

impulse[®]

AQ

Limited



OWNER'S
MANUAL

FISHER[®] RESEARCH
LABS

Congratulations on the purchase of your new Fisher Impulse AQ® Limited Metal Detector.

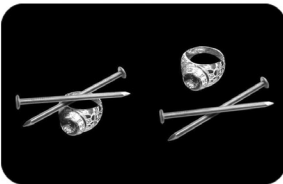
The Impulse AQ® Limited is the first detector to emerge from the collaboration of Fisher Research Labs and Alexandre Tartar. The Impulse AQ® Limited is designed to be an instant classic, designed for the demanding beach-hunting enthusiast. Alexandre's passion for scientific thought, physics and mechanical design bring us this breakthrough in pulse induction design.

The Impulse AQ® Limited features the latest advancements in Pulse Induction technology and lightweight design. The Impulse AQ® Limited excels in fresh and saltwater and volcanic sand. It is designed for beach-hunting, wading and shallow-water treasure hunting. Each detector is submersion tested at 1 meter for 4 hours.

Happy Hunting from Fisher Research Labs!

Important Features:

- Highest sensitivity to gold targets
- Highly Reactive System (HRS®)
- Rock-solid stability
- Neutralizes ground effect (all beach geologies)
- High Recovery Speed (ZTS®)
- Iron mask (ZTS®)
- Blocks EMI



ZTS® ZERO TARGET SEPARATION

In recent years, all metal detectors in the world have been competing for minimum recovery speed of varying degrees.



ZPT® ZERO PRESSURE TECHNOLOGY

ZPT technology distributes the torsion, traction and shock forces from the swing of the coil. Vibrations and oscillations of the moving coil are damped.



HRS® HIGHLY REACTIVE SYSTEM

HRS® is a technology that allows a very fast swing without a significant loss of sensitivity.

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	7µs – 11.5µs
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	3ft / 1m
Operating Temperature Range	-10°C to +40°C (+14°F to +104°F)

FACTORY SUBMERSION TESTED

DISCLAIMER:

Prior to assembling or using your new detector for the first time please read this manual carefully. After reading, store this manual in a safe place for future reference. Improper handling of this detector could result in physical damage.

You are in for some exciting gold hunting. Drop us a line if you have any questions, comments or good finds to tell us about. In the meantime, Happy 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:

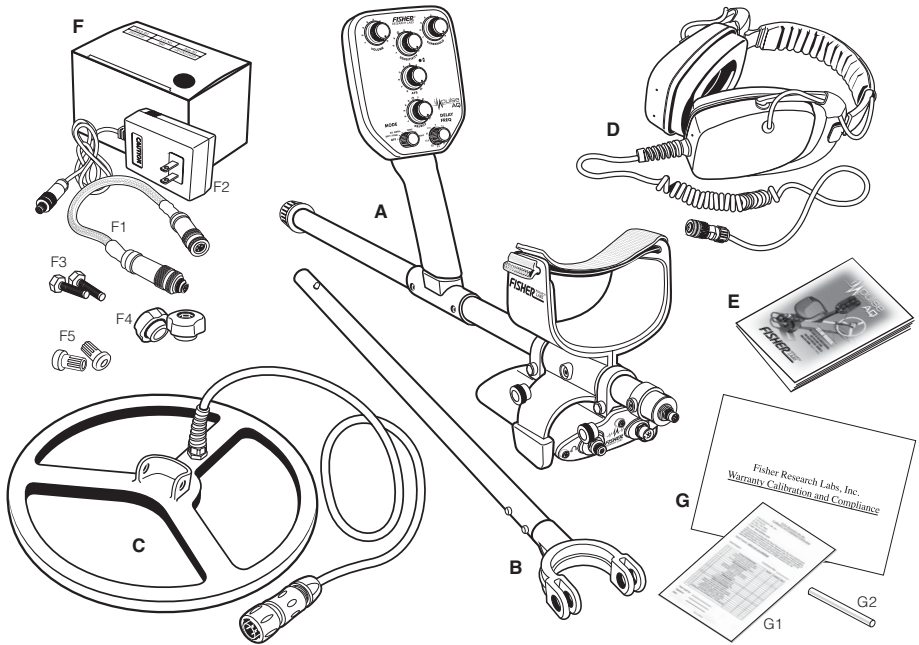


Figure 1

Detector Components

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

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.

