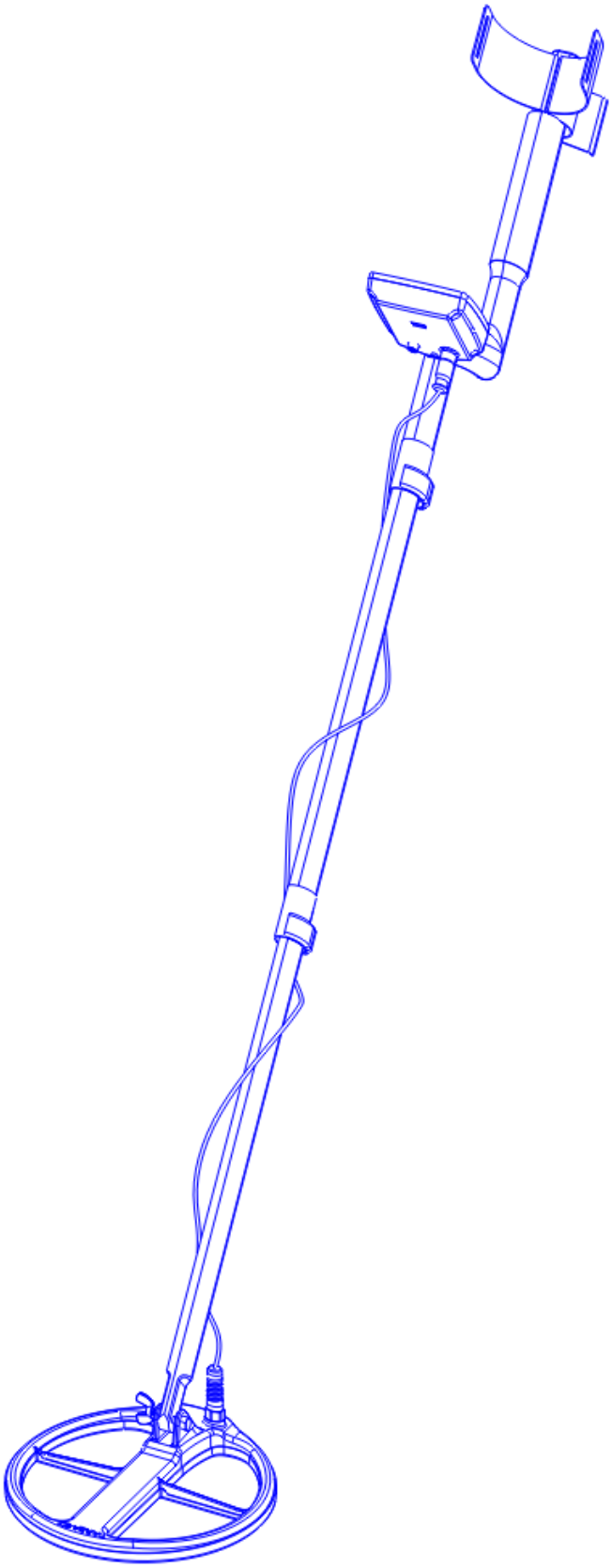
User Manual

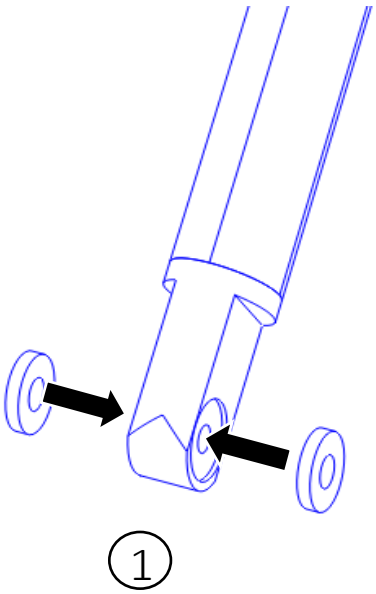
MDT 8000UXO

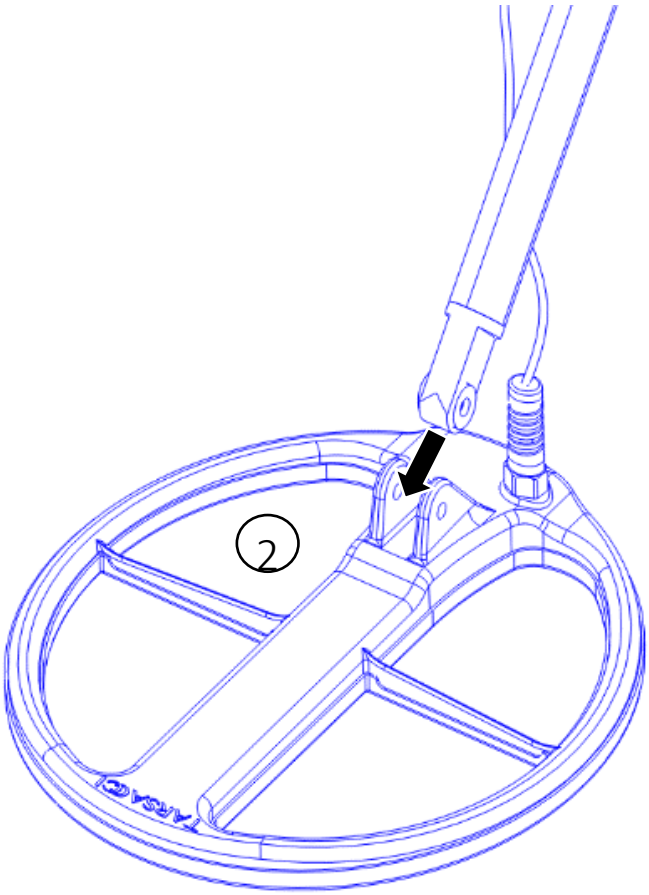
Contents

Assembly



1. Insert the two rubber washers into the holes on either side of the lower shaft.



