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READ THIS FIRST

The Saltwater Environment

Saltwater environments are harsh, extremely harsh. Saltwater carries particles of sand and salt that can build up on exterior surfaces and get trapped beneath the controls and around connections.

While the Impulse-AQ is designed to operate in this environment, **you must perform basic preventive maintenance** after using your detector at the beach.

1. **RINSE ENTIRE DETECTOR THOROUGHLY WITH A GARDEN HOSE** or under a freshwater spigot.
 - a. Rinse around the control knobs and connector junctions – rinse thoroughly.
 - b. Inspect for sand in all nooks and crannies – get it out.
2. Compress the headphone earpads to squeeze out excess water; air-dry before storage.
3. Dry out your detector completely before storage.

Do not disconnect any connectors when wet with saltwater.

- Any amount of saltwater on the outside of a cable or connector will seep into an open connector.
- Even the smallest amount of saltwater incursion into a connector will result in corrosion.

If saltwater or sand gets inside a connector:

1. Power down immediately.
2. Rinse the connector thoroughly with fresh water.
3. Use a small brush with soft fibers to dislodge any debris.
 - a. A toothbrush will work.
 - b. DO NOT use a wire brush.
4. Allow a connector to air-dry thoroughly before reconnecting.
 - a. Facilitate drying by blowing air into the connector.
 - b. Better yet... place the component in a plastic bag with white rice; leave overnight (rice will absorb the moisture).

If you do not rinse off your detector after use in a saltwater environment, you will shorten the life of your detector. But you can remedy a certain lack of maintenance as follows:

1. Decontaminate controls/connections/junctions with White Distilled Vinegar (WDV)
 - o Slowly pour the WDV from a small cup or eye dropper.
 - o Flush out all debris with the WDV.
2. Allow the WDV to soak into the buildup of debris for 5-10 minutes.
3. Rinse with freshwater.
4. Slowly rotate the controls/connections/junctions left and right to free them up.
5. Rinse again with WDV; let soak again.
6. Repeat this process as many times as necessary to free up a part that is stuck or binding

READ THIS FIRST

Understand your high-performance Pulse Induction Beach Detector

1. Sweep slowly.
 - Do not sweep the searchcoil rapidly as is common with VLF detectors.
 - Sweeping too quickly can reduce detection depth.
2. When pinpointing a target, do not shorten your sweep.
 - Always sweep the searchcoil out beyond the target response location.
 - Sweep 10 inches (25 cm) beyond the target.
 - Short sweeps, back-and-forth over the target, *will desensitize* target response.
3. Keep the searchcoil perfectly parallel to the ground as you sweep.
 - Do not lift at the ends of your sweeps.
 - Wet sand and saltwater will induce errant audio responses if the searchcoil is lifted and lowered over ground.
4. Pinpointing targets.
 - Use the edge of the searchcoil for small shallow targets.
 - "X" the larger, deeper targets.
5. Start detecting in **All Metal** mode.
 - Variations in the volume and duration of the tone in **All Metal** mode will help identify targets.
 - While this mode detects all metal targets, you will learn to identify targets and achieve the highest performance in other modes by first understanding **All Metal** operation.
6. Check targets by sweeping again at 90° after discovering a target.
 - A change in audio feedback as you sweep over a target at different angles provides important target-ID feedback.
7. Understand when to reduce pulse **Delay**.
 - Start detecting at setting 8 or higher.
 - Low settings will induce more false signals in saltwater.
 - Lower settings will increase sensitivity to low conductivity targets.
 - Lower settings will increase target sensitivity.
8. Handling
 - Do not hang the detector by its cables.
 - Do not carry the detector by its cables.

READ THIS FIRST

Understand the Controls

Volume

Volume is proportional to signal strength.

Set **Volume** as high as is safe and comfortable to maximize detection depth.

Threshold

- Always operate with a faint background audio hum. Without an audio hum, you will miss targets.
- Readjust **Threshold** during the first 15 minutes of use. After 15 minutes, threshold audio will remain consistent without user adjustment.
- The Impulse is not a silent-search detector.

Sensitivity

Always start at setting 4. High **Sensitivity** settings are *not recommended* for the following:

- Wet saltwater sand
- Highly mineralized ground
- In the surf

If detector seems unstable, reduce sensitivity.

ATS: Trade-offs

- Low settings increase sensitivity but can degrade stability in certain situations such as active surf or a sloped wet beach.
- Ferrous target IDs are not accurate at low settings.

Attributes of low ATS settings

- Improves depth but requires slow sweep speed.
- Degrades target separation.
- Increases unwanted response to saltwater in the surf.
- Makes iron rejection more difficult.

Attributes of high ATS settings

- Reduces depth.
- Allows for faster sweep speed; cover more ground, faster.
- Reduces interference from EMI, surf or mineralized ground.
- Improves iron rejection.

Reject

- This control is for rejection of ferrous metals and magnetic soils.
- The highest **Reject** settings risk eliminating good targets from detection.
- Use in conjunction with ATS. First set **ATS** to 8, then adjust **Reject** slowly.

TECHNICAL SPECIFICATIONS

Operating Principle	Pulse Induction
Pulse Frequency, All Metal Mode	4.02kHz – 4.17kHz
Pulse Frequency, Tone & Mute Modes	3.04kHz – 3.12kHz
Pulse Frequency, Volcanic Sand Mode	1.54kHz – 1.56kHz
Pulse Delay, adjustable	7 μ s – 15 μ s
Audio tones	Multitone / Mute
Audio output	Headphones
Searchcoil	12.5" mono
Weight	4.2 lbs.
Length	43-48", adjustable
Batteries	NiMH 2200 mAh
Battery Pack life	Approx 3.5 Hours
Warranty	2-year Limited Warranty to Original Purchaser
Waterproof	Housing 3ft / 1m Searchcoil Fully Waterproof
Operating Temperature Range	-10°C to +40°C (+14°F to +104°F)

FACTORY SUBMERSION TESTED

Drop us a line if you have any questions, comments or great finds to share.
Happy Hunting!

Congratulations on your purchase of the Fisher Impulse AQ[®].

The Impulse AQ[®] is designed for the demanding beach-hunting enthusiast. The Impulse AQ[®] features the latest advancements in Pulse Induction technology and lightweight design. It excels in fresh and saltwater and volcanic sand. It is designed for beach-hunting, wading and shallow-water treasure hunting.

-Fisher Research Labs

THIS DETECTOR IS FACTORY SEALED

Repair or Service to be conducted only by Fisher Research Labs[®].

Any attempt to modify, repair or open the sealed enclosure will void the manufacturer's warranty.

