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Mole LRL 3000D

Operating manual

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Mole LRL 3000D works in accordance with the *Molecular-frequency discrimination* principle. What's typical for this device is that an unexperienced operator can scan from 40 to 50 decares in 20-30 minutes. If the product detects metal, it will be localized accurately. This depends on the depth of the buried object and the period of stay underground. Mole LRL 3000D saves a lot of costs and walking and if it does not detect anything, then, there is no metal in the scope of the product. If the device detects a signal line, it has to be checked, registered and specified. It is almost impossible for an experienced operator to miss a real object in favourable weather conditions. Mole LRL 3000D also detects signals from objects dug out long ago. Metal ions which have remained in the soil after the metal has been removed are unmistakably detected after many years. For this purpose, we offer an eliminator that unloads the ionic field formed around the object during its stay underground. If the object has been taken out by using the eliminator, the search line disappears; but if the object is still there, the signal moves to its exact location. It is desirable when the location of the object is found, to check it with a powerful metal detector of the pulse-induction type, transmitter-receiver. Since the locator covers large depths, this device will help you determine the depth, size and composition of materials.

By using **LRL 3000D,** a good operator can find frequency oscillations of various metals at 5000 meters distance and at 60 meters depth. The registration of the object depends on the quantity of metal, soil dryness and mineral content, period of stay underground, weather conditions, and operator's experience. **LRL 3000D** can detect ore veins and lost treasures. It detects buried raw materials, explores gold nugget areas, etc. Metals can be registered under water and through water. When the two probes are stuck in the ground at a distance of 60 to 90 cm, they

emit an electromagnetic field that spreads in all directions. It is the strongest where the electrical resistance is the least. The field is distributed to the ground by the soil moisture in a vertical and horizontal direction. As the distance increases, the tension of the field decreases. If there is a metal in the area of the detection, the product receives information, i.e. it traces and registers resonance currents.

This resonance is between the probes and the object. After that, there is no line to be registered, although the field goes further. If the soil is dry or rocky, the currents flow along a curve and follow the moist soil. The most important thing for the range of the detector is the size of the object. Large objects are detected at a great distance, while small ones, like a bracelet or a coin - within 40-50 meters. Another important factor is the period the object spent underground and the soil's chemical composition. The longer the object has been underground, the more metal ions have formed around it. The ions are formed from the electrolytes in the soil. They locate around the object and make it larger and easier to detect. Old objects that have stayed hundreds of years underground are easier to discover than objects that have been buried underground for 2-3 years.

The other factor is the type of metal. The easier it is to get corrosion, the easier it is to be detected. Iron is the most easily found metal because it gets corrosion faster. Copper and copper alloys, bronze and brass, silver, etc. are easy to find as well. Gold is the hardest metal to find because it has little chemical activity, and that's why the ions around the gold objects are few. Besides, gold is one of the heaviest metals. For example, 5 kg of gold can be taken in a palm. Its small and low chemical activity makes it hard to find. For instance, one litre of melted gold is about 19 kg. The interesting thing about **LRL 3000D** is the way it registers objects. The operator holds metal baguettes in their hands which move very

slowly. Antennas are connected to the receiver with wires, which is self-powered and is worn on the operator's belt. Baguettes should be hold slightly bent and parallel to each other. Once the transmitter probes are stuck in the ground, the locator should be switched on. The operator should wait for 5-10 minutes, and then should start moving around the probe at a distance of 3-10 meters. If there is a metal in the range (for which we set the transmitter), a search line is obtained from the resonant currents between the locator and the metal. When the operator crosses this line, the two baguettes cross. Exit the search line and the antennas again stand in parallel position.

