

# *Using TargetPro™*

## ***User's Manual***

*Software documentation through 2.3*

*June 2004*

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# Chapter 1: Overview of the Software

## 1.1 Software Architecture

### 1.1.1 What is TargetPro?

TargetPro is a software module included with Isis sonar from Triton Elics International, Inc. TargetPro is also sold as a separate, standalone utility.

If you have the Isis Sonar software (also from Triton Elics International), you can use TargetPro to take snapshots of selective areas of your data imagery that may be of interest to you. When TargetPro takes a snapshot of an image, TargetPro also logs the quantitative data (geocoding, contact mensuration) associated with the original data imagery from which the image came.

You can then save these small images as files independent of the original data imagery. Furthermore, you can then recall the image in Isis without having to play back the entire data imagery that contained the selected image – or you can have Isis play back the image in the larger context of your data imagery, in case you want to see the area surrounding the selected image.

Even if you don't have Isis, you can still use TargetPro to view and modify a wide variety of images, including images that were created by someone else who did have Isis. Finally, you can run TargetPro from DelphMap as a utility for viewing and modifying files known to TargetPro.

### 1.1.2 What File Types Can TargetPro Read?

TargetPro can open (read) these file types:

- Contact (TEI proprietary \*.CON files)
- Target (TEI proprietary \*.TGT files)
- ESC image (\*.TIF or \*.TIFF files, with Tag 270 information in them)
- Pulse Code Modulation image (\*.PCM, which are compressed ESC image files)
- Joint Photographic Experts Group (\*.JPEG and \*.JPG files)
- Comuserve Portable Network Graphic (\*.PNG files)

- Microsoft Windows Paint (\*.PCX files, which support color as well as black and white)
- Microsoft Windows Bitmap (\*.BMP files)
- Microsoft Windows Metafile (\*.WMF files)
- Enhanced Metafile (\*.EMF files)

### **1.1.3 What File Types Can TargetPro Write?**

TargetPro can write (save) files into many file formats:

LEAD (1,8,24); JPEG (8,12,16,24); CALS 1-bit; Cserve PNG (1,8,24); DICOM DIC (8,16,24); FAX (raw); EPS; EXIF; FPX (8,24); GEM 1-bit; GIF (1-8); IOCA; MODCA (Raw IOCA); Mac PICT (1,4,8,24); MacPaint 1-bit; MS FAX (AWD); MS Paint; OS/2 BMP (1,4,8,24); PCX (1,4,8,24); PSD (1,8,24); SUN Ras (1,4,8,24,32); TGA 8,16,24,32); TIF (1-8,12,16,24,32); Win BMP (1,4,8,16,24,32); Winfax; WMF (8,24); EMF (8,24); WPG (1,4,8); Win Ico (1,4,8); Win Cur 1-bit.

In the preceding list, the numbers in parentheses are the number of bits supported for the named formats. Note, however, that TargetPro cannot save PCM images as PCM images; that format can only be saved in TargetPro as a non-PCM format file, such as TIFF.

### **1.1.4 What Formats Are Best for Exporting?**

If you're going to export an image from TargetPro and then use that image in another application, you may want to save your image in a format that offers the most support in the application that will receive the imported image. At present, the best formats for saving TargetPro images to be used in other applications are (in alphabetical order):

- BMP (24-bit)
- GIF (8-bit, 89a non-interlaced)
- JPG (24-bit progressive)
- PCX (24-bit, version5)
- PSD (24-bit PhotoShop file)
- TIF (24-bit)

The 24-bit formats are the only ones to support exporting the image in color. All formats other than 24-bit will be in gray scale.

Note: The 24-bit TIF and BMP file formats are lossless. This is desirable, since lossless formats retain all information even if you later compress or enlarge the image.

## **1.2 System Requirements**

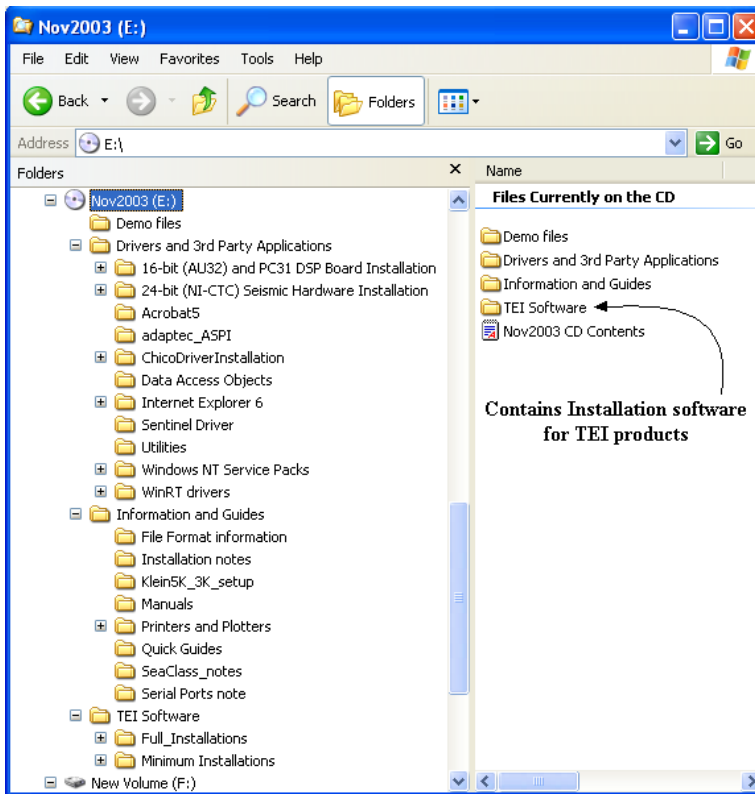
You need the following:

- A Pentium-class personal computer running Windows NT, Windows 2000, or Windows XP.
- At least 32 MB of RAM.
- A software license from Triton Elics International to use the product. (The license comes with TargetPro when you buy it.)
- A hardware dongle that has been programmed to recognize TargetPro.
- A computer monitor capable of displaying true 24-bit color images (potentially 16,777,216 colors.) You could use a monitor that supports fewer colors, but the results won't be as good as they would be on a monitor that can support 24-bit color images. Also, so that you can see all of the application's working area, your monitor must be set to at least:
  - 1280 X 1024 pixels if you are using large fonts, or
  - 1152 X 864 pixels if you are using small fonts

Before you can use TargetPro, you must install the TargetPro software using InstallShield, and you must attach a properly configured dongle to your computer to access the program.

## **1.3 Software Installation**

Typical software installation CD will contain folders like the ones depicted in the Windows Explorer layout. (See the figure, "Typical listing of TEI software installation folders'.)



**Figure 1. Typical listing of TEI software installation folders.**

TEI software is compatible with Windows NT 4.0, Windows 2000, and Windows XP. The following notes will help you achieve a smooth installation of the software.

- Please exit from all other applications before running any of the installation programs.
- You will not be able to complete the installation on an NT4.0 or Windows 2000 system if you do not have administrator's rights. All Isis "black boxes" ship with a user name Isis. In this case the Isis user name has administrator's rights and does not require a password.