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1 CONTENTS OF BOX

The following preassembled components are in the box:

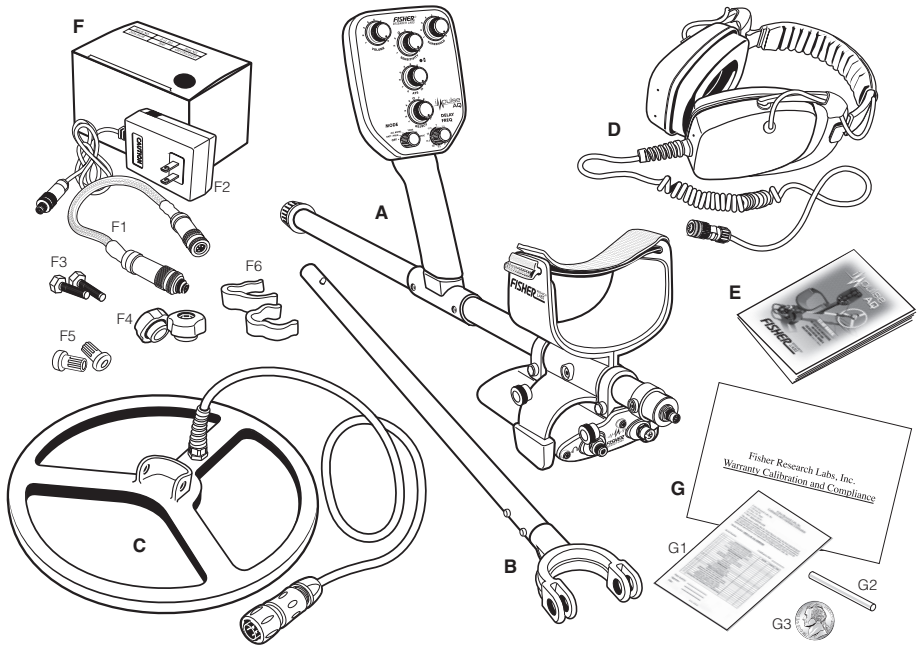


Figure 1

Detector Components

- A. Upper Assembly
- B. Lower Stem
- C. 12" Searchcoil (or optional 8" Searchcoil)
- D. Headphones
- E. Owner's Manual
- F. Accessory Components Box:
 - F1 Power Cable
 - F2 Charger
 - F3 Screw (2)
 - F4 Coil-Retaining-Nut (2)
 - F5 Hex Insert (2)
 - F6 Cable lock clips (2)
- G. Calibration and Compliance Envelope:
 - G1 Calibration and Compliance Certificate
 - G2 Iron Reference Target
 - G3 U.S. Nickel

2 BATTERY

This detector is powered by a battery pack. Additional battery packs are available for purchase.

Charging the Battery

NOTE: This battery is shipped at less than 100% charge. We recommend charging the battery before first operation. **Power the unit off before charging.**

The **Battery Pack** can be charged while attached to the detector or when removed from the detector.

To charge the **Battery Pack**:

1. Plug the **Charger** into a wall outlet.
2. Screw the **Charger Cable** on to the charging socket of the battery.

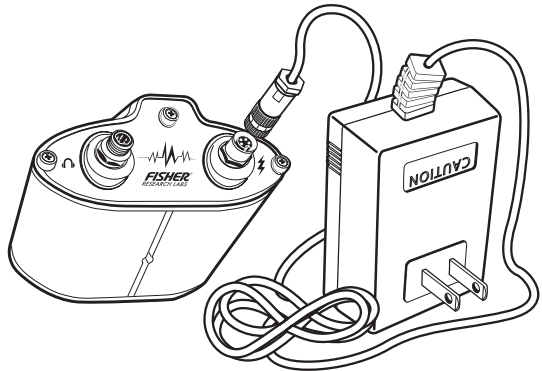


Figure 2

When the charger's green light is illuminated, the **Battery Pack** is fully charged. The **Battery**

Pack may be fully charged even when the light continues to illuminate red. After approximately 5 hours, the **Battery Pack** will be fully charged.

CAUTION: Please plug in AC power first, then connect the battery to the charger. Otherwise, there is no output from the charger.

Battery Life

Expect approximately 3.5 hours of battery life, depending on the operating mode.

Battery Disposal

NiMH batteries are not classified as hazardous waste by the United States Government. Consult the California Universal Waste Rules for battery disposal in the state of California. Other nations and some US states may regulate the disposal of these batteries based on additional criteria or different test protocols. Please consult battery disposal regulations in the nation or US state(s) where disposal occurs.

3 INITIAL ASSEMBLY

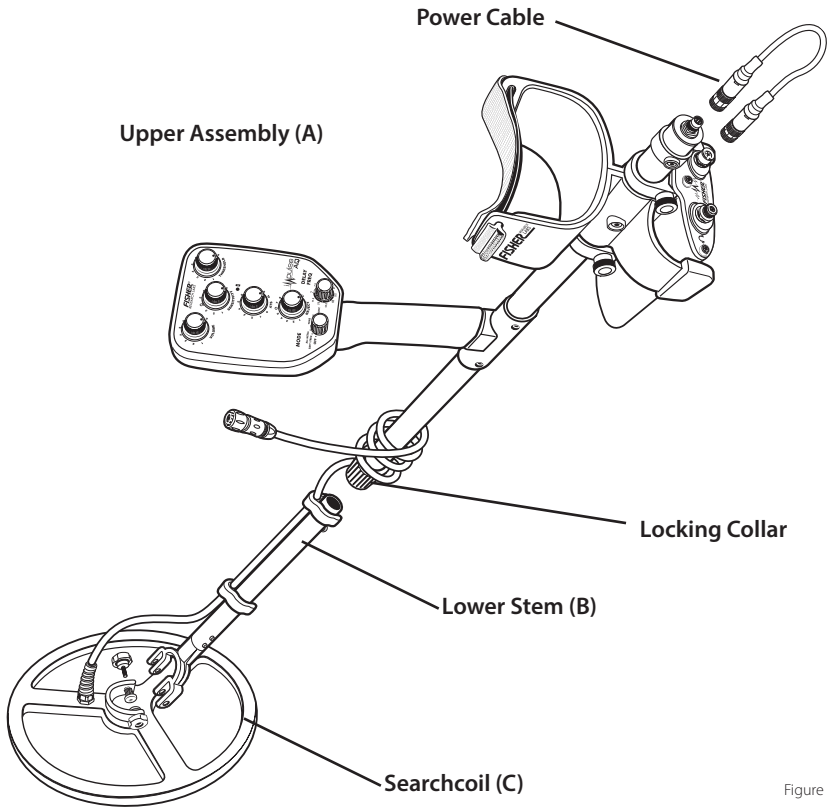


Figure 3

CAUTION: While adjusting the stem or searchcoil, be careful to avoid damaging the **Power Cable** and battery-pack connector.

1. Do not rest the rear of **Upper Assembly (A)** on any hard surfaces.
2. Do not hold or grab the detector by the **Power Cable**.

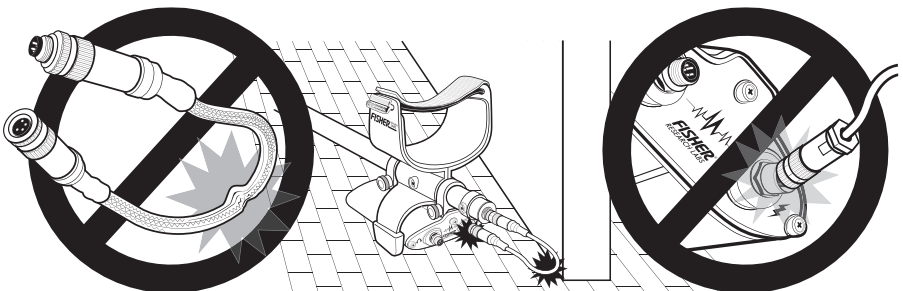


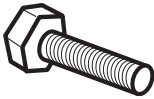
Figure 4

4 ASSEMBLY

Coil Knob Assembly

Assemble in well-lit environment.

Coil-Knob-Assembly Parts:



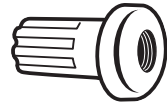
1. Screw

Figure 5



2. Coil-Retaining-Nut

Figure 6



3. Hex Insert

Figure 7

Assemble the Pieces Together:

1. The **Screw** fits into the **Coil-Retaining-Nut** to form a **Coil-Knob-Assembly**.
2. After the fork is aligned over the coil ears, the **Hex Insert** is pushed through the holes on each side of the fork (from inside to outside) to hold the fork of the shaft to the coil.
3. Finally, the **Coil-Knob-Assembly** screws into the installed **Hex Insert**.