This effect is created by the capacity and resistance of human body with the inductions of the receiving module and forms a broadband throbbing circle. When crossing the search line, this throbbing circle resonates and the two antennas are electrically drawn to each other. The device may detect signals in different directions when scanning a larger area. To specify which signal is more interesting for us, a gadget called collector should be used. This device looks like

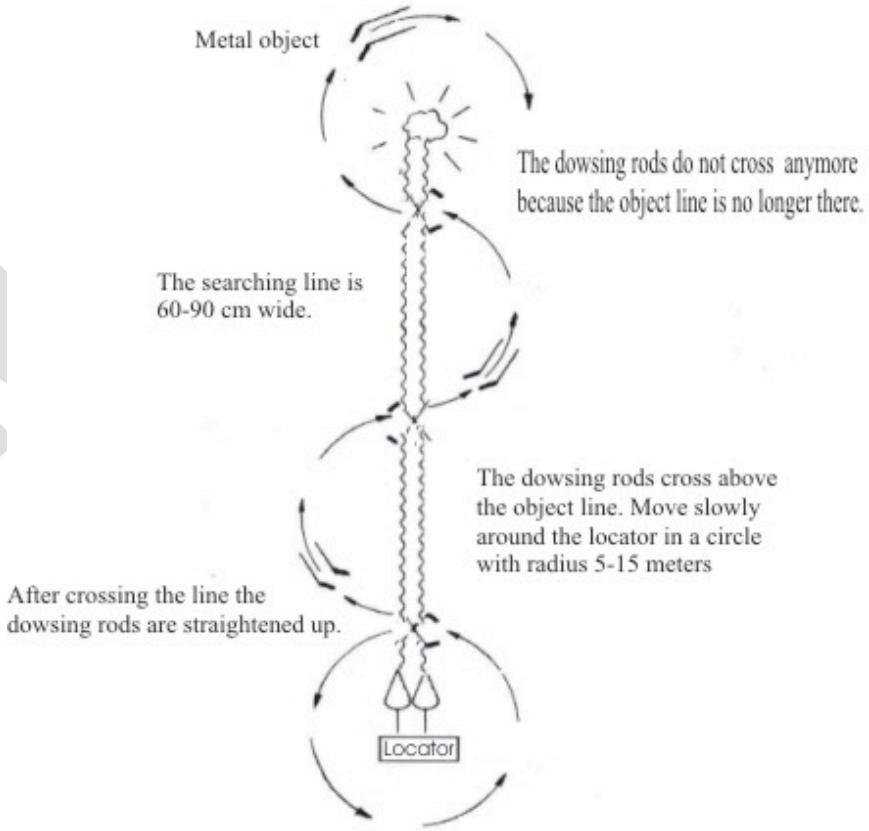

Fig.1 – Method of searching

a probe, but the cylinder is empty and a piece of the metal we are looking for should be put inside (for example, gold, silver, copper, bronze). The collector should be stuck in the ground between the transmitter probes and the operator, who is above the search line. If antennas open, this means that the detected signal is unreal or the detected metal is very small in weight. If antennas cross, the search continues. The collector is a device that eliminates objects ten times heavier than the collector itself. For example: If you put 20 g of gold into the collector, you will eliminate an object that weighs up to 200 g. If you put 1 g of metal, you will eliminate 10 grams. In this way, the operator can estimate the size of the object they have found (**Fig.2)**.

When selecting several collectors with different amounts of gold in them, we can determine the weight of the object. When measuring from another location at 90 degrees to the first one, we can run a second line and when it crosses the first one, we can find out the distance to the object (**Fig. 3**). As we go along the second line and move towards the point of crossing in space, baguettes will not cross.

Once you get to the object and step over it, baguettes will cross. Mark the place with a rod, go on and see that antennas become parallel. This means that there is no object further ahead. Now, the location of the possible metal object or the ion field without metal is established. The ion field around objects buried long ago move aside due to the Earth's magnetic field. The older the object is, the greater the displacement is. The locator registers ions, because they have larger volume than the metal itself. If there is a real finding, we can get its depth (**Fig. 6**).

The most often used operating frequencies are:

- Lead– 4,5 kHz
- Gold– 5,0-5,5 kHz
- Aluminium– 7,0 kHz
- Silver– 8,7-8,9 kHz
- Bronze– 11,3kHz
- Copper-brass - 11,7 kHz
- Diamonds– 12,7 kHz
- Iron– 17,0-17,8 kHz

LRL3000D is a precise digital locator for search of various metals underground. The operating frequencies are controlled by an encoder and are monitored by a digital display. The SENSITIVITY knob shall be put at 5 scale marks at least. Then, the forward search distance is half of the maximum one. In most cases, the knob should be put at (10) scale marks at the most. The sensitivity is set at the customer's request.

