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# CS1220XD

## Operating Instructions

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**C.SCOPE**

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# CS1220XD

## Quick Start

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### **Rapid get you going Instructions**

Assemble and adjust for length (Twist surplus lead around stem).

Insert batteries.

Set the FUNCTION Switch (bottom right) to METER AUDIO DISC.

Turn ON.

Set SENSITIVITY fully anticlockwise to the BATTERY CHECK position.  
The meter will indicate in the right hand green sector if the batteries are OK.

Set SENSITIVITY to mid position (12 o'clock).

With the search head 1-2cm from the ground, press and hold the RETUNE button (lower mid) and adjust the TUNE control until a tone is just heard.  
Release the RETUNE button.

The CS1220XD is now ready for use. If the tone drifts from the threshold position press the RETUNE button to reset the level.

You are now in a PROGRAMMED MODE.

The other modes require more detailed explanation found in the following pages.

**IF A PROBLEM IS ENCOUNTERED  
REFER TO THE FULL INSTRUCTIONS.**

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### CONTENTS

	PAGE
INTRODUCTION	4
ASSEMBLY	5
BATTERIES	6
BATTERY CHECK	7
CONTROLS AND WHAT THEY DO	8
METHODS OF OPERATION	11
GENERAL HINTS	15
ACCESSORIES (OPTIONAL) AVAILABLE FROM C.SCOPE	17
SWEEPING TECHNIQUE	18
THE COUNTRY CODE	18
DETECTOR CARE	18

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# CS1220XD

## Operating Instructions

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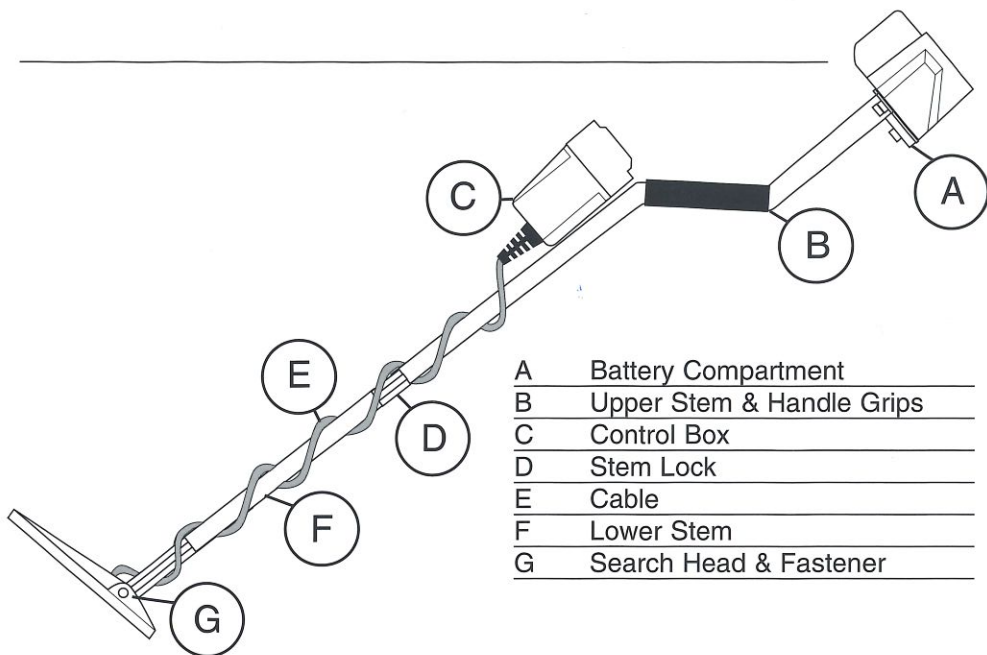
### INTRODUCTION

To protect your investment complete both sections of the enclosed guarantee card and return the relevant section to C.Scope. Please retain the original packing box. In the event that your detector should ever require to be serviced, this package will be most suitable for postal protection.