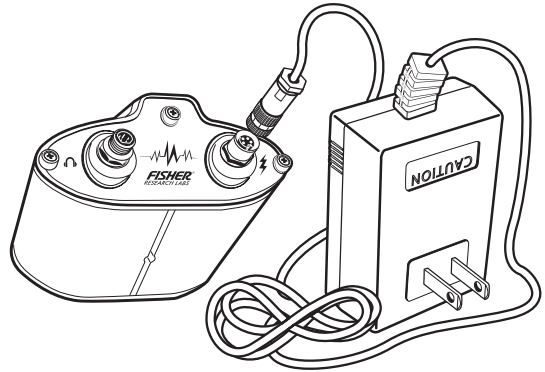


Figure 2

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

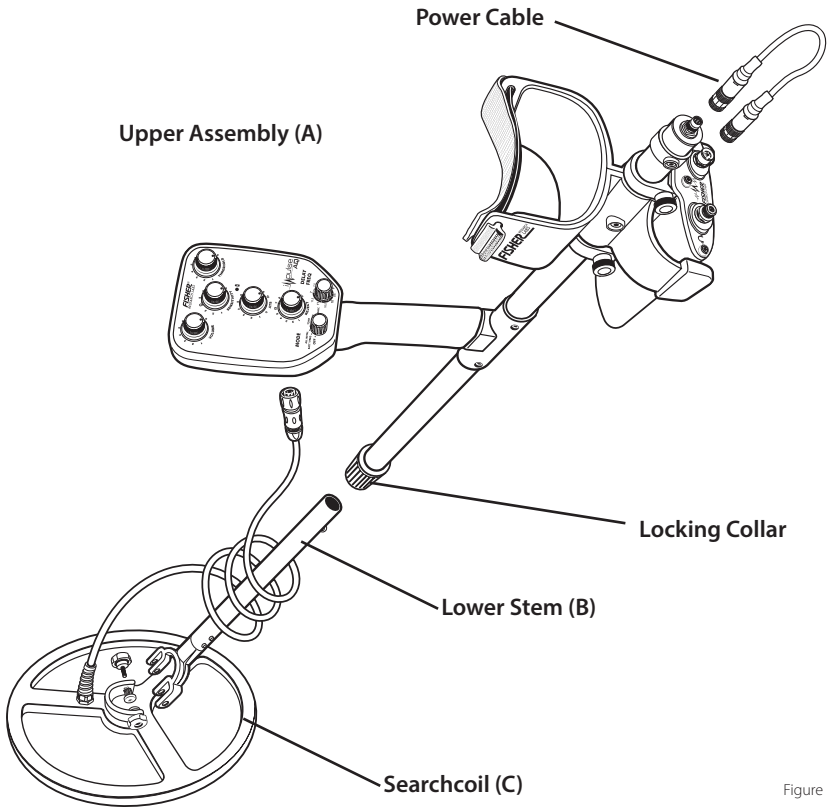


Figure 3

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**.

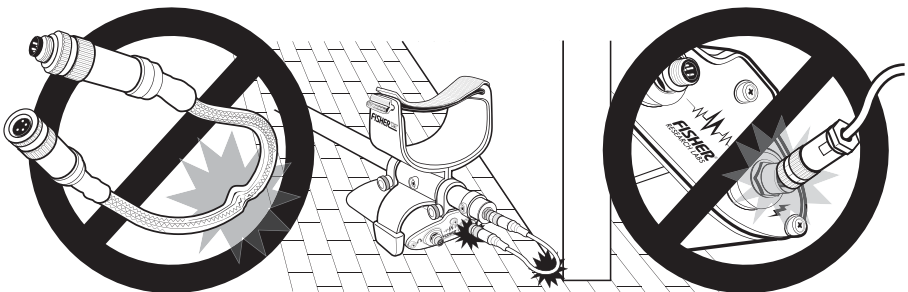


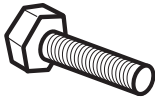
Figure 4

4 ASSEMBLY

Coil Knob Assembly

Assemble in well-lit environment.

