

# MetalliScanner® 6.0 Components

1. Mode Switch
2. Calibration Switch
3. Crosshairs
4. Liquid Crystal Display
5. Battery Compartment

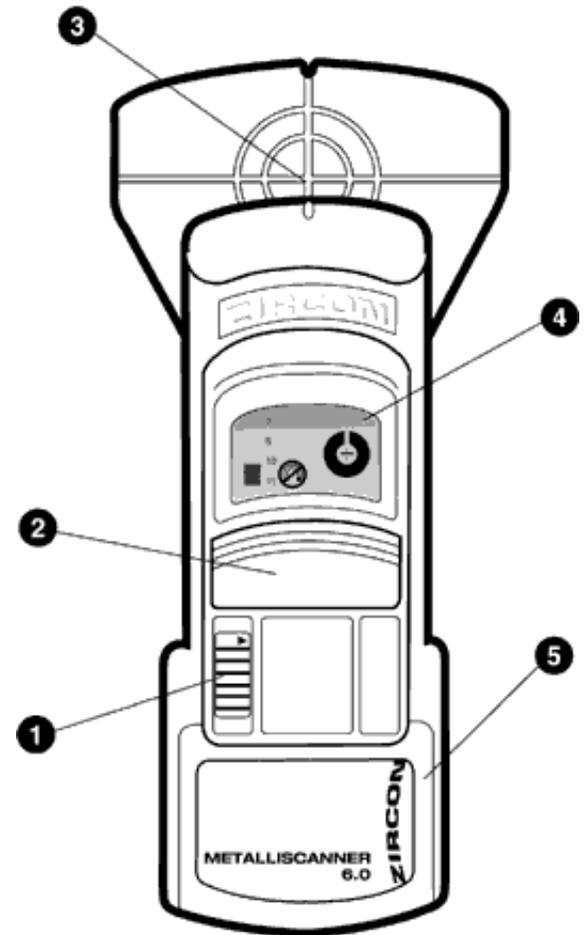


Figure 1: MetalliScanner components

# LCD Components

1. Depth Bars
2. Depth Numbers
3. Magnetic Icon
4. Low Battery Indicator
5. Plus/Minus Sign
6. Scanning Wheel
7. Scanning Wheel Spoke
8. Non Magnetic Icon

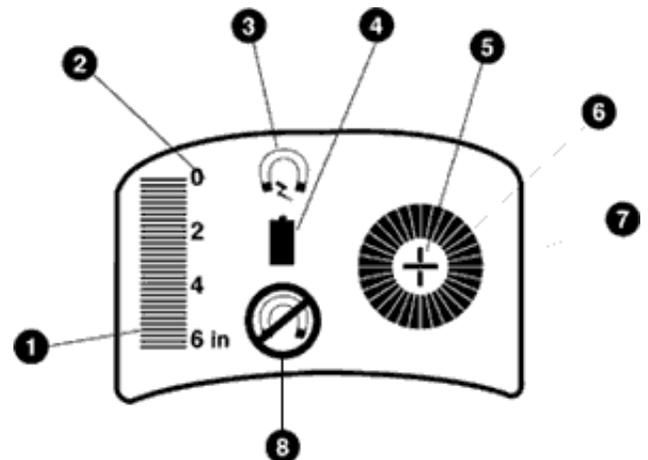


Figure 2: LCD Components

## Caution:

1. The MetalliScanner® metal finder will only locate metal objects. Nonmetallic objects such as wood studs and ceramic or PVC pipe cannot be located with this product.
2. Avoid wearing any jewelry, including watches, when using this product. The metal may cause inaccurate results.

## Installing the Battery

Before using the MetalliScanner® tool, you must install one 9-volt battery. To do this, slide open the battery compartment door and connect the battery to the battery clip (Figure 3). Insert the battery into the tool and replace the door.

Note: With normal use, one 9-volt battery should last approximately one year.