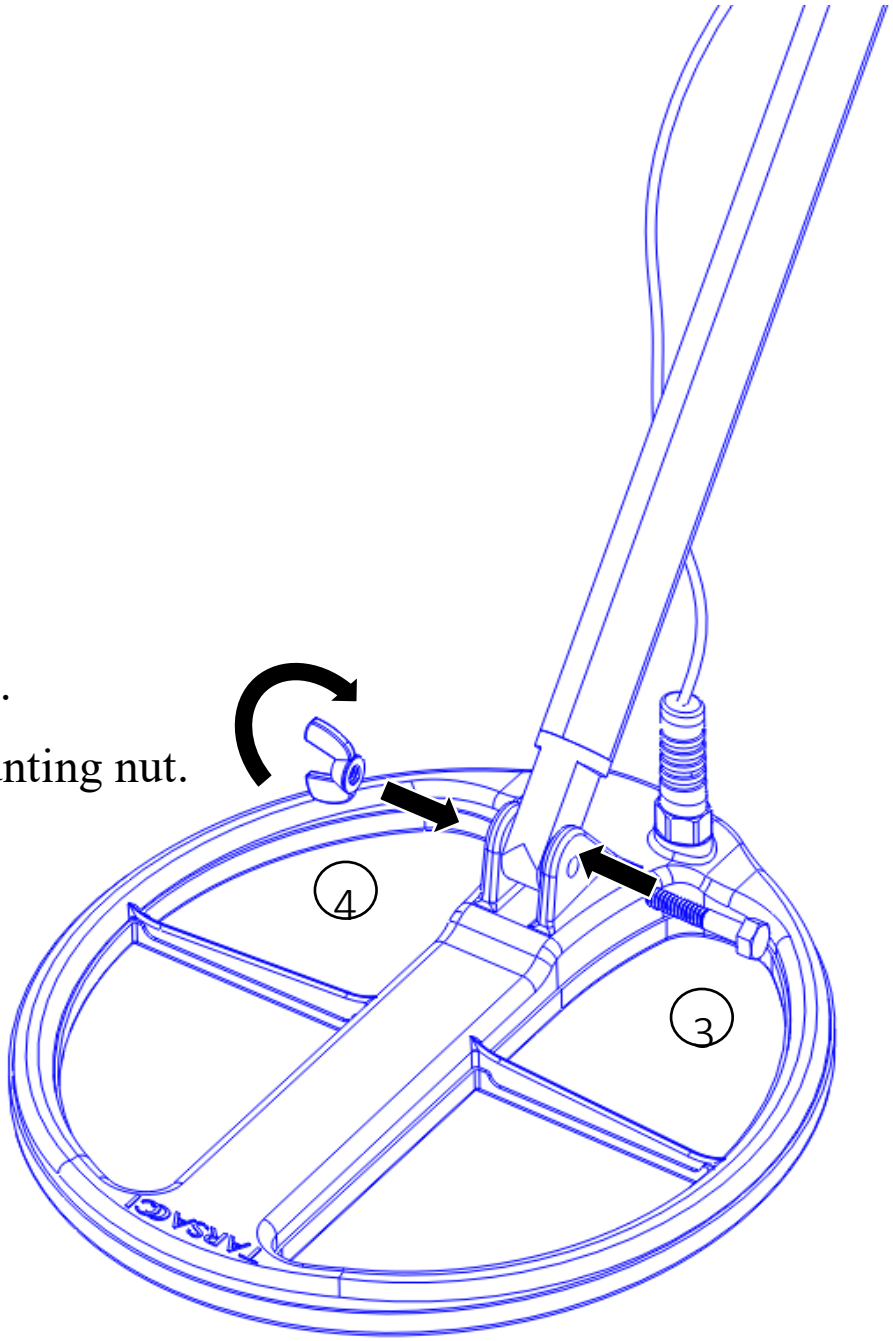


2. Slide the lower shaft into the search coil mounting bracket.

3. Insert the search coil mounting bolt through the search coil mounting bracket.

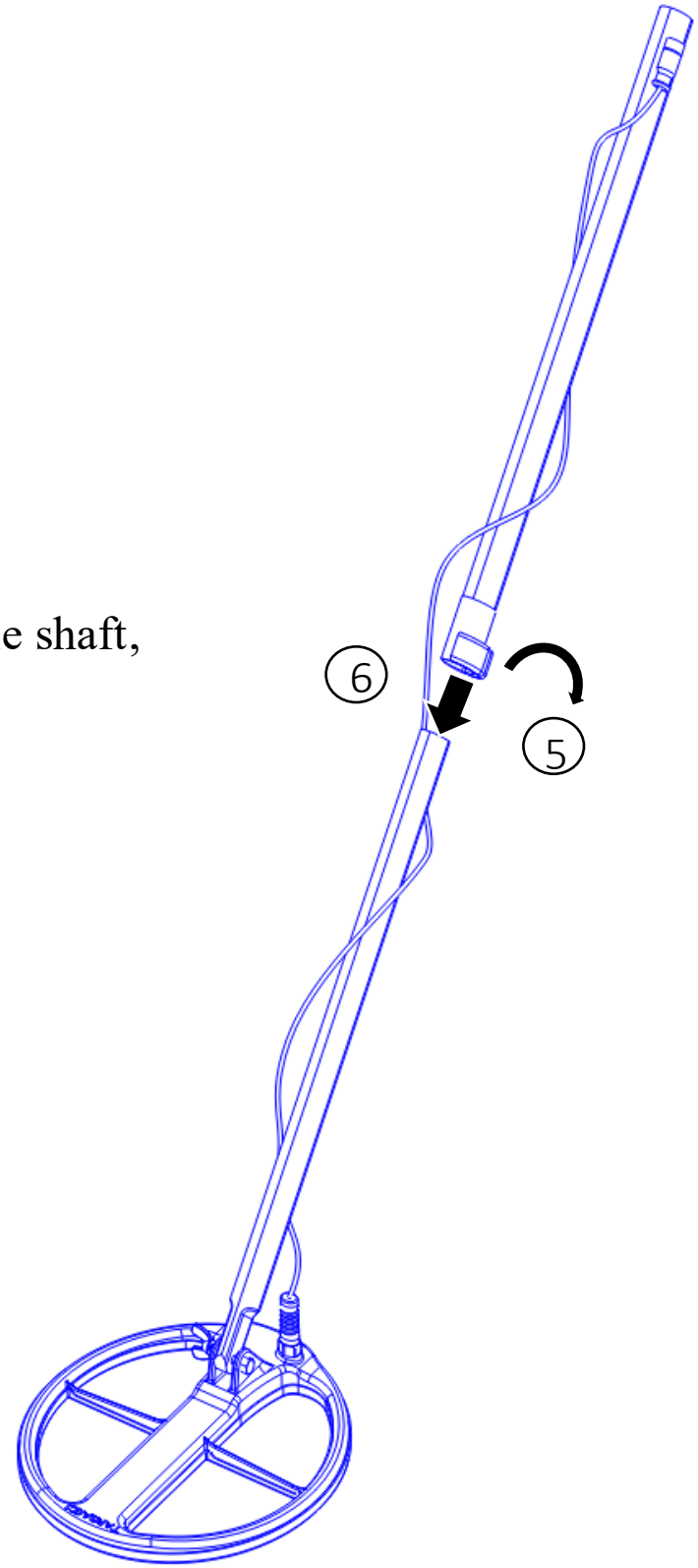
