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## Piranha 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

The Piranha is high performance metal detector which utilizes state of the art Pulse Induction technology and a revolutionary new kind of Printed Spiral searchcoil. The Piranha will satisfy the requirements of the serious detectorist, whether they are experienced or not, by incorporating simplicity and convertibility together. Don't be fooled by its simplicity, the Piranha is capable of delivering peak performance by eliminating troublesome adjustments and complicated features creating an extremely simple to operating light weight detector. The Piranha is the first of its kind. Not only does it offer a totally new concept in searchcoil design making it more responsive to fine gold coins, jewelry, and nuggets, but it is also the first to offer interchangeable searchcoils in a variety of sizes. The Piranha is packaged in an all new waterproof housing, making it ideal for wet weather use, beach hunting, or diving - in fresh or salt water. It is convertible to body/belt mount and requires no special tools.

As a Pulse Induction instrument the Piranha will provide mineral free operation in virtually all ground mineral or salt water environments. Equipped with auto tuning the Piranha is a motion based All Metal detector. Though the searchcoil must be moving when pinpointing, due to the auto tuning, the amount of motion is so slight that pinpoint is easily accomplished.

Designed as a turn on and go all purpose detector, the Piranha requires no special ground adjustments or complicated set up. A variety of optional searchcoils provides the operator greater versatility and a wider range of site selection. A guide to selecting the proper optional coil is included in the section for Field Use.

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

### ASSEMBLY

Assembly of the Piranha is very simple, and requires no special tools. In fact, the only assembly necessary is to mount the searchcoil to the end of the lower stem and connect the lower stem and the upper pole together.

1. Take the lower stem (the one with the black isolator pole tip), and remove the screw and nut. Put two of the friction washers into the recessed slots provided on the pole tip (where the screw fits through). Two sizes of friction washers are supplied, one thick set and one thin set. Using the washers that fit best, insert the pole tip between the mounting ears of the searchcoil and align the holes of the pole tip and washers with those of the mounting ears. The pole tip should fit snugly.
2. Insert the coil mounting screw through the ears of the searchcoil and pole tip, if the cable is in the way reverse the direction of the screw and insert it from the other side.
3. Install the thumb nut on the screw and tighten by hand.
4. Depress the two buttons on the upper end of the lower stem, and slide it into the upper pole section. Push the lower stem up so that the buttons click into the third set of holes from the end of the upper pole.
5. Wrap the searchcoil cable around the pole making sure it is snug to the pole, leaving just enough slack near the searchcoil to permit coil adjustment. Then connect the searchcoil connector into the matching connector found at the

searchcoil to permit coil adjustment. Then connect the searchcoil connector into the matching connector terminals at the back of the control box. Tighten it by hand.

**Note:** Do not allow the cable to flop loosely over the searchcoil. The Piranha is sensitive enough to see the tiny wires in the cable creating false signals caused by the moving wires.

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## CONVERSION

Obviously, converting the Piranha from pole mount to body/belt mount is simply a matter of removing the control box from the upper pole and unwinding the cable. To remove the control box from the pole, depress the four spring buttons that hold the mounting bracket and control box to the pole, and left. It is easiest to release one set of spring buttons at a time. Unwind the searchcoil cable from the poles and fasten it to the lower stem with a velcro fastener, just above the black isolator tip, then fasten the cable to the upper pole with the other velcro fastener, just below the foam hand grip.

Converting the Piranha back from body/belt mount to pole mount is simply a matter of reversing the above procedure.

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## ADJUSTMENT

The searchcoil angle and stem length should be adjusted so that the unit does not become uncomfortable or tiring to hold after long periods of use. The detector should rest in your hand with arm relaxed allowing it to swing back and forth without having to lift with the elbow or shoulder, while keeping the searchcoil as close as possible to the ground without touching. The pole length is adjusted by depressing the spring buttons and extending or shortening the lower stem, till they click into the holes that give you the most comfortable setting. The searchcoil 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.