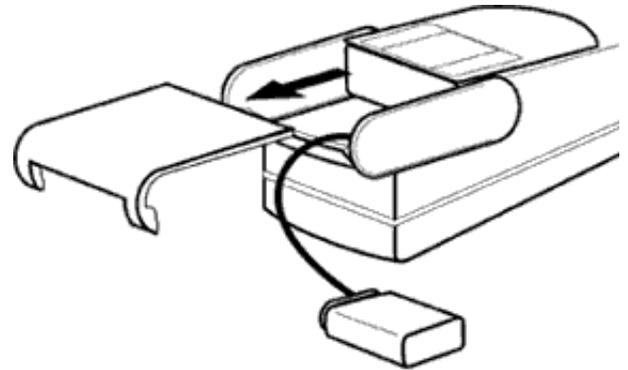


Figure 3. Installing the battery

## Getting Familiar with the Operational Indicators

There are three operational indicators, a low battery indicator and two mode icons.

The low battery indicator is displayed as a warning when the battery has less than five hours of use remaining.

The magnetic icon is displayed when the unit is in the magnetic mode.

The non-magnetic icon is displayed in the non-magnetic mode.

## Getting Familiar with the Location Indicators

There are four location indicators: the depth bars, the scanning wheel, the plus/minus sign, and the beep.

The depth bar consists of 31 bars and 4 numbers representing the depth to the target in inches or centimeters. The bars begin from the bottom of the display and sequentially turn on as the MetalliScanner® metal finder gets closer to the type of metal that corresponds to the mode that the unit is in. The numbers are only displayed after the device has been calibrated. (See "Calibrating in Either Mode".) When properly calibrated the depth numbers correspond to the depth to the top surface of the metal target.

The scanning wheel consists of 31 spokes with a plus or minus sign in the center. The wheel rotates clockwise and the plus sign is displayed when moving towards a target of the selected metal; the wheel rotates counter-clockwise and the minus sign is displayed when moving away from a target of the selected metal.

When a target is passed, the plus sign changes to the minus sign and the MetalliScanner® tool beeps. The plus/minus sign and the beep are primarily for estimating the general location of the target. The plus/ minus sign change and the beep occur as you pass the target, but not necessarily directly over the target.

To precisely locate the target, use the depth bars and the scanning wheel. The scanning wheel is more sensitive than the depth bars but also has a built-in sensitivity change (similar to when a car changes gears) around 3 to 4 inches. As a target gets closer, the wheel spins fairly quickly, but suddenly slows down at around 3 to 4 inches. Once past this point the wheel speeds up again.

There is also a less noticeable sensitivity change around 2 inches. If this sensitivity change interferes with determining the exact location of the target, you can press the calibration button when you think you are over the target and then try to locate that target more precisely.

## **NOTE:**

1. You then must start the pre-scanning procedure from the beginning to locate any other targets.
2. Calibrating over the target will make the depth reading inaccurate. Calibrating to determine depth must be done away from targets. (See Calibration Section.)

## **Selecting the Operating Mode**

The mode switch turns the MetalliScanner® metal finder on and off and simultaneously selects the operating mode.

The switch has three positions: magnetic mode, non-magnetic mode, and off.

- Move the mode switch to the magnetic mode position to find rebar, steel, iron, and other ferrous metal.
- Move the mode switch to the non-magnetic mode position to find copper pipe, brass, aluminum, and other non-ferrous metal.
- To turn the tool off, move the mode switch to the off position.

Note: The MetalliScanner® metal finder does a self test immediately after it is turned on. If the unit does not pass the self test, you will hear a long, low-pitched tone and every other spoke on the scanning wheel and all the depth bars will be displayed. If this happens, check this area for any large metal objects and remove them. Then try turning the unit on again.

# Pre-scanning the Target Area

1. Before scanning, wipe the area to be scanned clean of sand and pebbles.

2. If the scanning surface is fairly rough, place a very thin piece of cardboard between the surface and the unit. The thickness of the cardboard must be subtracted from the depth reading to determine the actual depth to the target when using this procedure.

If you do not know what types of metal are present, it is best to perform the pre-scanning procedure in both the magnetic and the non-magnetic mode. If you are sure only one type of metal is present, then you need only pre-scan for that type of metal.

