



Operating Instructions

I. Once fully assembled, and the batteries installed, set the ON/OFF DISC knob to the RING RANGE “P” (Preset) position and set the ALL-METAL toggle (located on the handle/rod) to the locked forward ALL-METAL position.

II. With the Toggle in the locked forward ALL-METAL position all types of metals, ferrous such as iron/steel and nonferrous such as brass, aluminum, copper, bronze, silver and gold, will respond with the same solid “beep” regardless of the DISC control setting.

III. If the desire is to locate nonferrous metals, place the ALL-METAL Toggle on the handle in the center position. The DISC (Discrimination) knob then adjusts the level of rejection against trash metals, such as iron and steel. Rejection is noted by a broken and/or inconsistent beep.

A. The Ring Range “P” (Preset) is recommended for most general purpose searching. In this position, the detector will reject most iron and light foil and respond to most nonferrous metals such as large aluminum, brass, bronze and jewelry.

1. Positions lower (counterclockwise) than Ring Range provide even less trash metal rejection, to the point of detecting virtually all types of common metals except small iron and small stainless steel.

B. The Coin Range “P” (Preset) is optional. In this position, the detector will reject more trash metals including some nonferrous such as aluminum pulltabs. However, some nonferrous metals such as nickels and jewelry will also be rejected.

1. Positions higher (clockwise) than the Coin Range will provide even greater degrees of trash metal rejection.

C. The most useful range on this control is between the Ring Range "P" and Coin Range "P" positions. If when searching at the Ring Range position you feel you are digging too much trash, adjust slightly toward the Coin Range and try again. Finding the lowest (furthest counter clockwise) position that eliminates the common trash metals in your area and still responds to the desired metal is ideal.

D. When a trash metal is being rejected, it will produce a shorter sounding beep that is typically inconsistent, a click or flutter-sounding beep. When a good metal is accepted it will produce a consistent, smooth, solid, and longer sounding beep. Some trash metals, such as larger pieces of lead, brass, aluminum or tin, will produce a good sound regardless of the DISC control position.

1. The speed the loop is swept and how closely the loop is swept over the center of the metal will impact how accurately the discriminate circuitry performs. For the best results the loop needs to be swept about two seconds per pass, from left to right and another two seconds from right to left returning to the starting point.

VI. Once either Ring Range "P" or Coin Range "P" has been selected, sweep the round loop close to the ground passing it from side to side. The loop must be swept (in motion) for metals to respond and provide accurate discrimination. Again each pass of the loop from left to right (or from right to left) should take about two seconds. If the loop is swept very very slowly or is stopped, the detector may not respond to metal.

V. At this point, it is a good idea to find an area relatively free of metal to practice. Place a coin on the ground. Pass the loop over the coin. Note that some loop movement is necessary to receive a good clean sound. Note that if you sweep the loop too slow the metal doesn't respond well.

VI. Now place a large nail and/or a steel bottle cap (not aluminum) on the ground. Sweep the loop over these metals. Note the inconsistency in the beep, and that it is a shorter click or has a flutter to the sound. An operator will soon learn to ignore the clicks or flutter sounds junk produces and listen for the smooth consistent beep coins and other nonferrous metals produce.

VII. Once a smooth consistent beep has been located, pinpoint exactly where to dig by squeezing and holding the ALL-METAL toggle in the temporary position and "X-ing" the loop slowly over the area "eyeballing" the center. The detector will "beep" as the physical center as the loop passes the center of the target. Note that some loop movement is required. It is a good idea to place coins on the ground and practice pinpointing. It takes some time to develop pinpointing skills. Release the ALL-METAL toggle and it will automatically return to the DISC position before continuing to search.

VIII. Again, if the desire is to detect iron/steel such as tools, relics or property stakes, place the ALL-METAL toggle in the forward LOCK position and leave it there during searching. With the ALL-METAL toggle in the forward LOCK position, all types of common metals ferrous and nonferrous respond.