- Each application is installed by browsing to the appropriate folder (for example, Isis5.50 Install) on the CD and double-clicking on the SETUP.EXE file found in that folder.
- TEI recommends that if you have more than one hard drive, you install the software on the second (usually the D:) drive, using the default folder names on the CD. You will be given the option to select any drive during the setup process, select the Custom option and change the drive letter.
- The first installation on an NT4.0 system requires a re-boot during the installation; however, this only occurs for the first installation. Under Windows 2000 and Windows XP, no rebooting is necessary **during** the installation process. However, you **must** reboot the system **after** installing under Windows NT 4.0.
- For each application, a number of sample data files can be optionally installed. These files will reside in a subfolder called Demo Files within each application's main folder. These special files can be played back or processed by the relevant TEI applications without a TEI sentinel being installed. If no sentinel (dongle) is attached, a message displays, indicating either that a sentinel was not found or that the sentinel is damaged. However, you can still play back the sample files that come from the CD.
- In order to run the software in acquisition mode, or to play back or process other files, you will need a TEI sentinel attached to the LPT1 printer port. Contact TEI if you need a sentinel.
- If the operating system is Windows NT 4.0 or Windows 2000, you will need to install a sentinel driver. The driver is included on the CD in the Sentinel folder; a text file, with installation instructions, is in that folder. The driver is **not** required under Windows 95 or Windows 98.
- In the case of Windows NT 4.0, Service Pack 5 (or higher) needs to be installed. Service Pack 5 is on the CD.
- The TEI manuals that are installed with the software are in Adobe Acrobat PDF format. Acrobat Reader software (required to read the PDF files) is also on the CD.
- The CD has a number of other folders containing drivers and applications that could be required; each folder has a text file with more information.
- To remove the software, use the Add/Remove Programs utility in the Windows Control Panel collection of utilities.
- The installations make two changes which are not restored when the programs are removed using Add/Remove Programs. They are:

- The addition of a folder called [TEIdlls] in the Windows, Win95 or WINNT folder, and
- a modification to the PATH environment variable which adds the [TEIdlls] folder to the PATH. The [TEIdlls] folder can be safely deleted after all TEI software has been removed.

### **1.3.1 Installing a Hardware Dongle**

A hardware dongle comes with TargetPro. The dongle permits TargetPro to run after the software is installed.

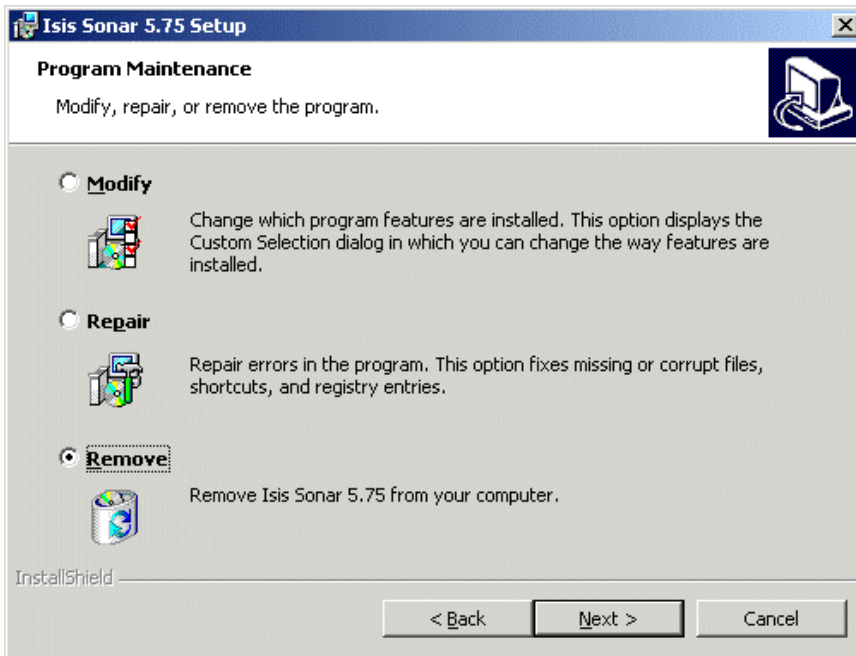
To install the dongle, plug in the male end of the dongle to the female end of a serial port on your computer.

### **1.3.2 Installing TargetPro**

Triton Elics Int ships TargetPro with a utility used to install the product for you. From the distribution medium made available to you from Triton Elics Int, find the file called **setup.exe** and double-click it. The system runs the install utility InstallShield. Respond to any InstallShield prompts, as may be needed; let InstallShield guide you in the installation. When InstallShield finished, the installation is complete, and TargetPro is ready to run.

## **1.4 Upgrading to New Releases of Software**

If you already have a version of the software that you wish to upgrade on your system you will see a dialog box inviting you to modify, repair, or remove the software you intend to install. See the figure, 'Modify, Repair, Remove choices during installation' for an example of this kind of dialog box.



**Figure 2. Modify, Repair, Remove choices during installation.**

You will need to remove the old version of the software before you will be permitted to install the new version. To do so, enable the Remove button in the dialog box and click Next. You can then install the new version by rerunning setup.exe As noted above, some items are deliberately not removed during the uninstall process; doing so can cause problems. If necessary, manually delete the VTEIDlls folder, but only do this if you are going to re-install all TEI applications.

**Important Note:** The Windows Installer will fail to uninstall the software if the operating system has been upgraded from (for example) Windows 98 to Windows 2000 after the TEI applications were installed. If you want to upgrade your operating system, uninstall the TEI programs first, and then re-install the TEI programs after the upgrade.



## Chapter 2: Using TargetPro

If you've installed the TargetPro software and have it running, you can use it to open CON (contact) or TGT (target) fields, enhance them, and save the changed files. This chapter explains how to do that.

You can then save these small images as files independent of the original data imagery. You can then recall the image in Isis without having to playback the entire data imagery that contained the selected image – or you can have Isis playback the image in the larger context of your data imagery, in case you want to see the area surrounding the selected image.

