

# XLIO IMAGER

16X HIGHER RESOLUTION

# PRO SERIES



3D Geovision

# Underground Surveyor Apparatus



## XL16 IMAGER PRO SERIES

### User's Guide

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# Introduction

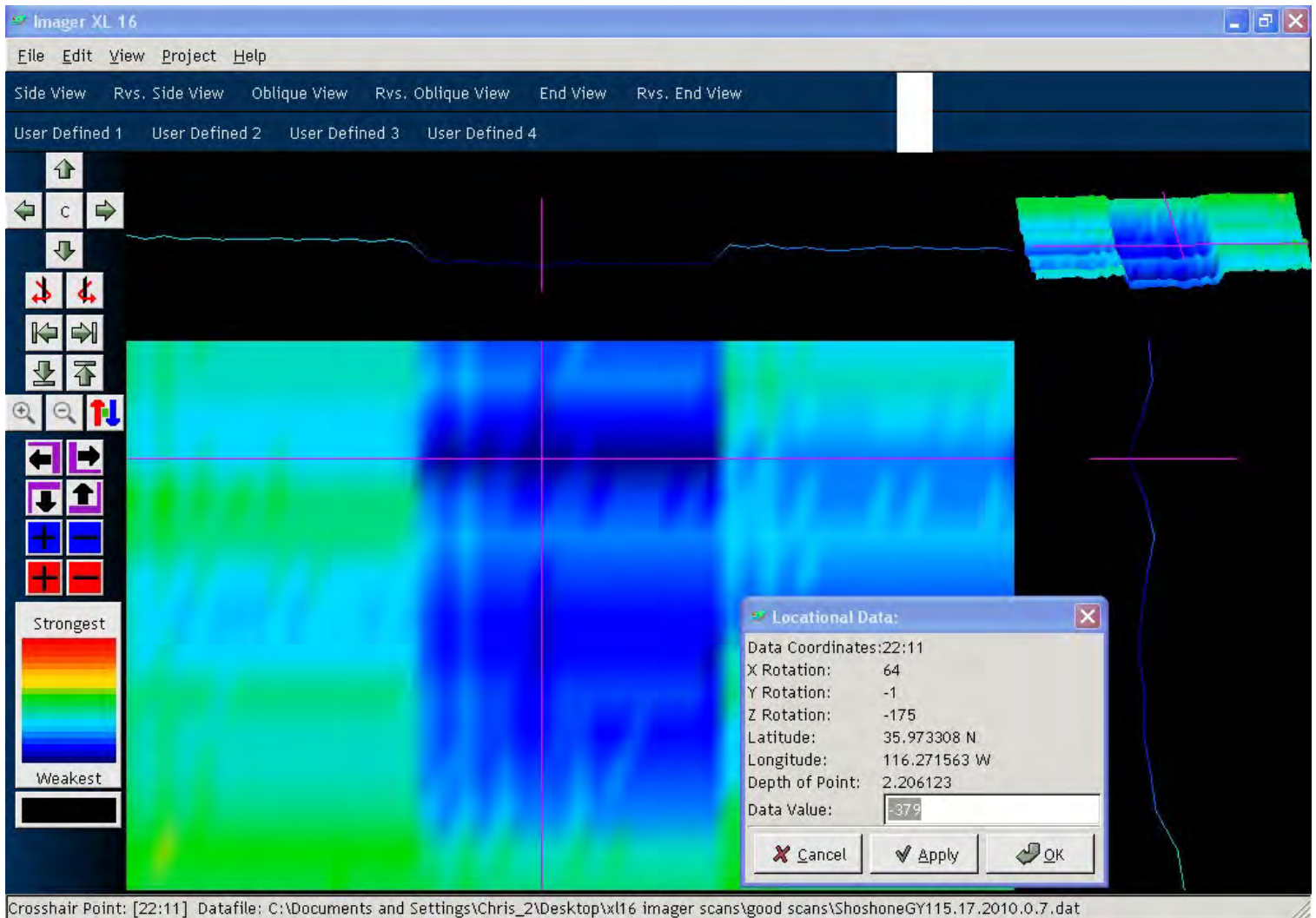
Thank you for your purchase of the XL16 IMAGER PRO SERIES (USA). Before operating the unit, please read this manual thoroughly and retain manual for future reference. With the XL16 IMAGER, you will be able to locate anomalies, buried objects and faults. The XL16 IMAGER works on the principle of detecting electromagnetic field changes that are emitted from the Earth.

With the XL16 IMAGER, there is no need to transmit a signal into the earth, because of the existing signals that are already present in the earth. The XL16 IMAGER has very sensitive broadband receivers, enabling it to receive electromagnetic and magnetic signals. When there is an item buried in the ground, a FERF (Free Electron Radiation Field) is created enabling the receiving antennas in the XL16 IMAGER to identify its presence. When a hole is dug, it creates a scar on the Earth's surface; this scar is visible to the XL16 IMAGER. Unlike any other detector ever built, it is looking for the difference, which enables the operator to locate anomalies.

The software that was created exclusively for the USA systems and is designed to highlight items in the ground, anomalies, disturbances, etc... You can see subsurface objects in *Real-Time* with the *GeoSurveyor 3-D Software*. Also a feature that assists in detecting a target area is *Auto Ground Balancing*. *Auto Ground Balancing* defines the compensation for the varying amount of minerals in the soil by sensing the mineralization and automatically adjusting the ground balance to achieve the best performance, thus producing a more "clearly defined target area". One of the main items to note is to do a large enough scan allowing you to see the background. When scanning in only one small area, determining the difference between the target and the background can be somewhat difficult. Another note to remember is to isolate suspected targets so that there is only one target per scan. This way you will be able to determine the approximate size of the object. As advancements in the software are available you may purchase upgrades, critical updates will be available free of charge. Please contact your sales representative for more information.

It is very important to read this manual through completely. If there are problems, our technical support staff will be able to assist you in the better understanding of the unit and its functionality. Our technicians will assist you in proper technique of scan and operation of the unit. Personalized training courses are also available at Accurate Locators in Oregon, USA. We have a dedicated test facility with buried objects of both Ferrous and Non-Ferrous metals. The training requires an entire afternoon and is by appointment only. Please contact your sales representative for more information on obtaining premium technical support services and personalized training for your unit. Of course, every unit comes with one (1) hour of free telephone technical support. A free product demonstration, not to exceed two (2) hours can be scheduled at the Accurate Locators, or Imaging Locators test sites.

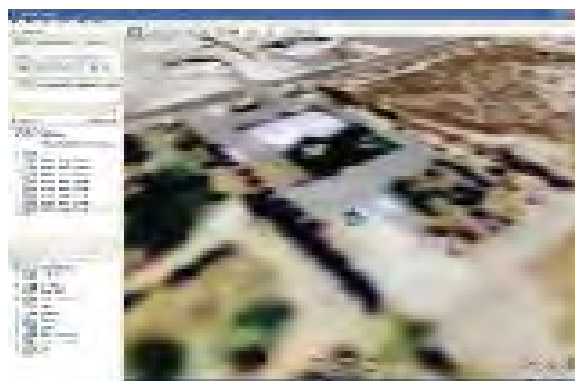
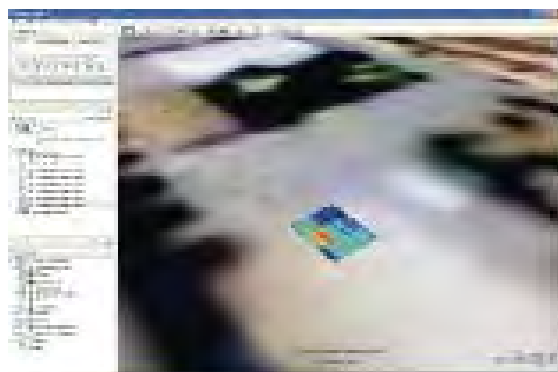
# SCREEN SHOT OF THE XL16 IMAGER PRO IN ACTION



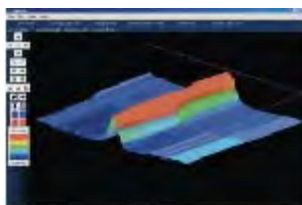
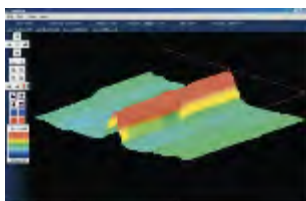
**You are seeing a screen shot from the new XL-16 IMAGER USA Pro Series. We have enhanced the imaging 16x times the average with increased data speed; producing higher resolution and more accurate detection of targets. With new features giving you greater control over your scanned image.**

- Adjusts visuals of scan relative to original ground balance point 0.0  
Visual color scales also in black and white.
- GPS interface features: Export Map Points, Export Map scans, Longitude/ Latitude coordinates, also Dilution of Precision data for precision of signal received.
- Project Mode to keep track of your scans while in the field.
- Enhanced saving features to better track your project scans.
- Added smooth mode to increase accuracy of target shape.
- Decreased scan lag to increase amount of scans during mobile scanning at higher speed.

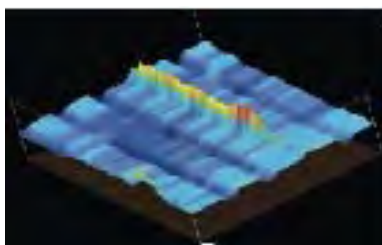
The XL16 IMAGER Pro has a special export function for Google Earth maps. Inside the XL-16 IMAGER Pro software scans can be exported to Google maps as a ground overlay (KML). It converts the scan either to an image with GPS references or remaps the entire scan point by point into Google Earth. Mapping the target area or an entire site or claim has never been easier. As fast as you can select it from the menu, the Google Earth file (KML) is saved into a special directory then can be double clicked or imported from there for use later. Archaeologists, as well as treasure hunters could find this very useful as it can show a multitude of underground areas simultaneously and then show where these areas are in Google Earth for later excavation and discovery.



An improved interface allows for multiple target analysis color options beyond just augmenting relatively weak or strong targets. This allows you to set the colors to what you need and allows you to see targets with the most resolution to distinguish a weak target from mineralization with ease.



The XL-16 IMAGER Pro can detect **PVC** pipe alongside ferrous pipe with greatly improved detail. A metal water pipe is denoted by the yellow-orange line and the dark blue furrows to the right and left of that pipe are **PVC** pipes in Leech Fields. The Dominator has integrated GPS so that surveys can be easily mapped and cataloged. The GPS Coordinates can be displayed in a data window, but are also logged in the scan file, where they can be retrieved and reviewed later.



## **Existing Potential Method (USA)**

When using specifically designed sensors the earth's self-potential of direct currents can be measured. The sensors become very useful when using a single forward motion just above, without contacting, the earth. With this rather simple technique, the geophysicist can trace zones of mineralization, having a strong signal, or tunnels having a weak signal. By receiving a combination of AC/DC and frequency to map potentials, we can map fields of interest. These rapid changing signals are amplified and analyzed by the software. The XL16 IMAGER allows for the rapid collection and interpretation of large quantities of data, making it a cost effective technique. EM equipment measures the background of the emitted signals from the earth; it then detects any differences that are present. Differences can be caused by anything in the subsurface that has disturbed the earth (like a void, metal objects, fault, tunnels, etc...). Other available geophysical techniques that are sensitive to the presence of both ferrous and non-ferrous metal objects include metal detectors, pulse induction, resistivity, ground penetrating radar, etc...

### **What EM Measures**

EM measures the apparent electromagnetic field of the ground, including effects of the soil, bedrock fractures, contaminants, metal objects, and ground water. Variations in the electromagnetic field may indicate changes in composition, layer thickness, or moisture content. The presence of buried metal such as drums, and/or other objects create a large variation. The UNDERGROUND SURVEYOR is specifically designed to detect subsurface anomalies by receiving varying signals from the ground.

### **Magnetic Surveying**

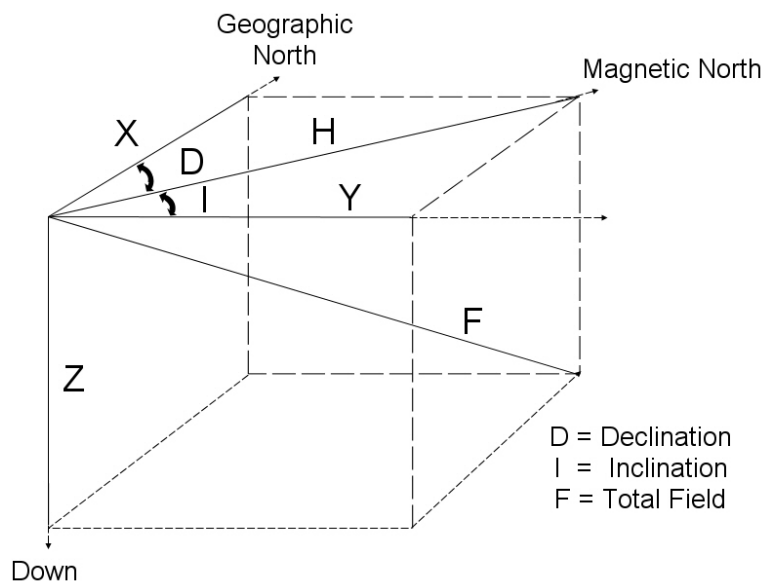
Magnetic surveying is ideal for both reconnaissance and focused surveys. It is expedient and cost effective, covers more ground in less time, and requires a minimum of field support. The portability of the instruments makes magnetic surveying well suited to sites with topographic variations.

### **What Magnetic Measures**

Magnetic surveys measure the earth's magnetic field and the Milligass level very accurately. Buried ferrous materials, and in some cases, changes in bedrock lithology, produce disturbances in the local magnetic field that can be readily detected by magnetic surveys. The UNDERGROUND SURVEYOR instrument is one such device that takes measurements in order to find anomalies that lie beneath the surface. Instruments like the "Discriminator", uses "Pulse Induction" to measure conductivity and in combination with a Magnetometer to discriminate ferrous and to see non-ferrous objects.

# Principles of Magnetism

The earth's geomagnetic field has three principal components: the main field itself, an external field and local perturbations superimposed on the main field. Caused by processes in the interior of the earth, the main field has a large magnitude which varies slowly over time. At present, the earth's field amplitude (T) ranges from a low of about 25,000 nanoTeslas (formerly gamma) (nT) near the geomagnetic equator to almost 70,000nT at the geomagnetic poles. The field inclination is horizontal at the equator and vertical at the poles. The external field originates outside the earth's crust and is associated mainly with electric currents in the ionized layers of the outer atmosphere because of interaction with the solar winds. Traveling along magnetic flux lines solar winds are ionized plasma or hot-charged particles, which transmit energy by wave motion. Local variation in the rock and mineral assemblage of the near-surface crust produce local perturbations that are the anomalies of exploration interest. The earth's magnetic field (a vector field having both amplitude and direction) is described by an intensity (total field intensity, T), an inclination (I) and a declination (D), Figure 1.1. For Specific applications, horizontal and vertical field components can be derived from T, D, and I



Rock units in the crust acquire a magnetization in the direction of the earth's field, which is referred to as induced magnetization or magnetic polarization. The resulting induced field of a typical finite source body is dipolar: that is, it contains positive and negative elements. In the middle-to-high magnetic latitudes of the Northern Hemisphere, the dipolar nature of an induced anomaly is typified by a positive (high) and related, but subdued, negative (low) on its north side. Anomalies of interest range in amplitude from a few nano Teslas (nT) for deep basement or sedimentary anomalies to 1,000's of nT for near-surface mafic rocks or iron formation to 10,000's nT for magnetite iron ore deposits. Several time-variant or temporal variations occur in the geomagnetic ambient field. A long period, or secular change, occurs slowly over many decades or centuries and modifies inclination, declination and intensity. Such a change can be observed as a change in the magnetic declination as noted on old maps when compared to today's version. A complete reversal of the total field direction, occurring over tens-to-hundreds of thousands of years, is a more dramatic effect of the secular change. More important to prospecting are the diurnal variations. A diurnal variation of 10 – 100+ nT occurs regularly on a daily basis, (Breiner, 1973). This diurnal is also related to solar winds, the small effects of which vary with the level of the ionosphere and intensity of solar winds. Micro pulsations of 0.001 to 10s nT are random effects lasting from 0.02 to tens of minutes. Magnetic storms also produce a short period random "noise" which may vary up to many 100s nT over periods of a few minutes to hours. Storm effects are unpredictable but are related to and follow solar flaring, commencing abruptly and decreasing slowly over hours or days.

Principles of Magnetism are an excerpt from:  
Practical Geophysics II for the Exploration Geologist  
© 1992 Northwest Mining Association  
ISBN: 0-931986-05-2

# PACKAGING CONTENT



- 2- Antenna sizes: 24" & 36"
- 1- 3D Geovision Pin Pointer
- 2- Adjustable Handles
- 1- Antenna case
- 1- Field pack (fully assembled)
- 4- 18v 3000m Batteries
- 1- 18v charger
- 2- 1- 12v 6000m Lap top back up battery
- 1- 400watt inverter with multi- adapters
- 1- Pelican weather protective carry case
- 1- XL16 Imager control unit
- 1- Panasonic Tough-book w/ GPS Fully configured
- 1- Thumb Drive with 3D & Pin Pointer
- 2- Detailed instruction manuals
- 1- Accurate Locators Hat w/ light
- 1- 3 year warranty information
- 1- Tech support information
- 1- Wiring harness
- 1- Wireless adapter
- 1- Wireless Manual
- 1- GPS setup Manual
- 2- Cross over cables

## Unit Operation “Quick Start Guide” For XL-16 Imager and Geovision EM detectors

The following is a “Quick Start Guide” to getting the unit up and running for the first time. There are two different methods that will be explained here in detail. Please remember the importance of the “Grid Pattern” (See page 10 & 11 for details) in order to achieve better data and make analysis easier.

### Normal Grid

1. Make sure that batteries are fully charged (not more than 3 hours for the XL16 IMAGER battery) for both the Laptop computer and the XL16 IMAGER.
2. Ensure that the laptop and the control unit are properly in the Front/Backpack.
3. Put pack on over shoulders and secure the side belts so the pack will not slide and so that the pack is balanced.
4. Turn on the power to the XL16 IMAGER.
5. Turn on the power to the laptop.
6. Once the laptop has started select the “XL16 IMAGER or Geovision” software.
7. After the software is running click on “File” then click on “New”. You can also use the keyboard shortcut by holding down the “Ctrl” and “N” keys.
8. The “New Scan Setup Wizard” will appear, click on the “Next” button.
9. In the next dialog box are your options, select the amount of time, in seconds, that it will take you to cover one survey line (Figure 4.1a). You can either click on the up and down arrows located next to the actual second count. For instance five seconds, or you can click on the “More” or “Less” buttons on the right hand side of the dialog box. Next you can select the Dominator option of “Live Mode” to view data in real time mode by clicking on the “Live Mode” button.
10. After selecting the amount of time, click on the “Next” button. Be sure to have your antenna oriented and on the ground ready to detect.
11. The next dialog box (Figure4.2) is for comments about the scan that is going to be taken. Comments that are typically entered include weather, soil condition, adverse terrain, location of scan, etc... Once completed with the comments, which of course, can be entered after completing the scan as well, click on the “Next” button.
12. A small dialog box will open in the top left hand corner waiting to establish a connection. At this time the sensors will “Ground Balance” allowing a more “easy to read” evaluation of the scanned data for target identification. Once the connection is established, you will be able to click the “Go/Pause” button or the “Quit” button.
13. Before you click on the “Go” button, align yourself with the desired path of the survey line. Set the mouse over the “Go” button and be prepared to click it. Click on the “Go” button and immediately begin your survey line.
14. The timer will automatically stop after the preset amount of time. You can repeat this row process by back tracking to your original start point and indexing to the right exactly the full width of the antenna (for most accurate row scans) Press go once more and start walking to execute another row scan. For a more detailed instruction about the “Grid Pattern”, please see the section called “Grid Pattern”. Follow the same routine as in #13.
15. When completed click on the “Quit” button, and save data.

**Important Note:** Make sure to have your antenna on the ground and pointed in the direction of the row when you are at the Comments screen do not pick the antenna up until it says connection established

(fig.4.1a)



(Fig. 4.2)

# GROUND BALANCE PROCEDURES

Before starting a new scan it is recommended to check your readings from your ground balance location

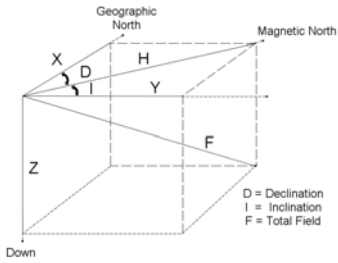


Fig. 1

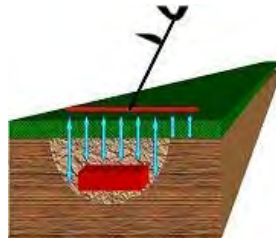


Fig. 2



Fig. 3

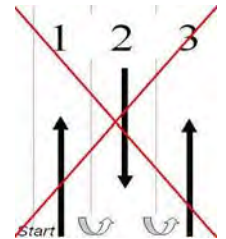
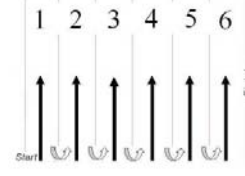


Fig. 5

1. Magnetic North to South is your recommended direction of scan within the Northern Hemisphere. It will be the exact opposite if scanning within the Southern Hemisphere. (Fig. 1)
2. First lift your antenna off the ground a minimum of 2". Normal setup of a new scan. Open software, click on File<New<set time for scan at 2 seconds<name scan file or leave default<make sure at this time your antenna is pointing in the direction you wish to scan<press ok at this time and allow system to self ground balance. (Refer to picture Fig. 2 above for direction)
3. After ground balance is executed you will need to do a minimum scan (2 seconds). Walking slowly until your 2 second scan has completed. It is not necessary to pay attention to what displays. You are only doing the scan to have a reading from your ground balance point.

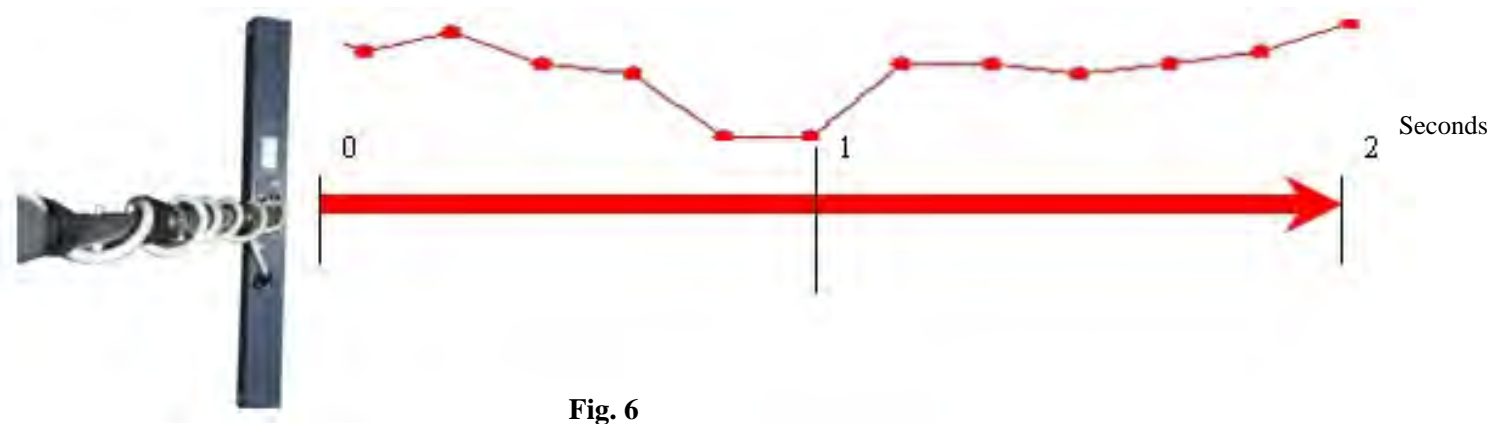


Fig. 6

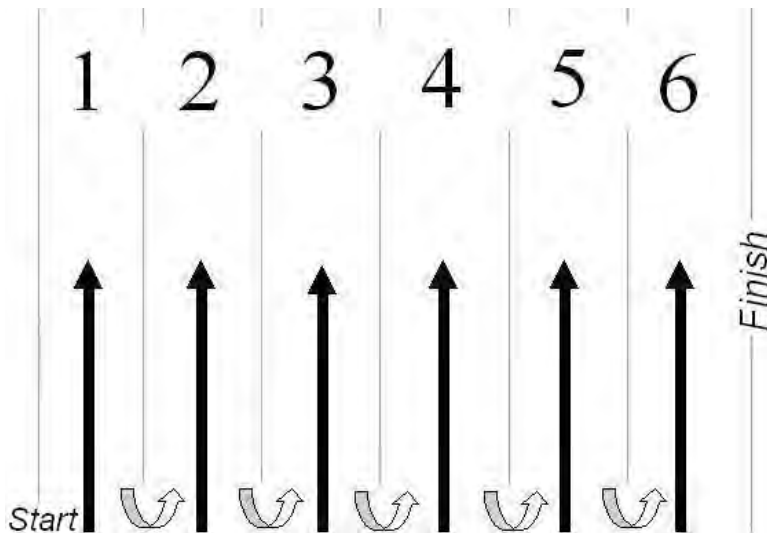
4. At this point you will want to click quit. You will not be doing anymore scanning at this point. Click on View at the top of your software screen and then click on the show data under cross hairs tab. Another window (Locational Data) will pop open with data that we will use to determine your ground balance point. You will want to use the data from the Data value Line. Your goal is to obtain the lowest ground balance number you can. Closest to 0. A recommended scan is nothing stronger or weaker than +/- 100. You can see by the data value picture we are at -4. That is a good ground balance point which will help us to see weaker targets such as natural veins, weak pay streaks or even sub surface anomalies.



