





The name that means Treasure

Diablo II OPERATOR INSTRUCTION MANUAL

CONGRATULATIONS!

Your new TESORO Metal Detector was designed to provide you with many happy hours of enjoyment in the most rewarding hobby I can think of – treasure hunting. Ahead of you lie fascinating and exciting experiences as you step into the past – uncovering artifacts lost by past generations. I wish we could share these experiences with you, and we wish you the best of success.

Your TESORO Metal Detector is capable of meeting your needs in any conceivable treasure hunting situation. As with any detector, operating skill and familiarity with this instrument are probably the limiting factors in determining how successful you will be. We recommend that you read this manual and understand fully before attempting to use the instrument in the field. As you become more familiar with your detector through practice, your rate of success will increase dramatically.

The TESORO Metal Detector is a precision electronic instrument, which will last for years if properly cared for. Treat it right and it won't let you down.

Good Hunting! Jack Gifford

GENERAL DESCRIPTION

Since most gold nuggets are very small, it has been very difficult to find them using normal detectors which were basically designed for coinshooting use. Historically, any attempts to discriminate against trash has caused a complete loss of the very small gold objects. The Diablo II was designed to help you find tiny pieces of gold in the very worst types of mineralization.

The Diablo II metal detector is the most powerful nugget hunting detector we have ever made. It is a VLF All Metal detector which operates at approximately 20 KHz, and offers a Ten Turn Ground Adjust control and the capability of selecting either Normal Tuning or Automatic Tuning.

A special Mineral Conditions switch is included to give the operator the ability to set the detector to suit the type of ground being searched.

The elliptical searchcoil is specially designed to be a superior nugget hunter, it's strength also allows it to be used for hunting relics, and for other hunting situations where discrimination is not necessary.

As with any detector, the familiarity of the user with the instrument will have a great deal to do with how successful the treasure hunter is. We recommend that you read and understand this manual fully before attempting to use the instrument in the field.

Be sure to fill out and mail your warranty registration card to validate your warranty.

ASSEMBLY

The Diablo II can be assembled in either of two configurations or easily converted from one to the other. The electronic control housing can be mounted on the arm rest pole, or can be body mounted. Installation of the lower pole and coil is the same for either configuration.

1. Depress the two buttons on the upper end of the lower stem, and slide it into the upper stem. Push the lower stem up so that the buttons click into the third set of holes from the end of the upper stem.
2. Insert the pole tip between the mounting ears of the searchcoil, after removing the screw and thumb nut. Align the holes in the pole tip and those in the mounting ears. Be sure that the rubber friction washers are in place. **NOTE:** Moistening the washers really helps.
3. Insert the coil mounting screw through the coil and pole tip. The screw head should be on the side of the searchcoil where the cable comes out.
4. Install the thumb nut on the screw and tighten by hand.
5. Wind the searchcoil cable around the pole.
6. Use the velcro straps to hold the cable tightly to the pole. Cable flopping just above the searchcoil will give false signals, since it is metal.

POLE MOUNT

1. The control housing is already mounted on the pole, as shipped from the factory, so all that is necessary is to insert the searchcoil connector into the control housing connector, and tighten finger tight.
2. Use the two velcro straps to hold the cable tight against the pole.

BODY MOUNT

1. To use the detector as a body mount, simply remove the control housing from the upper pole by depressing the spring nuts in the plastic mounting piece, and slide the control housing off the pole.
2. Insert the searchcoil connector into the control housing connector and then finger tighten.
3. Use the two velcro straps to clamp the searchcoil cable. It will be best for you to sometimes move the straps so that the wear on the cable is spread over a large area.

CONVERSION

Obviously, converting the unit from body to pole mount or vice versa, is simply putting the control housing back on the pole, or removing it from the pole. Be sure to keep the searchcoil cable wound tight enough around the pole that it doesn't flap right over searchcoil housing. The Diablo II is strong enough to see the tiny cable wires moving, and can give you false signals if the cable is too loose.

ADJUSTMENT

The searchcoil angle and stem length should be adjusted so that the unit is not uncomfortable or tiring after long periods of use. The stem length is adjusted by depressing the spring buttons and extending or shortening the pole till they click into the holes that give you the most comfortable setting. The coil should be about one inch above the ground while standing erect. Adjust the angle of the searchcoil, so that the coil is parallel to the ground. Tighten the searchcoil thumb nut by hand to maintain this setting.

The arm rest on the rear of the handle can be moved forward by removing the screws and nuts, and reinstalling the assembly into the most forward set of holes.