Coil-Knob-Assembly Parts:



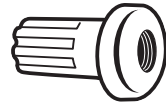
1. Screw

Figure 5



2. Coil-Retaining-Nut

Figure 6



3. Hex Insert

Figure 7

Assemble the Pieces Together:

1. The **Screw** fits in o 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**.

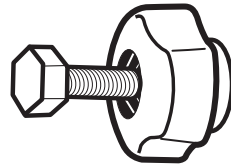


Figure 8

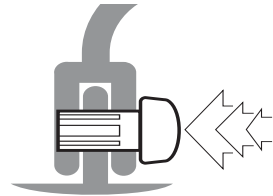


Figure 9

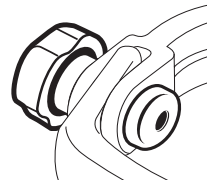


Figure 10

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

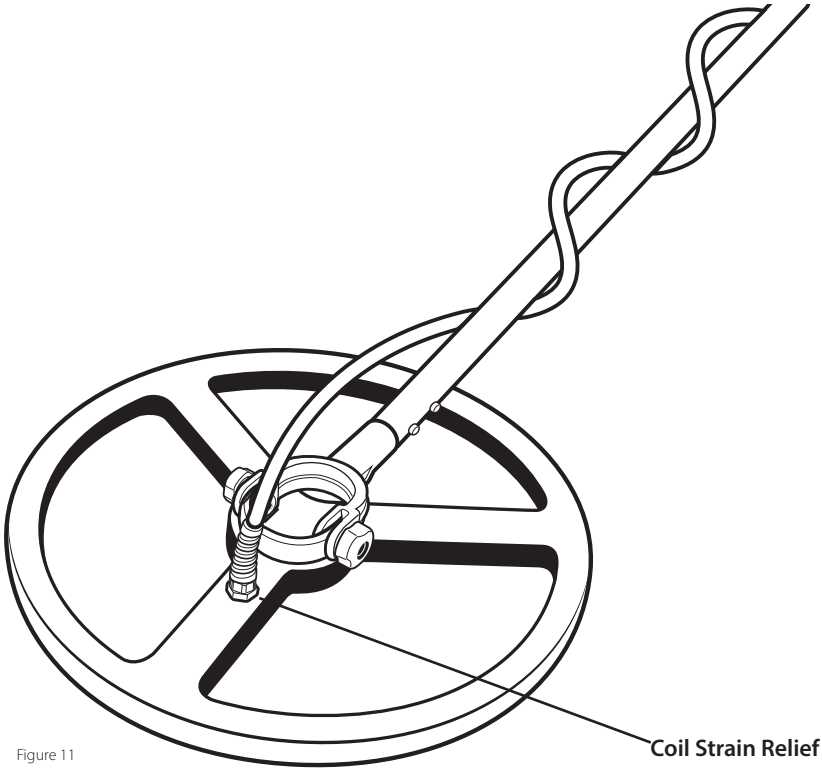
ASSEMBLY (Continued)

