

# BLISSTOOL

## BLISSTOOL LTC64X



### USER GUIDE

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## 1. FEATURES

- Base Technologies:
  - Induction Balance (IB)
  - Very Low Frequency (VLF)
  - SuperB Depth = Super BLISSTOOL Depth (SBD)
- One of the best deep detecting metal detectors in the world
- Base operating frequency:
  - v1 = 8.5KHz
  - v2, v2i and v3 = 8.0KHz
  - v4, v5 and v6 = 8.0KHz and 7.4KHz
- Adjustable operating frequency:
  - v1, v2, v2i and v3 = +-60Hz
  - v4, v5 and v6 = +-600Hz
- Operating mode: motion
- Sound discrimination of the metals
- Designed to work on all types of terrains
- Extreme deep metal detector designed to work on all types of terrains
- High efficiency even in highly mineralized terrains, terrains with a high content of ore, terrains dotted with ceramics and terrains dotted with stones and rocks
- Standard 28 cm (11") DD search coil BLISSTOOL DD28SC2
- Additional 38 cm (15") DD search coil BLISSTOOL DD38SC2
- Additional 17 x 22 cm (7x9") ellipse search coil BLISSTOOL E7X9SD2
- Built-in LiPo battery 11.1V, 2200mAh with high quality and long life
- Automatic LiPo battery charger
- Manual and Automatic ground balance mode
- Coarse and fine settings in manual ground balance mode
- Switch with three auto ground zones
- High detection speed
- High recovery speed
- Adaptable behavior: can be "noisy" or completely "silent"
- Mode "Explosion" and mode "Waft"
- Adjustable input AC amplification of the signal from the detected object
- Adjustable frequency of the sound
- Adjustable silencer of the background sound
- Adjustable audio threshold
- Adjustable audio volume control
- Discriminator with three independent modes of discrimination
- Adjustable detection/rejection level of iron, tin-foil and low-grade non-ferrous metals (usually pollutants)
- Adjustable depth of discrimination
- Smooth regulation of the transmitted power of the transmitter (at v4, v5 and v6)
- NORMAL and TURBO/BOOST mode of the transmitter (at v4, v5 and v6)
- Automatic stabilizers:
  - one with high degree of stabilization (at v4)
  - one with low, one with medium and one with high degree of stabilization (at v5)
  - one with very high degree of stabilization (at v6)
- Extreme extended discrimination range (at v5 and v6)
- Mode SOIL and mode ORE (at v6)
- LED low battery indicator
- 6.35mm (1/4") Stereo headphones outlet
- Single charge operating time: up to 30 - 35 working hours
- Consumption: min: 35mA, max: 100mA

- Detachable and adjustable carrier construction made from aluminum and carbon
- Robust and comfortable handle and armrest
- Electronic block from light and robust box made from ABS and aluminum
- Electronic block located under the armrest
- Electronics fully shielded against electromagnetic interference
- Double shielded against electromagnetic interference cable for the search coil
- Connectors for the search coil with gold-plated pins
- Connectors for battery charging with gold-plated pins
- Weight in a complete and ready to use condition: 1.78kg
- RoHS compliant
- Developed and manufactured in Bulgaria
- 3 Year Worldwide Warranty

## 2. INTRODUCTION

***Metal detectors BLISSTOOL LTC64 and BLISSTOOL LTC64X are representatives of the new generation BLISSTOOL metal detectors from series LTC.***

BLISSTOOL LTC64 and BLISSTOOL LTC64X are extended and improved version of the model BLISSTOOL LTC48X, so that entirely replaces and supplemented it. Their improvements, compared to BLISSTOOL LTC48X are in any direction, including: design, electronics, depth of detection, discrimination, stability and sensitivity, setting, indication and maintenance bodies.

In BLISSTOOL LTC64 and BLISSTOOL LTC64X, was implemented the first fully completed version of the BLISSTOOL technology SuperB Depth = Super BLISSTOOL Depth (SBD), whose basis was implemented in BLISSTOOL LTC48X, it provides excellent depth of detection, and has already developed and improved in BLISSTOOL LTC64 and BLISSTOOL LTC64X.

BLISSTOOL LTC64 is the base model of this generation, and BLISSTOOL LTC64X is its extended version. BLISSTOOL LTC64X contains GAIN and TONE potentiometers, which in BLISSTOOL LTC64 are not available. GAIN potentiometer is used to adjust the input AC amplification of the signal from the detected object, and through TONE potentiometer the user can adjust the frequency of the output sound of the metal detector as desired and adjust the most audible and pleasant sound to him. The presence of the GAIN potentiometer for BLISSTOOL LTC64X provide the user with fine-tune of the behavior of the metal detector, which generally permits BLISSTOOL LTC64X to achieve greater depth of detection, especially in terrains with, from low to medium mineralization, and opportunity to increase the stability of the metal detector in high mineralized terrains and terrains with a high content of ore.

## 3. PRESENTATION

BLISSTOOL LTC64X is a modern professional metal detector, designed to work on all types of terrains, including highly mineralized terrains, terrains with a high content of ore and highly contaminated terrains. Has perfect depth and discrimination and is outstanding for its high quality, easy user's adjustment and minimal maintenance need. This makes it equally suitable for beginners and experienced searchers.

**As a concept, BLISSTOOL LTC64X is designed:**

- to have excellent depth of detection in all conditions!;
- to be used on any type of terrains;
- to can change its behavior: whether to be "noisy" or completely "silent";
- to have expanded opportunities for setting of the discrimination and ground balance;
- to successfully detect coin placed into ceramics, stones and rocks;
- to successfully detect coins in highly mineralized terrains;
- to have good depth of detection, not only to copper but also to silver and gold objects;
- to have high detection speed and high recovery speed and at the same time to have good stability.

***Real, metal detector BLISSTOOL LTC64X is one of the best deep detecting metal detectors in the world, especially when it comes to no resonance metal detectors type induction balance.***

BLISSTOOL LTC64X is made of high quality, RoHS compliant and fully shielded against

electromagnetic interference electronics, and high quality components such as: light and robust detachable carrier construction made of aluminum and carbon; electronic block contained in a light and robust box made from ABS and aluminum; standard 28 cm (11") DD waterproof search coil, double shielded against electromagnetic interference cable for the search coil; connectors for the search coil with gold-plated pins; connectors for battery charging with gold-plated pins. All this ensures its smooth operation regardless of the temperature changes and the other environmental characteristics, and durability lined with a 3 year worldwide warranty.

Its electronics and rechargeable battery, are installed in the electronic block located under the armrest. This design allows for improved mass balance to handle, and allows for continuous use without significant user fatigue. In a complete, ready to use condition, BLISSTOOL LTC64X is weighing 1.78kg.

Standard, BLISSTOOL LTC64X is equipped with a LiPo battery 11.1V, 2200mAh, which is characterized by high quality, low weight and long life. In order to recharge it, in the metal detector standard package is included an automatic LiPo battery charger.

***BLISSTOOL LTC64X is available in seven versions: v1, v2, v2i, v3, v4, v5 and v6.***

Its operating frequency, by potentiometer FREQUENCY, can be adjusted, to avoid external interferences such as: interference from other close working metal detector with the same or similar operating frequency; and powerful industrial interferences. Adjustable by potentiometer TONE, is the frequency of the output sound of the metal detector.

Given its professional character, BLISSTOOL LTC64X has many options for adjust to the realization of its universality and getting the most of its opportunities. If the user is a beginner and do not understand for what serve the appropriate potentiometer or switch, it is sufficient to maintain it in the recommended, in the user guide, level, whereby relatively easy to make the metal detector in the regime close to optimal, but later, when the user gain experience in working with the metal detector, to optimize its behavior to a specific terrains by fine adjustment of the respective potentiometers and switches.

Its behavior can be fully configured according to the wishes of the user and the characteristics of the terrain. BLISSTOOL LTC64X can be "noisy" or completely "silent." Particular behavior is set by appropriate adjustment of the metal detector, notably through appropriate adjustment of the potentiometers which largely determine its sensitivity: potentiometer GAIN which serving for setup of the input AC amplification of the signal from the detected object; potentiometer THRESHOLD which serving for setup of the sound threshold; potentiometer SILENCER which serving for setup of degree of suppression of the background sound and for stabilization of the audio threshold.

BLISSTOOL LTC64X has high detection speed and high recovery speed. This ensures its stability regardless of the speed of search and allows the efficient detection of deeper objects located near to the iron.

It features manual and automatic ground balance mode, as in automatic mode is available additional switch with three auto ground zones for soils with low, medium and high mineralization. These preset zones make use of the metal detector easily and effectively.

Its discrimination is adjusts by: DISCRIMINATOR switch that provides three independent modes of discrimination and allow optimization of its behavior, and potentiometers DISCR LEVEL and DISCR DEPTH, which enable: set of detection/rejection level of iron, tin-foil and low-grade non-ferrous metals (usually pollutants) and set the depth of discrimination. All this allows to achieve optimum setting of the metal detector at contaminated terrains, terrains with hot rocks and mineralized terrains, and are a prerequisite for even better results.

Its audio discrimination, thanks to the perfect human abilities through their hearing to perceive and analyze in detail the sound signals, is the ideal solution for instant detection, analysis and recognition even and of the weakest signals by deeply buried objects.

***Before using your BLISSTOOL LTC64X for the first time, we recommend you to read detailed this user guide, in order to optimally use all its capabilities.***

## 4. VERSIONS

### **BLISSTOOL LTC64X (THE BEAST) is available in seven versions:**

- version 1 (LTC64X v1, LTC64X version 1);
- version 2 (LTC64X v2, LTC64X version 2);
- version 2i (LTC64X v2i, LTC64X version 2i);
- version 3 (LTC64X v3, LTC64X version 3);
- version 4 (LTC64X v4, LTC64X version 4);
- version 5 (LTC64X v5, LTC64X version 5);
- version 6 (LTC64X v6, LTC64X version 6).

*The version of BLISSTOOL LTC64X is marked on the box with the electronic block of the metal detector.*

*Although in appearance, all versions look the same, they have significant differences in their characteristics: depth of detection, stability, discrimination, basic behavior. Therefore, each version must be considered for a different model metal detector, not a upgrade of the previous version. For the same reason, the different versions have different prices, fall in different price range and are offered as different models metal detectors. Not available update from one to another version, i.e. from one model to another model metal detector, because this is associated with a complex and complicated changes in the electronics, which in some cases are even impossible to implement. Updates are possible, only within the same version, where such are available for it.*

*As with every new batch, the parameters of all versions of BLISSTOOL LTC64X are improved, the metal detectors from the latest batches are better compared to the first presented batch: they have even greater depth of detection, even higher stability and are with even higher quality. To indicate this fact, all BLISSTOOL LTC64X metal detectors from the latest batches are labeled "THE BEAST" left and right of the box with the electronics block, as "THE BEAST", is now the official alias (nickname) of all versions of metal detector BLISSTOOL LTC64X.*

*LTC64X v1 is the standard version.*

*LTC64X v2 is a version specially adapted for heavy field conditions.*

*LTC64X v2i is an improved version of v2.*

*LTC64X v3 is a top version with extreme performance.*

*LTC64X v4 is a top version with extreme depth of detection, automatic stabilizer with a high degree of stabilization, NORMAL and TURBO/BOOST mode of the transmitter.*

*LTC64X v5 is a top version with extreme depth of detection, three automatic stabilizers (with low, medium and high degree of stabilization), NORMAL and TURBO/BOOST mode of the transmitter and extreme extended discrimination range.*

*LTC64X v6 is a top version with extreme depth of detection, automatic stabilizer with a very high degree of stabilization, NORMAL and TURBO/BOOST mode of the transmitter, extreme extended discrimination range, ORE and SOIL modes.*

### **LTC64X v2 is better than v1 with that this LTC64X v2 is optimized to work on:**

- highly contaminated terrains;
- highly mineralized terrains;
- terrains with a high content of ore.

Of the above described terrains, LTC64X v1 also works, but LTC64X v2 is additional optimized for such terrains.

### **LTC64X v2i is better than v2, with that this LTC64X v2i has improved:**

- the depth of detection;
- the sensitivity to very small metal objects.

### **LTC64X v3 is better than v2i, with that this LTC64X v3 is:**

- with extreme improved depth of detection;
- with extreme improved sensitivity to very small metal objects;
- optimized for Gold Nugget prospecting;
- with extended setup of the sensitivity and the behavior;
- with capable of successfully competing with multi-period pulse induction metal detectors. In comparison with them, has a similar depth of detection, greater universality and excellent discrimination.

**LTC64X v4 is better than v3, with that this LTC64X v4 is:**

- with extreme improved depth of detection to very small, small, medium and large metal objects;
- with extremely improved stability, that is maintained even when using maximum settings;
- with two base operating frequencies: 8.0KHz and 7.4KHz;
- with smooth regulation of the operating frequency from 7.4KHz to 8.0KHz;
- with smooth regulation of the transmitted power of the transmitter;
- with NORMAL (at frequency 8.0KHz) and TURBO/BOOST mode of the transmitter (at frequency 7.4KHz) with increased transmitted power;
- TURBO/BOOST mode of the transmitter, effective not only at low mineralized terrains, but also in medium and highly mineralized terrains, terrains with a high content of ore and terrains dotted with stones and rocks;
- with an automatic stabilizer with a high degree of stabilization;
- with improved discrimination;
- with improved elimination of the inhomogeneities of the field;
- with improved rejection of iron, slag and hot rocks;
- with improved elimination of electromagnetic interferences;
- with behavior providing a more comfortable work in any type of terrain, including highly mineralized terrains, terrains with a high content of ore and terrains dotted with stones and rocks.

**LTC64X v5 is better than v4, with that this LTC64X v5 is:**

- with extreme extended discrimination range. Besides iron, aluminum foil and low conductive metal objects from non-ferrous metals and alloys, if necessary, can discriminate and medium and high conductive metal objects from non-ferrous metals (zinc, nickel, copper, lead, aluminum, silver, gold) and their alloys;
- with improved distribution of the three areas for discrimination, providing possibility for effective study and understanding of the detected metal object even before it to be excavated. Thanks to this, with high probability, can assume what exactly is the detected metal object even before it to be excavated: small, large, low quality, high quality, low, medium or high conductive. Moreover, for specific terrains and conditions, which the user is acquainted, can be assumed and from what kind of metal is the detected metal object: zinc, nickel, copper, lead, aluminum, silver, gold; and what exactly is the detected metal object: coin, artifact, treasure or modern pollutant. All this, provides a more effective and more convenient selective search of metal objects;
- with three automatic stabilizers (with low, medium and high degree of stabilization), providing the opportunity for highly effective stabilization and extreme performance in all field conditions.

**LTC64X v6 is better than v5, with that this LTC64X v6 is:**

- with improved work at highly mineralized terrains, terrains with a high content of ore, beach search (on the coast, moist soil, dry sand, wet sand, mineralized sands);
- with mode ORE, optimized for work at highly mineralized terrains, terrains with a high content of ore, terrains dotted with hot rocks and stones, highly contaminated with iron terrains, beach search in highly mineralized sands;
- with mode SOIL, optimized for work at low and medium mineralized terrains, terrains dotted with stones and rocks, beach search in low and medium mineralized sands;
- with higher detection speed and higher recovery speed in mode ORE;
- with improved depth of detection and improved comfort when working on any type of terrain;



- with automatic stabilizer with a very high degree of stabilization.

**All other base characteristics of v6 are the same as of v5:**

- v6 has the same extended range of discrimination (DISCRIMINATOR III, II and I) as v5;
- v6 has mode NORMAL (FREQUENCY = MAX, 8.0KHz) and mode TURBO/BOOST (FREQUENCY = MIN, 7.4KHz) as v5 and v4.

**For all BLISSTOOL LTC64X versions, are available packages with:**

- 28 cm (11") DD search coil BLISSTOOL DD28SC2
- 38 cm (15") DD search coil BLISSTOOL DD38SC2
- 17 x 22 cm (7x9") ellipse search coil BLISSTOOL E7X9SD2

Which version is right for you to judge yourself according to your specific needs.

**5. STANDARD PACKAGE**

1. Metal detector BLISSTOOL LTC64X with 28 cm (11") DD search coil BLISSTOOL DD28SC2 and LiPo battery 11.1V, 2200mAh
2. Automatic LiPo battery charger
3. User guide
4. Warranty card
5. Invoice
6. Transport and storage box
7. 3 Year Worldwide Transferable Warranty
8. Free Delivery by courier

## 6. OPTIONAL ACCESSORIES

As described below additional accessories can be purchased additionally, i.e. they are not included in the standard package of the metal detector.

### 6.1. ARMY BACKPACKS (KITBAG)

*The army backpacks is a soft backpack type bag in which can transport metal detector BLISSTOOL LTC64X.*

The army backpacks carried as a rucksack on your back.

BLISSTOOL LTC64X be placed in the army backpacks after disassembling. For this purpose, its detachable carrier construction is divided into its three major parts through the unscrewed of the small and large fixing ring.

*Dimensions in unfolded state:* rectangle with a width of 46 cm and a height of 68 cm.



### 6.2. ADAPTER TO CHARGE FROM CAR BLISSTOOL CL12V2

*BLISSTOOL CL12V2 is an adapter that allows the built LiPo battery of BLISSTOOL LTC64X to be charged by power from the car using a standard 12V car cigarette lighter connector.*

To this end:

**1/** The input of BLISSTOOL CL12V2 must be included into a standard 12V car cigarette lighter connector, available in each car, and its output includes to the input of the automatic LiPo battery charger, available in the standard package of BLISSTOOL LTC64X, which provided its the necessary power to charge a LiPo battery;

**2/** The output of automatic LiPo battery charger, through available in the standard package of BLISSTOOL LTC64X, cable adapter, must be included into the connector CHARGE available on the back panel of the electronic block of BLISSTOOL LTC64X.



Through the use of BLISSTOOL CL12V2, is eliminated the need to use of standard ~100-240V/DC12V power adapter, used for charging of the LiPo battery through ~100-240V network, and are achieve greater autonomy at work with BLISSTOOL LTC64X.

*In some models cars, to ensure the power supply through 12V car cigarette lighter connector, the cars need to be "of contact". In the presence of power, the green LED of BLISSTOOL CL12V2 lights permanently.*

BLISSTOOL CL12V2 has a cable with 2 meters length, which allows in charge, the automatic LiPo battery charger and the metal detector to be located in a safe and comfortable place in the car. The charging can be done and during working car engine and during movement of the car.

### 6.3. PROTECTIVE COVER OF DUST, MOISTURE AND RAIN BLISSTOOL PTC4R

***BLISSTOOL PTC4R is a protective cover of dust, moisture and rain of the electronic block of metal detector BLISSTOOL LTC64X.***

For this purpose, BLISSTOOL PTC4R must be put on the box with the electronic block of the metal detector.

To its repeated insertion and removal, some sides (panels) of BLISSTOOL PTC4R are assembled with Velcro tape type.

BLISSTOOL PTC4R is made from strong, flexible and waterproof materials such as leather, and transparent glass-like material that provides visibility into areas in which are available setting, indication and maintenance bodies of the metal detector.