C.Scope detectors are recognised as the finest detectors available. They are designed with lasting quality, high technology, and above all, value for money. The only way to realise this value is to carefully study and understand this instruction manual. You will then be able to obtain all the advantages designed into your detector.

It is also strongly recommended that you experiment with the detector's operation in air using various test samples, in order to learn to identify and understand the detector's capabilities and responses. Always remember that becoming a good metal detectorist is like becoming a good photographer or fisherman, that is, patience and hours of practice are the best way to reap rewards.

# CS1220XD



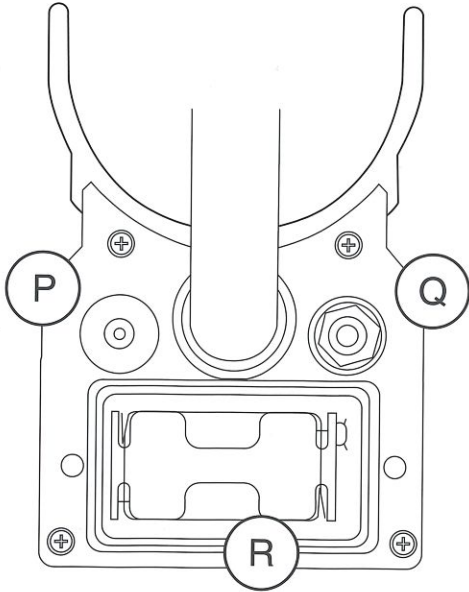
## ASSEMBLY

Insert the lower stem into the upper stem. Tuck the cable into the cable slots in the lower stem to prevent it trailing over the search head. Rotate the lower stem to wrap the cable around the stems and take up any slack and twist the stem lock to hold the lower stem in position.

## BATTERIES

The CS1220XD is powered by eight AA batteries (not supplied) available from supermarkets, garages, department stores. It is advisable to use good quality alkaline batteries to start with.

## BATTERY COMPARTMENT



P	Charger Socket
Q	Headphone Socket
R	Battery Compartment

The batteries should be fitted in the holder which is located in the battery compartment. To fit new batteries first check the power switch on the unit is switched to OFF. Then loosen the two captive screws located in the battery cover (do not fully remove these from the cover) and remove the cover. Inside is the battery holder. Lift out the holder and detach the connector if it is already fitted. Load it with the eight batteries ensuring that each battery is inserted the correct way round, (direction of batteries alternating). Roll each individual battery to ensure it is located correctly and making proper contact. Replace the connector making sure that it is firm and well seated, and put the loaded holder into the housing. Fit the cover and tighten the two captive screws finger tight.

Note: Batteries should not be left in the detector for long periods where they could leak, so remember to remove them at the end of the day's searching.



## BATTERY CHECK

A battery condition indicator is provided on the detector. To do this for the first time prior to reading the remainder of the operating instructions proceed as follows: Turn the POWER ON/OFF, TUNE control on. Turn the SENSITIVITY control fully anti-clockwise to the BATTERY CHECK position. The meter will indicate in the green area if the batteries are good and in the left or central position if the batteries need replacing or recharging. Rechargeable batteries will not read as high into the green as standard batteries even when fully charged. They also give less indication of discharge on the meter during use.

## CHECKING THE BATTERIES



## CONTROLS AND WHAT THEY DO



1. TUNE/ POWER ON/OFF

2. SENSITIVITY/ BATTERY CHECK

3. FUNCTION

4. DISCRIMINATE PUSH SELECT BUTTON

5. RETUNE BUTTON

6. GROUND PUSH SELECT BUTTON

7. DISCRIMINATION

8. SIGNAL METER

### TUNE/ POWER ON/OFF Switch (1)

This rotary control switches the detector on and adjust the level of audio tune to the user's preference and the level of meter tune when in the Manual Control modes (see below).

### SENSITIVITY/ BATTERY CHECK Switch (2)

In the fully anticlockwise switched position the Battery Check is enabled with the battery condition displayed on the meter (8).

When turned clockwise the control will adjust the sensitivity of the detector to metal objects.