5. You will need to make your exact ground balance point for your scan in the middle of your initial 2 second verification scan, this is the optimal spot. Refer to Fig.6
6. Your ground balance is not complete just yet. You still need to maintain the orientation and direction that you ground balanced in. (Refer to Fig. 3-4) If you ground balance heading West you must maintain that direction during your scans. It is the same if you do multiple rows with the same scan. You must maintain the same direction with the antenna at all times.

## Grid Pattern

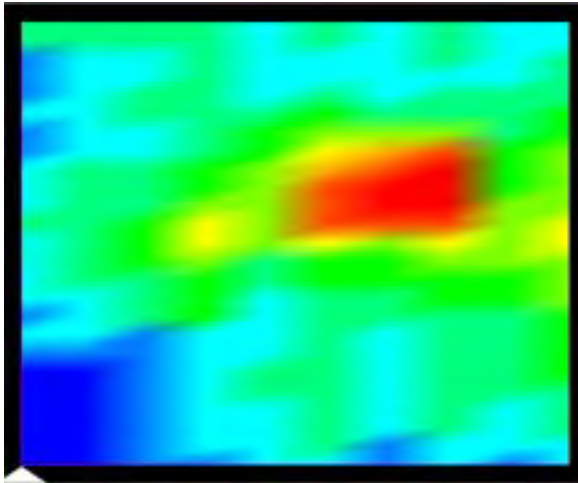
Let us create a Grid, in this example (Figure 4.3) we will go 14 second long reading on the survey line by 6 Survey lines wide. The grid pattern would look like the one below. Typical scans are a minimum of four or more survey lines. The larger your scan, the more background will be available to find your target. The length in between the pulses is only relevant to the previous reading. For example, if the distance between the first and second reading was 4 ft. (100cm) then each reading, including the turn should be 4 ft. (100cm) away from one another, this scan is commonly referred to as a rough scan. If the distance between the first and second reading was next to the last row, then this scan is typically referred to as a Fine Scan. **\*Tip** Raise sensor at least 1 Foot from ground to find larger targets faster with minimum filtering. The **SENSOR MUST ALWAYS FACE THE SAME DIRECTION**, unless in “Live Mode” In that case, you must pause the sensors from receiving data in order to change directions in “Live Mode” by pressing the space bar or the left mouse button the arrow on “pause”. Continue by clicking “go” or by pressing the spacebar once more to continue scanning in “Live Mode” Each time you complete this action, the sensors will once again “Ground Balance” This is relevant if it is going up a survey line or down a survey line. (See Figure 4.3a) Rotating the sensor itself will cause erroneous readings and the data collected will most likely be unusable.



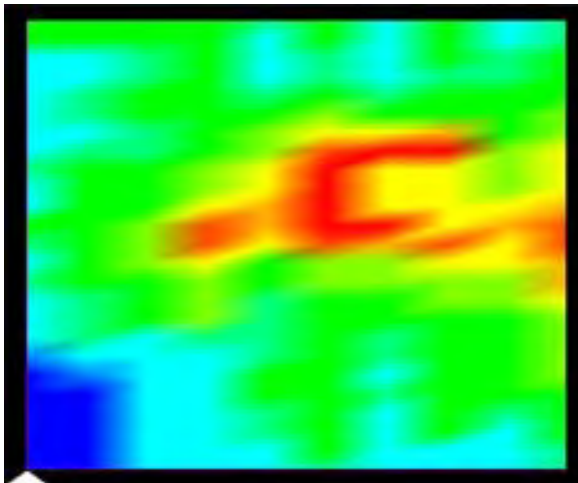
A typically scanned area would be like the image above. Always moving to the Right of the first survey line and working in the same direction to the last survey line. In addition, since this is an Electromagnetic instrument it is very important to know where magnetic North is. It is best to bring a compass to set magnetic declination for your area. In the Northern Hemisphere, it is always best to start from the South, go towards the North on the first survey line, in the Southern Hemisphere start from the North, and go towards the South. Although scans in the East/West direction also work, just not as well as the North/South directional scans (refer to page(s) 5-6 for further information) Remember that a fine scan and a rough scan are performed using the same Grid Pattern. Any variance from the grid pattern will result in an inaccurate reading, most likely producing erroneous results and leading to extra work in the field. If an object, like a tree, is blocking a survey line then shorten your grid to accommodate for the tree. In the event that you need to walk around a tree, “Live Mode” is a great approach to the target identification.

# Importance of the Grid Pattern

The grid performed is ninety percent of the work. If your grid does not align correctly then the scan that appears on the laptop may not be correct. An example of the grid pattern importance is shown below.



**In the example to the left (Figure 4.4) is a filtered view of an actual target. When the grid pattern *is* properly conducted, the image will show a definite man made anomaly very clearly.**

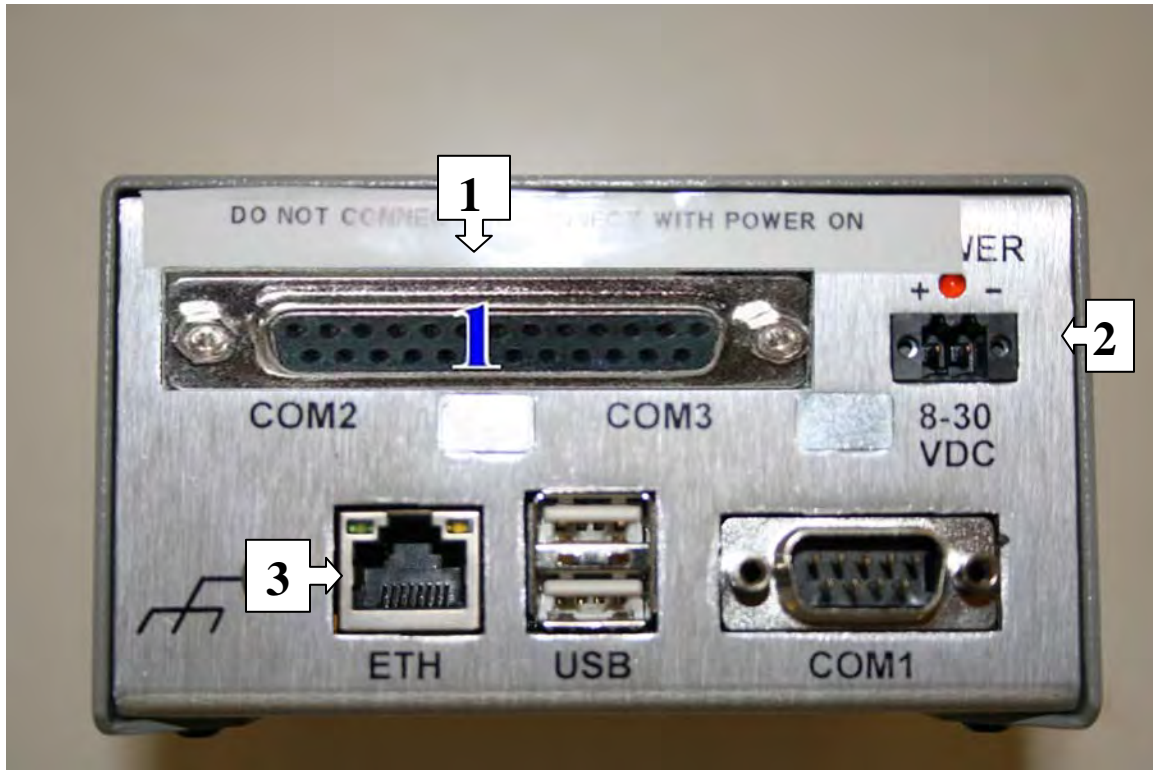


**In the example to the left (Figure 4.5) is a filtered view of an actual target. When the grid patterns *are NOT* properly conducted the target is not so easily identified. The image that you see to the left is common of mineralization, which can be quickly overlooked.**

In the two examples above, one can clearly see the difference. When training with the unit, it is always helpful that a second person watch the operator to ensure that the unit not be rotated at the end of the turn and that the operator is walking a straight line. The operators pace determine the distance of each scan and time set in the software.

# Connecting the XL-16 Imager Pro Control Unit

On the face of the Control Unit, several ports can be connected. *\*The XL-16 Imager does Not utilize all of the port connections.*



1. Connect Antenna to the Imaging Port (Com2)
  2. Connect the Power connector
  3. Plug in the RJ-45 into the ETHERNET port
  4. USB for wireless connection device(s).
- \*Presently the Control Units do not use COM1, COM3.*



Wireless adapter

*Your XL-16 Imager package Field pack will be fully assembled tested and your Lap Top will be fully configured. You are able to use your equipment immediately out of the box. It is highly recommended that you take at least a few weeks and practice with your USA series detector for best technique and detection results. Always check the above connections show in the picture before you turn on your control unit. This will help avoid any operating issues. \*Note some minimal assembly will be required.\**

## **VERY IMPORTANT:**

**DO NOT DISCONNECT / CONNECT ANY OF THE CABLES WITH POWER CONNECTED  
FAILURE TO DO SO CAN CAUSE DAMAGE TO INTERNAL CIRCUITRY AND VOID  
WARRANTY.**

## **SAFETY PRECAUTION**

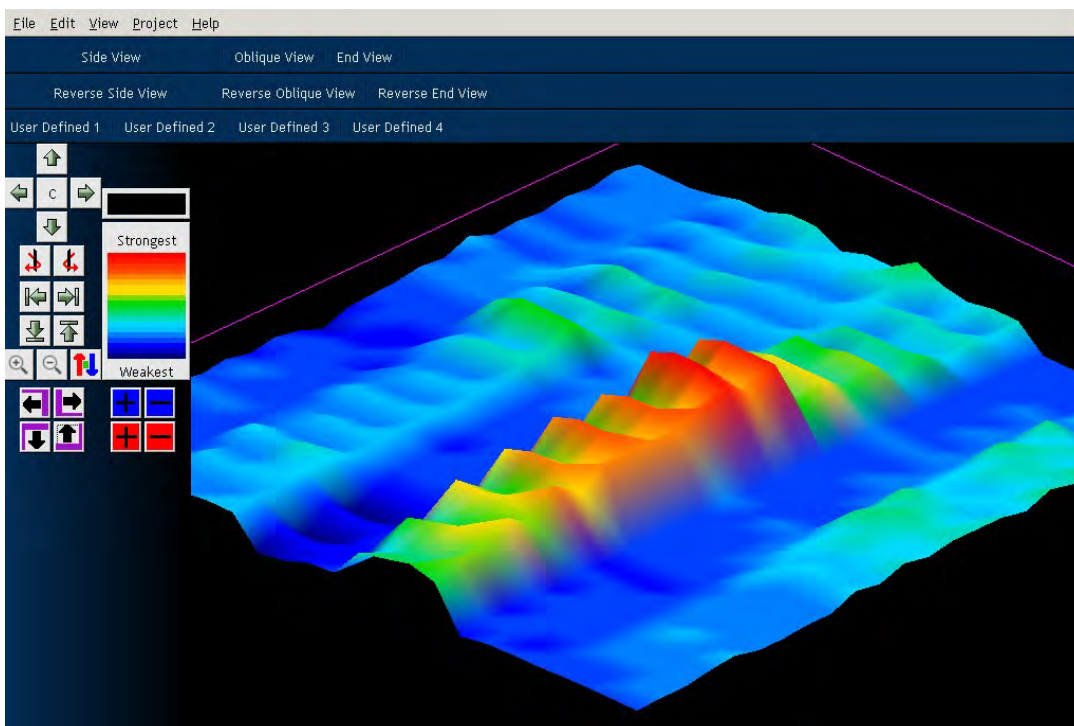
Do not let end of battery connection hit metal

## Software Introduction

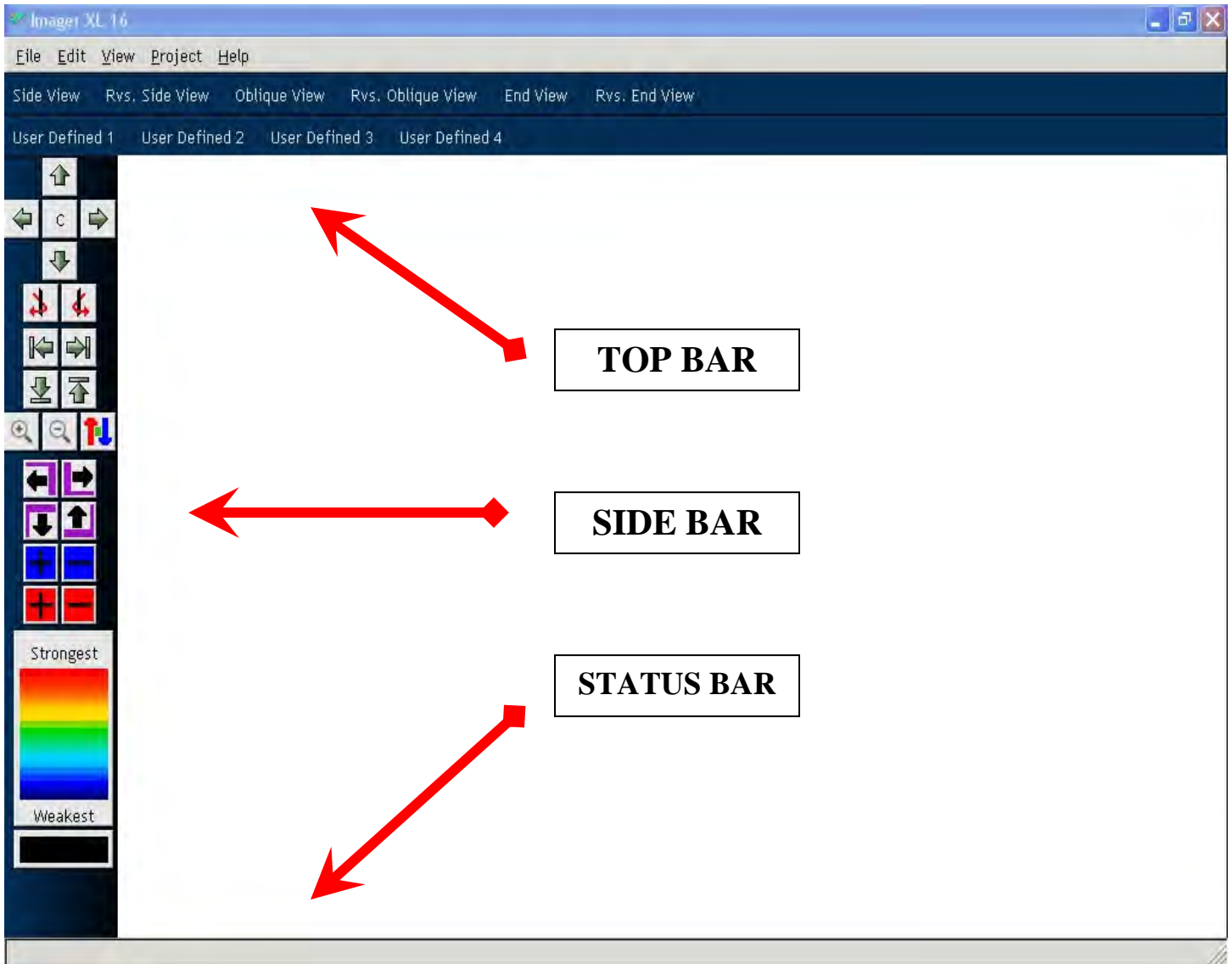
The software has been designed for both the hobbyist as well as the professional. For a better understanding of the software and the functionality that has been built in, the following pages will give a detailed breakdown of all the menu functions and quick control features.

In the development of the software, the goal was to create total functionality that completely frees the user of actually having to set any controls on the unit itself. This way everything is controlled from the software directly rather than having to handle two separate pieces of equipment. Though the functionality of the software is very easy to understand, it is imperative that the proper grid pattern be completed. Ninety percent of the work with the XL16 IMAGER is the proper completion of the grid pattern. Afterwards, the software and target identification are quite simple.

There are many different techniques for taking the actual scan. When the scans are complete, the data must be analyzed to locate the target. We will go over many scans and show examples of anomalies and buried targets that are in our training area. Unit training is available at our test area where we have several buried items. Our training area designs are similar to many real life conditions for buried targets. 2 Hour training courses are offered by appointment only. Please contact a sales representative for exact details and pricing.



# SCREEN BREAK DOWN



## Top Menu Bar

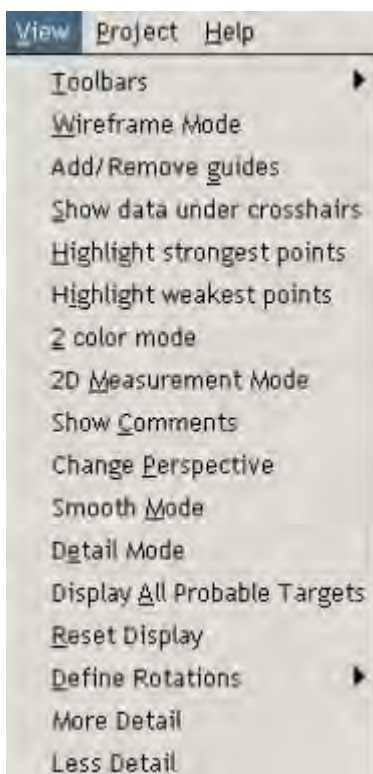
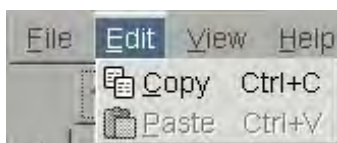
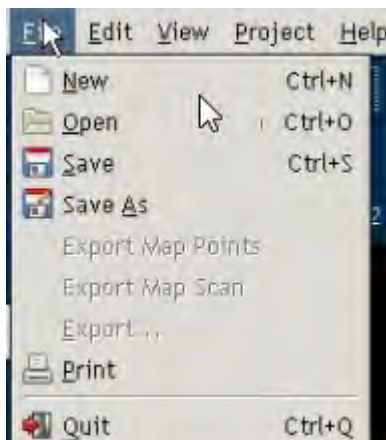
This menu provides full software functionality and quick views.

## Side Menu Bar

The Side Bar contains many of the features

**Status Bar** In the Status Bar information of the Crosshair Point and the name of the file that is open is displayed at all times

# Top Menu Bar

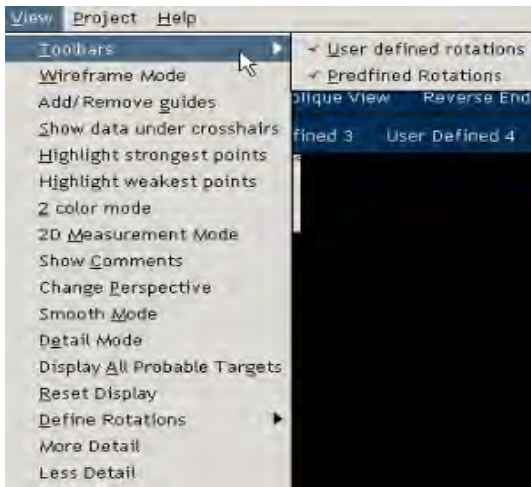


## File -

This file has the following options and links to the keyboard shortcuts. In here, you can begin a new scan, open a saved scan, save a scan, or save a scan as a different type of file or name, Export Map Points for topo mapping, Export Map scan for visual over topo mapping export a scan, print a scan, or quit the program. Where you see writing like "Ctrl+N" means a keyboard shortcut. By holding down the control "Ctrl" key and the letter "N" at the same time will start a new scan.

**Edit –** This menu will allow you to change the values in a given area on a scan. Occasionally there will be an extremely high or low signal. Using the "Copy" and "Paste" functions, you can alter your scan to make it easier to understand.

**View –** This menu is the most important menu to learn. With this menu, you will be able to set the views necessary to identify the anomalies. You can also see a partial View Menu by Right Clicking on the screen.



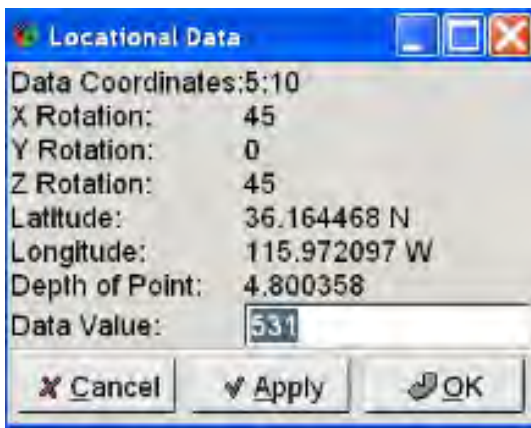
**Toolbars** – This function sets which toolbars the user wants to see at the top of the menu.

**User Defined Rotations** – Shows/Hides the toolbar.

**Pre-Defined Rotations** – Shows/Hides the toolbar.

**Wire frame Mode** – This changes the view from a solid to a wire frame.

**Add/Remove Guides** – This function will Hide/Show the side and bottom guides that are in a scan. Users when in “Wire frame Mode” commonly remove these.



**Show Data under Crosshairs** – This function is done by moving the cross hairs over a desired point and then when selected it will display in the image to the left.

**Data Coordinates** – gives the position of the crosshairs on the screen,

**X, Y and Z Rotation** – gives the rotation of the scan in degrees of variance from the original position.

**Latitude/Longitude** – coordinates provided in this section are based on GPS data received.

**Depth of Point** – software calculates approximate depth only. Depths will vary in different soil dielectric constants (soil types), i.e. weather, temperature, solar conditions, etc...Measured in FEET. Note: select reset display if you’re using Change Perspective.

**Data Value** – gives the data value at the specific coordinate. The value can be changed by using the crosshairs to highlight a point on the image to determine the value. The value is derived from the difference between the ground balance location and the current coordinates reading.



**Highlight Strongest Points** – will show the strongest signal values that were recorded during the scan.

**Highlight Weakest Points** – will show the weakest signal values that were recorded during the scan.

**2 Color Mode** – is a preset filter to highlight the strongest recorded signals in a scan with less change from smaller signals.

**2D Measurement Mode** – a very useful tool to highlight areas of a scan. Please see details on 2D Measurement Mode on page 25

**Show Comments** – allows you to view or change comments regarding the scan. Typical comments made are GPS coordinates, markers, distance of survey line, etc...

**Change Perspective** – changes the view so that all of the upper objects will appear on the bottom and vice versa. This is extremely helpful to identify certain anomalies and areas previously excavated. Also useful in determining approximate depth.

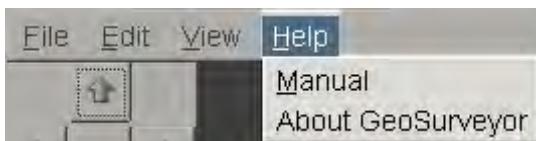
**Detail Mode** – put the scan into a very fine detail mode. Each point is represented by a single color.

**Display All Probable Targets** – is a preset filter that uses automatic highlighting of areas that show a significant difference.

**Reset Display** – changes all setting and returns the scan to all original colors and rotations.

**Define Rotations** - Enables the user to pre-program views and angles of scans for easier recognition of targets. To set the “User Defined Views” first put the scan in the view that you would like have as a preset then click on the “View” button then scroll down the list to “Define Rotations” then click on the desired View to set the view. You can change any of the “User Defined” views by repeating the above procedure.

