

# **USER MANUAL**





# **CAUTION!**

#### READ CAREFULLY BEFORE USING THE DEVICE!

Metals with an alloy structure (such as lead, galvanized, etc.) which have remained under ground for a long time may deteriorate and on occasion produce a gold effect.

Positions of different metals under the ground affect the sensing of the device and cause it to misinterpret those objects as gold or precious.

- 1- This is a highly sophisticated electronic device. Do not attempt to assemble and operate the device before reading the Instructions Manual.
- 2 Do not start searching before determining the ground balance. Devices with poor ground balance will not produce accurate results.
- **3** Magnetic fields may interfere with this device. If you run in to this type of interference simply reduce your sensitivity and then continue detecting.
- 4- Protect the coil from possible impacts.
- 5 Do not expose coil to direct heat sources. Do not apply excessive force during assembly and use.
- 6 Align the battery and carefully place it in its slot in the proper direction. Do not force the battery in to the holder.
- 7 To obtain maximum performance, do not expose battery to excessive heat. Charge the battery at room temperature.
- 8- Do not apply force on the LCD display.
- **9-** To prolong battery life, discharge it monthly by attaching it to the charging device. Always keep the battery in a charged state when storing the device.

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#### Thank You for Choosing Makro Detector.



#### Mode 1 - T44 Coil 36 x 44 cm (14.1 x 17.3 inches)

This is the coil used in searches for General Purpose. User monitors the results through the LCD display located on system box. This coil can only be used in Mode 1.



#### Mode 2 - C32 Coil & Coil Cover 26 x 32 cm (10.2 x 16.2 inches)

This coil is more effective in detecting single coins and smaller objects. All results of this system are monitored through an audio alert. This coil can only be used in Mode 2.



#### Mode 1 - T100 Coil & Coil Cover (Optional) 60 x 100 cm (23.6 x39.3 inches)

This is a coil developed for deep searches and handled by two persons. A separate control box and a carry bag are available for this coil. This system operates only in Mode 1. When sensitivity is adjusted to 6 and lower levels, it will be possible to make comfortable searches without any interference from mineral structures and small metals without any need for ground adjustment.



#### Mode 2 - C47 Coil (Optional) 39 x 47 cm (15.3 x 18.5 inches)

This is the largest and deepest coil designed for use in Mode 2. All results of mode 2 are monitored through an audio alert only. This coil can only be used in Mode 2.

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#### **Electronic System Unit**

This is the main control box. On this device you will find the coil connection, headphone jack, handset feed inlet and battery connection. Target results are evaluated and presented to user on the large color LCD Display.

In addition, the control box is equipped with an equipment for easy handling.



# SYSTEM (CONTROL) UNIT

- 1- ON/OFF BUTTON: This Control is used for turning the device On and Off. It will also determine which mode the device will operate in.
- 2- MENU: This is the Control for switching to the Settings Menu in Mode 1.
- **3- GROUND:** This is the Control for switching to Ground Balance Menu in Mode 1.
- **4- RECORD:** This is the Control for entering the record screen. This is accessed from the menu and used for recording the target Analysis report in Mode 1.
- **5- DEPTH:** This is the Control to switch to the Depth section in Mode 1. This is used for depth analysis.

- **6- SENSITIVITY:** This is the Control used for adjusting the sensitivity in Mode 2.
- **7-FERROUS DISCRIMINATION:** This is the Control for discriminating ferrous metals with different sound alerts in Mode 2.
- 8- FERROUS and MINERAL SETTING: This is the Control for elimination of ferrous metals and enabling search for highly mineralized grounds in Mode 2.
- **9- GROUND SETTING:** This is the adjustment for entering the ground balance in Mode 2.
- **10- SCREEN:** This is the visual display where data is presented to the user in Mode 1.



- 2- SCAN: This is the Control for enabling the analysis of the target. This should be pressed while sweeping the coil over the target to be scanned.
- 3- "–": Dash Button.
- 4- "+" : Plus Button.
- **5- OK:** This is the Control for confirming the current function and switching to the upper menu.

Note: Reset key is a significant key, frequently needed to be used during searches. This key enables clearing of erroneous signals and data and helps obtaining correct ones. Frequent use of Reset key would eliminate erroneous incoming signals.

# **CHARGING BATTERY**

Remove the battery from system box and connect it to the battery charging device. The light on charger will be red during charging and turn to green when charging is completed. The light will be green if no battery is inserted in to the charger or if the battery is fully charged.