***BLISSTOOL PTC4R protects the electronic block of the metal detector from scratch, shock, dust, moisture and rain: on terrains strewn with sharp stones; on sandy terrain; on muddy terrain; in the presence of dew; when rain (drizzle) light rain; in snow conditions; when it rains little snow.***

Before insertion of the protective cover BLISSTOOL PTC4R on the box with the electronic block, the user must to set the metal detector to the respective terrain. This is necessary because with fitted protective cover, the user does not have direct access to the potentiometers and the switches to adjust the metal detector.

On the front panel of BLISSTOOL PTC4R, is available hole with cap, which ensures access to the potentiometer VOLUME, to turn-on and to turn-off the metal detector and to set the desired from the user audio volume, without the need of removing the protective cover.

On the back panel of BLISSTOOL PTC4R are available: a hole for plug to connector COIL of the jack of the search coil; a hole with cap for plug to connector PHONES of the jack of the headphones (if the user use any); a hole with cap through which is heard the sound from the loudspeaker.

The putting of BLISSTOOL PTC4R on the box with the electronic block of the metal detector, is made by pulled of the protective cover in the direction from the front to the back panel of the electronic block. For this purpose, BLISSTOOL PTC4R must be in disassembled condition, ie its Velcro tape type, by which are connected its various sides (panels), must be posted in advance.



## 6.4. STEREO HEADPHONES

### 6.4.1. STEREO HEADPHONES PHILIPS SHP1900 B

#### Introduction

*PHILIPS SHP1900 B are high quality full-size stereo headphones with lightweight construction and sleek design.*

#### Features

- Frequency range: 20 Hz - 20 000 Hz
- Impedance: 32 Ohm
- Sensitivity: 98 dB
- Maximum power input: 500 mW
- Driver unit: 40 mm
- Plug type: 6.35mm (1/4") stereo
- Cable connection: Unilateral
- Cable length: 2 m
- Weight: 195 g
- Volume control: No



### 6.4.2. ADAPTER FOR HEADPHONES BLISSTOOL P635S35

*BLISSTOOL P635S35 is a headphones adapter from 6.35mm (1/4") stereo Jack plug to 3.5mm Jack socket.*

*Through it, to a connector PHONES of BLISSTOOL LTC64X, may be included stereo headphones with 3.5mm stereo Jack plug.*



## 6.5. SEARCH COILS

BLISSTOOL search coils for metal detector BLISSTOOL LTC64X, have the following characteristics:

**/1/** Constructed of robust and temperature stable construction of plastic and epoxy resin and have excellent electrical and mechanical characteristics.

**/2/** Completely waterproof.

**/3/** They have high quality:

- encapsulated and shielded connector with gold-plated pins
- double shielded against electromagnetic interference cable

### 6.5.1. 28 CM (11") DD SEARCH COIL BLISSTOOL DD28SC2

#### Description

**BLISSTOOL DD28SC2 represents a waterproof search coil type DD (double D) with a diameter of 28 cm (11").**

**Characterized by a very good balance between the parameters: depth of detection and discrimination.**

BLISSTOOL DD28SC2 is the standard search coil with which is equipped metal detector BLISSTOOL LTC64X, ie it is included in the standard package of the metal detector.



### 6.5.2. LOWER CONNECTING ROD

#### Description

**The lower connecting rod is made of carbon fiber to not interfere with the normal operation of the metal detector. The upper part of it is connected by small fixing ring to the intermediate connecting rod - enter into it, and at the bottom part it end with a plastic nozzle, which is connected to the search coil.**

A number of lower connecting rod is included in the standard package of metal detector BLISSTOOL LTC64X and to it is attached the included in the package standard 28 cm (11") DD search coil BLISSTOOL DD28SC2.

The lower connecting rod is available separately as an optional accessory, to be able to be purchased in a set with additional search coil, for example in set with a different size search coil, when the client wishes. In this way, each of the search coil purchased by the customer, can be equipped with its own lower connecting rod, in order to easily mount the metal detector if necessary. This, avoids the inconvenience, of a single number of a lower connecting rod to be moved frequently from one to another search coil.



**Lower connecting rod of carbon fiber with a plastic nozzle in complete with emollient and fixed rubbers type washer, that protect the ears of the search coil from deformation and breakage when tightening.**



**Lower connecting rod attached to a 28 cm (11") DD search coil BLISSTOOL DD28SC2 by the available in the complete with the search coil, plastic bolt and nut.**

### 6.5.3. 38 cm (15") DD SEARCH COIL BLISSTOOL DD38SC2

#### Description

***BLISSTOOL DD38SC2 represents a waterproof search coil type DD (Double D) with a diameter of 38 cm (15").***

***Characterized by an excellent depth of detection.***

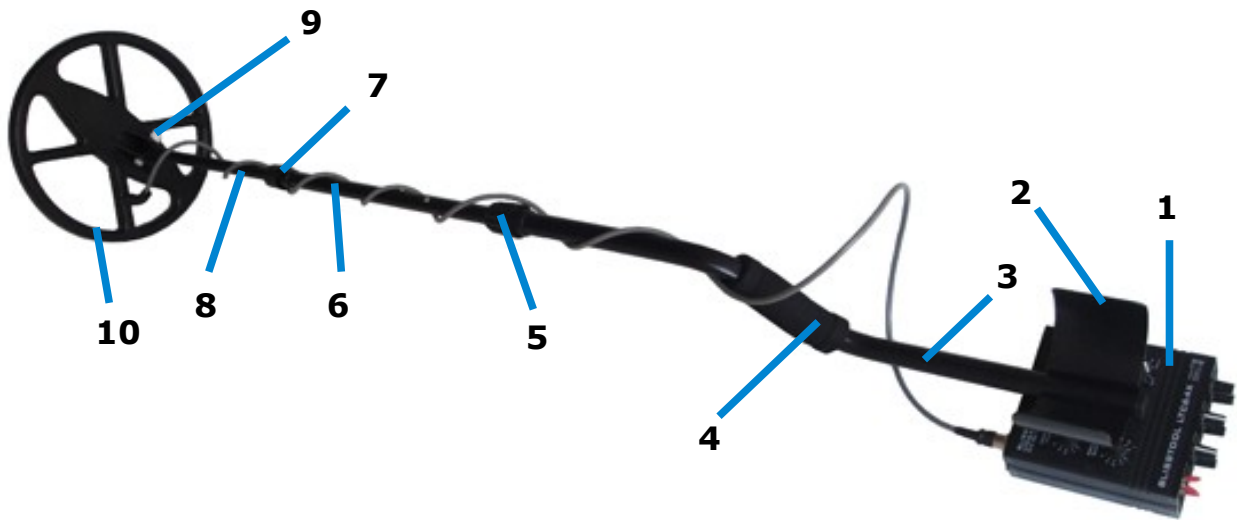
Compared with the standard 28 cm (11") DD search coil BLISSTOOL DD28SC2, the depth of detection of BLISSTOOL DD38SC2 is greater with several centimeters for coins, and with several tens of centimeters for larger metal objects.



## 7. STRUCTURE OF THE METAL DETECTOR

**BLISSTOOL LTC64X consists of the following basic elements:**

1. Electronic block with setting, indication and maintenance bodies
2. Armrest
3. Carrier rod
4. Handle
5. Large fixing ring
6. Intermediate connecting rod
7. Small fixing ring
8. Lower connecting rod
9. Plastic bolt and nut
10. Search coil



**Fig.1 / Construction of metal detector BLISSTOOL LTC64X**

For easy assembling and disassembling of the metal detector, in the standard package:

- the carrier rod with the large fixing ring, the electronic block, the handle and the armrest are combined in a single component;
- the small fixing ring is mounted on the intermediate connecting rod;
- the lower connecting rod and the search coil are assembled together with the plastic bolt and nut.



**Fig.2 / Components of metal detector BLISSTOOL LTC64X**

The carrier rod is made from aluminum pipe. The large fixing ring that is mounted on its lower end is used for connecting the pipe with the intermediate connecting rod.

The handle is part of the carrier rod and is coated with soft and solid foam.

For better stability, the armrest is made from aluminum. It has a strap for better fixation to the elbow during a search.

Under the armrest is mounted the electronic block. It consists of a plastic box with aluminum panels, in which are mounted the electronics and the LiPo battery of the metal detector. On the front panel, back panel and the lid of the electronic block are mounted the setting, indication and maintenance bodies.

The intermediate connecting rod is made from aluminum pipe. At its upper end it is connected by the large fixing ring to the carrier rod – it fits into it, while at its lower end it is connected to the lower connecting rod by the small fixing ring.

The lower connecting rod is made from carbon, so that it does not interfere with the normal working mode of the metal detector. At its upper end it is connected by the small fixing ring to the intermediate connecting rod – it fits into it, while at its lower part ends with a plastic nozzle by which is connected to the search coil.

To not affect the intermediate connecting rod on the work of the metal detector, because it is made from aluminum, ie metal, it is recommended that the lower connecting rod to be inserted in the intermediate connecting rod to a situation in which remain at least 20-30 centimeters away from the top of the search coil to the small fixing ring.

***To quickly and easily set the desired from the user length of the carrier construction, the fixed mechanisms type bud, available on the lower connecting rod and on the intermediate connecting rod, are inserts respectively on the holes located at a different levels on the intermediate connecting rod and on the carrier rod.***

The search coil is connected to the plastic nozzle of lower connecting rod via the plastic bolt and nut. Between the ears of the search coil and the plastic nozzle of the lower connecting rod, put the included in the standard package emollient and fixed rubber type washer, which prevent the ears of the search coil from deformation and breakage when tightening. Thus, the search coil can be installed and removed repeatedly from the lower connecting rod.

***The search coil, via the connector of the connecting shielded cable, is connecting to the connector COIL mounted on the back panel of the electronic block.***

If necessary to change the position of the search coil to the lower connecting rod (change the working angle during working with the metal detector or folding to carry and transport), is necessary to loose coupling fixing by a plastic bolt and nut and after the new setting, it can be tight to be fix the search coil in the new position.

***The changing of the working angle in tight situation can lead to breakage of the ears of the search coil, deformation of the ears and the search coil or a fatal frustration of the search coil and changes of its parameters.***

When changing the working angle of the search coil to the lower connecting rod, must be monitored for the presence of an advance of the bottom of the connecting shielded cable of the search coil to keep it stretched too much as this can cause damage its.

***Recommended always to provide a small advance of the connecting shielded cable of the search coil in its lower part, just above the nozzle during which it comes out of the search coil.***

The coil cable ends with a connector and there is a single correct position for it so that it could be plugged in the connector COIL, which lies on the back panel of the electronic block. In this position, the hollow cursor of the cable connector falls in with flange cursor of the connector COIL, and when inserted, the cable connector enters into the connector COIL at a depth of around 10 mm. After the cable connector is plugged in, it is screwed to the connector COIL by the means of the available metal stopping nut, used as a shield.

***The incorrect insertion and/or the application of a brute force while incorrectly inserting the connector of the search coil could lead to damaging of the metal detector.***



## **8. ASSEMBLING AND DISASSEMBLING OF THE METAL DETECTOR**

**The metal detector BLISSTOOL LTC64X is assembled in the following sequence:**

**1.** The upper part of the lower connecting rod is attached to the lower part of intermediate connecting rod via the small fixing ring, and adjusted at the appropriate length.

It is recommended that the mounting of the lower connecting rod to the intermediate connecting rod should be carried out, following the sequence below:

- the small fixing ring has to be unscrewed loose from the intermediate connecting rod and put on the lower connecting rod;
- the lower connecting rod is inserted in the intermediate connecting rod at the appropriate length;
- the small fixing ring is tightened until it is fixed.

**2.** The upper part of the intermediate connecting rod is attached to the carrier rod via the large fixing ring, and adjusted at the appropriate height.

It is recommended that the mounting of the intermediate connecting rod to the carrier rod should be carried out, following the sequence below:

- the large fixing ring has to be unscrewed loose from the carrier rod and put on the intermediate connecting rod;
- the intermediate connecting rod is inserted in the carrier rod at the appropriate length;
- the large fixing ring is tightened until it is fixed.

**3.** The search coil has to be adjusted horizontally against the ground surface, while the user is in an upright (working) position and is holding the metal detector by the handle.

This adjustment is possible, if the plastic bolt and nut used for assembling the search coil with the lower connecting rod are not tightly fastened.

**4.** The connecting shielded cable of the search coil is wound evenly and spirally up the lower connecting rod, the intermediate connecting rod and the carrier rod up to the handle, provides advance of the cable around the handle, as finally, the end connector of the cable is plugged in and tightened on the connector COIL that lies on the back panel of the electronic block. The plugging in and out of the cable connector is done while the metal detector is switched off (VOLUME potentiometer is turned in "OFF" position (Fig.4)). The cable is fixed through patches type velcro included in the standard package.

***The cable, at its lower end near the search coil, has to be slightly loose, so that it is not damaged when the search coil has been bent against the lower connecting rod, for example when search or when the device is folded for carrying and transporting.***

***IMPORTANT: The cable of the BLISSTOOL search coil is double shielded against electromagnetic interferences. The cord length is about 1.6 meters, which combined with its twin aluminum screen, makes it heavy. In this regard, in order to eliminate false signals and prevent damage of the connector on the cable and of connector COIL, is necessarily, the shielded connecting cable of the search coil to be wound tight spiral with a pitch about 12 cm along the length of the supporting structure up to the handle and to be fixed to the supporting structure of the metal detector, a total of three places: under the handle, over the handle and at the base of the lower connecting rod.***

***For fixing of the shielded connecting cable of the search coil, are used the included in the standard package locking tape type Velcro.***

***The correct winding and fixing of the cable is shown in Fig.3 available below.***

***The purpose of winding of the cable tight spiral with a pitch about 12 cm along the length of the supporting structure up to the handle, is the cable to be fixed during the search with the metal detector.***

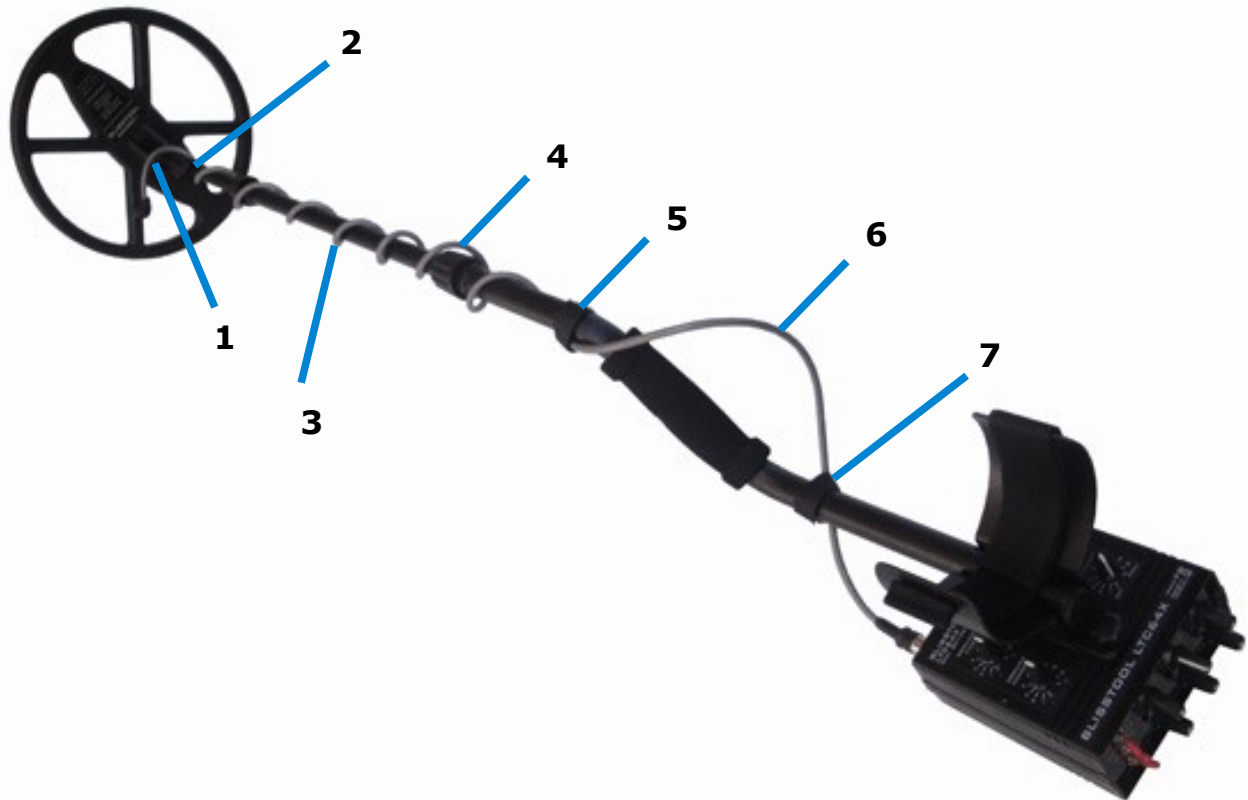
***If the cable is loose and moves during the search, this will generate false signals, since the metal detector will detect the cable moving towards the search coil (more precisely its metal aluminum screens).***

***For the same reason, after winding, the cable must be fixed at three places with Velcro patches: fixation in the base of the lower connecting rod, to ensure the advance of the cable provided after***

*exiting from the cable connection of the search coil, so to allow possibility for safe change the angle between the search coil and the lower connecting rod; fixation above and below the handle to ensure advance of the cable around the handle, so that it does not interfere when the user grip the metal detector for the handle, and also to immobilize the cable against the connector of the cable and connector COIL.*

*The unsecured heavy cable above and below the handle, causes movement of the connector of the cable against connector COIL, and this creates slack in their contact leads, which creates false signals.*

*Therefore, to avoid such problems, is mandatory, whenever, the cable to be wound and fixed exactly as described here. Any user who ignore this advice, inevitably dooms the metal detector BLISSTOOL LTC64X of damage and faces with false signals caused by the failure of the herein described recommendations.*



**Fig.3 / Correct folding and securing of the cable of the search coil of BLISSTOOL LTC64X**

**Description of the designated positions of Fig.3:**

- 1** - Secured advance of the cable at the base of the lower connecting rod, just above the nozzle;
- 2** - Fixed cable, with velcro type tape, at the base of the lower connecting rod;
- 3** - Correct: tight spiral wound cable;
- 4** - Incorrect: loosely spiral wound cable;
- 5** - Fixed cable, with velcro type tape, over the handle;
- 6** - Secured advance of the cable around the handle;
- 7** - Fixed cable, with velcro type tape, under the handle.

**The disassembling of the metal detector is carried in a reversed order.**

## 9. SETTING, INDICATION AND MAINTENANCE BODIES

*The setting, indication and maintenance bodies are mounted on the front panel, back panel and on the lid of the electronic block (Fig.4) of BLISSTOOL LTC64X.*

### Setting, indication and maintenance bodies of BLISSTOOL LTC64X

#### On the front panel of the electronic block:

- VOLUME potentiometer
- FREQUENCY potentiometer
- DISCR LEVEL potentiometer
- DISCR DEPTH potentiometer
- GAIN potentiometer
- TONE potentiometer
- GROUND MODE switch
- AUTO ZONES switch
- DISCRIMINATOR switch

#### On the back panel of the electronic block:

- COIL connector
- CHARGE connector
- Loudspeaker
- BAT LOW LED
- PHONES connector

#### On the lid of the electronic block:

- THRESHOLD potentiometer
- SILENCER potentiometer
- GROUND COARSE potentiometer
- GROUND FINE potentiometer

To optimally use the capabilities of your BLISSTOOL LTC64X, we recommend that you explore in detail all its bodies, using as a basis, a detailed description of them available below.