**Help** - This menu (Figure 3.7) allows you to view the basic Manual and to see the exact software release as stated in The “About GeoSurveyor” option. For a detailed electronic manual please insert thumb drive and click the manual option on the splash page.

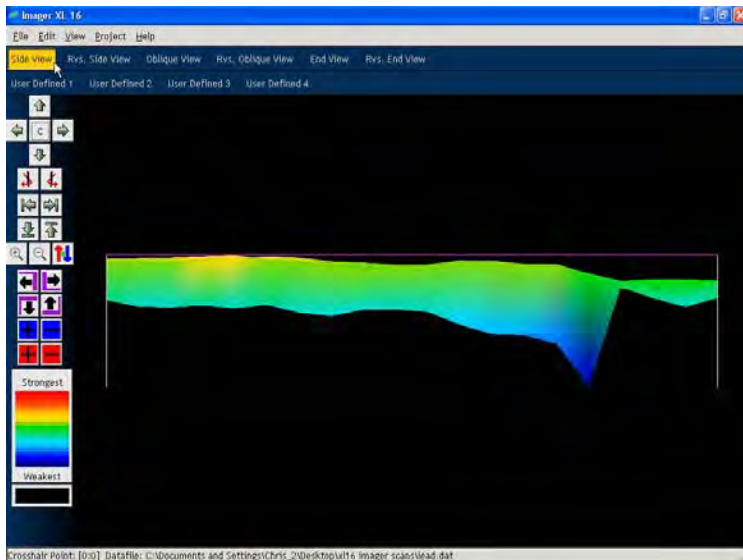


Side View	Oblique View	End View
Reverse Side View	Reverse Oblique View	Reverse End View
User Defined 1	User Defined 2	User Defined 3
User Defined 2	User Defined 3	User Defined 4

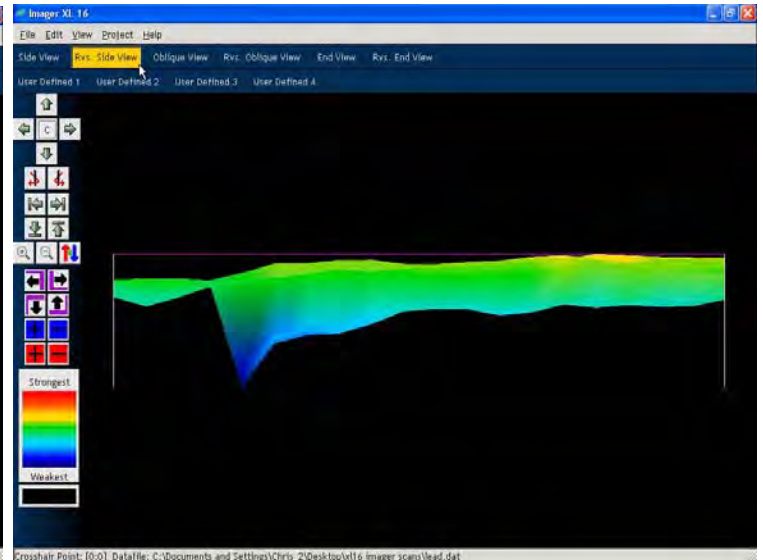
(Fig 3.8)

**Pre-Defined Rotations (Figure 3.8)**

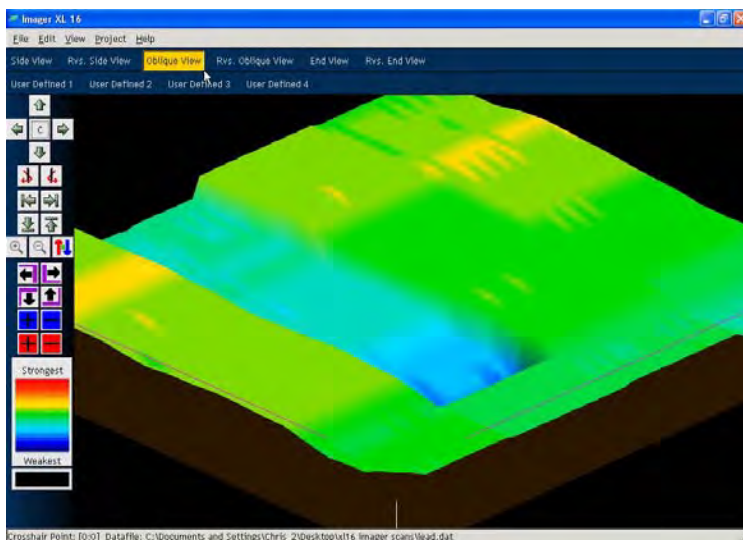
- **Side View** – Rotates the scan to a side view. (Figure 3.9)
- **Reverse Side View** – Rotates the scan to the opposite of “Side View” (Figure 4.0)
- **Oblique View** – Rotates the scan to an oblique view. (Figure 4.1)
- **Reverse Oblique View** - Rotates the scan to the opposite of “Oblique View”. (Figure 4.2)
- **End View** – Rotates the scan to an end view.(Figure 4.3)
- **Reverse End View** – Rotates the scan to the opposite of “End View” (Figure 4.4)



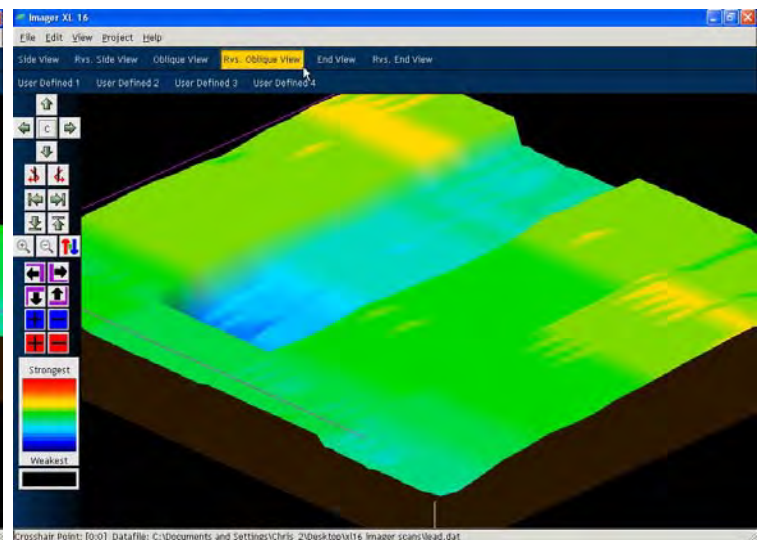
(Fig 3.9)



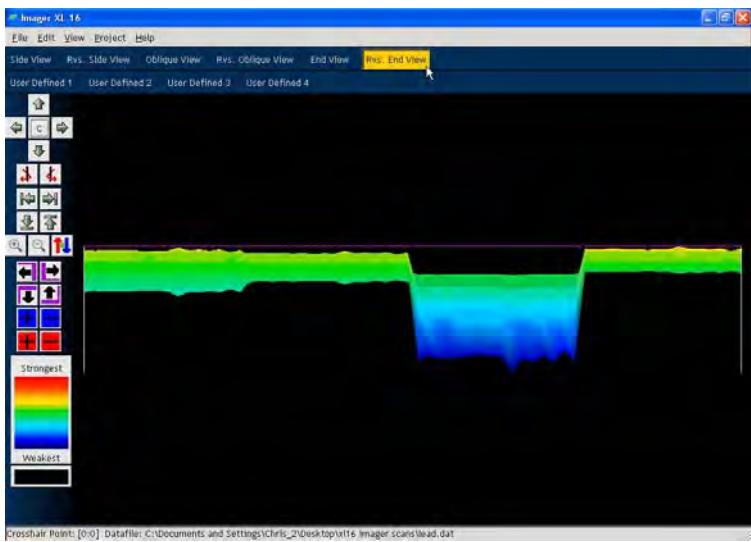
(Fig 4.0)



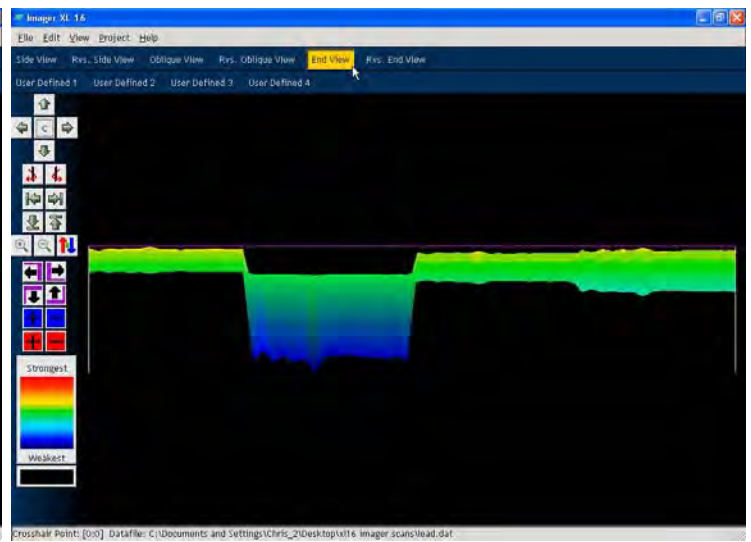
(Fig 4.1)



(fig.4.2)



(Fig 4.3)



(fig4.4)

**User Defined 1 -4: Enables the user to pre-program views and angles of scans for easier recognition of targets**

**To set the “User Defined Views” first put the scan in the view that you would like have as a preset then click on the “View” button then scroll down the list to “Define Rotations” then click on the desired View to set the view. You can change any of the “User Defined” views by repeating the above procedure.**

Crosshair Point: [5:10] Datafile: C:\sandbox\Dominator\scans\gps\iboxsn1.6.2007.20.41.dat

(Fig 4.5)

### Status Bar

The status bar (Figure4.5), which is located at the bottom of the screen, shows current Crosshair Point location and also the name and directory of the file that is currently open. Crosshair Point – This give the exact location in terms of a counter (0:0). The first number of the counter is how many pulses forward from the start point. The second number of the counter is how many survey lines to the right of the start point. The start point is always “0:0”.



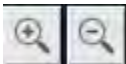
**Rotation control buttons.** With these buttons, you can rotate the scan up, down, left and right. The “C” (Center) button will clear all rotation and set the scan back to a top 2-D View.



The two lower buttons rotate the scan on the Z-axis.



**Scan position button.** With these buttons you can move entire scans towards top, bottom, left or right of screen to center scan.



You can Zoom In or Zoom Out of your current view



Adjusts visuals of scan relative to original ground balance point 0.0



### **Cross Hairs Buttons**

With these buttons, you can move the Cross Hairs to any desired point on the scan



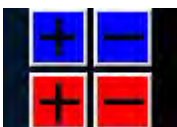
### **GPS Indicator**

You have the ability to enable GPS from this button. It will also give you a visual of the connect quality. When connected it will also show Dilution of Precision data as your satellite data improves or decreases



### **Color Legend**

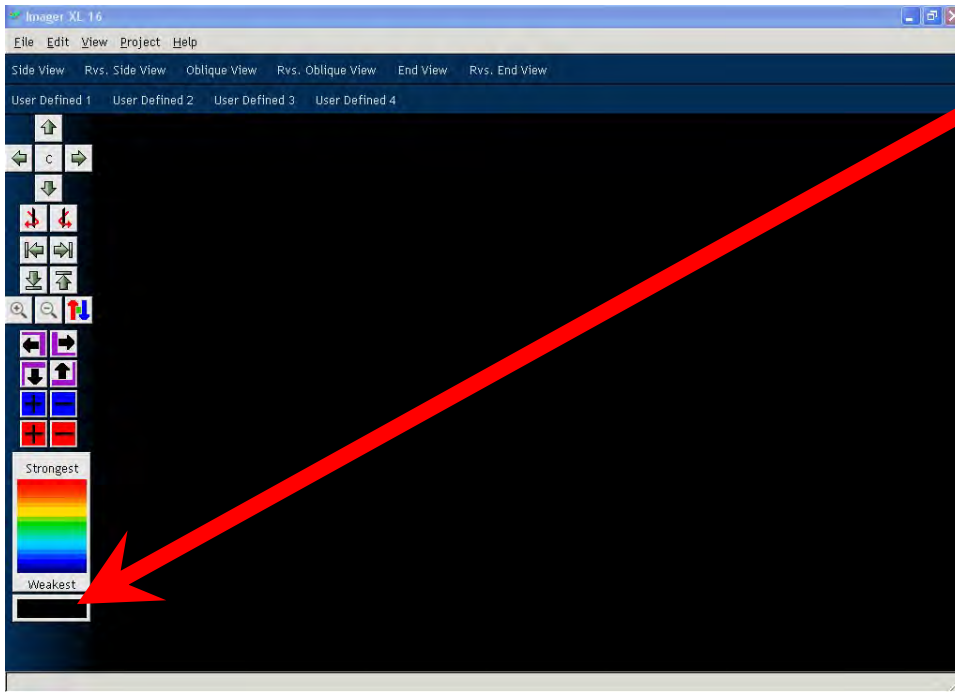
The color legend signifies what the colors on the screen represent in terms of signal strength. Typically, steel, iron and other ferrous metal targets will appear in the reds or yellows. Non-ferrous metals can appear in orange or blues depending on concentration. Tunnels, voids and pockets will appear in light and dark blues.



### **Color Filter Buttons**

With these buttons, you can either increase the amount of red or blue in the scan.

# GPS SYSTEM ACTIVATION WITH PRECISION OF DELUTION STATUS



**Press to establish connection with GPS hardware.**

**Black:** No connection/disabled

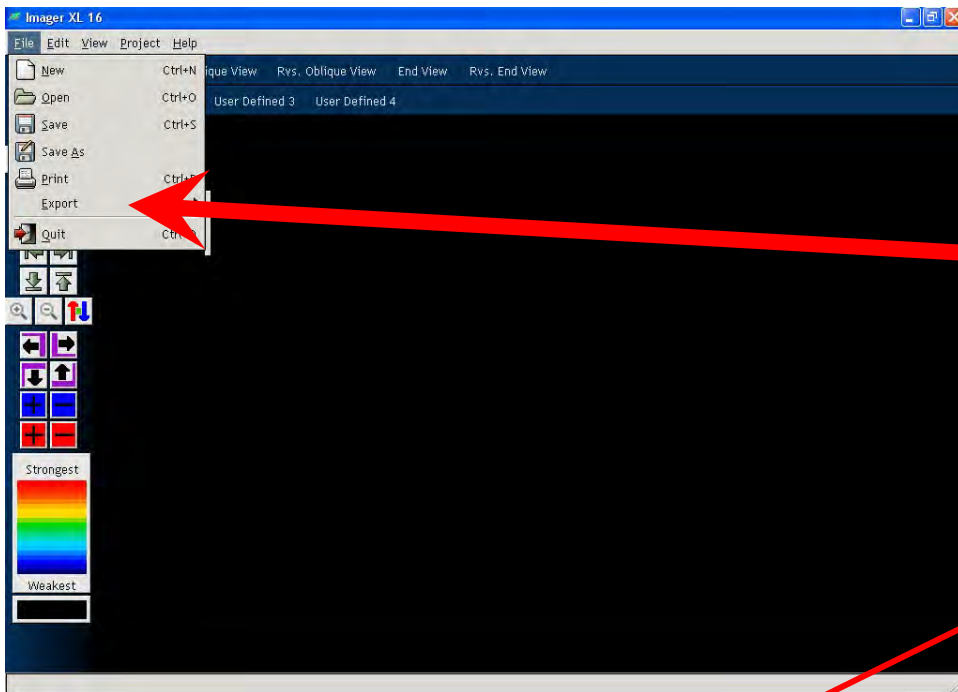
**Blue:** Attempting to connect to GPS

**Yellow:** Port ready acquiring satellite connection

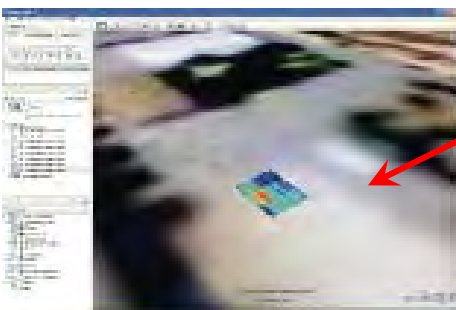
**Red:** Unable to connect/ read problems

**Green:** established connection/ data ready.

**Also displayed is the dilution of precision for determining accuracy of GPS signals received.**



The XL16 IMAGER PRO has a special export function for Google maps. Inside the XL16 IMAGER PRO software scans can be exported to Google maps as a ground overlay (KML). It converts the scan either to an image with GPS references or remaps the entire scan point by point into Google Earth. Mapping the target area or an entire site or claim has never been easier. As fast as you can select it from the menu, the **Google Earth** file (KML) is saved into a special directory then can be double clicked or imported from there for use later. Archaeologists, as well as treasure hunters could find this very useful as it can show a multitude of underground areas simultaneously and then show where these areas are in Google Earth for later excavation and discovery



# Keyboard Shortcuts

The Keyboard shortcuts were created for the power user who does not want to rely upon the laptop-pointing device. The following shortcuts are performed by pressing the combination of keys either together, shown with the “+” symbol, or consecutively, shown with the “→”symbol.

## File Tab

- Create a **New** scan Ctrl + N Alt+F→N
- **Open** an existing scan Ctrl + O Alt+F→O
- **Save** current scan Ctrl + S Alt+F→S
- **Quit** the program Ctrl + Q Alt+F→Q

## Edit Tab

- **Copy** crosshair value Ctrl + C Alt+E→C
- **Paste** crosshair value Ctrl + V Alt+E→P
- Define Rotations Alt+E→R→D
- Define User Key 1 Alt+E→R→D→1
- Define User Key 2 Alt+E→R→D→2
- Define User Key 3 Alt+E→R→D→3
- Define User Key 4 Alt+E→R→D→4

## View Tab

- Toolbars (show / hide) Alt+V→T
- User Defined Alt+V→T→U
- Predefined Alt+V→T→P
- Wireframe Mode Alt+V→W
- Add/Remove Guides Alt+V→G
- Show Data Under Crosshairs Alt+V→S
- Highlight Strongest Points Alt+V→H
- Highlight Weakest Point Alt+V→I
- 2 Color Mode Alt+V→2
- 2D Measurement Mode Alt+V→M
- Show Comments Alt+V→C
- Change Perspective Alt+V→P
- Detail Mode Alt+V→E
- Display All Probable Targets Alt+V→A
- Reset Display Alt+V→R

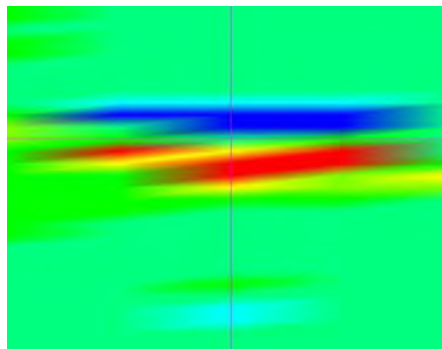
## Help Tab

- Manual Alt+H→M
- About Alt+H→A

First here is some general info on the cross hairs and data screen.

You can both determine depth and size using the XL16 IMAGER PRO software. After performing a scan, bring up the scan in the software. Using the purple and black arrows (cross hair buttons) on the left move the crosshairs over your target. Right click change perspective (This is very important for depth) and then right click show data under crosshairs. This window has the depth in meters on it as well as the strength or weakness of the target. To determine the size of the target you also use the crosshairs. So depending on the unit you can count the sensors in the scan and determine how many inches wide the object is in the scan. Using a XL16 IMAGER PRO with a 16 sensor antenna; count using the crosshairs over from left to right starting with 1 because the first position gets information. So each 16 sensors over is 24 inches per 16 sensors. So say the scan is made up of 4 rows and the target completely fills two of the rows we can determine that that the object is 48 inches wide. Now to determine length, we have a person, imagine how far they can walk in one second. So if that is 2 feet, every six clicks up using the crosshairs is one second. So say the object covers 6 clicks that would be equal to 2 feet so we now know that the object is 24 inches long and 48 inches wide. Data value is the strength of the point relative to the ground balance zero point. The relative strength or weakness of a target is important in determining which spot is amplifying the milligauss or dampening the milligauss. Strong or weak values may be important for determining the best place to dig or whether to dig at all, variation in soil mineralization and other important information. Depth of point should not change when the data value is changed but the data value should only be changed to create reminders as it will no longer be correct information.

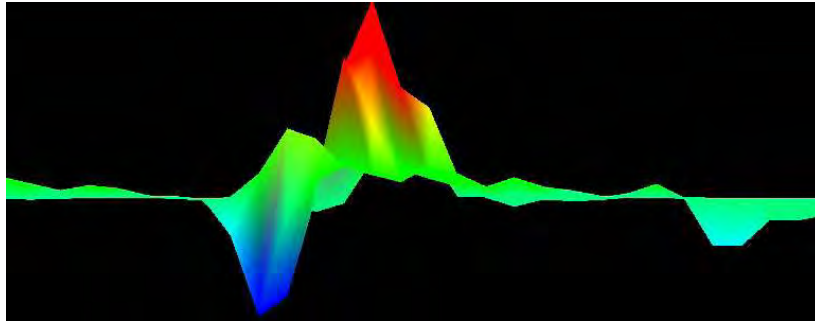
Analysis of data is by far the most important of all operations with the XL16 IMAGER PRO. Even though properly conducting the grid pattern is 90% of the task, identifying the target is the entire purpose of owning the XL16 IMAGER PRO. Take note of the locations of the scans and properly note your locations to find them again. Review your data immediately in the field. Very strong or very weak signals (Figure 3.10) should be marked for further scanning. Be sure to re-scan any strong anomalies to see if they are repeatable. The technique “Double Xing” is critical in the process of pin pointing the location. If an object is suspected to be in a particular location and further scans show that the object is constantly moving, be suspicious of mineralized soil conditions in the area. Real targets do not move, although the shapes that appear on the laptop screen may change.