Non-Ground Searching

I. The PRL-1 can penetrate a variety of surfaces to locate metal.

A. Wood, paper, cardboard, ice, food products, plastic, pharmaceuticals, cloth, rubber, meat, bone, glass, and all other nonmetal (nonconductive and/or nonmagnetic) surfaces can easily be penetrated to locate metal.

B. Most rock and soil types can also be penetrated to locate metal. However, metallic content (several ounces per ton of material) or magnetic content (usually associated with iron oxides) will tend to reduce penetration/sensitivity. The Ground Balance adjustment described under Advanced Operators will be of some help in such conditions.

C. The PRL-1, like all metal detectors without separate receivers, can not penetrate metal to locate other metal items. It will detect the first metal and be insensitive to further metal items beyond the first.

II. As with all surfaces to be searched, sweeping the loop as close as possible to the surface that you wish to penetrate and keeping the loop in motion, is critical to good performance.

A. The greatest degree of penetration is in the physical center of the loop thus, overlapping each pass of the loop is needed to assure good coverage.



Explanation Of Discrimination

With the ALL-METAL Toggle in the center position, the DISC (discrimination) control selects the amount of rejection against trash metals. At the fully counterclockwise position it has the minimum amount of discrimination against trash metals. Most common metals are detected at this setting except for small iron and small stainless steel. As the DISC knob is turned clockwise, more and more trash rejection is achieved. At the fully clockwise setting nearly all trash metals are rejected, as well as some valuables. Some larger items, such as lead, aluminum and tin will respond regardless of the DISC control setting.

An operator of the PRL-1 may want to adjust the DISC control for several reasons:

I. Although the ALL-METAL Toggle locked forward is recommended for the absolute detection of iron/steel, minimum trash rejection can also be used for detecting larger iron and steel such as tools, horseshoes, relics and property stakes. Iron and steels are rejected quickly when the ALL-METAL Toggle is in the center position as the DISC control is turned clockwise.

II. For the rejection of most common trash metals and the detection of most valuables the highest DISC control setting that still responds to a USA nickel is ideal. This should occur somewhere between the RING RANGE "P" and the COIN RANGE "P".

III. For the rejection of all trash metals, even though some valuables will also be lost, higher rejection levels are useful. Some areas of severe trash can easily be searched for silver coins at high DISC settings. Nickels and small to medium gold items will not be detected.



Explanation Of ALL-METAL toggle

The ALL-METAL toggle located on the handle selects between the two available operating modes. The center DISC position is used during most searching where the rejection of trash metals is desired. The temporary (squeezed and held) or forward LOCK positions are used to provide superior pinpointing, and for searching when the desire is to detect all types of metals, particularly iron/steel. The temporary (squeezed and held) is the same as LOCK except it provides for temporary use.

I. During most searching the center DISC position is desired.

A. The DISC position allows the rejection of trash metals based on the DISC control setting.

II. For pinpointing or when iron/steel items are desired, squeeze and hold the toggle on the handle or place it in the forward LOCK position.

A. When the ALL-METAL toggle is in the temporary or LOCK position the instrument responds to all types of common metals.



Headphones

Optional headphones are available for this model.

The Classic II SL comes equipped with a 1/4 inch stereo headphone jack. It is located below the elbow cup, above the battery compartment.

Most 1/4 inch headphones from 8-120 ohms will work with this model. White's has several high quality sets to choose from with volume controls, for winter or summer use. As this model doesn't have volume controls, if you have sensitive hearing be sure to select headphones with volume controls.