By increasing the sensitivity by tuning this control clockwise, the detector will be more prone to drift, erratic signals, ground interference etc. Where there is no ground effect or outside interference the SENSITIVITY control can be operated at higher levels.



If the signal becomes unsteady or erratic, the sensitivity level should be reduced to obtain a clear, steady tuning threshold. Only when the tuning is constant and steady will the detector operate at the optimum depth penetration.

The recommended starting point is midway, ie '12 o'clock' position.

### **FUNCTION Switch (3)**

This rotary switch selects the pre-programmed modes METER AUDIO DISC and METER DISC or the Manual Control modes GD1 and GD2.

When set to either METER DISC or METER AUDIO DISC, the levels of Discrimination or Rejection are identical (Discrimination can be defined as the ability to give a different type of signal for ferrous junk or worthless objects than the signal given by a non-ferrous object). Both these Discriminate Modes are set at such a level, so that depth penetration to coins etc is good, and discrimination against most iron and silver foil is achieved. A precise level of discrimination is selected to give maximum rejection, without affecting sensitivity to coins etc. Pull tabs, large silver foil, or large iron will not be rejected, because the levels of discrimination required to reject these also reduce the depth penetration to certain non-ferrous metals and thin section objects.

It is very unlikely that a valuable object will be rejected with the CS1220XD's AUDIO or METER DISCRIMINATION modes.

#### **Meter Audio Disc Mode**

In this mode, the Meter (8) will display rejected targets by the needle moving to the left of central. Positive targets, ie those likely to be worthwhile digging for, are indicated by no needle movement or a deflection to the right of centre.

The Audio signal will also vary in pitch providing further analysis of the target. An increase in pitch (high tone) is a good object and a decrease in pitch (low tone) is a bad object.

In summary, Meter Audio Disc is target analysis using both Meter and Audio signals.

#### **Meter Disc Mode**

In this mode the Meter (8) will display rejected targets by the needle moving left of centre and good targets by not moving or moving to the right of centre.

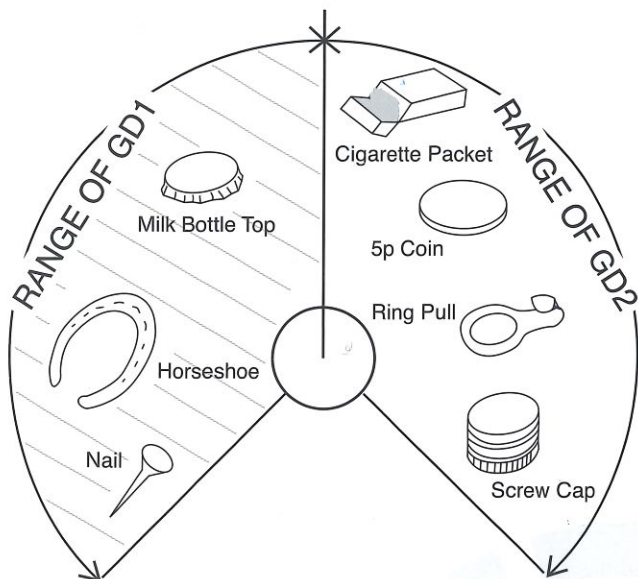
The audio signal will be at a fixed pitch whatever the target composition, only the loudness will vary depending on signal strength.

In summary, Meter Disc is target analysis using the Meter for metal content and loudness to indicate target size or depth.

### The Manual Control Modes GD1 and GD2.

Maximum detection depth is achieved when the detector is set to ignore the signals from ground itself. This setting is known as the ground exclude point. It is this setting which is operating when the 'G' mode is selected. Unfortunately this is an 'all metal' mode where all targets produce the same response and it is not possible to distinguish between good and junk ones. However by searching in this mode then quickly switching into an analysing or discriminating mode 'D' over the target it is possible to determine whether the target is worth digging or not.