Charging Charging completed

#### The charging time for a completely empty battery is approximately 7 hours.

WARNING: When storing the device, remove the batteries from the detector and the charger. For the best results, batteries should always be kept in a in a fully charged state. Batteries should not be stored in excessively cold places such as refrigerators or freezers. The battery should be stored in a dry place and at room temperature. Batteries should be charged on a fire resistant surface. The device should only be charged with the approved charger. Overcharging or charging at the wrong voltage will subject the battery to the risk of fire. The risk of charging at over currents and at extremely high temperatures should not be overlooked.

#### ASSEMBLY



- 1- Insert seals into the slots at the end of extension tube.
- 2- Connect extension tube to the connection point on the coil.
- 3- Insert the screw through the hole on the coil and tighten at the opposite end with a nut.



#### ASSEMBLY

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1- Pass the coil cable through telescopic tube.
2- Pull the cable out from the other end of the tube.
3 Compact the handrat connection cable with 8 pine to the connection point at

3- Connect the handset connection cable with 8 pins to the connection point at the rear of the armrest.



- 1- Connect the 9-pin terminal of the coil to the COIL connector and the 8-pin terminal of handset to HAND-SET connection on the system box and tighten it.
- 2- Connect the deep coil control box to the HANDSET connection on the deep coil.



If you wish to use headphones, connect the headphone cable to the headphone connection on the system box.



- 1- After inserting the battery, connect battery connection cable to the socket on the battery.
- 2- Close the cover by turning it in the direction of the arrow.

#### USAGE



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# USAGE



# USAGE with MODE 1 (VISUAL SYSTEM)



The device has two separate systems. These systems are called Mode 1 and Mode 2. Turn On/Off button to "Mode 1" position to operate the device with the screen system. Mode 1 is the operating mode in which the data obtained is presented to user with views and sounds. This mode is used for detection of larger targets at significant depth.

Mode 1 function of the device can be used only with either the 36x44 cm coil or the 60x100 cm coil attached.

Manual reset is available in this part, so there's no need to sweep the coil continuously. You can continue to receive signals from the target by holding the coil still over it.



User can make language selection by using "+" and "-" keys and pressing "OK" button after turning on the device.



The Device automatically identifies the coil which is attached to it at the time when it is turned On. The coil attached will be shown on the screen. If a coil other than the appropriate one(s) is attached to the device, this will be indicated on the screen as "COIL FAILURE" warning. In addition, data regarding the battery status is also shown on the same screen.

In case of any existing failures in the coil or the system, "COIL FAILURE" and "SYSTEM FAILURE" lights will flash at the bottom of the display and warn the operator. If the warning continues, the user should contact the authorized service center.

COIL FAILURE

SYSTEM FAILURE

# USAGE with MODE 1 (VISUAL SYSTEM)

#### **Checking Battery Charge Status**

RECORD

GROUN

The device will proceed to the "Ground Balance" section after identifying the attached coil. At the bottom of this section, there is a part indicating the battery status. The battery should be recharged as required.

#### **Entering Settings Menu**

Press the "MENU" button, no matter what section you are in, for adjusting device features such as sound, light, sensitivity and non-precious elimination. Current settings will be displayed under the respective section on the screen. Return to the previous menu by pressing "MENU" button after you make the adjustment of the desired selection.

VOLUME LIGHT SENSITIVITY FERROUS

VOLUME LIGHT SENSITIVITY FERROUS

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VOLUME LIGHT SENSITIVITY FERROUS

VOLUME LIGHT SENSITIVITY FERROUS

By pressing "+" and "-" keys, you will come to the desired area in the "SOUND", "LIGHT", "SENSITIVITY" or "FERROUS" sections, as shown above. After reaching the desired selection, press the "OK" button. The indicator bar will turn from yellow to green. Perform the desired adjustments by using the "+" and "-" keys and then press the "OK" button. The Green indicator will again turn to yellow. Now, your adjustments are saved. Repeat the same steps above to adjust other settings as desired.

CAUTION



**Use of RESET Button:** Some interferences arising from imbalanced motion of the coil and from the environment may occur while using the device. Such interference is shown on the device display and can cause the device to produce an audio signal. Reset the device by pressing the "RESET" button located under the handset. The Impact of this interference is eliminated through resetting the device

in this fashion. You should not reset the device while coil is over the target! This will cause loss of depth, the wrong interpretation of the incoming signal and will prevent the device from detecting the target. Resetting is done only after the coil is moved away from the target.