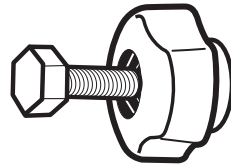


Figure 8

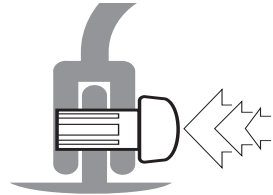


Figure 9

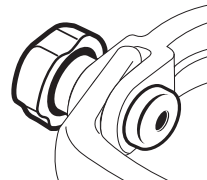


Figure 10

CAUTION: You must hold the head of the **Screw** in with your finger while screwing the **Coil-Knob-Assembly** into place.

ASSEMBLY (Continued)

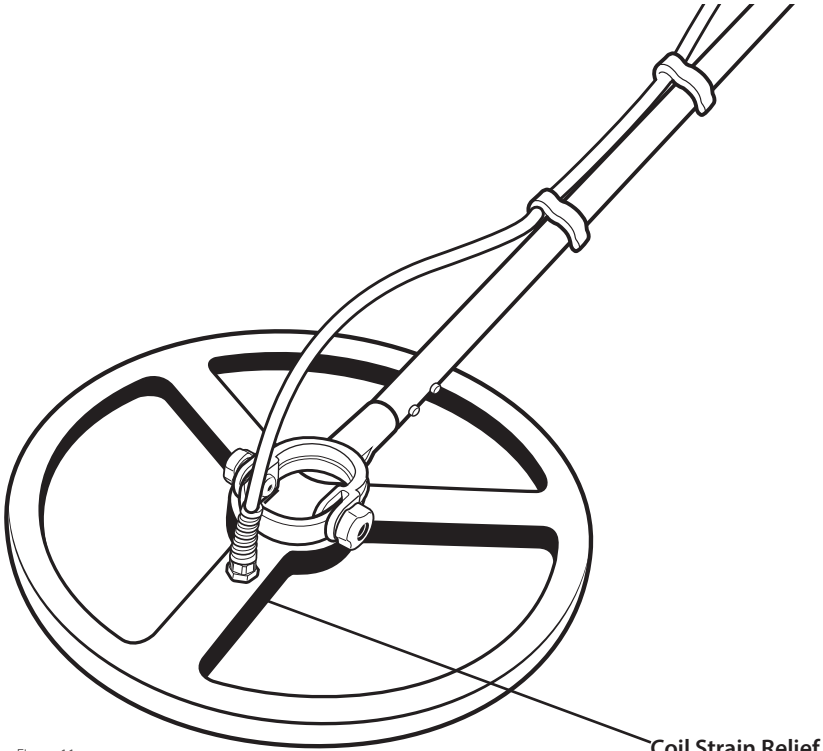


Figure 11

Coil Strain Relief

The **Coil Strain Relief** is located at the front of the coil, in front of the lower stem fork. It is positioned here to prevent interference with the lower tube when the detector is laid in the resting position.

ASSEMBLY (Continued)

Connect Upper Assembly to Lower Assembly

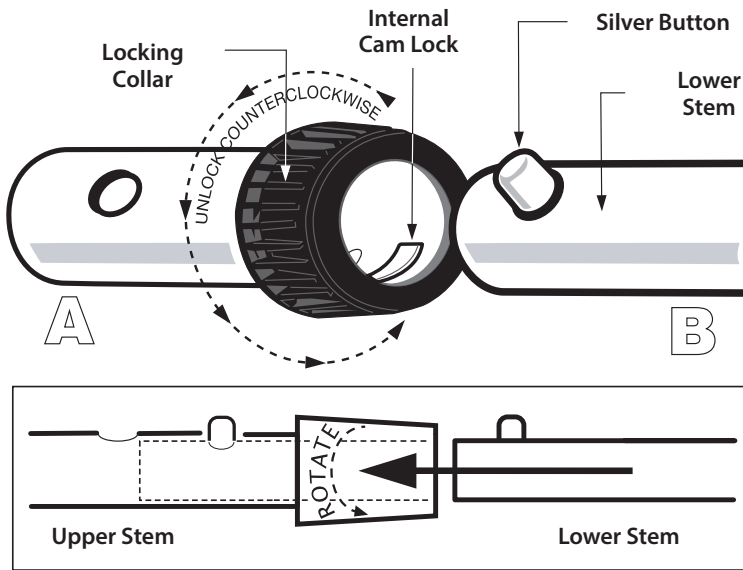


Figure 12

1. Position **Lower Assembly (B)** upright.
2. Rotate the **Locking Collar** fully in the counterclockwise direction.
3. Insert your finger inside the tube and make sure the **Internal Cam Lock** is flush with the inside of the tube.
4. Insert the **Lower Assembly Tube (B)** into the **Upper Assembly Tube (A)** with the silver button pointed upward.
5. Rotate the **Lower Assembly Tube (B)** downward until the silver button locates in the desired hole.
6. Adjust **Lower Assembly Tube (B)** to a length that lets you maintain a comfortable upright posture with your arm relaxed to your side, and the searchcoil parallel to the ground in front of you.
7. Twist the **Locking Collar** fully in the clockwise direction until it locks.
8. Wind the **Cable** securely around the stems, leaving slack at the bottom.
9. Connect **Searchcoil** to housing (see figures 13 & 14).

ASSEMBLY (Continued)

Connecting Searchcoil to Housing

1. Orient the Connector in your hand with the **Wide Notch** pointed upward (figure 13).
2. Push in connector to seat. If it doesn't seat, rotate slightly left and right until it seats.
3. Turn the **Locking Ring** clockwise until it locks (figure 14).

