tier Target ID scales while operating in Multi-Frequency.

Search Modes

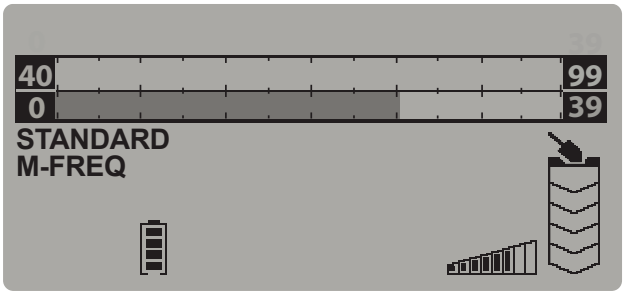
Standard Mode

Standard is ideal for detecting most international coins, and for finding all types of jewelry and non-ferrous relics. Standard Mode is available in any frequency. Recovery Speed is set to the default speed. Iron Discrimination is set to 27, eliminating many non-desired ferrous items from audible detection.

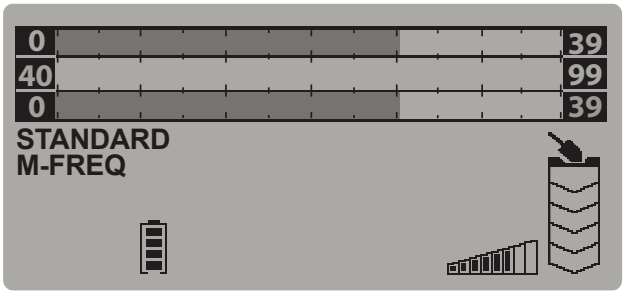
Standard Mode is available on VX5, VX7, and VX9 models.



Standard Mode as it appears on a *VX5* with single-tier Target ID scale or on *VX7* and *VX9* when operating in a Single Frequency.



Standard Mode as it appears on a *VX7* with two-tier Target ID scales in Multi-Frequency operation.

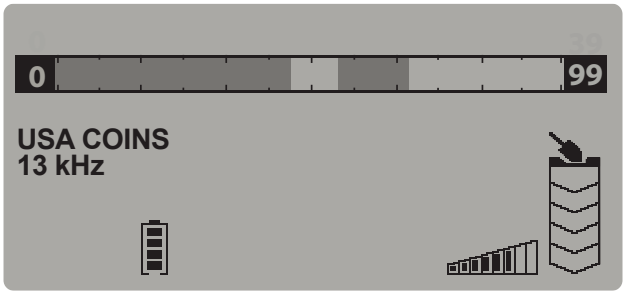


Standard Mode as it appears on a *VX9* with three-tier Target ID scales while operating in Multi-Frequency.

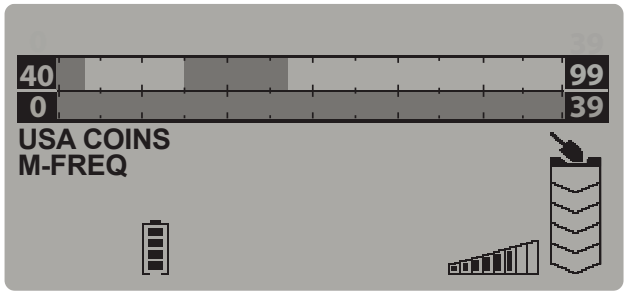
USA Coins Mode

Designed to find U.S. and similar coins, and to eliminate common trash items such as iron, foil, and pull-tabs. Be aware that medium-sized jewelry and non-U.S. coins may be missed with this mode. USA Coins Mode is available in any frequency. Recovery Speed is set to the default speed.

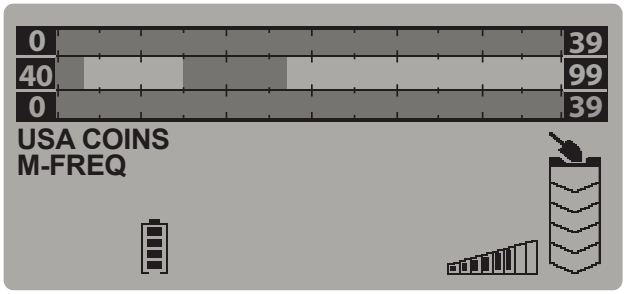
USA Coins Mode available on VX5, VX7, and VX9 models.



USA Coins Mode as it appears on a *VX5* with single-tier Target ID scale or on *VX7* and *VX9* when operating in a Single Frequency.



USA Coins Mode as it appears on a *VX7* with two-tier Target ID scales in Multi-Frequency operation.



USA Coins Mode as it appears on a *VX9* with three-tier Target ID scales while operating in Multi-Frequency.

Search Modes

Custom Mode

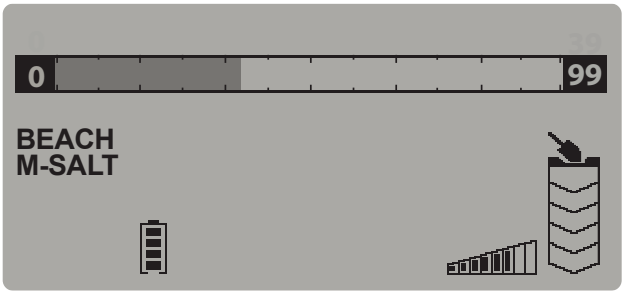
Can be programmed by the operator and *Vortex* will retain the changes when the detector is switched off. The factory preset for Custom Mode is the same as the Standard Mode. Begin with this setup, and then make desired alterations to iron discrimination and Notch Discrim, and they will be saved.

Custom Mode is available on VX5, VX7, and VX9 models.

Beach Mode

By default, the *Vortex* Beach Mode operates only in the Multi-Salt frequency setting and is specifically designed for wet saltwater beaches. Iron Discrimination is set to eliminate most common ferrous items from detection. The default Recovery Speed setting is 1. Targets in Beach Mode are displayed on a single-tier Target ID scale. *Note:* other frequencies such as Multi-Frequency can be used to search dry or fresh-water beaches simply by selecting a different Search Mode.

Beach Mode is only available on VX7 and VX9 models.

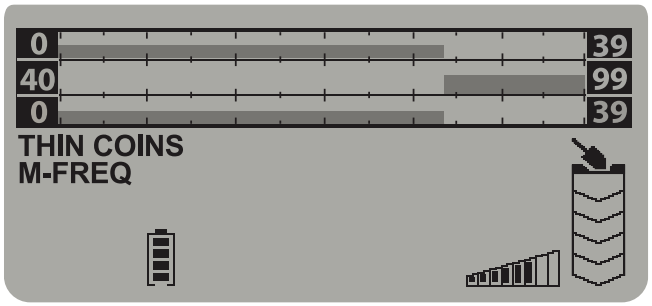


Beach Mode on *VX7* and *VX9* models, displaying a single-tier Target ID scale and operating in Multi-Salt frequency.