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## SPECIFICATIONS

Operating Frequency	900 kHz
Searchcoil Type	Printed Spiral
Searchcoil Size	8" Diameter
Cable Length	Approx. 3'
Audio Frequency	Approx. 900 Hz
Audio Output	Stereo Piezo Headphones
Weight (may vary slightly)	less than 4.5 lbs
Battery Requirement	(8) AA DC (alkaline)
Battery Life (typical)	10 to 20 hours
Optimum Temperature Range	30° to 100° F
Operating Modes	Motion (auto tune)
	All Metal
Maximum Depth Rating	200 ft.

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

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## CONTROLS

The Piranha has been specially automated so that only two controls are needed to make adjustments, one mounted on the front panel of the detector and the other is mounted inside the control housing.

1. **ON/OFF - BATTERY TEST - THRESHOLD CONTROL.** This control is used to perform several functions: It turns the instrument's power on and off. Turning the knob completely counterclockwise until it clicks disconnects the batteries from the circuit, shutting the instrument off. When the knob is first turned on (clockwise), the detector will automatically test its batteries, and give you a visible indication of their connection. Fresh batteries will cause a green LED to illuminate for about 3 to 5 seconds. As the batteries age and become weaker, the illumination will be weaker and, and decay more quickly. When the response is no glow from the LED it is time for new batteries. It is recommended to always use alkaline batteries. The Threshold function of this control TUNES the detector to Threshold. This adjustment will be explained further in the TUNING section of the manual.
2. **SIGNAL INDICATOR LIGHT.** A red light identified on the front control panel as "SIGNAL" will illuminate each time the searchcoil is passed over a metallic object indicating the presence of a target. It is important to make sure you do not have the Threshold set so sensitive that the detector responds to ground variations, hot rocks, other ground mineralization, or electrical interferences as the SIGNAL light will illuminate even when the detector produces a false signal caused by these.
3. **BATTERY TEST LAMP.** The Piranha features an automatic battery check that occurs each time the detector is

turned on. A fresh set of good batteries should illuminate the lamp for 3 to 5 seconds. As the batteries age the light will become dimmer and its duration of illumination will shorten. If only a short, quick flash occurs or no light is present it is time to replace the batteries. The Plranha requires 8 AA size alkaline batteries.

4. **VOLUME CONTROL.** The Plranha is equipped with a set of stereo piezo headphones that are hard-wired to the instrument for waterproof purposes. Because the instrument will be operated in different environments where the ambient noise level varies, such as: near the crashing surf at ocean beaches, wearing head gear or listening over a regulator when scuba diving, or detecting near a serene lake creates the need for a variable volume control. The volume control for the headphones is found inside the control housing. To access this control simply unlatch the draw bolts holding the control panel secure to the housing. Always make sure the control box is dry before opening. The volume control is found on the left, the opposite side from the battery compartment. You will notice a small shaft used to adjust the volume level.

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## **TUNING**

Since the most troublesome adjustments of standard detectors have been automated in the Plranha, or are not necessary with Pulse Induction, the tuning procedure for this detector is simply a matter of setting the desired Threshold tone and headphone volume.

Pulse Induction does not require special adjustments in order to ignore the effects of wet salt or ground mineralization. However, proper tuning is essential. To tune the Plranha, the Threshold control should be adjusted so that there is a barely audible tone. If the tone is set too low or silent, some of the deeper or weaker targets may not be heard. If the tone is set too loud, some deeper or weaker targets may not be heard due to audio masking. Setting the Threshold for silent operation will cause some loss of depth, but may be necessary in extreme conditions in order to achieve smooth operation. A silent Threshold may be necessary in some areas where gold nugget hunting in order to maintain a stable operation over hot rocks. Since depth may be sacrificed, the Plranha should only be used as a nugget hunter when not other system is able to be operated at the site.

You should not hear a change in the Threshold tone when lowering the searchcoil toward the ground. If a change occurs, or you obtain an audio increase when lowering the searchcoil into saltwater, simply hold the coil still for a moment allowing the auto tuning time to retune the instrument back to Threshold. Do not let the searchcoil raise at the end of your sweep as this may cause some false signals. Always hold the coil parallel with the ground.