#### WHAT IS GROUND BALANCE

Land conditions and soil structures may vary between regions (such as sandy soil, highly mineralized red soil, rocks etc.). In some places, the soil structure even within the same region may often differ.

Such variances in soil structures mislead the detector and cause the device to sense this change as a metal object or cavity. For this reason, you should first introduce the soil structure data of the region to be searched to the device. This definition will block all potential misleading effects from the ground within that region; which would otherwise be sensed as misleading signals from the soil. These will be eliminated through proper setting of the ground control.

A proper ground balance is one of the most important prerequisites for a productive search. Therefore, it is important that the user pay close attention to variances within the soil. If you notice misleading signals are being detected by the device from changes in the soil structure, you will need to adjust the ground balance again.

Ground balance is done to enable the device to "sample" the soil structure so that it can balance out the mineral effect. By adjusting this setting in this fashion, the device will not be affected by different soil structures being reflected as metal or cavities. If the ground balance is not done properly, this will cause loss of depth and false signals from minerals being interpreted as metals or cavities. Therefore, the ground balance must be performed as accurately as possible.

With highly mineralized land conditions in mind, the device uses a special ground balance system to ensure that it can work efficiently in such challenging conditions.

# **MODE 1: ADJUSTING GROUND BALANCE**



After the device is turned On, the "GROUND BALANCE" section will appear automatically. You should first check your SENSITIVITY adjustment to be able to obtain accurate results. The Sensitivity level recommended for new users is 8. When you reach soil structures with varying ground effects during your search and when you need to renew your ground balance, switch to the Ground section by pressing the "GROUND" button. You should periodically check and readjust your ground balance as necessary.



#### For adjusting Ground Balance;

Turn the On/Off button to the Mode 1 position. When the device is On, the Ground Balance screen will appear automatically.



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When you enter the Ground Balance menu the current setting stage is displayed on the screen as "Ground Balance".

This value will be between -201 and +201.

If you run in to a location where you are not able to adjust the Ground Balance this is caused by one of two situations. 1. You have located a target OR 2. There exists a mineral structure in the ground that is not suitable for your sensitivity level. In this case, you should change your position elsewhere from the point which does not allow such adjustment and retry readjusting the Ground Balance; if still unsuccessful, the sensitivity level should be reduced by 1 increment.



First, raise the coil approximately 40 cm above the ground (around your knee level) at the original position and press the RESET button.

M Note: If you fail to raise the coil 40 cm above and begin by pressing the RESET, no operation to be performed afterwards will be accurate.

# **MODE 1: ADJUSTING GROUND BALANCE**



# **MODE 1: ADJUSTING GROUND BALANCE**

In the case that the ground effect cannot be removed, reduce Sensitivity Level by 1 increment and repeat the above process.



# **MODE 1: SEARCH AND CAVITY DETECTION**



target can be monitored consecutively on the graph (Oscilloscope) located above these bars. In this graph, an ascending graph would be obtained for metal targets and a descending one for targets like cavities or voids.

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# **MODE 1: SEARCH AND CAVITY DETECTION**



If the target is a cavity, an inclination on the "CAVITY" bar and a descending graph on the graphic display will be shown. The strength of the "CAVITY" bar would be shown numerically at the top, depending on the target's depth of effect.



If the target is a precious metal, an inclination is expressed numerically, depending on the depth of effect. This will be shown on both the "METAL" and the "PRECIOUS" bars. Metal effect can also be monitored in the graph located above the bars.



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If the target is a ferrous metal, an inclination expressed numerically, depending on the depth of effect, would be observed both on the "METAL" and the "FERROUS" bars.

When you receive a warning from the device at any point, take the device away from that point and reset it. Next sweep the coil over the same point again. This is done to confirm the presence of a target.

#### **INTERPRETING OSCILLOSCOPE DATA**

The Oscilloscope is the portion of the screen where signals received by the device. These signals are displayed at the top of the search screen. Viewing this data provides you with a real time interpretation of the signals from the ground and the targets below.

VOLUME	LIGHT SENSITIVITY FERROUS				
3	7	7 8 0FF			
METAL					
CAVITY					
2.0	7.89	2.0	2 60		
CAVITY	мета	L FERRUS	NON-FERROUS		
		(IIII)			



# **INTERPRETING OSCILLOSCOPE DATA**



# **MODE 1: ELIMINATING FERROUS METALS**



If the user desires, the device can be adjusted to eliminate ferrous metals and not report them to the user. To use this feature the FERROUS setting must be disabled.

