"Sight" Survey 3.0

Integrated
Coordinate Geometry and CAD
for Professional Engineers
and Land Surveyors

Reference Manual

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"Sight" Survey 3.0

Section 1
The Basics

1.01 Introduction

Previous Users of "Sight" Survey

Menu and toolbar changes from "Sight" Survey 2.0 are listed in **Section 1.11** on page 28.

"Sight" Survey is a Windows based coordinate geometry program designed to provide you with simplified methods for solving any commonly encountered coordinate geometry and construction surveying problem.

"Sight" Survey contains several menus and provides numerous monitor prompts and help screens to guide you. You will be capable of running the routines contained in this package without the aid of the manual in a very short time. As each routine runs, all data inputs will be requested by screen prompts. As you enter data, the computer checks the responses for obvious errors, refusing most improper entries. This results in a collection of routines which actually guides you from beginning to end.

1.02 "Site" or "Sight"

We've already been chided about misspelling "Site" as "Sight", but rest assured it's intentional. Why? Because "Sight" Survey is a visual feedback program. Not content to show you a "connect-the-dots" or "not-to-scale" view screen, "Sight" Survey's CAD engine actually presents your work graphically while you calculate your data!

However "Sight" Survey's CAD features are much more than a simple routine to show your computations graphically. The entire package is more like a well-orchestrated harmony of two different programs: COGO and CAD.

Using "Sight" Survey's CAD routines, you may:

- Draw and annotate lines, points, and arcs;
- Set points;

- Select bearings and distances to be used as COGO data entries;
- Set line types, colors, and weights;
- Move, cut, copy and paste graphic elements;
- Place symbols and text;
- Select text fonts and colors;
- Import bitmaps or scanned images such as aerial photos or USGS quadrangles and overlay your computations on them;
- Import and export TrueCAD and AutoCAD drawings, and DXF files;
- Scale your drawing;
- Plot or print your drawing on any Windows compatible device.

1.03 Program Structure

"Sight" Survey is structured into two parts: The actual **"Sight" Survey (COGO/CAD)** section, which contains the routines most commonly used in field traverse programs; and the **Utility** section, which contains routines for the solution of curves, triangles, and slope reductions.

While the program runs in the Coordinate Geometry mode, you are allowed to access the Utility routines without any coordinate data loss.

1.04 What Version Do You Have?

Your "Sight" Survey program may have arrived as a **Demo**, or as a **Fully Functional** version. How can you tell? Well, if you ordered the program directly from Simplicity, and it's been less than 60 days since you received it, it's probably a full version.

It's Instantly Upgradable!

But if it's a demo… The "Sight" Survey program disks are designed to allow you to copy and distribute them to anyone who might be interested in this program. Each and every disk copied, no matter what copy method is used, will be a **Demo** disk. If the user decides to purchase the program, they need only call the Sim-

plicity Sales office at (800) 777-7978 or (218) 773-8917 and we can upgrade their disk to a full working version over the telephone. *Instant software, with no delay for shipping!*

How to Upgrade

To upgrade **"Sight" Survey**, you must first install it. Actual upgrading instructions may be found in Section 2.03.

"Sight" Survey Demo

The **"Sight" Survey Demo** allows access to the entire program. You will be limited to 25 data points and you will not be able to save coordinate files, import drawings, export data or drawings, or use your printer. Other restrictions may apply to the Utility programs.

"Sight" Survey Full

The **"Sight" Survey** program allows access of the entire program with a point capacity of over ***3.5 trillion*** data points! You will also be able to save coordinate files, use your printer, and import and export data and drawings.

1.05 The Reference Manual

This "Sight" Survey manuals are designed to provide information in a clear, convenient format. As you page through the manual sections you will notice that the program's monitor prompts and the names of the routines are shown in **Bold Style Helvetica** letters. All prompts are followed by detailed instructions for each needed response. In cases where the manual indicates a specific response, the response is printed in **`Bold Style Courier`** letters.

The three **Reference Manuals** are organized by sections and include:

Quick Start Manual

Section 1 - "Sight" Survey Basics

This section, which includes a general introduction, reference manual conventions, information regarding entering and leaving routines, terminology, jumping between windows, and using the pull-down menus.