I. Headphones:

- A. Increase battery life.
- B. Increase the operators ability to hear the metal target.
- C. Provide the operator privacy.
- D. Keep the detector noises from annoying less enthusiastic bystanders.
- E. Full-size headphones block external noise, such as traffic or surf,

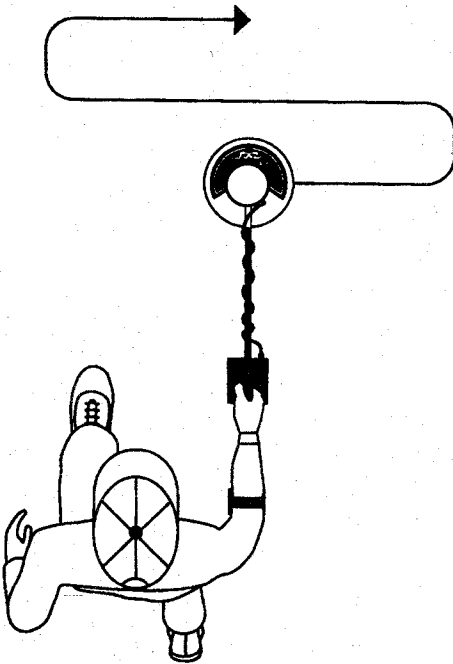
Headphones are recommended for the above reasons.

Search Methods

I. Loop Sweep

A. Because the loop must be moving in order to accurately respond, the sweep of the loop is critical to performance. Sweep the loop close to the ground. Keep it close throughout the sweep. (See examples.)

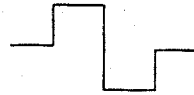
Overlap each pass to assure good coverage.



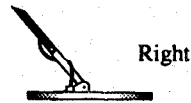
Good targets sound smooth



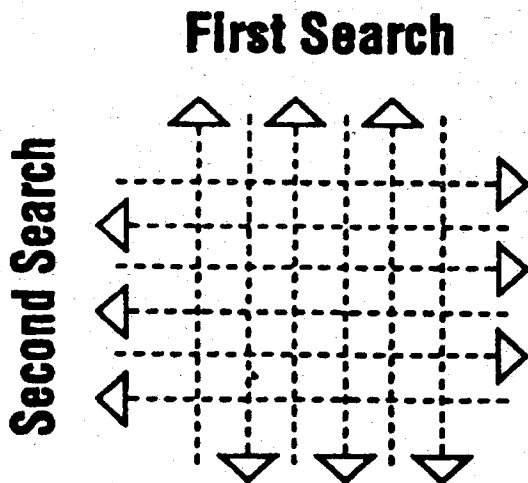
Bad targets sound rough



Keep loop flat to the ground as you sweep

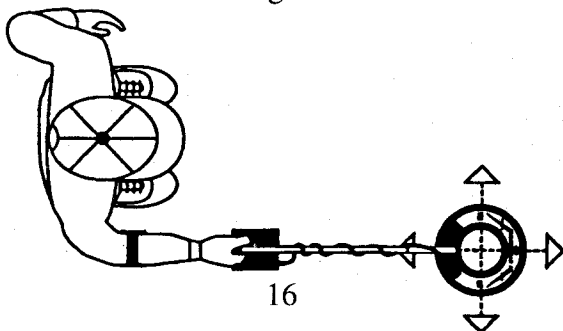


B. Productive areas, or areas that have potential, should be searched from at least two different directions, at ninety degree angles from each-other.



II. Pinpointing

A. Once a consistent good sound is located, squeeze and hold the ALL-METAL toggle in the temporary position, or locked forward ALL-METAL position and "X" the area slowly to pinpoint the exact center. The detector will beep as the physical center of the loop passes the center of the target. Listen for the loudest beep as you sweep the loop over the area, then stop and sweep in the other direction listening for the loudest beep. Where the two loudest beeps intersect is the center of the target. Release the ALL-METAL toggle and it will automatically return to the DISC position before continuing to search.



III. Digging

- A.** Care must be taken to use the appropriate digging tool for the terrain, and not to leave unsightly excavations or holes on other peoples property.
- B.** There are hundreds of digging tools designed to minimize the impact removal of small items has on the grass and vegetation, and avoid damaging the items found.
- C.** Sand scoops are all that is needed in some areas, in others a hand gardening spade. Challenging ground conditions may require more sophisticated tools. Check with your Dealer regarding an appropriate tool for your area.