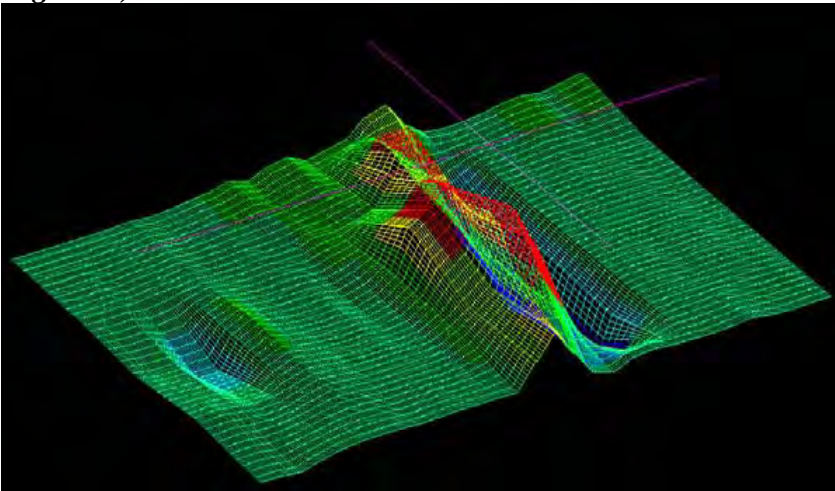
## Analysis of Scanned Data

When initially reviewing a scan, look for greater changes from the average background color. (I.e. Strong reds or blues with the rest of the scan having a single color.) Apply some filtering to the scan to enhance masked areas. (Figure 3.11, Figure 3.12, and Figure 3.13). If the targets are larger, look to see if they have a synthetic or manufactured shape. In regards to shapes, imagine the buried item or anomaly. Is it perfectly level? Is it skewed or inverted? The larger the item is and the closer to the surface the target is; the better of an image you will receive. Look for the initial shape of the target. A silhouette like image is shown on the software screen. When analyzing the data, use the given filters and wireframe mode (Fig 3.13) to view the scan from many different angles and perspectives. In addition to changing colors and wireframe view, rotate the images using either the rotation buttons or the pre-defined view. Unlike looking at an item from the top, a skewed view allows for better interpretation. *Please refer to the "Screen Breakdown" for functionality and description of menus and commands.* Errors while scanning can be quickly detected by obvious lows on the very first scan point. When viewing a scan and the very first point has the strongest reading, then "null" that difference to better view the rest of the data. *See Section III, "Nulling a high signal"*

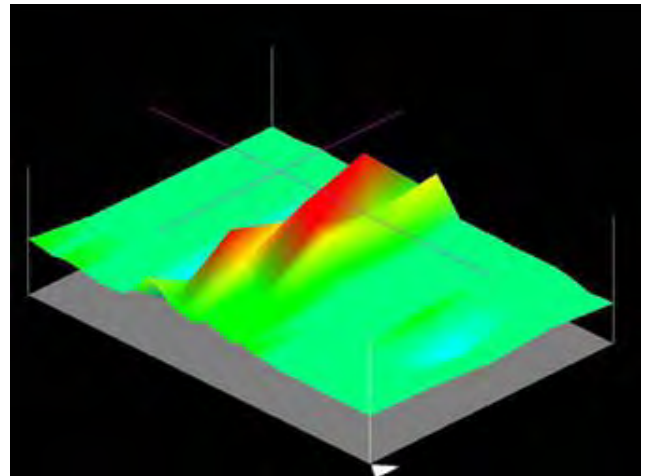
(Fig. 3.11)



(Fig. 3.13)



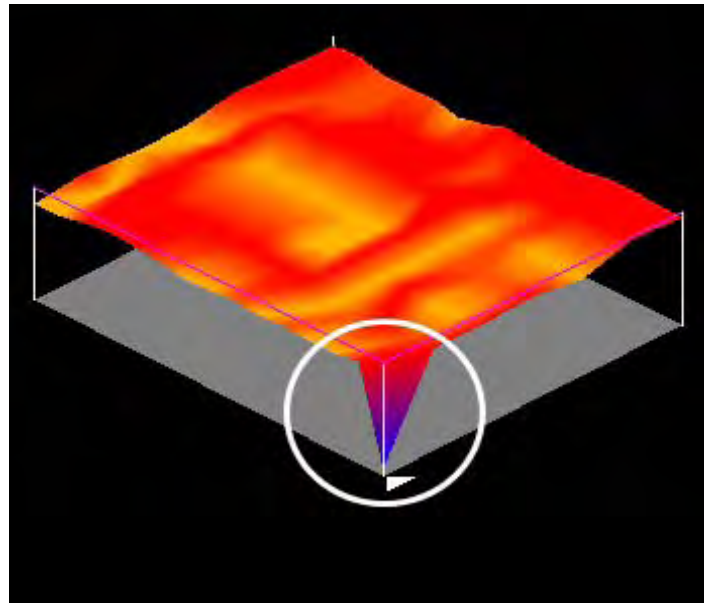
(Fig. 3.12)



## (Analysis of Scanned Data Cont.)

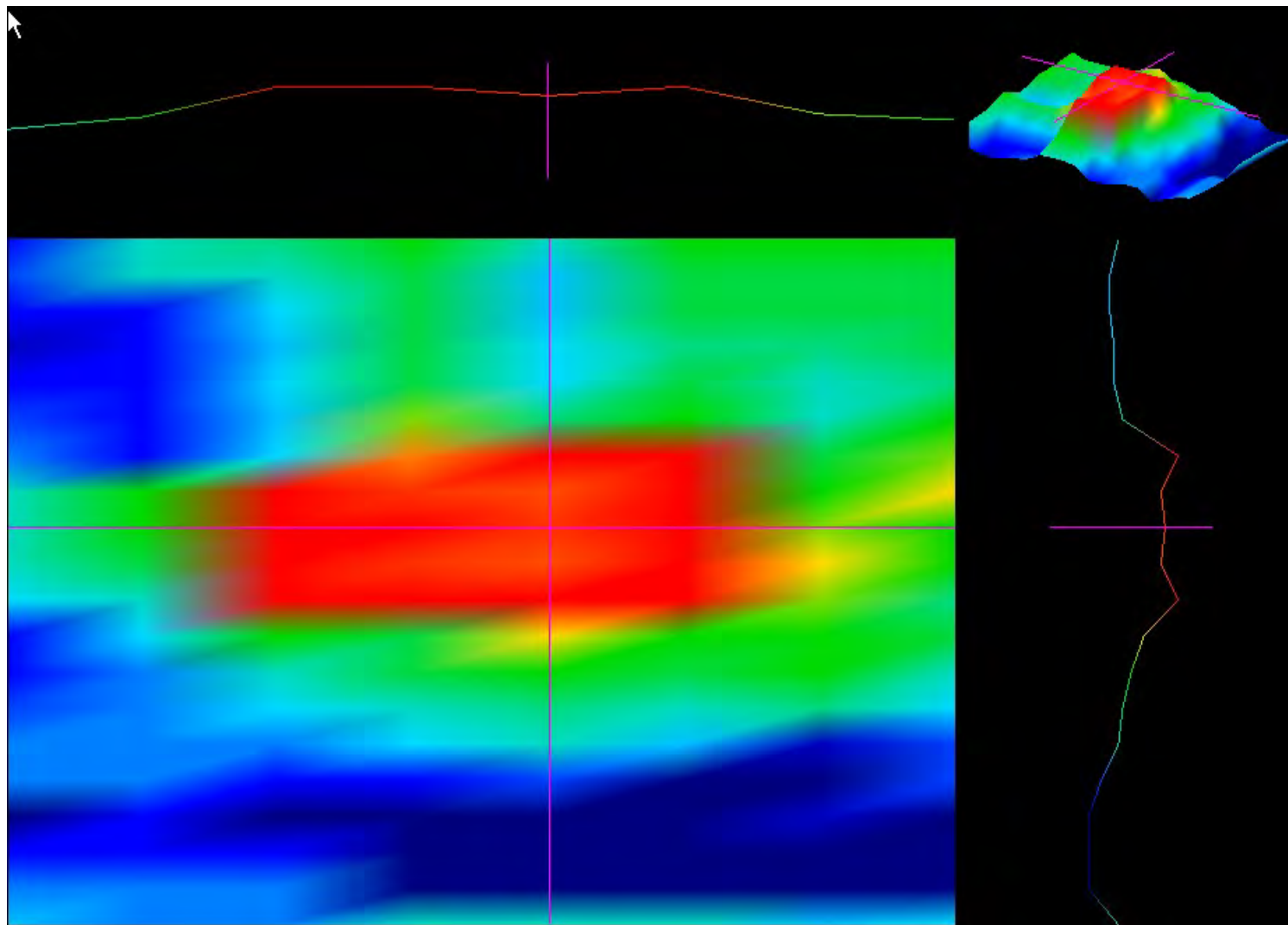
An example scan, Figure 3.14, shows that the first scan point is the strongest difference. This can be caused when first starting and not having the sensor in the correct position in reference to the ground. It is important to be ready when clicking on the go button. A helpful tip; have your hand on the mouse or spacebar ready to click and then line yourself up with the first survey line. Try not to look at the screen when clicking. After clicking and starting your grid, look at the screen to be sure that you successfully clicked on the go button and that you are actually receiving data. Another possibility with a scan of this caliber is that the sensors will actually “reverse polarity” based on the ferrous nature of the element that the sensor has come in contact with. In that case the blue void would signify a ferrous objectivity. The red is the common ground.

*(Fig. 3.14)*



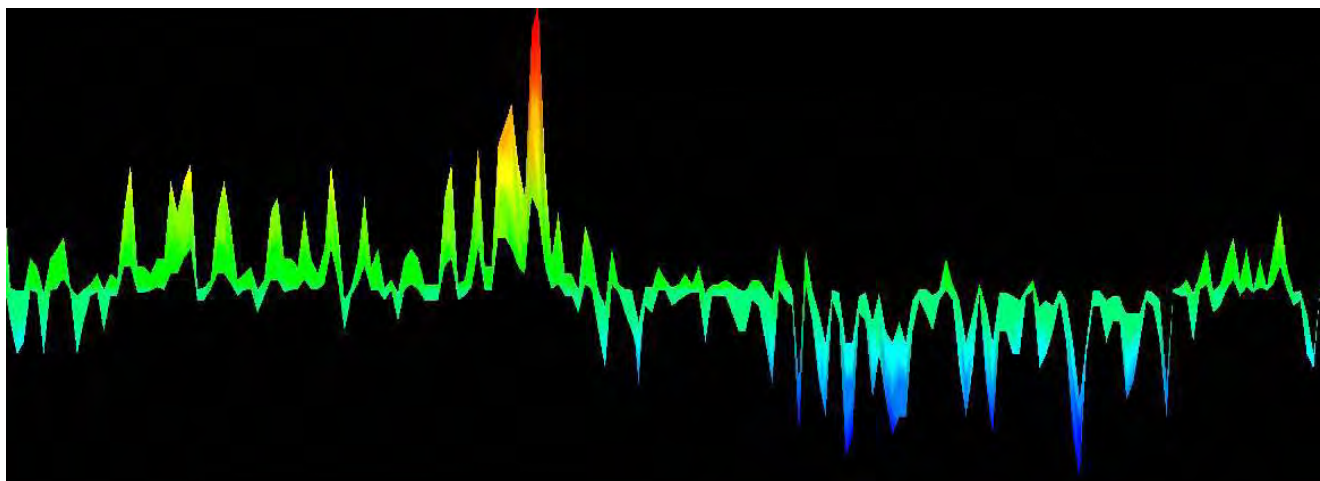
## 2D Measurement Mode

Perhaps one of the most useful tools built into the program is this one. Using the 2D Measurement Mode, you can look at a “Side View” of each individual crosshair. In addition, the rotation functionality is still available in the top right hand corner of the screen. Figure 3.15

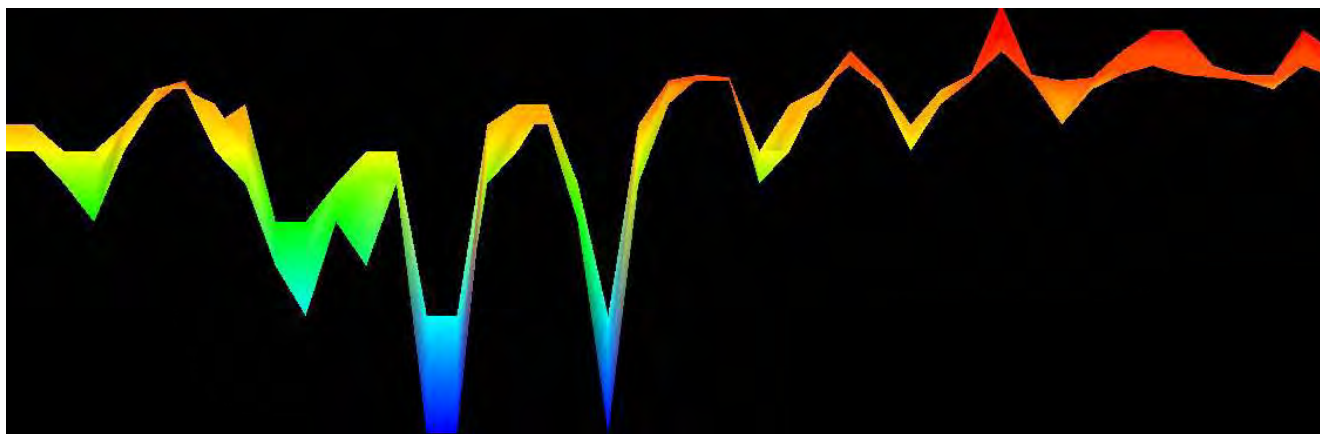


In Figure 3.15, there are several parts to the screen. In the top right hand corner there is a small view of the scan that would be seen normally. In the center, bottom left, this is the 2- Dimensional image. This view is from the top looking down. On the top of the screen and the right of the screen is a side view of what is being seen as if you were to look directly down the perspective crosshair.

**In Figure 3.16, the view here shows a strong rise with a fast fall. In relation to the overall image, the analysis will show a possible anomaly at this position.**



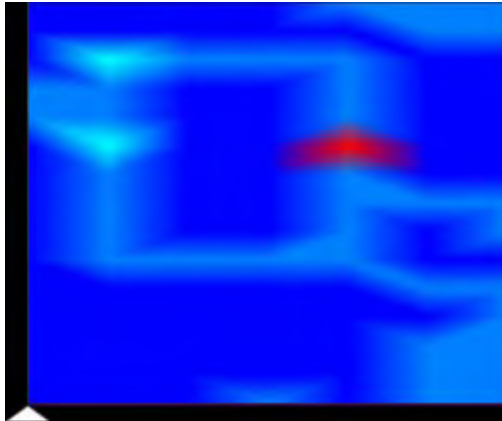
**As previously mentioned, the main characteristics that we are looking for in the scans are the difference in the signal values. When first scanning an area a rough scan will normally be conducted. The 2D Measurement Mode works very well on both the larger scans and the smaller scans. When analyzing a larger scan, the differences, for the most part, are not as much as when doing a smaller scan. The 2D mode will highlight stronger points and show more of the background in relationship to those points.**



**Of a larger scan, the difference shown here does not clearly stand out by itself when looking at the whole picture. By using this mode, a tunnel or void stands out clearly. The background of the image, Figure 3.17, is the upper portion shown in the red and orange on this particular scan. The larger your background area is on a rough scan the better. Once an anomaly is detected, it is important to mark that area and perform additional scans to narrow down and pinpoint the location of the target. When making smaller scans around a target, ensure that you are leaving enough room to see the background. A common mistake that tech support sees quite regularly are scans that start in or just before the target. An old saying says, “You cannot see the forest through the trees.” The same applies with analyzing data.**

## Nulling a High Signal

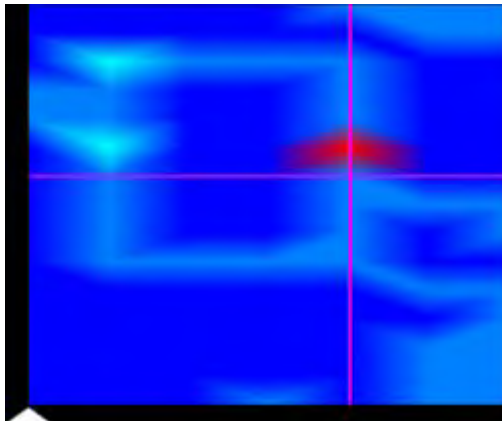
The process of nulling a signal is quite simple. If the initial scan appears like the one in Figure 3.18, there is a very high signal that is masking most items under it. *Nulling a signal means to change the value of a high or low point on the scan to match the background. Occasionally there are times when a scan point value is far too high or far too low, when this happens then we need to null or remove the signal error.*



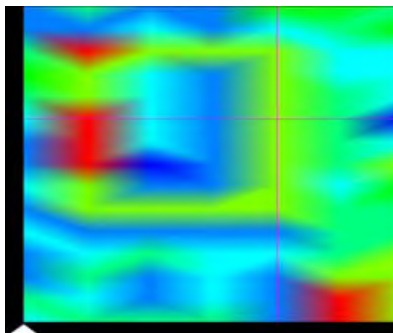
- Move the crosshairs by clicking on the crosshair buttons (Figure 3.19).



- Position the crosshairs so that they are one point in any direction where potential reading is located on screen from the scan point that you wish to change (Figure 3.20).

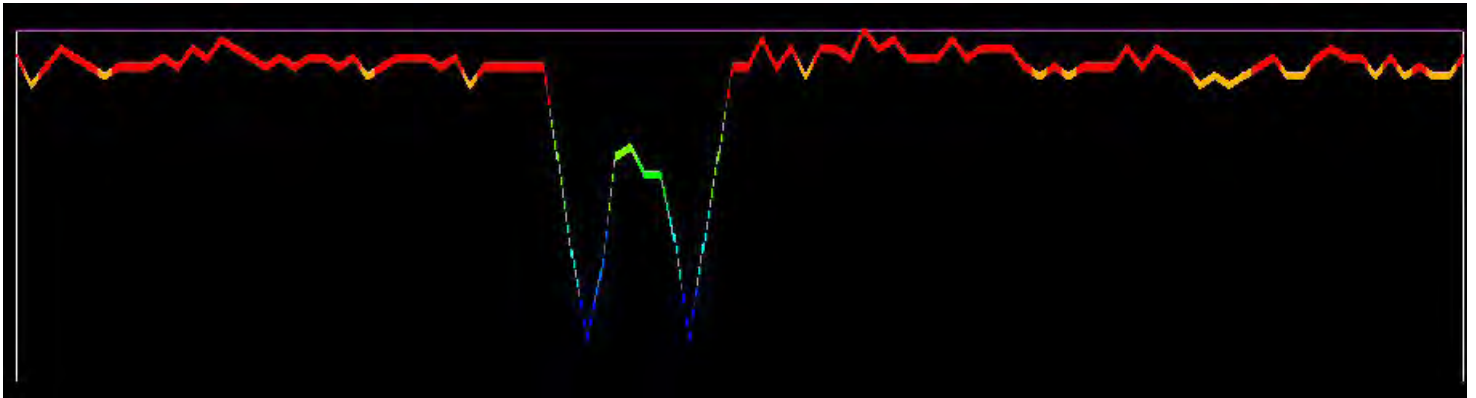


- Hold down the control key (Ctrl) and push on the letter “C”, this is the copy command.
- Move the crosshairs directly over the spot that you wish to change.
- Hold down the “Ctrl” key and push on the letter “V”, this is the paste command. The image should immediately change (Figure 3.21) after the signal has been changed. If more points need to be changed, then repeat the process until all scan points are changed.



# Tunnel & Void Locating

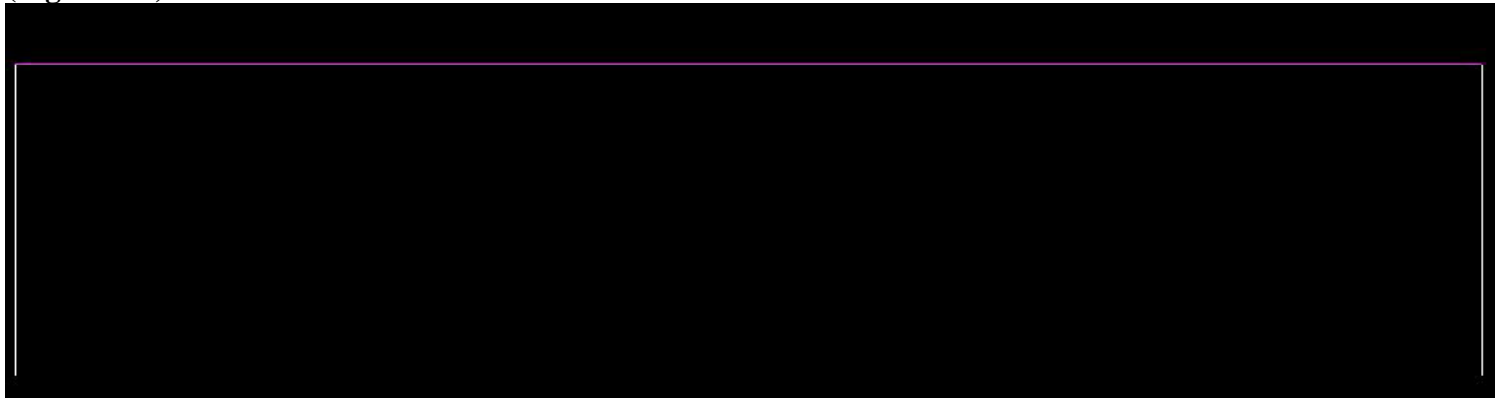
Being able to locate tunnels, voids, caverns, sinkholes, etc... is a major function of the XL16 IMAGER PRO. Using EM technology the XL16 IMAGER PRO Sensor Array is able to pick up the signals emitted by a void or tunnel. The following is the proper procedure for locating a tunnel. The grid pattern does change when looking for tunnels or voids. Instead of the pattern going forward and to the right, all you do is one straight line without turning the instrument at all. When doing the line please be sure that there is enough area on both sides of the suspected tunnel to get enough of the back ground area in so that the tunnel will stand out clearly. This technique can also be used to locate other anomalies but is best used for tunnels or larger voids in the earth below you. When you begin with your setup, please be sure that you have enough room within the time allotted on the software to travel the desired distance. If there is too much time then you can “Pause” the scan and then stop the scan by clicking on the “Quit” button.



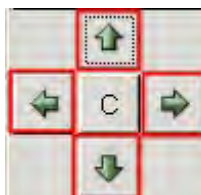
In the above image (Figure 4.6); there is an example of how a tunnel may appear. As you can see, there is enough background on either side of the void to allow it to stand out better. Here are the exact procedures for obtaining this image.

1. After stopping scan your screen should only have a single line.
2. Click on the “Side View” button on the top menu bar. Now you should see that same line but sideways.

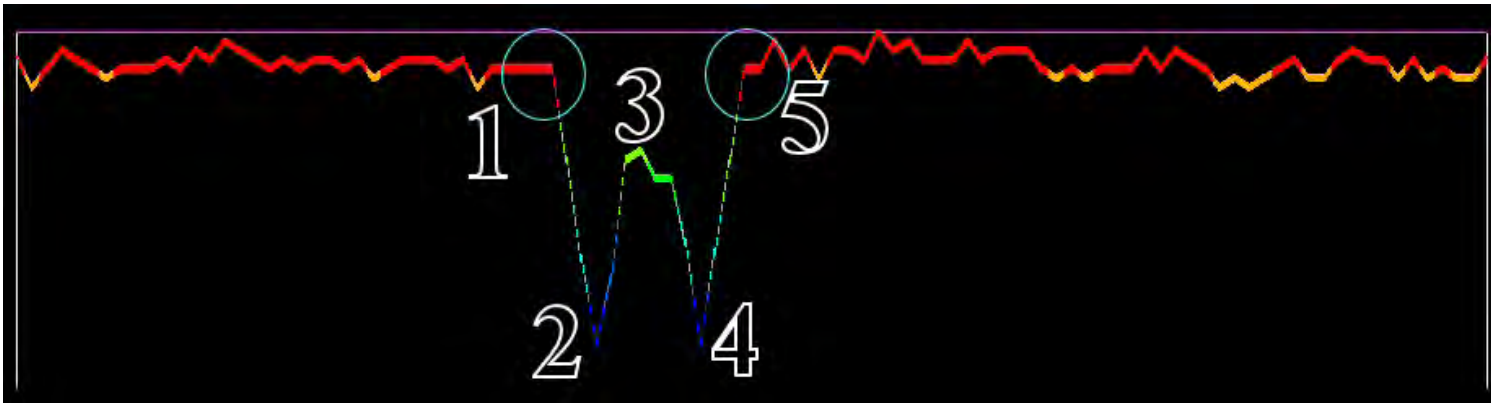
(Figure 4.7)



3. by clicking only one time on the rotate buttons (Figure 4.8); the view will change from a direct view to a slightly off-center view, which will enable you to see the tunnel



4. The final view will allow you to see where the tunnel begins and where it ends.
5. In Figure 4.9, all of the points of this type of tunnel are explained.
  1. Beginning of the tunnel.
  2. First lowest signal generated by the tunnel.
  3. Peak in the center of the tunnel. (This typically represents the highest point on the inside of the tunnel.)
  4. Last lowest signal generated by the tunnel.
  5. End of the tunnel.



To verify that it is a tunnel, do the scan multiple times perpendicular to the tunnels paths. Most tunnels are fairly long and will produce a semi-constant signal over a larger distance. In the event that a tunnel ends abruptly and you can narrow down both sides of it, it will most likely be a void or sinkhole under the surface.

## Searching an Area

When searching an area, the first thought is always to do the whole area in one shot. We recommend breaking up the area into smaller pieces if it is a large area (Figure 4.10). For example if the area to be searched is the size of a football field, we suggest cutting it up into several sections so that your scans can be more accurate with less chance of error. The search pattern is very easy to do and as mentioned previously, 90% of the work is performing a proper grid.