The circuit to ignore the ground signals is preset during manufacture at the optimum level. It is the same setting in both switch positions GD1 and GD2. The analysing mode 'D' can discriminate against various metals ranging from small pieces of iron through to aluminium screw caps. The level of discrimination is selected by the FUNCTION switch (GD1 or GD2) and finely adjusted by the DISC control.



### DISC push button (4) and DISC rotary control (7)

These two controls are enabled only when the FUNCTION switch (3) is in position GD1 or GD2. To adjust the discriminate rotate the DISC control (7) to the desired level then momentarily press the DISC button(4).

The level of Discriminate can be adjusted for each Discriminate mode by operating the DISCRIMINATE LEVEL control on the Main Control Box ie:

GD1	- Discriminate level 0	- No discrimination
GD1	- Discriminate level 10	- Iron and silver foil discrimination
GD2	- Discriminate level 0	- As D1 discriminate 10
GD2	- Discriminate level 10	- Iron, silver foil and pull tab discriminate

**Warning!** If the detector is set to GD2 and discriminate level 10 then as well as rejecting pull tabs some copper nickel coins and gold rings etc. will be rejected at these severe settings. Copper and solid silver or gold will be detected though. Generally, only set the detector to D2 - 10 on sites where the incidence of pull tabs makes detecting impossible otherwise.

The audio volume will decrease when a 'bad' target is identified and increase for a 'good' target.

### **RETUNE (5)**

This push button resets the level of tune to the level initially set by the user.

### **GROUND (6)**

This push button is operative in Manual Control Modes GD1 and GD2 only. It sets the detector for operation in most types of ground conditions and removes the requirement to keep the search head the same distance from the ground while searching. All metals will give a 'good' or 'positive' signal when the Ground mode is selected.

### **METER (8)**

The meter will display the following:

- i) battery condition - when Battery Check is selected.
- ii) target analysis to preset levels - when Meter Audio Disc or Meter Disc are selected.
- iii) target analysis to user set Discriminate level - when GD1 or GD2 are selected and the Discriminate mode operational.
- iv) Signal strength - when in GD1 or GD2 and the 'all metal' Ground mode.

## **METHODS OF OPERATION**

There are two main ways to use the CS1220XD:

1) Pre-programmed modes - for ease of use.  
(METER DISC / METER AUDIO DISC)

2) Manual control modes - for total flexibility on all sites. (GD1 / GD2)

Check the batteries are in good condition prior to searching. Frequently check battery condition during the search. Rechargeables give a little warning of failure so ensure they are fully charged prior to a long period of searching or carry a fresh set with you (see batteries page 4). The unit may operate with reduced sensitivity for a period after indicating 'flat' batteries. However, the batteries should be replaced or recharged at the first opportunity.

Use headphones when possible. Not only do they extend battery life, but they also cut out extraneous noise.



## PRE-PROGRAMMED MODES

There are two pre-programmed modes provided; i) Meter Audio Disc, ii) Meter Disc

### METER AUDIO DISC

This is the recommended mode when starting to use the CS1220XD and is best demonstrated by an air test (with the search head away from ground and all metal objects).

**Select METER AUDIO DISC on the FUNCTION mode select control.**



Turn the detector ON at the POWER ON/OFF TUNE control (1) which works in conjunction with the RETUNE button (5). Hold the RETUNE push button down and rotate the TUNE control clockwise until the sound is just beginning to be audible. Set this carefully and precisely and then release the RETUNE push button. If the tuning level alters or wanders off tune, do not adjust the TUNE control. Simply operate the RETUNE push button which will automatically re-tune the detector to the original selected level. The meter needle should be central when the RETUNE push button is released.

The detector is now excluding ground minerals at a pre-set level and discriminating at a pre-programmed level on the other channel.

All metal objects will be indicated by an increase in loudness but rejected objects will cause the meter to fall to the left and the tone frequency to decrease. Accepted targets will conversely cause the meter to rise to the right or remain stationary and the tone frequency to increase.

### Pre-programmed Meter Audio Disc Method of Operation Set Controls:



In this mode, the DISCRIMINATE controls and the GROUND control are not enabled.

