





The name that means Treasure

Stingray 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

The Stingray II is a waterproof VLF/TR/VLF Discriminator, which provides three basic operating modes. It can be used as an ALL METAL detector, as a TR discriminator, or as a Motion based discriminator. It is capable of providing Mineral Free operation in any environment, if adjusted correctly.

The Stingray II can be used on land, in the surf, or underwater to depths of 200 feet. It is perhaps the most versatile of all waterproof metal detector's yet made.

The detector is supplied with in standard land based metal detector form, but is equipped with a belt bracket for body mounting. Further, the Stingray II can be compressed to useable lengths for the diving TH'er.

The Stingray II is equipped with a waterproof coil connector so that optional coils can be utilized on the detector.

As with any detector, the familiarity of the user with his instrument will have a great effect on how successful he will be. We recommend that you read and understand this manual fully before attempting to use the instrument in the field.

ASSEMBLY

The Stingray II can be assembled into several configuration, but the most general forms are either the pole mount or the body mount configurations. It is relatively easy to convert the detector from one form to the other. The installation of the lower pole to the searchcoil is the same regardless of which configuration is used.

1. 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 friction washers are in place.

NOTE: It will be much easier to do this if you moisten the friction washers first.

2. Insert the coil mounting screw through the coil and pole tip. Install the thumbnut on the screw and tighten by hand.
3. Depress the two spring buttons on the upper end of the lower stem, and slide it into the middle stem. Push the lower stem up so that the buttons click into the third set of holes from the end of the middle stem.
4. The small end of the middle pole is then inserted into the upper pole and the pole lock is twisted to provide a snug fit.

NOTE: The Stingray II can be set up as a diver's pole configuration by simply putting the lower pole directly into the upper pole.

5. Wind the searchcoil cable around the pole.

The next step in setting up your Stingray II will be deciding which direction your faceplate will be.

Pointing the faceplate away from the coil gives you less chances of having the knobs turn when you set the detector down.

Pointing the faceplate toward the coil makes it less likely that the headphone cable will get in your way. Experiment with having your detector mounted both ways to find the configuration that best suits your hunting style.

Placing or removing the detector on the pole is an easy process. Simply depress one set of spring clips at a time and slide the detector on the pole.

Install the coil connector into its receptacle on the back of the control housing and tighten it finger tight.

NOTE: Do not use pliers to tighten the coil connector.

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. The Stingray II is powerful enough to see the fine wires moving, and can give you false signals if the cable is too loose enough to flop around. (Note: Use the two velcro straps to hold the cable tight against the pole.)

SPECIFICATIONS

Operating Frequency	12 kHz
Searchcoil Type	Concentric
Searchcoil Size	8" Diameter
Cable Length	Approx. 3’
Audio Frequency	Approx. 750 Hz
Audio Output	Waterproof Headphones
Weight (may vary slightly)	3 3/4 lbs.
Battery Requirement	9 volt DC 6 AA alkaline penlight
Battery Life (typical)	15 to 30 hours
Optimum Temperature Range	30° to 100° F
Operating Modes	All Metal, no motion
	Discriminate, motion
	Discriminate, no motion
Maximum Depth Rating	200 ft.

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

CONTROLS

The Stingray II has only four controls on its front panel but three additional controls are on the inside of the control housing and can be adjusted by opening the housing. Since the Threshold Adjust, Volume and Sensitivity for Motion discriminate are seldom used controls, they are placed on the inside of the housing to minimize the chance of leaking.