LRL 3000D digital locator has **15** built-in programs - **8** of which preset to the most common metal search frequencies, and **7** - customized and also preset. The operator can select frequencies different than the ones specified, except the frequencies for *lead, aluminium, bronze, copper-brass* and *diamonds*. All other frequencies for *gold, silver* and "*iron* can be changed within their limits. For example: If you want to change the frequency of *gold* from 0.005000 MHz to 0.005125 MHz, turn the encoder (frequency) clockwise until the counter shows the desired frequency. Each step of the encoder equals to 1Hz. If you turn the encoder faster, it will jump over 10 or 100 scale marks. The other frequency shift option is associated with a *step* shift. Press *Step* and a cursor will appear below the scale numbers. Turn the encoder to the left and it sets down to tenths. Then, release *Step*. From now on, each step of the encoder is multiplied by 10 Hz. Turn the encoder to the left or right, and make sure of it.

If you press *Step* again and move the cursor through the encoder below the hundredths or thousandths, each step of the encoder multiplies by 100 or 1000. After making the rough adjustment, press *Step* and return the cursor below the tenths by using the encoder and release *Step* ". Each change is automatically

saved in 5 seconds. If you want to search for another metal, press *Band* once. If you hold *Band* down for a longer period, the programs shift faster.

Probes – they should be stuck in a pre-moistened soil by taking them for the top and bottom caps. Carry out the same actions when taking them out. Handle with care in order not to damage or break them.

Fuses - There are three fuses on the front panel – one for each battery. If one of them burns out, you will not have a frequency on the display or the amplifier operation will be interrupted. There is a control lamp (Control) next to each fuse that lights on when the fuse is sound. The fuses are 2.5A.

Waist baguette receiver - Equipped with a 9V battery. Before each use, press the button for 3-4 seconds. The brightness of the LED should not change. Otherwise, replace the battery with a new 9V alkaline one.

CAUTION

1. Mind not to short-circuit the baguettes during operation. They are varnished, but, still, be careful. This does not apply to the handles that are completely insulated.

2. Do not change the frequency of operation without waiting for 15-20 minutes.

3. Do not adjust the frequency for the same metal. For example: You have searched for gold at 5.25kHz and the frequency cannot be immediately adjusted to 5.5kHz, regardless of the fact that it is also for gold; you should wait for the technological time.

4. Never short-circuit the probes (PROBE). The short circuit may damage the entire electronics of the product.

5. Charge the batteries each time you use the locator. When the operation is over, charge the batteries again. This is required, because the charger is automatic and the battery needs to have a residual voltage of about 11V in order to work properly. If you overuse the batteries (not more than 8-9 hours a day), this voltage will drop below 10V and the batteries cannot be used anymore.

6. Pay attention to the battery status by using the three LOW BATTERY lamps located on the panel. If the lamps are on, you must charge the batteries.

GET READY FOR OPERATION

1. Remove the probes from the suitcase and place them with the tips up.
2. Attach the cables from the probes to **LRL3000D** (PROBE OUT) by following the connection colours (black with black, red and red). This is very important for the proper operation of the locator.
3. Connect the three external rechargeable batteries with the three double cables to DC INPUT. Each battery should be connected to one of the double cables, by having in mind the proper position of the "+" and "-" of the batteries.