Thin Coins Mode

Enhanced detection of targets within a select Target ID range, such as gold coins, small Roman coins, and thin, hammered coins. Detection is suppressed for common ferrous targets and for highly conductive targets. The default Recovery Speed setting is 1. Thin Coins Mode is available in any frequency.

Thin Coins Mode is only available on the Vortex VX9.

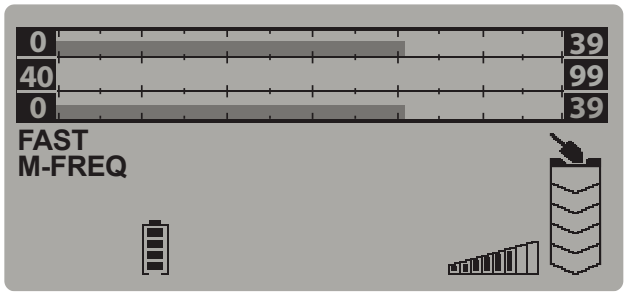


Thin Coins Mode on VX9 model, showing suppressed response on common ferrous targets and high conductors. This three-tier Target ID scale becomes a single scale while operating in a Single Frequency.

Fast Mode

Ideal for use in competition hunts and for high-trash search areas. Detection is suppressed for common ferrous targets. Recovery Speed is set to 3 for fastest target separation. Fast Mode is available in any frequency.

Fast Mode is only available on the Vortex VX9.



Fast Mode on *VX9* model, showing suppressed response on common ferrous targets. This three-tier Target ID scale becomes a single scale while in a Single Frequency.

Vortex Frequency Options

Detecting Versatility

Each *Vortex* operates with both single frequency and advanced multi-frequency detection options. The number of frequency choices increases as you advance in the *Vortex* family from *VX5* to *VX7* to *VX9*.

Choose from powerful single frequencies where all of the detector's transmitter power is focused into one frequency to offer enhanced detection on certain types of targets. Or select one of *Vortex*'s simultaneous multi-frequency modes to achieve excellent detection on all targets in all soils.

Single Frequency Operation

Each *Vortex* offers the versatile single frequency choice of 13kHz. This frequency provides optimal detection on a wide range of coins, relics, jewelry, and other targets.

In certain detecting situations, using a single frequency may offer a slight advantage over use of one of *Vortex*'s multi-frequency modes. For example, *VX7* users will also have the choice of 5kHz operation, which is well suited for locating larger, highly conductive targets such as large silver coins. *VX9* users might select the 25kHz option for enhanced detection on tiny gold nuggets or hammered silver coins.

Single frequency operation may offer quieter operation than multi-frequency in some noisy environments with high electromagnetic interference.

Frequency Options

VX5: Multi-Frequency (Multi-Freq.) and 13kHz

VX7: Multi-Freq., Multi-Salt, 5kHz, and 13kHz

VX9: Multi-Freq., Multi-Salt, 5kHz, 9kHz, 13kHz, 18kHz, 25kHz

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Multi-Dimensional Multi-Frequency (MD-MF)

In general, multi-frequency detection technologies blend a variety of detection frequencies together for improved detection on targets of all types.

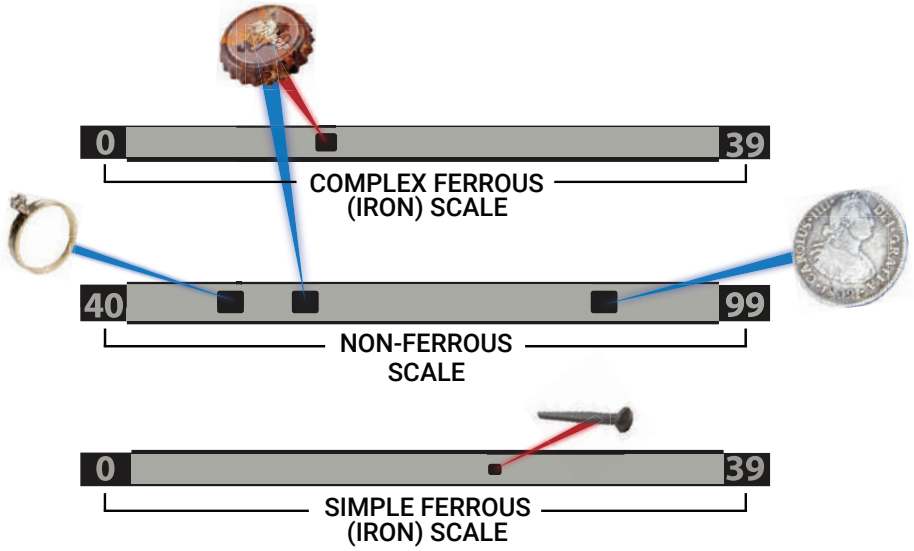
Garrett's exclusive Multi-Dimensional Multi-Frequency (MD-MF) technology also analyzes the targets and surrounding soil matrix utilizing multiple dimensions of conductivity and ferrous content. The addition of this advanced multi-dimensional technology provides a more comprehensive analysis to formulate a more accurate Target ID, and at even greater depths in areas with increased ground minerals.

This advanced MD-MF analysis takes place within all three *Vortex* models. It is most visible on the *VX9* model, whose LCD includes a multi-axis Target ID with three distinct scales *(see Figure A)*. This three-tiered system includes a non-ferrous Target ID scale and two different ferrous scales.

The center scale indicates non-ferrous items. Low conductivity items such as thin, hammered coins will

Vortex Frequency Options

Figure A



indicate toward the left side of the scale. High conductivity items, such as thick silver coins, will indicate toward the right side of this scale.

The upper iron scale indicates flat ferrous items such as steel bottlecaps and washers. These flat-shaped ferrous items create complex signals that trick many detectors into thinking they are coins. Bottlecaps can appear simultaneously on the central conductive scale, as well as the upper complex ferrous scale.

More common ferrous items such as nails or wire indicate on the lower ferrous scale.

Multi-Frequency Operation

The standard MD-MF Multi-Frequency (shown as Multi Freq in the frequency selection area of the Menu) employs a blend of frequencies that provide maximum target detection on all types and sizes of targets, while also minimizing ground noise.