Figure 13

Wide notch
pointed up

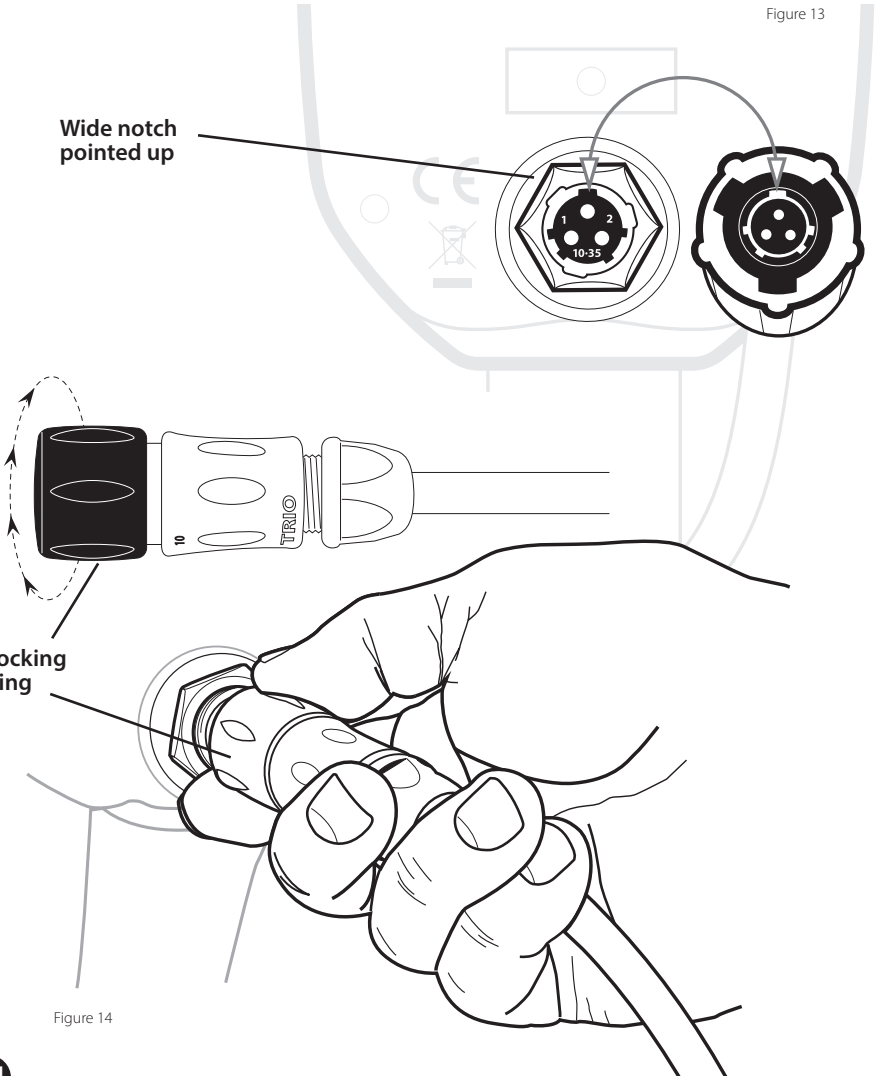


Figure 14

ASSEMBLY (Continued)

Connect Power Cable and Headphones

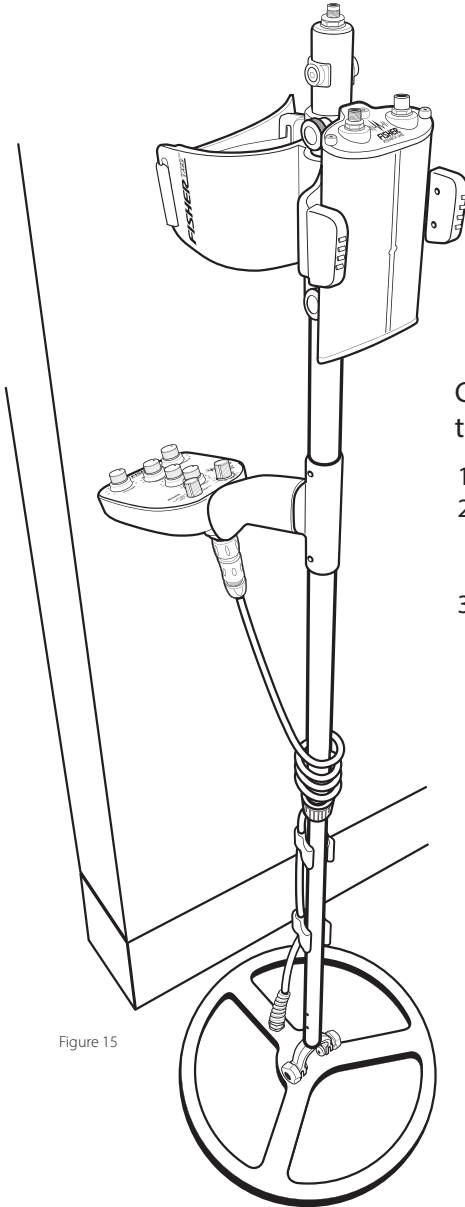


Figure 15

Connect Power Cable to Tube

1. Go into well-lit area.
2. Push lower assembly to shortest detector length possible.
3. Stand detector up with control housing against the wall (figure 15).

ASSEMBLY (Continued)

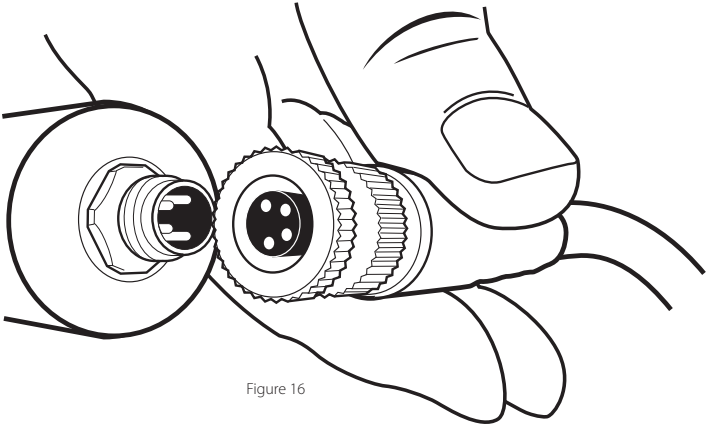


Figure 16

4. Pick up the female end of the **Power Cable** and align it with the connector protruding from the tube (figure 16).
5. Push **Power Cable** down onto connector and feel it seat.

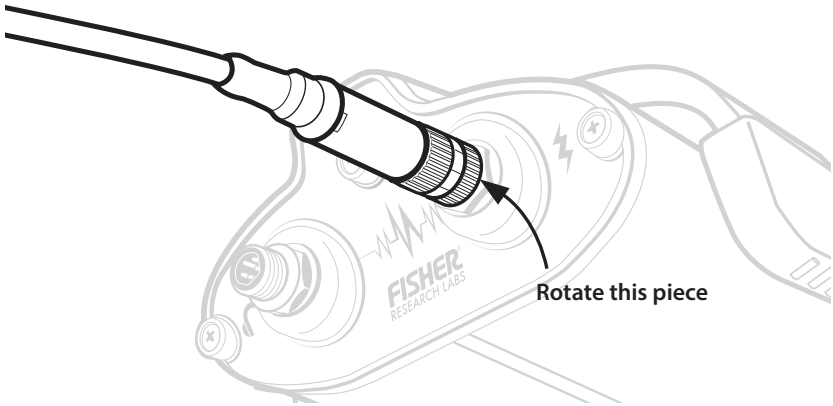


Figure 17

6. Turn outer knurled ring clockwise to thread on the connector (figure 17).
7. Tighten very firmly with fingers.

ASSEMBLY (Continued)

Connect Power Cable to Battery Pack

1. Align pins.
2. Push **Power Cable** down onto connector and feel it seat.
Handle with care: There is very little tactile feedback when connecting these parts.
3. Hold the **Power Cable** upright with one hand, with other hand turn outer knurled ring clockwise to thread on the connector (figure 18).
4. Tighten very firmly with fingers.

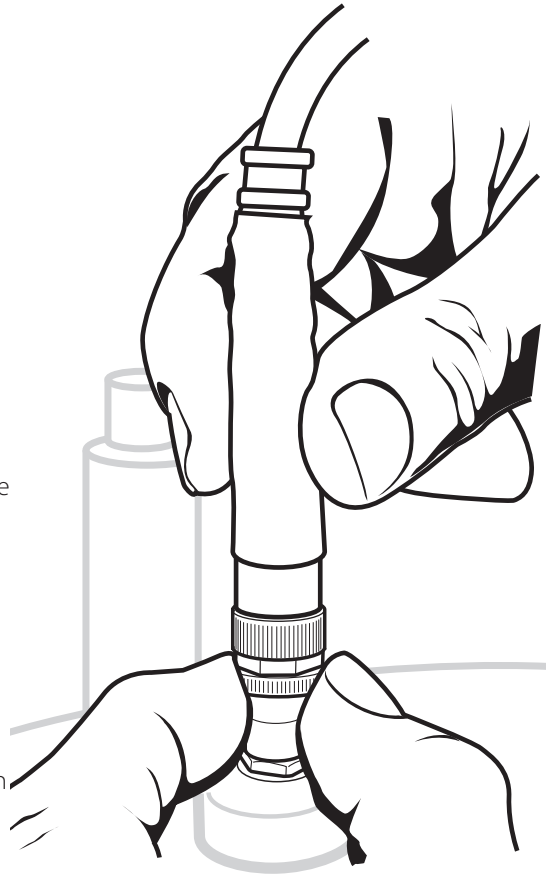


Figure 18

Connect Headphones

1. Hold cable connector with v-shaped key pointed toward the bottom of the battery pack.
2. Push in to seat.
3. Rotate knurled metal ring clockwise.
4. Tighten very firmly with fingers.