4. Fasten the search coil mounting nut.

(Do not overtighten the nut)



5. Loosen the middle shaft clamp.

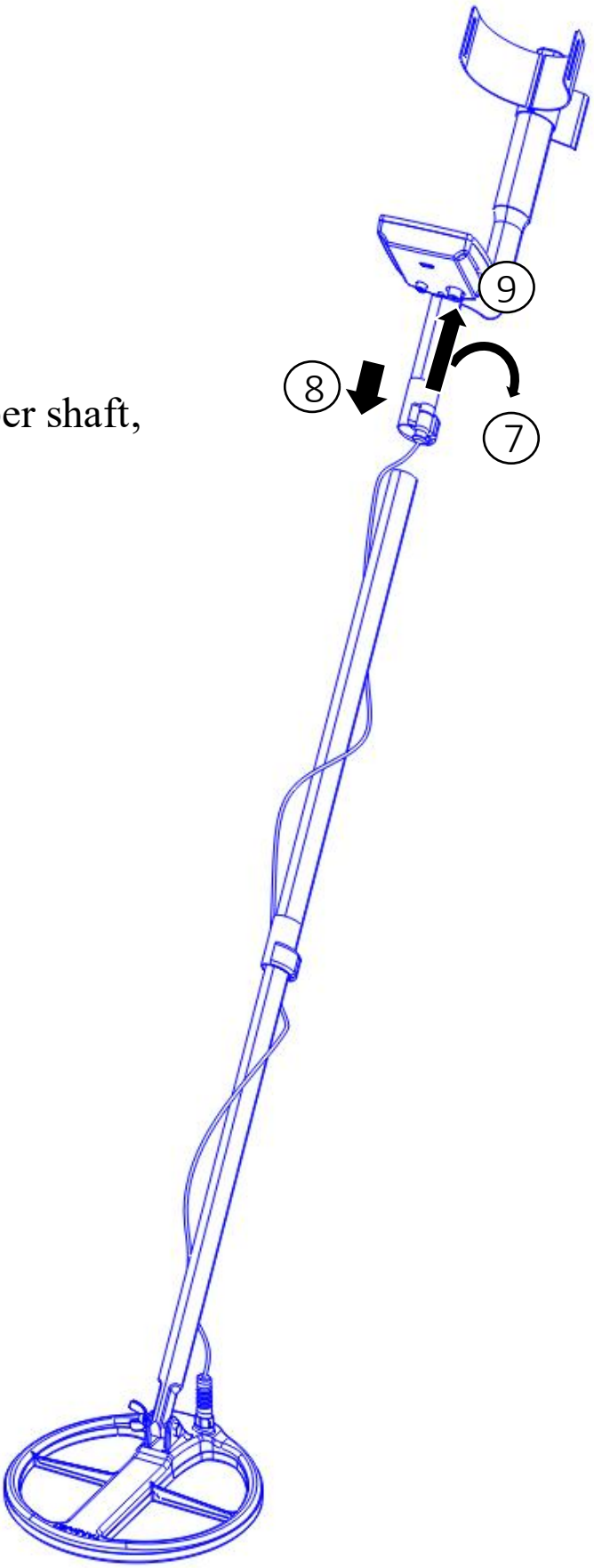
6. Insert the lower shaft into the middle shaft, then lock the clamp.