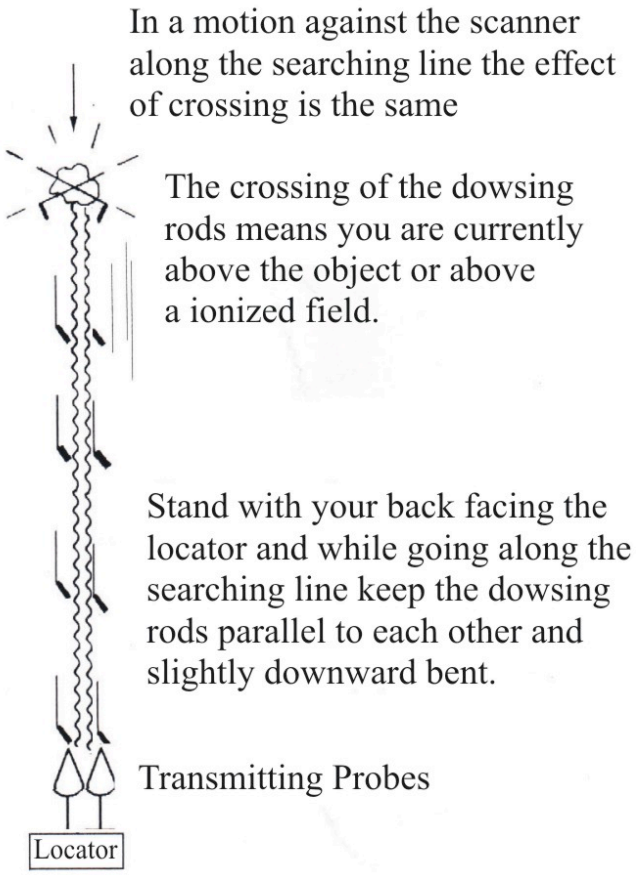

Fig.4 – Localization of the place of the underground object

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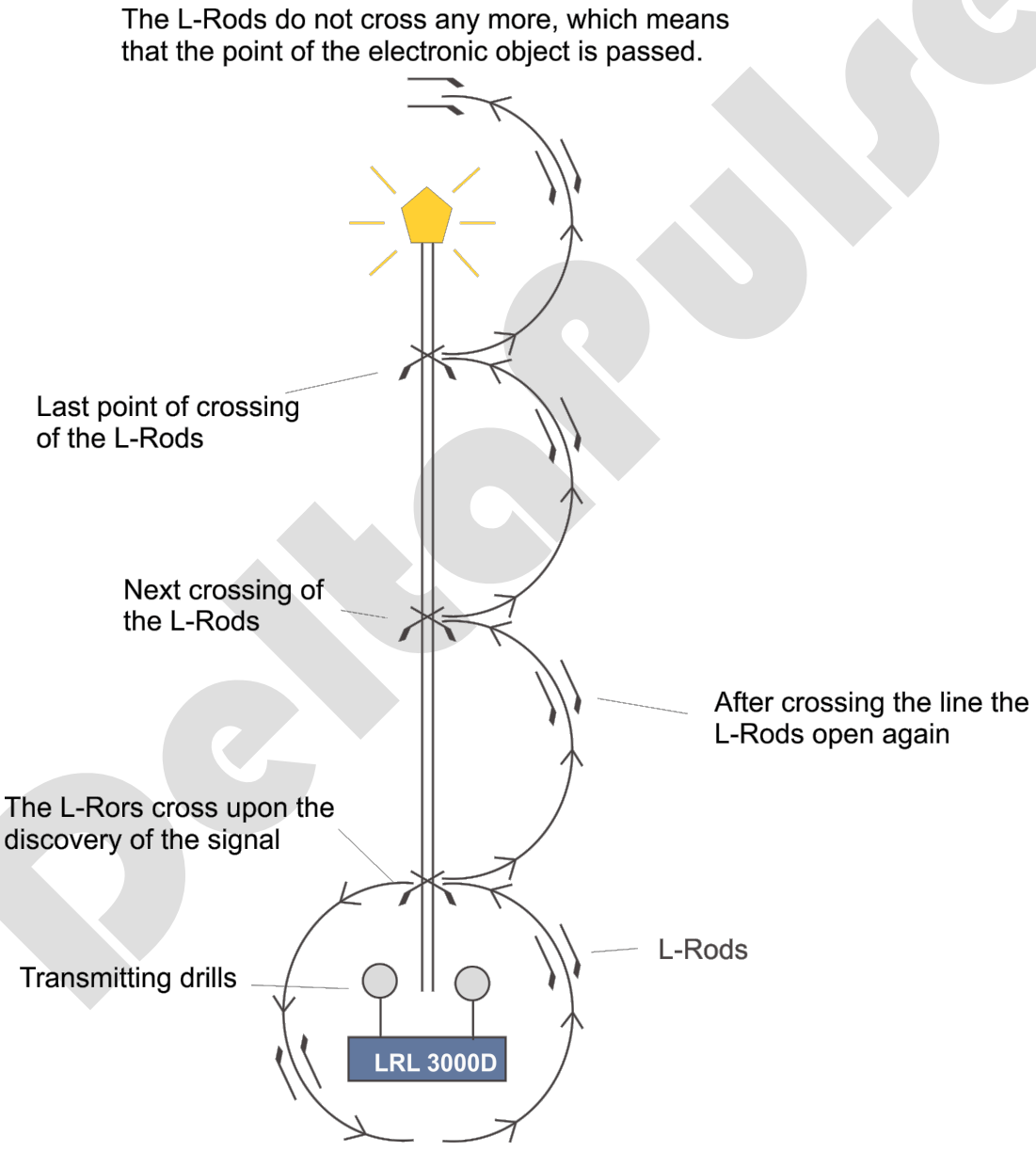
4. If the soil on which you use the device is dry, make two holes with a thin pike (not larger than 4 mm, since the probes are 5 mm) at about 10 cm depth. The gap between the holes should be at least 40 cm and at most 90 cm wide. The standard distance between them is 60 cm. Pour half a litre of water slowly in each hole, making sure that the wet spot around the holes is not too big. Under no circumstances should the probes be short-circuited. Hence, you should not use the device immediately after heavy rain.