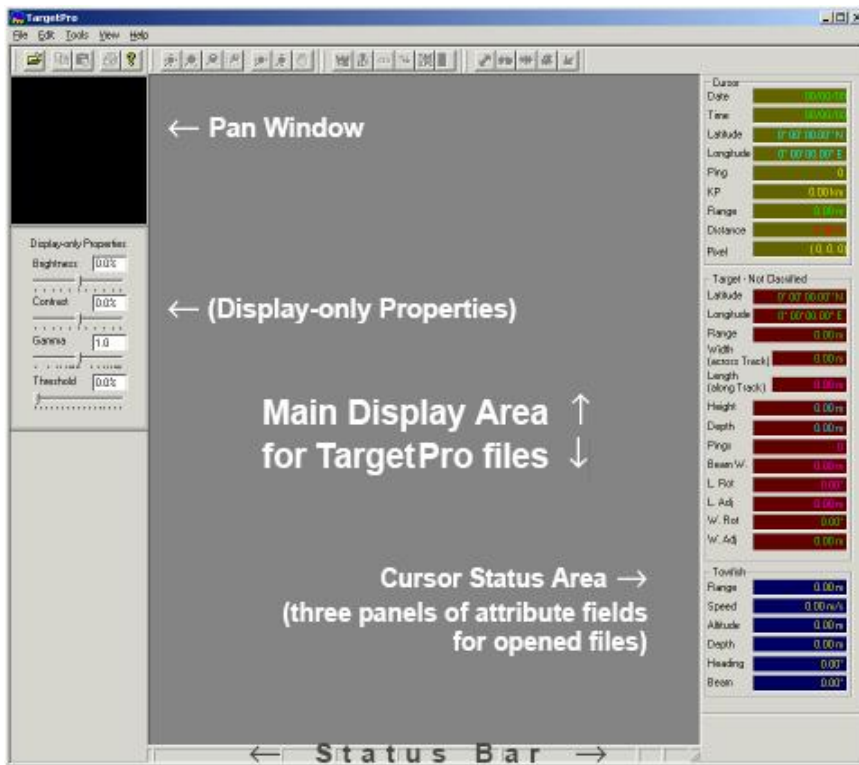
### 2.1 Running TargetPro

You can run TargetPro in a number of ways, shown next. Choose a convenient method.

To run TargetPro, double-click on the TargetPro icon in the Triton group (Microsoft Windows), or

- From Isis, configure for TargetPro availability (**Tools → Target Setup...**), and then double-click the left trackball button while imagery is scrolling in an Isis waterfall window to put a contact in the TargetPro working window.

TargetPro runs and displays its initial screen (Figure 3). Moreover, if you have run TargetPro before, TargetPro remember the overall size and position of the application window as it was when you last used it.



**Figure 3. Initial screen (empty) after first running TargetPro.**

Because you have not yet opened a file for TargetPro to display, the Main Working Area of the initial TargetPro screen, as well as any smaller child windows that may be present, are empty of information. See 'Understanding TargetPro's Windows' for an explanation of the various parts of the application's overall window.

## 2.2 Opening a File


As noted earlier, you can work with any file types in TargetPro:

- Contact (TEI proprietary \*.CON files)
- Target (TEI proprietary \*.TGT files)
- ESC Image (\*.TIF or \*.TIFF files, with Tag 270 information in them)

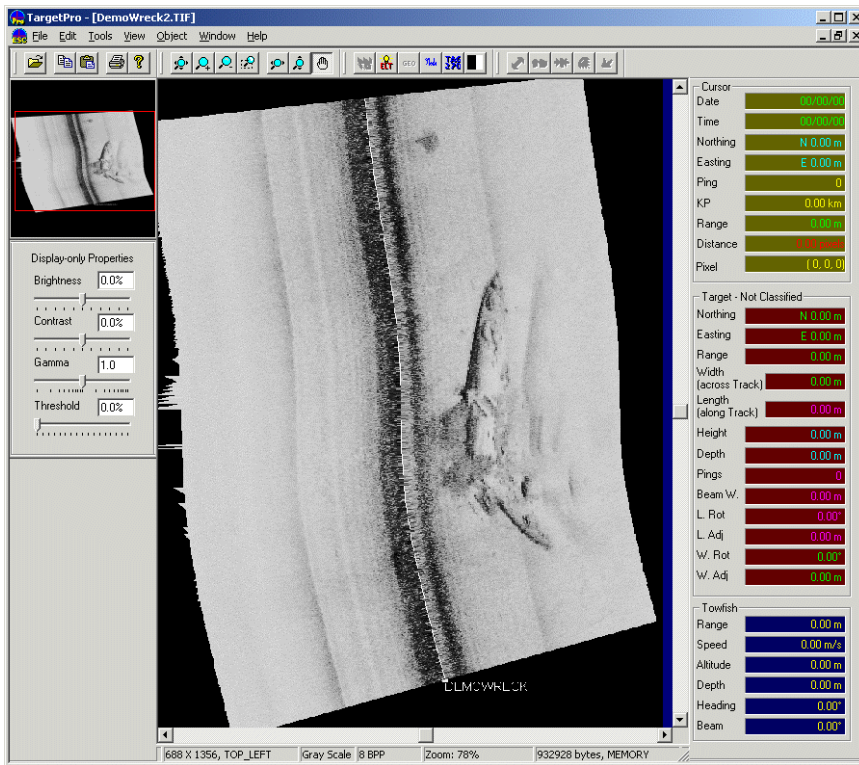
- PCM Image (\*.PCM, which are compressed ESC image files)
- Joint Photographic Experts Group (\*.JPEG and \*.JPG files)
- CompuServe Portable Network Graphic (\*.PNG files)
- Microsoft Windows Paint (\*.PCX files, which support color as well as black and white)
- Microsoft Windows Bitmap (\*.BMP files)
- Microsoft Windows Metafile (\*.WMF files)
- Enhanced Metafile (\*.EMF files)

Those are the only file types that can be opened in TargetPro. If your contact (CON) or target (TGT) files have been saved as digitized lines and/or polygons, then TargetPro will display them that way.

To open a file TargetPro can recognize, do any of the following:

- From TargetPro's main menu, choose **File→Open**, **or**
- Press <CTRL>+<O>, **or**
- Press [Insert], **or**
- On the taskbar click the Open icon: 

Any of those actions displays a standard Windows-based dialog box where you can specify a file to open. A typical file opened in TargetPro looks like the sample shown in Figure 4.



**Figure 4. Typical file opened in TargetPro**

After a file has been opened, the original list of menu items (File, Edit, Tools, View and Help) expands to include two additional menu choices: Object and Window.

## **2.3 Understanding TargetPro's Windows**

Initially TargetPro displays these windows and working areas:

- the Pan window
- the Display-Only Properties window
- the main display area for viewing opened files

- the Cursor Status window
- taskbar icons
- Status Bar

In the taskbar area, all icons except for the Open icon and the About icon are grayed out and unavailable until you open a file in TargetPro. All icons are explained in “Icons on the Taskbar”.

If you double-click on any of the windows (except for the main display area), the system displays the windows' title bars and reveals their identities (Figure 3). Note that the windows still lack information in them because you have not yet opened a file in TargetPro. The two windows (Pan and Display-Only Properties windows) are explained later on.

The Status Bar, where on-going and current status is displayed, is a narrow strip at the bottom of the TargetPro window (Figure 3).

### 2.3.1 Repositioning displayed child windows

To reposition a displayed child window, double-click in the child window to expose the windows title bar. Then, click in the title bar and drag the window to the new position.

To return an undocked window to its original position, double-click in the child window and the window moves back to its initial position.

All windows except the Main Display Area are child windows of TargetPro. You can close or open the child windows from the View menu listed above the Taskbar icons. The Main Display Area is not redockable (movable).

The individual windows are:

**Pan Window.** The black window near the upper left corner is a thumbnail window for the currently active, opened TargetPro image, if any is present. This window is known as the Pan Window. See ‘Pan and Display-Only Properties Windows’ for more detailed information on this window.