7. Loosen the upper shaft clamp.

8. Insert the middle shaft into the upper shaft, then lock the clamp.

9. Connect the coil cable connector to the control housing coil connector, and tighten the retaining ring.



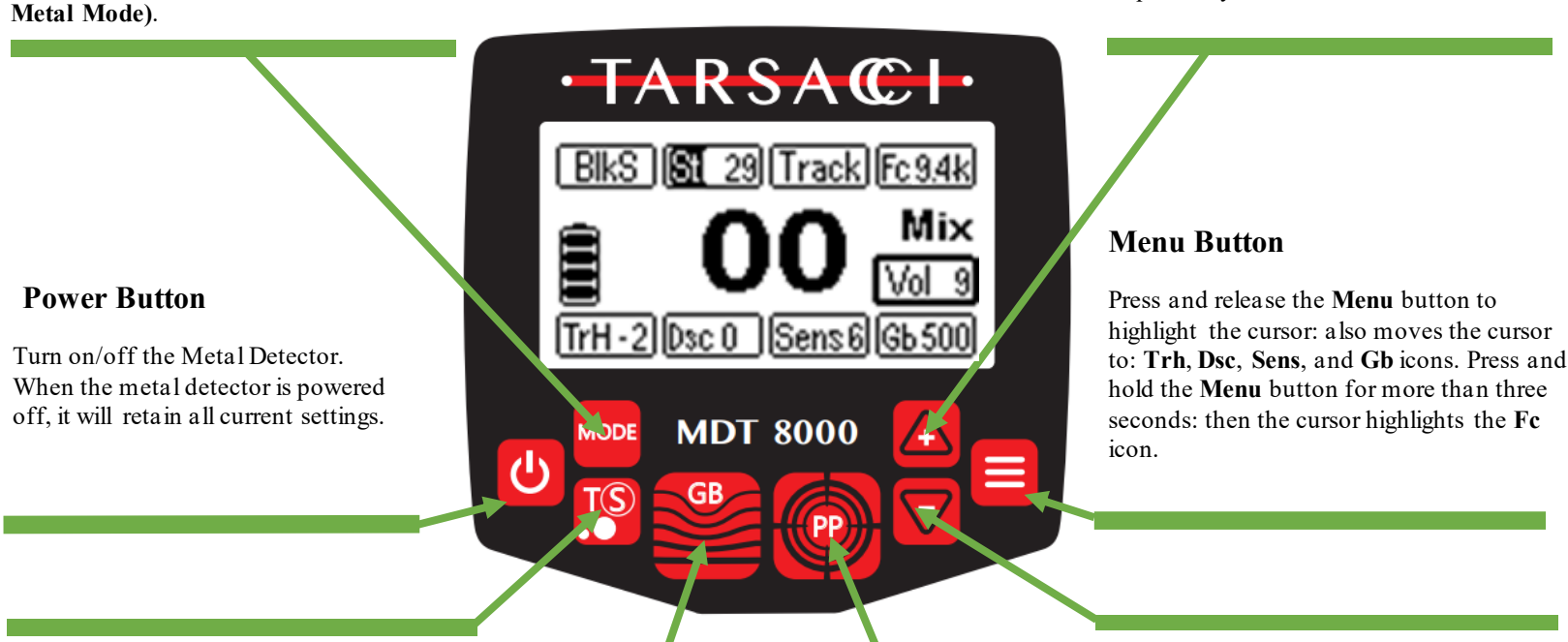
Control Panel

MODE Button

If the cursor highlights the **BlkS** or **St/Salt** icons, the **MODE** button activates or deactivates black sand or salt mode. If none of these icons are highlighted by the cursor, the **MODE** button toggles between: **Mix (Mix Mode)**, **Disc (Discrimination mode)** and **All M (All Metal Mode)**.

Plus Arrow Button

Increment the setting icon highlighted by the cursor. Press and release the button to increment the setting by **"1"**.Press and hold the button will increment the setting sequentially.



Power Button

Turn on/off the Metal Detector. When the metal detector is powered off, it will retain all current settings.

Menu Button

Press and release the **Menu** button to highlight the cursor: also moves the cursor to: **Trh**, **Dsc**, **Sens**, and **Gb** icons. Press and hold the **Menu** button for more than three seconds: then the cursor highlights the **Fc** icon.

TS (Terrain Select) Button

Press and release toggles the cursor between **BlkS** and **St/Salt**. Press and hold the **TS** button for more than 3 seconds to activate or deactivate the **Tracking**.

Minus Arrow Button

Decrement the setting icon highlighted by the cursor. Press and release the button to decrement the setting by **"1"**. Press and hold the button will decrement the setting sequentially.

GB (Ground Balance) Button

Automatic ground balance. Please refer to the **Auto Ground Balance Procedure** section for more details.

PP (Pinpoint) Button

Press and hold the Pinpoint button to activate Pinpoint mode.

Display

BlkS (Black Sand)

Indicates when the Black sand mode is activated or deactivated.

Dark = Activated

Light = Deactivated

St/Salt

Salinity range **0** to **120**.

When deactivated, it will display **Salt**. When activated, it will display **St** and the salinity level.

When the cursor highlights the **St/Salt** icon, the salinity level can be adjusted by using the **Plus Arrow** and **Minus Arrow** buttons.

Track (Tracking)

Displays if the tracking is activated or deactivated.

Dark = Activated

Light = Deactivated

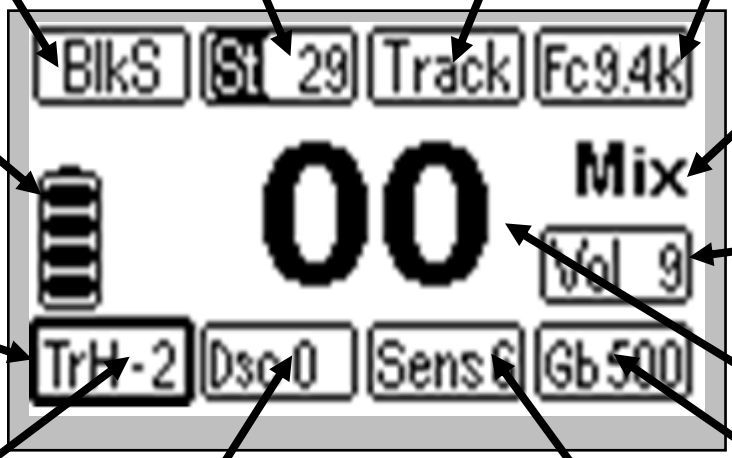
Fc

Frequency select displays the current operating frequency.