Section 2 - Setup

Contains installation and setup information for this program.

Section 3 - Examples

Contains keystroke by keystroke example solutions for: balancing a closed traverse; balancing an open traverse; and the development of a small subdivision. These examples illustrate the use of the majority of "Sight" Survey's COGO routines.

COGO Reference Manual

Section 4 - Data Entry Basics

Contains information regarding basic and advanced types of data entry, including formats, angular entry, bearing and distance recalls, station entry, point number entry, setting points graphically, and picking data from the drawing for use in data entry.

Section 5 - Windows Everywhere

Contains information on "Sight" Survey's main screen and the three main program windows.

Section 6 - Section 17 COGO Menu Functions

Contains information on "Sight" Survey's COGO commands, as well as information regarding "Sight" Survey's configuration options, and also the Utility programs.

Section 18 - Getting Support

Contains the information you need in the event that you find it necessary to call Simplicity Systems for technical support. Our support hours are listed in this section, as are the numbers for contacting us by phone, fax, or Email.

Section 19 - Troubleshooting

Contains information you may find helpful in the event that you encounter any unexpected problems while running "Sight" Survey.

Drawing Window Reference Manual

Section 20 - The Drawing Window

Contains information regarding the elements of the **Drawing** window, including snaps, jumps, drawing properties, and the **Drawing** window toolbar buttons.

Section 21 - Accurate Placement

Contains information on how to position the cursor accurately in the **Drawing** window, including polar moves, and moves to specific points or coordinates.

Section 22 - Section 30 CAD Menu Functions

Contains information on "Sight" Survey's CAD functions, accessed through the toolbar or

button menus.

Section 31 - Title Blocks

Contains information on constructing, saving, and loading title blocks into "Sight" Survey.

Section 32 - Hatches

Contains information on "Sight" Survey's hatching patterns, and how you may construct your own hatch patterns.

Section 33 - Line Types

Contains information on "Sight" Survey's line types, and how you may program your own custom line types.

The display illustrations shown throughout this manual may differ slightly from your actual displays. Screen captures for the manual were made while running Windows 95 and Windows 98. Also, "Sight" Survey was installed to drive E.

Three Manuals

As previously stated, the Reference Manuals consist of three volumes. The first book, **Quick Start**, contains Sections 1-3. The second book, the **COGO Reference Manual**, contains Sections 4-19. The third book, the **Drawing Window Reference Manual**, contains Sections 20-33.

Each manual contains a **Table of Contents**, and an **Index** encompassing all three volumes.

1.06 Response Terminology

Throughout this manual, you will see a variety of instructions for answering all of the various types of prompts. Some prompts will require a **YES** or **NO** answer, while others will be accompanied by instructions to **ENTER** your response. Still others will contain instructions for you to **PRESS** a key (either on the keyboard or with your mouse) in response to a given prompt. In an effort to simplify your operation of this program, the following guidelines apply to all the prompt responses for all "Sight" Survey routines.

ENTER vs. PRESS

When you encounter an instruction which requires you to **ENTER** data, the program expects you to press ↵Enter after the data has been entered. When you encounter the word **PRESS**, the program is indicating that it is expecting a single key press, or a series of key presses, in response. In these cases, do not press ↵Enter after your response.

Mouse Clicks

Since "Sight" Survey is a Windows program, you can expect to see a number of references to your mouse. It used to be possible to say "click" or "right-click" your mouse button and everyone knew that "click" meant the main mouse button, located directly under your index finger on your right hand. Now that a mouse may come with left hand configurations or software for configuring a right-hand mouse as left handed, "click" takes on a slightly altered meaning, no longer referring to the left button, but simply the main mouse button, still located under your index finger. (Unless you are using a right handed mouse configuration with your left hand.)

When you are asked to click your mouse, click once on the main mouse button, located under your index finger. Right-click means to click once on the secondary mouse button. "Double-click" simply means two clicks in rapid succession.

YES or NO

This type of prompt requires only that you press Y to answer in the affirmative, or N to answer in the negative.