Pulse Induction will allow signal filtering once the desired signal is recovered from the pulse. However, for proper operation, the pulse generator, searchcoil and input amplifier must be of very wide bandwidth. This makes the detector susceptible to picking up any sources of electrical interference, such as 60 cycle power transmission noise. An absolutely smooth Threshold may not be possible in my locations, and some rumble or motorboating may be present when the Threshold is adjusted to the proper point. This is inherent in the design of a Pulse unit. Adjusting the Threshold either louder or quieter is the only way to control this problem.

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## **FIELD USE**

The detector should be held in a position that is comfortable for you. Swing the detector from side to side in about a three foot arc, overlapping succeeding strokes well. This motion is called a "sweep." Go at a pace that is comfortable for you. In fact, trying to hunt too fast in Discriminate may even cause a loss of depth in heavily mineralized locations.

It would be helpful to bury some coins and trash metal junk items in an area that you know is clear of other metal objects, and then try the unit in its various modes. Check the area in All Metal Mode first to be sure its clear of trash then bury the targets at least a foot apart, and from 2 to 6 inches deep to start. Make a map of the test bed to be sure you know what each target is and how deep it is. Practice on these targets to familiarize yourself with your detector's target response. This will also help you learn the proper sweep rate to help insure against lost targets.

Try to keep your searchcoil height constant and close to the ground. Too often people tend to raise the coil at the end of a sweep, much like a pendulum, especially if they are hurrying. Try to avoid this, as any increase in height will cause a corresponding loss of depth. In areas with well kept lawns, the easiest way to maintain a constant searchcoil height is to allow the coil to rest on the grass as you sweep from side to side. In rough and rocky areas it is best not to "scrub" the coil on the ground, as the rocks will act like abrasives, and wear away the coil bottom (an optional coil scuff cover will protect against this.) Sweep the coil as close to the ground as possible without touching. Avoid hitting the ground or rocks with the coil as this may cause false signals that sound much like a desired target would. The higher you hold and sweep the coil above the ground the less depth you'll be able to obtain.

If there is any doubt whether a target is good or not, DIG IT. If you don't dig any junk at all, you are surely passing up a lot of good finds as well.

Once the detector has been tuned the auto tuning will maintain the Threshold at that level. Due to the auto tuning the searchcoil must be moving while searching or pinpointing. If you stop the searchcoil over a metallic object or target the detector will tune it out and return the instrument to the established Threshold. If you move the searchcoil slightly off the target to one side, and hold it there momentarily, and then move it back over the target once again, the detector will automatically retune to respond to the target.

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## **SELECTING THE RIGHT SEARCHCOIL**

Selecting the right searchcoil for the type of detecting you're doing will add greatly to your success. The Plranha come with a standard 8" Printed Spiral coil which is a new and revolutionary design developed by Tesoro specifically for the Plranha.

This is an excellent overall coil since most people who operate PI instruments are usually searching large sandy beach areas where targets are easy to dig and there is usually not an over abundance of trash. This coil will detect very tiny targets for its size and provides excellent target separation while giving more ground coverage. However, it is not always the right coil for the job. Therefore Tesoro has made it possible to interchange coils, and has developed a variety of its unique Printed Spiral searchcoil in a selection of sizes.

In addition to the standard 8" open center searchcoil, two optional coil sizes are available for the Piranha. The 10 1/2" open center coil is designed for areas where digging is easier, and where junk targets may not be too numerous. The 7 inch coil will be particularly useful when searching for smaller targets, such as gold nuggets.

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## **PINPOINTING**

Move the coil slowly across the target from side to side and then from front to back at 90 degree angles. Raise the coil slightly, slow the sweep speed, and shorten the sweep to narrow detection area enough that it's easy to tell where the coil center is at the instant of the sound as you criss-cross the target.

