



The name that means Treasure

Inca 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 Aztec is a Transmitter-receiver (TR) Metal Detector, operating in the very low frequency (VLF) portion of the RF spectrum. The detector utilizes the natural phenomena of the phase delay of all targets to provide mineral-free or ground compensated response in the normal mode of operation, or to provide discriminate capability in the discriminate mode.

The Aztec is an extremely sensitive metal detector, but because of its unique push-button MODE CHANGE/TUNING SWITCH is the easiest "one handed" VLF/TR Discriminator to use.

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

Assembly of the Inca is very simple, and requires no special tools. The only assembly required is to mount the searchcoil to the end of the lower stem and to install the lower stem and lock nut assembly to the upper stem.

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.
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 by depressing the spring buttons and turning the lower stem around several times as necessary.

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.

assembly into the most forward set of holes.

SPECIFICATIONS

Operating Frequency	12 kHz
Searchcoil Type	Concentric
Searchcoil Size	8 1/2" Diameter
Cable Length	Approx. 3’
Audio Frequency	Approx. 375 Hz
Audio Output	2 1/4" speaker
Headphone Compatibility	1/4" stereo earphone jack
Weight (may vary slightly)	3 lbs. 14 oz. nominal
Battery Requirement	12 volts DC 8 AA penlight batteries
Battery Life (typical)	15 to 30 hours
Optimum Temperature Range	30° to 100° F
Optimum Humidity	0 to 75% R.H.
Operating Modes	Normal (All Metal)
	Discriminate

CONTROLS

The function of the front panel controls the Inca are as follows.

1. **ON/OFF, TUNING, BATTERY TEST.** This control is used to tune the detector to it's most sensitive level (Threshold) regardless of which mode of operation is being used. It also controls the power for the detector, and activates the automatic battery test circuitry. The MODE control should always be in the NORMAL ONLY position and the MODE/TUNING switch depressed when setting the unit to threshold with the TUNING control, or when checking the batteries. The batteries should be tested after about 10 minutes of operation, and with a moderate to heavy amount of sound. Turn the detector off momentarily, and then back on, turning the TUNING control completely clockwise to make maximum sound. The detector will remain in the battery test mode for about 3 to 5 seconds. A meter reading of .6 or above indicates the battery strength is adequate for proper operation. If the meter reading is below .6, replace the batteries. Then after checking the batteries, retune to threshold before releasing the MODE/CHANGE TUNING SWITCH and turning the MODE control switch to the desired mode of operation.
2. **GROUND ADJUST.** The control is used to adjust the detector so that it doesn't respond to the mineralization in the ground when used in the NORMAL (all metal) mode. The GROUND ADJUST is easier to set when the MODE switch is in the NORMAL ONLY position, since the threshold will remain when the MODE CHANGE/TUNING SWITCH is depressed in this position.
3. **DISCRIMINATE LEVEL.** This control is used to adjust the detector's response to unwanted metallic trash when used in the Discriminate mode. At the lowest setting "0", the detector will eliminate most iron objects, but will still respond in a positive manner to light foil, bottle caps, pull tabs and most other metallic items. As the knob setting is increased, response to more of these metallic trash items is reversed so that these objects give no response.
4. **DISCRIMINATE SENSITIVITY.** Since the Inca is a mineral free discriminator, this control will usually be set at the maximum. There are situations, however, where reducing the sensitivity will yield better performance. These situations will usually be self-evident due to spurious noise "signals" caused by very heavy metallic trash concentrations, minerals, or RF or power line interference. Set this control as high as will allow you to operate with a tolerable level of interference.
5. **MODE SWITCH.** This switch is a three position rotary control which selects the detector's basic operating mode. In the NORMAL ONLY mode, the push-button MODE CHANGE/TUNING switch acts as a TUNING switch only, and no mode change is accomplished when the push-button is depressed. In the NORMAL or DISCRIM modes, depressing and holding the push-button causes a change to the other mode. When the push-button is released, the detector returns to the mode selected by the MODE SWITCH to help you remember which controls are operational in each of the two basic modes.
6. **TUNING/MODE CHANGE SWITCH.** This push button switch is located in the end of the handle, where it can be operated with the thumb of the hand holding the detector. This switch performs two functions.
    A. When depressed momentarily and released, it retunes the detector back to the desired threshold, when in NORMAL ONLY mode.
    B. When held in the depressed position, it causes the detector to switch to the other basic mode. If the MODE switch is in the Normal position, holding the button down will cause the detector to switch to Discriminate Mode. If the MODE switch is in the Discriminate position, holding the button down will cause the detector to switch to Normal mode. When the button is released, the detector returns to the mode selected by the Mode switch.
7. **METER.** The meter and it's associated circuitry, while not really a control, serves two important functions.
    A. **BATTERY TEST.** This function is automatically performed for about 4 seconds each time the detector power is turned on. The meter reading will be above the .6 mark on the intensity scale when the unit is making a loud noise if the battery strength is adequate for proper performance.
    B. **COIN DEPTH.** In the NORMAL position, the meter will indicate approximate depth of the detected target, assuming the target to be coin size. In the DISCRIM mode, the depth reading feature will be inoperable.