*Given its professional character, BLISSTOOL LTC64X has many options for adjust to the realization of its universality and getting the most of its opportunities.*

*If the user is a beginner and do not understand for what serve the appropriate potentiometer or switch, it is sufficient to maintain it in the recommended, in the user guide, level, whereby relatively easy to make the metal detector in the regime close to optimal, but later, when the user gain experience in working with the metal detector, to optimize its behavior to a specific terrains by fine adjustment of the respective potentiometers and switches.*

#### Description of the various bodies:

##### 9.1. VOLUME POTENTIOMETER



*The VOLUME potentiometer serves as the on/off the metal detector (level "OFF") and to regulate the audio volume (levels from "1" to "MAX").*

For optimal performance, should be placed at the level at which the the sound produced by the metal detector is a pleasant for listening, ie is not very loud, nor quiet.

*The recommended levels for VOLUME potentiometer are from level "3" to level "8".*

The use of the metal detector at higher levels of VOLUME potentiometer, provides better audibility of the sound produced by the metal detector, but at the same time increasing the consumption of power from the LiPo battery of the metal detector and wear it for a short time.

## 9.2. FREQUENCY POTENTIOMETER



**The FREQUENCY potentiometer serves to change the operating frequency of the metal detector in range  $\pm 60\text{Hz}$ , in order to avoid external interferences such as: interference from other close working metal detector with the same or similar operating frequency; and powerful industrial interferences.**

The presence of external interferences is expressed as: onset of instability of the audio threshold of the metal detector, marked and continuous increase in its instability, or total collapse of the audio threshold.

**The recommended level for FREQUENCY potentiometer is level "MAX", or levels close to level "MAX".**

**In the level "MAX" of the FREQUENCY potentiometer, the system for frequency adjustment is off and the metal detector operate at its base operating frequency.**

**In the occurrence of instability in the audio threshold, with a character as described above, in order to smooth the audio threshold and stabilization of the metal detector, is required by FREQUENCY potentiometer to change the operating frequency of the metal detector.**

**Under the same conditions, when connected to the metal detector of another, additional, BLISSTOOL search coil, other than the standard 28 cm (11") DD search coil BLISSTOOL DD28SC2, with which the metal detector is equipped in the standard package, the best base setting of potentiometer FREQUENCY may be different than the recommended for the standard package level "MAX". For the new search coil, the best base setting of potentiometer FREQUENCY is where the metal detector detects with a clear rich sound the weak signals from deeply buried metal objects. Accordingly, the best setting is a combination of individual settings of potentiometer FREQUENCY and potentiometer TONE.**

The change in the operating frequency of the metal detector is done by adjusting the FREQUENCY potentiometer to any of the levels at level "9" to level "MIN". Choose that level at which the audio threshold of the metal detector regains its stability.

**Because their primary function, the setting of the FREQUENCY potentiometer affect to the other settings of the metal detector and especially on its ground balance. It is desirable for this setting to be done before the rest of the metal detector settings, or after any change of the FREQUENCY potentiometer, to be done complete setup of the metal detector.**

## 9.3. GROUND MODE SWITCH



**The GROUND MODE switch serves for switching between the two working modes of the metal detector:**

**MAN: Manual ground balance**

**AUTO: Automatic ground balance**

**The recommended positions for GROUND MODE switch are: position "AUTO" for beginners and position "MAN" for experienced users.**

Manual ground balance mode and Automatic ground balance mode relate to the chosen technology for eliminating the ground (terrain) interference on the metal detector's work.

**The ground (terrain) interference usually causes instability of the metal detector and false signal registration (during the search while the search coil is moving, the metal detector is making sounds without real to has detected metal object).**

When working with a manual ground balance mode (GROUND MODE switch turned to the "MAN" position), the ground interference is eliminated by manual adjustment of the metal detector by the user, by following the procedure given in the description of the GROUND COARSE and GROUND FINE potentiometers, available below.

**Manual ground balance mode is appropriate for terrains with homogeneous soil, where the metal detector would reach its full potential by a fine manual adjustment.**

When working with an automatic ground balance mode (GROUND MODE switch turned to the "AUTO" position), the metal detector's electronics automatically eliminates the ground

interference and there is no further need for manual balance adjusting by the GROUND COARSE and GROUND FINE potentiometers from the user, and it is not important in what levels are set these potentiometers.

**Automatic ground balance mode is appropriate for terrains with a heterogeneous soil.**

In order to optimize and achieve the best possible balance, the automatic ground balance mode is divided into three ground zones with a small area of correlation. They are selected by an AUTO ZONES switch as described below.

#### 9.4. AUTO ZONES SWITCH



**The AUTO ZONES switch serves to set one of the three available automatic ground zones at work in automatic ground balance working mode.**

**The individual zones are numbered as zones "1", "2" and "3", which corresponds to the following soil type:**

- Zone "1": soils with black and/or negative mineralization;
- Zone "2": not mineralized or weakly mineralized soils;
- Zone "3": soils with a color and/or positive mineralization.

**The recommended position of switch AUTO ZONES is the "3" (recommended position for beginners).**

**Most often works in Zone "1".**

**In most cases:**

- Zone "1" is suitable for: terrains strewn with ceramic containing impurities of ferrous metals; terrains dotted with stones and rocks with negative mineralization; soil, sand, stones and rocks with black and/or negative mineralization;
- Zone "2" is suitable for: not mineralized or weakly mineralized soils; loose soils with low density; "light" soils; clean terrains;
- Zone "3" is suitable for: soil, sand, stones and rocks with color and/or positive mineralization; highly mineralized terrains and terrains with a high content of ore, terrains with a high content of hot rocks, terrains with high content of rusty black metals such as, but not limited to: small heavily corroded irons and steel, small pieces of wire, heavily corroded pieces of sheet metal, small iron nails and steel nails, tack, slag and other ancient and contemporary pollutants.

**To determine which of the three zones eliminates the best influence of soil is necessary:**

- to be chosen the auto ground balance mode (GROUND MODE switch turned to "AUTO" position);
- the DISCR LEVEL potentiometer to be set at a level "0";
- the THRESHOLD potentiometer to be set at a level, just before the level where the metal detector starts slightly zoom sound made (issued torn sound, buzzing, whiz) or one or two levels before the level of zoom (recommended for beginners searchers).

Then is done vertical (up-down) movement of the search coil ranging from 2-3 cm to 20-25 cm above the terrain and simultaneously AUTO ZONES switch, is switches alternately between the three available positions (zones).

**Most appropriate for use is the zone, where in the described manner of movement of the search coil, the metal detector does not beeps or issue possible weak sound, or at least the pre-set audio threshold level did not change significantly.**

In mineralized terrains, if has a strong responsive signal from the terrain and selection of most appropriate auto ground zone is difficult or the user has small practical experience, is recommended the THRESHOLD potentiometer to return with one or two levels back at the level where the metal detector starts to slightly zoom, then proceeding to the described above method of choice of zone. In addition, in order to reduce the response signal from the ground, can be set in advance desired level of discrimination (DISCR LEVEL potentiometer from level

"0" is placed in the desired operating level) and then performed the described above choice of zone.

For soils containing large amounts of salts, in moist and wet soils, in clay soils, when searching on the beach and searching in salt water, if the signal from the ground can not be ignored entirely, look for the setting in which in the horizontal (left-right) movement of the search coil of about 2-5 cm above the ground, have not drastic false signals, ie the metal detector does not sound like from a detected metal object in the absence of a real one. In such situations, it is usually necessary potentiometers THRESHOLD and GAIN to be set at lower levels, as instead of drastically reducing of the GAIN potentiometer is recommended reduction of the THRESHOLD potentiometer.

***Described above, vertical movement of the search coil, to the choice of most appropriate auto ground zone, should be carried at a place, with no metal objects near to the search coil, ie the piece of land on which moves the search coil should not contain metal objects.***

Otherwise, they would interfere the selection process of zone, therefore can not be selected most appropriate auto ground zone. Whether the terrain is clean, is easily established, when the search coil is moved horizontally above the terrain, ie without changing its distance towards the ground. When there are no metal objects, the predefined from the THRESHOLD potentiometer sound would not be changed.

After the choosing of auto ground zone has been finished, the GROUND MODE switch remains in "AUTO" position (auto ground balance), while the DISCR LEVEL and THRESHOLD potentiometers are turned to the desired from the user levels.

***When changing the terrain with another, significantly different from the previous (changing the soil characteristics), to the metal detector remain stable, necessary as described above, again to assess which is most suitable in the case auto ground zone.***

## 9.5. GROUND COARSE POTENTIOMETER



***The GROUND COARSE potentiometer (old name: GROUND RUDELY) serves as a coarse (base, fast) setting of the ground balance in a manual ground balance working mode, ie for a base eliminate of the ground effect at work in a manual ground balance working mode.***

***The GROUND COARSE potentiometer is used in combination with GROUND FINE potentiometer.***

***The recommended level for GROUND COARSE potentiometer is level "5" to about level "8".***

***Most often works at level around "5".***

### **For manual adjustment of the ground balance is needed:**

- to be chosen the manual ground balance mode (GROUND MODE switch turned to "MAN" position);
- the DISCR LEVEL potentiometer to be set at a level "0";
- the THRESHOLD potentiometer to be turned at a level, just before the level where the metal detector starts slightly zoom sound made (issued torn sound, buzzing, whiz) or one or two levels before the level of zoom (recommended for beginners searchers);
- the GROUND FINE potentiometer, to be set at a middle position, ie at a level "5".

Then is done vertical (up-down) movement of the search coil ranging from 2-3 cm to 20-25 cm above the terrain, simultaneously with turning the GROUND COARSE potentiometer. At some levels of the GROUND COARSE potentiometer, the sound is louder when the search coil is near the ground, while at others the sound is louder when the search coil is high above the ground.

***The balancing is actually finding the level (position) of the GROUND COARSE potentiometer, in which in the described manner of movement of the search coil, the metal detector does not beeps or issue possible weak sound, or at least the pre-set audio threshold level did not change significantly.***

***After the base balancing by GROUND COARSE potentiometer, if necessary, the metal detector can be further fine balancing by GROUND FINE potentiometer and described above vertically (up and down) movement of the search coil.***

In mineralized terrains, if has a strong responsive signal from the terrain and the manual balancing is difficult or the user has small practical experience, is recommended the THRESHOLD potentiometer to return with one or two levels back at the level where the metal detector starts to slightly zoom, then proceeding to the descriptions above balancing. In addition, in order to reduce the response signal from the ground, can be set in advance desired level of discrimination (DISCR LEVEL potentiometer from level "0" is placed in the desired operating level) and then performed the described above balancing of the metal detector.

For soils containing large amounts of salts, in moist and wet soils, in clay soils, when searching on the beach and searching in salt water, if the signal from the ground can not be ignored entirely, look for the setting in which in the horizontal (left-right) movement of the search coil of about 2-5 cm above the ground, have not drastic false signals, ie the metal detector does not sound like from a detected metal object in the absence of a real one. In such situations, it is usually necessary potentiometers THRESHOLD and GAIN to be set at lower levels, as instead of drastically reducing of the GAIN potentiometer is recommended reduction of the THRESHOLD potentiometer.

***The balancing should be carried at a place, with no metal objects near to the search coil, ie the piece of land on which is being done the described vertical movement of the search coil, should not contain metal objects.***

Otherwise, they would interfere the balancing process and the metal detector can not be balanced or will be balanced incorrectly. Whether the terrain is clean, is easily established, if the GROUND COARSE potentiometer is turned to a middle position and the search coil is moved horizontally above the terrain, ie without changing its distance towards the ground. When there are no metal objects, the predefined from the THRESHOLD potentiometer sound would not be changed. One other possibility is the chosen balancing terrain to be searched for metal objects in advance while using the automatic ground balance mode (GROUND MODE switch turned to "AUTO" position).

After the balancing has been finished, the GROUND MODE switch remains in "MAN" position (manual ground balance), while the DISCR LEVEL and THRESHOLD potentiometers are set to the desired from the user levels.

***When changing the terrain with another, significantly different from the previous (changing the soil characteristics), the metal detector should be balanced again following the above-described way, so that it remains stable. In most cases, when changing the terrain with another, or change in the characteristics of the terrain, should be made only adjustment of the ground balance by GROUND FINE potentiometer.***

***In v3, the setting of the ground balance should be done with more attention! This of course, albeit to a lesser extent, applies to all other versions. In order to balance, the level of potentiometer GROUND COARSE be increased until disappeared the sound from the ground or until it is reduced to an acceptable level. Greater increase in the level of potentiometer GROUND COARSE, than is necessary, can lead to decrease of the depth of detection.***

## 9.6. GROUND FINE POTENTIOMETER



The **GROUND FINE** potentiometer serves as a further fine (precise) setting of the ground balance in a manual ground balance working mode, ie for a fine and complete eliminate of the ground effect at work in a manual ground balance working mode.

The **GROUND FINE** potentiometer is used in combination with **GROUND COARSE** potentiometer.

The recommended level for **GROUND FINE** potentiometer is level "5". This allows, if required, through it to be made easy adjustment of the ground balance, by turning it on the left (levels from "4" to "-") or on the right (levels from "6" to "+").

**GROUND FINE** potentiometer is used for adjustment of an already set at base level by **GROUND COARSE** potentiometer, ground balance, in manual ground balance mode.

Additional information on the process of balancing in manual ground balance mode has in the description of a **GROUND COARSE** potentiometer available above.

*In practice, in a manual ground balance mode, the most commonly used settings are:*

**Setting for medium mineralized terrain in GAIN = MAX, GROUND MODE = MAN:**

- For v2: **GROUND FINE** = "5", **GROUND COARSE** = "6";
- For v2i: **GROUND FINE** = "5", **GROUND COARSE** = "5";
- For v3: **GROUND FINE** = "5", **GROUND COARSE** = "4".

**Setting for high mineralized terrain in GAIN = MAX, GROUND MODE = MAN:**

- For v2: **GROUND FINE** = "5", **GROUND COARSE** = "8";
- For v2i: **GROUND FINE** = "5", **GROUND COARSE** = "7";
- For v3: **GROUND FINE** = "5", **GROUND COARSE** = "6".

*In this mode (setting for high mineralized terrain) easily be rejected also very rotten (decomposed) small iron plates, pieces of tin cans and other heavily corroded irons, and of course, objects and soils with high content of iron and iron oxides.*

## 9.7. THRESHOLD POTENTIOMETER



The **THRESHOLD** potentiometer serves to define the desired from the user audio threshold and sensitivity of the metal detector.

It is adjusted at absence of metal objects around the search coil of the metal detector and depends on the terrain.

The recommended levels for **THRESHOLD** potentiometer are from level "4" to about level "6".

The best depth for finding metal objects is achieved, when the **THRESHOLD** potentiometer is turned in a position, corresponding to a quiet zoom sound made by the metal detector in working mode (issued torn sound, buzzing, whiz).

*Quiet zoom sound mode is suitable for experienced seekers. The beginners should work at lower levels, i.e. with completely silent (quiet) metal detector.*

When working in manual ground balance mode, is necessary the final audio threshold level to be set only after the metal detector is balanced.

The maximal audio threshold corresponding to a stable metal detector condition depends on the terrain's characteristics, the metal detector balancing (in manual ground balance mode) and the user search speed.

For soils containing large amounts of salts, in moist and wet soils, in clay soils, when searching on the beach and searching in salt water, is recommended potentiometer **THRESHOLD** to be set at lower levels (from "5" to "3").



**The proper adjustment of THRESHOLD potentiometer (setting lower levels) is one of the options by which BLISSTOOL LTC64X can be turned into a completely silent (quiet) metal detector.**

## 9.8. SILENCER POTENTIOMETER



**The SILENCER potentiometer serves for setting of the degree of suppression of the background sound and for stabilization of the audio threshold.**

**The recommended levels for SILENCER potentiometer are from level "OFF" to about level "2". Most often works at level "OFF".**

**The background sound is a set from defined by THRESHOLD potentiometer audio threshold of the metal detector and imported external noises (the base signal on the ground and other external interferences).**

**In most cases, the volume of the background sound is equal to the volume of the audio threshold, but its inequality due to imported external noises.**

**On the higher level is set potentiometer SILENCER, the more stable is the audio threshold of the detector.**

**With the increase of the silencer, not to overdo, since any increase improves the stability of the metal detector, but at the same time makes it less sensitive to weak signals from deep buried metal objects.**

**Recommended settings in which retains good depth of detection:**

- For v2: SILENCER = from "OFF" to "3";
- For v2i: SILENCER = from "OFF" to "5";
- For v3: SILENCER = from "OFF" to "FULL".

In the level "OFF" of SILENCER potentiometer, the silencer is turned off and the volume of the background sound is equal to the volume of the sound produced by the metal detector at detection of a metal object.

At levels, from level "1" to level "FULL", of a SILENCER potentiometer, the silencer is turned on and with each next level is increased the difference between the volume of the background sound and the volume of the sound produced by the metal detector at detection of a metal object.

Real, the SILENCER potentiometer reveals many opportunities to change the behavior of the metal detector, in order to optimize it.

**With the silencer turned on (from level "1" to level "FULL" of the SILENCER potentiometer), the volume of the background sound (audio threshold + interference) can be adjusted so that it could hardly be heard by the user, while the volume of the sound produced by the metal detector at detection of a metal object to be several times greater, so that when a metal object is detected is obtained "eruption" of the sound produced by the metal detector.**

In terrains with low mineralization and absence of external noise, it is advisable to operate at lower levels of SILENCER potentiometer.

In highly mineralized terrains and in terrains with a high content of ore, SILENCER potentiometer can be set at higher levels, for ignoring at a greater degree of the base signal from the terrain and maintain of the stability of the metal detector.

**With the silencer turned on, BLISSTOOL LTC64X can be configured to work with maximum adjusted audio threshold set by THRESHOLD potentiometer, ie with maximum sensitivity and thus the maximum depth of detection, and still be stable.**

Furthermore, by examining the detected metal object at different levels of SILENCER potentiometer, can be obtained basic idea of how deep it is.

**In v3, depending on whether the silencer is turned on or not, are clearly distinguish two separate working modes of the metal detector:**

**1/ Mode "Explosion": GAIN = between "5" and "MAX", SILENCER = "OFF", THRESHOLD = "5" (without audio threshold);**

2/ Mode "Waft": GAIN = between "5" and "MAX", SILENCER = between "3" and "FULL", THRESHOLD = "6" - "7" (with audio threshold).

These modes are also present in the other versions (v1, v2, v2i), but in v3 they are best expressed.

Categorically, v3 is with extreme improved sensitivity to very small metal objects. In mode "Waft", for deep and weak signals, is possible to need to work on higher levels of potentiometer SILENCER.