To disable this section, press the MENU button in the Search and Ground sections. Press "+" key to enter the FERROUS section and then press the OK button. The screen will turn from yellow into green and you will see OFF. Now press the OK button again. Next press

the MENU button again to return to the previous section.

The device will eliminate ferrous metals after this operation. To enable detection of ferrous metals again, repeat above steps to bring the frame to ON position.

#### **TARGET ANALYSIS**

To obtain the analysis of a target detected during search:

Remove the coil from the target after it is detected and then press the RESET button.

Press and hold the SCAN key while slowly sweeping the coil over the target again. Meanwhile, the device will analyze the target. After leaving the area above the target, release the SCAN key.

Then, the device will present an ANALYSIS REPORT to the user. In this report, the type of metal and the effect of the target reflected on the surface are obtained.

Press "RECORD" key if you wish to save this report, a message indicating the saving is completed will appear on the screen.

To exit this screen, press OK or the RESET button.



# **DETERMINATION OF TARGET DEPTH**

#### To determine the depth of a target detected during search:



## **DETERMINATION OF TARGET DEPTH**

Maximum value that can be entered for width and length is 160 cm. If measured values exceed 160 cm, enter 160 cm into the respective field and perform a depth scan.



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After entering these values, press and hold the SCAN button and sweep the coil over the target, release the SCAN button after the signal disappears.



At the end of these processes, a Depth Report showing the depth and measurement values entered will be obtained. The value obtained is an approximate one.

Press the "RECORD" key if you wish to save this report, a message indicating the saving is completed will appear on the screen.

Press the OK button or the "Reset" trigger to exit this report.

The device will return back to the Depth mode; you can switch to the Search mode by pressing the DEPTH button.

# **RECORDING AND EXAMINING THE RECORDS**

#### To save the Reports obtained:



After obtaining the Analysis and Depth Reports, press the RECORD button to save the Analysis Report.



Press OK button after a the completed message appears on the screen to indicate that the information has been saved.

A maximum of 20 records can be saved on the device.

#### To retrieve a saved record for review at a later time:



Enter the Recording menu by pressing the RECORD key in the search mode.



Records can be reviewed by using the "+" and the "-" keys.



#### To delete records:



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Press the OK button while viewing the record that which you wish to delete.

Use the "+" and the "-" keys to select Delete the Record and Exit the window on the left side of the screen.



After pressing the OK button, scroll to EXIT for exiting the recording menu or scroll to DELETE RECORD to delete the record by using the "+" and the "-" keys.



# USAGE with MODE 2 (AUDIO SYSTEM)

In Mode 2, target detection is performed with audio alerts only. This mode is recommended to be used for the detection of small objects and metals such as single coins.

This mode can be used only when Mode 2 compatible search coils are attached.

Since Mode 2 is a system running on the motion principal, the coil should be in continuous motion. Move the coil from left to right over the ground for metal detection.



Turn the On/Off button to the Mode 2 position. When the device is turned on, the opening sound will play. After approximately 10 seconds, the device will be ready to use with the active audio alert.



#### **GROUND SETTING**

This is the adjustment made to eliminate the interferences originating from the minerals within the ground. Ground Balance enables device to operate with a higher performance in different ground structures and prevents it from giving false signals due to the minerals within the soil.



#### **IRON DISCRIMINATION**

This is the key that enables the discrimination of ferrous metals from precious ones based on different audio alerts. With the use of this key, the user is able to conduct searches in highly mineralized soils containing iron minerals (humid and plowed soils, soils containing high amounts of iron and places such as beaches etc.). As this key is turned from 1 towards 10, a loss of depth will be seen for some metals. As this key is turned towards 10, the ferrous

discrimination of the device increases. The interval at which metals are detected the deepest is between 1 and 3. Metals are detected with a single audio tone. Above 4, metals are discriminated with audio tones; for ferrous metals a low tone and for precious metals and gold, two different but similar high tones will be produced.

Automatic (Auto): This is the setting where metals are discriminated as ferrous and precious. This setting is recommended for use where ground structures require. You can use this setting where metal discrimination is required but ferrous discrimination is not.