5 QUICK START

Basic Operation on Dry/Wet Sand

1. Set the Impulse controls to their preset positions, indicated on the faceplate with a blue circle:
 - **All Metal** mode
 - **Volume** = 7
 - **Sensitivity** = 4
 - **ATS** = 8
 - **Iron Reject** = NO EFFECT IN ALL METAL MODE
 - **Pulse Delay** = 8
2. Turn the detector on by moving the mode switch to the **Batt/Freq** position and note the green light indicating a charged battery.
3. Turn the **Mode** switch to **All Metal**.
4. Adjust the **Threshold** for a slightly audible threshold tone.
5. If the threshold tone is unsteady or noisy, refer to "Frequency" portion of Section 6 (p20).
6. Happy Hunting.

Underwater Operation

Same as Basic Operation, except:

- **Delay** = 15 μ s

Threshold and/or **Volume** may need to be increased if headphones are submerged.

Maximizing Detection Depth

Same as Basic Operation, except:

- **ATS** = 0
- **Delay** = 7 μ s

ATS = 0 creates a slower response that is optimized for deep targets and requires a slower sweep speed. As **ATS** is increased, the target response becomes sharper, with a slight loss of depth.

Delay = 7 μ s offers the greatest sensitivity to all targets but can increase ground noise, especially in saltwater. As **Delay** is increased, small/low conductor targets will progressively drop out. With extreme care, 7 μ s can be used in running surf but 8-8.5 μ s is more stable.

Noise from Electromagnetic Interference (EMI)

If the detector is experiencing EMI noise as evidenced by an uneven threshold tone in the **All Metal** mode, turn the **Mode** control to the **Batt/Freq** position and then rotate the **Pulse/Freq** control to find the quietest setting. Return the **Mode** control to the desired operating mode and then return the **Delay** control to the desired delay setting.

6 USER CONTROLS



Figure 19

MODE Control

The Mode selection switch has 6 positions:

- **Off**
- **Batt/Freq** – Used for battery check and frequency adjustment to minimize electrical interference. This position is not used for searching.
- **All Metal** – All targets induce a high tone.
- **Tone** – Low conductors induce a high tone – iron and high conductors induce a low tone – the setting of the **Reject** control determines the “crossover point” for the two tones.
- **Mute** – Low conductors induce a high tone – iron and high conductors are muted – again, the **Reject** control setting determines the “crossover point” for the muting.
- **Volcanic Sand** – A specialized mode with the ability to operate in the most extreme magnetic black sand (with reduced **Sensitivity**).

Battery Check/Frequency

Battery Check

The battery life of the fully-charged 2200mAh battery pack will be approximately 3.5 hours. Battery life will depend on the mode and the number of targets detected.

USER CONTROLS (*Continued*)

The **Battery Check** position is used to evaluate the battery level as follows (the LED is located between **Sensitivity** and **ATS** potentiometers):

Green LED: More than 30 minutes remaining

Orange LED: 30 minutes or less remaining

Red LED: Less than 15 minutes remaining

NOTE: In any search mode, the detector signals a critically low battery by flashing the LED red and emitting a continuous tone. At that point, there are less than 15 minutes left.

Frequency

The **Frequency/Delay** control has two functions. This entry describes its use to minimize the effects of EMI noise. To learn how to use this control to set the pulse delay, please refer to the **Pulse Delay Control** information on page 24.

The **Frequency** setting makes small adjustments to the transmitter pulse rate. This is used to counteract any interference from other electromagnetic sources, such as radio stations, microwaves, short waves, electric fences, power lines or other nearby metal detectors. This interference is recognizable as a warbling or repetitive pulsing of the audio threshold and can mask target signals.

If you are experiencing interference, adjust the **Frequency** as follows:

- Set the detector to **Batt/Freq** mode with **Sensitivity** set to 5.
- Hold the shaft horizontally with the coil positioned vertically perpendicular to the ground.
- Sweep 360° with the coil at least 3 feet above the ground.
- Stop at the position where you hear the most noise.
- Holding that position, rotate the **Frequency/Delay** switch to find the quietest setting.

Adjustments should be done slowly, with a few seconds between each adjustment to see if the detector stabilizes. If noise cannot be eliminated select the **Frequency** position that has the least noise and reduce the **Sensitivity** and/or **Threshold** settings to obtain a stable operating point.

USER CONTROLS (Continued)

NOTE: The **Frequency** value will be programmed in after the **Mode** switch is moved from the **Frequency** position. After adjusting the **Frequency** and returning to a detection mode, you must re-set the **Pulse Delay**.

When Mode is set to the **Batt/Freq** position the detector operates in **Tone** mode, but it is not recommended to use the **Batt/Freq** position during actual target searching. Instead, use the **Mode** control to select the desired operating mode – **All Metal**, **Tone**, **Mute** or **Volcanic Sand**.

All Metal Mode

All Metal mode detects all metal targets regardless of their nature and conductivity. This produces the deepest detection and has the smoothest audio. Some mineralized rocks (hot rocks) will also be detected.

All targets produce a single high tone. An experienced operator can identify some types of targets, such as:

- Nails, hairpins and other elongated shapes produce double beeps when the coil is swept lengthwise.
- Some ferrous items have an inconsistent sound duration or produce a double beep when the coil is raised near the limit of detection.
- Some aluminum targets (e.g. pull tabs) show a sharp drop in amplitude as the coil is raised.

Experienced detectorists favor the **All Metal** mode to maximize the detection of deeply buried targets.

All Metal mode has the highest power consumption and thus the least detecting time between battery charges.

Tone Mode

Tone mode detects all metal targets regardless of their nature and conductivity, but with a high tone or low tone:

- A low tone indicates a ferrous target or a high-conductive target such as silver or (sometimes) copper, depending on **Reject** setting.

USER CONTROLS (*Continued*)

- A *high tone* indicates a non-ferrous low-conductive target such as gold, platinum, lead, aluminum, or stainless steel.

In addition to tonal variations, other audio anomalies (such as a nail causing a double-beep) will assist in identifying targets. In **Tone** mode, use the **Reject** control to increase or decrease iron rejection and the **ATS** control to induce audio anomalies to identify certain targets.

NOTE: The **Tone** mode is more susceptible to EMI than the **All Metal** mode and is therefore usually noisier. There is also a slight depth loss compared to **All Metal** mode. However, in areas with a high iron concentration the **Tone** mode may have a significant advantage.

Mute Mode

Mute mode behaves like **Tone** mode, but low tones are suppressed. Depending on the setting of the **Reject** and **ATS** controls, some targets that would normally be rejected may produce a short high-tone “chirp.” This and other audio anomalies can assist in identifying targets.

Because **Mute** mode eliminates the low-tone responses, it tends to be smoother than **Tone** mode, especially in the presence of EMI. **Mute** mode is therefore useful in hunting areas with a high iron concentration and noisier EMI conditions.

Volcanic Sand Mode

Volcanic sand is found in many island locations. Volcanic sand will frequently be black or red. Black and red sands may be mixed together or stratified in layers.

Volcanic sand is magnetic. When adjusting the controls, remember that magnetic ground will be rejected before iron. After rejecting iron, the farther clockwise you turn the controls, the more you will reduce **Sensitivity** to gold, along with iron rejection.