Figure 11

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

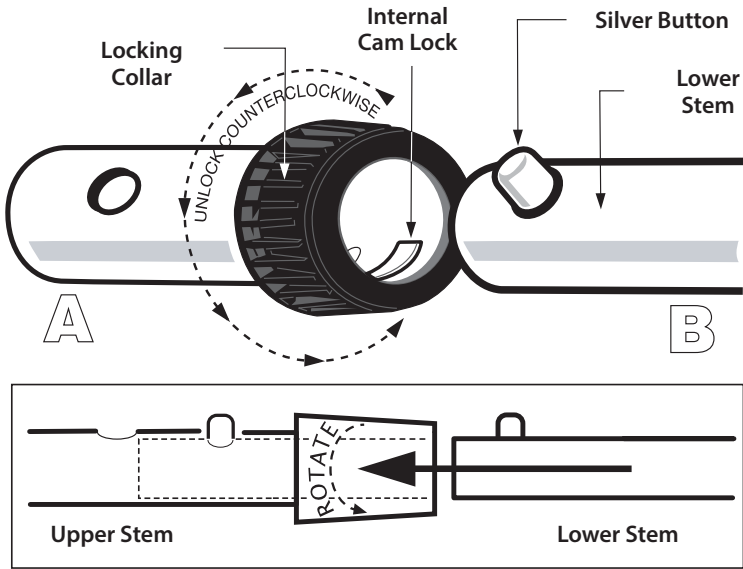


Figure 12

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

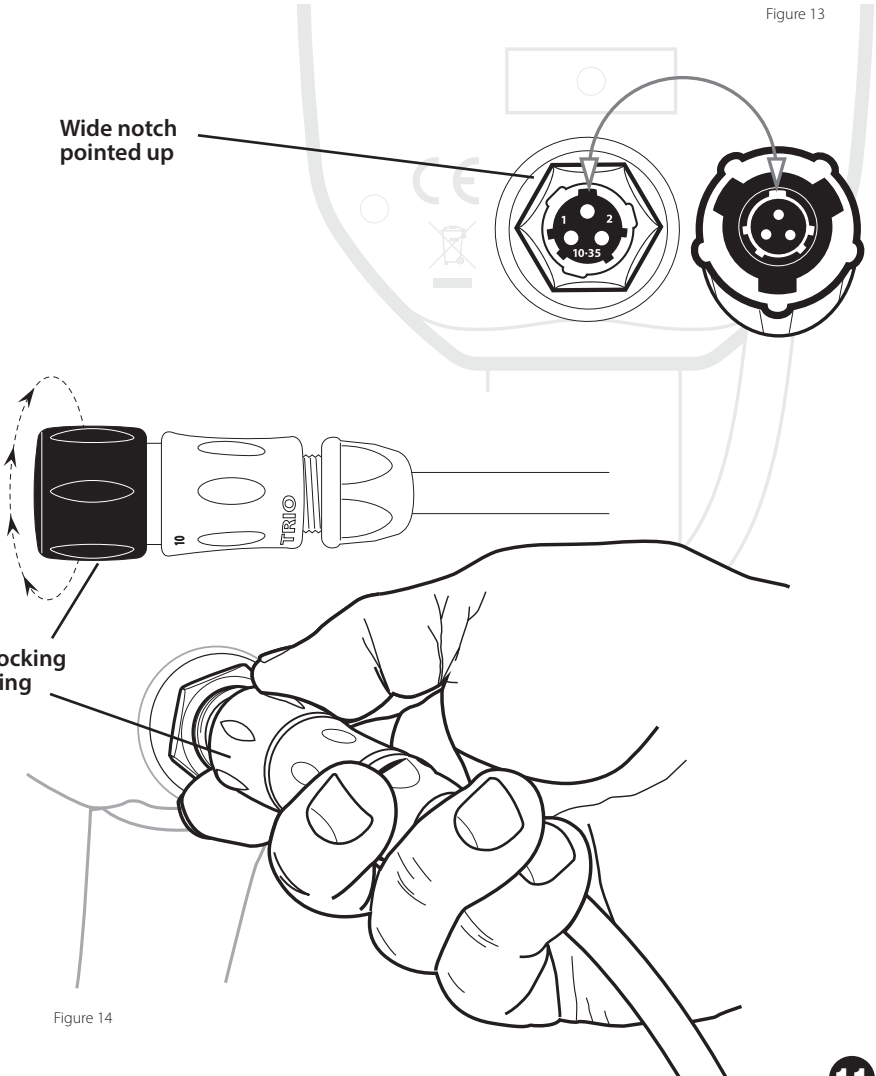


Figure 14

ASSEMBLY (Continued)

Connect Power Cable and Headphones

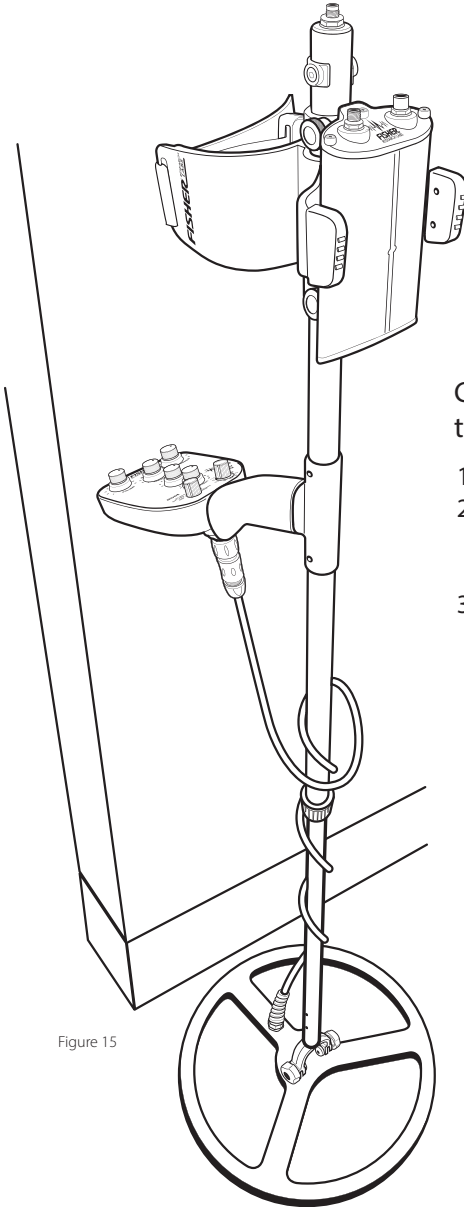


Figure 15

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)