First turn anticlockwise around DDS LS in circle with radius 5-15 meters until you detect the line of the signal

5. Whenever you have worked at a frequency of 5,300 kHz and you have switched the device off, in order to start using it again at the same frequency, you must press the BAND button as many times as the 5,300 kHz frequency reappears, i.e. to go through all frequencies, otherwise the frequency will be shown on the display, but there will be no transmission.

Once you've done all of this:

• Turn on POWER 1 and 2.

• Set the desired frequency for the type of metal.

• Insert the probes in the holes you have made at about 15 cm depth.

• Set SENSETIVITY from 7 to 10.

• Wait for at least 100 seconds until the ground is activated in a radius of 100 meters (200 m in diameter). Approximately 200 seconds are needed to get 200 meters processed, 1000 seconds – to get 1000 meters processed, 1500 seconds – to get 1500 meters processed, and so on.

• Put the receiver box on your waist by guiding its jacks and the jacks of the baguettes by colour.

• Move at least 3 meters away from the locator and slowly start moving counter clockwise in a circle around it. Make sure your shoulders are loose and your arms are folded in 90 degrees from the elbows. Both arms should be parallel to each other, and the baguettes should be about 40 cm apart from each other, slightly bent forward, between 3 and 5 degrees down the horizon.

LOCALISATION

If the locator detects the desired type of metal, the baguettes will cross. Place there a rod, a stone, a piece of stick, a bunch of grass or other non-metallic objects. Go 3-4 meters back and 10-15 meters to the right of the locator and cross the line of resonance again. If the baguettes cross again and again, put 2, 3, 4 rods and continue until the time when the baguettes do not cross after crossing the marked line (**Fig**.**1**). After that, go back along the marked line. Stand with your back to the locator (**Fig. 4**) and go with the baguettes along the line. Now, the baguettes will cross when you reach the electronic metal object. If the searched object is close to the locator, that's good, but if the buried metal is not close, then you have to do something else. Once you have found the line of the electronic object and marked 3-4 points with rods, turn off the device and move it 90 degrees to the established line (see **Fig. 3**). Start a new measurement after switching on the device and carrying out all the necessary operations carried out in the first measurement. There should be an interval of 15 to 20 minutes from one