#### **USAGE with MODE 2 (AUDIO SYSTEM)**



#### SENSITIVITY ADJUSTMENT

This adjustment is used to reduce the interference the device receives from the surrounding environment due to electromagnetic waves and the effects from the ground. Moreover, this is the depth adjustment of the device. When the device is set to the maximum sensitivity, the depth is also maximized. However, as the sensitivity is increased, the sensitivity of device towards electromagnetic waves and ground effects will also increase. The user will have to reduce the sensitivity level to a point where the device is stable and produces a comfortable operation with minimal interferences from the environment.

#### **IRON and MINERAL SETTINGS**



**Iron On:** If you wish to see ferrous metals during your search, use this mode. To enable ferrous metals to be detected with different sound tones, the ferrous discrimination key should be set to automatic or positioned between 5 and 10.

**Iron Off:** Conduct your search in this mode to prevent your device from producing signals for ferrous metals. The Ferrous discrimination key should be set to automatic or positioned between 5 and 10 for searches conducted in this mode.

**Beach & Mineral:** Conduct your searches in highly mineralized soils or at beaches where you face difficulty in setting the ground balance. To conduct the search in this mode, the Ferrous Discrimination must be at position 10. In this position, the device will not be affected by the iron content or high levels of minerals contained within the ground. It will not produce signals for ferrous metals, however a reduction in metal detection depth will occur. If you continue to receive signals from highly mineralized ground, simply reduce the sensitivity level.

# **MODE 2: GROUND BALANCE**



Bring the Ground Balance to position 1. Sweep the coil from left to right at 5 cm above the ground. If the device receives any interference, to remove it, increase the Ground Balance level in small increments while sweeping the coil at the same time. Leave the setting at the point where the sound goes off. Now, your Ground Balance is complete.

If the Ground Balance is still not matching at position 10, reduce the sensitivity level incrementally and repeat the above steps. If you still receive intense effects from the ground even when the sensitivity is reduced, then the soil may be rich in the mineral iron. In this case, try adjusting the Ground Balance again after bringing the Ferrous and Mineral Adjustment to Beach & Mineral and the Ferrous Adjustment to 10.

If your search area has a highly variable structure, adjusting Ground Balance at points where you receive the highest effects from the ground (such as over rocks or pits) would minimize the ground effect during your search.

NOTE: You may need to readjust the Sensitivity and Ground Balance when the effects from ground or environment vary.

# CAUTION



After Ground Balance passes to the red marked area, depth loss may occur for precious metals other than gold. When the Ground Balance is at position 10, the device will not sense ferrous and precious metals except gold. Therefore, if you are also searching for precious metals, you should keep the Ground Balance between the blue and orange areas. If the Ground Balance does not match within these areas, enable it to match by reducing the sensitivity level. The recommended Ground Balance level is 4-6.

# **MODE 2: SEARCH and METAL DETECTION**



The Device will produce a sound alert when it detects metal. To check the target, sweep the coil over the same target several times to confirm that you receive the same signal.



You can detect metals which are hard to detect more easily if you sweep the coil from left to right in both directions over the area to be scanned.

# **TECHNICAL SPECIFICATIONS**

	MODE 1 (VISUAL SYSTEM)	MODE 2 (AUDIO SYSTEM)	
Operating System	VLF	VLF	
Frequency	12.5 KHz	17.5 KHz	
Metal Detection	Display and Sound	Sound	
Sensitivity Adjustment	Manual		
Ground Balance	Manual		
Headphone Output	1/4'' Stereo		

	Control Unit	T44 Coil	T100 Coil (Optional)	C32 Coil	C47 Coil (Optional)	Stem
Dimensions	21x18x8,5 cm	36x44 cm	60x100 cm	26x32 cm	39x47 cm	85-135 cm
Dimensions	8,2″ x 7" x 3,3″	14″ x 17,5″	23,5″ x 40″	10" x 12,5"	15″ x 18,5″	33" - 53"
Weight	1.380 gr	1.400 gr	6.450 gr	850 gr	1.200 gr	1.000 gr
weight	3 Pounds	3 Pounds	14.2 Pounds	1.85 Pounds	2.65 Pounds	2.2 Pounds

Battery	16.8 V 3300 mA Lithium Polymer, rechargeable
Operating Voltage	12 V - 16.8 V
Battery Charger	AC 100 - 240V / 50 - 60 Hz - DC 16.8 V / 500mA
Battery Weight	320 gr

#### Warranty Period is 2 years.

Note: Battery, bags, headphones and battery charger devices are not included in the warranty coverage.





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