The Multi-Frequency operation is available on all three *Vortex* models, and is the default frequency on all search modes except Beach mode.

Multi-Frequency Salt Operation

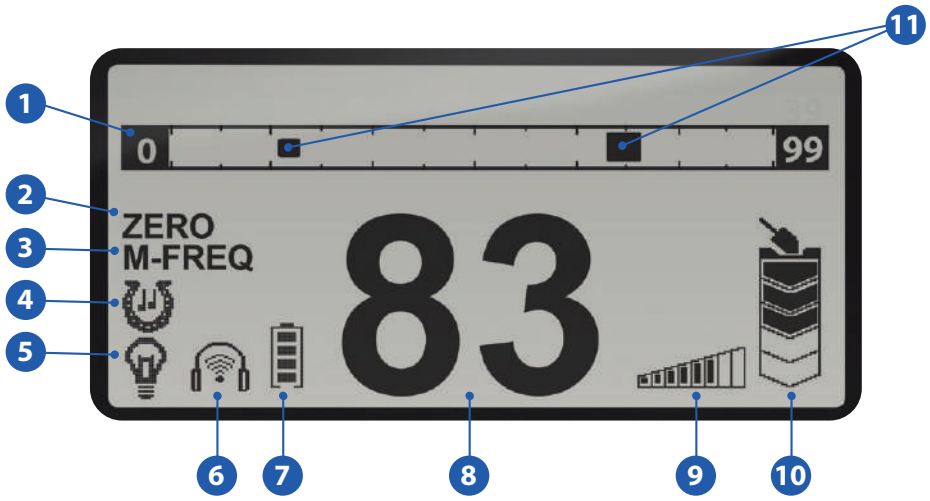
Vortex's multi-frequency options for use in salt environments is shown as "Multi Salt" in the frequency selection area of the Menu. This choice is available on the *VX7* and *VX9* models.

Multi-Salt utilizes a blend of frequencies to help overcome the negative effects of saltwater beaches. As you move from the dry sand into the wet sand and into the shallow water, increasing levels of salt minerals may cause your detector to become unstable. Switch to Multi-Salt Beach Mode to achieve maximum stability and target detection.

Ground balance your detector if needed. In saltwater areas with more highly mineralized ferrous sands (also known as "black sand"), you may choose to reduce Sensitivity to achieve maximum stability. Be aware that some coastal and inland soils can contain significant amounts of salts (for example, fields that were once ancient sea beds, dry salt lakes, etc.). When moisture is present in the ground, these salty soils essentially become saltwater environments and may require Multi-Salt mode for best *Vortex* operation.

LCD Display Elements

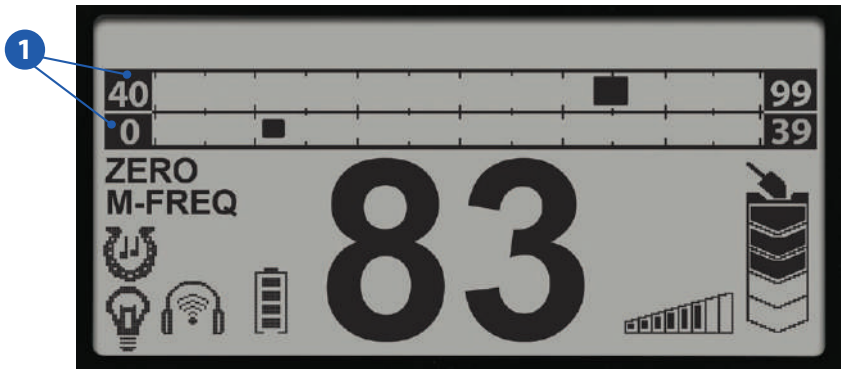
VORTEX™ VX5



1. **Target Scale**—Single-tier Target ID scale indicates both ferrous and non-ferrous targets, with ferrous targets indicating toward the left, low conductivity in the middle, and high conductivity toward the right.
2. **Search Mode**—Displays the current Search Mode (e.g., Zero, Standard, USA Coins, etc.).
3. **Frequency**—Displays the current Frequency setting (e.g., Multi-Freq. 13 kHz)
4. **Iron Audio**—Indicates Iron Audio feature is in use when this icon is displayed.
5. **Backlight**—Indicates LCD backlight feature is in use when displayed.
6. **Wireless Headphones**—Icon flashes while attempting to pair headphones. Icon is solid when unit is paired with headphones.
7. **Battery Level**—Shows status of battery life (25% per segment).
8. **Digital Target ID**—Provides a value from 0 to 99 to identify targets more precisely.
9. **Sensitivity**—Indicates current Sensitivity setting.
10. **Target Depth**—Shows depth of coin-sized target in 2" (5cm) increments. Targets larger than a coin may display shallower than actual depth. Targets smaller than a coin may display deeper than actual depth.
11. **Target ID Cursor**—Indicates Target ID of detected targets. Complex targets may register more than one Target ID cursor. For adjacent targets, Vortex is capable of presenting more than one Target ID on the screen simultaneously.

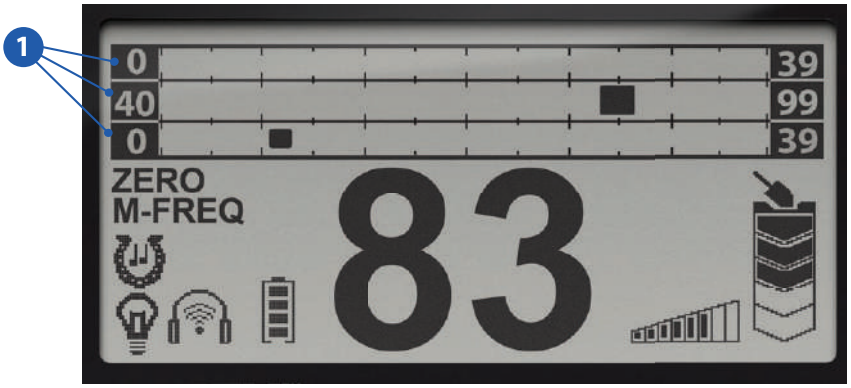
LCD Display Elements

VORTEX™ VX7



1 **Target Scale**—Two-tier Target ID scale indicates different metal types. The top scale indicates non-ferrous (conductive) targets. The lower scale indicates ferrous (iron) targets. *For other LCD elements and more on Target Scale, refer to VX5 key shown on adjacent page.*

VORTEX™ VX9



1 **Target Scale**—Three-tier Target ID scale indicates different metal types. The top scale indicates flat, "tricky" or complex ferrous (iron) items. The center scale indicates non-ferrous (conductive) targets. The lower scale indicates common ferrous targets. *For other LCD elements, refer to VX5 key shown on adjacent page.*

Target ID and Tone Information

Digital Target ID

The large Digital Target ID numeral on the *Vortex* LCD provides a value from 0 to 99 to help identify targets more precisely.