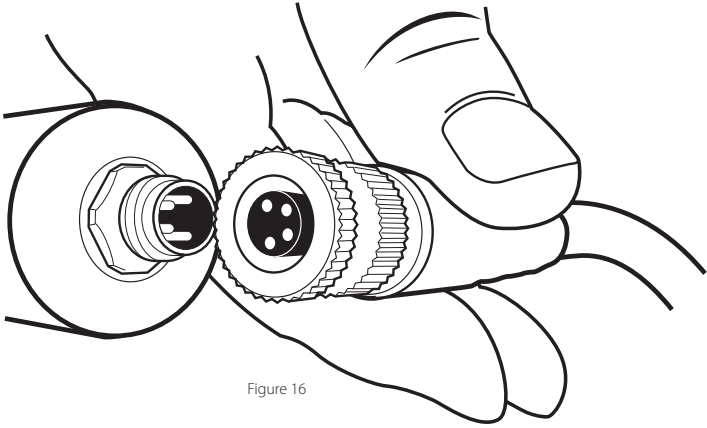


Figure 16

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.

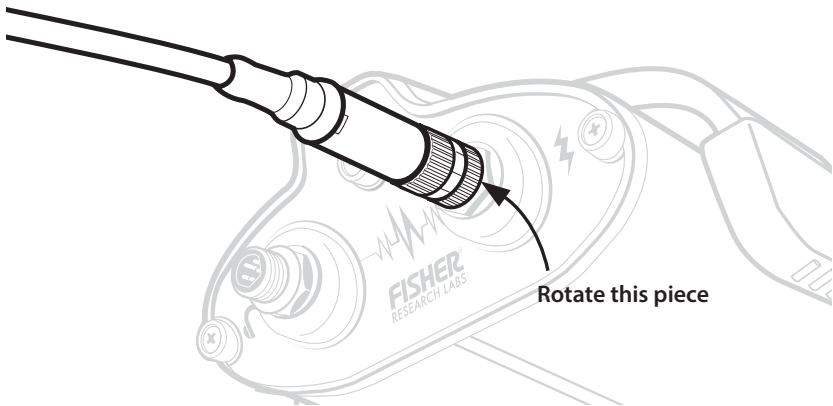


Figure 17

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.

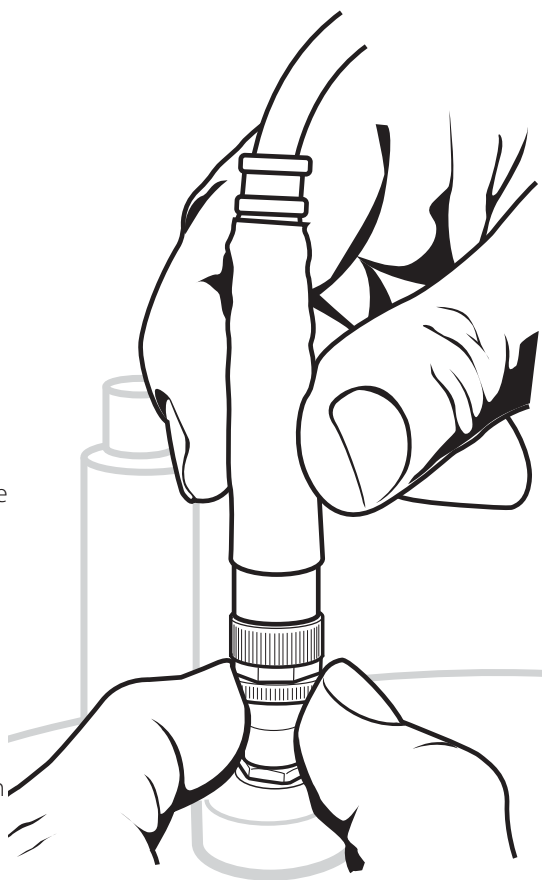


Figure 18

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 EMI noise section below.
6. Happy Hunting.

Underwater Operation

Same as Basic Operation, except:

- **Delay** = 11.5 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.

QUICK START *(Continued)*

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. In **All Metal** mode 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 21.

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**.

In the **Batt/Freq** position the detector operates by default in **Tone** mode, but it is not recommended to use this 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 whatever their nature and conductivity. This produces the deepest detection and has the smoothest audio. Some mineralized rocks (hot rocks) will also be detected as metal targets.