In this section, we explain how to reject magnetic ground using the **ATS** and **Reject** controls. On p 26-28 we explain how to fine-tune iron reject for the expert user.

USER CONTROLS (Continued)

Volcanic Sand Mode (Continued)

Volcanic Sand mode behaves like **Mute** mode but has special timing parameters to allow hunting areas with extreme concentrations of volcanic sand. Hot rock responses also tend to be reduced. **Volcanic Sand** mode has lower target sensitivity than other modes. In this mode the recommended minimum **Pulse Delay** is 9 μs and recommended **ATS** is 8 μs . A lower **Sensitivity** may be required for good stability, depending on ground conditions.

NOTE: In **Volcanic Sand** mode, low-conductor targets may have a modest reduction in depth while high-conductor targets may have a depth loss of 50%. However, this mode may allow the detector to operate in conditions where other detectors fail. It is important to understand that not all volcanic soils are the same and there may still be some conditions which are beyond the ability of the Impulse AQ. In general, for the most extreme conditions a higher **Pulse Delay**, lower **Sensitivity**, higher **ATS**, and higher **Reject** setting should be tried. You may find that “bobbing” the coil produces a ground response but a steady level sweep produces minimal ground noise. A slower sweep rate may also help.

In **Volcanic Sand** Mode on dry sand, set **Pulse Delay** to 9 μs , minimum, and **ATS** to 8. When over wet sand or in saltwater:

- Increase the **Pulse Delay** to 11.5 μs .
- Set **ATS** to 8 or higher to improve magnetic sand and hot rock rejection
- If hot rocks are present, lower **Sensitivity** to the range of 2 to 4.
- Consider purchasing the 8” searchcoil for superior ground rejection.

Follow this procedure to set the REJECT level:

- Bob the searchcoil up and down from 2” to 4” over ground, while rotating REJECT, until the sound from magnetic ground is completely, or almost completely, eliminated.
- If REJECT is at maximum and magnetic ground still sounds off, increase **ATS** and then repeat the procedure

If you switch from **Volcanic Sand** mode to **Tone** or **Mute** modes, you must re-set **ATS** and **Reject**

USER CONTROLS (*Continued*)

Volcanic Sand Mode (*Continued*)

Recognize that there is a wide variety of beach geologies and volcanic landscapes; some contain only fine magnetic sand while others may only contain hot rocks. Some beaches may have magnetic bedrock under the sand. Other beaches will have different types of soil geologies compacted and/or stratified, for example hot rocks may be mixed with magnetic sand over bedrock.

Caution: the settings recommended above are suggestions. Depending on the concentration of magnetic material in the soil, the settings required for your location may be different.

Always remember: in complex geologies or challenging ground conditions, **reduce the Sensitivity** if detector operation is not stable.

NOTE: In **Volcanic Sand** mode, low-conductor targets may have a modest reduction in depth while high-conductor targets may have a depth loss of 50%. However, this mode allows the detector to perform well in conditions where other detectors fail.

Pulse Delay Control

The Impulse AQ Limited transmits a pulse and then, after a time delay, samples the received signal. The **Pulse Delay** control can adjust this time delay from 7 μ s to 11.5 μ s. The lowest delay setting produces the highest sensitivity to all targets, especially small gold pieces. But a low delay is also sensitive to conductive salt water so for wet sand or surf hunting, it may be necessary to increase the delay. Higher delay settings progressively reject lower conductors, so if you want to primarily search for high conductors, and eliminate foil and other small trash, then a higher setting is appropriate. When hunting for jewelry, run the lowest possible delay that still has good stability.

NOTE: The **Pulse Delay** setting can alter the effects of the **Iron Reject** and **ATS** controls. Re-adjust as needed.

USER CONTROLS (*Continued*)

Volume Control

The **Volume** control adjusts the loudness of all audio responses. There is a trade-off between a setting high enough to hear a faint deep target, but not so high that a strong shallow target hurts your ears. It is good practice to lower the **Volume** before turning on the detector, especially if you are already wearing the headphones.

Threshold Control

The **Threshold** control sets the level at which the background audio tone (the “threshold” tone) is heard. In most cases, faint target signals are easiest to hear when the **Threshold** is set to a low but clearly audible level. If the **Threshold** is too low (especially “silent search”) then a stronger target signal is required to activate the audio, resulting in a loss of depth. A high **Threshold** level can result in audio fatigue.

NOTE: With the **Threshold** turned down, you will normally want to first adjust the **Volume** for a comfortable level on a strong target response, then adjust the **Threshold** for a comfortable threshold tone level.

Sensitivity Control

The **Sensitivity** control increases or decreases the amplification of the receive signal. Normally, this determines how deep the detector will “see” a target. However, increasing the **Sensitivity** not only increases the amplification of target signals, but also of ground signals and EMI. A common mistake is that higher **Sensitivity** will always give better depth. In air tests this is generally true, but ground results can depend on the amount and type of mineralization.

With the coil on the ground, increase the **Sensitivity** until the detector exhibits chatter, then back off slightly for a reasonably steady threshold tone. Beyond the preset level of 4 the signal gain increases only moderately, but noise can increase substantially. Only use higher **Sensitivity** settings in exceedingly low-noise areas.

USER CONTROLS (*Continued*)

ATS (Auto Tune Speed) Control

Normally the coil must be in motion to detect targets. If you stop directly over a target, the detector will “retune” itself and the target response will cease. The **ATS** control sets the retune speed of the receiver.

A lower setting produces a slower retune speed which:

- Requires a slower sweep speed
- Improves target depth detection
- Degrades target separation
- Increases the salt response in active surf conditions
- Makes iron rejection more difficult

A higher setting produces a faster retune speed which:

- Allows for a faster coil sweep
- Reduces the depth at which targets are detected
- Reduces ground and EMI noise, including salt-surf operation
- Improves iron rejection
- Covers more ground

The **ATS** control affects all modes; start with an **ATS** setting of 8.

NOTE: If the coil is swept very slowly, a faster retune speed can substantially reduce depth. For the deepest results, use a slow retune speed and sweep slowly.

For maximum sensitivity to gold, reject only ground (not iron nails). See p 28 for Expert control.

With experience, and after gaining proficiency with the Impulse AQ, follow the instructions under the *Expert Reject Control* section of this manual. That section explains how to use **ATS** to fine-tune iron audio feedback for better target identification.

USER CONTROLS (*Continued*)

Reject Control

Note that for maximum sensitivity to gold, use the controls to reject ground but not iron targets. As you progressively reduce sensitivity to iron, you will also reduce sensitivity to gold.

The **Reject** control determines the Impulse-AQ's reaction to iron targets in **Tone**, **Mute** and **Volcanic** modes. A high **Reject** level also rejects highly conductive targets like larger silver coins; on rare occasions, large gold items (such as a large heavy ring) can fall in this range. **Reject** should be used only when there is an abundance of iron.

Reject is best adjusted using an example target you want to reject. A sample iron nail is included with the Impulse AQ Limited.

1. Choose **Tone**, **Mute** or **Volcanic Sand** mode.
2. Set the **Reject** control to 0 and the **ATS** to 8.
3. Put the reference iron target on the ground in a horizontal position.
4. Swing the coil over the target at a height of around 4 inches while slowly increasing the **Reject** control.
5. Stop when the nail responds as follows:
 - a. In **Tone** mode, the iron response is mostly low tone with some minor high tone mixed in.
 - b. In **Mute** mode, the iron response is mostly silent with some minor high tone breaking through.
 - c. In **Volcanic Sand** mode, the iron response is fully silent which is necessary to reject volcanic ground.
6. Optionally, test a US nickel to verify that it gives a high tone.