It is important to note that Target ID can vary widely based upon the target's size and thickness because small, thin pieces of metal do not conduct electrical current as well as thicker pieces of metal. For example, a thin hammered silver coin may ID in the 50s whereas a thick silver coin will ID in the 90s.

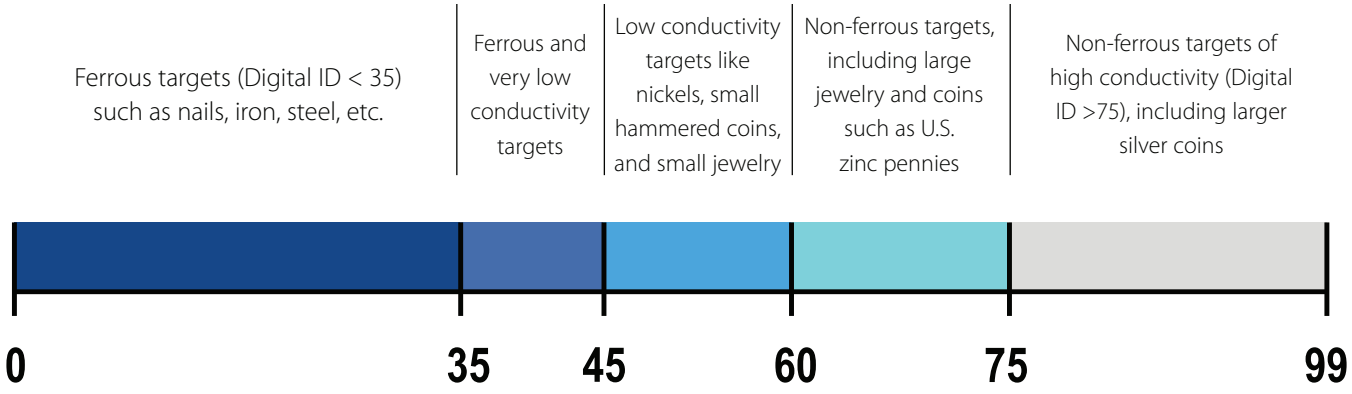
In addition, mineralized soils can cause Target ID errors, especially for small and/or deep targets.

Vortex operates with proportional audio response, meaning that the loudness of a target's response is proportional to a target's signal strength. Small/deep signals sound faint, while strong/large signals sound loud.

Tip: Target ID is most reliable when the target is centered under the searchcoil and the coil is swept flat and at a constant height above the ground.

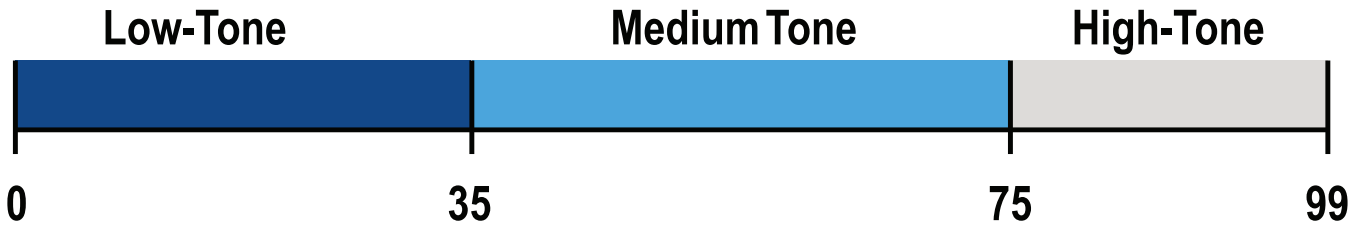
Audio Target ID: 5-Tones

The normal tones breaks for the five audio tones on VX7 and VX9 models are shown here.



Audio Target ID: 3-Tones

The normal tones breaks for the three audio tones on VX5 model are shown here.
Note: 3-Tone operation is also available as a choice on VX7 and VX9.



Auto Ground Balance

Detector performance can be negatively affected by ground mineralization. *Vortex* can be ground balanced automatically to cancel unwanted ground signals and obtain maximum stability and target detection.

Note: Always locate an area of soil free of metal before attempting to ground balance the detector. *Vortex* includes High Resolution Ground Balance, with 175 points of resolution, ranging from conductive soil, such as saltwater beaches, to ferrous mineralized ground. During Ground Balance function, the words GND BAL appear on the display and the ground balance value is indicated on the LCD.

Ground Balance Procedure

Press and hold the GND BAL button while continually "bouncing" or "pumping" the searchcoil from 1 to 8 inches (2 to 20 cm) above the ground until there is minimal to no audio response from the ground. Then release the button and begin hunting. While ground balancing, the value will indicate on the LCD. A low ground balance value indicates conductive soil, such as saltwater beaches; high ground balance values indicate ferrous soil.

Ground balance values from 0 to 75 are indicated with whole numerals. Ground balance values from 75 to 99 represent hot ground, and at this point the *Vortex* utilizes High Resolution Ground Balance.

Beginning at 75, the ground balance value begins increasing in quarter-point steps. This is represented by a whole numeral and smaller quarter-point numerals. *(See illustration showing GND BAL value of 92.75.)*

Note: If the Ground Balance setting does not change during the auto ground balancing process, one of three issues likely exists: the detector is either sufficiently ground balanced already; the current ground exhibits such neutral mineralization that the settings will not change; or there is a metal object beneath the coil preventing the detector from ground balancing.

Ground Balance reading of 92.75 indicates highly ferrous soil content.

GROUND BALANCE Button (Hold while bouncing coil above soil)

Typical Ground Balance Ranges:

80–99: Highly ferrous (magnetite, ferrous oxide minerals, black sands, hot rocks, terra cotta)

50–80: Moderately mineralized soils (red clay, brown clay, iron-bearing clay minerals, etc.)

30–50: Likely an iron object or moist, salty soil

0–30: Highly conductive, non-ferrous minerals such as saltwater

Iron Audio

Press the Menu button and continue tapping to reach the Iron Audio setting. Use Plus (+) or Minus (-) buttons to switch the Iron Audio feature ON/OFF.