VI. Where To Search

- A.** Start with your own yard. Valuables can be found anywhere people have congregated, gathered, lived, sat, walked, played, camped, picnicked, traveled or fought.
- B.** Any area inhabited before 1965, is likely to have the older styles of collectable coins.

V. How To Search

- A.** You must have permission to search private property from the owner or person in charge of managing the property. In most cases, you can locate the owner through City Hall or the County Seat.
- B.** If the area is City owned contact the Parks and Recreations Department. If it is a State or Federal Park contact the superintendent or grounds keeper. In most cases permission to search is not a problem, given a few restrictions, such as known and marked historical parks.



Advanced Operator

Ground Rejection

The ground rejection of the PRL-1 is factory preset at a level slightly positive of a ferrite mineral sample. This setting will provide good performance in most searching conditions.

If you notice a lot of false targeting (beeps where there are no metal items) or if ground/surface penetration is less than several inches, the ground rejection may need to be adjusted for your conditions.

Some areas will not allow good ground rejection, such as wet salt water beaches or black sand. In these areas, it is advisable to leave the ground rejection alone and work the detector as best you can under these conditions.

To reset the ground rejection:

I. Place the ALL-METAL toggle in the center DISC position and abruptly lower and lift the loop from the surface being searched. A beep indicates ground/surface rejection is not set perfectly.

II. Under the "Made In America" decal on top of the instrument, there is an access hole with a trimmer inside.

III. Use a very small regular head screwdriver to very slightly adjust this trimmer.

A. Find the edge where in one direction the detector beeps as the loop is abruptly lowered and lifted from the surface and in the other direction the detector doesn't beep as the loop is abruptly lowered to and lifted from the surface.

B. The correct setting is the point or edge where the detector just stops beeping as the loop is abruptly lowered to and lifted from the surface. Going further into the silent area in most cases hinders performance.

C. Cover the access hole with the decal or a small section of black electrical tape, to prevent moisture and dirt from entering the control box.

Discrimination:

The DISC (discrimination) control can be further labeled with information that will aid in determining if a metal is trash such as a pulltab, or good such as jewelry. Toggle center position.

I. Obtain a USA nickel, and an ordinary (common) aluminum pulltab with tail.

II. Bury the nickel about an inch deep in the ground.

A. Sweep the loop over the nickel while adjusting the DISC control. Note that if the DISC control is turned too high the nickel is rejected.

1. Find the furthest clockwise DISC setting that still detects the nickel well, and mark this position on the control.

III. Now do the same thing with the pulltab. Bury it an inch in the ground.

A. Sweep the loop over the pulltab while adjusting the DISC control noting the point it is first rejected.

1. This time however, mark the furthest counter clockwise position that rejects the pulltab.

IV. If completed correctly, you should now have two marks on your DISC control.

- A.** Furthest point (clockwise) a nickel is accepted.
- B.** Furthest point (counterclockwise) a pulltab is rejected.
- C.** Note that if the marks for nickel and pulltab are very close together, the pulltab is probably not ordinary. Try a different, more common pulltab.

V. You are now ready to search.

- A.** Use the DISC position you marked for accepting a nickel.
- B.** Once a consistent, smooth, solid beep is found continue sweeping the loop over the target while slowly turning the DISC control clockwise.
 - 1.** If the target starts rejecting prior to the pulltab mark, it is likely a nickel or jewelry.
 - 2.** If the target is rejected at the pulltab mark, it is likely a pulltab.
 - 3.** If the target is not rejected until well after the pulltab mark, it is either large jewelry, large aluminum foil or an aluminum screw cap.
 - 4.** If the target is not rejected with the DISC control fully clockwise, it is likely a coin other than a nickel, or a large item.



Glossary Of Detecting Terms

AC (Alternating Current) - Metal detector modes that require loop motion to respond to metal.

Air Test - Testing a metal detectors response to various metallic samples with the loop held away from the ground.

All-Metal - Describes any mode or control setting allowing total acceptance of all types of metal targets, iron and non-iron.

Audio Identification - Circuitry or mode producing different audio tones (pitches) for different target types.