You may also use your mouse to answer "Yes or No" questions. To answer **Yes**, click on the Yes button. To answer **No**, click on the No button.

Keyboard Responses

In this manual you will occasionally see K E Y C A P responses which indicate that you should press the key or keys shown. When you see keycaps shown in combination (but not with an ↵Enter key) such as Alt E, press the first key and hold it down while pressing the second key.

In most cases, pull-down menu items may also be selected from the keyboard. This type of selection will be depicted in some form of this manner: Alt F, O or Alt F, I, D. To respond to this type of entry, press the first key and hold it down while pressing the second key, then release the keys and press the next key (or keys) in succession. ***DO NOT press the , key.***

When a combination includes an ↵Enter key, such as E ↵Enter, press and release the keys shown in succession.

Even though the key presses and responses within this manual may be shown in capital letters, lower case data entry is acceptable.

Button Responses

You will also see graphic representations of Windows response buttons, such as [Accept]. Activate a response button in one of two ways: either by clicking your mouse on the button, or (in this example) by pressing Alt A, ↵Enter, where the letter following the Alt key corresponds to the underlined letter on the button.

Accessing Menus

Menus are accessed using the keyboard or your mouse. To access any of the menus, either click on the menu name or press (for example) Alt F, where the letter following the Alt key corresponds to the underlined letter on the menu name. In this case, the **File** menu would have been opened.

Once a menu has been opened and you are presented with a list of routines, simply click on a routine or press the letter corresponding to the underlined letter in the routine name.

If you see a menu item with a right arrow (⌐) on the right end of the line, selecting that item or simply using your mouse to move the highlight bar over the item will result in the opening of a sub-menu. Select items from any sub-menu in the same manner as you would select an item from a main menu.

Depicting Menus in the Manual

In this manual, menus and sub-menus are depicted in the following manner: **Menu** ➪ **Sub-menu 1** ➪ **Sub-menu 2**.

The manual uses the symbol ➪ to indicate items in a menu structure. For example, the function **Get an Arc** is on the **CAD to COGO** sub-menu of the **Draw** menu. To get to this function you select the **Draw** menu (with your mouse or by pressing Alt D), then the **CAD to COGO** item (with your mouse or by pressing G). Finally you would select the **Get an Arc** function (with your mouse or by pressing A). In the manual, the location of the function is shown as: **Draw** ➪ **CAD to COGO** ➪ **Get an Arc**.

1.07 Message Icons

Throughout the manual, you will see various messages preceded by a message icon. The icons are:

WARNING

NOTE

HINT

REFER TO

IMPORTANT NOTE

SHORTCUT

1.08 Routine Codes & Keyboard Shortcuts

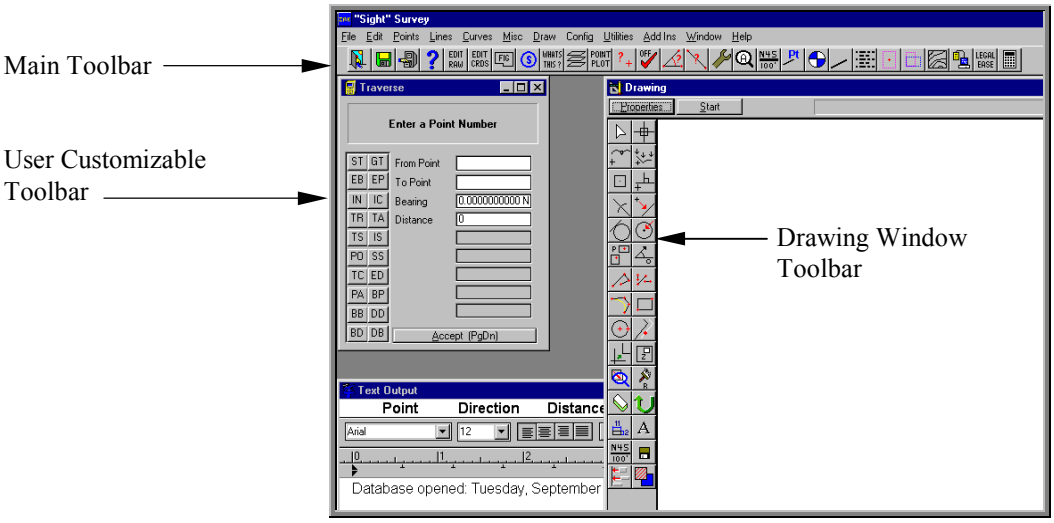
If you've ever used a Simplicity Systems COGO program before, you're probably very familiar with our two letter routine codes. While most all of the routine codes we've used in the past have been retained, a few have been altered, and more have been added. In addition, the Windows menu system adds a considerable number of keyboard shortcuts. Of course you may always use your mouse , but if you can rember the keyboard shortcuts and routine codes you