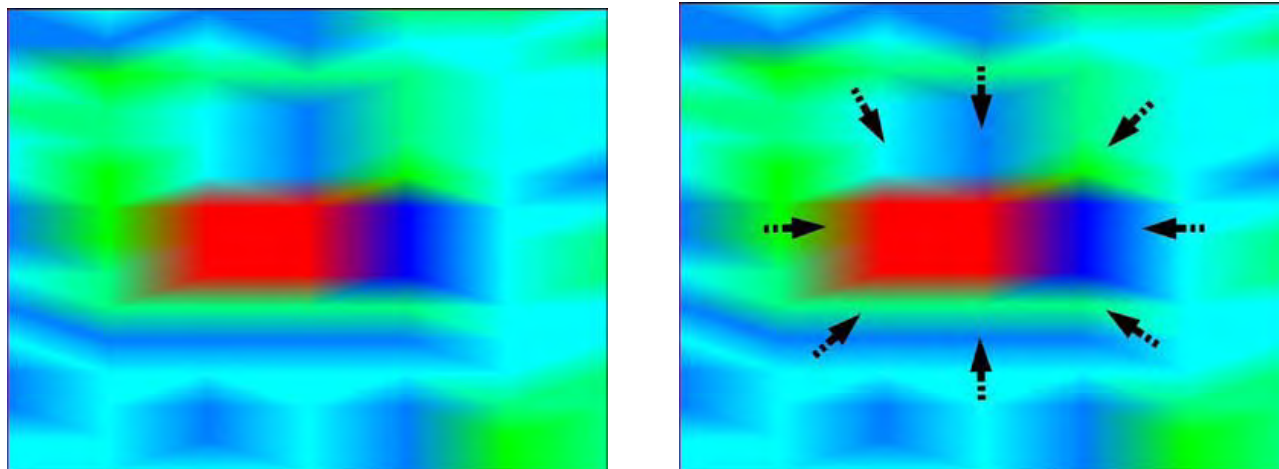
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>

Suppose in the drawing above that the area in the red is the total area to search. In this example, we will say that the width of the field is 50 yards or 50m and the length is 100 yards or 100m. By breaking up the scans into smaller sections, like the area in the green, you can search much quicker with better data. Be sure to mark off the areas already searched and to enter the data into the comments in the scan itself. Also, make note on the fields so in the event that you find an object in section 4 you will be able to return directly to section 4 rather than having to repeat the entire process again.

## Double X your Target

One of the most commonly asked questions is, “How do I know I’m looking at a real target?”

We call this procedure “Double X-ing”. This routine is extremely important, especially with Electromagnetic devices that can see deeper than most detectors. Figure 4.11 is a typical visual example of a found cache. The more times that you cross over a target at different angles and times of day will help in validating a good target (Figure 4.12). Temperature, radio frequency transmitters, solar energy, ground mineralization, clay, salt water, etc. can interfere and cause erroneous conclusions. Figure

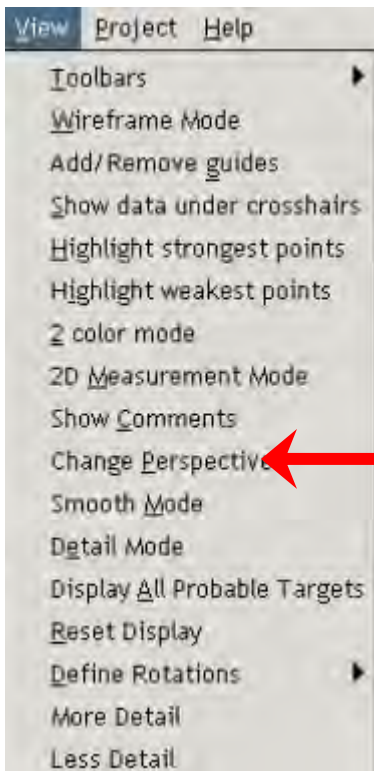
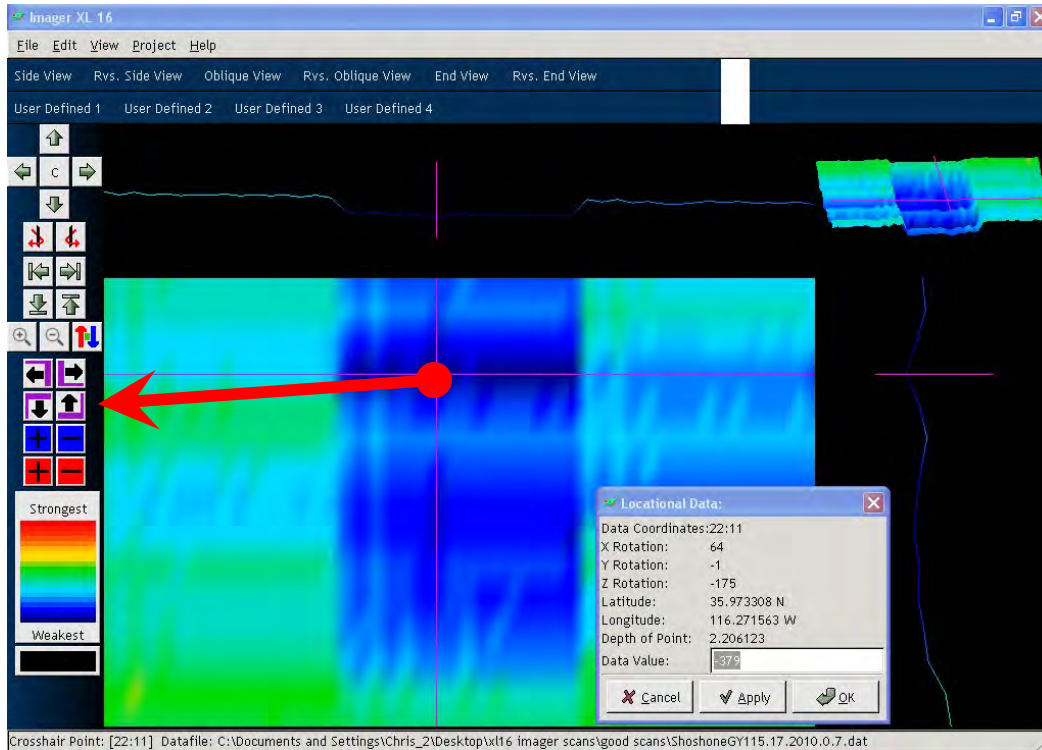


Before you mark your location for excavation be sure to go over every target at least 4 times but it is recommend 6 or more times to be sure that you end up with the same or similar image over the location. The finer the scan, the horizontal and vertical position of the antenna, automatic or manual modes are all contributing factors as to what image will appear on your screen. For finer scans, we recommend to lay out a grid (string or chalk lines) and scanning the suspect location several times in manual mode. If the target moves from one area to another, it may not be a real target. When targets move, it typically is mineralization. Mineralization often fools the software. Using the “Double-Xing” technique you can rule out what is and what is not real. Targets may vary; attempt to isolate the cache to its closest points prior to considering excavation. Remember to fill in all holes after recovery.

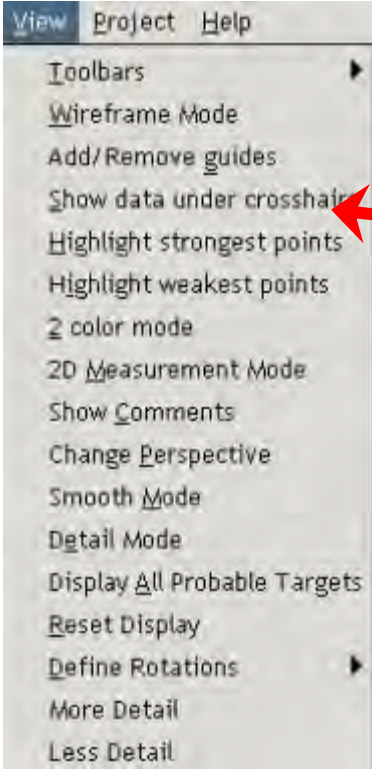
**Tip:** In Northern Hemisphere South East to North West Scans Display Best.

# Determining Approximate Depth Point

First, here is some general info on the cross hairs and data screen. You can both determine depth estimate and size using the Geo Surveyor software. After performing a scan, bring up the scan in the software. Using the purple and black arrows on the left move the crosshairs over your target.

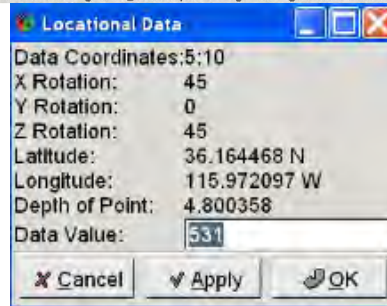
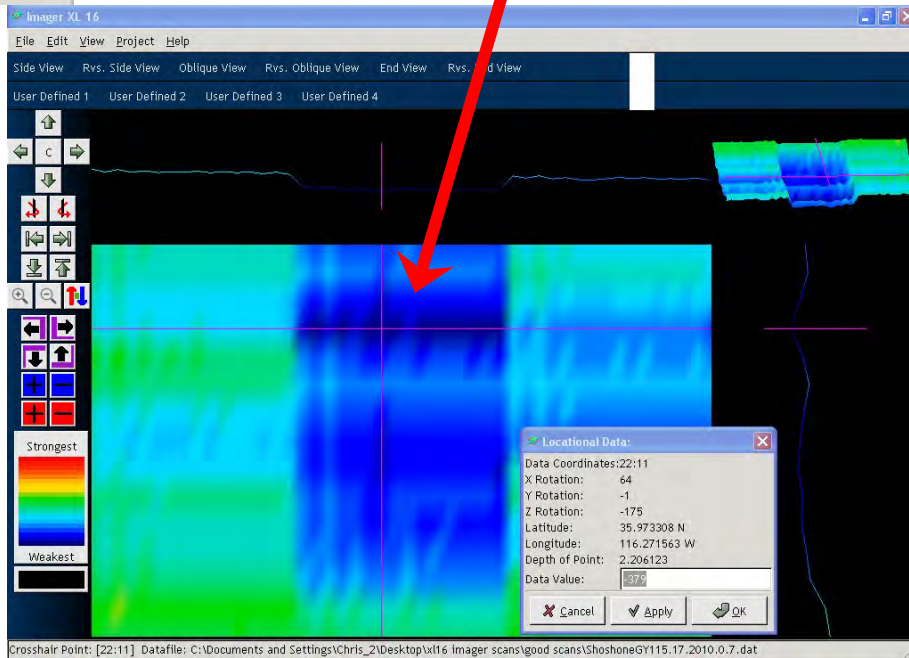


Right click "*Change perspective*" (This is very important for best depth indication). Also can select from top menu "View", and then "*Change Perspective*".



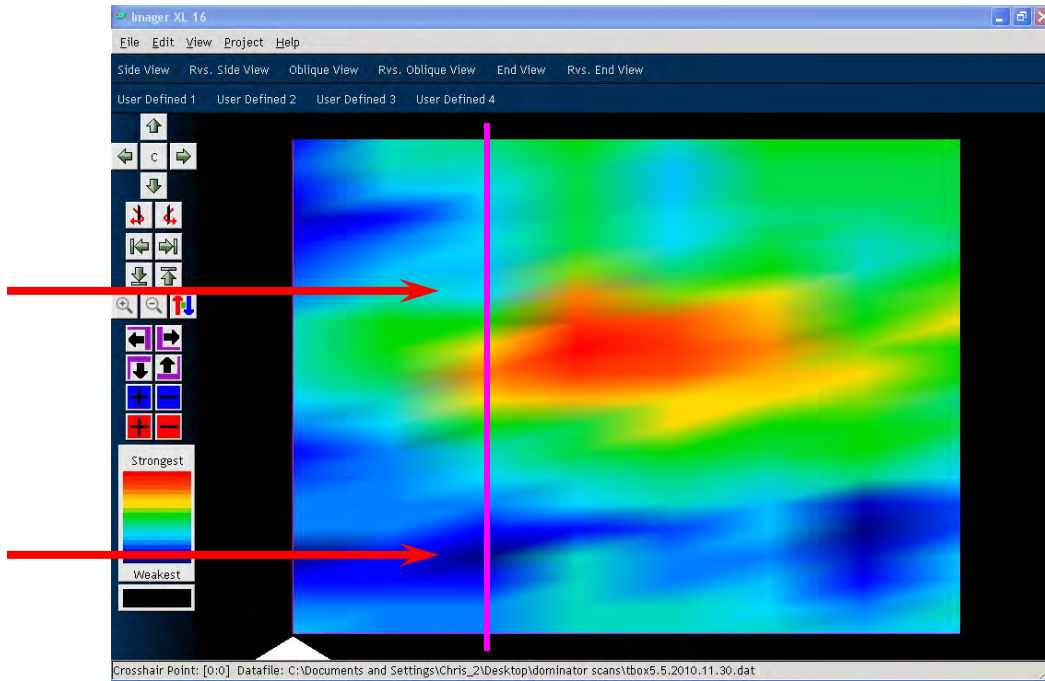
Then click view and then click Show Data under Cross hairs. This brings up a window that has the depth in *METERS* on it as well as the strength or weakness of the target *"Data Value"*. Numbers before Decimal point are *less than 1 meter* (3.3 Feet). Example: 0.88 under "Depth of Point" is *less than 1 whole meter*.

Below is the Locational Data box that displays Data Coordinates, Latitude, Longitude, Depth of Point and Data value.

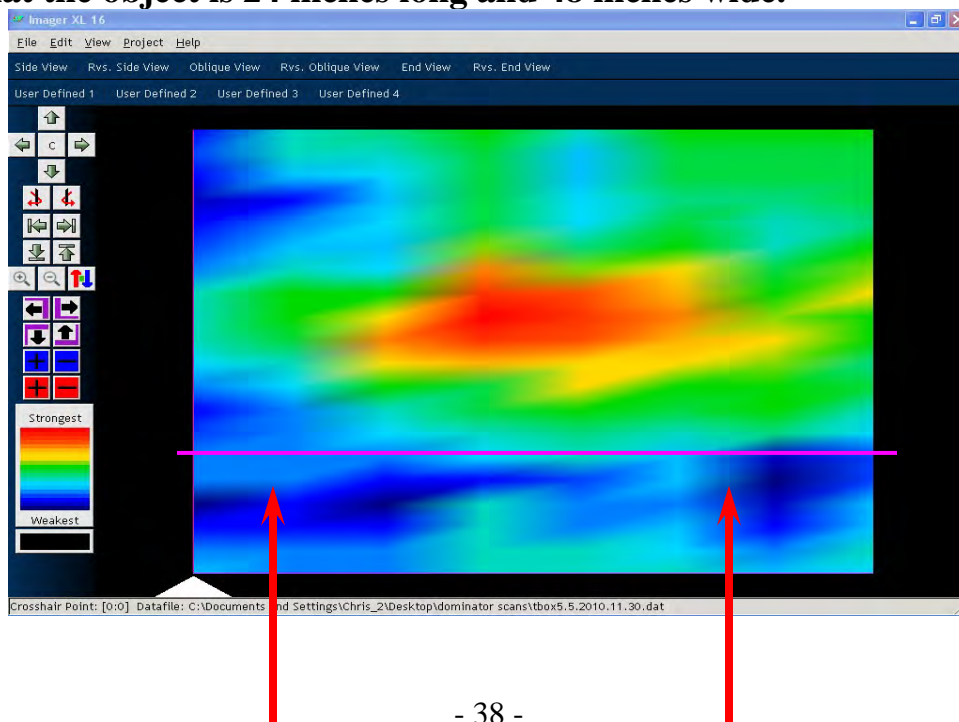


\**Data value* is the strength of the point relative to the ground balance zero point. The relative strength or weakness of a target is important in determining which spot is amplifying the milligauss or dampening the milligauss. Strong or weak values may be important for determining the best place to dig or whether to dig at all, variation in soil mineralization and other important information.

To determine the size of the target, you also use the crosshairs. So depending on the unit, you can count the sensors in the scan and determine how many inches wide the object is in the scan. *Example*, using a XL16 IMAGER PRO with a 16 sensor, antenna count using the crosshairs over from left to right starting with 1 because the first position gets information (each sensor gets 1 count). So each 16 sensors over is 24 inches per sixteen sensors (when using a 24" antenna). So say the scan is made up of 4 rows and the target completely fills two of the rows we can determine that that the object is 48 inches wide.

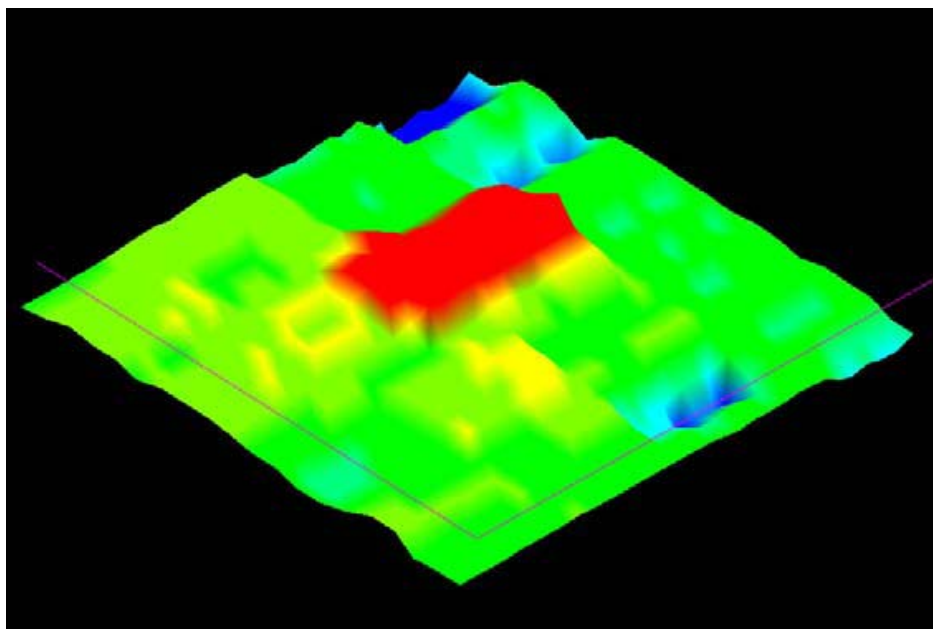


Now to determine length, we have a person imaging determine how far they can walk in one second. So, if that is 2 feet every so every six clicks up using the crosshairs is one second traveled forward. So say the object covers 6 clicks that would be equal to 2 feet so we now know that the object is 24 inches long and 48 inches wide.

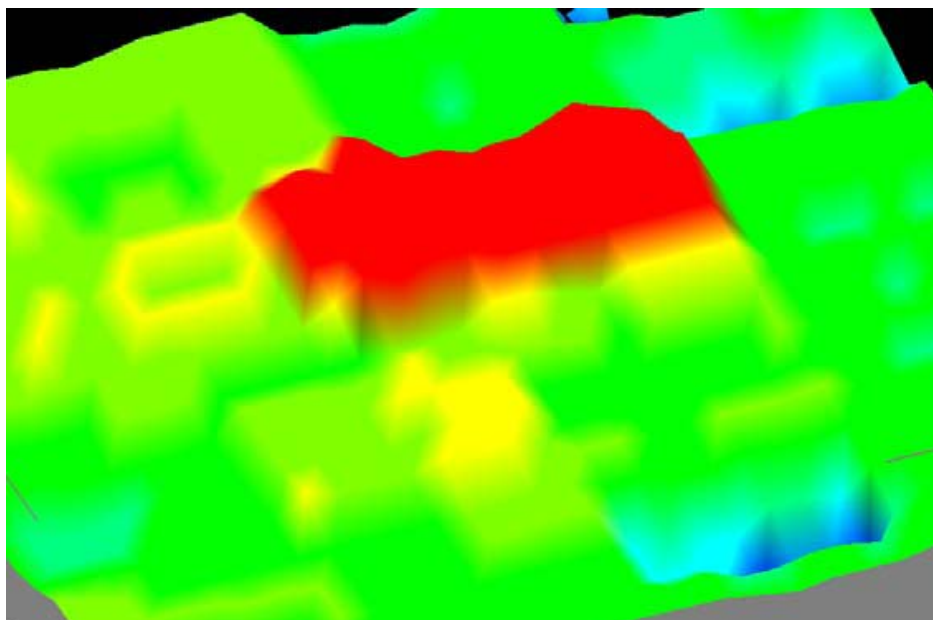


# Examples

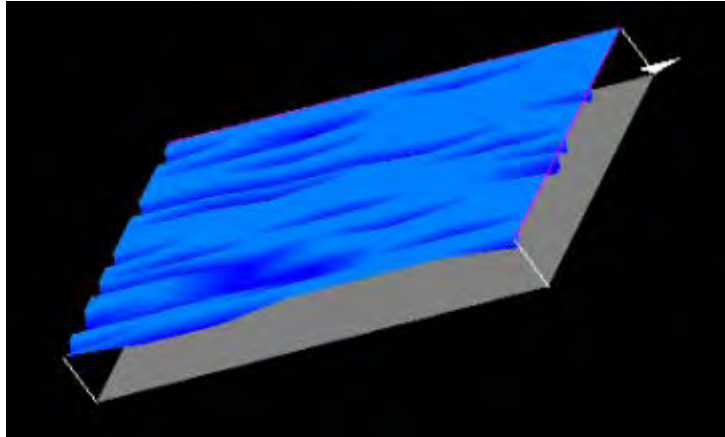
The following examples are a collection of actual targets, from both our dedicated training facilities and scans taken in the field. This is an example of a 55-gallon drum that is buried at our test facility in Oregon. The background is mainly green and yellow while the target (barrel) shows as a red.



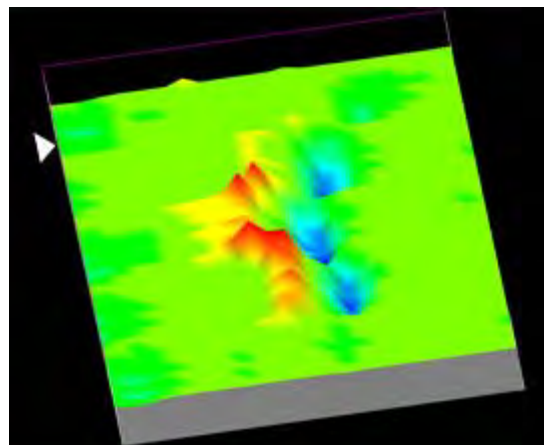
This is the same barrel as above and is on a lot smaller grid size. The one above was a very large grid (rough grid); the one below is a fine grid of the same barrel.



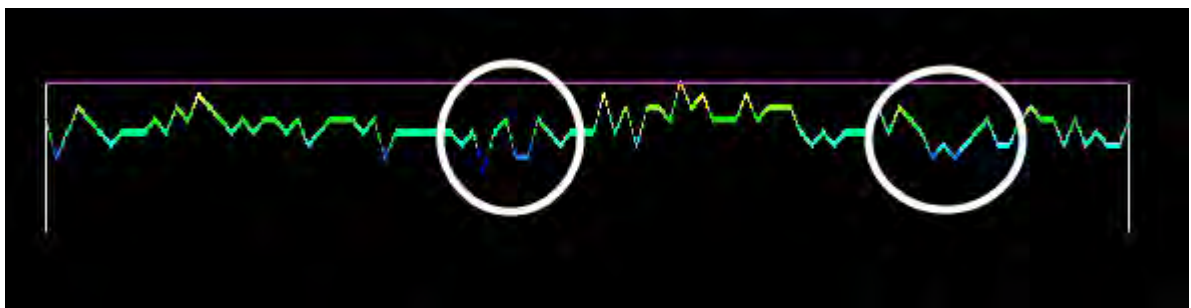
**This is an example scan of clear soil. The soil in this scan is free of any anomalies or surface mineralization.**

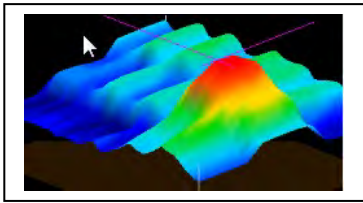


**This scan has three targets. All of the targets are buried under 6 inches of concrete. They are shown as the blue from the dug holes in the center of the scan, and Red for the metal content with strong reading. The first and third targets are ferrous metal and the middle target is nonferrous.**



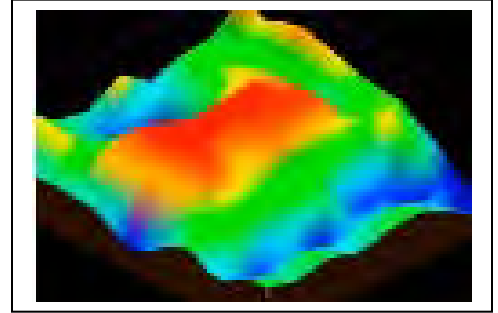
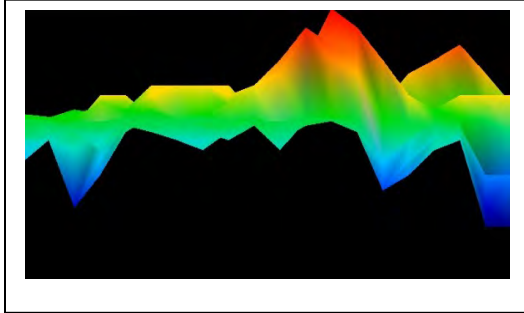
**This tunnel scan shows the location of two tunnels, both circled. When looking for tunnels, it is important to see both the down side and the up side. Be sure that there is enough background to see the differences of the tunnels.**





# GEOVISION

## Single Sensor Professional Series



The all new GEOVISION Professional Series.