The proper adjustment of SILENCER potentiometer (setting higher levels) is one of the options by which BLISSTOOL LTC64X can be turned into a completely silent (quiet) metal detector.

## 9.9. DISCRIMINATOR SWITCH



The DISCRIMINATOR switch serves to set the maximum range of discrimination of the metal detector, ie it defines the scope of potentiometer DISCR LEVEL.

The various modes are conditional numbered as: "I", "II" and "III".

The purpose of using of DISCRIMINATOR switch is, for a particular terrain, the user to find this mode in which the metal detector has the most sinless and therefore the best discrimination. For this purpose, DISCR LEVEL and DISCR DEPTH potentiometers should also be adequately adjusted.

The recommended position of DISCRIMINATOR switch is mode "III".

For beginner searchers, the most appropriate is mode "I", as in this mode choke up in most the ground background and the local heterogeneous clusters.

In the same situation DISCR LEVEL and DISCR DEPTH, the scope of discrimination is the widest in mode "I", with an average width is in mode "II", and the closest is in mode "III".

The ratio of the individual modes is:

mode "III" = 1 x mode "III"

mode "II" = 1.5 x mode "III"

mode "I" = 2 x mode "III"

In mode "III", the scope of discrimination is limited to small pieces of aluminum foil, ie in this mode can discriminate mainly iron. According to the user setup of potentiometers DISCR LEVEL and DISCR DEPTH, can be ignored: iron and small pieces of aluminum foil. Mode "III" is suitable for search of iron, gold, copper, bronze and silver metal objects (foils, coins, jewelry, artifacts), ie this mode is universal because it is suitable for all metal objects: low conductive, highly conductive, low quality, high quality.

In mode "II", the scope of discrimination is limited to small pieces of low conductive metals and alloys (usually different modern pollutants from non-ferrous metals). According to the user setup of potentiometers DISCR LEVEL and DISCR DEPTH, can be ignored: iron; small pieces of aluminum foil; various modern pollutants from non-ferrous metals; thin foils from non-ferrous metals. Mode "II" is suitable for search of copper, bronze and silver metal objects (foils, coins, jewelry, artifacts), ie this mode is special as it is only suitable for the following metal objects: highly conductive, low quality, high quality.

In mode "I", the scope of discrimination is limited to small pieces of low quality metals and alloys (small, low quality and thin pieces of non-ferrous metals). According to the user setup of potentiometers DISCR LEVEL and DISCR DEPTH, can be ignored: iron; small pieces of aluminum foil; various modern pollutants from non-ferrous metals; thin foils from non-ferrous metals; small, low quality and thin pieces of non-ferrous metals. Mode "I" is suitable for search of silver metal objects (coins, jewelry, artifacts), ie this mode is special as it is only suitable for the following metal objects: highly conductive, high quality.

Besides a change in the scope of discrimination, with the change of the mode, is change and the basic behavior of the metal detector in regard to the ground and the located in it metal objects. Therefore, in practice, through DISCRIMINATOR switch, the user can set three different basic behaviors of the metal detector in terms of its discrimination, ie though having three different metal

**detectors.**

Work in lower discrimination mode, set by DISCRIMINATOR switch, is recommended only in extreme necessity. So if the terrain allows it, it is recommended always to work under a mode "III". In mode "III", the metal detector has the lowest, but the safest discrimination. Working in small mode, for example "II" or "I", only makes sense when mode "III" is insufficient to comfortably search. These are situations in which the aim is ignoring at a greater degree of the characteristics of the terrain, such as highly contaminated terrains, terrains with a high content of ore and slag, and areas with hot rocks. In mode "I", the metal detector muted in most the response signal caused by the ore and slag.

***When is detected metal object, the consistent switching in different modes of the DISCRIMINATOR switch, allows examination of the detected object at different levels of discrimination and at different behavior of the metal detector. Thus, relatively easily, may become more complete idea for the detected object.***

***The specific behavior of the metal detector at the appropriate mode of the DISCRIMINATOR switch, depends and from the current settings of the DISCR LEVEL and DISCR DEPTH potentiometers. Therefore, the optimal setting of discrimination is different for each terrain and can only be achieved with practice and knowledge of the metal detector and the terrain.***

***It is recommended to work at possible higher mode of DISCRIMINATOR switch. Working at less than real proper mode of discrimination, selected by DISCRIMINATOR switch, in combination with set at a higher levels DISCR LEVEL and DISCR DEPTH potentiometers, may lead to rejection of signals from small or deeply buried non-ferrous metals, especially when they are at great depth in mineralized terrains, or under mineralized ceramics and/or mineralized stones and rocks.***

## 9.10. DISCR LEVEL POTENTIOMETER



The DISCR LEVEL potentiometer serves for adjusting the detection/rejection level of iron, tin-foil and low-grade non-ferrous metals (usually pollutants), and for baseline exclusion of the discrimination (All metals mode) when it is set to level "0".

The recommended levels for DISCR LEVEL potentiometer are:

- from "3" to "6" at DISCRIMINATOR switch in mode "I";
- from "3" to "8" at DISCRIMINATOR switch in mode "II";
- from "3" to "10" at DISCRIMINATOR switch in mode "III";

Most often works at level around "4". For beginner searchers is recommended work at higher levels (about level "6").

**In level "0" the discrimination is excluded**, ie the metal detector produced same sound for all metals, ie it does not distinguish them and does not rejected them. For a complete exclusion of the discrimination, may further the DISCR DEPTH potentiometer also to be set at level "0".

*In level "0" of DISCR LEVEL potentiometer, in combination with level "0" of DISCR DEPTH potentiometer, the metal detector is in real mode "All metals". This mode is appropriate when the target is to be detected absolutely all metal objects available in the soil (ferrous and non-ferrous metals). In this mode, is recommended to carry out precision choice of auto ground zone and/or manual balancing of the metal detector, with the aim of achieving the maximal balance for a particular terrain.*

**When increasing the level of the DISCR LEVEL potentiometer, the metal detector starts to distinguish the metals**, and at each successive level betters the discrimination, ie the metal detector rejected to a greater extent iron, tin-foil and low-grade non-ferrous metals.

*Upon detection of non-ferrous metals (copper, bronze, silver, gold) is heard a short, dense and uninterrupted single sound with each pass of the search coil over them.*

*Upon detection of ferrous metals (iron), the sound is interrupted (intermittent), blunted or absent, ie they are completely ignored (rejected). Moreover, in the most cases, especially when they have a long side, the ferrous metals issue dual sound (two sounds one after another) with each pass of the search coil over them.*

*In a large local inhomogeneity (clusters) on a particular stretch of the terrain, such as topical clustering of irons, in locally scattered small irons, on terrains with a high content of ore and slag, or on terrains whose soil is mixed with small pieces of mineralized ceramics, it is possible the metal detector to produce a sound, that is long and scattered, and sometimes heterogeneous, broken or blunted. By nature, it can remind the sound of ferrous metal or sound of non-ferrous metal, but always apart from them, for example, that it is long and scattered, ie it has not solid area for centering.*

At levels from "3" to "10", the metal detector rejects at a different level iron objects, tin-foil and low-grade non-ferrous metals, ie when detecting them it is making either no sound or a quiet pop sound.

*Upon detection of very weak signal, for its better detection and discrimination, that surface may be slightly cleaning by removing from 1 to 3 cm from the soil layer, to reduce the depth of which is buried the found object.*

Upon detection of unresolved (dubious) signal, usually heavily corroded iron, iron with alloys or deeply buried non-ferrous metal, to assess what is the metal, it can be studied at different levels of discrimination. For this purpose, the level of discrimination set by DISCR LEVEL potentiometer can be increased further, or the metal detector to be switched to lower discrimination mode through DISCRIMINATOR switch.

*In v3, in small degree has improved and the discrimination. For the same discrimination, compared with v2, in v3 is necessary to work with smaller levels of discrimination. Example: for v2: DISCR LEVEL = "5"; and for v3: DISCR LEVEL = "3".*

*The specific behavior of the metal detector at the selected setting of DISCR LEVEL potentiometer, depends and from the current settings of the DISCRIMINATOR switch and DISCR DEPTH*

*potentiometer. Therefore, the optimal setting of discrimination is different for each terrain and can only be achieved with practice and knowledge of the metal detector and the terrain.*

*It is recommended to work at possible lower level of DISCR LEVEL potentiometer. Working at a higher than real proper level of DISCR LEVEL potentiometer, in combination with set at a higher level DISCR DEPTH potentiometer, and set to a lower mode DISCRIMINATOR switch, may lead to rejection of signals from small or deeply buried non-ferrous metals, especially when they are at great depth in mineralized terrains, or under mineralized ceramics and/or mineralized stones and rocks.*

### 9.11. DISCR DEPTH POTENTIOMETER



*The DISCR DEPTH potentiometer serves for adjusting of a specific depth of discrimination. This is the maximum depth to which the metal detector distinguish the metals, ie the depth to which the metal detector rejects respective ferrous metals and pollutants.*

*The recommended levels for DISCR DEPTH potentiometer are:*

- level "10" for terrains contaminated with small irons (small heavily corroded iron nails, iron nails with large head, small pieces of wire, small highly corroded irons and steel);*
- from level "7" to level "9" for non contaminated with small irons terrains;*
- from level "0" to level "6" when search for any type of metal (ferrous and non-ferrous), ie when not intended to ignore ferrous metals.*

*Most often works at level "9". For beginner searchers, and in the presence of small iron, is recommended work at level "10".*

*By increasing the level of the DISCR DEPTH potentiometer, set the depth of discrimination begins to grow, and increasing from 0% to 100% of the real potential for the respective metal object.*

*The depth of the discrimination does not increase linearly with increasing the level of DISCR DEPTH potentiometer, and strongly depend from the dimensions of the respective metal object (sizes, form, uninterrupted flat surface).*

*In the table available below, are presents indicative data for the function of the DISCR DEPTH potentiometer in respect of metal objects with different flat surface. The depth of discrimination is presented in percentages (%) and in the approximate their equivalent in centimeters (cm) for real search on terrain.*

Given that in real the depth of detection is the distance from the metal object to the surface of the search coil, and given that in standard search underway, usually the search coil is located at a distance from 1 to 3-5 cm above the surface of the terrain, ie these centimeters are literally lost in regard to a maximum depth of detection, in the table in bold are presented practically important data for the depth of discrimination, in real field work for the relevant setting (level) of the DISCR DEPTH potentiometer.

The shown in the table percentages (%) and corresponding centimeters, are indicative and refer to the worst case, ie relate to iron objects that are ignored by hard (Group 1) compared to the other (Group 2):

**Group 1:** iron objects with round, square and/or rectangles form, with ratio of their flat sizes 1:1 or 1:2, ie these are iron objects whose form is similar to the form of coins. The iron objects with such form are the most difficult to ignore, and exactly data about them are available in the table above;

**Group 2:** iron objects with elongated form, with ratio of their flat sizes 1:3, 1:4, 1:5... 1:10 and so on, ie they are iron objects whose one size many times exceeds the other. Such are various long pieces of wire, various blades, large nails, etc. Iron objects of such form are ignored and/or identified as iron much easier, especially if their long side is located along and across to the surface of the search coil. For such objects, the real percentages (%) and corresponding centimeters, are higher than those described in the table above.

Level of DISCR DEPTH	Depth of discrimination in real field work			
	for very small iron objects	for small iron objects	for medium-sized iron objects	for large iron objects
0	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm
1	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm
2	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm
3	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm
4	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm
5	0% ~ = 0 cm	0% ~ = 0 cm	0% ~ = 0 cm	40% ~ = 16 cm
6	0% ~ = 0 cm	20% ~ = 4 cm	40% ~ = 12 cm	50% ~ = 20 cm
7	10% ~ = 1 cm	40% ~ = 8 cm	<b>50% ~ = 15 cm</b>	<b>60% ~ = 24 cm</b>
8	40% ~ = 4 cm	<b>50% ~ = 10 cm</b>	<b>60% ~ = 18 cm</b>	<b>70% ~ = 28 cm</b>
9	50% ~ = 5 cm	<b>60% ~ = 12 cm</b>	<b>70% ~ = 21 cm</b>	<b>80% ~ = 32 cm</b>
10	<b>100% ~ = 10 cm</b>	<b>100% ~ = 20 cm</b>	<b>100% ~ = 30 cm</b>	<b>100% ~ = 40 cm</b>

**Data from the table can be presented in the form of conclusions:**

- at levels from "0" to "4", in a practice for a most common sizes of iron objects, the depth of discrimination is practically equal to 0 cm, ie the metal detector produced the same sound (single solid signal) for all metals and consequently do not distinguish and reject them;
- at levels from "4" to "6", partial depth of discrimination has partially for medium and large iron objects, therefore, in practice can be assumed that up to level "6" the metal detector does not distinguish the metals;

**- in level "0" of DISCR DEPTH potentiometer, in combination with level "0" of DISCR LEVEL potentiometer, the metal detector is in real mode "All metals". This mode is appropriate when the target is to be detected absolutely all metal objects available in the soil (ferrous and non-ferrous metals). In this mode, is recommended to carry out precision choice of auto ground zone and/or manual balancing of the metal detector, with the aim of achieving the maximal balance for a particular terrain.**

- with increase of the level, the set depth of discrimination begins to grow, as with each successive level the depth of discrimination is greater. This in practice is observed at levels from "7" to "10". At these levels, on detection of non-ferrous metals (copper, bronze, silver, gold) is heard a dense and uninterrupted sound, and on detection of ferrous metals (iron) the sound is interrupted (intermittent) or absent, ie they are completely ignored (rejected);
- medium and large iron objects are rejected satisfactory at levels "7" and "8", and entirely at levels "9" and "10";
- small iron objects are rejected satisfactory at level "9", and entirely at level "10";

**- very small iron objects are rejected satisfactory and entirely only at level "10".**

**For this, level "10" is highly recommended setting for terrains contaminated with small irons (small heavily corroded iron nails, iron nails with large head, small pieces of wire, small highly corroded irons and steel);**

- at level "10", the depth of discrimination is 100%, ie it is most and respectively at this level the metal detector rejects the relevant iron object to the greatest depth. This depth expressed in centimeters, is different for the different iron objects, as it depends heavily from the uninterrupted flat surface of the relevant iron object. The maximum depth of discrimination (depth of discrimination 100%) is: for very small iron objects: ~ 10 cm; for small iron objects: ~ 20 cm; for medium-sized iron objects: ~ 30 cm; and for large iron objects: ~ 40 cm.

**It is recommended to work at possible lower level of DISCR DEPTH potentiometer. Working at a higher than real proper level of DISCR DEPTH potentiometer, in combination with set at a higher level DISCR LEVEL potentiometer, and set to a lower mode DISCRIMINATOR switch, may lead to rejection of signals from small or deeply buried non-ferrous metals, especially when they are at great depth in mineralized terrains, or under mineralized ceramics and/or mineralized stones and rocks.**

*The reason for this, is that such terrains are usually with negative mineralization and thus mask (hide) the deep non-ferrous objects as ferrous. So, if under such conditions be set a maximum depth of discrimination (DISCR DEPTH potentiometer set to level "10"), has probability the weaker signals from non-ferrous metals to be rejected as ferrous. To prevent this, is sufficient the DISCR DEPTH potentiometer to be set at a lower level: "9", "8" or even at level "7", if the terrain is not contaminated with very small and small irons.*

For optimum performance under such conditions, it is desirable the metal detector to be preset and balanced on the terrain to a specific piece of ceramic, stone or rock.

*In practice, in discrimination mode, under extreme field conditions, such as contaminated and simultaneously mineralized terrains, the user must make a choice:*

*Choice 1: to adjust DISCR DEPTH potentiometer at level "10" to reject the smallest irons, ie any tendency to iron signal, in order not to dig iron, but with risk to miss the weak signals from small or deeply buried non-ferrous metals;*

*or*

*Choice 2: to adjust DISCR DEPTH potentiometer at level "8" to easily detect non-ferrous metals present in greater depth in the relevant mineralized terrain or that are located in mineralized ceramics and/or mineralized stones and rocks, but while not entirely to reject many small irons and partly small irons, ie may need to dig some and other irons at the relevant contaminated terrain.*

*The specific behavior of the metal detector at the selected setting of DISCR DEPTH potentiometer, depends and from the current settings of the DISCRIMINATOR switch and DISCR LEVEL potentiometer. Therefore, the optimal setting of discrimination is different for each terrain and can only be achieved with practice and knowledge of the metal detector and the terrain.*

## **9.12. LOUDSPEAKER**



*The Loudspeaker serves for producing a sound when the metal detector detect an object. The sound is deep-toned and non-pausing for non-ferrous metals and recurring (repeating) for ferrous metals (iron).*

**The loudspeaker lies on the back panel of the electronic block.**

### 9.13. PHONES CONNECTOR



The PHONES connector serves for plug to metal detector, if necessary, stereo headphones with 6.35mm (1/4") stereo jack. When the headphones are plugged in, the loudspeaker is switched off automatically and the metal detector's sound is heard only in the headphones. To make this possible, in advance, by pulling back, from the connector PHONES must be removable the protective cap, designed to prevent from corrosion, contamination and water its pins.

**ATTENTION:** To protect your hearing, it is desirable before turning stereo headphones to BLISSTOOL LTC64X, to reduce the volume of the metal detector by VOLUME potentiometer, as put it between levels "2" and "3".

**The use of stereo headphones with set high volume of the sound by the VOLUME potentiometer can seriously damage your hearing!**

**In order to protect BLISSTOOL LTC64X from damage, is recommended the inclusion and exclusion of the jack of the stereo headphones to/from the PHONES connector, to be carried in power-off condition of the metal detector! Furthermore, the jack of the stereo headphones should be excluded from connector PHONES also in transportation of the metal detector, again to prevent damage!**

The use of stereo headphones while using the metal detector has many advantages:

- the stereo headphones block outside noise such as wind and traffic and allow you to hear better, even the weakest signals from deeply buried metal objects;
- through their use, the sound of your metal detector will not interfere with other searchers around you;
- their use, provides reduced power consumption from the LiPo battery of the metal detector, leading to an extension of its life.

**When leaving of the metal detector on the ground, care must be taken during the PHONES connector in its electronic block to not enter sand, dust or moisture.**

### 9.14. COIL CONNECTOR



The COIL connector serves for connection of the search coil of the metal detector to its electronic block.

For quality work of the metal detector, connector COIL and the connector of the search coil which includes in it, must be kept from dust, dirt, moistening and wetting.

### 9.15. BAT LOW LED



The BAT LOW LED shows the available charge in the LiPo battery. When this LED lights up, it is a signal for low battery.

In very low battery, from the loudspeaker of the metal detector began to hear periodic pulled sounds and the metal detector stops working or not working correctly.

### 9.16. CHARGE CONNECTOR



The CHARGE connector serves for connection of the automatic LiPo battery charger to the built-in LiPo battery of the metal detector. To make this possible, in advance, by pulling back, from the connector CHARGE must be removable the protective cap, designed to prevent from corrosion, contamination and water its pins.

**The charging of the LiPo battery is carried out according to the description in 19.**



The described below GAIN and TONE potentiometers, are only available in BLISSTOOL LTC64X and absent in BLISSTOOL LTC64. Therefore, BLISSTOOL LTC64X is extended version of BLISSTOOL LTC64.

