

USER'S GUIDE GRIZZLY TWINS METAL DETECTOR

DIGITAL PULSE INDUCTION
AND
INDUCTION BALANCE
IN ONE DETECTOR



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PREFACE

Electronics of metal detectors use different principles, some of them have proved in practice to be more successful and reliable than others. Unquestionably, the most popular, the most effective and affordable metal detectors function on the principles of Induction Balance/IB/ and Pulse Induction/PI/. This makes the problem of ground neutralization crucial. On "heavy" soils and when the induction balance detectors cannot be used, the pulse induction detectors become preferable. Their very low frequency makes them efficient even on highly mineralized and salty ground. This explains why almost all well-known manufacturers have pulse induction models. With this type of detectors, the search coil is not part of the resonance circuit, but a self-contained generator starts the pulse signal. The parameter to be analyzed is the transition time /the position of the pulse front/.

Pulse induction detectors are very efficient at profound search as they allow scanning with large square heads /frames/ of size from 1m x 1m to 2m x 2m and even larger. At the same time, the main disadvantage of this technology is its low capability to distinguish ferrous from non-ferrous metals. This narrows otherwise the entire hegemony of pulse induction detectors. The experience with these teaches that they alone are difficult to use, especially when they are equipped with large loops or frames. Pinpointing of small metal objects is hard and their identification unreliable. The two technologies advantages and disadvantages complement one another and they are almost always used together especially when a pulse induction detector with a large search frame is needed. First you scan with the induction balance detector to eliminate tiny and near the surface objects and then the pulse induction detector with its deep search frame will identify bigger objects deeper in the ground. Moreover, very deep small and large metal objects can be detected with ease. The only thing that has to be done is to switch between the two technologies and change the search heads in turn.

GRIZZLY TWINS combines the two technologies and provides detection on any soil and up to 3 m in depth. GRIZZLY TWINS is compact, highly sensitive, stable and easy to use. The detector and its accessories come in a sturdy and convenient carry bag which makes its use and transportation simple and handy.

The induction balance detector has its control knobs and switches positioned in the left on the control panel, the right portion of which is for the pulse induction detector digital display and its control buttons.

The selection of the mode is done with a button in the middle of the panel. It is this button that provides you to use only the advantages of these metal detection technologies.



I PACKING

Basic Pack 1

- | Search head for PI 38 cm;
- | Search head for IB ellipse DD22x32 cm;
- | Camouflage rucksack;
- | Telescopic handle with a carbon bar;
- | Control unit;
- | Stereo headphones with adapter and independent left and right active volume control;
- | Charging unit: 220 and 12V for a car lighter;
- | Control unit case – made of high-quality waterproof and heat-resistant isolation material;

Optional: Search frame 1m x 1m. It can be ordered in addition to the basic pack or as a replace of the search head for PI 38 cm – this pack is called:

Basic Pack 2

- | Search head for PI 1m x 1m;

- | Search head for IB ellipse DD22x32 cm;
- | Camouflage rucksack;
- | Telescopic handle with a carbon bar;
- | Control unit;
- | Stereo headphones with adapter and independent left and right active volume control;
- | Charging unit: 220 and 12V for a car lighter;
- | Control unit case – made of high-quality waterproof and heat-resistant isolation material;

II PREPARATION FOR USE

2.1. Assembly

You do not need to have special skills to assemble the tool – it is easy to do. You only need to follow these steps:

- Placement of search head:
Remove the nut and then tighten the search head, fix the detector rod into the search head clamp, insert the screw back into its hole and secure with the nut. Now you have assembled the head with rod.

-Adjustment of the rod length:

- a) Turn the lock coupler clockwise to loose position
- b) Pull out the carbon handle beneath that of the detector. Adjust the length so that the search head is at 2 to 5 cm above the ground when standing and holding the detector loose by your side. Then lock the coupler back into its original position.

-Connect the cable to the search head:

- a) Wrap the search head cable round the rod. Leave it loose so that you can level the search head when scanning uneven ground.
- b) Plug the search head cable into the corresponding socket (for IB and PI) in the control unit back panel, next tighten the connector with the attached nut.

2.2. Battery charging

Your metal detector is equipped with a built-in battery and it needs no other batteries for its work.

If the detector is on, turn it off with the POWER switch (the instrument is turned off when the switch is in middle position). Plug in the charging unit cable into the charging socket in the back panel of the control unit. Then plug the charging unit into the socket. During the charging process the charging unit red indicator is on. The battery is fully charged for 12 hours.

One battery cycle provides a 20-40-hours work of the the instrument.

You can prolong the battery life cycle if you work with headphones which are less energy consuming than the built-in speakers.