Specifications

Operating Frequency	Approx. 20 KHz
Searchcoil Type	Wide scan
Searchcoil Size	10" Elliptical
Cable Length	Approx. 3’
Audio Frequency	Approx. 625 Hz
Audio Output	1 1/2" speaker
Headphone Compatibility	1/4" stereo earphone jack
Weight (may vary slightly)	3 lbs.
Battery Requirement	9 volts DC 2 ea. 9V alkaline batteries
Battery Life (typical)	15 to 30 hours
Optimum Temperature Range	30° to 100° F
Optimum Humidity	0 to 75% R.H.
Operating Modes	All Metal only
Tuning	Automatic or Normal

NOTE: Due to the extreme amount of gain in the electric circuitry, the Normal mode has been furnished with a very slow automatic tuning. This tuning is necessary to keep the detector from drifting up or down when tuned to threshold. The autotuning is disconnected when strong mineral signals are sensed.

TESORO Electronics, Inc., reserves the right to modify or improve the design without further notice.

CONTROLS

The Diablo II has five controls on the front panel of the detector.

1. **GROUND ADJUST CONTROL.** This control is used to adjust the sampling of the Diablo II so that the mineralization is ignored. This control is a Ten Turn device, and the setting of it is the most critical adjustment to make on the Diablo. Study the manual section on TUNING to learn how to adjust it properly.
2. **MINERAL CONDITIONS SWITCH.** This three position toggle switch is used to set the Diablo II for the type of ground that is being searched. Since most areas likely to contain gold nuggets are heavily mineralized, this switch should usually be set in the NORMAL position when hunting nuggets. If the ground is not broken up and not heavily mineralized,

the LOW mineral position can be used. In cases of very heavy mineralization and/or hot rock areas, the EXTREME position will give best results, although some depth will be lost.

3. **SEARCH MODE SWITCH.** This three position toggle switch is used to retune the detector to Threshold, or to select the Automatic tuning mode. The center position leaves the detector in the Manual tuning mode. The Retune position is spring loaded, so that a brief jab will cause the detector to regain the Threshold sound.
4. **ON/OFF, SENSITIVITY CONTROL.** The primary function of this control is to reduce the detectors sensitivity to those influences that could make the operation more difficult for you. This control also is used to turn the power on and off. When the knob is first turned on, the detector will automatically test its batteries for about 3 to 5 seconds, with the audio strength indicating the available power of the batteries.
5. **THESHOLD ADJUST.** This control is placed on the back panel of the detector, since it requires very little usage. Once the control is adjusted to the desired setting, the contorl rarely needs to be readjusted.

TUNING

The extra power of the Diablo II, as compared to a coin hunting detector, makes its Ground Adjust tuning one of the more critical settings you must make. Also, as you are hunting in most areas that will yield gold nuggets, you will be plagued by false signals caused by "hot rocks". Most of these false signals can be minimized or eliminated by constant attention to the Ground Adjust setting. Since the mineralization will change sometimes quite drastically within a few feet, you may need to readjust the control very often to maintain the proper tuning. Also the MINERAL CONDITIONS switch will help you set the detector's performance so that it is not affected so much by the intense mineral changes.

TUNING IN THE AUTO TUNED MODE

1. Put the SEARCH MODE switch in the Auto position, the MINERAL CONDITIONS switch in the Normal position, and the SENSITIVITY control on Max. Make sure that the Threshold adjust just gives a beginning of sound signal.
2. Rapidly lower the searchcoil from a bout one foot above the ground to about two inches above the ground. Listen to see what effect this has on the threshold sound. If there is no change, you are properly tuned. If the sound decreases as the coil is lowered, and then comes back to threshold as the auto tuning recovers, you should turn the Ground Adjust control about one half a turn clockwise. Repeat the step of lowering the coil rapidly again. If the sound increases before the auto tuning recovers, you will need to turn the Ground adjust control about one half a turn counterclockwise. Repeat the step of lowering the coil rapidly again.
3. Keep repeating the lowering of the searchcoil, and making such adjustments to the Ground Adjust control until the response is reversed. Then turn the Ground Adjust cointrol back in small increments until you find the setting where there is not change in the threshold sound as the searchcoil is lowered towards the ground.
4. You are now tuned properly, and only need to begin your search. Keep monitoring the tuning by raising and lowering the searchcoil every so often. Readjust the Ground Adjust as necessary to keep the detector probably tuned.