## Searching

Tune the detector with the search head 1-2cm above the ground. Sweep the detector in an arc, ensuring the head is level and as close to the ground as possible. Advance half a head length at a time. Periodically ensure the tune level is correctly set by raising the head 1-2cm, depressing the RETUNE push button, then lowering the head and continuing the search.

When searching satisfactorily the SENSITIVITY control can be adjusted up to obtain the optimum setting for the conditions (it will be necessary to retune the detector when this is done).

## METER DISC

This mode is similar to operate to the Meter Audio Disc.

The only difference is the way the CS1220XD responds to metal objects. All detected metal objects will be indicated by an increase in loudness. The meter will indicate whether the target is accepted or rejected. In this mode the audio pitch is constant.



## MANUAL CONTROL MODES

There are two manually set modes set by the FUNCTION switch; i) GD1, ii) GD2

The operation is the same for both modes.



Initially GD1 or GD2 is selected. For a low to mid range of Discrimination GD1 is selected, and for mid to high range of Discrimination GD2 is selected. See page 10 for an explanation of the D1 and D2 range.



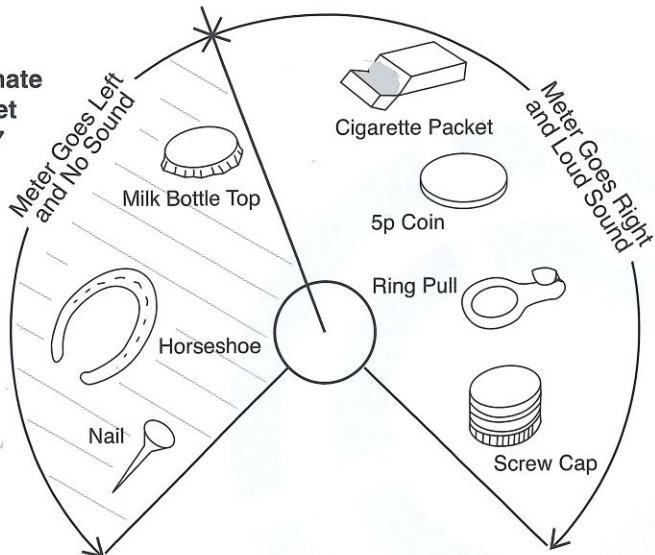
Initially adjust the Sensitivity control (2) to approximately mid position. Select GD1 on the FUNCTION switch and adjust the DISC control to 7.

Turn ON and establish audio threshold by holding the RETUNE button (5) (or the GROUND button (6)) depressed and rotating the TUNE (1) control to audio threshold. Activate the ground exclude mode by momentarily pressing the GROUND button (6). Begin searching. Try and keep the search head at a constant height above the ground, as close as is practicable without the search head getting knocked. If necessary recover audio threshold at any time by momentarily pressing the GROUND (or RETUNE) button. In the ground exclude mode all (metal) targets will be accepted i.e. an increase in loudness and a meter needle movement to the right. To analyse a target move the search head to one side of the target and activate the discrimination circuit by momentarily pressing the DISC button (4). Move the search head back over the target at a constant height. At this DISC control setting small iron will be rejected. i.e. quiet on the audio and a meter needle movement to the left. More desirable targets will be accepted.

The DISC control setting (discrimination level) can be adjusted to reject/accept a range of targets. Reducing the DISC control setting will result in ever smaller pieces of iron being accepted. Increasing the DISC control setting will result in fragments of aluminium foil being rejected as well as the iron. After each adjustment momentarily press the DISC button.

A greater level of discrimination can be obtained by operating in the D2 mode. Activate the D2 discrimination range by selecting GD2 on the FUNCTION switch and momentarily press the DISC button. Caution should be exercised while analysing in the D2 range as many desirable targets will be rejected as well as worthless ones, especially at high settings of the DISC control.

**Effect of Discriminate control position set to approximately 7 in GD1**



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The discriminate level may be fine tuned in each of the GD1 or GD2 modes by varying the DISCRIMINATE level control, if unwanted objects are found. Always retune the detector if the DISCRIMINATE level is altered.

