

X 500

White's Electronics, Inc.

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OPERATORS INSTRUCTIONS



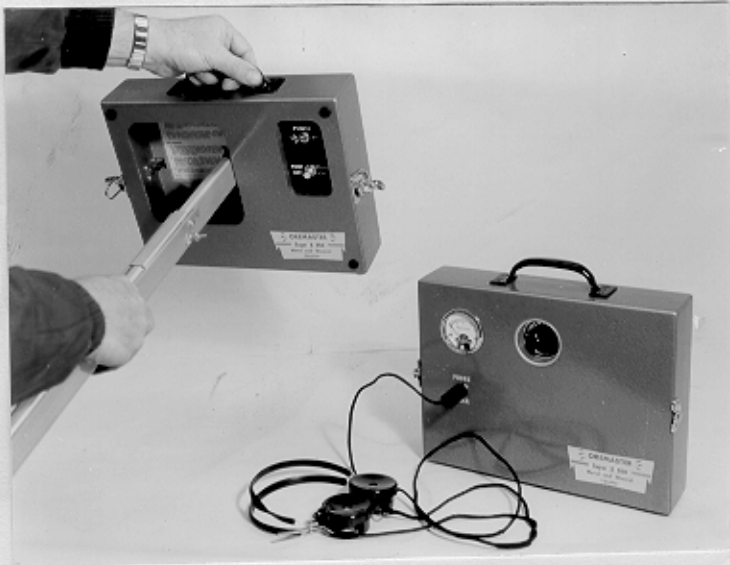
Manufacturers of OREMASTER

MINERAL and METAL
DETECTORS

OIL PROSPECTING
EQUIPMENT

SUPER GEIGER AND
SCINTILLATION COUNTERS

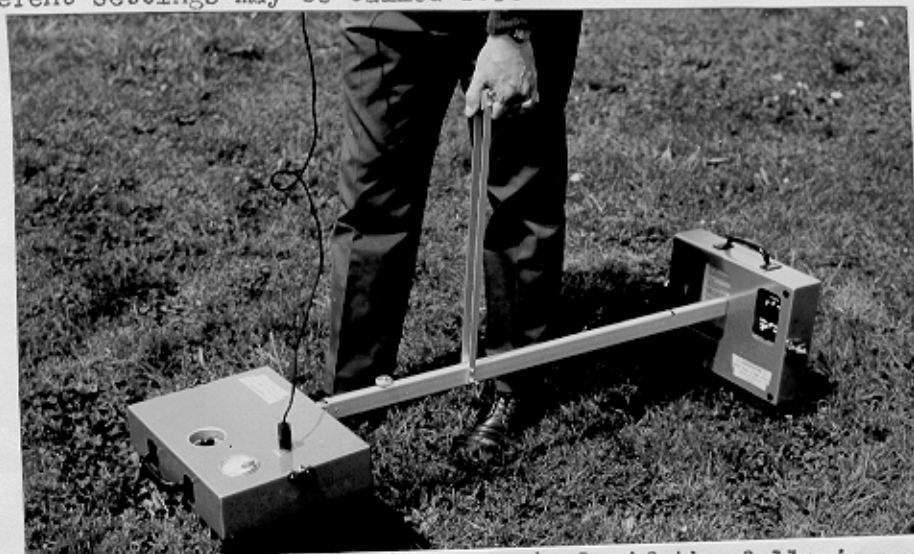
ULTRA VIOLET
LIGHTS



The instrument can be held by the main aluminum handle at the center (balance point) or the drop-handle assembly can be used which makes it possible to operate the locator at ground level. The latter method makes it slightly more difficult to manipulate the instrument over rough terrain but you can be assured of slightly greater depth penetration. Figure 3 shows the instrument as used on the drop-handle.

3. ADJUSTMENT

The instrument is tuned at the factory for maximum sensitivity and the receiver is tuned to match the particular transmitter which goes with it. Certain field adjustments must be made, however, to compensate for the particular transmitter which goes with it. Certain field adjustments must be made, however, to compensate for the particular ground conditions that the operator encounters. This is necessary to be assured of maximum sensitivity under all types of ground conditions. In one area the instrument will require certain settings while perhaps only a short distance away because of ground mineralization different settings may be called for.



The tuning or adjustment procedure is very simple if the following steps are followed carefully:

1. During adjustment hold the instrument at the height it is to be carried. If it is to be used on the drop-handle then make the adjustments while holding it in this position. Do not, for example, tune it at the waist then lower it to the ground for operation. This will result in a loss of sensitivity.

OPERATING INSTRUCTIONS

for the

OREMASTER MODEL 500 Mineral and Metal Locator

1. GENERAL DESCRIPTION

The Model 500 is a fully transistorized Metal Locator. With reasonable care it will last for many years and perform with a high degree of sensitivity and reliability throughout its life.

The complete instrument is made up of the transmitter, the receiver, earphones, and the carrying handle. The carrying handle also has a built-in drop handle which is available for immediate use. Figure 1 shows the complete locator and all its controls. The controls are flush mounted so that the two boxes will clamp together face-to-face. Since the on-off switch on the receiver is part of the phone jack it is only necessary to remove the phone plug to turn the receiver off. The on-off switch on the transmitter is set so that it is automatically turned off when the two boxes are clamped together.



Both the transmitter and the receiver are transistorized and each carries its own battery supply consisting of 4 size "C" flashlight batteries. The handle is aluminum and has a very carefully machined end piece which controls the position of the receiver box with respect to the transmitter. The microtuner screw makes the receiver box move up and down very slightly as it is turned. This is the most important control on the machine when making the initial adjustments.