BATTERY TESTING: If, on turning the instrument on, the battery state indicator – BAT is on, but the detector still does not start, if there is a sound but yet very weak or if the instrument cannot be adjusted properly and is unstable, then you need to charge the batteries.

2.3. Use of headphones

You can connect the headphones so that you are the only one to hear the sound in them. Using headphones will also enhance the battery efficiency and life cycle and they facilitate the sound identification to end up with better detection (search) results. To connect the headphones, simply plug their connector into the PHONE socket on the control unit front panel. On this, the built-in speaker automatically switches off. The GRIZZLY TWINS set is equipped with a pair of professional stereo headphones.

SAFE HEARING:

To protect your hearing be aware of the following:

- Before putting the headphones on make sure you have adjusted the volume of the sound to the lowest level. Then you can adjust the sound

to your liking.

- Do not turn the sound up too much.

Continuous exposure to loud noise sounds can cause permanent loss of hearing.

- Once adjusted to taste, the volume of the sound should not be increased. Before long your hearing will adapt to the sound and you

will be able to hear the signals from the detectors.

MIND THE TRAFFIC:

Do not wear the headphones in heavy traffic.

Although certain headphones allow you to hear sounds from the environment, using them at noisy places can be risky.



Fig.2.1.

III. CONTROL UNIT AND BACK PANEL

/Fig.2.1./

The POWER switch will turn the instrument on and off, as well as to switch between IB and PI mode /fig.3.1./:



Fig.3.1.

2. Back panel /fig.3.2./:

- Charging unit socket;
- Signal outlets – produce a sound of a certain frequency at the detection of metal objects
 - 5 - pin socket for IB search heads
 - 2 - pin socket fro PI search heads



Fig.3.2.

IV. HOW TO WORK WITH THE PULSE INDUCTION METAL DETECTOR

Grizzly Twins Digital PI was designed by a new technology in which the signal 'back integration' used with this type of instruments (Pulse Induction) was replaced by a contemporary analog-to-digital converter and a microprocessor.

The POWER switch is normally in middle position, the detector being turned off. Turn the switch to the left (towards IB) and there will be a slight click, which means that the instrument is working in IB mode. To disable the mode leave the switch in middle position and turn the POWER switch right (towards PI), you will hear a click that means the PI mode is enabled. To turn off simply leave the POWER switch in middle position.

Turn the POWER switch right (towards PI) and you will hear a quiet click, the instrument is now working in PI mode. To exit the mode, leave the POWER switch in middle position.



Fig.4.1.

4.1 Control functions

The front panel has 4 buttons on it with the following functions:



On pressing one of these buttons you decrease or increase the silent threshold.



ZERO or reset. The button also confirms each change of a parameter in the menu.



This button is to enter the menu as well as to cancel an adjustment.

4.2 Information on the display:



Fig.4.2.

The first line shows the strength of the signal.

The second line gives the following values (fig.4.2.)

T xx V x xx.x V

T xx- *Threshold* - is the Threshold which can be directly adjusted by the left and right arrows without having to enter the menu.



V x - *Volume*

5 xx.x V - *U batt* - Shows the battery voltage

4.3 Menu



Press the MENU button to enter the menu and change the setting. Use the left and



right arrows to move up and down within the menu items. To enter a submenu, press the ENTER/ZERO button.



- Volume
- Light
- U min of batt
- Guard interval
- Ground adjust
- Volume raise



Fig.4.3.

Description:

Volume – Sound from a minimum level of 0 to a maximum level of 7 (fig. 4.3).

Light – Backlight – By default the setting is ON, but this menu will allow you to turn it off. (fig. 4.3)



Fig.4.4.

U min of batt - The minimum voltage at which the instrument will alarm a weak battery. The

minimum user's adjustment step is 100 mV. (fig.4.4. and fig.4.5.)



Fig.4.5.

Guard interval – The coil settings (fig. 4.6.)

-*auto* – At each start of the instrument it will adjust to the installed search head automatically.

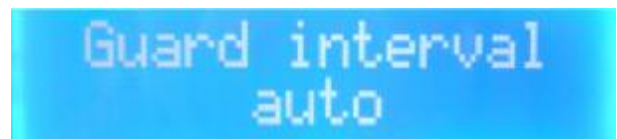


Fig.4.6.

-*last* - In case you will not use a different search head and you will scan with the head the instrument has already been set to work with, you need not waste time and wait for the detector to adjust to it, at the next start the last settings will be applied.

-You can manually change the setting for the *Ground interval* from 2 to 80; this parameter can be used as an additional function to eliminate the signals from the ground if such are present and cannot be neutralized with the *Ground adjust* function.

If the instrument detects signals from the ground at setting of 20, for example, a lower number will cause unstable work and false signals but higher sensitivity at the same time.