The sensitivity level may also be varied but midway is recommended.

## GENERAL HINTS

### Beach Mode

On a wet salt beach it is best to reduce the SENSITIVITY to mid range and operate in a Discrimination Mode all the time (ie GD1 or GD2 then press the DISCRIMINATE push button and release). This is because the salt water makes the ground conductive, and to Ground Exclude in these conditions the detector needs to be set at a point where iron is rejected. This is a useful coincidence because it means that Ground Exclusion and Discrimination against iron are possible at the same setting on wet sand with the CS1220XD.

The Ground Exclude setting for beaches will vary significantly and in practice it is possible to reject silver paper and ground exclude on a severe beach. GD1 is the recommended mode setting and Discriminate level can be adjusted to suit the particular conditions.

It is essential when operating on a beach that the Search head is kept at a constant height above the surface. It may also be necessary to reduce the SENSITIVITY further because of variation in the salt content over the area searched.

Lower the search head to the ground. Keep it at a steady height above the ground and ensure the Tuning Level is set correctly by operating the RETUNE button on the Meter Console and then release it.

If however, the detector is being operated in the Discriminate Mode on the inland site, it will be necessary to balance the sensitivity level to reduce the ground effect. In practice this means setting it to the highest level possible, which of course will depend on the degree of mineralisation, and how capable the operator is at keeping the search head level with the ground. A sacrifice in sensitivity level will drastically reduce the ground effect, but will not reduce the depth penetration to the same degree. For example, by reducing the sensitivity level from full to midway, ground effect will be reduced by 80%, but depth penetration will only be reduced by about 20%.

### Discriminating

When used in Ground Mode the CS1220XD will detect all metals and will not discriminate. However, in the Meter Disc and Meter Audio Disc Modes the CS1220XD has been programmed to operate at a fixed discriminate setting.

It is recommended that all objects that are not rejected should be recovered, ie. if the meter needle does not dip or the audio pitch is inconclusive, then find the object.



Iron, unlike a coin, occurs in a multitude of shapes and sizes and as a result it is possible that large pieces of iron may give a positive reading. Iron in the shape of nails or pieces of wire also may be present on the surface of a site. In this case anomalies in discrimination may occur. Anomalies or confusing signals can occur in the first few inches away from the search head, and are typically characterised by a double signal from the same object, usually iron, which often ranges from a strong negative signal. To overcome these problems simply raise the search head, retuning if necessary, and rescan until a clear signal of rejection or acceptance is obtained.

### **Detection Range**

Your CS1220XD is a top performance detector but adverse soil conditions can significantly reduce the depth detection.

Detection ranges will vary depending on the size of the object, the length of time an object has been buried, and the type of ground the object is buried in.

The best ground conditions are well compacted soils and coins can be found at the greatest depth if the object has been buried for some time and the coin has interacted with the salts in the ground, thereby appearing larger to the detector. The worst conditions for detecting are on loosely compacted or freshly dug ground or when the object has only recently been buried. In these conditions detection range will be reduced. 90% of all artifacts are found within 6" of the surface.

### **Determining the Target Size and Depth**

An operator who is familiar with his instrument will be able to do an excellent job of determining object size, shape and depth before he digs. This technique is learned from careful analysis of the meter and audio signal coming from the detector. Each time a signal is heard, listen for any peculiar characteristics it may have, determine over how large an area you get a detector signal, and try to 'outline' the object before you dig.

After digging up the object, compare the object size, shape, depth and position in the ground with signal information you received before digging. After careful analysis of many signals you will learn to 'read' the hidden target before digging.