There are eight frequencies **9.0K**, **9.1K**,**9.2K**…**9.7k**. The frequency can be adjusted by using the **Plus Arrow** and **Minus Arrow** buttons when the cursor highlights the **Fc** icon.

Battery Icon

Battery gauge
4 bars --- Battery Full
3 bars ---75% capacity
2 bars ---50% capacity
1 bar ---25% capacity



Sound Mode

Displays the current mode: **Mix**, **Disc**, or **All M.**

Volume

Volume range: **1** to **15**. If the Vol cursor is not highlighted, press and release the **PP** button to quickly go to Volume setting

Cursor

Highlights the border of the currently selected icon.

Target ID

Range **-30** to **30** or

Signal Strength when in **PP** mode. Range **0** to **99**

TrH (Threshold)

Range **0** to **-9**.

When the cursor highlights the **TrH** icon, the Threshold can be adjusted by using the **Plus Arrow** and **Minus Arrow** buttons.

Dsc (Discrimination)

Range **-30** to **+30**.

When the cursor highlights the **Dsc** icon, the Discrimination Set Point can be adjusted by using the **Plus Arrow** and **Minus Arrow** buttons.

Sens (Sensitivity)

Range **1** to **9**.

When the cursor highlights the **Sens** icon, the Sensitivity can be adjusted by using the **Plus Arrow** and **Minus Arrow** buttons.

Gb (Ground Balance)

Range **0** to **999**.

When the cursor highlights the **Gb** icon, the Ground Balance can be adjusted by using the **Plus Arrow** and **Minus Arrow** buttons.

Metal Detector Modes and Settings

Activating/Deactivating Black Sand Mode (BlkS)

- To activate **Black Sand Mode**:

1. Press and release the **TS** button until the cursor highlights the **BlkS** icon.

*Fig. 1: **BlkS** icon is highlighted*

- While the cursor highlights the **BlkS** icon, **press and release the Mode button** to **activate** or **deactivate** Black Sand Mode.
    - When activated, the **BlkS icon will turn black**.
    - To deactivate, **press and release the Mode button again**.

*Fig. 2: **Black Sand mode** is activated*

Salt Mode (St/Salt)

- To **Activate** or **Deactivate Salt Mode**:

1. **Press and release** the **TS** button until the cursor highlights the **St/Salt** icon.

*Fig. 3: **St/Salt** icon is highlighted.*

2. While the **St/Salt** icon is highlighted, **press and release the Mode button** to **activate or deactivate** Salt Mode.
    1. When activated, the **St/Salt icon will turn black**.
    2. To deactivate, press and release the **Mode button** again.

Adjusting the Salinity Level

- With the **St/Salt** icon highlighted, use the **Plus (▲)** or **Minus (▼)** arrow buttons to **adjust the salinity level** as needed.

*Fig. 4: **Salt mode** is activated and the salinity level is set to **29***

Tracking Mode (Track)

- To **Activate** or **Deactivate Tracking Mode**:

1. **Press and hold** the **TS button** for **more than 3 seconds**.
   ➤ This will **activate or deactivate Tracking Mode**.

*Fig. 5: **Tracking** is activated*

Frequency Setting (Fc)

- **Press and hold** the **Menu** button for **more than three seconds**.
  ➤ The cursor will automatically highlight the **Fc (Frequency)** icon.

*Fig. 6: **Frequency** select is highlighted and the frequency can be changed*

1. While the cursor highlights the **Fc** icon, adjust the frequency with the **Plus Arrow** or **Minus Arrow** buttons to change the frequency.
   (Eight Frequencies are available: **9.0 KHz**, **9.1 KHz**, **9.2 KHz**…. **9.7 KHz)**

Threshold Adjustment (TrH)

1. **Press and release** the **Menu** button repeatedly until the cursor highlights the **TrH** (Threshold) icon.

Fig. 7: ***Threshold*** *is highlighted and can now be adjusted.*

While the **TrH icon is highlighted**, use the **Plus (▲)** or **Minus (▼)** arrow buttons to **adjust the Threshold level**.

Discrimination Adjustment (Dsc)

1. **Press and release** the **Menu** button repeatedly until the cursor highlights the **Dsc** (Discrimination) icon.

Fig. 8: ***Discrimination Set Point*** *is highlighted and can be adjusted*

2. While the **Dsc icon is highlighted**, use the **Plus (▲)** or **Minus (▼)** arrow buttons to **adjust the Discrimination Set Point**.

Refer to the **Discrimination Breakdown Visuals** section for a visual representation of how tones respond based on your discrimination setting.

Sensitivity Adjustment (Sens)

1. **Press and release** the **Menu** button repeatedly until the cursor highlights the **Sens** (Sensitivity) icon.

*Fig. 9: **Sensitivity** is highlighted and can be adjusted*

2. While the **Sens** icon is highlighted, use the **Plus (▲)** or **Minus (▼)** arrow buttons to **adjust the Sensitivity level** as needed

Ground Balance Adjustment (Gb)

1. Press and release the **Menu** button repeatedly until the cursor highlights the **Gb (Ground Balance)** icon.

*Fig. 10: **Ground balance** is highlighted and can be adjusted accordingly.*

2. While the cursor highlights the **Gb** icon, adjust the ground balance using the **Plus (▲)** or **Minus (▼)** arrow buttons.

Volume Adjustment (Vol)

1. If any setting is highlighted and the detector is **idle for more than 8 seconds**, the cursor will automatically move to highlight the **Volume (Vol)** icon.
   - For a **quick volume adjustment**, simply **press and release the PP (Pinpoint) button**.
2. While the **Volume icon is highlighted**, adjust the volume using the **Plus (▲)** or **Minus (▼)** arrow buttons.