### 9.17. GAIN POTENTIOMETER



*The GAIN potentiometer serves to define the input AC amplification of the signal from the detected object.*

*The proper adjustment of the GAIN potentiometer provides increased depth of detection.*

*The recommended level for GAIN potentiometer is about level "6". This level may vary, depending on the characteristics of the terrain and the external weather conditions. Choose that level at which the metal detector retains its stability.*

*Usually, the best depth of detection is achieved when the GAIN potentiometer is in level "MAX", but not always this high level is the best choice.*

*For beginner searchers and initial use and knowledge of the metal detector, should work at a levels of "MIN" to "3".*

At terrains with, from low to medium mineralization, GAIN potentiometer may be increased at a level greater than level "6", for example, of level "8" or level "MAX" in order to increase the depth of detection.

*In highly contaminated with iron terrains, in soils containing large amounts of salts, in moist and wet soils, in clay soils, when searching on the beach and searching in the salt water, in some highly mineralized terrains and in terrains with a high content of ore, usually GAIN potentiometer must be set at a level less than level "6" (typically at levels from "MIN" to "3"), since in such terrains are much larger background and response signals from the field. At high levels of potentiometer GAIN, they could lead to greater instability, blunting, withdrawal, nasal and/or cutting of the signal from the detected metal object and/or a failure to ground balance the metal detector to the field.*

*Signaling for the fact that the GAIN potentiometer is increased to a level greater than the actual eligible for the relevant conditions, is the presence of great instability, blunting, withdrawal, nasal and/or cutting of the signal from the detected metal object, and in principle, of the sound of the metal detector upon approaching of the search coil very close to the terrain. In the perception of any of these signs, potentiometer GAIN should be reduced to a level where the sound of the metal detector regains its purity, openness and stability.*

Under extreme field conditions, the setting of a GAIN potentiometer of a smaller levels, stabilize the metal detector, which allows to achieve better depth of detection after adjust the sensitivity and the behavior of the metal detector by THRESHOLD and SILENCER potentiometers.

The GAIN potentiometer must be reduced to a level less than level "6" and in the presence of strong external interference and/or other factors that cause visible instability of the metal detector.

*Because their primary function, the setting of the GAIN potentiometer affect to the other settings of the metal detector, and especially on setting of its ground balance and its audio threshold. For this, is desirable its setting to be done before the rest of the metal detector settings, or after any change of the GAIN potentiometer, to be done complete setup of the metal detector.*

*At work in manual ground balance mode (GROUND MODE = MAN), after each change of the setting of potentiometer GAIN, need again to be made manual ground balance of the metal detector (from potentiometers GROUND COARSE and GROUND FINE).*

## 9.18. TONE POTENTIOMETER



*The TONE potentiometer serves to regulate the frequency of the output sound of the metal detector, to ensure stability of the audio threshold for specific conditions.*

*The recommended levels for TONE potentiometer are level "MIN" and level "MAX", but in practice it is desirable the user to set the most audible and pleasant sound to him, without restriction in the choice of level of TONE potentiometer.*

*In the presence of external interference and/or under specific field conditions, for a particular level of TONE potentiometer, it is possible to get instability of the audio threshold of the metal detector. The instability is removed by adjusting of TONE potentiometer of level different from the current. Select this level, thus achieving maximum stabilization of the audio threshold of the metal detector.*

For specific conditions, at a given frequency, can be obtained better sensitivity of the metal detector, than in other frequency (other level of TONE potentiometer).

*Under the same conditions, when connected to the metal detector of another, additional, BLISSTOOL search coil, other than the standard 28 cm (11") DD search coil BLISSTOOL DD28SC2, with which the metal detector is equipped in the standard package, the best base setting of potentiometer TONE may be different from the user's chosen a good base setting for the standard 28 cm (11") DD search coil. For the new search coil, the best base setting of potentiometer TONE is that in which the metal detector detects with a clear rich sound the weak signals from deeply buried metal objects. In this regard, the best setting is a combination of the individual settings of potentiometer TONE and potentiometer FREQUENCY.*



Fig.4 / Setting, indication and maintenance bodies of BLISSTOOL LTC64X

## **10. SENSITIVITY. MODE "EXPLOSION" AND MODE "WAFT". MODE WITHOUT AUDIO THRESHOLD (SILENT MODE) AND MODE WITH AUDIO THRESHOLD.**

*The sensitivity of BLISSTOOL LTC64X is set complex from potentiometers GAIN, THRESHOLD and SILENCER, not just with a single potentiometer. In this respect, in BLISSTOOL LTC64X are available two basic modes for work: mode "Explosion" and mode "Waft". Broadly speaking, the metal detector operates in mode "Explosion" when turn off the silencer (SILENCER at level "OFF"), and in mode "Waft" when turn on the silencer (SILENCER at levels from "1" to "MAX", but mostly at higher levels (from "5" to "MAX"). In both modes, in order to achieve top performance, the metal detector must be balanced to the ground, and if necessary stabilized by potentiometers TONE and FREQUENCY.*

**BLISSTOOL LTC64X be brought in the mode "Explosion" in increasing its sensitivity up to the maximum possible or close to it.** For example, in the following settings: GAIN = "8" or "MAX", THRESHOLD = "6.0" or "6.5", SILENCER = "OFF". In this mode, the audio threshold of the metal detector is likely to be more or less unstable, but at the expense of this, the deep weak signals are detected with a powerful rich sound resembling an explosion, ie with a sound volume similar to the volume with which are detect shallow buried metal objects. This mode allows faster and more casual search, as the deep weak signals are detected with sufficiently powerful and easily audible sound, and do not need constant monitoring from the user, to the nuances in the sound threshold, as in mode "Waft". On the other hand, because of the instability of the audio threshold and the possible occurrence of false signals, mode "Explosion" is suitable only for experienced users and is not recommended for beginners. In order to maintain the sensitivity and depth of detection, and at the same time providing a comfortable search, mode "Explosion" can be combined with silent mode, ie mode without audio threshold. For this purpose, the THRESHOLD potentiometer is set to one or two levels, before the level in which is available audio threshold. For example, in the following settings: GAIN = "MAX", THRESHOLD = "5", SILENCER = "OFF".

**BLISSTOOL LTC64X be brought in mode "Waft" while increasing its sensitivity to a level at which remains stable and smooth sound threshold of the metal detector.** For example, in the following settings: GAIN = "6", "8" or "MAX", THRESHOLD = "6.0" or "6.5", SILENCER = "5" (or a level from "1" to "MAX"). In this mode, the audio threshold of the metal detector is perfectly smooth and even, without false signals, ie the metal detector buzzing like a bee. In consequence, the deep weak signals are detected as shade with greater force of the sound threshold, ie as waft and for their noticing, ie hearing, is required more attention from the user, in combination with a slower and more careful search. For comparison, the same deep weak signals in mode "Explosion" are detected with a strong and easily audible sound, but the metal detector is not quite as stable. Mode "Waft" allows comfortable search in mode with audible threshold and also in silent mode. It is suitable for both beginners and advanced.

**BLISSTOOL LTC64X brought into mode without audio threshold (silent mode) when THRESHOLD potentiometer is set at a level at which there is no audio threshold, ie the metal detector is not buzzing.** For example, with the following setting: THRESHOLD = "5". In order to preserve sensitivity and good depth of detection, is recommended THRESHOLD to not be decreased by more than one or two levels from the level at which appears sound threshold. For example, if the sound threshold appears when THRESHOLD = "6.5", then for set at optimal silent mode, THRESHOLD can be set at "5.5", "5.0" or "4.5".

**BLISSTOOL LTC64X brought into mode with audio threshold when THRESHOLD potentiometer is set at a level that starts to beep audio threshold, ie the metal detector buzzing.** For example, with the following setting: THRESHOLD = "6.5" or "7.0". By potentiometer THRESHOLD, the density of the the buzz, can be adjusted according to the desire of the user and the field conditions, ie the buzz can only be hints or even hears tightly buzz. Recommended the buzz to be neither very strong, nor very weak, ie to achieve threshold level, wherein the metal detector has the best sensitivity.

## **1 1. MAIN DIFFERENCES IN THE CONTROL AND THE POWER OF V4 AND V5 OF BLISSTOOL LTC64X (THE BEAST)**

**v4 and v5 have the same knobs and switches as v3, v2i, v2 and v1, but because of the many improvements and new features of v4 and v5, their potentiometer FREQUENCY (for v4 and v5) and switch AUTO ZONES (only for v5) have a dual function, i.e. they have a second, additional function, only available in v4 and v5.**

**Thanks to this second, additional function of potentiometer FREQUENCY and switch AUTO ZONES, at v4 and v5, in an elegant way, there is provided a quick and convenient access to the new features available in v4 and v5, without the need of adding other knobs and switches.**

**Moreover, v5 is with extreme extended discrimination range and with improved distribution of the three areas for discrimination, selectable by switch DISCRIMINATOR.**

**The main differences in the control and the power of v4 and v5 of BLISSTOOL LTC64X (THE BEAST), compared to v3, v2i, v2, v1, are described below:**

### **1 1.1. POTENTIOMETER FREQUENCY OF V4 AND V5**

**- At v3, v2i, v2 and v1, potentiometer FREQUENCY has only one function:**

**/1/** Change of the operating frequency of the metal detector in range  $\pm 60\text{Hz}$ , in order to avoid external electromagnetic interferences. The metal detector always work in NORMAL mode of the transmitter with normal transmitted power. The basic operating frequency of the metal detector is just one: 8.0KHz for v3, v2i, v2, and 8.5KHz for v1.

**- At v4 and v5, potentiometer FREQUENCY has two functions:**

**/1/** Change of the operating frequency of the metal detector in range  $\pm 600\text{Hz}$ , in order to avoid external electromagnetic interferences and/or in order to switch between the two base operating frequencies: 8.0KHz and 7.4KHz. With setting FREQUENCY = MAX, the metal detector works with base operating frequency 8.0KHz, but with setting FREQUENCY = MIN, the metal detector works with base operating frequency 7.4KHz. By turning the potentiometer FREQUENCY from level MAX to level MIN, provides smooth regulation of the operating frequency from 8.0KHz to 7.4KHz;

**/2/** Switch between NORMAL and TURBO/BOOST mode of the transmitter and smooth regulation of the transmitted power of the transmitter: with setting FREQUENCY = MAX, the metal detector works in NORMAL mode of the transmitter, i.e. with normal transmitted power, but with setting FREQUENCY = MIN, the metal detector works in TURBO/BOOST mode of the transmitter, i.e. with increased transmitted power. By turning the potentiometer FREQUENCY from level MAX to level MIN, provides smooth regulation of the transmitted power of the transmitter from NORMAL to TURBO/BOOST power.

**Because of the combination in v4 and v5 of the above-described two functions of potentiometer FREQUENCY:**

**- with setting FREQUENCY = MAX, v4 and v5 work with base operating frequency 8.0KHz and NORMAL mode of the transmitter with normal transmitted power;**

**- with setting FREQUENCY = MIN, v4 and v5 work with base operating frequency 7.4KHz and TURBO/BOOST mode of the transmitter with increased transmitted power;**

**- by turning the potentiometer FREQUENCY from level MAX to level MIN, provides smooth regulation of the operating frequency from 8.0KHz to 7.4KHz and of the transmitted power of the transmitter from NORMAL to TURBO/BOOST power;**

**- by turning the potentiometer FREQUENCY from level MIN to level MAX, provides smooth regulation of the operating frequency from 7.4KHz to 8.0KHz and of the transmitted power of the transmitter from TURBO/BOOST to NORMAL power.**

**Usually, mode TURBO/BOOST provides several centimeters better depth of detection versus mode NORMAL. Moreover, in TURBO/BOOST mode, the metal detector is more**

## **resistant to external electromagnetic interferences.**

When working in a manual ground balance mode (switch GROUND MODE = MAN), if changing the setting of potentiometer FREQUENCY, is necessary a new manual setting of the ground balance via potentiometers GROUND COARSE and GROUND FINE. It is necessary to increase the level, as typically, the offset is with maximum 1 - 1.5 - 2 levels. For example, if with a setting FREQUENCY = MAX, the metal detector is balanced to the ground at GROUND COARSE = 5.0 and GROUND FINE = 5.0, follows that with a setting FREQUENCY = MIN, for the same terrain, the metal detector will have balance to the ground at GROUND COARSE = about 6.5 and GROUND FINE = 5.0. For low mineralized terrains, this difference is usually negligible, but for medium and highly mineralized terrains, it is significant and should be considered.

**The TURBO/BOOST mode of v4 and v5, is effective not only at low mineralized terrains, but also in medium and highly mineralized terrains, terrains with a high content of ore and terrains dotted with stones and rocks.** However, due to the increased transmitted power in TURBO/BOOST mode, in medium and highly mineralized terrains, terrains with a high content of ore and terrains dotted with stones and rocks, the manual ground balance may be more difficult to achieve, than in mode NORMAL. In such terrains, the manual ground balance in mode TURBO/BOOST, is still relatively easily attainable, but the setting should be done more carefully and more precisely by the user. For this purpose, after the basic setup of the ground balance from potentiometer GROUND COARSE, is very convenient the use of a potentiometer GROUND FINE for additional, fine tuning.

In some terrains, for example in highly mineralized terrains, terrains with a high content of ore and terrains dotted with stones and rocks, and especially in heavy specific field conditions, the TURBO/BOOST mode instead providing of a greater depth of detection, may have the opposite effect. Therefore, in v4 and v5 are available for selection by the user the two modes: mode NORMAL and mode TURBO/BOOST. It provides an opportunity for excellent depth of detection in all field conditions.

### **1 1.2. ADDITION ABOUT POTENTIOMETER FREQUENCY OF V4 AND V5**

**With setting FREQUENCY = MAX, v4 and v5 work with base operating frequency 8.0KHz and NORMAL mode of the transmitter.**

**With setting FREQUENCY = MIN, v4 and v5 work with base operating frequency 7.4KHz and TURBO/BOOST mode of the transmitter.**

**Mode TURBO/BOOST is designed to be used as a search mode in itself, similar of the mode NORMAL.** Not recommended switching between the two modes (NORMAL and TURBO/BOOST), in order to further examination of the detected metal object, because in a manual ground balance mode (GROUND MODE = MAN), the switching between the two modes, requires a new setting of the ground balance of the metal detector. The difference in the ground balance, is particularly noticeable at high levels of GAIN, and also at medium and highly mineralized terrains, terrains with a high content of ore and terrains dotted with stones and rocks. Therefore, switching between the two modes (NORMAL and TURBO/BOOST), in order to further examination of the detected metal object, is only effective at low mineralized terrains and when working with low levels of GAIN (GAIN = from MIN to 3).

Moreover, unlike other brands of metal detectors, **the TURBO/BOOST mode of THE BEAST is designed to be completely stable and universal, like the mode NORMAL.** However, due to the increased transmitted power of the transmitter, mode TURBO/BOOST is not recommended in damp and wet soils, as for such field conditions, mode NORMAL is most suitable.

**Because of the different transmitted power in mode NORMAL and in mode TURBO/BOOST of the transmitter:**

- with a single charge of the LiPo battery, v1, v2 and v2i can work up to about 35 - 40 working

hours;

- with a single charge of the LiPo battery, v3 can work up to about 30 - 35 working hours;
- with a single charge of the LiPo battery, v4 and v5 can work up to **about 30 - 35 working hours in mode NORMAL** and up to **about 16 - 20 working hours in mode TURBO/BOOST** of the transmitter with increased transmitted power.

Then, the battery needs to be recharged.

### **1 1.3. SWITCH AUTO ZONES OF v4 AND v5**

**- At v4, v3, v2i, v2 and v1, switch AUTO ZONES has only one function:**

**/1/** To set one of the three available automatic ground zones at work in automatic ground balance mode (switch GROUND MODE = AUTO). In manual ground balance mode (switch GROUND MODE = MAN), this function of switch AUTO ZONES not working.

**- At v5, switch AUTO ZONES has two functions:**

**/1/** Function identical to its function in v4, v3, v2i, v2 and v1, i.e. to set one of the three available automatic ground zones at work in automatic ground balance mode (switch GROUND MODE = AUTO). In manual ground balance mode (switch GROUND MODE = MAN), this function of switch AUTO ZONES not working;

**/2/** Switching between the three automatic stabilizers available in v5, as this its function work in auto ground balance mode (switch GROUND MODE = AUTO), and also in manual ground balance mode (switch GROUND MODE = MAN):

- **with setting: AUTO ZONES = I, v5 work with an automatic stabilizer with a low degree of stabilization;**
- **with setting: AUTO ZONES = II, v5 work with an automatic stabilizer with a medium degree of stabilization;**
- **with setting: AUTO ZONES = III, v5 work with an automatic stabilizer with a high degree of stabilization.**

**Unlike v5, which has three automatic stabilizers (with low, medium and high degree of stabilization), which can be selected by a switch AUTO ZONES, v4 has only one automatic stabilizer (with a high degree of stabilization), as it always works with it, i.e. therefore is not necessary its switching, switch AUTO ZONES at v4, has only one function, as at v3, v2i, v2 and v1.**

**Because of the combination in v5 of the above-described two functions of switch AUTO ZONES:**

- with settings: GROUND MODE = AUTO, AUTO ZONES = I, the metal detector work in automatic ground balance mode, with an automatic ground zone I and an automatic stabilizer with a low degree of stabilization. Automatic ground zone I is optimized for low mineralized terrains, for which an automatic stabilizer with a low degree of stabilization is completely sufficient;
- with settings: GROUND MODE = AUTO, AUTO ZONES = II, the metal detector work in automatic ground balance mode, with an automatic ground zone II and an automatic stabilizer with a medium degree of stabilization. Automatic ground zone II is optimized for medium mineralized terrains, for which an automatic stabilizer with a medium degree of stabilization is completely sufficient;
- with settings: GROUND MODE = AUTO, AUTO ZONES = III, the metal detector work in automatic ground balance mode, with an automatic ground zone III and an automatic stabilizer with a high degree of stabilization. Automatic ground zone III is optimized for highly mineralized terrains, for which an automatic stabilizer with a high degree of stabilization is completely sufficient;
- with settings: GROUND MODE = MAN, AUTO ZONES = I, the metal detector work in manual

ground balance mode and an automatic stabilizer with a low degree of stabilization;

- with settings: GROUND MODE = MAN, AUTO ZONES = II, the metal detector work in manual ground balance mode and an automatic stabilizer with a medium degree of stabilization;
- with settings: GROUND MODE = MAN, AUTO ZONES = III, the metal detector work in manual ground balance mode and an automatic stabilizer with a high degree of stabilization.