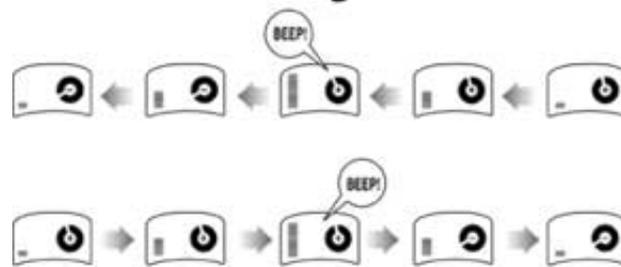
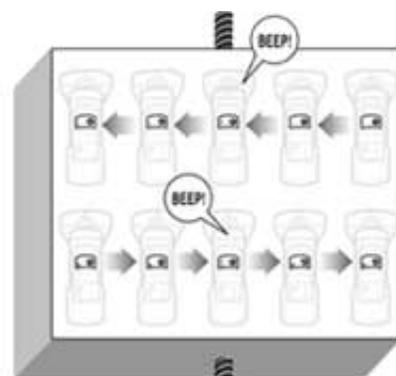


Figure 4: Locating targets

- Hold the MetalliScanner® metal finder out in air away from all objects and switch to magnetic mode or non-magnetic mode by sliding the mode switch to the appropriate position. The corresponding icon is displayed.
- Place the unit on the scanning surface and scan for targets by either watching for the greatest number of depth bars or scanning until you hear a beep and see the plus sign change to the minus sign. Then, reversing direction, the minus sign should change to the plus sign. Continue scanning in this direction until the plus sign again changes to the minus sign and the unit beeps at approximately the same location (Figure 4).

The greatest number of depth bars, the beep, and the plus/minus change should all occur at approximately the same time and place.

Note: When the target is more than four inches deep, the unit will not beep at the same time as the plus/minus change and the maximum depth bars.

Once you have located a target, reposition the MetalliScanner® metal finder over it and scan perpendicular to your original scanning direction to be sure you have located the desired target and not a nail or scrap piece of metal (Figure 5). The depth bars should remain constant when scanning along a length of rebar or copper pipe. Look for a pattern if you are searching for rebar since it is often laid out with equal spacing or in a grid array.

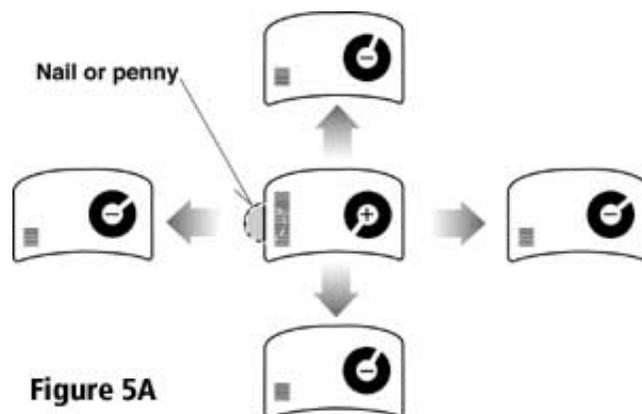


Figure 5A

To more accurately locate the target, watch for where the direction of rotation of the scanning wheel changes from clockwise to counter-clockwise. Where this change in direction occurs should be directly over the center, or closest part, of the object.

Mark the location of the target(s).

If you do not know what types of metal are present, repeat the preceding instructions for the other

metal type.

#### NOTE:

1. Cross-hairs on the top and front of the unit show where sensitivity is maximum.
2. If the tool is close to a large metal object or surface, it may indicate the opposite metal type.
3. The MetalliScanner® metal finder is designed to operate at approximately 70°F. The sensitivity decreases slightly at higher temperatures but is not noticeably affected at lower temperatures.