will be able to operate "Sight" Survey faster than navigating with the mouse alone.

Where routine codes are available for a particular function, the codes are indicated next to the menu item for that function. Routine codes are also listed in the manual discussion for each individual function.

1.09 Toolbars

Throughout this manual, you will see instructions to click on toolbar icons. It is important that you know where to find the referenced toolbar. "Sight Survey" has three toolbars: the **Main** toolbar, a horizontal bar running along the top of the screen; the **Drawing** window toolbar, a vertical bar on the left side of the **Drawing** window; and the **User Customizable** toolbar, in the **Data Entry** window. The toolbar locations are shown below:



Depending upon your screen resolution setting, the **Drawing** window toolbar may be formatted in one, two, or three columns.

1.10 Read Me Files

Quite often, software manufacturers will place a file on their disk(s) which contains information regarding software version updates and features not described in the manual. These files are typically named **ReadMe.Txt**, **ReadMe.Doc** or just **Read.Me**. It's a good idea to always directory your software to determine if the disk contains a "**Read Me**" file.

The easiest way to read a "**Read Me**" file is to load the file into the **Notepad** or **Write** program in Windows 3.1, or into the **Wordpad** program in Windows 95/98. From any of these programs, you can scroll through "**Read Me**" files or print them to have a paper copy.

1.11 Changes from "Sight" Survey 2.0

"Now where did that go?"

As we incorporated new buttons and menus into "Sight" Survey, it became inevitable that we had to move some things around. We tried to keep changes to a minimum, and we tried to make only changes that seemed logical. For example, a number of drawing related items were moved from the pull-down menus to the new CAD menus. Makes sense, right? But it still may be aggravating when you can't find what you are looking for.

If you didn't use the menus, instead relying on keyboard shortcuts and routine codes, you're in luck! We didn't change the shortcuts.

As for menu items and toolbar buttons… well, that's a different story. Here is your guide to "Sight" Survey's changes:

The **File** menu:

New becomes **New Job**

Open becomes **Open Job**

Save becomes **Save Job**

Save As becomes **Save Job As**

Save Settings has moved to **Start** ➪**File** ➪**Save Settings**

Import ➪**Drawing** has moved to **Start** ➪**File** ➪**Load Drawing**
This routine will import an AutoCAD **.dwg** or **.dxf** file.

Export ➪**Drawing** has moved to **Start** ➪**File** ➪**Save Drawing As**
This routine will export a drawing to the AutoCAD **.dwg** or **.dxf** format. To save a drawing as a .dwg or .dxf format, you must select the appropriate file type from the **Save file as type** selection box in the lower left of the **Save** dialog box, and then type in filename with the desired filename extension.

Import ➪**Bitmap** has moved to **Start** ➪**File** ➪**Import Bitmap**

Import ➪**Title Block** has moved to **Start** ➪**File** ➪**Load Title Block**

Export ➪**Title Block** is replaced by **Start** ➪**File** ➪**Save Drawing**

Repair Drawing has moved to **Start** ➪**File** ➪ **Repair Drawing File**

The **Edit** menu: The **Edit** menu items are unchanged.

The **Points** menu: The **Points** menu items are unchanged.

The **Lines** menu: The **Lines** menu items are unchanged.

The **Curves** menu: The **Curves** menu items are unchanged.