1. **ON/OFF Tune Speed, Battery Check.** The power to the Stingray II is controlled by this switch. A battery test is accomplished each time the switch is turned on and the switch selects the speed of the tuning for non-motion modes. The counterclockwise position turns off the detector. When the switch is turned clockwise to the fast speed position, the automatic battery test sequence is triggered. The audio sound will be very loud for roughly 4 - 5 seconds when fresh batteries are used. As the batteries lose power, the sound will be less intense and will die away faster until there is no audio at all or just a short chirp. This lack of audio sound indicates it is time for fresh batteries. The non-motion modes (TR DISC and ALL METAL) are retuned back to threshold by placing this switch in the FAST, MED, or SLOW position. Tuning speed should be selected to suit the particular hunting mode and mineral conditions.
2. **Mode Control.** This switch selects the desired operating mode of the Stingray II. TR DISC is generally more suitable for searching salt water beaches, and the disc level control is used to adjust the detector's response to the wet salt beach, since the TR mode is not mineral free. MOT DISC is the mineral-free motion discriminate mode, and the disc level control can be used to adjust the detector to eliminate trash items as desired. ALL METAL is a non-motion mode, and the GND adjust control can be used to adjust the detector’s response to ground mineralization.
3. **Disc Level Control.** This control is used to adjust the detector's response to unwanted trash items when the detector is used in motion discriminate and to adjust the detector’s response to wet salt beaches when it is used in the TR discriminate mode. Wet salt beaches can usually be tuned neutral somewhere around 2 to 4 on the dial.
4. **GND Adjust.** This control is used to set the desired response to ground minerals when the detector is used in the ALL METAL mode. It doesn't have enough range to compensate for wet salt beaches, so is not usable when searching them. The detector's response to ground minerals should be set so that as the searchcoil approaches normal ground, the detector’s threshold goes slightly louder. This will keep the detector from reading holes in the ground when it is used in the motion discriminate mode.

NOTE: The following three controls are mounted inside the control housing, since they are seldom used controls and do not need constant adjustment.

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5. **Threshold Adjust.** This control is used to adjust the threshold (the beginning of sound) for the two non-motion modes. Threshold should be adjusted with the coil in the air, the tune speed switch on fast, and the mode switch in TR disc or ALL METAL position. Adjust so sound is very low - just barely audible.
6. **Volume.** This control adjusts the volume of the loudest sound to be comfortable to the user. If the loudest sounds are too loud, you may become weary of using the detector, and if they are not loud enough, you may miss the deepest targets.
7. **Motion DISC Sensitivity.** This control should be set as high as possible (clockwise direction) while still allowing quiet operation. When it is set too high, false signals may become predominant, which may reduce your ability o make out the faint deep target signals.

TUNING THE STRINGRAY II

The Stingray II, like other high power metal detectors, will give much better performance if it is properly tuned. To achieve maximum performance from your Stingray II, be sure that you understand the following sections of the manual and that you use it in the best mode for the site you are hunting.

1. Tuning In The All Metal Mode

The Ground Adjust control is located on the front panel and is not designed to be used as the ground adjust control would normally be used on a land based metal detector. It should be set t the best setting for the areas that you work and then left alone.

The Ground Adjust control should be set so that the most negative mineral backgrounds that you will be detecting in response with a slight positive increase in volume as the searchcoil is lowered to the ground. This will yield the best results when the detector is used in the motion discriminate mode by keeping the detector from responding to negative minerals or from detecting a hole in the ground.

The Ground Adjust control doesn't have enough range to neutralize salt water beaches. Salt water beaches are always very positive, so the TR discriminate mode should be used with the Disc Level control being set to neutralize the conductive nature of the beach.

1. Put the On/Off control to fast and the Mode select switch to ALL METAL. Hold the searchcoil about two feet above the ground and rapidly lower the searchcoil to about two inches above the ground.
2. If there is no change in the Threshold sound, or only a slight positive increase, the detector is properly tuned. If the sound decreases, the ground adjust should be turned slightly clockwise (in the direction labeled Max). If the sound increases dramatically, turn the ground adjust slightly counterclockwise.
3. Repeat the above step until the threshold doesn't change or until there is a slight positive increase in the threshold sound.

2. Tuning In Motion Discriminate Mode

Using the detector in Motion discriminate is simply a matter of setting the Disc Level control to the desired position. The detector should not be affected by mineralization, unless it is quite severe. A slightly improvement in response may be noted by reducing the Sensitivity Control on the inside of the housing.