## Particular Situations

**Situation:** Scanning near the edge of a piece

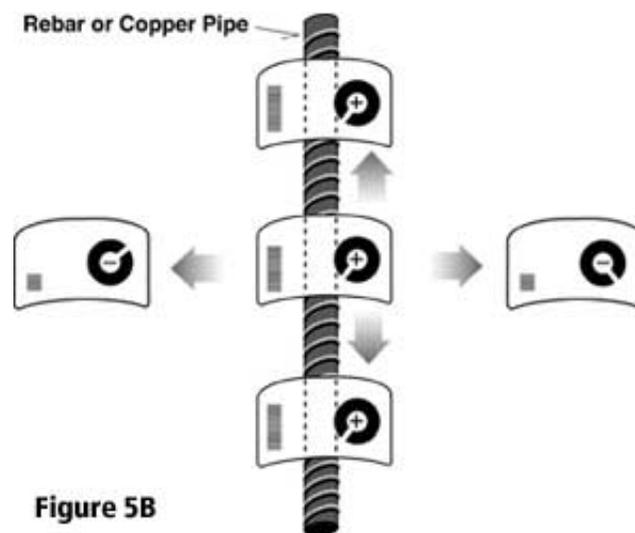
**Result:** Cannot rely on beep to locate target of concrete

**Action to be taken:** Ignore beep and rely on scanning wheel and depth bars to locate target

**Situation:** Concrete is in segments which could have been poured at different times

**Result:** Cannot rely on a single calibration for the entire area

**Action to be taken:** Pre-scan each segment separately, calibrate and determine depth of targets for each segment of concrete

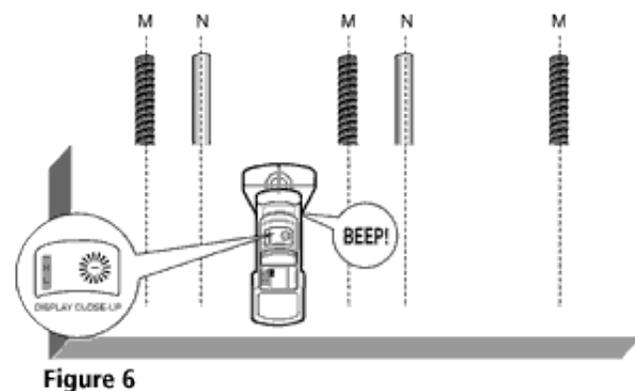


## Finding Depth Calibrating in Either Mode

You must calibrate the tool before it can give an accurate depth for rebar, copper, or other metal objects. For each type of metal located in the pre-scan procedure, calibrate the unit and determine the depth, if necessary, in the appropriate mode before changing modes and recalibrating.

Place the MetalliScanner® metal finder on the scanning surface as far away from any target (magnetic or non-magnetic) as possible with the mode switch in the position corresponding to the target of interest.

If there are multiple targets present, position the unit halfway between the widest-spaced targets (Figure 6).



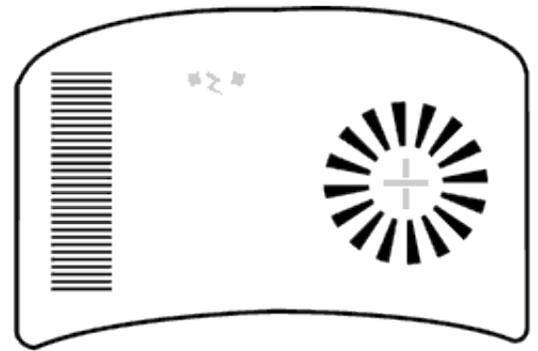
Prior to calibration the numbers next to the depth bar are not displayed.

Calibrate the tool by pressing and releasing the calibration switch.

While the unit is calibrating, every other spoke on the scanning wheel and all the depth bars are displayed momentarily and the unit makes a high-pitched tone once (Figure 7).

When the unit has successfully calibrated, the numbers next to the depth bar will be displayed.

The MetalliScanner® metal finder is now calibrated for that type of metal and capable of determining the depth of targets located in that mode.