The greater this number is, the less sensitive but more stable the instrument will be. In cases when the ground signals cannot be eliminated

by adjusting the three parameters of *Ground adjust*, this number has to be manually increased.

4.4 *Ground adjust* / fig.4.7./ – This function has three software approaches to neutralize the ground at different scan modes.

-off(static) - Ground balance is turned off or this is also called static mode or *'if there is an object, there is a signal'*.

-adaptive - Adaptive processing of the signal - 1st dynamic mode.

* When holding the search head still above a target the signal dies away, the head must be in motion so that the detector produces a sound.

-fixing - fixed software Ground balance adjustment - 2nd dynamic mode.



Fig.4.7.

* This mode is a combination of the previous two modes with the search head being in motion all the time. Keep in mind that this mode is slower, i.e. if you reach out a coin towards the search head in *adaptive* mode, then take it away and back again, the instrument will detect the coin, while in *fixing* mode and especially when the search speed is higher, it is likely that the target does not produce a sound.



Fig.4.8.

Volume raise /fig.4.8. & fig.4.9./

-1/32, 1/16/ 1/8, 1/4, 1/2 , 1 – This parameter is used to slow down the increase of the sound level at the beginning of the scale. It improves the stable work of the scheme at lower threshold. This parameter is reciprocal to the instrument sensitivity. So it is the most sensitive at 1/32 and when the silent threshold is low, it ought to be closer to 1.



Fig.4.9.

4.4 Work with PI DIGITAL TWINS



Start work with PI DIGITAL TWINS in a few steps only:

You are highly advised to work and test the instrument in the open!

Lift the search head to 40 – 50 cm above the ground and turn the detector on.

A TUNE.. message will be displayed and a countdown will start. fig.4.10.



Fig.4.10.

When the PI DIGITAL TWINS is ready to start, you will hear a three-pitch tune. Lower the search head to a distance 4 – 5 cm off the

ground (5-15 cm for larger coils) and move it in parallel with it.

If PI DIGITAL TWINS produces a signal, press the ZERO button, if there is still no effect, press the plus arrow and then ZERO again. Repeat the steps of this procedure until the instrument does not detect the ground any longer at normal speed of the search head. When doing this, make sure there are no metal objects in the ground.

If you have reached to a silent threshold of 15 and the instrument still, whenever moved, goes off, change the setting for *Menu: Ground adjust*.

If the threshold is 15 and neither of the menu adjustments of *Ground adjust* work and the instrument keeps producing ground signals when moved, you may have to consider that the place you have chosen to scan has a great deal of metal trash in it. Try a different spot or as an extreme option at 'severe ground', you may have to manually adjust the instrument's parameters to be able to search the lot. This can be done by changing manually the setting for Menu: Guard Interval like this. If on turning the detector on, the TUNE... countdown stops, for example, at 30, then the value is to be increased by means of (-) and (+) buttons to 31 and then confirmed with ENTER. Exit the menu (ESC) and press the ZERO button. Test the instrument on the respective type of ground and if necessary, increase the value to 32. Mind

that this is applicable to places with a great number of metal trash; normally, high values of this parameter will not increase the instrument's sensitivity.

If you wish to increase the detector's sensitivity in the above case, you need to set the parameters to lower values, i. e. 29, 28, 27 in the above said way.

When manually changing the *Guard interval* setting, the instrument may become unstable and less sensitive, but an experienced user may manipulate these to work with the detector on grounds that are normally considered unsearchable.

V. HOW TO WORK WITH THE IB DETECTOR

Use the POWER switch to turn on/off the instrument as well as to switch between the IB and PI mode. Normally the switch is in middle position, then, the instrument is off. Turn the POWER switch to the left (towards IB) and you will hear a low click, this means the detector is started in IB mode.

To turn off leave the POWER switch in middle position. fig.5.1.



Fig.5.1.

5.1. Control knobs fig. 5.2.

- **Discrimination mode switch:** The switch has two positions: 1 – Left position (GEB), in this mode the discrimination is off, i.e. the instrument detects all metals and produces a consistent sound; 2 - Right position (DISK), when the instrument discriminates the metals, i.e. at detection of non-ferrous metal targets it gives out a consistent sound versus broken and inconsistent signals when detected ferrous objects.



Fig.5.2.

- **VOLUME knob:** Use this control to increase or decrease the signal out of the speaker;
- **TUNE knob** (for adjustment of the critical signal). The TUNE knob controls the silent threshold. Turn the knob right and you will hear a slowly increasing signal, with the help of the knob set this signal very weak. This weak signal is called critical signal (silent threshold). The instrument is the most sensitive when it works at the signal threshold setting.
- **DISK knob** (to increase or decrease the discrimination level). It controls the instrument's

level of discrimination the discrimination being higher at greater numbers at the DISK knob, namely the instrument will produce a consistent signal (Discrimination ON) when it detects purer non-ferrous metals and its sound will be broken and inconsistent when the detected object is iron.