TUNING IN THE NORMAL MODE

1. Put the SEARCH MODE switch in the Norm position (center), the MINERAL CONDITIONS switch in the Normal position, and the SENSITIVITY control on Max. Be sure that the Threshold signal is just at the beginning of sound. Hold the searchcoil about one foot from the ground, and if the threshold has changed, momentarily lift the SEARCH MODE switch till the detector tunes back to threshold. Then release the switch, and lower the searchcoil to about two inches above the ground.
2. If there is no change in the threshold sound, you are properly tuned. If the sound increases or decreases, it will not recover automatically as it did in the Auto Tuned mode. If the sound decreased, turn the Ground Adjust control about one half turn clockwise. If the sound increased, turn the Ground Adjust control about one half turn counterclockwise. When you turn the Ground Adjust control, the threshold sound may get either louder or go quiet. That's normal, and means nothing to the tuning procedure.
3. Move the searchcoil back up to about one foot above the ground, and momentarily push the Search Mode switch into the Retune position to reestablish the threshold sound. Repeat the step of lowering the searchcoil to the ground. Readjust the Ground Adjust control as indicated by the change in the threshold.
4. When the threshold change reverses, then move the Ground Adjust control back in small increments, until there is no change as the searchcoil is lowered back the ground. Remember to momentarily hold the Search Mode switch in the Retune position each time just before you lower the coil toward the ground.

NOTE: The Normal mode of operation has a very slow automatic retuning which is just fast enough to help you maintain the threshold sound as you search. Since a strong mineral signal would cause the threshold tuning to "pump up" or become too loud, the slow autotuning is disconnected when a strong mineral signal is sensed. This slow autotuning is necessary because of the extreme power of the Diablo II circuitry.

SELECTING THE PROPER MODE OF OPERATION

Using the Diablo II with the MINERAL CONDITIONS switch in the Low position will increase it's ability to find tiny targets, but it iwll also be affected considerably more by the ground. This mode is best where the ground mineralization is reasonably consistent, and hot rocks are not a problem. The Normal position will work best in most areas where gold is likely to be present. The Extreme position should be used only when the detector is so badly affected by the intense mineral changes, that the other two positions are unusable.

We feel that for most nuggetshotting use, the Auto Tuned mode will provide the best performance. Since most gold nuggets are quite small, you need to be sure that your detector is turned to threshold at all times to avoid missing any of these little nuggets. Obviously, the Auto Tuned mode will help you in this respect. Hot Rocks will cause a momentary silence

as the coil is swept over them. This sound is so different from a good target sound, that it is very easily recognized. The only problem with just ignoring these sounds is that a small nugget may be hiding beneath the hot rock. Adjusting the Ground Adjust control in the clockwise direction until the hot rocks are almost neutralized will help detect small gold nuggets but the ground will read as a positive signal. So you will have to be very careful to keep your coil height constant.

The Normal mode is very useful for pinpointing, since searchcoil motion isn't necessary. This mode is also useful for searching and for identifying whether a sound is a target or the overshoot from an intense mineral signal such as a hot rock. This mode is going to require much more care and attention from you also, since you will need to retune the detector more often to maintain threshold, and you will also need to readjust the Ground Adjust control more often.

Remember that the slow autotuning will cause a nulling of the threshold sound if you pas the searchcoil over a very strong metallic target.

PINPOINTING

It will probably be a good idea to check the Ground Adjust setting to be sure that your Diablo II is properly tuned prior to pinpointing, especially if you have been searching in the Auto tuned mode. Pinpointing is best done in the Normal mode however, since you can do this without sweeping the searchcoil, and you can also retune close to the target center to cut the detector's response to the target.

1. Try moving the searchcoil back and forth and forward and backward until you get the strongest audio signal. The target should be directly below the coil center.
2. If the audio response is maximum over a very large area, just momentarily push the Search Mode switch over to the Retune position when you are close to the target center. This will cause the target sound to shrink drastically, which will allow more accurate pinpointing.
3. You may have better luck at pinpointing if you try "X-ing" the target. Sweep the coil from size to side until you get the loudest response. Make a mental note of this point and then move to a position where you can sweep the coil at 90 degrees to the original position. Again, sweep side to side until you get the loudest response. Dig where these two lines intersect.

RECOVERING OUR TARGET

With the extreme power of the Diablo II, just pinpointing isn't all there is to recovering a target. Since most of the really tiny nuggets look just like the rocks and other pieces of soil they are found in, they can be very difficult to locate. Also, most of your targets won't be gold, they will be junk such as nails, wire, iron, pulltabs, etc. you will need to dig them all to be sure you don't miss that occasional small piece of gold.

Your choice of a digging tool will be up to you, but most prospectors use a small pick axe and carry a magnet to help identify iron targets. Some stores sell a pick axe with a magnet in the end of the handle.