**Figure 7: Display during calibration**

## **NOTES:**

1. If, while the MetalliScanner® metal finder is calibrating, the unit makes a long, low-pitched tone and the display does not return to normal, a calibration error has occurred. Reposition the tool and recalibrate.
2. If a metal target was located during pre-scan and the MetalliScanner® metal finder does not locate it after calibration, the unit may have been calibrated directly over a target. Relocate the tool and recalibrate.
3. Changing modes or turning the unit off causes the unit to lose its calibration.
4. You must calibrate with the MetalliScanner® metal finder on the surface of the concrete to get an accurate depth reading.

## **Determining the Depth of the Metal Target**

You must calibrate in the mode corresponding to the type of metal target for which you want to determine the depth (see preceding section).

After calibrating, reposition over any target of that type. The depth bars indicate depth to top surface of the target.

Repeat if necessary for targets of the opposite type of metal after first calibrating in that mode.

**Conversion Table for Copper Pipe other than 1/2"**

MetalliScanner Reading	Actual Depth for Various Pipe Diameters	
	1/4"	3/4"
0	<1	0.5
1	1	1.5
2	1.5	2.5
3	2.5	3.5
4	3.0	5.0
5	3.5	6.0
6	5.0	>6.0

## NOTES:

1. The depth reading is only accurate after the unit has been properly calibrated (see preceding section).
2. The depth readings are specifically tuned for measuring 1/2 inch copper pipe or #4 rebar. For any other metal object, the direct reading of the MetalliScanner® metal finder will be less precise. For most sizes of rebar (other than #4), the depth reading is accurate to  $\pm 1$  inch.

To get a more accurate depth for copper pipe of other diameters refer to the following conversion table.

## Operating Tips

1. When scanning with the MetalliScanner® metal finder, hold the unit against the surface with a constant, light pressure. Changes in pressure can cause inaccurate fluctuations in the scanning wheel display.
2. When the Low Battery Indicator appears on the display, replace the battery as soon as possible to maintain sensitivity.
3. For best results when pre-scanning, move the tool at a constant, moderate speed over the surface. Then, once you have found a target, move slowly to pinpoint its location.
4. Since rebar may be in a grid array, scan the surface vertically and horizontally to locate its position. You may use the depth bars to locate rebar in one direction. While still over that piece of rebar, scan along that bar and use the scanning wheel to indicate rebar in the opposite direction (Figure 8).
5. The MetalliScanner® metal finder is sensitive to changes in temperature. Allow 5 to 10 minutes

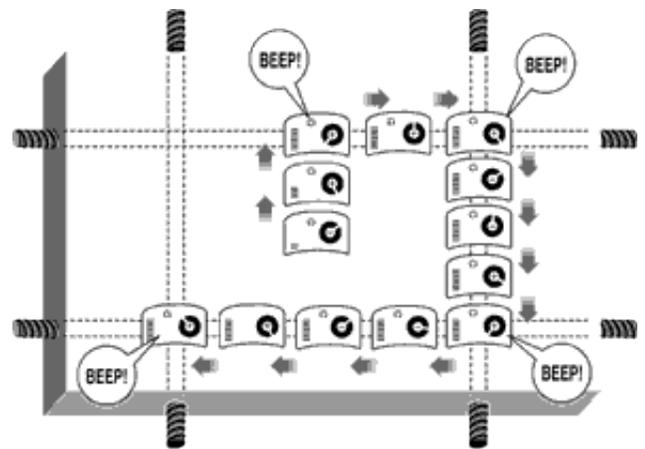


Figure 8

for the temperature to stabilize before operating if the unit has been moved from one area to another where there is a 5°F change or greater (ex. from an air-conditioned building outside on a warm day).

6. For maximum accuracy, only use the device on fully cured concrete.

## **CAUTION:**

1. Always turn off power when working near electrical wires.

2. In situations involving multiple, closely spaced targets, the MetalliScanner® metal finder may be unable to detect the exact location and/or depth of each piece of metal. Always use caution and wear safety glasses when nailing, cutting or drilling in walls, floors, and ceilings that may contain metal objects.

3. If a magnetic and non-magnetic object (ex. rebar and copper pipe) are positioned side-by side or on top of each other, the tool may have difficulty locating them.