**Display-Only Properties Window.** This child window contains four independent controls for adjusting an image's brightness, contrast, gamma,

and threshold. See 'Pan and Display-Only Properties Windows' for more detailed information on this window.

**Cursor Status Area.** The rightmost area contains three panels of attribute fields that may show information when you open a file in TargetPro, depending on the type of navigation data and other attributes that may have been present in the opened file prior to opening. Within the Cursor Status Area, information is arranged in three panels:

- Cursor Panel
- Target-Debris Panel (or Target – Not Classified, if your opened file is not a target or contact type of file)
- Towfish Panel

The fields in these three groups are explained in Table 1.

**Status Bar.** When you open a TargetPro file and that file has the active focus, text identifying key properties of that file (such as file name, number of pixels in the x and y axes, file size, zoom level, etc.) appear here.

**TABLE 1. Table One: Fields in the Cursor Status window**

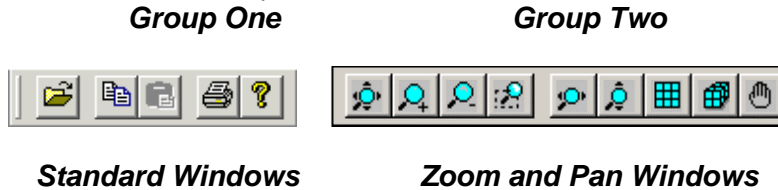
Parent Panel for Attributes	Attribute Field Name and Explanation
<b>Cursor</b>	Date: This is the Julian date the data were recorded. Time: This is the time (hh:mm:ss) the data were recorded. Latitude: These are the degrees north or south of the equator as measured from the point of the trackball pointer when the contact was made. The heading of this field changes to Northings if the data were recorded that way. Longitude: These are the degrees east or west of the meridian as measured from the point of the trackball pointer when the contact was made. The heading of this field changes to Eastings if the data were recorded that way. Ping: The nth consecutive ping (shot) of the recorded data at the point where the trackball pointer was placed when the Target contact was created. KP: Kilometers of Pipe or Kilometer Posting. Measure of distance along a pipe or pipeline route. Range: This is the range from the towfish to the current point, either the cursor or the object being measured.

	<p>Distance: This is the distance between the end-points of the rubber-band line drawn from one contact to another.</p> <p>Pixel: This displays the x (x-axis coordinate), y (y-axis coordinate), and z data (intensity) of any pixel in the displayed image.</p>
<p><b>Target – Debris (or Target – Not Classified for non-contact files)</b></p>	<p>Latitude: Degrees north or south of the equator. This changes to Northings if the data were recorded that way</p> <p>Longitude: Degrees east or west of the meridian. This changes to Eastings if the data were recorded that way.</p> <p>Range: This is the range from the towfish to the current point, either the cursor or the object being measured.</p> <p>Width: Across-track distance of mensuration.</p> <p>Length: Along-track distance of mensuration.</p> <p>Height: Height is how far an object stands above the seabed. Height computation uses the length (width in across-track) of the shadow, distance of the object from the towfish, and the towfish altitude.</p> <p>Depth: This is the vertical distance the target is from the sea surface.</p> <p>Pings: Number of pings traversed by a drawn line. Also see 'Number of Pings'.</p> <p>Beam W.: Width of the beam at a specific range distance. This parameter is updated with any length measurements. Also see 'Beam Width'.</p>
<p><b>Target – Debris (or Target – Not Classified for non-contact files, cont'd)</b></p>	<p>L.Rot. (Length Rotation) Rotation angle of the length line relative to a horizontal line. Angle is computed from a horizontal line. Also see 'Length Rotation' on page 28.</p> <p>L.Adj. (Length Adjust) is the difference between the length of a line and its along-track length. In the case of a slanted line, length is derived from the vertical component of the line, and the L.Adj. measures the difference between the length of the line and the along-track length. Also see 'Length Adjust'.</p> <p>W.Adj. (Width Adjust) is the difference between the length of the line and the across-track width. Also see 'Width Adjust'.</p> <p>W.Rot. (Width Rotation) Rotation angle of the width line relative to a horizontal line.</p>

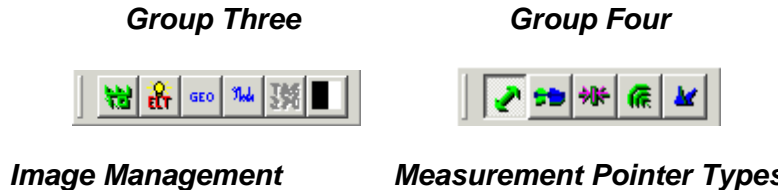
<b>Towfish</b>	<p>Range: This is the range from the towfish to the current point, either the cursor or the object being measured.</p> <p>Speed: This is the towfish's speed.</p> <p>Altitude: This is the vertical distance the towfish is from the seafloor at nadir.</p> <p>Depth: This is the vertical distance the towfish is from the sea surface.</p> <p>Note: altitude + depth = total water column depth</p> <p>Heading: With respect to standard compass bearings, this is the direction, in decimal degrees, in which the towfish is pointed.</p> <p>Beam: This is the horizontal beam angle of the sidescan sonar.</p>
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## 2.4 Icons on the Taskbar

Immediately underneath the menu list is the TargetPro taskbar of icons. They are shown in Figures 5 and 6. Several of the icons have to do with operating the cursor, or trackball pointer in the program. Additional icons are associated with the Measurement Tool and the Zoom Tool. Tool Tips are attached to each icon, and each icon has a menu equivalent in the Tools menu.



**Figure 5. Groups One and Two of TargetPro's taskbar icons**








**Figure 6. Groups Three and Four of TargetPro's taskbar icons.**












For space reasons, the icons appear in this book in two rows. In the TargetPro program, the icons are laid out in a single row. Most icons are grayed out until a contact image is opened. All icons become visible when an image is opened and as long as the Cursor Tool icon remains clicked. (The Paste icon will be grayed out if there is nothing in the Windows Clipboard.) All choices within an icon group are mutually exclusive; you can perform only one function at a time from a group. Icons in Groups Two, Three and Four are unique to TargetPro. All the icons are explained in the next few tables.