The **Misc** menu: The **Balance Traverse** sub-menu, along with sub-items: **Traverse Closure (TC)**; **Adjust Traverse (AT)**; and **Re-Run Adjusted Traverse** has been deleted since balancing is a part of **Traverse Closure**. The two-letter commands still work.

Label an Arc (AL) has been renamed **Label an Angle** and has moved to the **Draw** menu. The two-letter command is still **AL**.

LegalEase has been moved to the **Add Ins** menu.

The **Draw** menu: **Edit** ➪**Selection Filter** has moved to **Start** ➪**Edit** ➪**Selection Filters**

Edit ➪**Cut** has moved to **Start** ➪**Edit** ➪**Cut**

Edit ➪**Copy** has moved to **Start** ➪**Edit** ➪**Copy**

Edit ➪**Paste** has moved to **Start** ➪**Edit** ➪**Paste**

Edit ➪Delete has moved to **Start ➪Edit ➪Delete**

Edit ➪Change Text Properties (XT) has moved to
Start ➪Settings ➪Set Text Defaults

Edit ➪Change Line Properties (XL) has moved to
Start ➪Settings ➪Line Defaults

Edit ➪Move Objects to New Layer (XY) has moved to
Start ➪Modify ➪Move Selected to New Layer

Edit ➪Edit Layers (EL) has moved to
Start ➪Settings ➪Layer Control

Point/Symbol (PS) has moved to **Start ➪Draw ➪Symbol**

Line (LI) has moved to **Start ➪Draw ➪Line (Chained)**

Circle (DC) has moved to **Start ➪Draw ➪Circle**

Arc (AC) has moved to **Start ➪Draw ➪Arc 3 Point**

Rectangle (DR) has moved to **Start ➪Draw ➪Rectangle**

Random Curve (RC) has moved to **Start ➪Draw ➪Cubic Spline**

Text (TL) has moved to **Start ➪Annotate ➪Text Line Entry**

Break Line (BL) has moved to **Start ➪Modify ➪Divide/Extend**

Leader Line & Arrow Create (AW) has moved to
Start ➪Annotate ➪Add Arrow

Leader Line & Arrow Setup (XA) has moved to
Start ➪Settings ➪Set Arrow Defaults

Parallel Lines Parallel to Selection (DP) has moved to
Start ➪Draw ➪Parallel Line

Parallel Lines Around a Perimeter (PU) has moved to
Start ➪Draw ➪ Around a Perimeter

Query Entity has moved to **Start ➪Tools ➪ Query Entity**

Zooms ➪Zoom All (ZA) has moved to **Start ➪View ➪Zoom All**

Zooms ➪Zoom Last (ZL) has moved to **Start ➪View ➪Zoom Last**

Zooms ➪Zoom Window (ZW) has moved to
Start ➪View ➪Zoom Window

Zooms ➪Zoom Page (ZP) has changed to
Start ➪View ➪Zoom Sheet (ZS) (Note: **ZP** still works)

Zooms ➪**Magnify (MG)** has moved to **Start** ➪**View** ➪**Magnify**

Zooms ➪**Demagnify (DM)** has moved to **Start** ➪**View** ➪**Demagnify**

Center Paper has moved to **Start** ➪**Settings** ➪**Re-Center Paper**

Redraw (RD) has moved to **Start** ➪**View** ➪**Redraw**

Cancel/Done has been eliminated

The **Config** menu:

Drawing Configuration Menu has changed to **CAD Configuration Menu**

Properties has moved to the Properties (PR) button at the top of the **Drawing** window

Conversion Settings (XG) have moved to **Start** ➪**Settings** ➪**DXF/DWG Conversion**

CAD Paper in Landscape Orientation has moved to the **Draw** menu

The **Utilities** menu:

The **Utilities** menu items are unchanged.

The **Add Ins** menu:

Make Contour Lines has been renamed **Contour It!**

LegalEase has been moved here from the **Misc** menu

Transfer Record (Landmark) has been deleted due to a change in their program format.

The **Window** menu:

Default Arrangement #1 has been replaced by **User Arrangement #1**

Default Arrangement #2 has been replaced by **User Arrangement #2**

Main Toolbar Buttons

Many of the **Main** toolbar buttons have been enhanced to include right-click functions. The new button functions are described in **Section 13.11**.