2. ASSEMBLY

The transmitter is mounted upright on the slotted end of the aluminum handle as shown in Figure 2. It is important that this be clamped tight as any movement of the transmitter box on the handle will give questionable results. The machined fitting on the other end of the handle fits snugly into the receiver box. To insure a firm connection here there is a steel wedge in the box which mates with a machined area on the side surface of the handle end. Additionally there is a bullet catch which drops into a shallow hole in the bottom of the handle end.

2. Pull out the on-off switch on the transmitter to turn this unit on. Set the power switch on "hi" to be assured of maximum transmitter power. Plug in the earphones to turn on the receiver and advance the volume control full clockwise.
3. The meter will probably be reading full scale and a tone will be heard in the phones when first turned on. With the instrument level (parallel to the surface you are prospecting), turn the microtuner screw (see Figure 1) in one direction or the other until the "null" is found. The "null" is a dead area where no tone is heard and the meter reads zero.
4. The null is the starting point and adjusts the instrument rather coarsely. For fine tuning and maximum sensitivity this same microtuner control is then turned in a CLOCKWISE direction very slowly until the meter just starts to read up (or until the tone just starts to come into the earphones). This is the correct operating point.

It should be pointed out that in some areas where a high degree of mineralization exists it may not be possible to find the null area. It will then be necessary to reduce power until the null can be found. First turn the transmitter power switch to "lo" then turn the microtuner adjustment screw through its full travel (about 6 turns). If it is still impossible to "null" the instrument then it will be necessary to begin reducing the receiver volume. This, of course, reduces the sensitivity of the locator, but it makes it possible to use the instrument in highly mineralized areas and still detect buried metal objects.

In any case it is recommended that the locator be readjusted frequently during use to be assured of maximum sensitivity at all times. Remember to turn the microtuner screw CLOCKWISE after the "null" is found. This is often referred to as the "plus-null" setting. Using the instrument with the full null setting will result in some loss of sensitivity while a counterclockwise adjustment (negative-null) will cause "false signals". The rule then for maximum sensitivity is "plus-null".

4. INTERPRETING THE SIGNALS

The Model 500 is a very sensitive instrument and when tuned to a "plus-null" setting it will have excellent detection power. With the instrument tuned in this manner the operator may be troubled at first by slightly jumpy meter action. In other words the meter and the phones may produce short bursts as the operator takes each step. This, however, is an indication that the instrument is in peak adjustment. With a little experience it will be learned that this is a very good characteristic. Contrary to what one might think these short bursts will not cause any confusion. As metal is encountered the meter moves over to the full-scale position and leaves no doubt in the operators mind as to the presence of metal.

A metal object as it is crossed will cause the meter to move full scale and produce a full tone in the earphones. The initial pass may be quite broad particularly on larger objects. In order to pinpoint the object or "center" it the volume control on the receiver is then reduced. DO NOT change the distance above the ground that the instrument is being carried. The volume control setting should be reduced until the meter reads approximately half-scale. Then by moving the entire assembly back and forth a "peak" meter reading will be found. At this point the metal object will be centered directly under the front box (receiver).

A pipe or rich metallic vein is also electrically conductive and can therefore be detected. In this case because of the elongated nature of the conductive area the maximum indication will occur when the back box (transmitter) is directly over the pipe or vein.

Essentially, instruments of this type indicate changes of electrical conductivity. A metallic object in the ground is more conductive than the surrounding ground and it can therefore be detected. A metal object, if of sufficient size and within the depth range of the instrument, can be detected even if in a highly mineralized field. This is because it represents additional conductivity.



The sensitivity of the instrument falls off rapidly to the sides. In other words in searching for a metal object buried in an open field it is recommended that a grid pattern be followed. Walk a straight line down one side of the area then come back four or five feet to one side of the first pass. In this way you can cover the entire area and be assured of locating what you are looking for.

In prospecting walls, the sides of caves, or steep hillsides, the important point to remember is to tune the instrument in the manner in which it will be carried. In other words hold the instrument as close to the surface to be prospected as

is practical and make the tuning adjustment. (See Figure 4). Then prospect the area maintaining a constant distance between the instrument and the surface of the wall or hillside.

5. CARE AND MAINTENANCE

The Model 500 will perform for many years requiring only an occasional battery replacement. With transistors and the circuits "potted" or "encapsulated" in a plastic compound the entire unit offers the greatest amount of resistance to shock, humidity, temperature, and vibration. In the event that the unit is seriously damaged it is possible to replace individual stages and put the unit back in operation.

IMPORTANT: When ordering a particular stage copy the number from the damaged part, and when writing about any part of the instrument or its operation always refer to the Serial Number which appears on the inside surface of each back panel.

The batteries required are the size "C", $1\frac{1}{2}$ volt flashlight type. The transmitter and the receiver each require 4 of these batteries. Be sure and replace the batteries in the same way that the old ones come out; with the button-end of the battery against the wired contact of the battery holder. Always push this end of the holder in some before replacing the batteries to assure a tight contact. Note: DO NOT use metal-cased flashlight cells. The extra metal in the battery shell affects the tuning of the instrument. Use only plastic or cardboard cased batteries.

The null width with the instrument assembled is an indication of the battery condition. You will note when the batteries are new the null area is extremely sharp and extends over a very small amount of rotation of the microtuner screw. When the batteries start to weaken the null width will become broad. At this point it is recommended that the batteries be replaced.

The antenna is positioned in a groove all around the edge of each box. Care should be exercised not to subject the antenna to extreme moisture, and of course, no metal plates or tags should be attached to either the inside or the outside of the boxes.

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