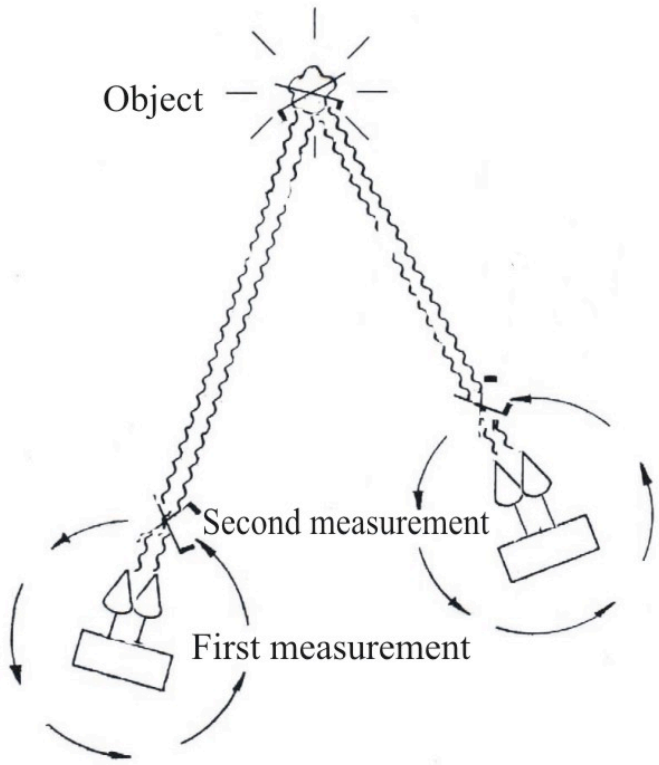


Fig.3 Measurement

measurement to another, i.e. this time is needed to move the device to the new location, treat the soil with water, prepare the device, etc. If you want to check the same place for other type of metal, then, after looking for silver for example at 8.7 to 8.9k Hz, you do not need to take out the probes:

• Turn the power off.

• Wait for 15-20 minutes.

• Remove the probe cables from **LRL3000D**

• Turn the power on.

• Adjust for gold search, for example, at 5 to 5.6k Hz.

• Connect the cables to the locator and wait for at least 100 seconds again, which is equal to approximately 100 meters of processed area, and start searching.

• These 15-20 minutes of rest are required to clear off the previous frequency on and at least 100 seconds for the newly transmitted frequency. If you have not changed the operating frequency and only triangulated at 90 degrees, you will find a new crossing point with the new measurement. If you draw an imaginary line between the locator, the new point and the marked line from the previous measurement, you will see the location of the potential object (see **Fig. 3**). That is not all. Make a few more measurements on the established location to determine the size and depth of the buried object. Pay attention to **Fig. 6**. It shows that there is a crossing in point one, a second crossing on the object, and a third crossing in point two. The way of studying the object is described in detail around **Fig. 6**.

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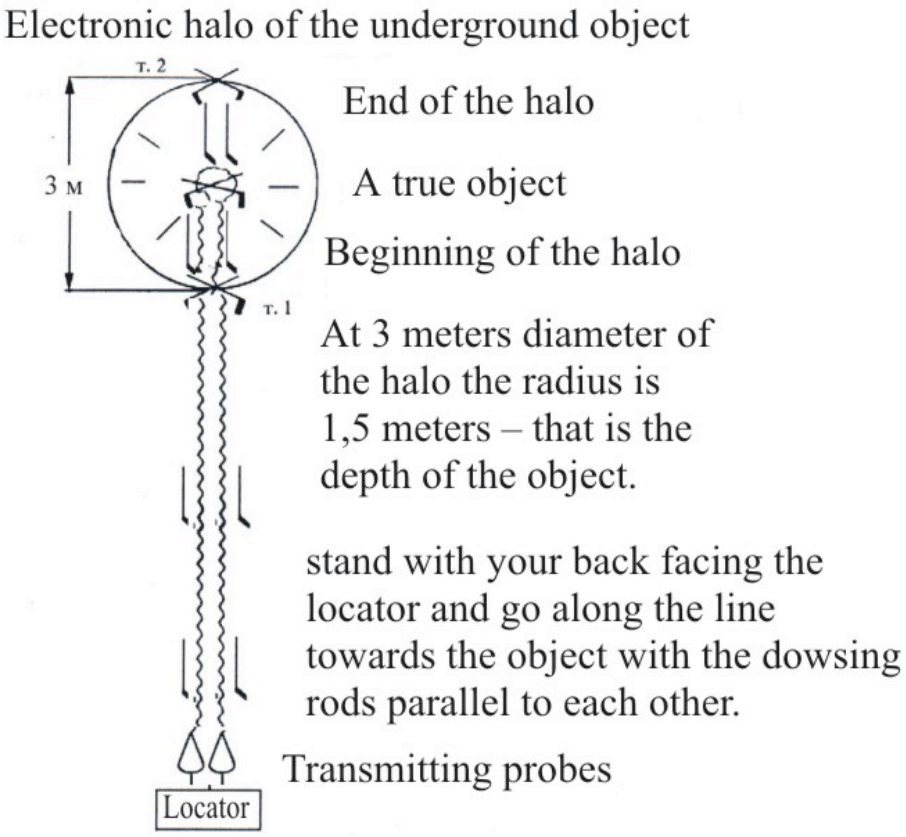