Another easy method is to sweep the coil from side to side across the target in very short sweeps, as you slowly move forward and backward across the target, criss-crossing the target until you just barely get a response at one spot. Slow down the sweep rate and shorten the sweeps until you just barely get a response at one spot. Again the target will be directly below the coil center at the instant of response. Caution: this method will require some practice as well in order to get used to not having your eyes follow the searchcoil. Typically it is easy to miss the spot by a fraction causing you to dig a large hole in order to find the target is off to one side from where you started.

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## **BATTERY REPLACEMENT**

The Piranha is equipped with an automatic battery test circuit so that you can always be sure you are getting top performance from it. The batteries should be checked after the detector has been on for about 10 minutes, and then periodically as you are using it for long periods. To activate the batter test circuit, simply turn the detector off momentarily and then back on. To test, follow the procedure described in the control section of this manual. **When testing the batteries, be sure that the Mode Switch is in the Disc position, so that the All Metal threshold signal doesn't add to the battery test signal.** The detector should beep loudly for about 4 or 5 seconds, with the sound slowly fading into silence, if the batteries are fresh. 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 knob on the battery door on the rear of the unit. The entire door will pop out. Remove the batteries from the detector. Replace the new 9 volt batteries into the snaps, observing the polarity indicators. Slide the batteries back into the detector, making sure that the battery clip lead is connected. Install the battery door flange into the top of the cutout in the chassis, making sure that the plunger is still pulled out. Then push the plungers back in to lock the door in place.

Should you desire to do so, rechargeable Nickel-Cadmium batteries can be substituted for standard 9 volt cells. Individual 9 volt size cells are readily available at most electronic supply stores, as well as the chargers for them, and they can be inserted into the standard holder used in your Piranha. The initial battery check reading will be slightly lower, but will not drop as much with use, until the batteries are completely discharged.

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## **DETECTOR PROTECTION CHECKLIST**

Congratulations, you have just purchased a new metal detector, and we wish to thank you for choosing Tesoro.

So many people are disappointed when their new "state of the art" detector because less and less exciting to use, and doesn't seem to go as deep anymore. There is something that you can do to keep your new detector working as good as when it was new.

The most important thing is to simply to remember that your detector is an electronic instrument, and to treat it as such. You wouldn't expect your TV set to operate properly if you stored it in the trunk of your car, would you?

We have generated the following list to help you take care of your detector and to help ensure that you do not void its warranty. If you will follow its guidelines, you will find your detector will not let you down.

- Operate your detector exactly as recommended in this instruction manual.
- Do not attempt to modify or repair the detector's electronics; caution: opening of control housing may void your warranty.
- Cable is hard wired into search coil, do not attempt removal of the spring retainer on the search coil housing.
- Use only high-quality carbon-zinc, alkaline, or nicad batteries. Never substitute a different voltage. Brand should not be mixed. Do not attempt to modify the power supply system.
- Never spray lubricants such as WD-40 or any type of cleaners, sealants or other chemical preparation on or into the detector.
- Avoid banging the searchcoil against rocks or foundation walls.
- Remove and clean out scuff covers periodically to avoid build up of mineralized dirt particles which will affect performance.
- After each use, clean the detector with a soft cloth to remove dust, moisture, and other contaminants.
- Do not transport or store your detector in the trunk of your car.
- If your detector has a protective spring at the coil cable connector be sure that the spring does not work its way

If your detector has a pressure spring at the coil cable connector, be sure that the spring does not move into the plug, causing a short. (On Tesoro detectors, the spring should extend approximately 5/8th from the base of the connector.)

- Keep cables properly wound around the pole stems and protect them during use. Floppy, pinched, or cables that become snagged during use may short, causing erratic noises or unnecessary replacement of the searchcoil.
- Protect your detector from dust, moisture, and extreme temperatures during storage. Avoid storing it in places such as attics, basements, or garages. When shipping, use the original factory carton or similar heavy-duty container; a one inch minimum clearance of padding around the detector must be provided when shipping.
- Treat your detector as you would any sensitive electronic instrument. Though ruggedly constructed and designed to withstand the demands of normal treasure hunting applications, it is not intended to be improperly operated or abused.

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## **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 one 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.

## **WATERPROOF METAL DETECTOR 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 charge 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 factory for nearest repair center.

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