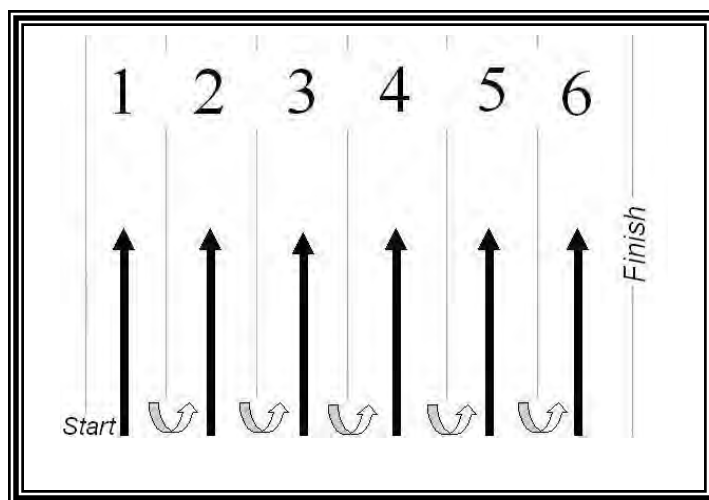
- **New processor for faster and greater resolution than previous models.**
- **32 times higher resolution than standard Pin Pointer Pro.**
- **New handle design with compass for easier directional orientation.**
- **Greater detection and ground balance ability in heavy mineralized conditions.**
- **3-D software technology for greatest shape, size and depth detection of any targets or anomalies.**
- **Light weight and compact for easy carrying.**
- **No matter the ground conditions, heavy bushes, rocks, downed tree's you can easily work with and around many objects in your scanning path giving you much greater ability to located valid and valued targets.**
- **Designed to detect Ferrous and Non- Ferrous metals as well as anomalies, this will provide the detection ability you require.**
- **Fallow a grid pattern scan for greatest detection ability and highest resolution.**

# Ground Balancing and Scan Method

## USA Geovision Professional Series

*\*Before you connect or disconnect any component make sure to turn off your XL16 IMAGER PRO Control unit first. Failure to follow these instructions will potentially damage your control unit and void your existing warranty.\**

Your Geovision EM detector connects to your XL16 IMAGER Pro Series processor system. Giving it the highest quality resolution provided from the new Dominator processor. We have now offered 3D features for the Single Sensor detector for greater ability to visually discriminate between ferrous and non-ferrous and anomaly targets. With the sleek and narrow design of the Geovision now you can accurately work in very small spaces in rock crevices, around bushes, downed logs, small spaces in tunnels etc. The Geovision gives you enhanced ability to work in heavy mineralized ground with minimal effects. Your only working with one sensor so it is much easier to find a ground balance point within your heavy mineralized zones. All of the Geosurveyor software instructions will work for you while operating the Geovision EM detector. As said through out this manual the best way to get higher resolution from your scan is use a grid pattern scan method. This will give you the best detail of your target so you can accurately determine what your target is before you dig.



# XL-USA Geo Pin-pointer

## Quick-Start Easy Use Card

1. Turn on control unit power
2. Start laptop computer and start software
3. Make sure antenna and network cables are plugged in
4. Allow a few moments for programs to communicate with one another
5. When ready press connect then start to begin scanning
6. Keep antenna pointing down without turning, in the same direction (for best results)
7. In the Southern Hemisphere, south to north scans will provide best results.

**Current Reading** - Very useful for finding location of interest.

**HIGH/LOW** reading to distinguish between targets and target approximation

**Change Defaults** (as needed) example: For weaker targets set the high/low value to 10/-10 or 5/-5 for even weaker anomalies.

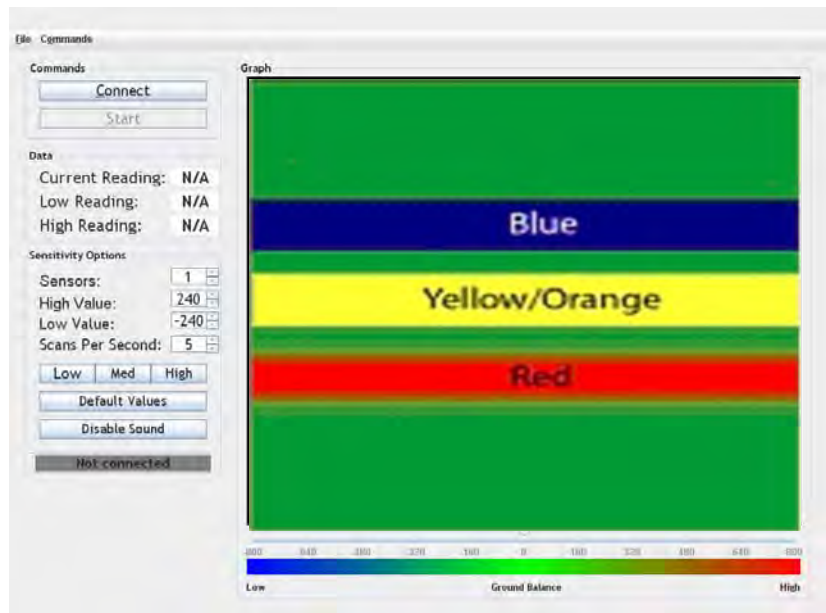
**Scans Per Second** - Number of readings per second may be increased for fast traveling.





**Default** - Resets values back to their preset levels.

**Disable/Enable Sound** - Turns on/off high/low strength sound beep.

**Status Bar** - Shows Connectivity to control unit. Wait for ready before hitting start.

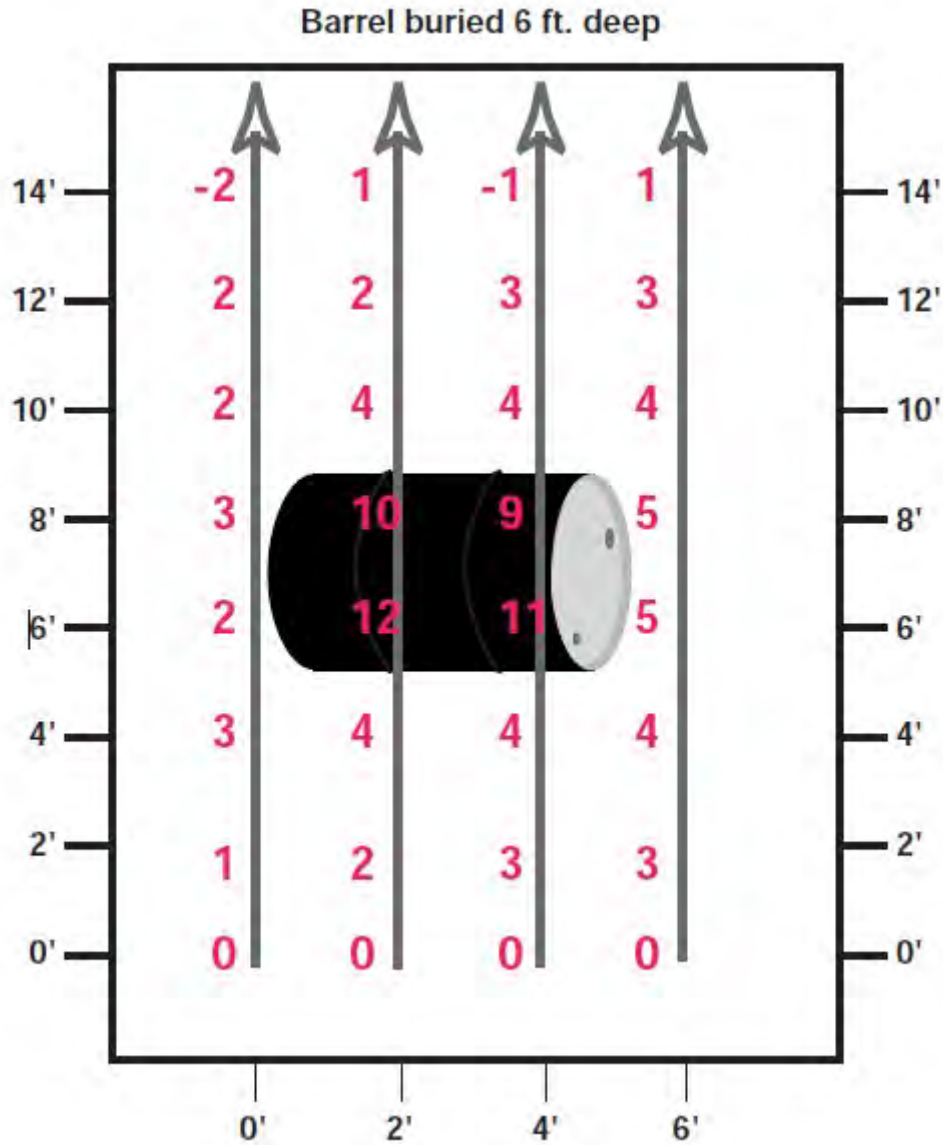
**Ground Balance** - Shows auto-changing Balancing of low to high ground mineral Conditions



-  Green- Background(common ground)
-  Blue - Negative Target(void, cave, tunnel)
-  Yellow/Orange - Medium Target
-  Red - Strong Target

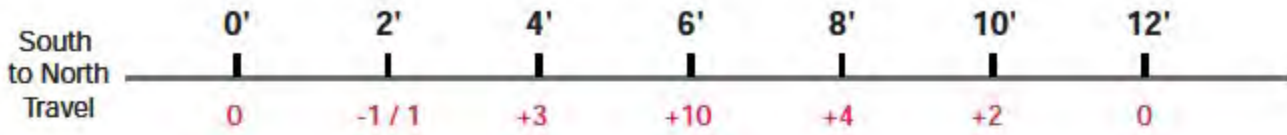
- Pause often (Ground Balancing) every 1 or 2 minutes to reset to zero and clear past readings.
- For Depth Estimation, mark the ground over target (largest number) then walk away from target until you get “0” reading. Then measure distance to target, that distance will be approximate depth. Repeat several times at different angles of approach to affirm depth estimation.
- At time of pinpointing exact spot of interest, mark on ground for reference.

# Scan Method and Samples

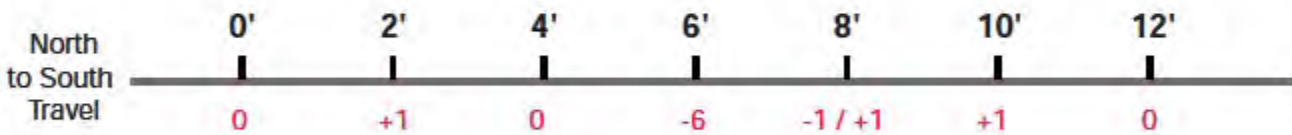


*For depth estimation mark the ground over target (largest Number) then walk away from target until you get "0" reading. Then measure distance to target, that distance will be approximate depth. Repeat several times at different angles of approach to affirm depth estimation.*

Scans Performed in the Dry Desert Climate at Walking Speed\*  
 \*wet climates will increase readings



Tire Rim Buried 6 ft. Deep



PVC Buried 2 ft. Deep

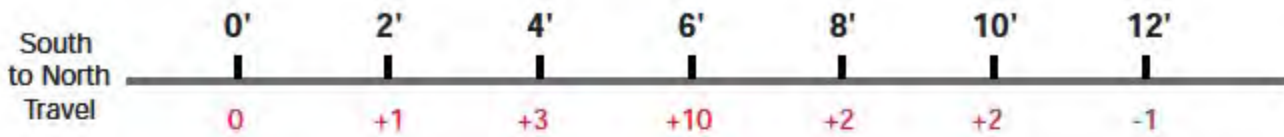


Note: can read +15 it depends on orientation of the object (pointing north or south)



Rebar 3 in. deep in concrete

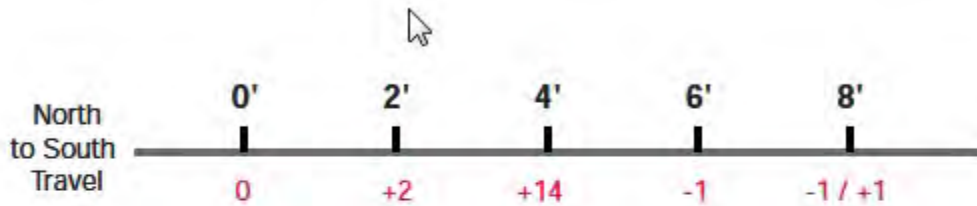
Scans Performed in the Dry Desert Climate at Walking Speed\*  
\*wet climates will increase readings



Copper, Aluminum and Other Metals Buried 5 ft. Deep



Copper, Aluminum and Other Metals Buried 5 ft. Deep



Hammer Head Buried below concrete floor

Scans Performed in the Dry Desert Climate at Walking Speed\*  
\*wet climates will increase readings



Ten Pounds of Gold and Silver Buried 5 ft. Deep in the Back Yard for a Period of Time

# Common Errors

Here is a list of some common problems that can be easily overlooked.

- **Overcharge battery**



- **Leave battery connection attached when putting field pack in case**



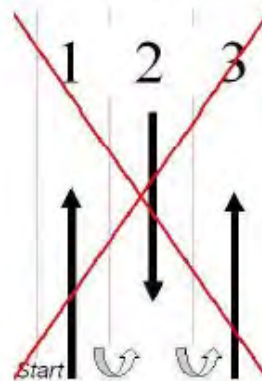
- **Leave unit on when changing antennas**



- **Update Java**



- **Scan back and forth**



- **Forget unit is ground balancing when in comments screen and antenna not in proper position on ground**



# Troubleshooting

Improperly charged batteries cause the #1 reason for errors with the XL16 IMAGER PRO. Please be sure that your batteries are fully charged. The best way to test for fully charged batteries is to use a Multimeter.

**Q.** My laptop screen saver came on and an error window appeared. When I closed the window the software closed, where is my data?

**A.** Since the software is in an always-ready state, disable your screen saver or increase the time prior to activation. To avoid this if you are taking a scan and the screen saver appears while in the middle of a scan, do not close the error window until after you are done with your scan and it is saved. Increase the time in your control panel on the screen saver or disable it completely when taking scans.

**Q.** I am getting high peaks and low valleys on every scan, why is this?

**A.** This is caused by the unit rotating at the end of each survey line. Please double check that your sensor is always pointing the same direction. For example, if a scan is being conducted in front of a wall and the connector is pointing towards the wall on the first survey line, on the return survey line, the connector still needs to be pointing towards the wall. This is probably the most common mistake and the data becomes very difficult to interpret.

**Q.** I am not turning the unit and am still getting high peaks and low valleys on every scan, why?

**A.** Most probable explanation is that the sensor is at an angle. Loosen the sensor so that it can easily swing back and forth. Let the sensor hang naturally so that it is not at an angle to the ground and that it remains perpendicular the entire time.

# Unexploded Ordnances

## What is UXO?

UXO, which stands for Unexploded Ordnance, results from the military's use of munitions in training. Military munitions include bullets, bombs, rockets, pyrotechnics, grenades, blasting caps, shells, fuses, pyrotechnic and explosive simulators, and other explosive items. Most military munitions contain some form of propellants, explosives, or pyrotechnic (PEP) mixes to make them function (explode, propel, or produce intense smoke or light) properly. When military munitions do not function as intended (do what it is supposed to do) during use, they normally become Unexploded Ordnance or UXO. Many people also refer to UXO as "duds." These items are extremely dangerous and should never be touched or moved because they can still explode and cause serious injury or death.

## What does UXO look like?

Production of military munitions comes in many different sizes, shapes, and colors. Their size and shape depends on how the military intends to use them. (For example: small arms munitions, which are used for training soldiers on how to shoot their individual weapons, like pistols or rifles, are small; artillery and tank rounds, which are used to train soldiers in the use of crew-served weapons, like tanks and artillery weapons, are large; and rockets, fired from helicopters, aircraft or ground vehicles, can vary in size, as can bombs dropped from aircraft.) Explosives safety experts know that, overtime, the paint on military munitions that have been used in training and that did not function properly (UXO) will wear off or fade. They also know that because UXO are normally exposed to the weather they will normally rust, making them more difficult to spot or recognize.

## It is important to know that UXO:

- o Come in many shapes and sizes. (Some will look new and other will look old and rusty. Some will look like bullets or bombs. Some will look like pointed metal pipes, soda cans, small balls, or even an old car muffler.)
- o May not be easy to spot, most are partially or completely hidden.

## UXO can be found:

- o on top of the ground or partially or completely buried in the ground or even by sand or snow.
- o in or under high grass or bushes.
- o under water, in lakes or streams or, even, the ocean.
- o May be look like a bullet or bomb, or be in many pieces. (Even small pieces of UXO can be fatal)

## (UXO CONT.)

**All UXO should be considered extremely dangerous!**

**What types of areas would I encounter UXO? What areas are the most dangerous?**

Areas that the military uses for weapons training or for testing weapons or munitions are most likely to contain UXO. Signs, like those below, normally mark these areas, which are normally on military installations or bases.

### **Signs**

It is however important to know that some areas that were used in the past to prepare our military for war (i.e., World War I, World War II, the Korean War, and Viet Nam) are no longer used by the military. Some of these areas, from which the government attempted to remove any dangerous UXO, are now being used for other purposes, like recreational or industrial parks, or even housing areas. Some of these areas may also be marked with signs warning that UXO may be found on them.

**What should you do if you see UXO?**

- 1) Do not continue to move toward a suspected UXO. Some UXO are sensitive to motion and could explode if you come too near.
- 2) Do not move or disturb UXO. It could explode, resulting in injury or death.
- 3) Do not move any object on or near UXO. UXO can become unstable over time and detonate with any motion.
- 4) Note the location. Note the direction, any landmarks, or other features that would aid in locating the UXO.
- 5) Leave the UXO hazard area the same way area was entered. If there is one, there may be more UXO.
- 6) Contact the local law enforcement agency and report the UXO.
- 7) Stay away from areas of known or suspected UXO. Do not enter fenced areas or areas with posted UXO warnings. This is the best way to prevent injury or death.

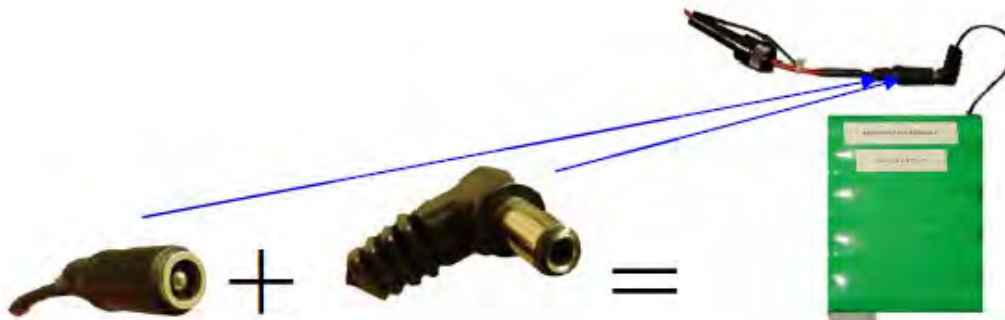
# ALTERNATIVE POWER SUPPLY

## Assembly for the Pre-Configured Laptop

1. Using the Vector Power Inverter and supplied wiring harness, assemble the Male/Female adapters as such.



2. Then connect the 12V battery (small thick one) and adapter to the assembled wiring harness connector detailed below



3. The final product should look like below:



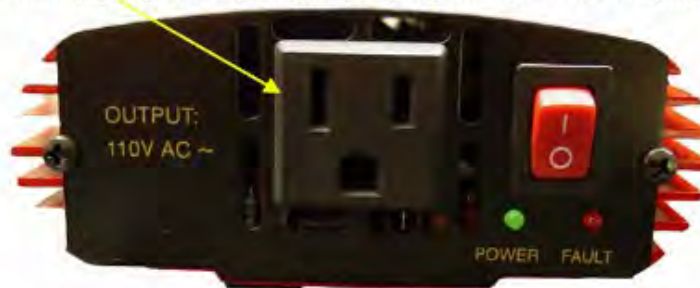
(Note) Make sure when charging the green/black control unit battery **18V** and the green/black Alternative power battery (12V) to use the appropriate chargers as indicated below



4. After the final product is assembled, you may now connect the Laptop AC Adapter Cord to the Laptop as shown below



5. Finally plug in the prong-style plug into the Inverter plug in

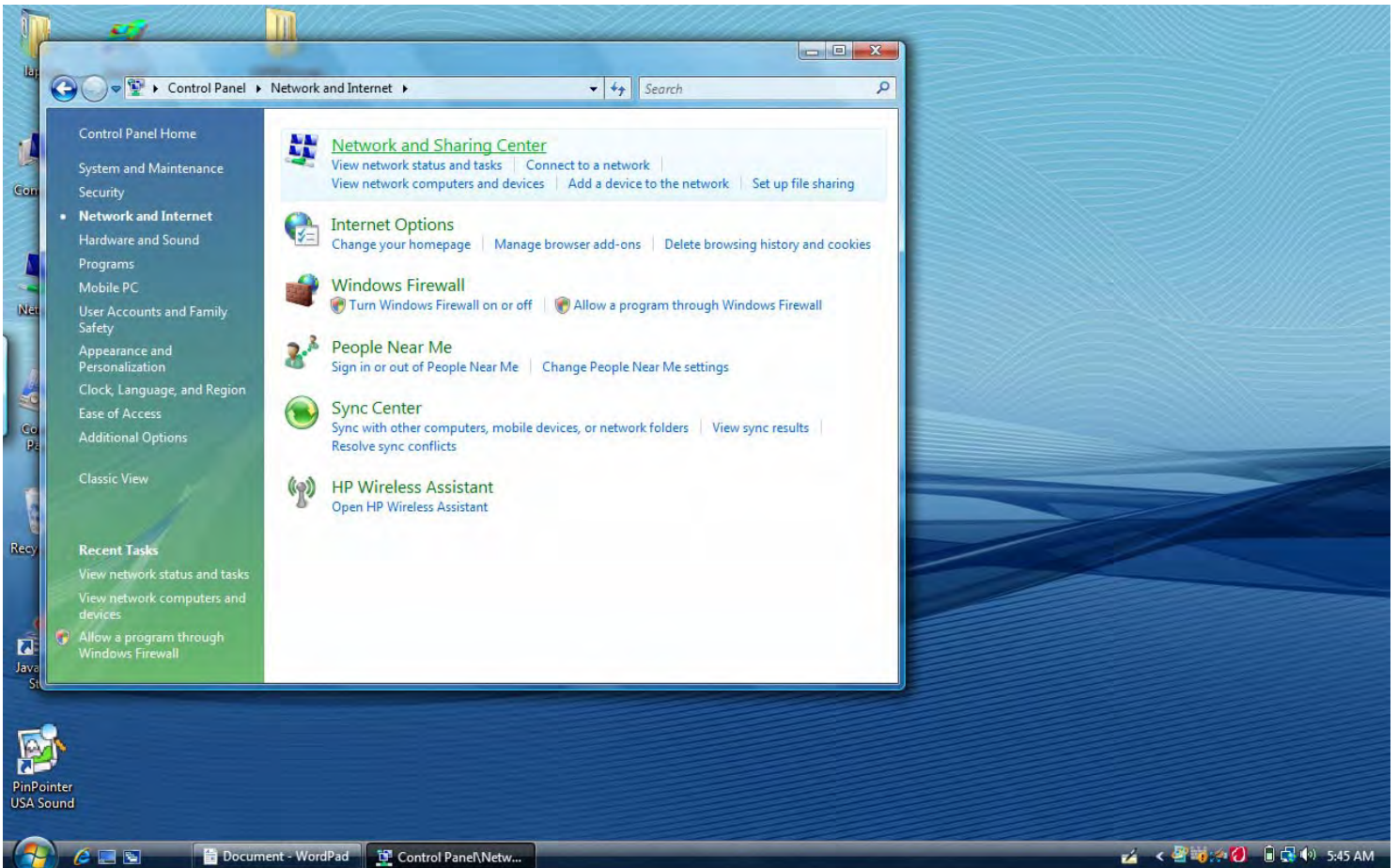
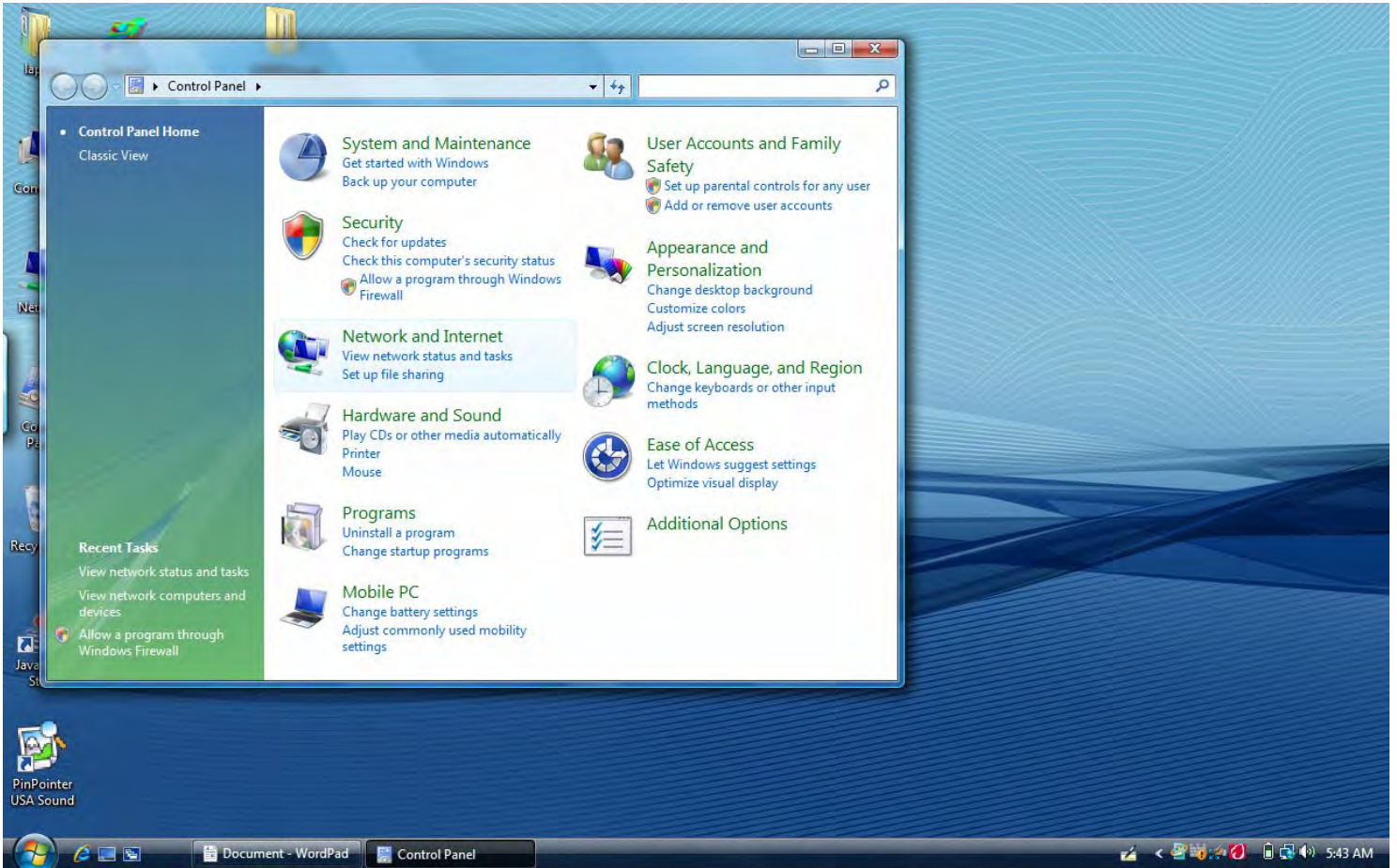