    The coin depth reading feature of the Inca is an extremely useful aid in pinpointing. The reading will reach it's maximum forward deflection on the meter needle when the searchcoil is directly over the target, and the meter reading will then indicate the approximate target depth.

TUNING

No detector, regardless of how powerful it is, can provide optimum depth if it is improperly tuned. In fact, the more powerful a detector is, the more critical the tuning becomes. Less powerful units are more tolerant of operator misadjustment, but are not capable of the depth of a properly tuned high power detector such as the Inca.

To achieve maximum performance from your Inca be sure to properly adjust the GROUND ADJUST and TUNING controls in the Normal Mode only. The settings of these controls will also affect the detector's performance in the Discrim mode, so be sure to adjust them properly, even if you only plan to operate the detector in the Discrim mode.

Following the tuning procedures outlined below will help you properly tune your Inca, and will allow you to fully utilize its performance capabilities.

A. NORMAL MODE TUNING.Normal Mode Tuning.

1. Set the Mode Switch to the Normal Only position.
2. Depress the handle mounted push-button switch, and turn the On/Off Tuning control completely clockwise. Check to see that the battery reading is above .6.
3. After the battery test period ahs elapsed, turn the Tuning control down so the detector is making just a moderate buzz. Be sure to keep the push-button depressed while setting the Tuning control.
4. Hold the searchcoil about two feet above the ground, and release the push-button.
5. Lower the searchcoil to about one or two inches above the ground, and notice any changes in the audio sound as this is done.
6. If the audio sound level increased, turn the Ground Adjust control slightly lower. Note that turning the Ground Adjust control will cause a change in the audio level. Ignore this change, as it is of no consequence. The only change of concern is that change which occurs as the searchcoil is lowered to the ground.
7. Raise the searchcoil to about two feet above the ground, and momentarily depress the push-button to retune the detector to the moderate buzz.
8. Repeat steps 5, 6, and 7, until there is almost no change in the audio level as the searchcoil is lowered to the ground. NOTE: the ground must be free of all metallic items where the coil is lowered. If you cannot adjust the detector to do this, you may be over a piece of metal. Move to another spot and try again.
9. Momentarily depress the tuning switch, and turn the TUNING control down to get just a faint audio buzz. The detector is now ready to use in the NORMAL mode of operation. Once the detector is Ground Compensated, remember the number setting on the GROUND ADJUST control, and use it as a starting point next time.

B. DISCRIMINATE MODE TUNING.

Tuning the Inca for use in the Discriminate mode requires that the Normal Mode tuning procedure be properly accomplished, as the Ground Adjust control provides for mineral free operating in both the All Metal and Discrim modes. Also, the threshold setting of the Tuning control determines the minimum sound level for deep targets in the Discriminate mode. Too little threshold, and depth will be lost. Too much threshold, and the detector may become erratic.

After the Normal mode procedure is accomplished, the only settings necessary for operation in Discriminate mode is to set the Disc Level control to the desired amount of trash rejection, and to set the Sensitivity control the maximum setting that will allow smooth operation.

SELECTING THE PROPER MODE OF OPERATION

The Inca offers two basic modes of operation, the Normal mode (All Metal) and the Discriminate mode. Both modes are mineral free if the unit is properly adjusted. The Normal mode is the industry standard "VLF" type which does not require motion of the searchcoil for proper operation. This mode, while requiring an initial ground adjust setting of sound threshold, offers two very important advantages, these being the ability to pin-point without motion, and to provide exact ground canceling. The Discriminate mode is based on motion of the searchcoil, but requires very little motion, and offers the advantage of completely silent operation. Push-button mode change between these two modes is also included, offering the most versatile "one handed" operating system.