The following buttons have been moved to the **Drawing** window toolbar: **Delete**; **Undo**; **Redo** (right-click the **Undo** button); **Zoom Page** (right-click the **Redraw** button); **Zoom All** (right-click the **Zoom Menu** button); **Zoom Window**; and **Redraw**. Additionally, the **Properties** toolbar button has been replaced by the Properties (PR) button at the top of the **Drawing** window.

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"Sight" Survey 3.0

Section 2
Setup

2.01 Minimum System Configuration

To function effectively, "Sight" Survey must run on a computer capable of running Windows 95/98 or NT.

Required Items:

1. Windows 95/98/NT;
2. 64 Mb of RAM;
3. One 3½" high-density floppy drive (or CD-ROM drive);
4. A hard drive with at least 10 Mb of free space;
5. A VGA (or higher resolution) display adapter;
6. A mouse, or compatible pointing device.

Optional Hardware:

7. A dot matrix or laser printer;
8. A plotter.

2.02 Do You Need A Site License?

Your purchase of "Sight" Survey is nothing more than a license to run the "Sight" Survey program on a single computer. You may need an additional site license if you plan to:

- ❒ Install "Sight" Survey on more than one computer at your place of business;
- ❒ Install "Sight" Survey on a home computer;
- ❒ Install "Sight" Survey on a field computer;
- ❒ Install "Sight" Survey on a network computer or server;
- ❒ Have "Sight" Survey available at temporary field office sites within your company.

The best rule to follow is: ***If there is any probability that a single copy of "Sight" Survey will be running on more than one computer at a time, an additional site license is required!***

The "Transportable" License

Realizing that you may not always perform your job entirely in the office, the "Sight" Survey license is a "Transportable" license which allows you to copy the "Sight" Survey program to your home computer and use it there for no additional fee, provided that "Sight" Survey is used in accordance with the copyright. In other words, you may use "Sight" Survey under the "Transportable" license only when you are certain that no other licensed copies of "Sight" Survey are running at the same time.

If the "Sight" Survey license was originally purchased by a Company, and the Company has multiple owners, the license extends to one owner only. The Company must purchase site licenses in order for additional owners and/or their employees to have a legal copy of "Sight" Survey on their home computers. The purchasing Company retains ownership of ALL licenses of the programs.

The "Transportable" license may also be used to allow "Sight" Survey to be loaded on a portable field computer instead of, *or in addition to*, a single home computer, *if the user can guarantee that only a single copy of "Sight" Survey is running at a time.*

Multiple Office Installations

The "Sight" Survey license covers only a single site, i.e. building or address. ***If you have multiple locations, each location is expected to purchase their first license at full cost,*** with subsequent purchases for each location in accordance with the established site licensing fees.

Network Installations

If "Sight" Survey is loaded on a *network* computer, either a server or a node, a site license may be needed. If the network administrator limits access to "Sight" Survey to a single user at any one time, a site license is not needed. However, if "Sight" Survey is available to more than one networked computer at a time, at least one additional site license is required. The number of site licenses required is based on the number of computers likely to be using "Sight" Survey *concurrently*, not necessarily the total number of computers on the network.

Site Licensing Fees

A site license granting you permission to make an additional copy of this software and manual is available at a cost of approximately ***50% of the full version price***, ***per computer licensed***. An extra manual and disks may be purchased at an additional cost. Prices are subject to change without notice. Call for verification.

2.03 Installation

"Sight" Survey may only be installed to a hard disk containing at least 10Mb of free space. To install "Sight" Survey, you must begin by loading Microsoft Windows. To simplify the installation instructions, we will assume that you are logged to drive **C:\>** and your floppy disk is drive **A:\>**.

Step 1.

Place the **"Sight" Survey Disk 1** into your floppy drive.

For Windows 95/98/NT users, use your mouse to select **Start** ➪ **Run** (or press Alt S, R) and type **A:SETUP** ↵Enter.