**The automatic stabilizers available in v4 and v5, providing extreme improving of the stability of THE BEAST, as high stability is maintained even when using maximum settings, especially in mode with a stabilizer with a high degree of stabilization (available permanently in v4 and available in v5 with a setting AUTO ZONES = III). Moreover, the improving of the stability, leads and to an improving of the depth of detection.**

#### **1 1.4. ADDITION ABOUT THE AUTOMATIC STABILIZERS AVAILABLE AT V4 AND V5**

**v4 has permanently automatic stabilizer with a high degree of stabilization, but v5 has three automatic stabilizers (with low, medium and high degree of stabilization), which can be selected by a switch AUTO ZONES:**

- **AUTO ZONES = I = automatic stabilizer with a low degree of stabilization;**
- **AUTO ZONES = II = automatic stabilizer with a medium degree of stabilization;**
- **AUTO ZONES = III = automatic stabilizer with a high degree of stabilization.**

In v3, at high levels of THRESHOLD in combination with high levels of GAIN, for example, when GAIN = MAX, and off silencer (SILENCER = OFF), i.e. with maximum sensitivity of the metal detector, in some terrains and specific terrain conditions, may occur the first signs of instability. Therefore, this mode is suitable only for more experienced users.

Unlike v3, **v4 and v5 in an automatic stabilizer with a high degree of stabilization (AUTO ZONES = III), are completely stable even at GAIN = MAX, having an extreme depth of detection.**

**For best stability and best depth of detection, at v5, is recommended mode AUTO ZONES = III (automatic stabilizer with a high degree of stabilization).**

With settings GROUND MODE = MAN, AUTO ZONES = III, at v5, usually achieves the best stability and best depth of detection.

**Mode AUTO ZONES = III at v5, is suitable for about 80% of the terrains, as is particularly suitable and for beginners and for initial testing and learning of v5.**

Moreover, at v5, usually, in AUTO ZONES = III versus AUTO ZONES = II, achieved with about 2 cm greater depth of detection for coins, and in AUTO ZONES = III versus AUTO ZONES = I, achieved with about 4 cm greater depth of detection for coins.

**In v5, the recommended combinations between GAIN and AUTO ZONES, in a manual ground balance mode (GROUND MODE = MAN), are:**

- At GAIN from MIN to 3, are recommended: AUTO ZONES = III, AUTO ZONES = II, AUTO ZONES = I;
- At GAIN from 4 to 6, are recommended: AUTO ZONES = III, AUTO ZONES = II;
- At GAIN from 7 to MAX, is recommended: AUTO ZONES = III.

**In v5, the recommended combinations between the mineralization of the terrain and AUTO ZONES, in a manual ground balance mode (GROUND MODE = MAN), are:**

- In low mineralized terrains (GROUND COARSE = from - to 3), are recommended: AUTO ZONES = III, AUTO ZONES = II, AUTO ZONES = I;
- In medium mineralized terrains (GROUND COARSE = from 4 to 6), are recommended: AUTO



ZONES = III, AUTO ZONES = II;

- In highly mineralized terrains (GROUND COARSE = from 7 to +), is recommended: AUTO ZONES = III.

**In v5, the recommended combinations between the contamination (granularity) of the terrain and AUTO ZONES, in a manual ground balance mode (GROUND MODE = MAN), are:**

- In unpolluted terrains, are recommended: AUTO ZONES = III, AUTO ZONES = II, AUTO ZONES = I;

- In highly contaminated with iron and other pollutants terrains, are recommended: AUTO ZONES = III, AUTO ZONES = II;

- In terrains dotted with stones and rocks, slag, hot rocks, ceramics, is recommended: AUTO ZONES = III.

At v4 has only one automatic stabilizer (with a high degree of stabilization), but at v5, are available three automatic stabilizers (with low, medium and high degree of stabilization), to provide even greater versatility of the metal detector, as **the various automatic stabilizers, influence not only of the overall stability and the depth of detection, but also of the base behavior of the metal detector:**

- **with an automatic stabilizer with a low degree of stabilization (AUTO ZONES = I), v5 has more aggressively, primary behavior of THE BEAST**, as can hear all the nuances of the terrain. This mode is suitable for all users, but at high levels of GAIN, it is recommended only for very experienced users, who are able to distinguish all the specific nuances of the sound of the metal detector;

- **with an automatic stabilizer with a medium degree of stabilization (AUTO ZONES = II), v5 has more moderate, semi tamed behavior of THE BEAST**, as the field work is more comfortable. This mode is suitable for all users, but at high levels of GAIN, it is only recommended for intermediate and advanced users;

- **with an automatic stabilizer with a high degree of stabilization (AUTO ZONES = III), v5 has totally stable, tamed behavior of THE BEAST**, as the field work is much more comfortable. This mode is suitable for all users, including beginners, intermediate and advanced users. In this mode, even with GAIN = MAX, THE BEAST is completely stable and unconditionally obeys of the user.

Moreover, with an automatic stabilizer with a high degree of stabilization (available permanently in v4 and accessible in v5 with setting AUTO ZONES = III), due to the increased overall stability of the metal detector, at deeply buried metal objects, which are of the maximum possible depth of detection, **the audio sound of the metal detector is extended, denser and more audible** versus the mode with an automatic stabilizer with a medium degree of stabilization (available in v5 with setting AUTO ZONES = II) and mode with an automatic stabilizer with a low degree of stabilization (available in v5 with setting AUTO ZONES = I).

### 1 1.5. SWITCH DISCRIMINATOR OF V4 AND V5

**The DISCRIMINATOR switch, for all versions, serves to set the maximum range of discrimination of the metal detector, ie it defines the scope of potentiometer DISCR LEVEL. The various modes are conditional numbered as: "I", "II" and "III".**

- **At v4, v3, v2i, v2 and v1:**

- In mode DISCRIMINATOR = III, the maximum range of discrimination is limited to **iron, aluminum foil and very small, low conductive metal objects, from non-ferrous metals and alloys;**

- In mode DISCRIMINATOR = II, the maximum range of discrimination is limited to **small, low conductive metal objects, mainly from the following non-ferrous metals and their**

**alloys: zinc, nickel, copper;**

- In mode DISCRIMINATOR = I, the maximum range of discrimination is limited to **small, high conductive metal objects, mainly from the following non-ferrous metals and their alloys: zinc, nickel, copper, lead, aluminum.**

- **At v5:**

- In mode DISCRIMINATOR = III, the maximum range of discrimination is limited to **iron, aluminum foil and very small, low conductive metal objects, from non-ferrous metals and alloys;**

- In mode DISCRIMINATOR = II, the maximum range of discrimination is limited to **medium, high conductive metal objects, mainly from the following non-ferrous metals and their alloys: zinc, nickel, copper, lead, aluminum.**

- In mode DISCRIMINATOR = I, the maximum range of discrimination is limited to **large, high conductive metal objects, mainly from the following non-ferrous metals and their alloys: zinc, nickel, copper, lead, aluminum, silver, gold.**

Given the above available information for switch DISCRIMINATOR:

- Mode DISCRIMINATOR = III is the same for all versions (v5, v4, v3, v2i, v2 and v1);

- **Mode DISCRIMINATOR = II of v5, is with about 25% larger than the largest range, i.e. mode DISCRIMINATOR = I, of v4, v3, v2i, v2 and v1. Therefore, mode DISCRIMINATOR = II of v5, is very similar to the mode DISCRIMINATOR = I of v4, v3, v2i, v2 and v1;**

- **Mode DISCRIMINATOR = I of v5, is several times larger than the largest range, i.e. mode DISCRIMINATOR = I, of v4, v3, v2i, v2 and v1. Therefore, v5 has extreme extended discrimination range.**

**The extreme extended discrimination range and the improved distribution of the three areas for discrimination at v5, providing possibility for effective study and understanding of the detected metal object even before it to be excavated. For this purpose, the user must explore intentionally, the detected metal object at various modes of switch DISCRIMINATOR: III, II and I. This is done by easily and quickly manual switching between them (from switch DISCRIMINATOR). Depending on what exactly is the detected metal object, in some modes it will be detected, while in others will be rejected.** For starters, the exploration (the study) is carried out without changing the current levels of potentiometers DISCR LEVEL and DISCR DEPTH, as only if need additional orientation, can be applied study at higher levels of DISCR LEVEL and DISCR DEPTH.

Thanks to the above described method, at v5, with high probability, can assume what exactly is the detected metal object even before it to be excavated: small, large, low quality, high quality, low, medium or high conductive. Moreover, for specific terrains and conditions, which the user is acquainted, can be assumed and from what kind of metal is the detected metal object: zinc, nickel, copper, lead, aluminum, silver, gold; and what exactly is the detected metal object: coin, artifact, treasure or modern pollutant. All this, provides a more effective and more convenient selective search of metal objects.

**An example for the above-described method for effective study and understanding of the detected metal object even before it to be excavated:**

**Introduction:** The user works with v5 on medium mineralized terrain in discrimination mode with settings: DISCRIMINATOR = III, DISCR DEPTH = 9, DISCR LEVEL = 6. The user detects with the metal detector (on DISCRIMINATOR = III), a clear signal from non-ferrous metal (as at these settings the metal detector rejected iron):

- If in mode DISCRIMINATOR = II and in mode DISCRIMINATOR = I, the object is still detected, follows that the detected metal object is probably a silver coin;

- If in mode DISCRIMINATOR = II the object is still detected, but in mode DISCRIMINATOR = I the object is rejected, follows that the detected metal object is probably an aluminum cap;

- If in mode DISCRIMINATOR = II and in mode DISCRIMINATOR = I, the object is rejected, follows that the detected metal object is probably a bronze coin.

The settings and the assumptions described in the example above are examples only, but for a

specific terrain, the user of v5, relatively easy can find such combinations, which in practice to do a good job for his particular terrain and for the specific metal objects which are most often detected there.

### **1 1.6. ADDITION ABOUT SWITCH DISCRIMINATOR OF V4 AND V5**

In all versions of THE BEAST, in mode DISCRIMINATOR = III, the maximum range of discrimination is limited to **iron, aluminum foil and very small, low conductive metal objects, from non-ferrous metals and alloys**. Therefore, **mode DISCRIMINATOR = III is recommended for basic, universal search mode**. Due to the limited up to aluminum foil discrimination, this mode is the safest and most effective at search of coins from different non-ferrous metals and their alloys: zinc, nickel, copper, lead, aluminum, silver, gold.

In v1, v2, v2i, v3, v4, all modes of switch DISCRIMINATOR (III, II, I) are suitable for basic search mode of metal objects from all non-ferrous metals and their alloys.

In v5, because of the extreme extended discrimination range, only mode DISCRIMINATOR = III is suitable for basic search mode of metal objects from all non-ferrous metals and their alloys. **Modes DISCRIMINATOR = II and DISCRIMINATOR = I of v5, usually are not suitable for general search**, because due to the extreme extended discrimination range at them, at high levels of DISCR LEVEL and DISCR DEPTH, can be rejected some small metal objects, as small bronze coins. These modes are suitable for specialized search of metal objects from specific non-ferrous metals and their alloys (for example: silver coins).

Furthermore, modes DISCRIMINATOR = II and DISCRIMINATOR = I of v5, in combination with mode DISCRIMINATOR = III, are particularly suitable for studying and understanding of the detected metal object even before it to be excavated.

**Modes DISCRIMINATOR = II and DISCRIMINATOR = I of v5, are used and for distinguish (rejection) of various modern pollutants from aluminum, such as various aluminum caps, pull tabs of aluminum beverage cans, other aluminum packaging and boxes, and others.**

### **1 1.7. GENERAL CONCLUSION FOR BLISSTOOL LTC64X (THE BEAST) V4 AND V5**

Compared to the previous versions, v4 and v5 of THE BEAST, have many improvements and new features, which make them an excellent choice for top metal detector. However, even the oldest version available for sale (v2), there are parameters, that are only dreams for many other metal detectors, especially on the depth of detection for coins. So, regardless of which version of THE BEAST you decide to purchase, or no matter what version of THE BEAST you currently have, you can be confident and proud that you have top metal detector with extreme depth of detection. But, if you want to have the best so far, v4 and v5 are the best choice.

## **1 2. MAIN DIFFERENCES IN THE CONTROL AND THE POWER OF V6 OF BLISSTOOL LTC64X (THE BEAST)**

**v6 has the same knobs and switches as v5, v4, v3, v2i, v2 and v1, but because of the many improvements and new features of v6, its potentiometers GAIN and GROUND FINE have a dual function, i.e. they have a second, additional function, only available in v6.**

**Thanks to this second, additional function of potentiometers GAIN and GROUND FINE, at v6, in an elegant way, there is provided a quick and convenient access to the new features available in v6, without the need of adding other knobs and switches.**

**The main differences in the control and the power of v6 of BLISSTOOL LTC64X (THE BEAST), compared to v5, v4, v3, v2i, v2, v1, are described below:**

### **1 2.1. POTENTIOMETER GAIN OF V6**

**- At v5, v4, v3, v2i, v2 and v1, potentiometer GAIN has only one function:**

**/1/ Set the input AC amplification of the signal from the detected object.**

**- At v6, potentiometer GAIN has two functions:**

**/1/ Function identical to its function in v5, v4, v3, v2i, v2 and v1, i.e. set the input AC amplification of the signal from the detected object;**

**/2/ Switch between mode ORE and mode SOIL: with setting GAIN = MIN, v6 work in mode ORE, but with setting GAIN = from 1 to MAX, v6 work in mode SOIL. The intermediate levels from GAIN = MIN to GAIN = 1, ensure a smooth transition from mode ORE to mode SOIL.**

**Mode ORE is optimized for work at highly mineralized terrains, terrains with a high content of ore, terrains dotted with hot rocks and stones, highly contaminated with iron terrains, beach search in highly mineralized sands. When working on such terrains, mode ORE provides: better depth of detection, greater stability, higher detection speed, higher recovery speed, greater comfort at search.**

**Mode SOIL is optimized for work at low and medium mineralized terrains, terrains dotted with stones and rocks, beach search in low and medium mineralized sands. When working on such terrains, mode SOIL provides: extreme depth of detection.**

In mode SOIL, the maximum depth of detection for a single coin with a diameter 24 mm is 58 cm (22.8") in mode NORMAL and 66 cm (26") in mode TURBO/BOOST, while in mode ORE, the maximum depth of detection for a single coin is about 30 cm, account the purpose of mode ORE, i.e.: work in heavy terrain conditions, at which the work in mode SOIL is impossible or very limited and difficult.

**The best depth of detection, highest detection speed and highest recovery speed in mode ORE are achieved when work with settings DISCR DEPTH = 0, DISCR LEVEL = 0 (mode All metals). Therefore, to maintain these parameters, especially under very heavy terrain conditions, it is recommended work exactly with these settings.**

**In mode ORE, in very difficult terrain conditions, in need of work in discrimination mode, the recommended settings are: DISCR DEPTH = 0, DISCR LEVEL = 10, as a last resort are recommended and settings close to them: DISCR DEPTH = from 0 to 6, DISCR LEVEL = from 0 to 10.**

**In mode ORE, with settings: DISCR DEPTH = 0, DISCR LEVEL = 10, the metal detector discriminate only in the surface layer, to a depth of about 10 - 15 cm, while maintaining the high depth of detection, detection speed and recovery speed, available with settings DISCR DEPTH = 0, DISCR LEVEL = 0 (mode All metals).**

In mode ORE, with settings DISCR DEPTH = 0, DISCR LEVEL = 0 (mode All metals) and with settings: DISCR DEPTH = 0, DISCR LEVEL = 10, BLISSTOOL LTC64X (THE BEAST) v6 as behavior, resembles multi-period pulse induction metal detectors.

Described above settings in mode ORE, with recommended possible lower levels of DISCR DEPTH relate mostly for very heavy terrain conditions, such as: highly mineralized terrains, terrains with a high content of ore, highly mineralized sands. For lighter terrain conditions, in mode ORE, may also be used the standard levels of discrimination (such as settings: DISCR DEPTH = from 7 to 9, DISCR LEVEL = from 3 to 6), which are generally most suitable for mode SOIL.

In mode ORE, to achieve the quality of discrimination available with standard levels of discrimination in mode SOIL, DISCR DEPTH and DISCR LEVEL must be set to higher levels compared to their standard setting in mode SOIL.

In mode SOIL, when work with high levels of GAIN is recommended work at possible lower levels of DISCR DEPTH and DISCR LEVEL and conversely: when work with lower levels of GAIN is admissible and work at higher levels of DISCR DEPTH and DISCR LEVEL.

**In mode SOIL, settings GAIN = from 1 to 6 are best suitable for low and medium mineralized terrains, while settings GAIN = from 7 to MAX are only suitable for low mineralized terrains and are recommend only for very experienced users,** which through skillful precision setting of the sensitivity of the metal detector (through potentiometers GAIN, THRESHOLD and SILENCER), with this extreme increased amplification at GAIN = from 7 to MAX, can achieve better depth of detection in low mineralized terrains.

**At work in manual ground balance mode (GROUND MODE = MAN), after each change of the setting of potentiometer GAIN, need again to be made manual ground balance of the metal detector (from potentiometer GROUND COARSE in mode ORE and from potentiometers GROUND COARSE and GROUND FINE in mode SOIL).**

## **1 2.2. POTENTIOMETER GROUND FINE OF V6**

**- At v5, v4, v3, v2i, v2 and v1, potentiometer GROUND FINE has only one function:**

**/1/** Serves as a further fine (precise) setting of the ground balance in a manual ground balance working mode, ie for a fine and complete eliminate of the ground effect at work in a manual ground balance working mode.

**- At v6, potentiometer GROUND FINE has two functions:**

**/1/** Function identical to its function in v5, v4, v3, v2i, v2 and v1, i.e. serves as a further fine (precise) setting of the ground balance in a manual ground balance working mode, ie for a fine and complete eliminate of the ground effect at work in a manual ground balance working mode;

**/2/ Set the depth of detection in mode ORE.**

**In mode ORE (GAIN = MIN), the depth of detection is the lowest at GROUND FINE = "-" and the greatest at GROUND FINE = "+", i.e. with each higher level of GROUND FINE, the depth of detection is better, but greatly increased depth of detection is not recommended for very heavy terrain conditions, because this reducing the detection speed and the recovery speed.**

**In mode ORE, in heavy terrain conditions, such as: highly mineralized terrains, terrains with a high content of ore, highly mineralized sands, is recomended work with settings GROUND FINE = from 1 to 5.**

**In mode ORE, BLISSTOOL LTC64X (THE BEAST) v6 has the highest detection speed and the highest recovery speed with settings GROUND FINE = from 1 to 3. Therefore, usually these settings are most suitable for extremely heavy terrain conditions.**

**In mode ORE, at work in manual ground balance mode (GROUND MODE = MAN), after each change of the setting of potentiometer GROUND FINE, need again to be made manual ground balance of the metal detector (from potentiometer GROUND COARSE).**

### **1 2.3. SWITCH AUTO ZONES OF V6**

Unlike from v5, which has three automatic stabilizers (with low, medium and high level of stabilization), which can be selected by switch AUTO ZONES, **v6 has only one automatic stabilizer (with a very high degree of stabilization), as it always work with it, i.e. therefore does not need its switching, switch AUTO ZONES at v6, has only one function,** as at v4, v3, v2i, v2 and v1, i.e:

**/1/** To set one of the three available automatic ground zones at work in automatic ground balance mode (switch GROUND MODE = AUTO). In manual ground balance mode (switch GROUND MODE = MAN), this function of switch AUTO ZONES not working.