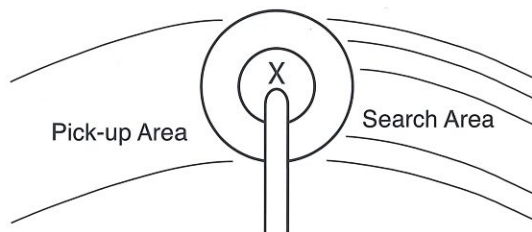
### **Detecting**

To test for the type of signal you will get, take coin or metal object and with the detector set up on a table tuned as previously described, move the metal object towards and across the search head. You will note that the volume will increase quickly as the metal object passes across the search head, with the loudest sound occurring when the search head is immediately centred over the metal object. As the object passes beyond the search head the sound will quickly fade.

Since the detectors employ a total response search head, the object can be detected across the full width, back to front, of the search head. Maximum sensitivity is down the middle of the search head.

## Pinpointing

(i) The strongest signal will always be received when the object is directly beneath the centre of the head (see X in the diagram below). To pinpoint the find, stop the search head when you are directly over the target object, then move the search head through  $90^\circ$  and sweep again, thus forming a cross with the two sweeps as shown in the diagram.



(ii) to 'focus' the target signal still further raise the search head, retuning if necessary, and pass the search head over the object until only a faint signal is heard.

The faint signal will then be occurring at a point X under the centre of the head (see diagram). More accurate pinpointing, particularly of deep buried objects can be achieved by finding the centre of the target object as described above and fixing its position in the 'minds eye'.

Turning your detector through  $90^\circ$  and sweeping across the target again will give a second reading, accurately determining the centre of the object.

Digging carefully at point X will reveal the find. With little practice, size, shape and depth of an article may be estimated in this way before digging.

## ACCESSORIES (OPTIONAL) Available from C.Scope

### Headphones

Headphones not only extend battery life but improve sensitivity by cutting extraneous noise. The headphones should be fitted with a standard stereo 1/4 inch (6.35mm) jack plug. The headphone socket is located under the protective cap in the battery housing.

### Search head cover

This provides protection to the underside of the search head when detecting in muddy or stony conditions with no loss of performance.

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## **SWEEPING TECHNIQUE**

For extremely small object searching, such as coins, rings, nuggets, etc. lower the search head to within 2.5 cm of the ground. Sweeping the coil from side to side in a straight line in front of you. Keep the coil at a constant height as you sweep from side to side. Move the head at a rate of 0.5 metre per second.

The optimum sweep rate must be determined by each operator. The detector should be held comfortably in the hand, with the head held as closely to the ground as possible. As the detector is scanned from side to side in front of the operator, the search head should be advanced approximately two-thirds the diameter of the coil. This keeps the operator moving ahead, and it allows some overlapping of each sweep. This overlapping ensures that nothing will be missed. It is well to note here that the operator should not rush. This is one of the most common mistakes made by detector users. If you rush, you will not adequately cover the ground.

## **THE COUNTRY CODE**

Follow the 'Country Code'. Do not trespass. Do not touch anything you suspect might be live ammunition - inform the police.

Do not take your detector on any scheduled historic site. If you find anything which looks like it could have historical significance, report it to your local museum.

Acquaint yourself with any laws relating to the use of metal detectors particularly if you want to go detecting in countries other than the UK.

## **DETECTOR CARE**

The CS1220XD is a robust design, however the control box should be treated with similar care as any electronic product. Dry off any water splashes immediately. The search-head may be immersed in water. Stem and search-head parts should be cleaned and dried at the end of a day's detecting. Do not use solvents. If the detector has been used on a beach it will be necessary to wash sand and salt residue off the stem adjustment mechanism and the search-head retaining parts using tap water. Remove batteries if the detector is going to be stored for any length of time. Do not open the controlbox front panel. There are no user serviceable parts inside and you may invalidate your warranty.



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C.SCOPE is an ISO 9001 Quality Manufacturer.

This equipment conforms to the EMC directive 2004/108/EC.

System performance may be impaired by unusually strong electromagnetic fields.



Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your local authority or retailer for recycling advice. (In the UK visit [www.recycle-more.co.uk](http://www.recycle-more.co.uk))

### **CAUTION**

It is the user's responsibility to use this product and dig only where it is safe to do so.



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