- **GEB knob** (to control mineralized ground detection): Turn the knob left or right to neutralize the signals from the ground, i.e. this control allows to ground balance the instrument in IB mode.

5.2. Work with the detector in IB mode

Switch the detector in IB mode (POWER button from middle to left position towards IB until you hear a click). Disable the discrimination function (the DISK switch is turned towards GEB) (fig. 5.2.) Adjust the silent threshold level with the TUNE knob. Lift the instrument to 40-50 cm off the ground. While holding the search head at about 40-50 cm above the ground: 1. Turn the TUNE knob to the rightmost position; 2. Put the GEB knob in middle position; 3. Keep the instrument in the air. You will hear a strong and continuous signal. 4. With the instrument still in the air, now slowly turn the TUNE knob to the left, the signal becoming weaker and weaker or even dying out (This is the silent threshold. The instrument detects deepest targets when you hear its signal like humming); 5. Lower the

search head to 2-5 cm above the ground (down position); MIND THE FOLLOWING:

I. If, on its lowering to the ground, the instrument produces a signal, do the following: lift the detector again at 40-50 cm above the ground and slightly turn left the GEB knob.

Then place the search head at 2-5 cm above the ground again (down position) and check if it will produce a signal. If there is no sound from the speaker, you have done the GROUND BALANCE (i.e. the detector is ready to be used at these ground conditions), but if it still goes off when approaching the ground, repeat the above described steps (underlined text) until the instrument is silent with the search head being moved downwards closer to the ground.

II. If the instrument produces a signal when being lifted, do the following: lift the search head 40-50 cm above the ground and slightly turn the GEB knob to the right. Then place the search head at 2-5 cm above the ground (down position) and lift it again. If you can hear a signal from the instrument, repeat the above steps again.

The instrument is GROUND BALANCED if it does not go off when you lower or raise the search head (that means that the detector is ready to be used).

In case that the instrument produces signals both on lowering towards and lifting from the ground, then decrease the sensitivity by really slightly turning the TUNE knob left. After the

settings have been made, you can test the instrument. While scanning, hold the detector firm, make a smooth and easy swing with the search head at 2-5 cm over the ground. Now you can begin searching.

5.3. Test and use of the instrument in the open

- (1) Look for a parcel where you are certain there are no metal objects.
- (2) Place a target object of the type you would like to search in the ground. If you use a gold object for the test, make sure you have marked the place where you have buried it or you might not be able to find it later.
- (3) Holding the search head at 2-5 cm above the ground, slowly swing it left and right over the buried object.

VI. CARE AND MAINTENANCE

1. If the detector does not work properly, one possible reason might be a weak battery. Recharge it.
2. The search head plug must be dry or the detector will not perform properly. It can be used only after having been dried up well.
3. Do not use the detector in wet and rainy weather or at very high temperatures.
4. Do not put the search head close to ovens or other hot objects.
5. The instrument comes with warranty and it could be repaired if the warranty is still valid at

the time of the instrument's failure. However, the warranty is considered void if the instrument's seal has been removed by the user.

Useful advice

- Use high-quality headphones.
- Be persistent in your practice and soon you will have your own style of searching.
- If you have difficulties when using the instrument, read this manual over.

False signal

Radio and television signals can interfere with the instrument. To avoid this, step further away, decrease the silent threshold and slow down your pace.

Highly mineralized soils and wet sands normally produce distinct and static signals, too. If so,

decrease the silent threshold and go on scanning.

If you hold a metal tool in one hand to help you dig out detected targets, bear in mind that it will cause GRIZZLY TWINS to produce a signal whenever you put it closer to the search head. Better carry this tool in your rucksack on your back or hung up on your belt. In practice, to gain satisfactory skills with the GRIZZLY TWINS, at least 30-40 hours of work are needed.

To stay informed about all novelties concerning your metal detector, visit www.grizzlymetaldetectors.com

ETHICAL CODE

It is a must that you have an exemplary behaviour. Here are some basic rules to follow when searching with your metal detector:

Make sure you have the land owners' permission to search a place.

Respect other people's rights and possessions. Observe all local and national laws. Do not damage historical or archaeological sites and objects. Do not search at archaeological sites. If you come across a find or you dig out a valuable object (even not certain of its value), contact a local or a national museum. Do not search military sites and ranges. Do not disturb the lawn or the landscape. Fill up all your digs. Use the instrument at safe places only. If you find rubbish, take it away to the designated places. Do not leave it there for the next digger.