### **1 2.4. GENERAL CONCLUSION FOR BLISSTOOL LTC64X (THE BEAST) V6**

Compared to v5 of THE BEAST, v6 provides better work at heavy terrain conditions, such as: highly mineralized terrains, terrains with a high content of ore, highly contaminated with iron terrains, highly mineralized sands, but also better depth of detection at low and medium mineralized terrains. These parameters can only be achieved with precision adequate setting from users with a very good knowledge for the metal detector and the hobby metal detecting as a whole. With medium levels of setting, v6 has parameters very similar to v5. Therefore **v6 is recommended only for VERY EXPERIENCED users, which have the necessary knowledge and skills to make the most of the power of THE BEAST v6** and which want to have the BLISSTOOL metal detector with the best depth of detection until now. **For BEGINNERS, INTERMEDIATE and EXPERIENCED users, more suitable are v4 and v5.**

### **13. SETTING UP OF THE METAL DETECTOR AND PREPARATION FOR WORK**

***The metal detector is ready for use when the LiPo battery is charged and undamaged (the BAT LOW LED is not lit up).***

Before initial use, please charge the LiPo battery at least 2 hours (from 2 to 4 hours), by the automatic LiPo battery charger available in the standard package, as described in 19. The LiPo battery reaches full capacity and respectively toughness, after at least about 5 cycles of charge-discharge.

***To optimally use the capabilities of your BLISSTOOL LTC64X, we recommend that you explore in detail all its setting, indication and maintenance bodies by using the detailed description of them available in 9.***

After the metal detector is assembled according to the description in 8, it can be turned on via turning from left (level "OFF") to right of the VOLUME potentiometer. With this potentiometer is set and the desired audio volume (levels from "1" to "MAX").

***Before initial use of BLISSTOOL LTC64X, for the beginners users we recommend to set all its switches and potentiometers of the recommended for these levels (positions), available as described in 9.***

The choice of manual or automatic mode to eliminate the influence of the ground is done by GROUND MODE switch described in 9.3 and the optimal way of tuning and balance, according to the selected mode, are made according to the description available in 9.3, 9.4, 9.5 and 9.6.

The setting of the desired degree of discrimination (distinction of the metals) is made by DISCR LEVEL potentiometer as description in 9.10. The depth of discrimination is set by DISCR DEPTH potentiometer as description in 9.11. In 9.9 describes the DISCRIMINATOR switch.

If the target is detection of any type of metals is necessary DISCR LEVEL potentiometer to be set at level "0". For the complete exclusion of the discrimination, DISCR DEPTH potentiometer can also be set at "0".

In the case of ignoring of the ferrous metals (detection only of non-ferrous metals), ie this is mode of discrimination, is necessary DISCR LEVEL and DISCR DEPTH potentiometers to be set at least of the recommended levels present in their descriptions in 9.10 and 9.11.

The stability and the sensitivity of BLISSTOOL LTC64X is set by GAIN, FREQUENCY, THRESHOLD, SILENCER and TONE potentiometers. They should also be set at least of the recommended levels, available in the description in the points, respectively: 9.17, 9.2, 9.7, 9.8 and 9.18.

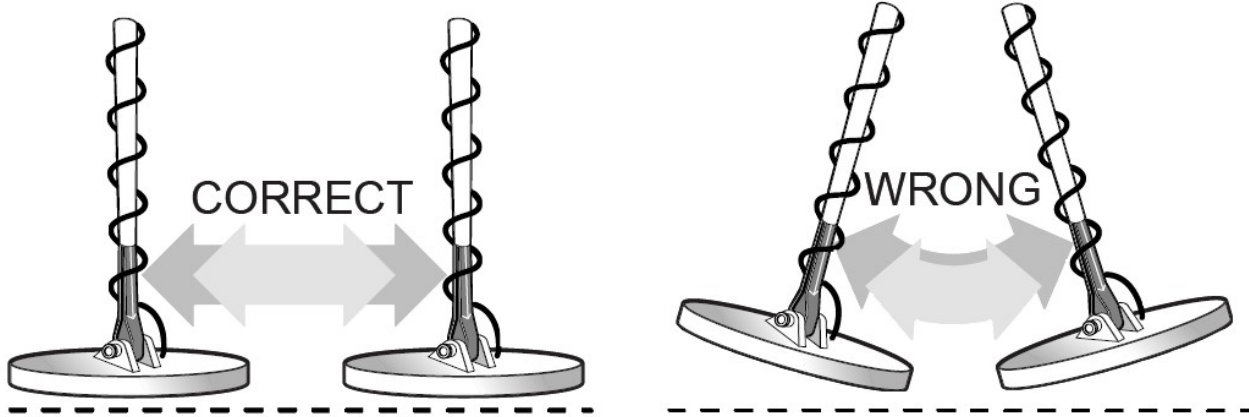
**After implementing of the above described steps, the metal detector will be set up and ready for use.**

### **14. METHOD OF SEARCH WITH THE METAL DETECTOR**

***The metal detector BLISSTOOL LTC64X works in motion mode, ie it reacts to a metal object buried in the ground only when the search coil is swung above it.***

***The searching of metal objects is actually by moving the search coil above the ground surface.***

While doing this, the search coil has to be held parallel towards the ground surface and at a minimum distance above it. The raising reduces the search depth.



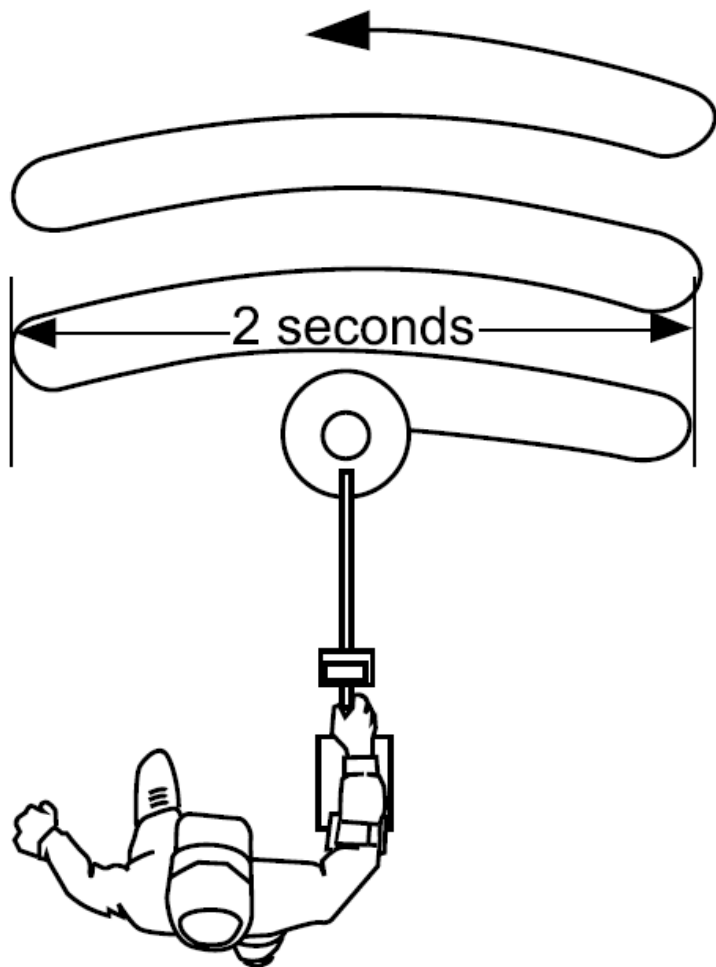
The search consists of a uniform and slow swinging of the coil one side to another, while the user holds the metal detector's handle and uses the armrest for support.

Too fast or too slow moving of the search coil could result in shortening of the depth of detection, especially for deeply buried or small objects.

**The search coil path during the search resembles a zigzag movement, which is a result from the uniform and slow swinging of the search coil one side to another while the user is moving forward.**

The swing's breadth and the user's speed are chosen from the user, according to the terrain, the sloping and the size of the terrain to be searched.

**During swinging the user should avoid hitting the search coil in the available objects on the terrain (stones, roots and parts from tree and shrubs, uneven ground).**



**The precise location of the detected object (centering of the signal), is determined by moving the search coil in two perpendicular axes, while the user stands still or turns round for detecting the signal from different sides.**

To gain an idea for the depth of which is the detected object, the search coil gradually lifted in the air above the ground and monitor height to which the metal detector still detect the object. This, together with specific particular sound (power, duration, purity), is sufficient in most cases to determine whether it is a shallow or deep object, respectively large or small object. For this purpose, helps the already described above centering of the signal to study the area of detection: whether it is narrow or wide.



## **15. RECOMMENDED SETTINGS WHEN GETTING STARTED, IMMEDIATELY AFTER THE PURCHASE, OF METAL DETECTOR BLISSTOOL LTC64X (THE BEAST)**

**In getting started, immediately after the purchase, of metal detector BLISSTOOL LTC64X (THE BEAST), regardless of its version, the following settings are recommended:**

### **In auto ground balance mode and low sensitivity:**

GROUND MODE = AUTO  
AUTO ZONES = II (and if necessary III or I, depending on the terrain)  
GAIN = MIN - 3  
THRESHOLD = 5.0  
SILENCER = 2  
DISCRIMINATOR = III  
DISCR LEVEL = 5  
DISCR DEPTH = 8.8 - 9.0  
FREQUENCY = MAX  
TONE = MIN or MAX  
VOLUME = MAX

### **In manual ground balance mode and low sensitivity:**

GROUND MODE = MAN  
GROUND COARSE = about 5 (depending on the terrain)  
GROUND FINE = 5  
AUTO ZONES = III (only for v5)  
GAIN = MIN - 3  
THRESHOLD = 5.0  
SILENCER = 2  
DISCRIMINATOR = III  
DISCR LEVEL = 5  
DISCR DEPTH = 8.8 - 9.0  
FREQUENCY = MAX  
TONE = MIN or MAX  
VOLUME = MAX

**The above mentioned settings, are especially suitable for beginners and are applicable to at least 80% of the terrains.**

## **1 6. DEPTH OF DETECTION OF THE DIFFERENT VERSIONS OF BLISSTOOL LTC64X (THE BEAST)**

### **In terms of the depth of detection:**

- In practice, when properly adjusted, v1 and v2 have the same depth of detection;
- v2i has better depth of detection of v1 and v2;
- v3 has better depth of detection of v1, v2 and v2i;
- In practice, when properly adjusted, v4 and v5 have the same depth of detection. v4 and v5 have better depth of detection of v1, v2, v2i and v3;
- v6 has better depth of detection of v1, v2, v2i, v3, v4 and v5.

### **1 6.1. MAXIMUM DEPTH OF DETECTION OF BLISSTOOL LTC64X (THE BEAST) v2**

**In a medium mineralized terrain, the maximum depth of detection of BLISSTOOL LTC64X (THE BEAST) v2 with 28 cm (11") DD search coil, is:**

<i>Experimental model:</i>	<i>Maximum depth of detection:</i>
coin with a diameter 10 mm	22 cm (8.6")
coin with a diameter 12 mm	25 cm (9.8")
coin with a diameter 18.5 mm	35 cm (13.7")
coin with a diameter 24.5 mm	40 cm (15.7")
coin with a diameter 30 mm	45 cm (17.7")
metal with dimensions 5x5 cm	60 cm (23.6")
metal with dimensions 10x10 cm	75 cm (29.5")
metal with dimensions 15x15 cm	85 cm (33.4")
metal with dimensions 25x25 cm	100 cm (39.3")
larger metal object	up to 120 - 150 cm (up to 47.2 - 59")

**In real work underway in medium mineralized terrain, usually the achieved in the practice depths of detection are of the order of 80 - 90% from the maximum depth of detection, described above.**

**The typical setting of metal detector BLISSTOOL LTC64X (THE BEAST) v2, at which are achieved the above described maximum depths of detection, is:**

GROUND MODE = MAN  
GROUND COARSE = 4 - 6  
GROUND FINE = 5  
AUTO ZONES = III  
GAIN = MAX  
THRESHOLD = 6.0 - 6.8  
SILENCER = OFF  
DISCRIMINATOR = III  
DISCR LEVEL = 4 - 5  
DISCR DEPTH = 8.0 - 8.5 - 8.8  
FREQUENCY = MAX  
TONE = MIN, 5, MAX.  
VOLUME = MAX

## **16.2. MAXIMUM DEPTH OF DETECTION OF A COIN 24 MM FOR THE DIFFERENT VERSIONS OF BLISSTOOL LTC64X (THE BEAST)**

**In a medium mineralized terrain, the maximum depth of detection of a coin with a diameter 24 mm, for the different versions of BLISSTOOL LTC64X (THE BEAST), with 28 cm (11") DD search coil, is:**

- for v2 = 40 cm (15.7")
- for v2i = 43 cm (16.9")
- for v3 = 45 cm (17.7")
- for v4 = 52 cm (20.4") in mode NORMAL / 58 cm (22.8") in mode TURBO/BOOST.
- for v5 = 52 cm (20.4") in mode NORMAL, AUTO ZONES = III / 58 cm (22.8") in mode TURBO/BOOST, AUTO ZONES = III.
- for v6 = 58 cm (22.8") in mode NORMAL / 66 cm (26") in mode TURBO/BOOST.

**The maximum depths of detection, described above, are achieved and in SILENT mode of the metal detector, i.e. without audio threshold (THRESHOLD set to level just before the buzz), but with amplification (GAIN) close to the maximum.**

**In real work underway in medium mineralized terrain, usually the achieved in the practice depths of detection are of the order of 80 - 90% from the maximum depth of detection, described above.**

**The typical setting of the metal detector, at which are achieved the above described maximum depths of detection, is:**

GROUND MODE = MAN  
GROUND COARSE = 4 - 6  
GROUND FINE = 5  
AUTO ZONES = III (only for v5)  
GAIN = MAX  
THRESHOLD = 6.0 - 6.8  
SILENCER = OFF - 2  
DISCRIMINATOR = III  
DISCR LEVEL = 4 - 5  
DISCR DEPTH = 8.0 - 8.5 - 8.8  
FREQUENCY = MAX (and also MIN for v4 v5 and v6)  
TONE = MIN, 5, MAX.  
VOLUME = MAX

**The above-described setting, is and a recommended setting for achieve a maximum depth of detection.**

### **16.3. THE DIFFERENCES IN THE DEPTH OF DETECTION OF THE DIFFERENT VERSIONS OF BLISSTOOL LTC64X (THE BEAST)**

**In practice, the differences in the depth of detection between the different versions of THE BEAST, with 28 cm (11") DD search coil, in soil with greater than medium degree of mineralization, are approximately the following:**

#### **For LTC64X v2i vs LTC64X v2:**

- Compared with v2, v2i has from 3 to 5 cm greater depth of detection for coins. **Most often about 3 cm;**
- Compared with v2, v2i has from 5 to 10 cm greater depth of detection for small metal objects with size greater than that of the coins. **Most often about 6 cm;**
- Compared with v2, v2i has from 15 to 30 cm greater depth of detection for large metal objects.

#### **For LTC64X v3 vs LTC64X v2i:**

- Compared with v2i, v3 has from 3 to 5 cm greater depth of detection for coins. **Most often about 3 cm;**
- Compared with v2i, v3 has from 6 to 12 cm greater depth of detection for small metal objects with size greater than that of the coins. **Most often about 8 cm;**
- Compared with v2i, v3 has from 10 to 20 cm greater depth of detection for large metal objects.

#### **For LTC64X v4 and LTC64X v5 vs LTC64X v3:**

- Compared with v3, v4 and v5 have from 4 to 8 cm greater depth of detection for coins. **Most often about 5 cm;**
- Compared with v3, v4 and v5 have from 6 to 16 cm greater depth of detection for small metal objects with size greater than that of the coins. **Most often about 10 cm;**
- Compared with v3, v4 and v5 have from 15 to 25 cm greater depth of detection for large metal objects.

#### **For LTC64X with 28 cm (11") DD search coil vs LTC64X with 38 cm (15") DD search coil, applies to all versions (v1, v2, v2i, v3, v4, v5):**

- Compared with LTC64X with 28 cm (11") DD search coil, LTC64X with 38 cm (15") DD search coil has a greater depth of detection, from **several centimeters** for coins, to **several tens of centimeters** for large metal objects.

#### **For LTC64X v4 and LTC64X v5 in NORMAL mode vs LTC64X v4 and LTC64X v5 in TURBO/BOOST mode:**

- Compared with v4 and v5 in NORMAL mode, v4 and v5 in TURBO/BOOST mode have from 1 to 7 cm greater depth of detection for coins. **Most often about 3 cm;**
- Compared with v4 and v5 in NORMAL mode, v4 and v5 in TURBO/BOOST mode have from 8 to 16 cm greater depth of detection for large metal objects. **Most often about 10 cm.**

#### **For LTC64X v5, depending on the automatic stabilizer:**

- Compared with v5 in mode with an automatic stabilizer with a low degree of stabilization, v5 in mode with an automatic stabilizer with a medium degree of stabilization has from 1 to 3 cm greater depth of detection for coins. **Most often about 2 cm;**
- Compared with v5 in mode with an automatic stabilizer with a medium degree of stabilization, v5 in mode with an automatic stabilizer with a high degree of stabilization has from 1 to 3 cm greater depth of detection for coins. **Most often about 2 cm;**
- Compared with v5 in mode with an automatic stabilizer with a low degree of stabilization, v5 in mode with an automatic stabilizer with a high degree of stabilization has from 2 to 6 cm greater depth of detection for coins. **Most often about 4 cm.**

**The recommended setting for achieve a maximum depth of detection, is:**

GROUND MODE = MAN  
GROUND COARSE = 4 - 6  
GROUND FINE = 5  
AUTO ZONES = III (only for v5)  
GAIN = MAX  
THRESHOLD = 6.0 - 6.8  
SILENCER = OFF - 2  
DISCRIMINATOR = III  
DISCR LEVEL = 4 - 5  
DISCR DEPTH = 8.0 - 8.5 - 8.8  
FREQUENCY = MAX (and also MIN for v4 and v5)  
TONE = MIN, 5, MAX.  
VOLUME = MAX

## **17. REJECTION OF HOT ROCKS FROM METAL DETECTOR BLISSTOOL LTC64X (THE BEAST)**

Metal detector BLISSTOOL LTC64X (THE BEAST) is designed to be effective on all types of terrains, including medium and highly mineralized terrains, terrains with a high content of ore and terrains dotted with stones and rocks, slag, hot rocks and ceramics.

**In all versions of THE BEAST, for effective rejection of hot rocks, is recommended :**

- work in manual ground balance mode (GROUND MODE = MAN) and manual ground balancing of the metal detector (with potentiometers GROUND COARSE and GROUND FINE), not to the ground, but **directly on a piece of hot rock (placed on the ground) up to its rejection**. The same method is applied and for manual ground balancing to ceramics, stones and rocks.

- work in automatic ground balance mode (GROUND MODE = AUTO), AUTO ZONES = III.

**For hot rocks, containing ferrous metals and their oxides** (for example: iron and iron oxides), the manual ground balance is done in mode "All metal", i.e. with off discrimination of the metal detector (DISCR LEVEL = 0, DISCR DEPTH = 0). After the manual ground balancing on the hot rock, are set the user-selected levels of discrimination (for example: DISCR LEVEL = 4 - 5, DISCR DEPTH = 8.5 - 9.0).