Iron Audio allows the user to hear discriminated iron that is normally silenced in order to avoid being tricked into digging iron "ghost signals" that appear to be good. It also adjusts the low iron-tone boundary to match the Iron Discrim setting to audibly separate good targets from iron. Iron Audio provides distinctive responses for iron and steel targets. For example, a nail or wire will produce several fast low tones as the coil passes over.

Most importantly, Iron Audio will produce a very distinctive Low-High-Low response to flat iron objects like bottlecaps or steel washers that normally trick detectors by producing a good Target ID and tone.

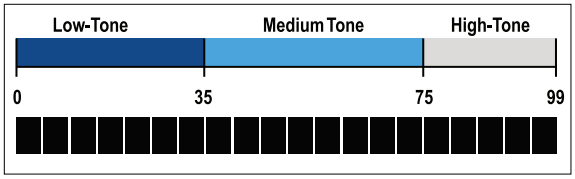
Note: Iron Audio applies only to the notched out pixels within the iron (ferrous) range. If zero discrimination has been applied, the use of Iron Audio will simply eliminate the low tone.

Tip: In areas with heavy concentrations of iron, where Iron Audio produces numerous signals, it is recommended to reduce Iron Volume to a comfortable level. Some users may opt to switch off Iron Audio, switching it back on only when needed to check a detected target with questionable or inconsistent response to see if the target is iron.

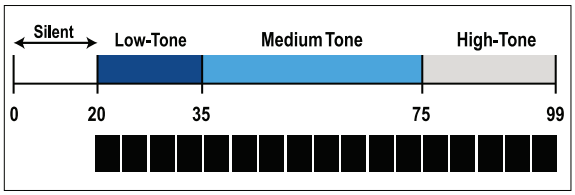
Refer to the illustrations below regarding the use of Iron Audio and High Res Iron Discrimination on the *VX5* model (3 tones).

VX5

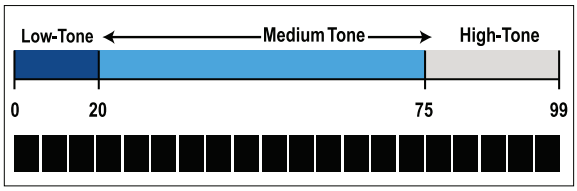
IRON AUDIO OFF:
Normal division of *Vortex VX5*'s low, medium, and high audio tones.



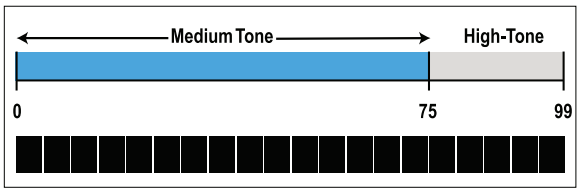
IRON AUDIO OFF:
With High Resolution Iron Discrimination set to 20, all targets below 20 are silent.



IRON AUDIO ON:
Targets below 20 are now heard as a low tone and targets above 20 will produce a mid or high tone.



IRON AUDIO ON:
With zero discrimination utilized and with Iron Audio ON, *Vortex*'s low tone is eliminated. The mid-tone extends down to 0.

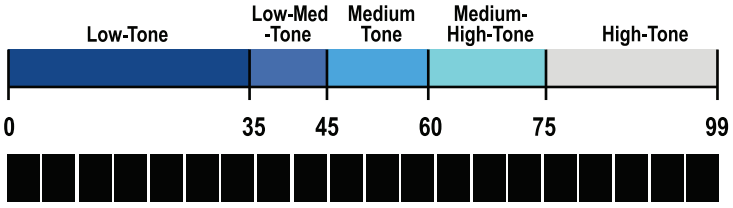


Iron Audio

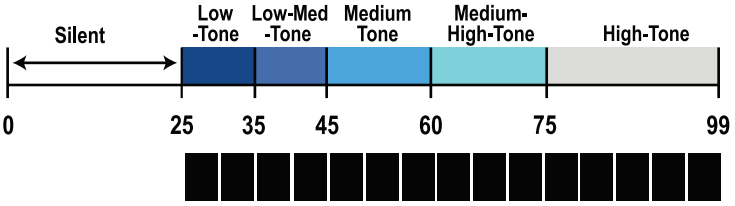
Refer to the illustrations below regarding the use of Iron Audio and High Res Iron Discrimination on the VX7 and VX9 models.

VX7 VX9

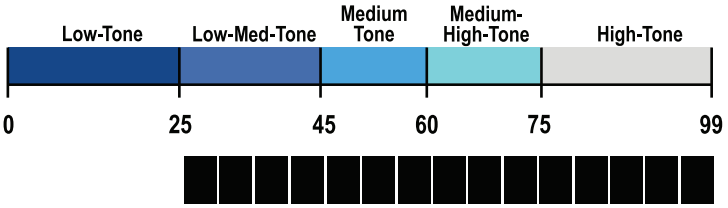
IRON AUDIO OFF:
Normal division of *Vortex*'s five audio tones that are in use on *VX7* and *VX9* models. (See previous page for Iron Audio feature depicted on the *VX5* model with three audio tones.)



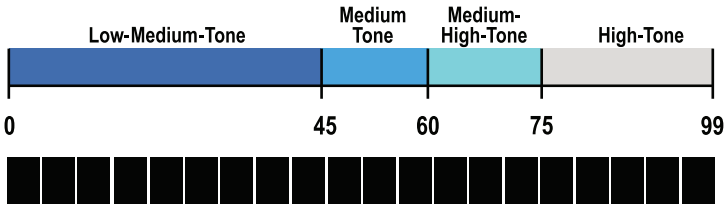
IRON AUDIO OFF:
With High Res Iron Discrimination set to 25, all targets below 25 are silent.



IRON AUDIO ON:
Targets below 25 are now heard as a low tone and targets from 25 to 44 will now produce *Vortex*'s low-medium tone. The normal tone breaks above 44 remain unchanged.



IRON AUDIO ON:
With zero discrimination utilized and with Iron Audio ON, *Vortex*'s low tone is eliminated. The low-medium tone extends down to 0.



Underwater Operation

Your *Vortex* can be used for searching shallow bodies of water, such as shorelines, creeks, rivers, and swimming areas. Since radio signals do not transmit through water, wired headphones must be utilized. (Garrett offers an optional, full-submersible set of *Vortex* dive headphones.)

Button Lock for Diving

Vortex is engineered for submersible operation down to 16 feet (5m). At these depths, the increased water pressure can cause the buttons to depress.

To prevent unintentional button presses, activate the Button Lock feature if you plan to submerge below 6 feet (2m). Simultaneously press the Plus (+) and Minus (-) buttons 3 times, quickly. This can be done from the Button Lock menu screen or from the normal operating screen. Repeat this process to unlock buttons.