All targets produce a single high tone; however, audio anomalies allow an experienced operator to 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 duration of sound 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 their chances of finding deeper targets.

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

Tone Mode

Tone mode detects all metal targets whatever 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. The exact responses in **Tone** mode can be altered by the **Reject** control to increase or decrease the rejection of iron, and by the **ATS** control to alter the audio anomalies produced by some 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 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 μ s and recommended **ATS** is 8 μ s. 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 allows the detector to perform well in conditions where other detectors fail.

USER CONTROLS (Continued)

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 μs to 11.5 μs . The lowest delay setting produces the greatest 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.

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.

USER CONTROLS (*Continued*)

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 to 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.

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; it slightly improves target responses (depth) but target separation will degrade. A higher setting produces a faster retune; it will slightly reduce target depth but can also reduce ground and EMI noise and potentially improve overall sensitivity.

A lower setting produces a slower retune speed which:

- Improves target depth detection (but requires slower sweep speed)
- 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:

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

USER CONTROLS (Continued)

The **ATS** control affects all modes; a setting of 8 is recommended, especially in salt-surf environments.

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

Reject Control

The **Reject** control determines the amount of iron rejection. It applies to **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 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*)

NOTE: The **Reject** feature of the detector does not function in the same way as the discrimination control on a VLF detector. It provides variable audio masking of iron targets as well as high-conductivity targets. Also, unlike some PI detectors, there is no target hole.

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 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 our setting and decrease 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.

In setting up iron rejection, both the **ATS** and **Reject** controls affect each other and should be adjusted together to achieve the desired rejection responses.

It is highly recommended that iron rejection is set up in the field using test targets.

7 SEARCH TIPS

Search Environments

Dry Beach

On a dry beach, salt is not as much of an issue so the sample delay can be minimized, usually to 7 μ s. 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 begins to be an issue. Depending on salinity, 7 μ s may still work or you may need to increase to 7.5 or 8 μ s. 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 μ s 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 μ s 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 μ s 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 fiber, 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**.

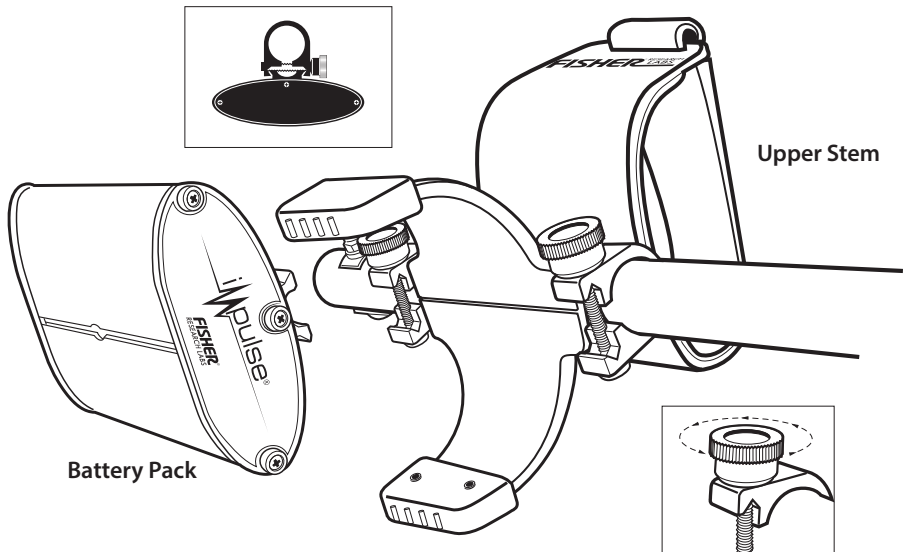


Figure 20

9 TROUBLESHOOTING

PROBLEM	SOURCE	SOLUTION
<p>The Detector emits signals at the end of your sweeps.</p>	<p>Underwater/Wet Sand</p>	<ol style="list-style-type: none"> 1. Reduce swing speed. 2. If the problem persists, change the swinging direction. 3. If the problem persists, increase the pulse delay between 10 μs and 11.5 μs. 4. If the problem persists, decrease the sensitivity. 5. If the problem persists, switch to Volcanic Mode

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 ext. 1004

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 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



Fisher[®] Battery Pack, 12 Cell NIMH

PI-BATPK-NIMH

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

\$199.00