*Fig. 13: **Volume** is highlighted and can be adjusted*

Sound Modes

1. To toggle between the three available sound modes, press and release the **Mode** button.

Note: If the cursor is highlighting the **St/Salt or BlkS** icons, the sound modes cannot be toggled.

*Fig. 14: **All Metal Mode** is active*

*Fig. 15: **Disc Mode** is active*

*Fig. 16: **Mix Mode** is active*

Pinpoint Procedure:

The **MDT 8000UXO metal detector** uses a **DD (Double-D) search coil configuration**. The most sensitive area of the coil is along its **longitudinal centerline**. The detector will produce the **loudest audio response** and the **highest signal strength** when a target is located **directly beneath this centerline**.

The MDT 8000UXO features a **high-resolution numerical signal strength indicator**, ranging from **0 to 99**, along with **amplitude and frequency modulated audio** that corresponds to the target's signal strength.

Pinpoint Procedure

1. **Position the Coil**
   Lower the search coil to approximately **1 inch above the ground**, **10 to 12 inches** to the side of the estimated target location.
2. **Activate Pinpoint Mode**
   Press and **hold the PP (Pinpoint) button**.
3. **Sweep Across the Target**
   While keeping the coil **parallel to the ground**, slowly sweep it across the target area.
4. **Identify the Target Location**
   Listen for the **loudest sound** and **highest pitch**, and observe the **peak signal strength value** (approaching 99).
   ➤ The target is centered when it is directly **beneath the coil's centerline**.

Target ID and Sound Modes

- The **Numerical Target ID Display** represents the target's **conductivity** and is **always visible** during operation.
  - **Non-ferrous targets** have **positive** Target ID numbers.
  - **Ferrous targets** have **negative** Target ID numbers.
  - The Target ID ranges from **-30 to +30** and depends on the target's **shape, thickness, and conductivity**.
  - A **lower Target ID** indicates **lower conductivity**, while a **higher Target ID** indicates **higher conductivity**.

Sound Modes

- The MDT 8000UXO offers **three sound profiles** with a total of **four distinct tones**. The graph in the section **Discrimination Breakdown Visuals** illustrates when each tone is heard based on the selected sound profile.

The Four Tones:

1. **Low Tone**
   - Represents **ferrous targets**.
   - Heard **only in Discrimination and Mix modes**.
2. **Low-High Tone**
   - Represents **all targets**.
   - Heard **only in All Metal and Mix modes**.
3. **High-Low Tone**
   - Represents **low conductivity non-ferrous targets**.
   - Heard **only in Discrimination and Mix modes**.
4. **High Tone**
   - Represents **high conductivity non-ferrous targets**.
   - Heard **only in Discrimination and Mix modes**.

Sound Profiles

1. **All M (All Metal Mode)**
   - Only the **Low-High tone** is heard when a target is detected.
   - Numerical Target ID is **always displayed**.

2. **Disc (Discrimination Mode)**

    - Allows up to **three different tones** based on Target ID.
    - Sound may be **silenced** for certain Target IDs depending on discrimination settings.

3. **Discrimination Set Point Effects:**

    - If set between **-30 and 0**, any target with a Target ID **lower than the set point** will be silenced.
    - If set between **0 and +30**, any target with a Target ID **below 0** will be silenced, and targets within **±2 of the set point** will also be silenced.
    - Numerical Target ID is **always displayed**.

4. **Mix Mode**

    - Combines **All Metal Mode** and **Discrimination Mode** sounds in sequence.
    - The first tone corresponds to All Metal Mode (Low-High tone).
    - The second tone corresponds to Discrimination Mode and may be silenced based on settings and Target ID.

Pinpoint Sound

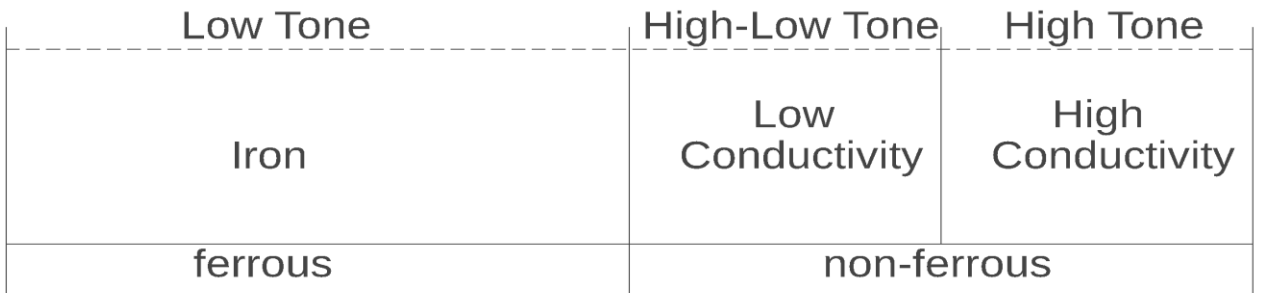
- The pinpoint audio's **volume** and **frequency** are modulated according to the **target signal strength** (VCO style):

- The **stronger the signal**, the **higher the pitch** and **louder** the audio response.

Discrimination Breakdown Visuals

The following figures give a visual breakdown of Discrimination sounds related to the **Target ID** numbers.