AutoTrac (Automatic Ground Tracking) - A feature that continually and automatically readjusts the ground balance (ground rejection) of a metal detector during searching.

Back Reading - A false target response caused by either overloading due to a very strong target near the loop, or a rejected trash target very close to the loop.

Black Sand - One of the most extreme components of nonconducting negative ground mineralization. Also called (Fe₃O₄), magnetite, iron oxide, magnetic sand.

Cache - Intentionally buried or secreted hoard of valuables.

Conductive Salts - One of the major mineral types which makes up the positive ground matrix. Wet ocean salt/sand will produce a positive indication much like a metal target.

Conductivity - The measure of eddy currents of electricity that generate on a metals surface.

Custom Program - Feature choices on a computerized metal detector that are then saved or stored for future use.

DC (Direct Current) - Used to refer to metal detector modes that do not require loop motion to respond to metal targets.

Detection Pattern - The shape of the electromagnetic detection field generated by a metal detector's loop.

De-tuning - A method of narrowing a target signal's width and length for precise pinpointing.

Depth - How deep a detector can respond to metal targets.

Depth Reading - Feature that indicates how deep a target is in the ground before digging.

Discrimination - Adjustable feature that can ignore or respond to different metal types based on their amplitude and phase. Used to cancel responses of unwanted trash metals.

Drift - A loss or increase in threshold caused by the passage of time or variations in temperature.

Eddy Currents - Small circulating currents of electricity on the surface of metals produced by external electromagnetic fields.

Electromagnetic Field - An invisible force extending from the loop created by the flow of alternating oscillator frequency current around the transmit winding.

Elliptical Coil - A loop with an ellipse (oval) shape.

False Signal - Erroneous signal caused by non-metal items.

Faraday Shield - Conductive coating inside loops, loop cables, and control housings to eliminate electrostatic interference.

Ferrous Oxide - Decomposed particles of iron (mineralization).

Frequency - The number of complete alternating current cycles produced by the transmit oscillator per second. Measured in Hertz (Hz) or cycles per second.

Frequency Shift - Changes the operating frequency suppressing the interference (cross talk) between detectors.

Fringe Target - A target so deep or so small as to be barely detectable with a metal detector.

Ground Balance - A feature that can be adjusted to ignore the masking effect ground minerals have over metal targets.

Ground Matrix - Total volume of undisturbed ground, usually contains varying amounts and combinations of minerals, moisture, and salt. In an undisturbed condition the ground matrix can exhibit numerous phenomenons regarding metal detector performance.

Hipmount - A configuration where the control box of a metal detector is mounted on the operators hip limiting the weight one has to sweep to that of the loop and rod assembly.

Hot Rock - A rock that contains a higher concentration of minerals than the surrounding ground.

Interference - Hinderance of performance due to sources outside a metal detector causing static and unwanted or false signals.

LCD (Liquid Crystal Display) - A digital display used for graphic visual indications as an alternative to the use of meters.

Loop - A non-metal housing containing the transmit and receive windings used to generate and receive signals from metal targets. Also called search coil, antenna, or search disc.

Memory - A computerized metal detector's ability to retain operator selected settings for future use.

Menu - A display screen that allows the operator to choose among different features.

Metal - Metallic substances: iron, foil, nickel, aluminum, gold, brass, lead, copper, silver, etc.

Meter - An analog component which provides visual indications regarding a metal target (Alternative to LCD displays).

Mineralized Ground - Any soil or sand that contains conductive and/or magnetic components (minerals).

Mixed Mode - A special metal detector mode that combines all metal and discriminate features into one operating mode.

Mode - A condition or feature of operation selected by the operator for specific functions.

Motion Instrument - A detector type that requires search loop movement to activate the signal from a metal target.

Microprocessor - An electronic component (chip) that can be programmed to perform a variety of functions and control a variety of features.

Negative Ground - Soil containing mostly magnetic minerals.

Neutral Ground - Soil that contains no significant minerals.