When setting up iron rejection, both the **ATS** and **Reject** controls affect each other so should be adjusted in coordination with one another to achieve the desired rejection responses. It is highly recommended that iron rejection is set up in the field using test targets.

USER CONTROLS (*Continued*)

Expert Reject Control

1. Choose **Tone**, **Mute**, or **Volcanic Sand** mode.
2. Set the **Reject** control to 6 and the **ATS** control to 0.
3. Put the reference iron target on the ground in a horizontal position.
4. Swing the coil over the target at a height of around 3 inches while slowly increasing the **ATS** control.
5. Stop when the nail responds as follows:
 - a. In **Tone** mode, the iron response is mostly low tone with some minor high tone mixed in.
 - b. In **Mute** mode, the iron response is mostly silent with some minor high tone breaking through.
 - c. In **Volcanic Sand** mode, the iron response is fully silent which is necessary to reject volcanic ground.
6. Finally, refine your setting by lowering the **Reject** control to obtain an iron response low tone with some minor high tone mixed in.
7. Optionally, test a US nickel to verify that it gives a high tone.

Note: The **Reject** control on the Impulse AQ does not behave like the Discrimination control on a traditional VLF detector. The Impulse AQ is a two-channel PI design where one channel (the all-metal, or AM, channel) is optimized for low conductors and the other channel (the iron channel) is optimized for high conductors. The **Reject** control alters the balance between the channels so that certain targets (like nails) produce a low-tone response or a blended low-high tone response, depending on both the **Reject** and **ATS** settings. Unlike two-channel prospecting PI detectors, there is no target hole.

It is important to understand that different iron targets can behave differently and react differently to the **Reject** control. Nails, for example, tend to be easier to distinguish but a nail bent at a 90° angle can be more difficult. Large chunks of iron, iron rings and steel bottlecaps can also be difficult to reject. When learning the **Reject** feature of the Impulse-AQ it is recommended to dig all targets to learn their responses. In general, the **Reject** feature is one of finesse that requires experience to use effectively.

7 SEARCH TIPS

Search Environments

Dry Beach

On a dry beach, the salt content of the sand is less troublesome so a low **Delay** setting can be used. While beaches often have a fair amount of trash, a beach scoop makes recovery fast and easy so **All Metal** mode is recommended. The use of **Tone** or **Mute** mode is more beneficial in an area with a lot of iron targets (e.g. near fire sites). For fast coverage use a brisk sweep speed, coupled with a high **ATS** setting.

Wet Salt Sand

Here the salt content begins to be an issue. Depending on salinity, a delay of 7 μs may still work or you may need to increase the delay to 7.5 or 8 μs . Trash is not as prevalent as it does not tend to settle into the wet sand, so **All Metal** mode is preferred. This is also where deeper targets are likely; slow down the sweep, using an **ATS** of 8 or lower.

Surf Zone

If you are in the active surf with the coil in (and out of) the water, then the salt problem is magnified and 8 μs is likely the minimum delay that will offer reasonable stability. Pushing the coil through the water demands a much slower sweep speed, and the **ATS** should be reduced accordingly.

Shallow Water

If you are wading in water, the coil has a large volume of water over it. If the surf swells, the constantly changing volume of water can create slow false signals. Increase the **ATS** to minimize the falsing, but keep in mind that sweep speed is extremely limited and reducing **ATS** will impact depth. It may be better to attain an "ear" for picking out a target signal in the middle of swell noise. A delay of 9-10 μs may be necessary.

Volcanic Black Sand

When hunting extreme black sand beaches using **Volcanic Sand** mode, all the above scenarios still apply, but in addition the pulse delay may need to be increased even more.

SEARCH TIPS *(Continued)*

Pinpointing

The Impulse AQ Limited does not have a “no-motion” pinpoint mode; the coil must be in motion in order to detect a target. When you initially detect a target, slow down and use short sweeps across the target, looking “through” the coil and taking a mental snapshot of the ground location where the peak target response occurs. Then sweep across the target at a 90° direction to get a 2D visualization of the location. This is called “X-ing” the target. Listen to the audio in both directions to get a better idea of what the target might be:

- Crisp response in both directions: likely a good target.
- Crisp response in one direction, but muddled or broken response in the other: likely a trash target like a pull tab or iron. However, some jewelry (chains, pendants) can produce odd responses.
- Single response in one direction, but double response in the other: likely a nail or other long ferrous target. However, a coin or ring buried on-edge can also produce this response.
- Double response in both directions: likely a small iron shard near the surface. These are prevalent on salt beaches where iron/steel (especially fishhooks) decompose and small shards are left. They are detected at the perimeter of the coil, not center, and produce a double-beep, regardless of sweep direction. Since shards fall through a scoop and are difficult to see, if your target is constantly moving around in the sand during recovery, then it is likely a shard.
- In general, when you think the target is out of the hole but it is still difficult to find, turn the coil on-edge and use the edge of the coil for pinpointing.

For beach hunting, a beach scoop is the fastest way to recover targets. In the water, a beach scoop is a necessity as the sand fills in very quickly. In dry sand or for land hunting, a pinpointer will also speed up recovery.

SEARCH TIPS *(Continued)*

Target Conductivity

Target Conductivity refers to the reactance of the target and depends not only on the metal alloy but also the shape, size and thickness. Small gold jewelry (earrings, thin rings, thin chains) is usually low-conductive and large gold jewelry (heavy rings, thick chains) usually has a higher conductivity. But jewelry occupies a continuum of conductivities. Unlike many other PI detectors, the Impulse AQ Limited can detect most gold targets within the category of low conductors.

Coins can also occupy a continuum of conductivities, but many (especially those with high silver content) fall in the high range, whereby some smaller bronze and cupro-nickel coins (like the US nickel) and thin coins like hammered silvers fall in the low range.

Finally, trash will fall across the conductivity spectrum. Pieces of aluminum foil are among the lowest conductors. Pull tabs, screw caps and bottle caps are in the middle and iron tends to be on the high side.

8 DETECTOR CARE

Handling/Transport

Avoid placing stress on the battery cable:

- Never lift the detector by the power cable.
- Never hang the detector by the power cable.
- Never stand the detector upside-down with the weight of the detector on the power cable.

When transporting the Impulse AQ Limited, either dismantle and place in a padded detector bag or lay in a horizontal position. Avoid placing other items on top of the detector. Never leave the detector in a vehicle where it can be subject to extreme heat.

Storage

Store in a dry place and avoid extreme temperatures. If the detector has been exposed to excessive heat, it is recommended to let it to cool down before switching it on. We recommend storing at room temperature to preserve battery capacity. When storing the detector, charge the batteries completely before storage. If storing for a prolonged period of time, recharge the batteries occasionally to preserve battery capacity.

Cleaning

After any water hunting or operation near salt water, **thoroughly rinse with fresh water**. Compress the headphone ear pads to squeeze out excess water. After rinsing, allow the detector to completely dry out before storing. If using a coil cover occasionally remove the cover and clean out any accumulated sand.

If salt water and/or sand get inside any one of the connectors:

- Turn off power to detector immediately.
- Rinse the connector thoroughly with fresh water.
- Use a small brush with soft fibers, such as a toothbrush, to dislodge any foreign material (do not use a wire brush of any type).
- Allow the connector to dry thoroughly before reconnecting. You can facilitate drying by blowing air into the connector, or you can place the power cable, and/or battery, in a plastic bag with white rice overnight (the rice will absorb any moisture).

DETECTOR CARE (Continued)

Securing Battery

1. The **Battery Pack** can be charged while installed on the detector, or it can be removed and charged.
2. Loosen or tighten the two knobs to detach or install.
3. The **Battery Pack** slides through two ring-guides and reaches a stop on the rear ring-guide.
4. Tighten the two knobs to secure the **Battery Pack**.