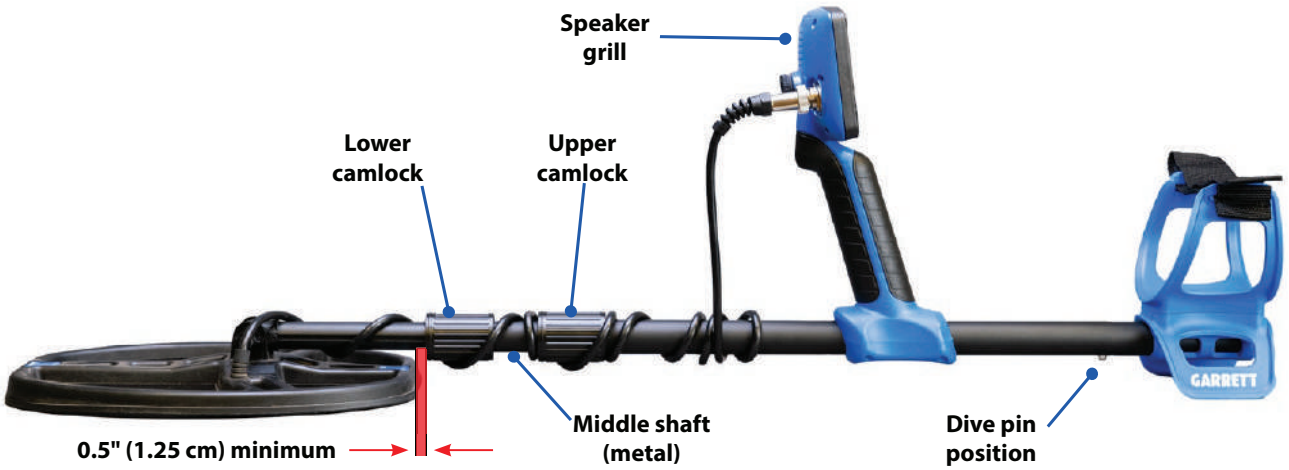
For submerged (diving) use, your *Vortex* can be collapsed as shown below. Loosen the upper camlock and collapse the middle shaft until pin locks into the position closest to the arm cuff.

To reduce detection of the middle metal shaft, make sure the searchcoil is properly adjusted. With the searchcoil folded flat (*as shown below*), allow at least ½" (1.25cm) between the tail of the coil and the lower camlock.

After using *Vortex* in any body of water, it is very important to properly rinse the detector with fresh water to remove sand or sediment before collapsing the stems. Ensure connectors are fully dried before attempting to recharge the detector's battery.

If the *Vortex* external audio speaker sounds muffled after submerged use, shake out any water remaining in the speaker grill (on the back of the control box).

To activate Button Lock for submerged use below 6 feet (2m), simultaneously press the Plus (+) and Minus (-) buttons 3 times, quickly.



Detecting Techniques and Tips

If you are new to metal detecting, start searching in areas with sandy and loose soil to make it easier to learn how to use your metal detector, how to pinpoint a target, and how to recover it.

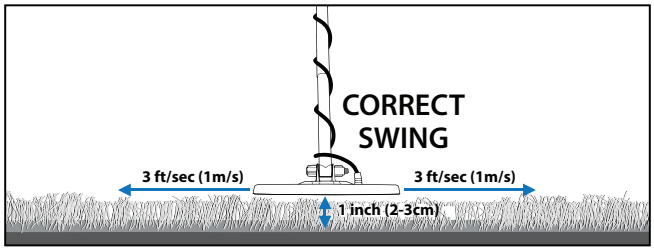
Adjust Detector Shaft and Coil Angle

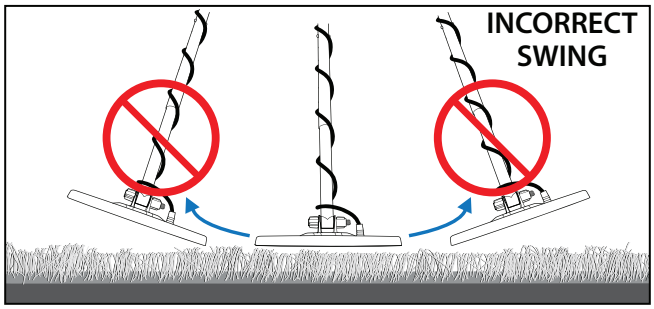
Loosen *Vortex* shaft camlocks and adjust the stem to an appropriate length. When your detector is properly adjusted, you should be able to swing the coil over the ground without stretching or stooping.

Your searchcoil should remain parallel to the ground as you sweep it. The coil's wingnut should not be overtightened. When properly tightened, the coil should remain in a stable position when scanning, but loose enough so that the coil's angle can be easily adjusted by pressing against the tip or tail of the coil.

Proper Coil Swinging

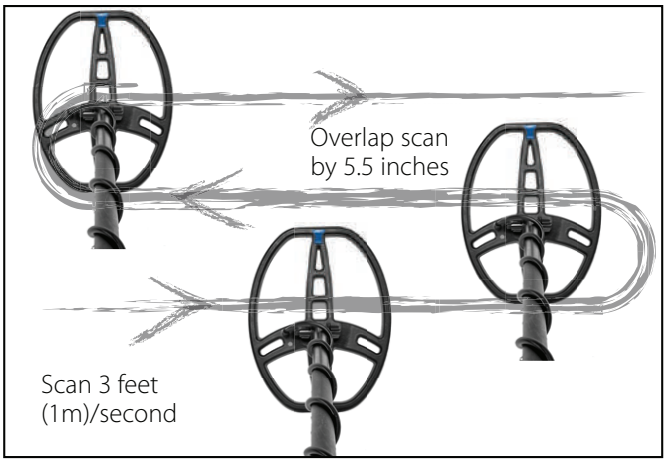
Keep your searchcoil height about 1 inch (2.5cm) above and parallel to the ground at all times for best detection results.





Scan your searchcoil parallel to plow lines and the water's edge. This will minimize the negative effects caused by uneven ground in plowed fields and varying amounts of moisture near the water. Do not swing the searchcoil perpendicular to plow lines and the water's edge, as this may produce abrupt changes in ground response that can reduce the detector's performance.

Walk slowly as you scan your searchcoil in a straight line from side to side at a speed of about 3 feet (1 meter) per second. Advance the searchcoil about half the length of the searchcoil at the end of each sweep.