Fig.6 – Approximate depth of the object

Continue to measure the location with a deep search detector, having in mind that the object is still electronic and not real.

Bulgaria is located north of the Equator and the deviation will be to it, i.e. to the south. If necessary, use a compass or, in other words, stand on the electronic object (with a compass in hand). Stand with your back to the south and you can see the direction of the eventual object to the north. If the object is small, shallow

and not buried long ago, the electronic object in this case is a real metal. If any of the conditions are missing, check with a deep search metal detector. If you do not have one, we offer MOLE IMPULSE with depth of work up to 6 meters. If this does not result in anything, this means that the object is located at a great depth and is not within the scope of the device. In such cases, it is good to use an electronic object eliminator, which we also offer in such cases. The eliminator is used when it comes to underground entrances, corridors, and cavities. With old objects dated hundreds or thousands of years, the electronic object can be located up to 30 meters southwards from the real one. That's why you need to carry out a full study to ensure that no holes are left empty and not in place, and that the object is away from the measurement. It is desirable to have a deep search metal detector and eliminator. It is advisable to have at least one of the two extras. If you own a metal detector for deep search with 1- or 2-meter coils, search northwards of the electronic object. If you have an eliminator, use it as shown in **Figure 5** and let it work for a while, and, at intervals of half an hour, monitor whether the electronic point moves to the north.

The eliminator remains switched on until the last two half-hour measurements have changed, i.e. the last point is the real object. If the object is buried near the surface, this happens very quickly with a metal detector, but for objects buried very deep, the eliminator is the only solution. It is possible to locate an electronic object and when working with the eliminator, it will disappear (i.e. it will be eliminated). Then you have come across a real object taken out long ago. Its field exists until it is eliminated electronically.