- ***-30*** *to* ***0*** *= Low Tone, ferrous Target*
- ***1*** *to* ***+15*** *= High-Low Tone, Low Conductivity, non-ferrous Target*
- ***+15*** *to* ***+30*** *= High Tone, High Conductivity, non-ferrous target*



-3*Fig. 15: Displays the tone and conductivity of the metal based on the Target ID being displayed (The Disc is set to -30).*

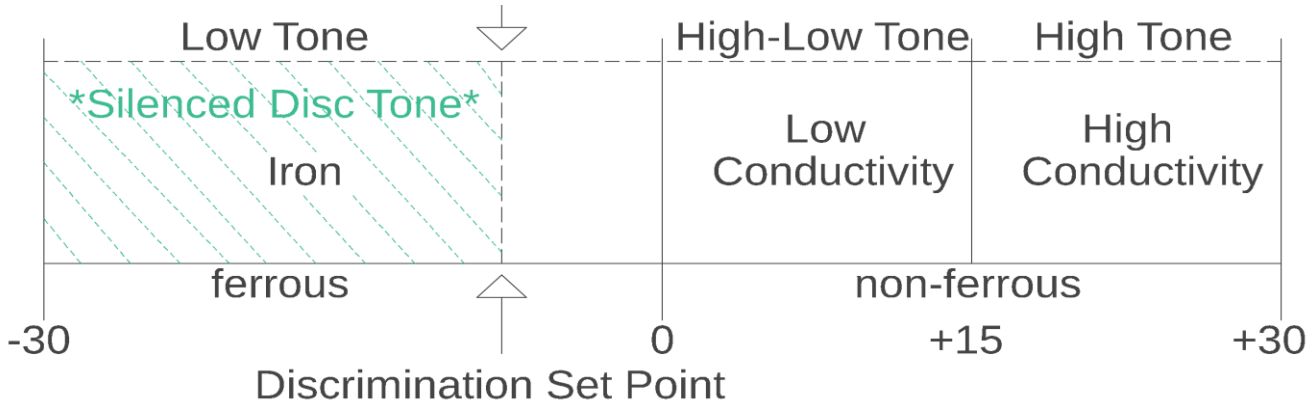


Fig. 16: When the Discrimination Set Point is set at a value less than 0, any Target ID lower than the set value will be silenced. The dashed lines indicate the silenced region.

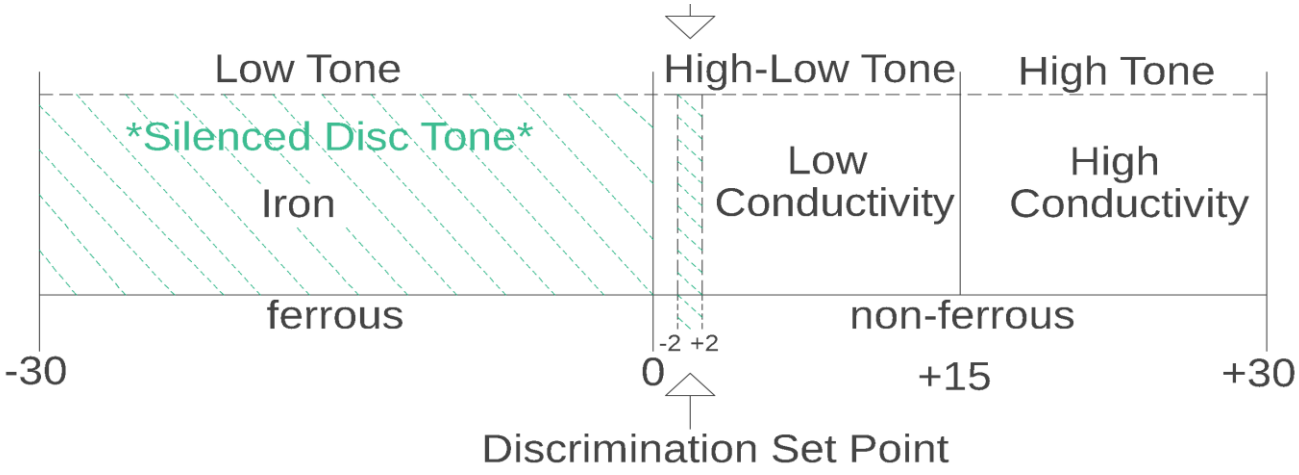


Fig. 17: When the Discrimination Set Point is set at a value greater than 0, any Target ID lower than 0 will be silenced; any Target ID within +- 2 of the Discrimination Set Point will be silenced. The dashed lines indicate the silenced regions (i.e. Notching option).

Manual Ground Balance Procedure

Important:
Ground balancing must be performed on soil that is **free of any metal**. If metal is present during ground balance, the process will be incorrect and may result in **false or erratic signals** during operation.

Steps:

1. **Activate the Manual Ground Balance** function.
2. **Pump the Search Coil**:
   Move the coil **up and down**—starting from approximately **1 inch above the ground** up to **4–5 inches**—while keeping it **parallel to the ground surface**.
3. **Adjust Ground Balance Setting**:
   - Increase or decrease the **ground balance level** until the detector becomes **silent** (no response when pumping).
   - Ensure the **GB (Ground Balance) icon** is highlighted to enable adjustment.

Troubleshooting Tip:

If the metal detector **cannot be balanced**, reduce the **Sensitivity** level and attempt the process again.

Auto Ground Balance Procedure

Important:
Ground balance must be performed on soil that is **free of metal objects**. If metal is present, the ground balance will be incorrect and may result in **undesirable false signals** during use.

Procedure:

1. **Lower the search coil** to approximately **1 inch above the ground**, keeping the coil **parallel to the ground surface**.
2. **Press and hold** the **Ground Balance** button.
   While holding the button, **raise the coil** to approximately **4–5 inches above the ground**, maintaining the coil parallel to the ground.
   Then, **release the Ground Balance button**.
3. **Verify the ground balance**:
   Bob the coil **up and down** several times between **1" and 5" above the ground**. Listen for any false signals.

If the Metal Detector Remains Noisy:

- **Reason 1:** Ground balance was performed incorrectly.
  ➤ Repeat the procedure starting from **Step 1**.
- **Reason 2:** Ground mineralization is too high.
  ➤ **Reduce the sensitivity** by **1 or 2 increments**, then test again.