Nicad (Nical Cadmium) - A battery type that can be recharged.

Non-Ferrous - Not of iron . Metals of the precious and semi-precious class (i.e. aluminum, brass, lead, gold, silver, copper).

Non-Motion - Mode that will respond to metals with or without movement of the loop.

Notch Discrimination - Discrimination circuitry that allows an area of the discrimination range to be accepted or rejected independently of the remaining discrimination range (a window of acceptance or rejection within the discriminate range).

Notch Width - Finite range of a notch discrimination setting (how wide of window is accepted or rejected).

Null - A decrease in sound caused by rejection of targets or ground mineralization.

Oscillator - An electronic component or circuitry designed to generate a specific rate of current frequency to power the loop's transmit winding.

Overlap - Advancing each sweep of the loop in small increments to insure good area coverage. Each sweep should overlap the last by at least 50%.

Overload - Occurs when the receiver of a metal detector becomes overwhelmed due to too much signal (ground and/or target).

Overshoot - A false signal heard as the loop passes over a rejected target when using a non-motion discriminate mode in combination with automatic tuning (S.A.T.). Excessive tuning restoration pushes the audio above the threshold level creating a positive response at the edges of target detection.

Phase - The length of time between eddy current generation sustained on a metals surface and the resultant secondary electromagnetic field effect on the loops receive winding. Relates to target conductivity.

Pinpointing - Finding the exact target location with respect to the loops physical center.

PI (Pulse Induction) - A type of metal detector circuitry that operates differently than the standard Transmit Receive or Very Low Frequency instruments. Primarily recommended for better results in salt water.

Positive Ground - Soils that contain conductive components such as salt.

Preset - A control setting or marking determined to work well for average conditions.

Preset Program - A selection of a computerized metal detector that automatically selects all the features suited to a particular type of searching condition.

Prospecting - Searching for gold in its natural state (nuggets).

Rejection - Non-acceptance or cancelation of a target response by discrimination circuitry.

Relic - An artifact of the past.

S.A.T. (Self Adjusting Threshold) - Automatically resets the threshold to correct for any minor ground, temperature, or electrical changes that typically cause threshold variations.

Scrubbing - Sweeping the loop with contact to the ground.

Searchcoil - (See Loop)

Sensitivity - Measure of a detectors ability to respond to targets within the detection pattern. Usually indicates the capability to respond to small targets rather than maximum detection depth.

Signagraph - A graphic display of a pattern characterizing a targets electrical and/or magnetic properties.

Signal - An audio response or visual indication alerting the operator that a metal target has been detected.

Silent Search - Capability of a metal detector to respond to metals without a threshold or background sound being heard continually during searching.

Stability - The ability of a metal detector to maintain smooth operation without interference or unstable behavior.

Sweep - Motion employed in moving the loop over the ground.

Target - Any object that causes a metal detector to respond.

Target Masking - When large size or high concentrations of trash metals, or extreme ground mineralization, drive the threshold into the null zone suppressing weaker positive responses.

Ten-Turn Control - A control knob which can be rotated ten times to cover the full electrical range of the feature.

Test Garden - A mapped plot of buried targets at various depths to aid in learning the characteristics of a metal detector.

TH'er, TH'ing - Universal word contractions for treasure hunter and treasure hunting.

Threshold - The background hum heard continually during the use of a metal detector indicating the most sensitive audio.

Tone Control - An adjustment for audio frequency or pitch.

Touch-Pad - Switches encapsulated in plastic or that allows the operator to select different functions or features.

Transmit Coil - A coil of wire inside the loop that creates the primary electromagnetic field.

TR (Transmit Receive) - Term used to describe early metal detector technology. Usually describes non-ground rejecting detectors or modes.

Two Box - A metal detector that has the transmit and receive coils mounted in separate housings. By enlarging and separating the transmit and receive coils great depths regarding large metal items can be achieved. Also called cache detectors.

Viewing Angle - A liquid crystals display adjustment for contrast allowing optimum visibility for various light conditions.