Electrical Interference and Ground Noise

Detector performance can be affected at times due to electromagnetic interference (EMI), which can create false signals or inaccurate Target ID. Examples of common EMI are electric fences, power lines, phone towers, and other detectors operating nearby.

To reduce or eliminate the effects of EMI, press the MENU button and scroll to CHANNEL. Use the (+) or (-) buttons to find a channel, or minor frequency shift, that results in more stable detector performance.

Ground noise, or ground interference, may be experienced in environments where high levels of ground mineralization are present, as is often found in gold fields. To eliminate or reduce the effects of ground noise, ground balance your *Vortex (see Auto Ground Balance section for full details)*.

Pinpointing

Accurate pinpointing enables fast recovery with the smallest hole possible. To use Pinpoint:

- Position the searchcoil to the side of the target's suspected location at a fixed height above the ground.
- Press and hold the Pinpoint button and slowly sweep the searchcoil over the target area while maintaining the same fixed height above the ground (e.g. 1 inch).
- Sweep the searchcoil side-to-side and front-to-back in a cross-hair pattern to locate the peak signal, indicated by the loudest audio and the greatest number of segments on the Upper Scale.
- The Pinpoint symbol displays on the LCD while pinpointing, and depth of a coin-sized target is indicated.

It is recommended to practice pinpointing in a test plot.

For the best pinpointing results, maintain a constant height above the ground (e.g. 1 inch).

Indicates pinpointing center of the 8.5" x 11" DD Raider searchcoil.

Note: Alternative pinpointing methods using a DD searchcoil are demonstrated on the *Vortex* training video, which can be seen at garrett.com.

Updates and Upgrades

The *Vortex* series has both firmware (software) update capability and detector transformation ability. *Vortex* is the world's first fully transformable detector series. As your skills increase, transform your *VX5* to a *VX7* or *VX9*, each offering more power, options, and versatility for skilled users.

Firmware Updates

All firmware updates made after the *Vortex* is released to the market will be announced on the product's web page, along with updating instructions. Basic firmware updates are free for *Vortex* owners.

To update your Garrett detector, a PC running Windows 7 or newer operating system or an Apple running Mac OS 10.13 and higher is required. You will need to be connected to the Internet to perform your update.

Note: To access any updates, you must be a registered user on the garrett.com/store/ website.

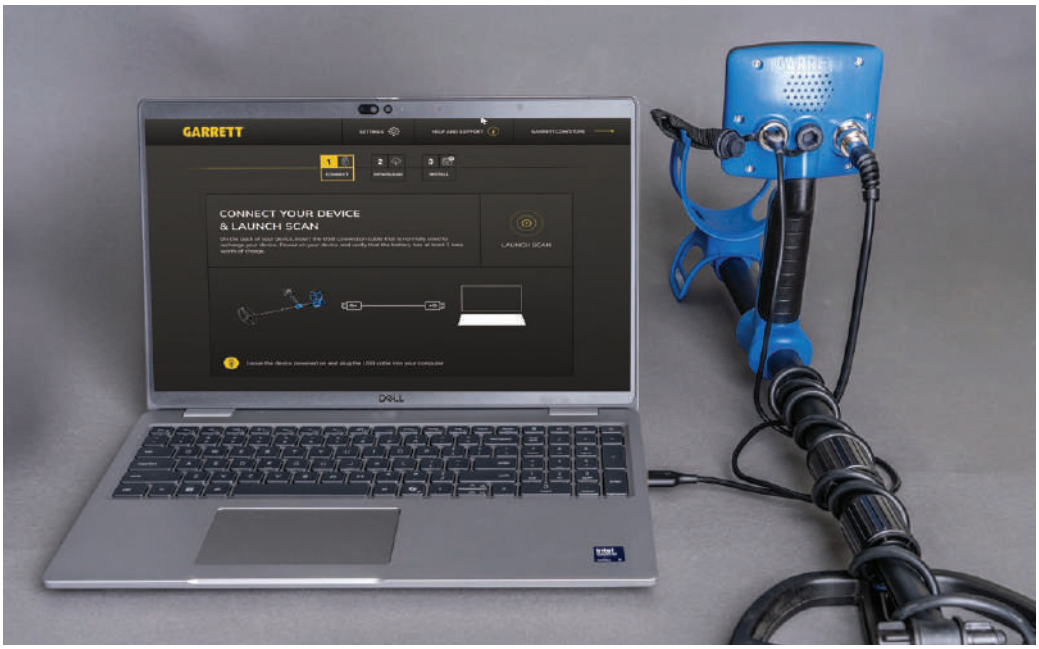
Please visit this site for complete details on how to: locate and install the Garrett installer software; connect your *Vortex* to your computer via the USB-C port on its control box; and how to complete the update.

Note: Your *Vortex* must be adequately charged (at least two bars of battery indicated) in order to complete an update/upgrade.

Vortex Upgrades

Garrett's patent-pending technology allows any *Vortex* user to upgrade their *VX* unit to a higher level unit by implementing a paid software/firmware upgrade. A *VX5* user can choose to transform their detector into a *VX7* or even a VX9 through the Garrett store.

The customer must first purchase an upgrade code to complete the detector transformation process. Please visit Garrett's website or Garrett's online store for full details on the detector transformation process.



◀ Connect to Internet, launch Garrett Installer, and connect USB cable to *Vortex* USB-C port.

General Advice

Metal Detecting Code of Ethics

The following is a Code of Ethics that many treasure hunters and clubs follow to preserve our exciting sport of metal detecting. We encourage you to do the same:

- 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 local and national legislation relating to the discovery and reporting of found treasures.
- I will aid law enforcement officials whenever possible.
- I will cause no willful damage to property of any kind, including fences, signs and buildings.
- I will always fill the holes I dig.
- I will not destroy property, buildings or the remains of deserted structures.
- I will not leave litter or other discarded junk items lying around.
- I will carry all rubbish 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.

Cautions

When searching for treasure with your Garrett detector, observe these precautions:

- Never trespass or hunt on private property without permission.
- National and state parks / monuments and military zones, etc. are absolutely off-limits.
- Avoid areas where pipelines or electric lines may be buried. If found, do not disturb and notify proper authorities.
- Use reasonable caution in digging any target, particularly if you are uncertain of the conditions.
- If you are unsure about using your metal detector in any area, always seek permission from the proper authorities.

Caring for Your Vortex

Your Garrett detector is rugged, designed for outdoor use. However, as with all electronic equipment, there are some simple ways you can care for your detector to maintain its high performance.