**For hot rocks containing non-ferrous metals and their oxides**, because of their presence, usually manual ground balance in mode "All metal", i.e. with off discrimination of the metal detector (DISCR LEVEL = 0, DISCR DEPTH = 0) is not possible. In this case, the manual ground balance is performed with prior set discrimination of the metal detector (for example: DISCR LEVEL = 4 - 5, DISCR DEPTH = 8.5 - 9.0).

**In most cases, the setting for rejection of hot rocks, coincides with the setting for ground balance to ferrite and with the setting for work on highly mineralized terrains.**

## **18. SETTINGS FOR GROUND BALANCE TO FERRITE OF THE DIFFERENT VERSIONS OF BLISSTOOL LTC64X (THE BEAST)**

The settings for ground balance to ferrite, usually are particularly effective and are recommended as the base setting at: highly mineralized terrains, terrains with a high content of ore, terrains dotted with stones and rocks, slag, hot rocks, and terrains highly contaminated with small pieces of strong rotten (rusted) iron wires and iron sheets.

**Settings for ground balance to ferrite of BLISSTOOL LTC64X (THE BEAST), all versions (v1, v2, v2i, v3, v4, v5):**

### **In manual ground balance mode and low sensitivity:**

GROUND MODE = MAN

GROUND COARSE = 8 (for v1, v2, v2i, v3; and v4 and v5 in mode TURBO/BOOST)

GROUND COARSE = 7 (for v4 and v5 in mode NORMAL)

GROUND FINE = 5

AUTO ZONES = III (only for v5)

GAIN = 3

THRESHOLD = 5.0 - 6.5

SILENCER = OFF - 2

DISCRIMINATOR = III

DISCR LEVEL = 4 - 5

DISCR DEPTH = 8.0 - 8.5 - 8.8

FREQUENCY = MAX (for v1, v2, v2i, v3; and v4 and v5 = mode NORMAL)

FREQUENCY = MIN (for v4 and v5 = mode TURBO/BOOST)

TONE = MIN or MAX

VOLUME = MAX

### **In manual ground balance mode and medium sensitivity:**

GROUND MODE = MAN

GROUND COARSE = 7.2 - 7.5 (for v1, v2, v2i, v3; and v4 and v5 in mode TURBO/BOOST)

GROUND COARSE = 6.2 - 6.5 (for v4 and v5 in mode NORMAL)

GROUND FINE = 5

AUTO ZONES = III (only for v5)

GAIN = 5

THRESHOLD = 5.0 - 6.5

SILENCER = OFF - 2

DISCRIMINATOR = III

DISCR LEVEL = 4 - 5

DISCR DEPTH = 8.0 - 8.5 - 8.8

FREQUENCY = MAX (for v1, v2, v2i, v3; and v4 and v5 = mode NORMAL)

FREQUENCY = MIN (for v4 and v5 = mode TURBO/BOOST)

TONE = MIN or MAX

VOLUME = MAX

### **In manual ground balance mode and high sensitivity:**

GROUND MODE = MAN

GROUND COARSE = 6.0 - 6.2 (for v1, v2, v2i, v3; and v4 and v5 in mode TURBO/BOOST)

GROUND COARSE = 5.0 - 5.2 (for v4 and v5 in mode NORMAL)

GROUND FINE = 5

AUTO ZONES = III (only for v5)

GAIN = MAX

THRESHOLD = 5.0 - 6.5  
SILENCER = OFF - 2  
DISCRIMINATOR = III  
DISCR LEVEL = 4 - 5  
DISCR DEPTH = 8.0 - 8.5 - 8.8  
FREQUENCY = MAX (for v1, v2, v2i, v3; and v4 and v5 = mode NORMAL)  
FREQUENCY = MIN (for v4 and v5 = mode TURBO/BOOST)  
TONE = MIN or MAX  
VOLUME = MAX

**In automatic ground balance mode and from medium to high sensitivity:**

GROUND MODE = AUTO  
AUTO ZONES = III  
GAIN = 6 (for v1, v2, v2i, v3; and v4 and v5 in mode NORMAL)  
GAIN = 9 (for v4 and v5 in mode TURBO/BOOST)  
THRESHOLD = 5.0 - 6.5  
SILENCER = OFF - 2  
DISCRIMINATOR = III  
DISCR LEVEL = 4 - 5  
DISCR DEPTH = 8.0 - 8.5 - 8.8  
FREQUENCY = MAX (for v1, v2, v2i, v3; and v4 and v5 = mode NORMAL)  
FREQUENCY = MIN (for v4 and v5 = mode TURBO/BOOST)  
TONE = MIN or MAX  
VOLUME = MAX

Depending on the specific conditions, the above-described settings can vary, generally in a small extent (with about 0.2 - 0.5 levels), so that, if necessary, the user can optimize them.



## 19. BATTERY. BATTERY CHARGING

**Standard, BLISSTOOL LTC64X is equipped with a LiPo battery 11.1V, 2200mAh, which is characterized by high quality, low weight and long life. To recharge it, in the standard package of the metal detector is included automatic LiPo battery charger.**

The LiPo battery is located in the electronic block located under the armrest.

**With a single charge of the LiPo battery, BLISSTOOL LTC64X can work up to about 30 - 35 working hours. Then, the battery needs to be recharged.**

**The LiPo battery of BLISSTOOL LTC64X, has about 500 - 800 cycles of charge - discharge (battery life), after which its capacitance drops sharply and it must be replaced with a new.**

**Calculations:**

**- 800 cycles charge - discharge x 30 hours each = 24 000 hours total.**

**- 24 000 hours : 8 working hours per day = 3000 days = 8 years.**

**Therefore, the built-in LiPo battery of BLISSTOOL LTC64X is sufficient for at least 5-8 years working with the metal detector.**

The built-in rechargeable LiPo battery, does not need any further maintenance besides being charged.

**CAUTION: The charge of the LiPo battery should only through the automatic LiPo battery charger available in the standard package. It is optimized for quality and safe charging of the LiPo battery. The use of other chargers may cause rupture or ignition of the LiPo battery and the metal detectors, and/or fire in the room in which they are!**

**During charging, the metal detector should be switched off. Its switching on while being charged could cause serious damage to the electronic block or to decrease its quality.**

**CAUTION: The inclusion of the LiPo battery for charge, should always be carried out in the following sequence (in order to avoid damage of the metal detector):**

**1/ Make sure that the metal detector is turned off (potentiometer VOLUME is at level "OFF");**

**2/ Remove the protective cap of connector CHARGE;**

**The CHARGE connector is available on the back panel of the electronic block of BLISSTOOL LTC64X).**

**3/ Turn the connector of the automatic LiPo battery charger, available in standard package of BLISSTOOL LTC64X, into the connector CHARGE;**

**4/ Turn the power plug of the automatic LiPo battery charger into the ~100-240V supply network.**

**After the process of charging, the exclusion takes place in reverse sequence, i.e. from point 4/ to point 1/.**

**The connector of the automatic LiPo battery charger, has a single correct position for insertion into the connector CHARGE. In this position, the hollow cursor of the charger connector falls in with flange cursor of the connector CHARGE, and when inserted, the charger connector enters into the connector CHARGE at a depth of around 10 mm. After the charger connector is plugged in, it is screwed to the connector CHARGE by the means of the available metal stopping nut, used as a shield.**

**The incorrect insertion and/or the application of a brute force for incorrectly inserting of the charger connector, leading to failure of the metal detector.**

**CAUTION: The plugging in and out of the charger connector is done while the metal detector is switched off (VOLUME potentiometer is turned in level "OFF" (Fig.4)) and disconnected from the supply network power plug of the automatic LiPo battery charger.**

**Usually, the charging continues from several minutes to about 2-4 hours, depending on the level of discharge of the LiPo battery. It is not necessary to follow the process of charge, as the charger is automatic and then charge of the battery it goes into trickle charge mode, which protects the battery from over-charging.**

**Never leave the LiPo battery deeply discharged, as this will damage it completely or dramatically will lowered its capacity and life. Charge the LiPo battery, best, after about every 18-25 hours work with the metal detector. You can charge the LiPo battery at any time, no matter how discharged is it.**

**If you no longer use your BLISSTOOL metal detector, make sure that before "winterizing", you are completely charged the LiPo battery and charge the battery at least once a month. If the LiPo battery stays longer than 2-3 months discharged, especially if it is deeply discharged, it will be damaged.**

**The standard package with the metal detector includes one of the following models automatic LiPo battery charger described by the difference in their LED indicators:**

**/1/ If the automatic LiPo battery charger has three LED indicators, and in off state, they are with white or yellow colors:**

- **During the charge, indicators A, B and C light in red color;**
- **After completing the process of charge, indicators A, B and C light in green color.**

**/2/ If the automatic LiPo battery charger has two LED indicators, and in off state, they are with white color:**

- **During the charge, the first indicator light in red color, and the second light in green color;**
- **After completing the process of charge, the first indicator light in red color, and the second is off.**

**/3/ If the LED indicators A, B and C of the automatic LiPo battery charger, in off condition, are with colors red for A, red for B and green for C:**

- **During the charge, indicators A and B light in red, and C not light;**
- **After completing the process of charge, A light in red, B not light, and C light with green color.**

**In most of the models automatic LiPo battery chargers, offered with the standard package, the power adapter ~100-240V/DC12V is not a separate element, but is included in the box with the electronics of the automatic LiPo battery charger.**

## **20. PRACTICAL ADVICES**

The metal detector BLISSTOOL LTC64X is designed to find metal objects buried in the ground. It does not work well in residential areas and rich urban environment because it is highly sensitive electronic device and is troubled by surrounding electric devices, systems with electricity and metal objects (metal parts of the structure of the property, equipment and furnishings of the property). Therefore, when working in residential areas, the metal detector may be unstable, nervous, to give false signals. Typically in such conditions can not be demonstrated and measured its maximum parameters. If you want to measure the maximum parameters of your metal detector, do the test in terrain outside the settlement, ie where you will search for buried metal objects. There, the metal detector has maximum appropriate behavior and parameters.

When working with the metal detector near another metal detector, they can interfere with each other. This is inevitable in cases where the metal detectors operate on the same or similar operating frequency. Such are the metal detectors from the same brand and model, but not limited, because at the same operating frequency able to work and other than their metal detectors. Disturbance is expressed in the issuing of periodicals, evenly and pulled sounds from the metal detector.

**You can limit or completely eliminate this interference by appropriate adjustment of FREQUENCY potentiometer, as described in 9.2.**

If during work with the metal detector, you on the call via mobile phone or your mobile phone rings, is possible the metal detector to be troubled by it. Usually the metal detector does not interfere with mobile phone in standby mode, except where the terrain on which you are, a mobile operator's signal is weak or lost. In this case, even in standby mode, your mobile phone periodically tries to connect to the nearest mobile cell of the used by you mobile operator, with the result that it can cause a periodic disturbance of the metal detector.

One of the most important components of the metal detector is the search coil, which to a great extent determines its sensitivity.

***When the metal detector is carried, for example in a rucksack or a traveling bag, an exceptional care should be taken to avoid the bending of the coil cable near the nozzle at the base of the search coil, because that may result in tearing the cable connecting cores and damaging of the search coil and the metal detector.***

When necessary, the search coil and the box of the electronic block, can be cleaned with wet cloth. Do not use detergents, as they may damage the plastic parts or the inscription on the front panel, back panel and on the lid of the electronic block.

The electronic block and the search coil are very sensitive towards sudden environmental temperature alterations. When there is a sudden temperature change, the user should wait usually 20-30 minutes before switching on the metal detector.

***The power on of non air-conditioned and non tempered metal detector can cause its damage.***

Signs of non tempering are: frustration, inability to regulate or evenness of the sound threshold; a general lack of sound. In the presence of at least one of these signs, to prevent injury, it is necessary metal detector immediately be power off and left off a few minutes to temper and/or air conditioning (in high humidity, the transition from warm to cold and vice versa).

While working with the metal detector, the search coil should be protected from damage (hit).

***The usage of the metal detector during rain may result its damage.***

The metal detector could be safely and properly used, if there is morning dew (because of the watertight search coil). An extensive care should be taken, if the detector is put on the ground, especially on a wet grass, as the water should not be allowed to get inside the box of the electronic block (as in connector PHONES). The electronic block is not watertight and a serious damage would be caused to the metal detector, if water gets inside it.

At mineralized terrains, terrains with moist, wet or clay soil, it is possible the metal detector to has the hole effect.

***The hole effect is expressed by the detection from the metal detector of false signal such as from metal object, in a search over the blank, usually freshly dug hole.***

***The hole effect is due to the dependence of the metal detector from the balance to the ground, and consequently of the drastic difference between the earthly balance over the hole (excavated section from the terrain) and on the side of the hole (not excavated section from the terrain).***

When working with the metal detector on a particular terrain, the user balance the metal detector to it, and to the ground, the metal detector does not issue false signals caused by the ground. When on this terrain be excavated hole, it has a different ground balance compared to the balance of the terrain to which the metal detector is set, ie to hole the metal detector is not balanced. For this, when search over her and in her, the metal detector can issue false signals.

***The greater difference in the ground balance between the terrain and the hole, the stronger is the false signal. For this, the hole effect usually occurs visible only on mineralized terrains, terrains with moist, wet or clay soil.***

***The hole effect is increased, when in the deep the hole covers different in composition and mineralization ground layers, to which, accordingly, the metal detector has a different ground balance.***

In practice, the user recourse to search over hole, when he is detected a signal, dug a hole and examined the excavated soil from the hole, for the presence of the detected metal object. In the case where the metal object is not in the excavated soil, should that user have not dug it, because it is of greater depth, or because it is dig in the wrong place. For this, in practice is evident the need, the user to search over already excavated hole to center again the signal, ie to decide whether to continue to dig in the same place in depth, or somewhere sideways.

***To reduce and eliminate the hole effect are apply the following methods:***

- search over the hole with a slow and careful swings of the search coil. If the swings are fast, the hole effect will manifest itself dramatically;***
- in advance for specific terrain, the user to dig a hole, to balance the metal detector to it and to remember these settings. Accordingly, in every hole which he should check, to set of the metal***

**detector these settings, but after checking the hole, to set of the metal detector the default settings, through which the metal detector is balanced not to the hole, but to the terrain;**

**- the user to switch the metal detector to one of the other modes of the DISCRIMINATOR switch. For example, if he currently search in mode "III", to switch to mode "II" or to mode "I";**

**- on terrains where the hole effect visible occurs, the user to comply with it, ie after first detected and centered well the signal, and dug a hole to find the buried metal object, not to verify that the metal is still in the hole, but to continue to dig until he detect the metal object in the excavated from the hole soil.**

**False signal than over a blank hole, can be registered and in greater local heterogeneity (clusters) on a particular section from the terrain, especially on terrains with a high content of ore and slag, or on terrains whose soil is mixed with small pieces of mineralized ceramics.**

In practice, such false signals, are not a serious problem, especially for experienced searchers who through his experience, detect relatively easily the difference in the sound, at signal from real metal object and at false signal due to the excavated hole or heterogeneity (clustering).

**The sound in detecting of a signal from a metal object is a solid, brief and uninterrupted, and can be easily centered, and in most cases, the sound of a false signal is long and scattered, sometimes heterogeneous, interrupted or blunted.**

If you are searching in areas, where ammunitions or other explosive substances may be detected, be extremely careful when excavating, because we do not carry the responsibility for your actions and behavior.

Do not open the box of the electronic block, because otherwise you will lose the warranty of your metal detector. If this is necessary, please contact us, using the contact information, given in 24, to ensure adequate support and service.

## **21. WARRANTY SUPPORT AND SERVICE**

*The metal detector BLISSTOOL LTC64X has a 3 Year Worldwide Warranty for the quality of the produced components and in case of any factory flaws.*

*If open the electronic block and/or breach the integrity of the seals placed on the lid of the electronic block, the warranty is not valid.*

The warranty excludes the battery and the battery charger, and is not valid for mechanical damages of the respective components and for damages done by an incorrect usage or unauthorized access and repair (opening the electronic block; wearing, force opening or damaging of the carrier construction, the search coil, the cable or the connector for the coil; incorrect plugging of the search coil; damaging due to connecting of incompatible search coils, batteries, battery chargers and headphones).

*To be a subject of a repair under warranty, the metal detector should be delivered to any of our authorized service support offices. The customer must pay all delivery and transport expenses.*

In order to protect the metal detector from a damage, it is desirable its transportation to carry out in its original purchase box (included in the standard package), since it is optimized for a safe storage and transport.

*The serial number and the purchase date, written on the warranty card, verify the warranty.*

For further details and information about warranty and after warranty support and service, please contact us, by using the contact information, given in 24.

## **22. LEGISLATION**

The possession of a metal detector is completely legal as long as they comply with existing legislative framework. For this purpose, please check the specific laws that relate to metal detecting in your country.

## **23. BLISSTOOL**

BLISSTOOL is a Bulgarian manufacturer of professional metal detectors and metal detecting accessories.

BLISSTOOL produces one of the best deep detecting metal detectors in the world.

All BLISSTOOL metal detectors are developed, tested and manufactured in Bulgaria, in close cooperation with professional treasure hunters, and have a 3 Year Worldwide Warranty for the quality of the produced components and in case of any factory flaws.

The BLISSTOOL team has years of experience in metal detecting and design of metal detectors. BLISSTOOL thoroughly test each metal detector before send it to the final customer and is confident in the quality of its products.

BLISSTOOL offer professional products at an affordable price.

## **24. CONTACT INFORMATION**

### **BLISSTOOL**

web site: [www.blisstool.com](http://www.blisstool.com)

Email: [info@blisstool.com](mailto:info@blisstool.com)

GSM: 00359 883450667

web forum: [www.blisstoolforum.com](http://www.blisstoolforum.com)



### **BLISSTOOL LTC64X is RoHS compliant**

When RoHS compliant symbol is marked on your product means that it is compatible with European Directive 2002/95/EC (RoHS, Restriction of Hazardous Substances Directive).

With this directive, the EU recommended limiting the use and incorporation of harmful materials, such as lead, in the manufacture of electrical and electronic products.

In order RoHS compliance, in the electronics of BLISSTOOL LTC64X are used high quality electronic components, unleaded tino for soldering and pcb board with a final coating nickel-gold. These green technologies ensure of your metal detector high quality and a long life. For comparison, the standard and cheaper technology that is not RoHS compliant, includes the use of tino with a high content of lead and pcb board with a final coating tin-lead.



### **BLISSTOOL LTC64X falls under the WEEE directive**

When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC (WEEE, Waste Electrical and Electronic Equipment).

This EU directive governs matters relating to the collection, storage and recycling of waste from electrical and electronic products.

BLISSTOOL LTC64X is designed and manufactured with high quality materials and components, which can be recycled and reused.

Please inform yourself about the local separate collection system for electrical and electronic products.

Please act according to your local rules and do not dispose of your old products with your normal household waste. The correct disposal of your old product will help prevent potential negative consequences for the environment and human health.

In order to improve the product, BLISSTOOL reserves the right to make changes without notice.

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