**TABLE 2. Group Two: Standard Icons**

	<p><b>Open icon.</b> Click this to get a dialog box where you can specify a file to open from TargetPro's combo box. This icon is equivalent to choosing <b>File → Open</b> from the main menu. The equivalent keyboard shortcut is &lt;CTRL&gt;+&lt;O&gt;</p>
	<p><b>Copy icon.</b> Click this to copy the currently displayed target contact to the Windows Clipboard. Menu equivalent: <b>Edit → Copy</b>. The equivalent keyboard shortcut is &lt;CTRL&gt;+&lt;C&gt;</p>
	<p><b>Paste icon.</b> Click this to get a dialog box where you can choose a type of image to paste: ESC (Electronic Still Camera images as TIFF files having the Tag 270 attribute), Generic Image, Contact File, or Target. Menu equivalent: <b>Edit → Paste</b>. The equivalent keyboard shortcut is &lt;CTRL&gt;+&lt;V&gt;</p>
	<p><b>Print icon.</b> Click this to get the standard Windows Print dialog box from which you can print the currently displayed image. Menu equivalent: <b>File → Print</b>. The equivalent keyboard shortcut is &lt;CTRL&gt;+&lt;P&gt;</p>
	<p><b>About icon.</b> Click this to see the About TargetPro information box. The box reveals the program's name, version number, date compiled, Copyright date, and the icon associated with the program. There is no equivalent keyboard shortcut.</p>






**TABLE 3. Group Three: Zoom and Pan Icons**

	<b>Fit to Window.</b> Fills the current display area, out to the nearest border, with the contents of the image. The aspect ratio of the image is preserved.
	<b>Zoom In.</b> Enlarges the size of the displayed image by some amount. The aspect ratio of the image is preserved.
	<b>Zoom Out.</b> Reduces the size of the displayed image by some amount. The aspect ratio of the image is preserved.
	<b>Zoom Rectangle.</b> Allows you to drag your pointer across and up (or down) the image to define a rectangle which becomes an area to frame the displayed image
	<b>Fit Width.</b> The image enlarges until the left and right edges of the image have reached the left and right edges of the current display area. The aspect ratio of the image is preserved.
	<b>Fit Height.</b> When this icon is clicked, the image enlarges until the top and bottom edges of the image have reached the top and bottom edges of the current display area. There is no menu equivalent. The aspect ratio of the image is preserved.
	<b>Linear Zoom.</b> Creates a new image by averaging adjacent pixels.
	<b>Cubic Zoom.</b> Minimizes the raggedness by using interpolation which estimates how the “missing pixels” should appear. Then fills them with the appropriate color
	<b>Pan Image.</b> Your pointer changes to the shape of a red hand. You can move a contact image around in the main display area to visually observe different areas of interest in the image. The image is not zoomed. The menu equivalent is Tools → Pan Image.

**TABLE 4. Group Four: Image Management Icons**

	<b>Measurement Tool.</b> When selected, this icon enables five more icons specific to mensuration when you select Measurement Tool (see Table 4, 'Group Four: Measurement Pointer Icons,' on page 24.)
	<b>Display ELT.</b> Summons the Electronic Light Table dialog box where you can modify (enhance) several aspects of the existing contact image. Menu equivalent: Tools →ELT (see 'The Electronic Light Table' on page 37.
	<b>Geometrically Correct Image.</b> This icon launches the Geometrical Correction Parameters dialog box, a tool for correcting distortion caused by the compression of images during a recording session. Menu equivalent: Tools Geocorrect (see 'Geocorrecting a Contact or Target Image').
	<b>Annotate.</b> Clicking this icon (or choosing Tools Annotate from the main menu) summons a dialog box where you can inspect text that may have been typed at an earlier time. You can modify this text or type new text. If you click OK, any text that may be present here will then be associated as an annotation to the currently displayed con file. The annotation will be available for the currently displayed con file whenever that file is opened. The keyboard shortcut is <F2>.
	<b>TAG270.</b> If you opened a TIFF file containing Tag 270 information, this icon becomes available. Clicking it causes the TAG270 Information dialog box to be displayed. This icon has no menu equivalent. For images not containing Tag 270 TIFF information, this icon is grayed out and unavailable
	<b>Reverse Palette.</b> Inverts the order of the displayed colors (for example, black becomes white and white becomes black, etc.)
	<b>Object Detection.</b> Clicking this icon summons the Object Detection dialog, where TargetPro will automatically detect objects using variations in amplitude of the image.

**TABLE 5. Group Five: Measurement Pointer Icons**

<p>Note: The Measurement Tool (see Table 3, 'Group Three: Image Management Icons') must first be selected before you can choose a measurement type. Right-clicking in imagery reveals a menu of equivalents.</p>	
	<p><b>Measure Distance:</b> When this measurement pointer type is selected, you can draw a straight line in any direction across the image. The length of that line is reported as a distance value in the Cursor Status Panel</p>
	<p><b>Object Echo-Shadow:</b> Use this measurement pointer tool to find the height of an object in the imagery.</p>
	<p><b>Object Length:</b> Use this measurement pointer tool to find the along-track distance of an object in the imagery.</p>
	<p><b>Object Echo:</b> Use this measurement pointer tool to find the across-track distance of an object in the imagery.</p>
	<p><b>Object Shadow:</b> Use this measurement pointer tool to find the across-track distance of an object's shadow in the imagery.</p>

## ***2.5 Pan and Display Only Properties Windows***

The two leftmost child windows, the Pan window and the Display-Only Properties window, control image panning and three basic image properties. You can move these windows around and reposition them ("redocking" windows) to suit your own needs – even outside the borders of the TargetPro application window, if you so desire. See 'Understanding TargetPro's Windows' for the repositioning methods and sample screens.

## 2.5.1 The Pan Window

The small, redockable Pan window acts as a visual aid to show you what part of the total image is being displayed in the larger main display window, rather like being able to see the forest from the trees, as the saying goes. Figure 3 shows an example of this. Initially, the area indicated in the Pan window is the same as the area covered in the main display window, and the Pan window has a thin red line around the Pan window. This is the default for a newly opened TargetPro file.

**To use the TargetPro Pan window, follow these steps:**

1. Select the Pan Image tool. The trackball's or mouse's pointer changes to the same shape as the icon (a hand)
2. Move the pointer over the image in the main display area.
3. Click and drag the image in a desired direction.

As you drag, the rectangle surrounding the Pan window moves to show which parts of the image in the main display are actively displayed. Notice that the size of the rectangle adjusts to reflect the change. The overall size of the image in the Pan window remains the same, thereby showing the contact's context.

## 2.5.2 The Display-Only Properties Window

This redockable child window contains three independent controls for adjusting an image's brightness, contrast and gamma. These are controls of convenience, not precision. If you slide any of these slider bars, you will notice that there are no numerical values displayed. These slider bars are there so that you can make some quick, temporary and rough changes to the images to get an idea what the effects might be like. For precise changes to your imagery, use the Electronic Light Table function (see 'The Electronic Light Table').

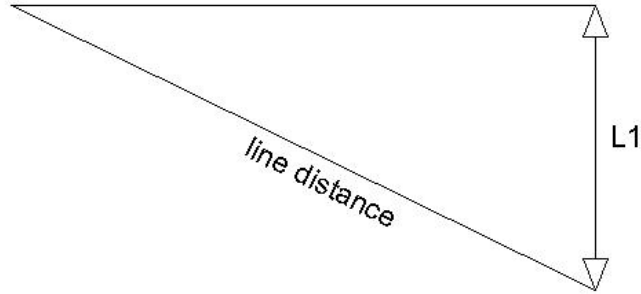
- Brightness, which affects the brightness of the image. Sliding the brightness indicator to the right along the bar increases brightness; sliding it to the left decreases brightness. The midpoint position represents no applied intensity, which is the default.
- Contrast, which affects the dynamic range of the dark and light parts of an image. Sliding the contrast indicator to the right along the bar increases the image's contrast. This results in a larger standard

deviation between the dark and light parts of an image. Sliding the contrast indicator to the left along the bar decreases the image's contrast. This results in a smaller standard deviation between dark and light parts of an image. The midpoint position represents no applied contrast, which is the default.