Salinity Balance Procedure

Salt Balance Procedure (Similar to Manual Ground Balance)

1. **Ground Balance** the metal detector on the **dry sand** of the beach with **Salt Mode activated**.
   - *(If the beach is not mineralized—such as on white sand beaches—ground balancing is not necessary. In this case, manually set the ground balance to 500.)*
2. **Activate Salt Mode Adjustment**:
   - Highlight the **St/Salt** icon (see Fig. 4) using the control cursor.
3. **Set Initial Salinity Level**:
   - If the salinity is unknown, set the **Salinity Level** to **27** as a starting point.
4. **Choose a Save Location**:
   - Move to a location in the water approximately **18 inches deep**.
   - **WARNING**: Be cautious of tides, currents, sinkholes, and other hazards. **Your safety should always come first.**
5. **Pump the Coil to Tune Salinity**:
   - While keeping the search coil **parallel to the water**, pump it from about **8 inches above** the water surface down to **1 inch above** the surface.
   - As you pump, **adjust the salinity level up or down** to find the setting where **minimal or zero audio response** is produced.
   - **Note**: The salinity level can only be adjusted if the **St/Salt icon is highlighted**.

Threshold

The **Threshold (TrH)** setting ranges from **-9 to 0**.

- A **Threshold of 0** does **not affect the target signal**.
- When using a **negative threshold**, the value is **subtracted from the target signal**, effectively reducing the detector's audio response to faint or marginal signals.

To **enhance your ability to hear faint targets**, it is recommended to set the **Threshold to -1 or 0**.

If the detector becomes **too noisy** and **quieter operation is preferred**, a **more negative threshold** (e.g., -2 to -9) can be used to **reduce chatter** and provide a more stable audio response.

Suggested Settings for Stable Metal Detector Work

Suggested Initial Settings for mineralized (black sand) wet salt water beach

- Set the **Threshold** to **-2**.
- Set the **Sensitivity** to **5**.
- Black Sand (**BlkS**) ON.
- Salt Mode (**St**) ON.
- Choose the desired **Frequency**.
- Set the **Salinity** level, if unknown, to **27**.
- **Ground Balance** the Detector(on dry sand)
- **Salinity Balance** the Detector

Suggested Initial Settings for a wet saltwater beach

- Set the **Threshold** to **-2**.
- Set the **Sensitivity** to **7**.
- Black Sand (**BlkS**) OFF.
- Salt Mode (**St**) ON.
- Choose the desired **Frequency**.
- Set the **Salinity** level, if unknown, to **27**.
- **Ground Balance** the Detector or preset the **Gb** to **500**.
- **Salinity Balance** the Detector

Advanced Performance Notes

The MDT 8000UXO was developed with mineralized soil in mind. Because there is a wide variance in mineral content around the world, performance may, in many cases, be enhanced by enabling **Black Sand** and/or **Salt Mode**—even if the local soil does not contain black sand or salt. Finding a few deep targets, then experimenting with the Black Sand and Salt modes on these deeper targets, can be a real eye-opener.

Example: Natural graphite (a type of "hot rock") is present in mineralized magnetic soil.
For this example, locate a piece of native graphite. Use the **Salinity Balance** function to balance the detector to the graphite, then perform a ground balance. With the proper salinity balance setting, the MDT 8000 will no longer detect the graphite. In the presence of graphite, real targets will now become unmasked—with greatly improved **Target ID** accuracy and greater depth.

Depending on local conditions, the MDT 8000UXO can utilize the conductivity of wet salt to enhance overall depth performance. In some cases, **buried wet salt** may yield better results than **air test** performance. However, it's also common for the conductive wet salt to increase depth performance too much, resulting in instability. In such cases, lowering the **Sensitivity** a few points becomes necessary to restore stable operation.

Important: The intended purpose of balancing the MDT 8000UXO to salt is to create a condition where the unit no longer detects the wet salt. This contrasts with conventional detectors, which must phase-shift out or compensate for salt. If the MDT 8000UXO detects and uses too much of the wet salt's conductive properties, the detector may become unstable. To resolve this, use the **Salt Balance** function to nullify the salt signal. Use this function wisely and to your advantage.

If the volume of salt becomes highly conductive (e.g., when the detector is submerged in salt water), it may also be necessary to reduce the **Sensitivity** to bring excessive (unstable) depth performance back down to a stable maximum.

Specifications

Technical Specifications

Technology: Mixed Domain (US Patent No. 10,969,512 / EU Patent No. 3,794,362)
Operating Frequency: 9.0 kHz / 9.1 kHz / 9.2 kHz / 9.3 kHz / 9.4 kHz / 9.5 kHz / 9.6 kHz / 9.7 kHz
Ground Balance: Manual / Fast Auto
Tracking: Yes
Black Sand Mode: Yes
Salt Mode: Yes
Salinity Balance: Manual
Salinity Level: 0 to 120
Target Identification (TID): Ferrous –30 to 0 / Non-ferrous 1 to 30
Sensitivity: 1 to 9
Threshold Level: –9 to 0
Target Volume: 1 to 15
Target Tones: 4
Tone Break: Ferrous and Non-ferrous with adjustable notch filter
Audio Modes: All Metal / Discrimination / Mix
Audio Output: Speaker / Headphones
Display: 128×64 Graphic LCD
LCD Backlight: Yes
Battery: 26650 Rechargeable Li-ion (3.7V @ 5000mAh)
Battery Life: Up to 24 hours
Operating Temperature: –10 °C to +50 °C (14 °F to +122 °F)
Search Coil: Tarsacci MDT 12″ DD
Shaft: Telescopic 3K carbon fiber with molded 3K carbon fiber “S” rod and armrest
Length: 965 mm to 1345 mm
Weight: 1470 g including battery (with MDT 12″ DD coil)
Waterproof: IP67 (up to 1 m for 30 minutes in still water)
Headphones (Included): Wired 3.5mm (non-waterproof)
Limited Warranty: 18 months

Designed and manufactured in the USA