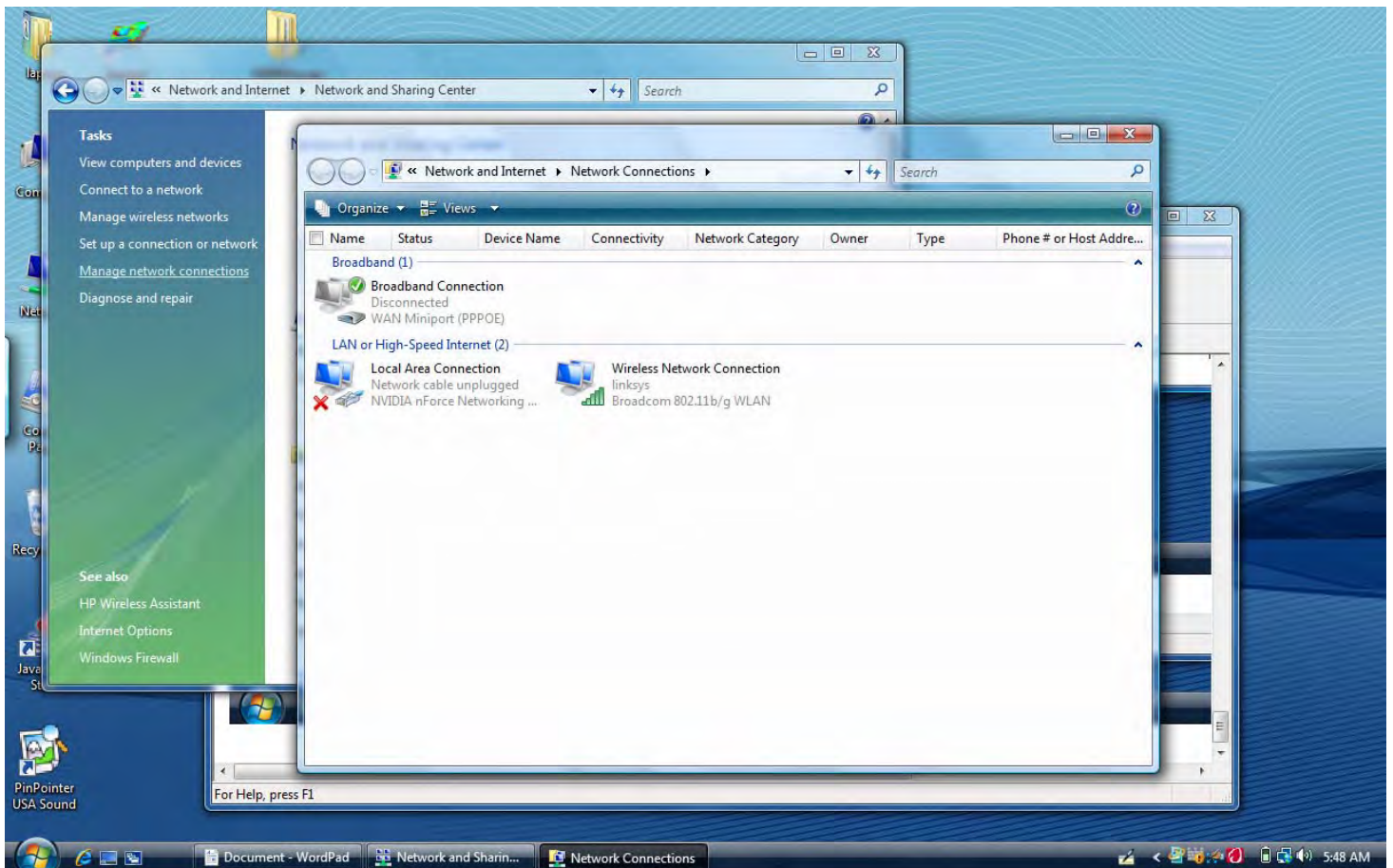
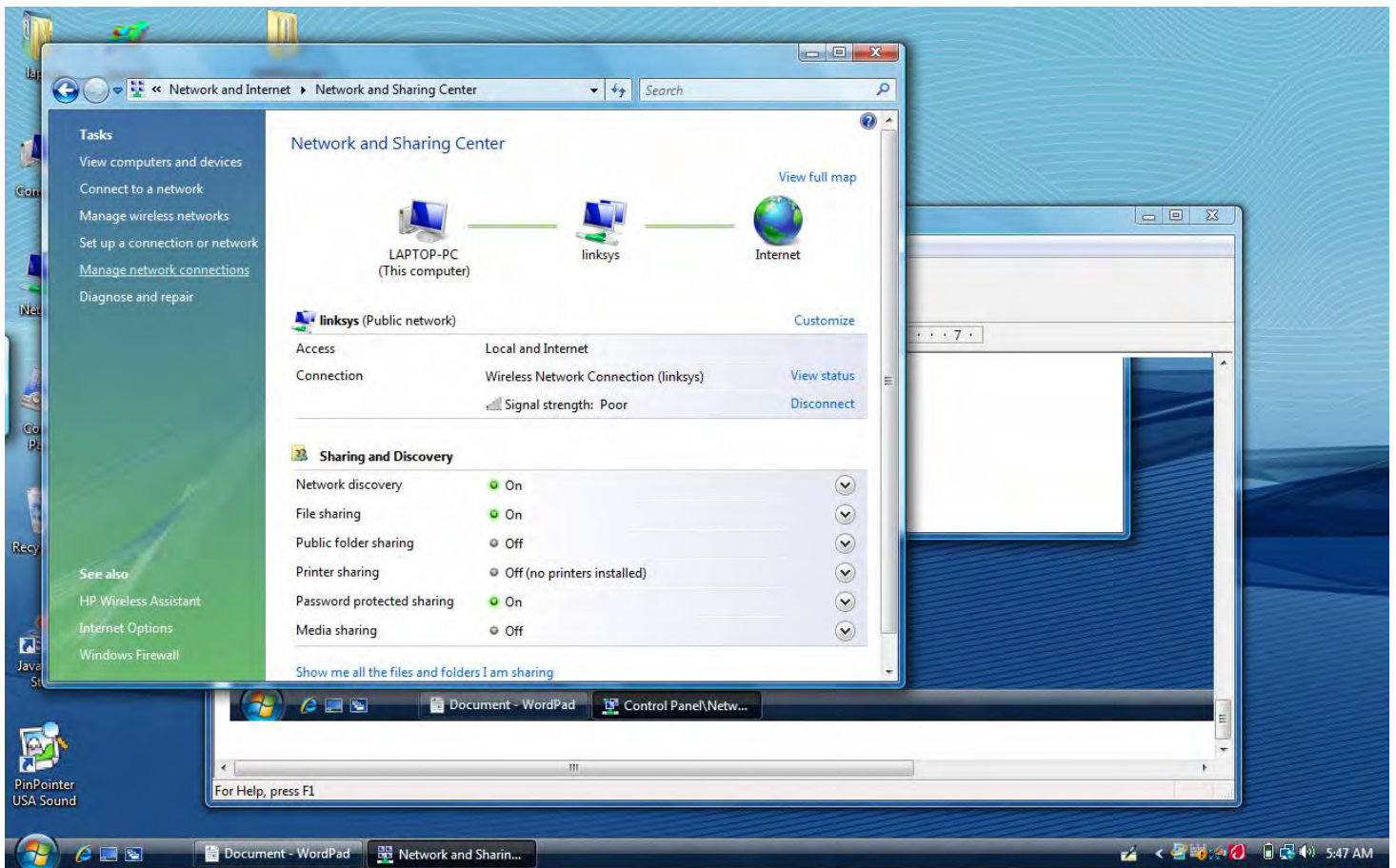
(Note: Laptop Model/Make may differ based on laptop chosen for purchase)

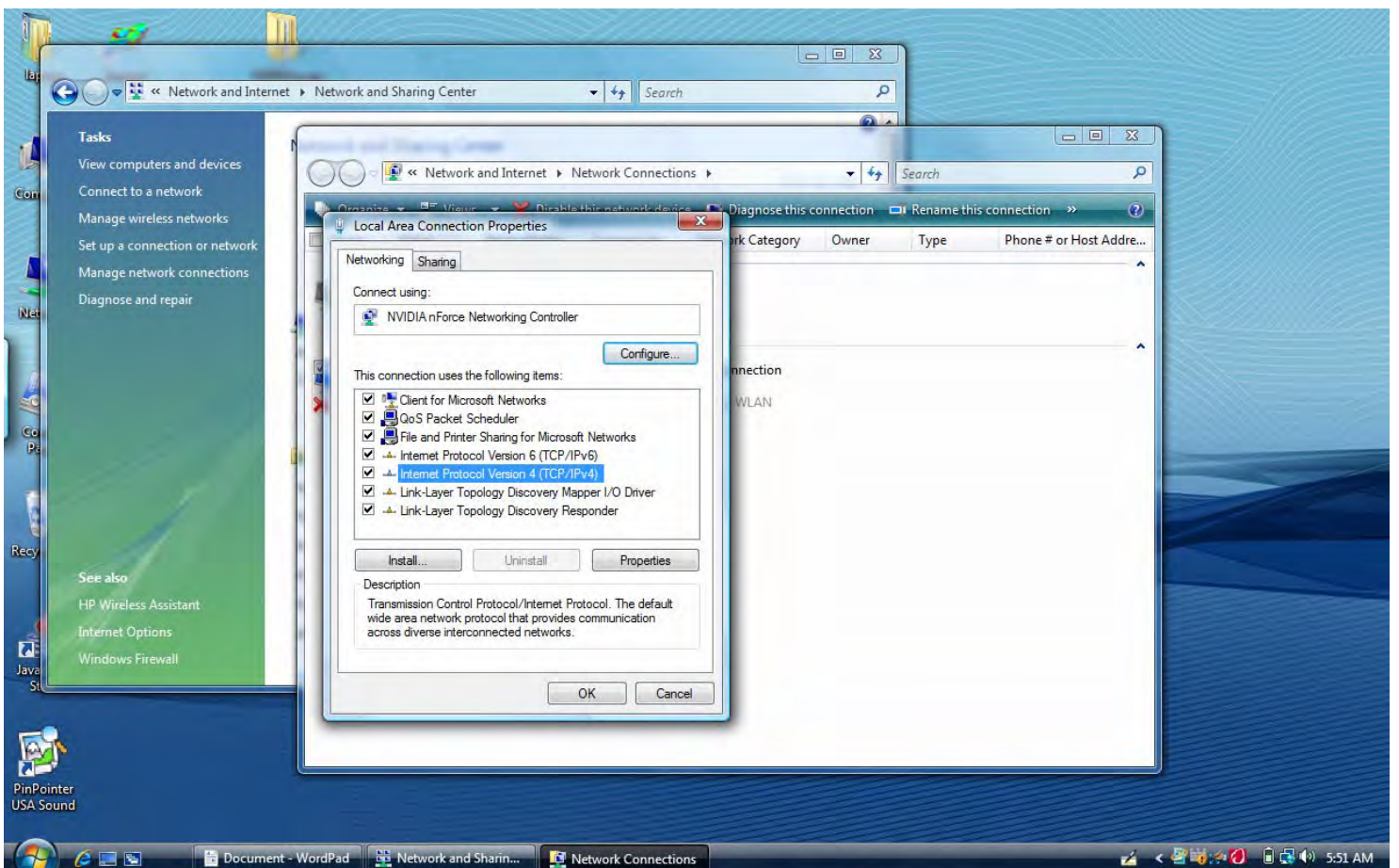
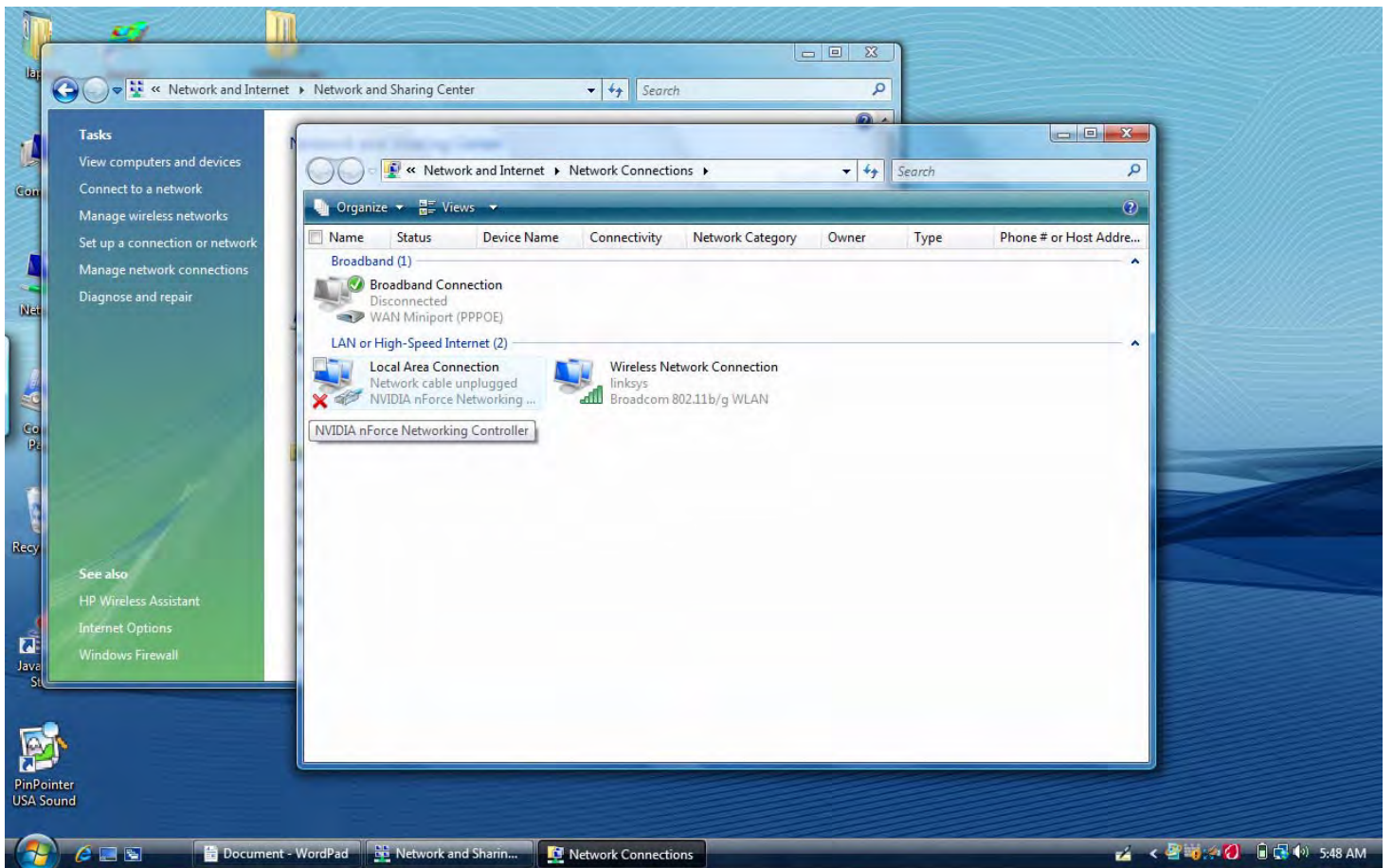
**Operation:** When all steps have been connected, turn on the above red power switch and let the inverter run till an audible sound is emitted (low voltage warning) At this point, turn off the inverter power switch, and let the Laptop run on its own battery power. The purpose of this setup is to give you an extra (~2-2.5 hours) battery time before running on the laptops main power (~2-4 hours)

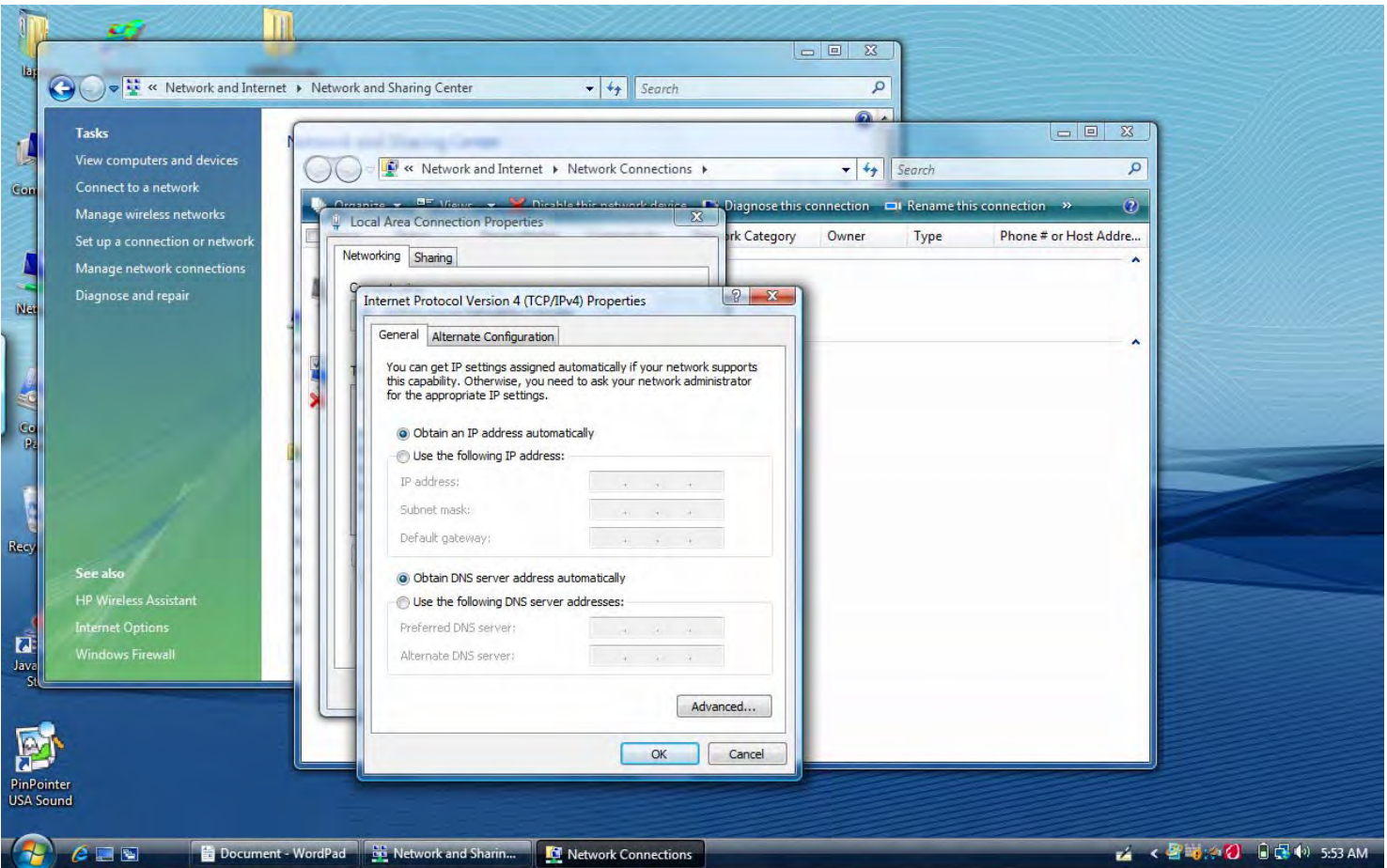
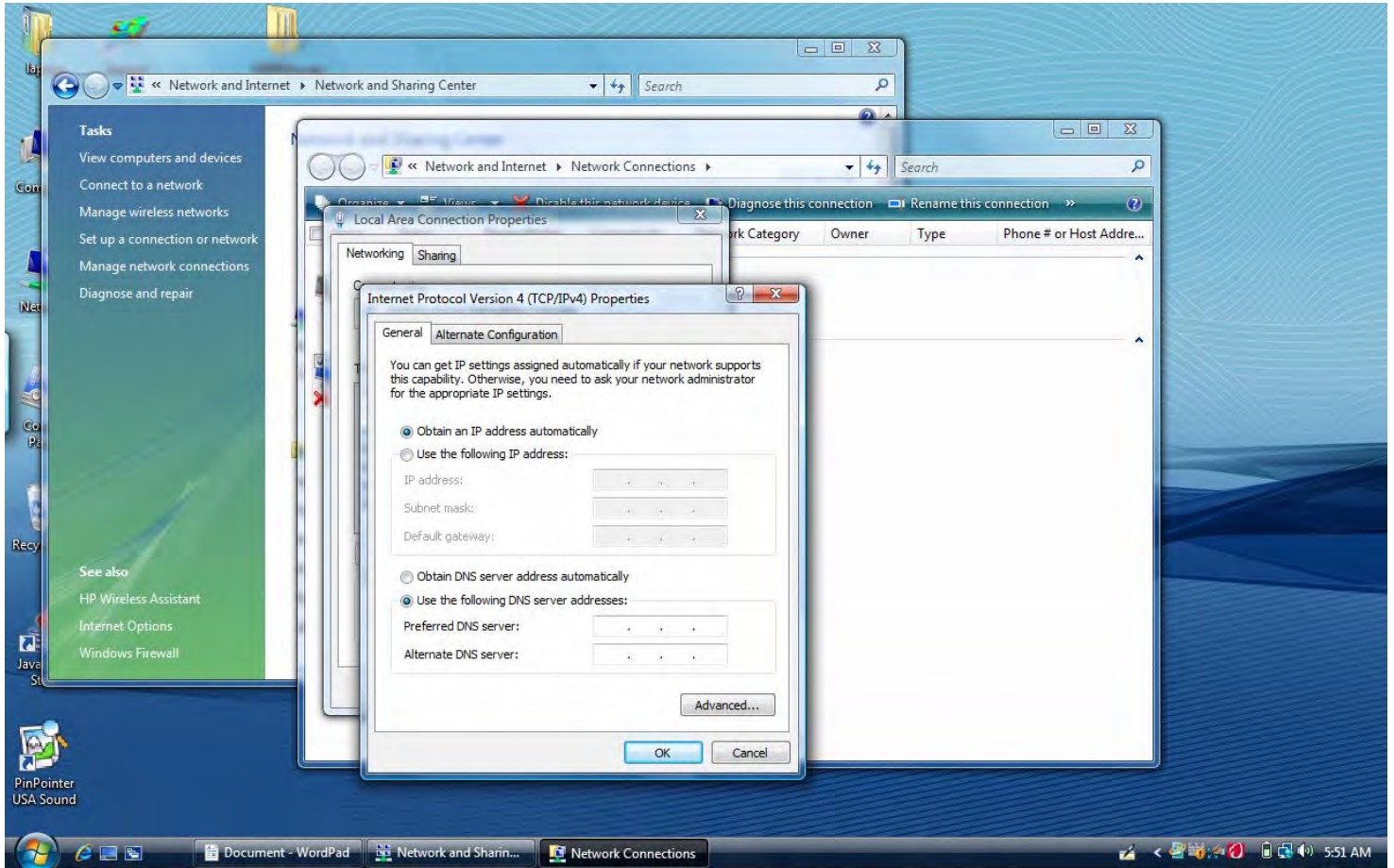
# How to reset the IP address to talk to the USA Control Unit WINDOWS VISTA/WIN 7 OPERATING SYSTEM(S)