- Gamma, which is a way of logarithmically compensating for low intensity pixels that may be present in some images. Only low intensity pixels are affected. Sliding the bar to the right increases the gamma index for the image; sliding it to the left decreases it. The midpoint of the scale represents no gamma applied.

Threshold, which acts upon the current contrast setting, can be used to adjust the level of contrast stretching. When the slider control is positioned at the left side of the bar, no thresholding is applied. Maximum thresholding of the contrast is applied when the slider control is at the far right side of the bar.





$$\text{Length} = L1 - \text{Beam Width}$$
$$L.\text{Adj.} = \text{line distance} - \text{Length}$$

**Figure 7. Length Adjust concept and relationship to length and line**

### 3.1.2 Length Rotation

(L Rot.) is the rotation angle of the drawn line. This angle is relative to the horizontal line of the across-track vector. As indicated in Figure 8, angles above the imaginary horizontal line are positive (>0); angles below the imaginary horizontal line are negative (<0). The angle's value is not computed in the bitmap space but is based on real ground distances (that is, the angle value takes into account that the scale is different in the along-track and across-track direction).



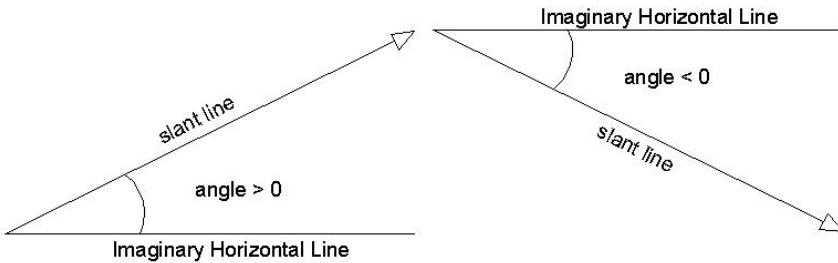


Figure 8. Length Rotation angle sign conventions

### 3.1.3 Beam Width

*(Beam W.) is the width of the beam in ground distance at a specific range. Figure 9 demonstrates the concept.*

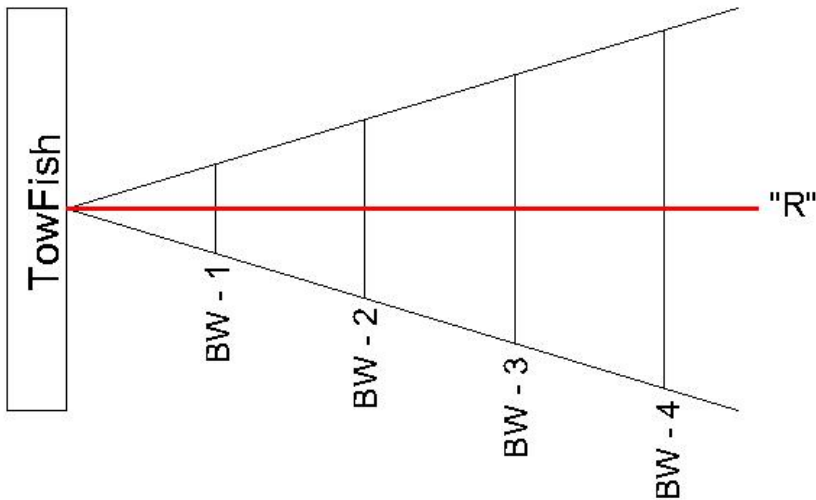


Figure 9. Top view of four beam widths at four arbitrary ranges

### 3.1.4 Number of Pings

(Pings) Number of pings in the Cursor Status Area) traversed by the drawn line.

## 3.2 Width

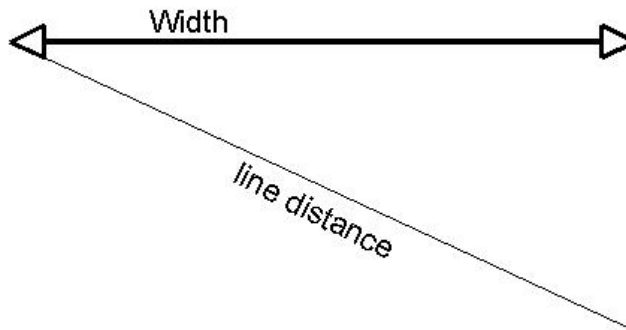


Width is the across-track ground distance between the start and end points of a drawn line. The Measurement Tool's Object Echo function (shown here at the side of the page is used to draw the line.

Two secondary aspects of contact measurement are associated with Width: Width Adjust and Width Rotation. Fields for these secondary aspects are found in TargetPro's Cursor Status Area.

### 3.2.1 Width Adjust

(W. Adj) is the difference between the length of the line and the across-track distance (see below).



$$\text{W. Adj.} = \text{line distance} - \text{Width}$$

**Figure 10. Width Adjust derived from line distance and width**

### 3.2.2 Width Rotation

(W.Rot.) is the rotation angle of the width line relative to a horizontal line.

### 3.3 Height

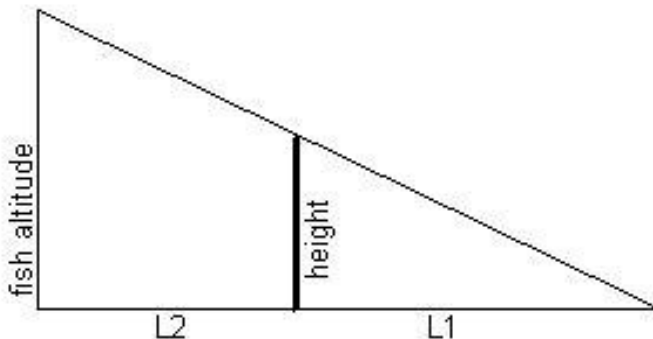


Height is the magnitude to which an object stands above the seabed. The Measurement Tool's Object Shadow function (shown here at the side of the page) is used to draw a line in imagery.

Such objects cast an acoustic shadow on the side facing away from the towfish. The length (or across-track width) of this shadow can be used in combination with the fish altitude and horizontal distance from the fish to derive height information.

The computational method assumes that the target is a thin, vertical object. As such, the height formula is:

$$\text{Height} = \text{FishAlt} * L1 / (L1 + L2)$$



$$\text{Height} = \text{fish altitude} \quad L1 / (L1+L2)$$

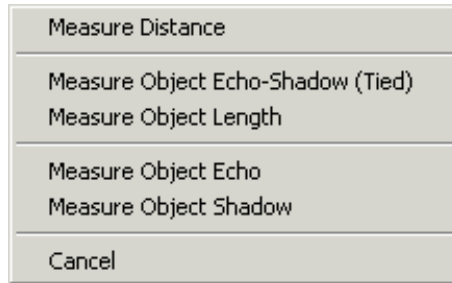
**Figure 11. Height from fish altitude, shadow lengths and distances**

**Note:** The shadow occurs on the left of the contact for a port channel and on the right of the contact for a starboard channel.