- Avoid extreme temperatures as much as possible, such as storing the detector in an automobile trunk during the summer or outdoors in sub-freezing weather.
- Keep your detector clean. Disassemble the stem and wipe it, the control housing, and the searchcoil with a damp cloth when necessary.
- Recharge the detector's battery at least once a year if you are not using it regularly.

Troubleshooting

SYMPTOM	SOLUTION
No power	1. Connect to charger and verify the battery icon is blinking (indicating charge is in progress). 2. Check charging cable and charger.
Erratic sounds or target ID cursor movement	1. Ensure the coil connector is secure and the coil cable is snugly wound around the stem. 2. Perform a factory reset to clear all settings by holding down the Power button for 5 seconds. 3. If using the detector indoors, be aware that excessive amounts of electrical interference exists, plus excessive amounts of metal can be found in floors and walls. Move outdoors to test the unit in an area of ground clear of excessive metal, buried or overhead powerlines, etc. 4. Determine if erratic noise is caused by electrical interference or something else. Hold the coil perfectly stationary on the ground away from any target. a. If noise continues, then it is likely caused by electrical interference: i. While keeping the coil stationary, step through all Channels to find the quietest. If needed, change Frequency and again step through all Channels. ii. Reduce sensitivity, if needed. b. If noise stops when coil is stationary, then it is likely due to ground or metal detection: i. Ensure *Vortex* is properly ground balanced. ii. If ground balance is below 50, use Mult-Salt frequency. iii. Investigate remaining responses; could be deep/faint signals that are marginally detectable. iv. Reduce sensitivity, if needed.
Intermittent Signals	Intermittent signals typically mean you have found a deeply buried target or one that is positioned at a difficult angle for your detector to read. Scan from different directions to help define the signal or try selecting a different frequency to possibly enhance the target's response and scan again. In the case of multiple targets, switch to the ZERO Mode or press the pinpoint button to precisely locate all targets. *NOTE: Iron targets may cause Intermittent Signals. You can identify iron targets in ZERO Mode or with the Iron Audio feature.*
I'm not finding specific targets	Ensure you are using the correct mode for the type of hunting you are doing. If specifically hunting for U.S. coins, USA COINS mode should be your best choice to eliminate other undesirable targets. You may also use the ZERO mode, which detects all metal targets to ensure desired targets are present.
Inconsistent Target ID	If your Target ID changes erratically, chances are you've found a trash target. However, Target ID may bounce if a good target (such as a coin) is not parallel to the searchcoil (e.g. on edge). It may also bounce if there is one or multiple "junk" targets laying next to the good target. Scan from different directions until your Target ID becomes more stable. Higher ground mineralization may also cause the Target ID to be unstable. *NOTE: Large, flat pieces of iron—depending on their orientation in the ground—can read as a good target or can cause erratic Target ID Cursor movement. Use Iron Audio to help identify iron targets.*

Vortex Warranty Info

Your *Vortex* detector is warranted for 36 months, limited parts and labor, but does not cover damage caused by alteration, modification, neglect, accident or misuse.

In the event you encounter problems with your *Vortex* detector, please read through this Owner's Manual carefully to ensure the detector is not inoperable due to manual adjustments. Press and hold the power button for 5 seconds to return to the recommended factory settings.

You should also make certain you have:

1. Checked your battery charge and connections. A low battery is the most common cause of detector "failure."
2. Contacted your dealer for help, particularly if you are not familiar with the *Vortex* detector.

In the event that repairs or warranty service are necessary for your *Vortex*, contact the retail outlet where your detector was purchased. To avoid excessive shipping and import charges, do not attempt to return a Garrett product to the factory in the United States.

Information on international warranty/repair needs can be found on the Garrett website: **www.garrett.com**. Click on the Sport Division and then the Warranty/Support menu for more details.

Regulatory Info

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Ce produit est conforme aux normes RSS exemptes de licence d'Industry Canada. Son fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas provoquer d'interférences et (2) ce dispositif doit accepter toute interférence, y compris celles pouvant entraîner un dysfonctionnement.

Z-Lynk Specifications

Audio Delay:	17 milliseconds
Audio Bandwidth:	30-18,000 Hz
Operating Frequency:	2406–2474 MHz
Transmit Power:	9 dBm EIRP
Certifications:	FCC, CE, UK, CA, IC, AS/NZ

Detector Specifications

Operating Frequency:	5 – 25 kHz
Transmit Power:	41 dBuA/m at 10m
Certifications:	FCC, CE, UK, CA, IC, AS/NZ

Technical Specifications

Comparison Chart	VX9	VX7	VX5
MD-MF Target ID Scale	3-tier Target ID Scales	2-tier Target ID Scales	One Target ID Scale (0 to 99)
Frequencies	5, 9, 13, 18, 25 kHz, Multi-Freq., Multi-Salt	5, 13 kHz, Multi-Freq., Multi-Salt	13 kHz, Multi-Freq.
Search Modes	Zero, Standard, USA Coins, Thin Coins, Beach, Custom, Fast	Zero, Standard, USA Coins, Beach, Custom	Zero, Standard, USA Coins, Custom
Bottlecap Reject (MF function)	6 Settings	4 Settings	Fixed
Iron Boundary (MF function)	6 Settings	4 Settings	Fixed
Notch Discrimination	✓	✓	✓
High-Resolution Iron Discrimination	✓	✓	✓
Sensitivity settings	8	8	8
Variable Recovery Speed	Yes: 3 settings	Yes: 2 settings	Fixed
Z-Lynk Wireless	✓	✓	✓
Channel (EMI Reduction)	✓	✓	✓
Increased sensitivity/depth	✓ ✓ ✓	✓ ✓	-
Auto Ground Balance	✓	✓	✓
Number of Tones	3, 5	3, 5	3
Volume Control	✓	✓	✓
Iron Audio™	✓	✓	✓
Iron Volume	✓	✓	✓
Button Lock (Dive Mode)	✓	✓	✓
Pinpoint	✓	✓	✓
LCD Backlight	✓	✓	✓
Battery Condition Indicator	✓	✓	✓
Length (Adjustable)	24.75" to 56.75" (62.86 cm - 144.14 cm)	24.75" to 56.75" (62.86 cm - 144.14 cm)	24.75" to 56.75" (62.86 cm - 144.14 cm)
Total Weight (with 8.5" x 11" coil)	3 lbs (1.38 kgs)	3 lbs (1.38 kgs)	3 lbs (1.38 kgs)
Fully Waterproof to	16 ft (5m)	16 ft (5m)	16 ft (5m)
Warranty	3 Years, Limited Parts/Labor	3 Years, Limited Parts/Labor	3 Years, Limited Parts/Labor