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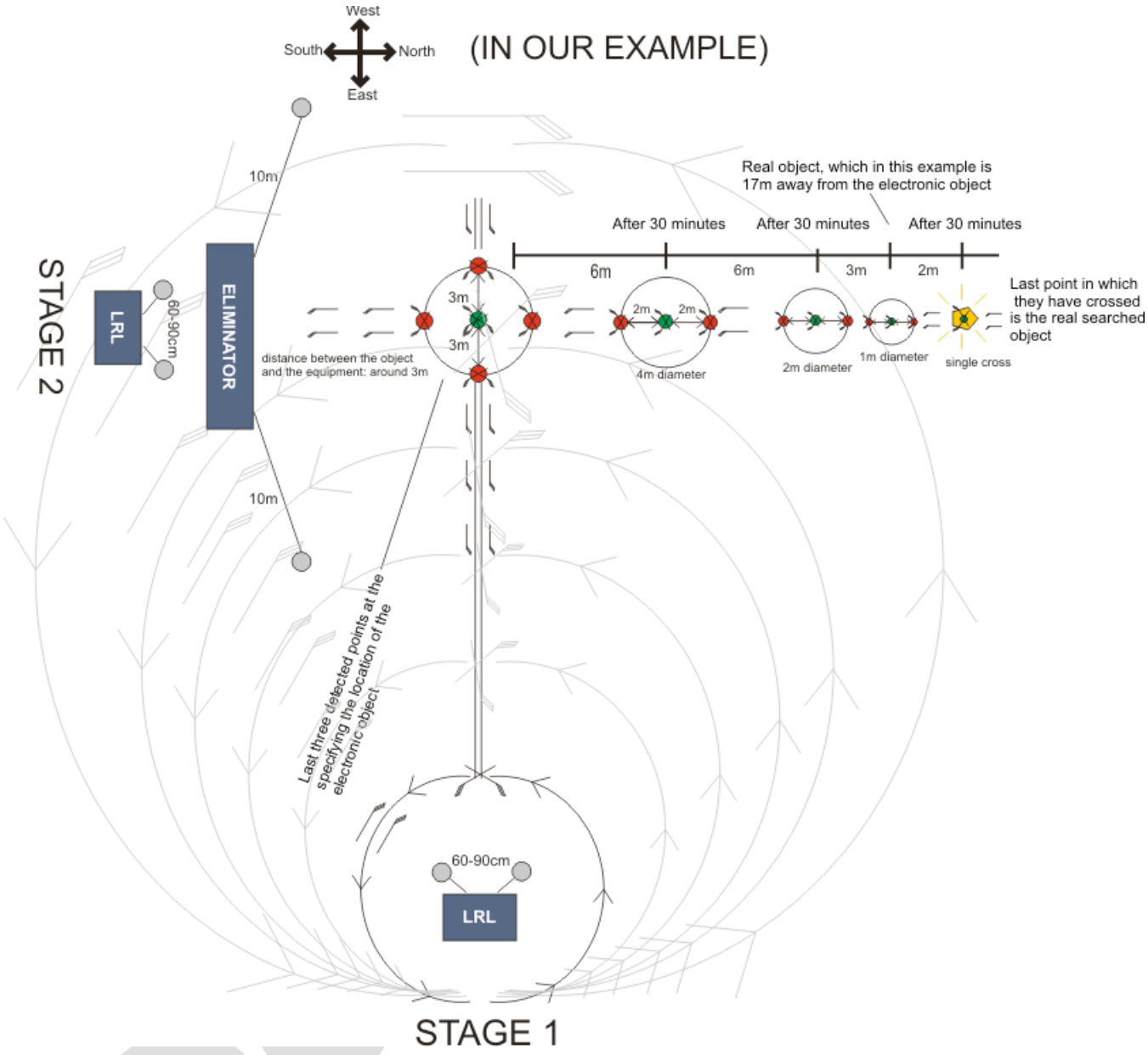

Many of our LRL users use the electronic object of findings that were proven and taken out, in order to learn how to use the device. Such an object stands at a distance of 1 to 30 meters from the real one. If you know a place like that, never uncharge it with an eliminator. This will help you check whether you are a good operator on that day. Try to remember all this while you train to become a professional prospector.

Battery charge: plug the jack of the charger into CHARGE 1 socket on the panel and plug the charger into a 220V power source. The charger LED lights up red. After charging the battery, the charger LED lights up green. Do the same with the other two batteries.

If you have charged a battery and have to charge another one at night, this should not bother you. The charger is automatic and no matter how many hours it works after the battery is fully charged, neither the device, nor the battery will get damaged. After charging is complete, unplug the charger from the 220V power source, and then unplug the jack from the panel socket.

Caution: When replacing the charger jack from socket 1 to socket 2 and 3, unplug the charger from the 220V power source and then move the jack to the next socket and reconnect the charger to the 220V power source.

Maintenance: Do not use thinners to clean the device. Wipe it with a damp cloth. Avoid causing shocks and wetting the device.

WARRANTY

The warranty terms and conditions are specified in the warranty card, and exclude the following cases of improper use, such as:

1. Short circuit between the two transducer probes;
2. Incorrect connection of the poles of the external batteries;
3. Liquid damages;
4. Improper handling of the charger;
5. Hits, shocks or exposure to direct sunlight;
6. Unsealing of modules.

Good luck!

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