A negative range in the Cursor Status window indicates a port-side image, and a positive range indicates a starboard-side image. A separation of the shadow from the contact indicates that the contact is moored (that is, not in contact with the seabed).

### 3.4 General Directions for Object Mensuration

1. Activate Measurement Tool (choose **Tools→Measure** from the main menu or the Measurement Tool icon, pictured on Table 4, 'Group Four: Image Management Icons,' from the taskbar of icons).
2. The system displays a set of mensuration icons on the taskbar, and your pointer changes to a canted arrow with tick marks (hash marks) under it.
3. Choose a mensuration method either by selecting one of the mensuration icons or by right-clicking in your imagery to reveal a menu of mensuration choices as shown in Figure 12. (The left-to-right lineup of mensuration icons corresponds to the top-to-bottom choices in the submenu.)
4. Draw your line by traversing the desired distance or area to be measured, releasing your pointer, and finally left-clicking again to complete the line.



**FIGURE 12. Measurement Tool menu choices (from Tools→Measure)**

A line representing the type of mensuration technique you performed is drawn in your imagery. Reading from left to right in the set of mensuration icons, the color schemes for each type of mensuration line is as follows:

- Measure Distance: red
- Object Echo-Shadow: green
- Object Length: purple (magenta)
- Object Echo: green
- Object Shadow: cyan

At the same time that your measured line appears in the imagery, the metrics for that line appear in a related field of TargetPro's Cursor panel.

The different ways of mensurating with the Measurement Tool are explained next.

### 3.4.1 Measure Distance

Use this method to mensurate a distance in your imagery. A distance can cover any part or all of your imagery in any direction and does not have to start and stop at the boundaries of objects.

**To measure distance in your imagery, do the following:**

1. Activate the Measurement Tool (choose **Tools**→**Measure** from the main menu or the Measurement Tool icon from the taskbar of icons).
2. Choose the Measure Distance method of mensuration.
3. Starting from some visual point of interest, hold down the mouse or trackball button and drag in some direction.
4. As you do, a red line is drawn.
5. Stop dragging and left-click the mouse or trackball again.
6. A red line is completed. The red line is completed. The length of this line is the distance, and is reported in the Grid Dist. field of the Cursor Status window.

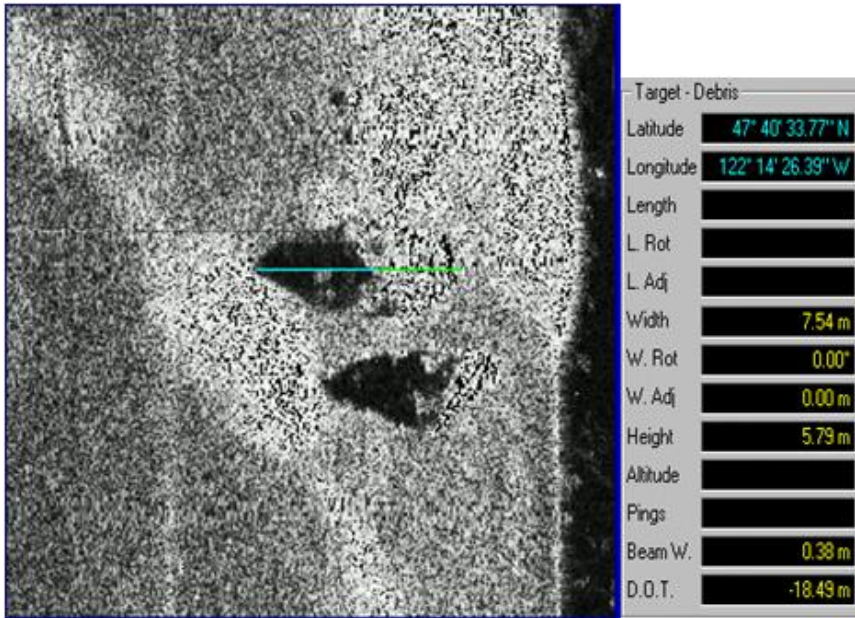
### 3.4.2 Measure Object Echo-Shadow (Tied)

In this method of mensuration the initial ping selection is maintained (held constant) during echo-shadow definition. Also, the end of the measured echo automatically becomes the start of the shadow in this mode.

**To measure an object's echo and shadow together, do the following:**

1. Activate the Measurement Tool (choose **Tools**→**Measure** from the main menu or the Measurement Tool icon from the taskbar of icons).
2. Choose the Measure Object Echo-Shadow (Tied) method of mensuration.
3. Starting from a point on the object closest to the survey vessel's vector, drag your pointer along the object across-track; release your pointer when the drawn line reaches the other side to be measured, where the shadow begins.
4. The system displays a green line across the measured object's echo (width).
5. Continue dragging your pointer in the same direction as you were going in step #3.
6. The system displays a blue line across the measured object's shadow (height).

Figure 13 shows an example of this.



**Figure 13. Measure Object Echo-Shadow (Tied) Example with Data**

In the example, the green line is the object's width (reported as 9.15m in the Width field), and the blue line is the object's shadow (4.42m in the Height field).

### 3.4.3 Measure Object Length

Use this mensuration function to measure a contact's length.

**To measure an object's length, do the following:**

1. Activate the Measurement Tool (choose **Tools**→**Measure** from the main menu or the Measurement Tool icon from the taskbar of icons).
2. Choose the Measure Object Length method of mensuration.
3. Drag your pointer over the contact in the along-track direction. The system draws a magenta line.
4. When you have finished measuring, left-click once to end the line.

A drawn, magenta line is completed. This is the object's length. TargetPro also quantitatively states the contact's length in the Length field of the Target-Debris fields of the Cursor Status window.

### 3.4.4 Measure Object Echo

Use this mensuration function to measure a contact's width.

**To measure a contact's width, do the following:**

1. Activate the Measurement Tool (choose **Tools→Measure** from the main menu or the Measurement Tool icon from the taskbar of icons).
2. Choose the Measure Object Echo method of mensuration.
3. Drag your pointer over the contact in the across-track direction. The system draws a green line.
4. When you have finished measuring, left-click once to end the line. The line drawn is green when completed. TargetPro also quantitatively states the contact's width in the Width field of the Target-Debris portion of the Cursor Status window.