NOTE: Be very careful not to get any sand or dirt particles on the front edge of the housing or onto the O-ring in the panel. Any particles in this seal can cause the detector to leak when it is submerged. When closing the housing, operate both draw bolts at the same time, rather than clamping one side and then the other. From time to time, you should apply a bit of O-ring grease to the panel O-ring seal.

3. Tuning In TR Discriminate Mode

The TR discriminate mode will probably be unusable in virtually all land locations due to mineralization levels. It may be the most useable mode on certain salt water beaches, however, but only if the discriminate level control is set to neutralize the effects of the combined mineralization and conductive salt water. This obviously means you cannot use the Disc Level control to eliminate any trash items, since you must used it to eliminate mineral effects.

It will probably be best to try using the Motion discriminate mode on salt water beaches since you can use the entire range of the Disc Level control to eliminate some of the more prevalent trash.

1. Turn the ON/OFF control to the fast position and the Discriminate Level control to about mid-range. With the Mode switch in the TR Disc position, hold the searchcoil about two inches above the ground.
2. Rapidly raise the coil about two or three inches. If raising the searchcoil slightly makes the threshold sound increase to maximum, the mineralization level will probably make the TR discriminate mode very difficult to use. You must be able to sweep the coil from side to side and still maintain the threshold sound. Attempting to operate in TR discriminate in heavily mineralized ground will almost always cause a large decrease in depth.
3. On a salt water beach, the discriminate level control can be used to essentially ground compensate the detector if it used in the TR discriminate mode. It will be best to adjust the Disc Level control for a slight increase in sound as the searchcoil approaches the wet salt beach.

SELECTING THE PROPER OPERATING MODE

The TR discriminate mode will probably be unusable in most land areas due to the mineralization levels encountered. However, the TR discriminate mode can be quite possibly the best choice to use on a salt water beach because the Disc Level control can be used to neutralize the conductive wet salt sands. Also if the Motion discriminate mode gives a lot of false signals on such a beach, the TR probably can be adjusted to operate quite well without all of the false signals.

In land hunting, it will be best to use either the ALL METAL mode or the Motion discriminate mode. Either of these modes will be mineral free if the detector is adjusted properly. It will be best to adjust the ground adjust control for a slight positive increase as the searchcoil approaches the ground. This will keep the Motion discriminate mode from reading holes in the ground as you recheck a target you have started to recover.

NOTE: Be very careful not to get any sand or dirt particles on the front edge of the housing or onto the O-ring in the panel. Any particles in this seal can cause the detector to leak when it is submerged. When closing the housing, operate both draw bolts at the same time, rather than clamping one side and then the other. From time to time, you should apply a bit of O-ring grease to the panel O-ring seal.

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. Tighten the searchcoil thumbnut by hand so that the searchcoil will maintain this setting.

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.” The Stingray II was designed to get maximum depth without the frantic pace required of earlier motion detectors, so 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 for DISC operation.

In ALL METAL mode operation, keep the detector tuned so that it is just lightly buzzing. This is easy to do because the ground minerals do not affect the ALL METAL mode if properly adjusted. Regardless of which mode you are using, try to keep your searchcoil height constant and close to the ground. Most people tend to raise the coil at the end of a sweep, much like a pendulum, especially if they hurry. 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. Hitting the ground or rocks may cause a false signal much like a desired target would. Sweeping the coil too high above the ground results in a loss of depth.