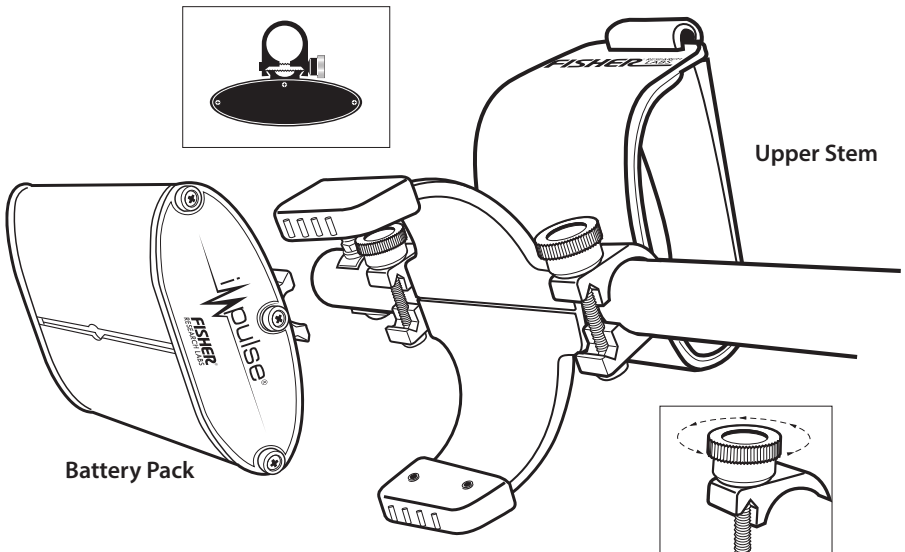


Figure 20

9 TROUBLESHOOTING

PROBLEM	CONDITION	CAUSE	SOLUTION
The detector is noisy	In or around the home	EMI – homes are especially noisy environments and not conducive to using or testing metal detectors	<ol style="list-style-type: none"> 1. Use the Frequency adjust to minimize EMI 2. Try to turn off EMI sources (WiFi, electric motors, invisible fences, etc.) 3 Reduce sensitivity
The detector is noisy	In remote places	EMI – power lines, aviation, and military installations can be strong emitters	<ol style="list-style-type: none"> 1. Use the Frequency adjust to minimize EMI 2. Turn off your cell phone 3 Reduce sensitivity
The detector is noisy	In salt water or in the salt surf zone	Likely caused by conductive salt water	<ol style="list-style-type: none"> 1. Increase the pulse delay 2. Increase the ATS 3 Reduce sensitivity
The detector is noisy	On volcanic sand beaches	Volcanic minerals	<ol style="list-style-type: none"> 1. Use Volcanic mode 2. Adjust the Reject control for minimal response
The detector emits signals at one or both ends of your sweep	Wet salt sand, especially on sloped beaches	This is usually caused by the changing density of salt between the low and high points of a sloped surf zone.	<ol style="list-style-type: none"> 1. Reduce the sweep speed 2. Increase the pulse delay 3. Increase the ATS 4. Walk into and out of the water, sweeping the coil in parallel to the surf line
The detector responds to hot rocks	Especially along volcanic beaches	Some volcanic rocks can create false target signals	<ol style="list-style-type: none"> 1. Use the Reject control to create a negative or broken response 2. Use Mute mode to suppress negative hot rock responses 3. Use Volcanic mode (with the Reject control) for especially difficult conditions
Cannot find the target; target keeps moving around	Usually happens in dry beach sand	Likely a very tiny iron shard	<ol style="list-style-type: none"> 1. See Pinpointing Tips on p 30 2. Use a solid plastic scoop instead of a sifter-scoop
Cannot find the target	In general	A large target can be deep; a tilted coin or ring can produce an off-center response	<ol style="list-style-type: none"> 1. Lift the coil a few inches off the ground; if the target response strength is not diminished then it could be a large deep target 2. Lift the coil a few inches off the ground; if the target center seems to move that indicates a tilted target that is located toward the direction of movement

10 COMPLIANCE

FCC Class A Notice

THIS DEVICE COMPLIES WITH PART 15 OF FCC REGULATIONS. 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 UNDESIRE OPERATION.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of FCC Regulations. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause interference in which case the user will be required to correct the interference at his own expense.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer.



11 CODE OF ETHICS

- Always check Federal, State, County and local laws before searching.
- Respect private property and do not enter private property without the owner's permission.
- Take care to refill all holes and leave no damage.
- Remove and dispose of any and all trash and litter found.
- Appreciate and protect our inheritance of natural resources, wildlife and private property.
- Act as an ambassador for all treasure hunters. Use thoughtfulness, consideration and courtesy at all times.
- Never destroy historical or archaeological treasures.
- All treasure hunters may be judged by the example you set; always conduct yourself with courtesy and consideration of others.

12 2-YEAR LIMITED WARRANTY

The Impulse AQ® Limited metal detector is warranted against defects in materials and workmanship under normal use for two years from the date of purchase by the original owner. Damage due to neglect or usage beyond its rated capability is not covered under this warranty. Decisions regarding abuse or misuse of the Impulse AQ® Limited metal detector are made solely at the discretion of the manufacturer.

WARRANTY NOTICES:

- 1 Damage to power cable or headphone connector is not warrantable if damaged by excessive force.
- 2 Leakage through power or headphone connector is not warrantable if a result of improper assembly or submersion beyond the detector's rated submersion depth of 1 meter.

Proof of Purchase is required to make a claim under this warranty.

Liability under this warranty is limited to replacing or repairing, at our option, the metal detector returned, shipping cost prepaid, to Fisher Research Labs. Shipping cost to Fisher Research Labs is the responsibility of the customer. To return your detector for service, please first contact Fisher Research Labs for a Return Authorization (RA) Number. Reference the RA number on your package and return the detector within 15 days of calling to:

Fisher Research Labs, Inc.

1120 Alza Drive
El Paso, TX 79907
Phone: 915-225-0333

NOTICE TO CUSTOMERS OUTSIDE THE U.S.A.

This warranty may vary in other countries, check with your distributor for details.
Warranty does not cover shipping costs to and from the U.S.A.

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www.fisherlab.com

13 OPTIONAL ACCESSORIES

Extended Lower Tube Assby

TUBE-EXTD-AQ

38" overall length. Provides user additional reach of up to 8" beyond the standard lower tube.

\$79.00



8" Open-face Searchcoil

8COIL-AQ

For smaller and tighter search objectives than the standard 12" searchcoil. Includes lower tube and coil connections.

\$299.00



8" Searchcoil Cover

8COVER-AQ

Protect your coil from abrasion and damage.

\$29.75

12" Searchcoil Cover

12COVER-AQ

Protect your coil from abrasion and damage.

\$32.00

Fisher[®] Padded Carry Bag

103693000C

Extended-length Carry Bag to fit Impulse-AQ[®]. Rugged, double-stitched construction with exterior pocket to store small accessories or supplies.

\$45.00

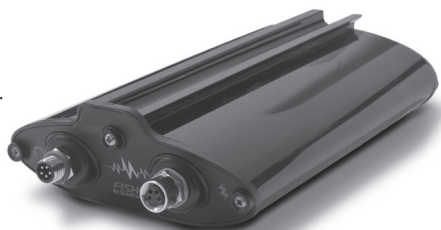


Standard Fisher[®] Battery Pack

PI-BATPK-NIMH

Original equipment Impulse-AQ Battery Pack. An additional battery pack will double run-time on an outing.

\$199.00





FISHER RESEARCH
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