When you have pinpointed your target, dig some of the soil back from the pinpointed area with your pick axe. Recheck your Diablo II to see if you have moved the target. If you have, try the magnet to see if you can pick up the target. If the magnet doesn't pick it up, you can set your detector down with the coil close to the area containing the target.

Pick up some dirt, and wave your hand in front of the coil. If you are holding the target you should get a good signal from the detector. Since the Diablo II has so much gain, it will probably read a positive signal just from your hand at max sensitivity. You will probably need to try just a small amount of dirt held in your fingertips.

You can also put the Diablo II in the Auto tuned mode, and set the coil on the ground. Try dumping some of the dirt onto the top of the searchcoil. When the target hits the coil, you will receive a good signal from the detector. You will need to be careful using this technique though, since the wear on the searchcoil won't be covered by warranty.

BATTERY REPLACEMENT

The Diablo II has an automatic battery test sequence with each initial power turn on. To check the batteries simply turn the detector off momentarily and then back on. The detector should beep loudly for about 3 to 5 seconds, with the audio output loudness indicating the remaining battery strength. As the batteries age, this sound less intense, and fades out quicker. When you just hear a brief buzz, or not audio at all, replace the batteries.

To replace the batteries, pull the large knobs on the battery door on the rear of the unit. The entire door will pop out. Remove the battery packs from the detector, and then remove the leads. Place the new penlight batteries into the packs, being sure that you observe the polarity indicators on the clip leads. Install the battery door back onto the chassis, and push the nylon fasteners into the holes on the chassis, making sure that the plungers are still pulled out. Then push the plungers back in to lock the door in place.

We recommend when you replace the batteries, that you change all at the same time, and that you always use good quality alkaline batteries.

GENERAL CARE AND USE

If the detector is to be stored for a long period of time, it is best to remove the battery pack from the detector. This will

prevent internal damage to the detector if the batteries should leak.

The searchcoil is waterproof and may be submerged in either fresh or salt water. Caution should be exercised to prevent water from entering the chassis, where it could damage the electronic circuitry. After the coil is used in salt water, the coil and lower stem assembly should be rinsed well with fresh water to prevent corrosion of the metal parts. When used in the body mount configuration, you should not allow the cable connectors to be submerged. Several waterproof adapters are available through your dealer which will allow you to waterproof the connection between the searchcoil and extender cable connectors.

There are several good books to help the beginner learn how to use the detector, where to search and how to recover a target without damaging the environment. A good coin shooter can recover a lot of finds and leave the area looking as though he had never been there. Above all, always fill your holes when you have recovered the target.

TESORO Metal Detectors are sold through independent dealers, who are almost always treasure hunters themselves. They can provide you with you much needed information about how to use your detector, how to probe, plug and dig in your locale, and answer most of your questions about treasure hunting in general.

The use of earphones will benefit you in two ways. Most earphones will very effectively block out most of the ambient noise, such as traffic noise and wind noise, which will enable you to better hear the fainter signals caused by the deeper targets. Obviously, the older, more valuable coins will probably be deeper than the ones which were lost last week, so you should take advantage of anything that will help you hear the weaker signals. Secondly, using earphones will greatly extend the battery life, since it takes much less power to operate them. The Diablo II is not equipped with a volume control, but does have a limiting circuit in the earphone jack. If less volume is desired with earphones, you may want to use earphones with a built in volume control. Any good 8 or 16 ohm set with 1/4 inch stereo jack will do.

HAPPY HUNTING, and thank you for purchasing a TESORO.

WARRANTY SERVICE

Your Tesoro metal detector is covered by a **Limited Lifetime Warranty**, the terms of which are listed below. If your metal detector should require service, you may return it to the Tesoro factory, or tone of the factory authorized service centers. Contact the factory for the name and address of the nearest service center.

If you have any questions, don't hesitate to contact the factory.

LIMITED LIFETIME WARRANTY

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

This instrument is warranted to be free of defects in material and workmanship as long as it is owned by the original consumer purchaser. This warranty is not transferable, and is valid only if the warranty registration card has been completed and mailed within 10 days of purchase.

During the first two years, TESORO will, at its option, repair or replace any instrument covered by this warranty, without charge, except for transportation charges, at its factory in Prescott, Arizona, or at one of its authorized repair centers. After two years from date of purchase, TESORO will replace defective parts at no charge except a nominal labor change and transportation charges.

This warranty excludes batteries, damage caused by leaky batteries, cable breakage due to flexing on body mount units, and wear of the searchcoil housing. Also excluded are instruments which have been abused, altered, or repaired by an unauthorized party.

If warrant service should be necessary, contact the factor for nearest repair center.

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