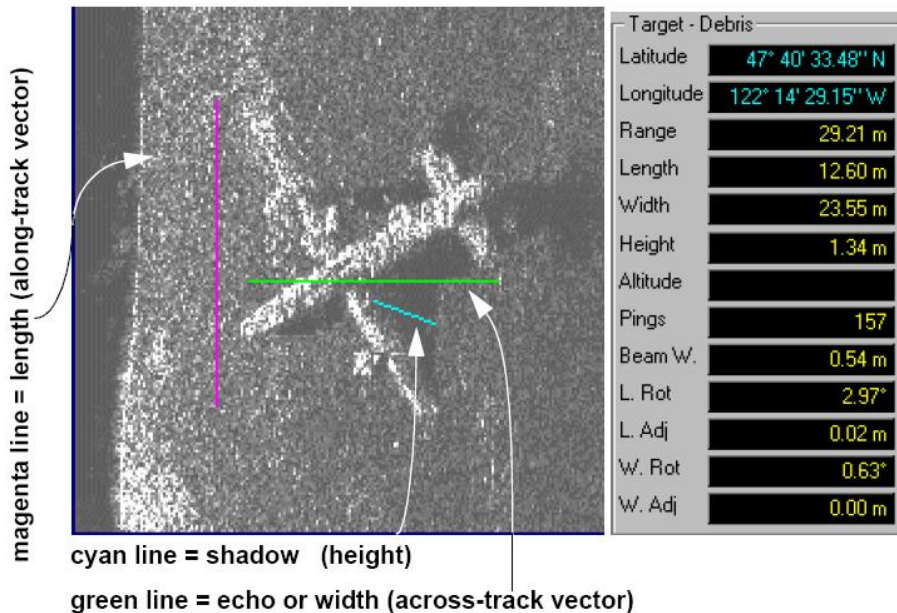
### 3.4.5 Measure Object Shadow

Use this mensuration function to measure an object's shadow or height.

**To measure a contact's shadow, do the following:**

1. Drag across a contact's shadow. The system draws a cyan line.
2. When you have finished measuring, left-click once to end the line. The line drawn is cyan when completed. TargetPro also quantitatively states the contact's height in the Height field of the Target-Debris portion of the Cursor Status window.

A fully mensurated contact might look like the sample shown in Figure 14. The data for that mensurated sample are shown in Figure 14, to show you typical values that can appear in Target-Debris fields of the Cursor Status window.



**Figure 14. Mensuration lines on a contact image with data.**

### 3.5 Object Detection

TargetPro can automatically measure and display objects that may be present in a contact image. To TargetPro, anything with a definable shadow is an object. Measured objects can be displayed but not saved. The automatic aspect of target measurement and region growing is controlled through the Object Measurement on Image Load area of the TargetPro Configuration dialog box. (see 'Configuring to Display Data' for these options.) The manual aspect of target measurement and region growing is controlled through the Object detection on the toolbar.

When you use the object detection from the toolbar, TargetPro finds objects and/or main regions of measured objects one object at a time. Regions are delineated with a box that TargetPro puts around them. Each boxed area is known as a growing region. A growing region symbolically represents that part of a measured object having the potentially densest mass, suggesting an area of interest for the user or operator to explore further.



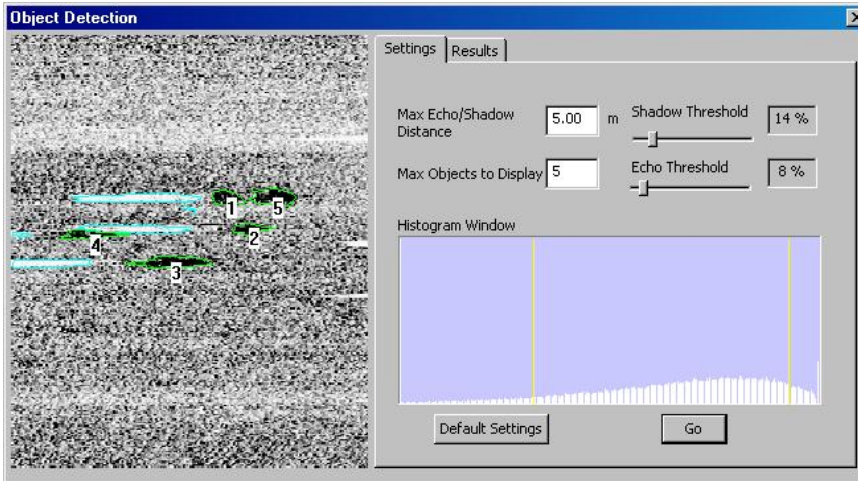
As part of the object/region growing measurement process, TargetPro can be configured to control the degree of sensitivity that you wish TargetPro to use in its search.

Finally, after objects have been measured (with or without growing regions), you can have TargetPro display a list summarizing statistical data of the measured objects. You can also use the choices in this menu to resize (fit) your TargetPro image with respect to the main display area it occupies. Through **View→Fit** you can fit the displayed image to fill the window size, to fill just the window's height, or to fill just the window's width. These functions can also be achieved through icons.

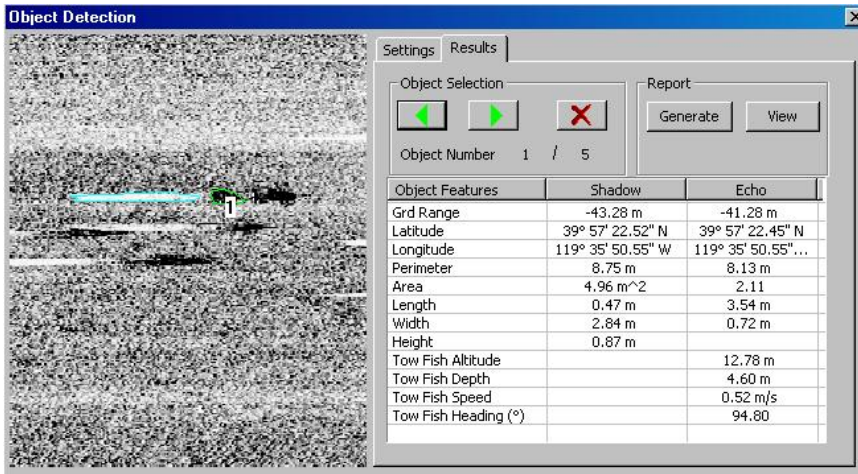
### 3.5.1 Configuring Object Measurement

Before you have TargetPro measure objects, you may want to control the degree of sensitivity TargetPro uses for measuring objects, especially if you anticipate your image will contain many objects. This helps reduce the amount of clutter you may have to look at after objects have been measured.

1. From the toolbar click on the object detection icon. The system displays the Object Detection Window (Figure 15)
2. Make selections on the right according to these definitions:
  - **Radius of Confidence.** The maximum distance between an echo and show. Thus, if the distance from an object to it's corresponding shadow exceeds the radius of confidence then the object will not be detected.
  - **Max Objects to Display.** Sets the maximum number of object that TargetPro to measure in a displayed file. The default setting is 3.
  - **Shadow Threshold.** The percentage of amplitude values below this setting will define which areas are shadows.
  - **Echo Threshold.** The percentage of amplitude values below this setting will define which areas of the image are echo returns.
  - **Histogram Window.** The distribution of amplitude values across the image.



**Figure 15. Object Detection Window, settings and activation (Go).**



**Figure 16. Object Detection Window results and list of individual object properties.**

TargetPro displays all the objects at their locations in the contact image. Objects are outlined in green, shadows are outlined in blue, and one or

more red lines connect the centers of mass of the objects to their shadows. Numbers in the image field indicate the ranking of the objects in the field according to their coefficients of correlation for the measured objects — 1 being the item having the highest coefficient of correlation, and therefore the most likely item in the field to be deemed an object. As the numbers get bigger, the coefficients of correlation decrease. Figures 15 and 16 shows examples of objects measured by TargetPro.