When operating in the Motion Discriminate Mode, some “false signals” may be caused by heavy concentrations of trash metal objects, by very large trash items, or by electrical interference. These signals will sound different than good target signals because they are generally short, choppy sounds. At the end of your sweep, as you the reverse the coil direction, the detector is most susceptible to trash induced noise. There are two ways to tell whether these sounds are good deep signals or trash “noise.” The first is by repeatability. Trash induced noises will not be regular as you sweep the coil over the suspected target several times, whereas a good target response will be repeatable. The second method is to switch to All Metal Mode and check the target response sound. If the response is weak, it may well be a deep, good target; but if the response is very strong, it is probably trash. Note that a coin close to the surface can give a double beep sound, but it is regular and repeatable. Raising the coil an inch or two will restore the single beep on surface targets.

If there is any doubt whether a target is good or not, DIG IT. For this same reason, in the Motion Discriminate Mode, it is best not to use a higher DISC LEVEL setting than necessary. Nickels and most smaller rings are rejected when the DISC LEVEL is set to reject pull tabs on any metal detector that is a TR Discriminator like the Stingray II. If you don’t dig any junk at all, you are surely passing up a lot of good finds as well. Set the DISC LEVEL only high enough to suit the conditions where you are searching.

PINPOINTING

The sweep speed of the detector is low enough to allow pin-pointing in the Motion Discriminate Mode, but will require a little more practice. Move the coil slowly from side to side and then from front to back over the target. Raising the coil slightly and slowing the sweep speed will narrow down the detection area enough that it's easy to tell where the coil center is at the instant of the sound.

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. Slow down the sweep rate and shorten the sweeps until you just barely get a response at one spot. The target will be directly below the coil center at this response time.

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The easiest way to pinpoint for most people will be to switch to the All Metal, since no motion is required. To pinpoint a target that doesn't saturate the audio, just move the coil forward and back, and side to side until you get the strongest sound. The target will be directly below the coil center. If the audio saturates over a large area, hold the coil over the target momentarily to detune the detector. This will narrow its field of response to allow you to once again seek the area of strongest response.

BATTERY INSTALLATION

The Stingray II 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 test, follow the procedure described in the control section of this manual.

To install or replace the batteries, make sure the detector housing is dry then release the two draw bolts securing the control panel to the housing. Gently pull the control panel free, being careful not to twist or strain the ribbon cable connecting the control panel to the printed circuit board. Remove the foam insert and lift out the battery holder. Remove the battery terminal snap from the battery holder. The Stingray II takes 6 AA alkaline batteries. Make sure that the terminal polarity snaps fit tightly to the polarity snaps of the battery holder. A loose connection may cause the detector to fail to respond or to act erratically when operating. Also make certain that you follow the polarity indicators on both the battery holder as well as the batteries themselves. Place the terminal end against the foam insert when inserting the battery holder back into the battery compartment.

IMPORTANT NOTE: Always make sure the instrument is dry before opening. Water, if allowed to make contact with the circuit board, may damage it. Always make sure the O-ring is clean and free of dirt or sand. It is recommend you wipe the O-ring with a dry cloth and look for damage and apply a new coat of diver's silicone grease before replacing. Failure to maintain the O-ring will result in extensive damage and will not be covered under warranty.

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 inside 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.

RECOMMENDED RECOVERY METHODS

Always obtain permission from the person in charge before hunting on private property, schoolyards, parks, churches, or state parks. Even when relic hunting in the woods, NEER LEAVE A HOLE!, or damage anything on the property.

PROTECT YOUR HOBBY - FILL ALL HOLES

OPTIONAL SEARCHCOILS

Selecting the right searchcoil for the type of detecting you are doing will add greatly to your success. The Stingray II is equipped with an 8" open center concentric style coil. To increase the flexibility of your Stingray II, Tesoro has designed it so that the searchcoil is replaceable by the user. Optional searchcoils of 7" and 10 1/2" are available through your dealer.

The 8" unit furnished as standard is probably the best overall coil size for use by most people, since it offers the best compromise as far as depth vs. target size are concerned. For people who need to find targets larger than coins, the 10 1/2" coil will greatly increase detection depth. For finding small pieces, such as some jewelry, the 7" coil will increase the detector's response to smaller targets.

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 at the address below.

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 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 factory for nearest repair center.

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