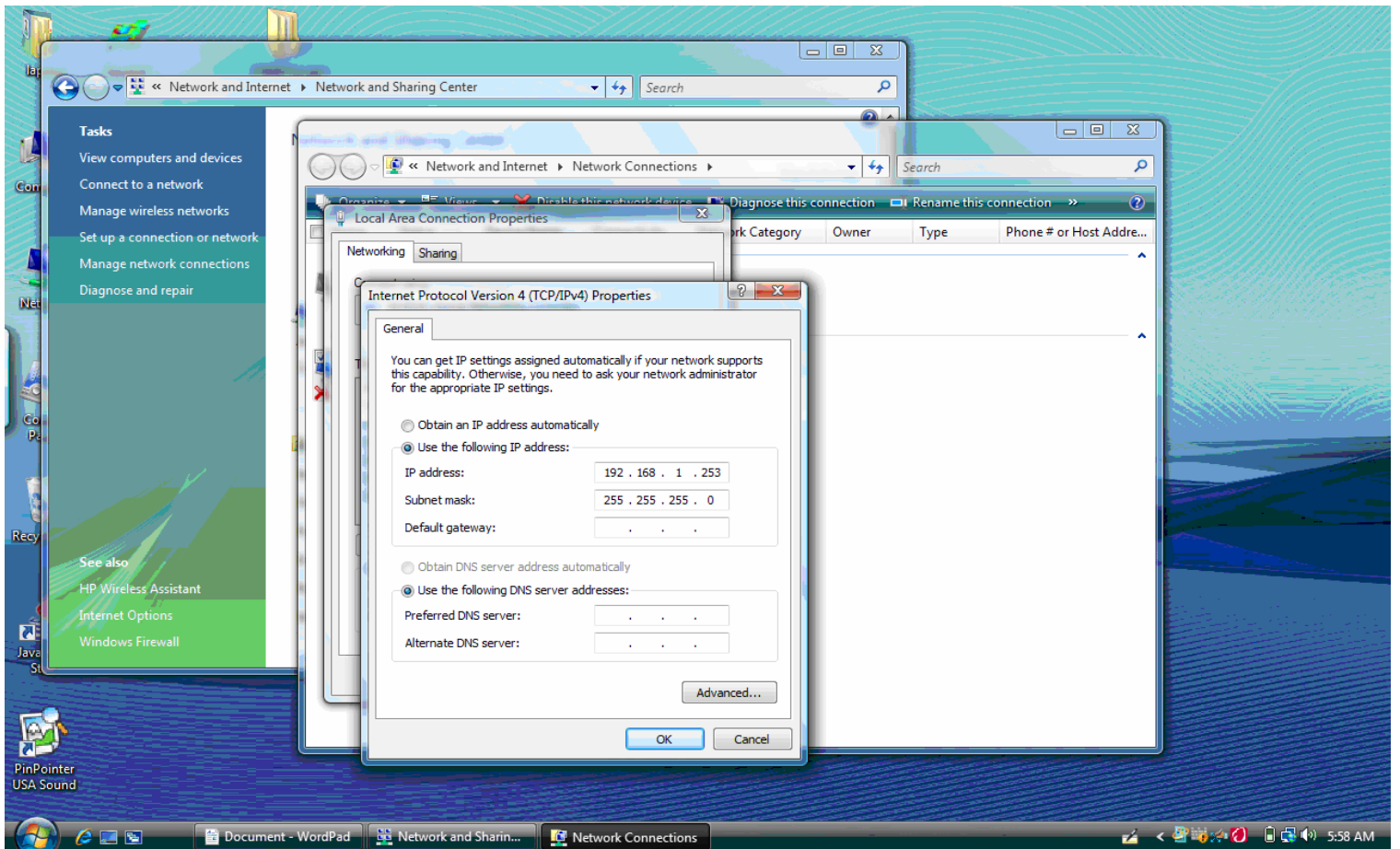
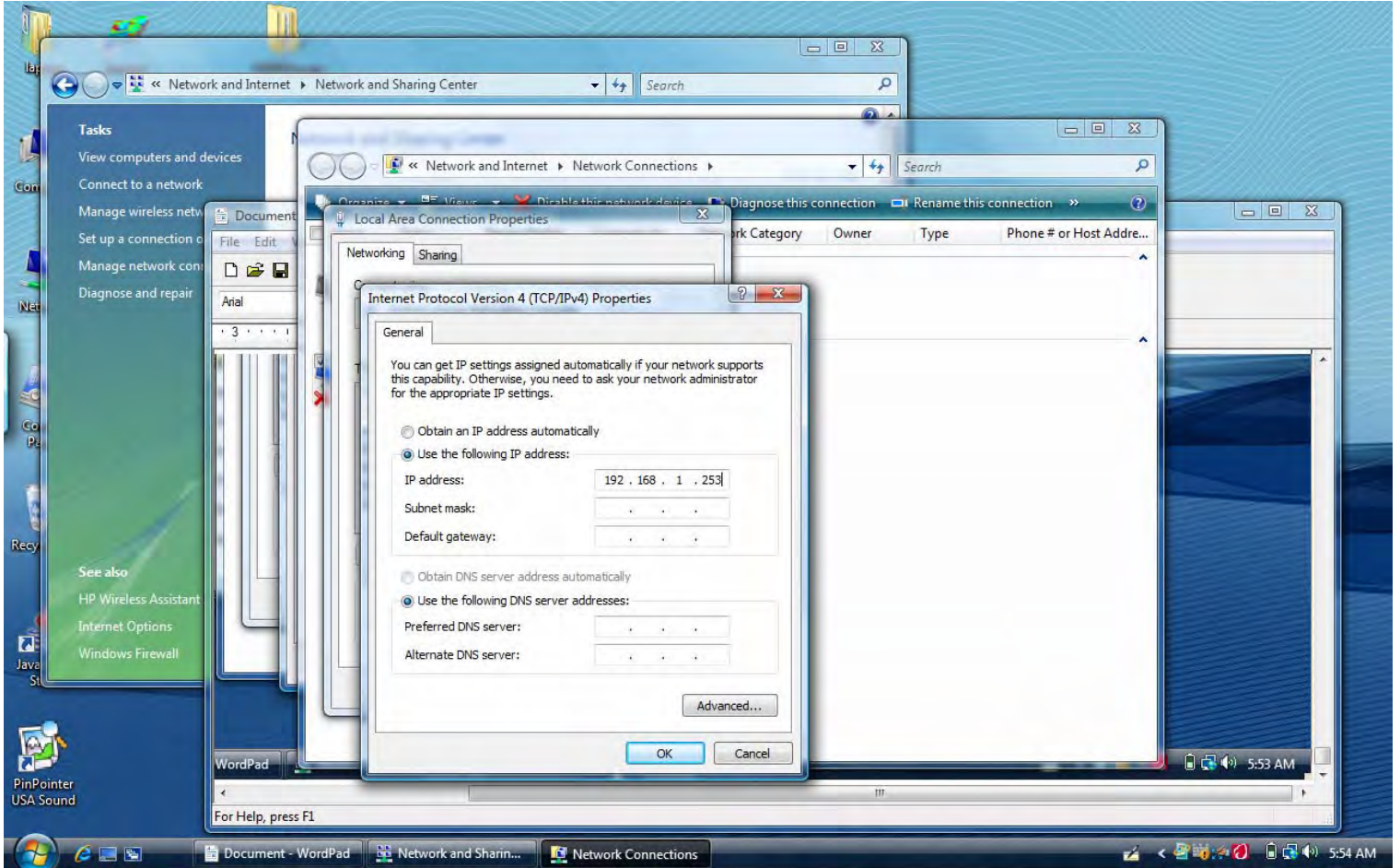






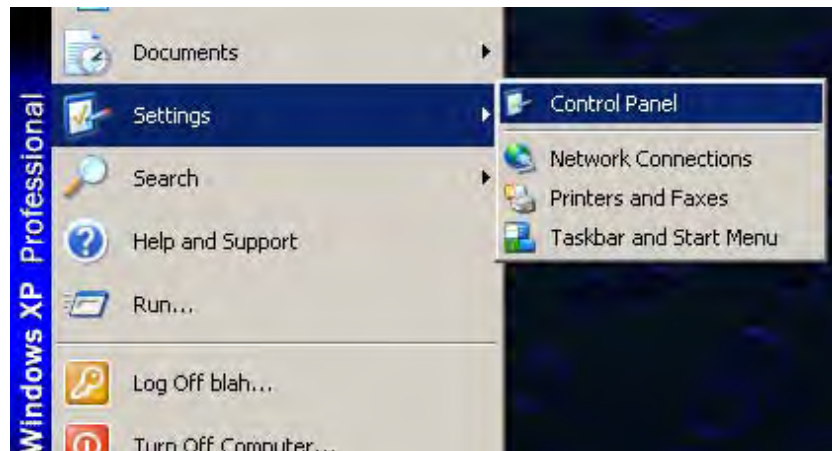






**IMPORTANT NOTE: BE SURE TO DISABLE ANY FIREWALL FROM WINDOWS OR OTHER SECURITY SOFTWARE. USA UNIT WILL NOT CONNECT WITH FIREWALL ENABLED.**

## How to reset the IP address to talk to the control unit WINXP



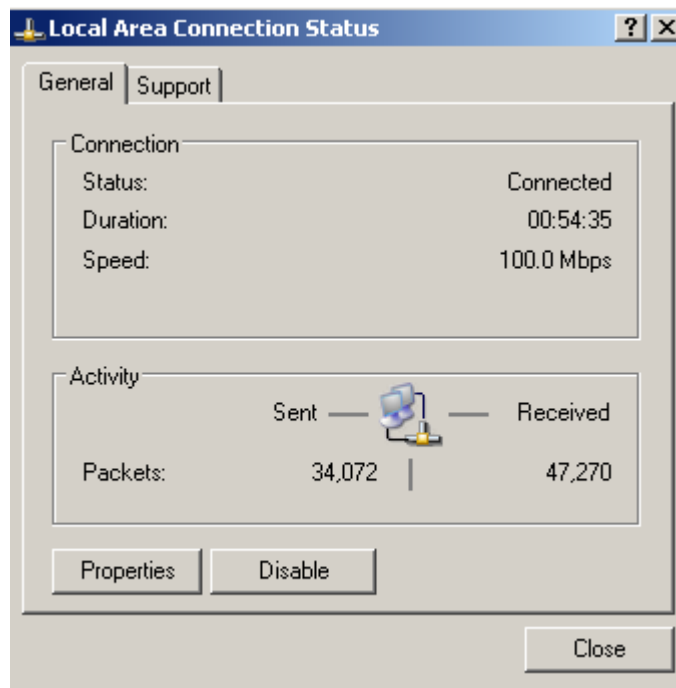
Click on **Start > Settings > Control Panel**



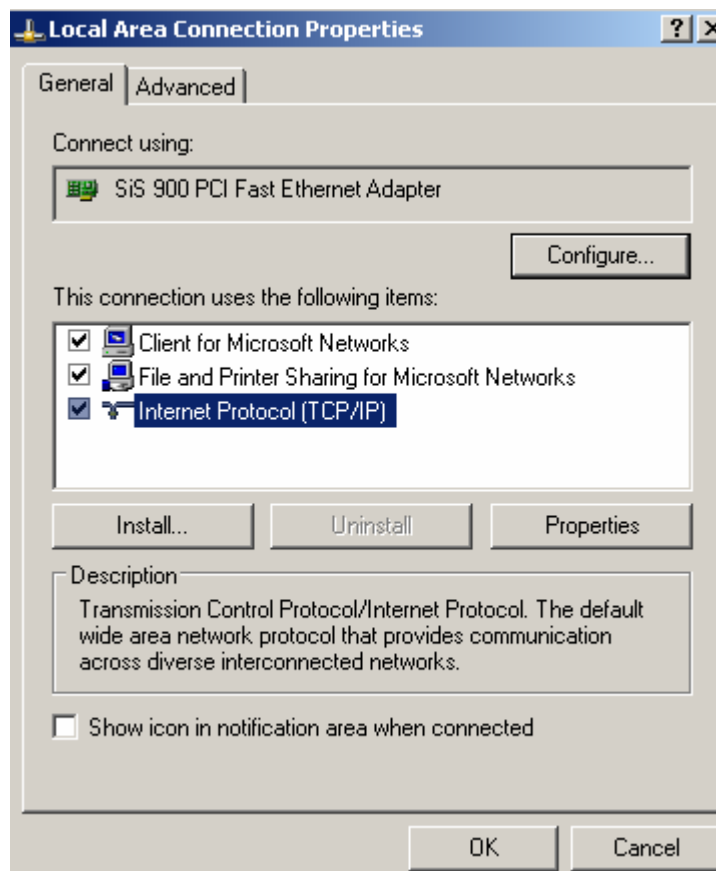
Double Click on **Network Connections**



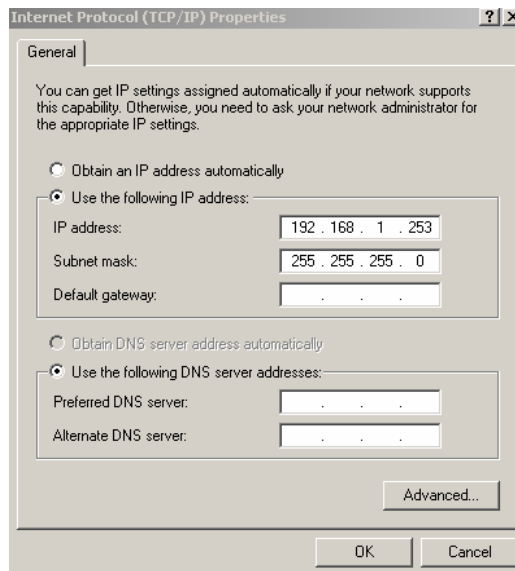
Double Click on **Local Area Connection**



Click on **Properties**

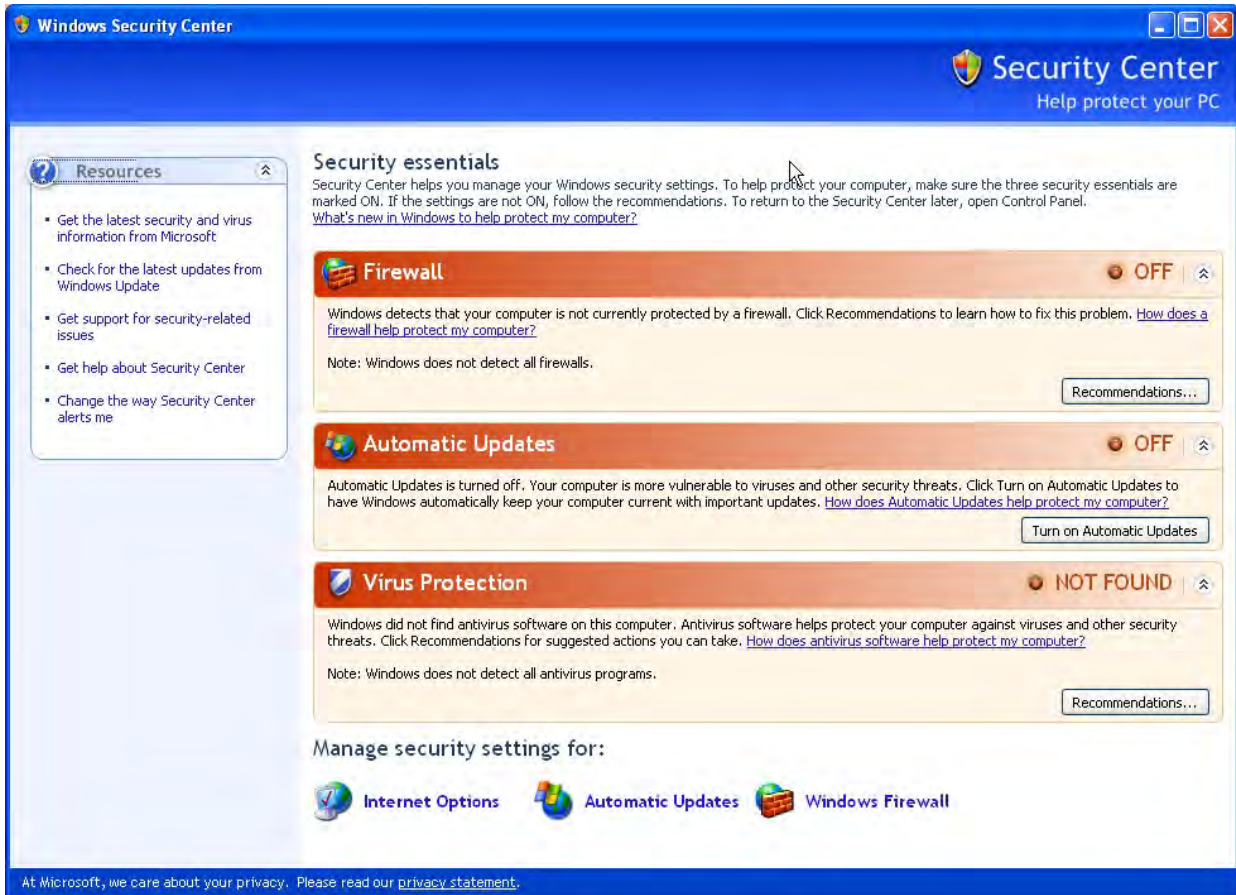


Double Click on **Internet Protocol (TCP/IP)**



Click on the “**use the following IP address**” selection and set the IP to the above listed parameters in the IP Address Field, then click on the subnet mask line...and the listed above numbers will automatically appear, click on **OK** 2 times, might seem slow during this process as the IP address is changing (be patient) and **close** the remaining dialog boxes open.

**IMPORTANT NOTE: BE SURE TO DISABLE ANY FIREWALL FROM WINDOWS OR OTHER SECURITY SOFTWARE. USA UNIT WILL NOT CONNECT WITH FIREWALL ENABLED.**



# Technical Specifications

## USA PRO SERIES XL16 IMAGER

### Control Unit

Control Unit Voltage 8-28 VDC  
Current Consumption unknown  
RAM 32MB SDRAM  
Operating Temperature 40°F - 130°F  
Data Transfer Rate 100 MB/S  
Battery Run Time up to 10 HOURS  
Sensor Current Consumption max 2.50 mA ±0.50 mA  
Control Unit H x W x L 2-1/2" x 4 3/8" x 5 3/8"  
Control Unit Weight 1.75 lbs

### Laptop Computer min specs\*

Duo core processor or equivalent  
256 mb graphics card  
1 gig memory (minimum)  
40 GB Hard Drive (minimum)  
10/100 NIC Ethernet Port

### Geo Surveyor Software

Supported Operating Systems  
Windows XP, Vista, Windows 7 compatible  
System Requirements  
Duo core processor or equivalent  
1 GB RAM  
256 MB Video Card  
10 Gig Hard Drive Space

\*Laptop makes and model specifications may change without notice.\*

#### We recommend Panasonic Tough Books.

The Tough books with integrated GPS, daylight readable display and touch screen is an integral part of our Pro Imaging Package. Rugged design and ease of use make this notebook the best yet for heavy outdoor use and abuse. A powerful integrated GPS system with a fast processor provides excellent performance. 1 GB of RAM provide the power to process graphics, applications and GPS without any performance shortfall. A 7-10 hour lithium ion battery and backup battery provide more than a day's worth of power to cover more area faster. Windows 7 Professional



# Training

Training at the Accurate Locators facility in Southern Oregon and Imaging Locators near Las Vegas Nevada is quite extensive and hands on. Training is conducted on a one and one basis. Students learn more and have a better chance of mastering the equipment in a shorter amount of time.



*For more information on receiving personalized training on Equipment, please contact your sales representative for details.*

# Certification of Performance

## Accurate Locators Inc. Underground Surveying Apparatus and Imaging Systems

This document certifies that the advertised claims for the Underground Surveying Apparatus and Imaging Systems, produced and marketed by Accurate Locators Incorporated, of Gold Hill, Oregon, USA, are indeed accurate and not fraudulent or deceptive. The equipment is intended to locate metallic objects, and voids or tunnels, located under the surface of the Earth. When used in accordance with the prescribed operating procedures, and within the prescribed technical parameters of the equipment, the surveying and imaging systems will perform as indicated. This certification of performance is based on actual field-testing, performed by the undersigned on 20 April 2009, with the guidance of Accurate Locators' personnel, at a test site located in Pahrump, Nevada, USA.

Furthermore, the undersigned testifies, after fifteen years of association and business with Accurate Locators, Inc., that this company is exceptionally conscientious to hardware claims and its relationship to the customer. I highly recommend Accurate Locators, Incorporated, for your surveying and imaging systems requirements.



*R. J. Decesari*  
R. J. Decesari

Registered Professional Engineer  
State of California License Number E-14122

# Limited Manufacturer's Warranty

Accurate Locators Inc. warrants your consumer or industrial product ("Product") against defects in material or workmanship for a period of one (3) years from the date of purchase. If Accurate determines the product to be defective in materials or workmanship, Accurate will replace or repair the product to the original purchaser only. To obtain warranty service worldwide, call +1 541-855-1590 or visit us at [www accuratelocators.com](http://www accuratelocators.com). Please include a written description of the problem encountered. A Return Merchandise Authorization ("RMA") will need to be obtained prior to returning the equipment. If equipment is returned without a RMA it will not be accepted.

**REPLACEMENT OF THIS PRODUCT AS PROVIDED UNDER THIS LIMITED WARRANTY SHALL BE THE EXCLUSIVE REMEDY OF THE CONSUMER. ACCURATE SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGES, INCLUDING CONSEQUENTIAL, INDIRECT AND INCIDENTAL DAMAGES, ARISING OUT OF THE USE OF, OR INABILITY TO USE, THE PRODUCT OR FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY OR CONDITION ON THIS PRODUCT. EXCEPT TO THE EXTENT PROHIBITED BY LAW, ANY IMPLIED WARRANTIES OR CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED IN DURATION TO THE DURATION OF THIS WARRANTY.**

Some states/jurisdictions do not allow limitations on how long an implied warranty or condition lasts or exclusions or limitation or consequential or incidental damages, so the above limitation or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state in the U.S. and Puerto Rico or from province to province or territory in Canada. Accurate's warranty is for repair or replacement only of products that proves to be defective in workmanship or material subject to the warranty period and any other conditions set forth on the package. In some cases manufacturer's warranty may supersede Accurate Locators warranty. Physically damaged merchandise or merchandise where control seals are removed or damaged is not covered under warranty. Customer is responsible for all shipping costs to and from Accurate Locators.

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