Since the threshold sound will "come and go" as the push-button is used to change modes, a third operation mode was added, this being the Normal Only mode. In this mode, the mode change feature is defeated, and the detector will retune to threshold when the push-button is depressed.

The Normal Only mode is the bet mode for the initial ground adjust and threshold adjustments, since the threshold does not go away when the button is pushed. This mode would probably e the best choice for someone who is nugget hunting or relic hunting, and is not interested in switching to Disc.

The push-button mode change feature of the Inca allows the user the options of either searching in normal mode to find all targets and switching to discriminate to check them, or to search in discriminate and switch to normal to pinpoint and measure depth. The former method has historically been the most thorough way to search a given area, but the extra slow sweep of the Inca tends to overcome most of the disadvantages of searching in discriminate, so most people will probably operate in discriminate because of the silent operation.

Earlier motion discriminators that are operated with the "Threshold" sound would give the user a definite indication of metallic trash by either nulling completely or by generating short, choppy sounds. Since the Discriminate mode operates without threshold sound, there is no nulling to indicate that the area is extremely trashy. When searching in the Discriminate mode, we recommend that you periodically switch to Normal mode and check the area you are searching to get an idea of how much trash is really there. In extremely heavy trash areas, it may be desirable to switch to a smaller search coil, even

through doing so will cause a loss of depth. The smaller coil will allow you a better chance of finding coins between the close pieces of trash.

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 Inca 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 Normal mode operation, keep the detector tuned so that there is just a slight buzzing of a sound. This is easy to do because the ground minerals do not affect the Normal 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 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. 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 Discriminate Mode, some “false signals” may be caused by 1) heavy concentrations of trash metal objects, 2) very large trash metal objects, or 3) 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 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 Inca. 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.

The sweep speed of the Inca is slow enough to allow pin-pointing in the 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.

To pinpoint in Normal mode does not require any motion, so may be easier for most people. To pin-point 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, simply push the tuning mode switch to the retune position momentarily over the area to detune the detector. This will narrow its field of response to allow you to once again seek the area of strongest response. It may be necessary to retune more than once with this technique. The coin depth meter is also a good pinpointing tool, since it doesn't saturate under normal conditions. Simply switch to Normal to the side of the target, move the coil over the target, and move it until you get the most forward deflection of the meter. This will not only tell you target center, but depth also if you did not tune over a target.

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

BATTERY REPLACEMENT

The Inca has an automatic battery test circuit so you can always know you're getting top performance from your detector. The batteries should be tested after the detector has been operated for about ten minutes, and while the detector is making a loud noise, so the batteries are properly loaded. To check the batteries, simply turn the Inca of for about five seconds, and then turn it back on and rotate the TUNING control completely clockwise. Depress the TUNING/MODE CHANGE button if it is not making lots of sound. The meter will indicate the battery strength for about four seconds. If the meter reads less than .6 during this period, replace the batteries.

To replace the batteries, pull the large knob on the battery door on the front of the unit. The entire door will pop out. Remove the battery pack from the detector, and then remove the batteries from the pack. Replace the new penlight batteries

Remove the battery pack from the detector, and then remove the batteries from the pack. Replace the new penlight batteries into the pack, observing the polarity indicators that are embossed into the insides of the pack. Slide the pack back into the detector, making sure that the battery clip lead is connected to the pack. Install the battery door flange into the top of the cutout in the chassis, and push the nylon fastener into the hole at the bottom of the chassis, making sure that the plungers are still pulled out. Then push the plunger back in to lock the door in place.

Should you desire to do so, rechargeable Nickel-Cadmium batteries can be substituted for standard penlight cells. Individual AA 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 8 holder used in your Inca. The initial battery check reading will be slightly lower, but will not drop as much with use, until the batteries are completely discharged.

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.

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 detector 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.

Under the copyright laws this documentation may not be copied, photocopied, reproduced, translated or reduced to any electronic or machine-readable form, in whole or in part, without the prior written consent of Tesoro Electronics Incorporated, except for the private use of a Inca owner or operator, or in a manner otherwise described in this documentation.
© 1995, 1996 Tesoro Electronics Incorporated. All rights reserved. Printed in the United States.

© 1995-1996 Tesoro Electronics Incorporated. All rights reserved. Printed in the United States.

Tesoro Electronics, Inc. 715 White Spar Road Prescott, AZ, USA 86303 1-928-771-2646