USING THE MICROSOFT INTELLIMOUSE

If you are installing "Sight" Survey on a computer equipped with the Microsoft Intellimouse (the mouse with a wheel) you may have to disable the mouse driver during the installation. The mouse driver may conflict with the installation program and may cause the program to hang. Once installed, "Sight" Survey will run just fine with the Intellimouse.

To disable the Intellimouse, press Ctrl Alt Delete *In the* **Close Program** *window that appears, click on* **MSWheel** *and then click the* ***End Task*** *button.*

Reboot your computer after installing "Sight" Survey and your Intellimouse will once again be running normally.

If you are installing "Sight" Survey from a CD-ROM, simply insert the CD into the drive, and the startup program will run automatically.

Step 2. Follow the installation instructions that appear on your display. We strongly recommend that you accept the default directory structure, (but not necessarily the disk drive), presented in the installation program.

Step 3. After the installation is complete, store the original "Sight" Survey disks in a safe place.

Step 4. After you've finished the installation procedure, your computer will automatically create a Simplicity Systems program group containing the "Sight" Survey program and the Utility programs.

Step 5. View the original ***"Sight" Survey Last Minute Changes*** file by clicking on the icon in the Simplicity Systems group.

2.04 Starting "Sight" Survey

You may start "Sight" Survey in a wide variety of ways, just as you may for any Windows program. This manual will touch on the most common start-up methods for both Windows 3.1 and Windows 95/98/NT.

Windows 95/98/NT

Start **Button Method:** Click on the Windows Start button. Point to **Programs**. After a moment, the **Program List** appears. Point to **Simplicity Systems**. After a moment, the **Simplicity Systems Program Group List** appears. Point to **"Sight" Survey 3** and click your mouse once.

Shortcut Method: First you must create a shortcut for ***"Sight" Survey***.

If you wish to create a shortcut on your **Desktop** for ***"Sight" Survey*** we recommend that you do it immediately after installing the program, while the **Simplicity Systems Program Folder** is displayed on the screen.

Click and hold the right mouse botton on the "***Sight" Survey*** 3.0 icon while you drag it to the **Desktop**. Release the mouse button when the icon is over the **Desktop**, and select **Create Shortcut(s) Here**. You may now use the mouse to drag shortcut to a convenient location on the **Desktop**. If you would like to create icon later please use the following instructions.

? *If you are not familiar with the Windows Desktop and the Windows Explorer, please consult your Windows documentation for instructions before attempting this procedure.*

1. Click on the Windows Start button. Point to **Programs**. After a moment, the **Program List** appears. Point to **Windows Explorer** and click your mouse once.

2. Use the **Explorer** to move to the folder containing the ***"Sight" Survey*** program. This folder will usually be named **SightSrv**, unless you change it during "Sight" Survey's installation.

3. To create a shortcut to ***"Sight" Survey,*** simply click and hold your right mouse button on the file **SightSrv.Exe** and drag the item from the **Explorer** to the **Desktop**.

4. When you release the mouse button, the shortcut to ***"Sight" Survey*** will be located on the **Desktop**. Close the **Explorer**. You may now use your mouse to drag the shortcut icon to a convenient location on the **Desktop**.

5. To launch "Sight" Survey from the shortcut icon, double-click your mouse on the icon.

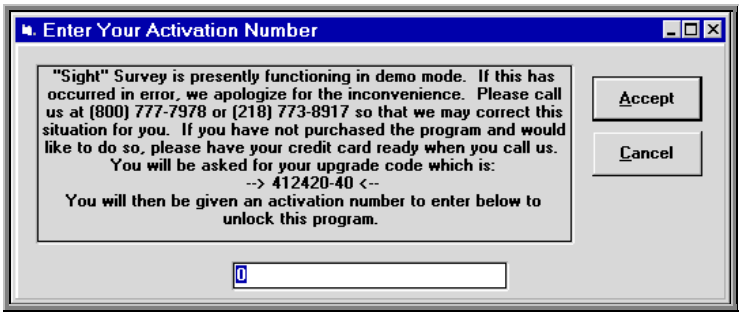
Keyboard Method: Press Alt S, R to open the **Start** ➪ **Run** dialog window. Type `C:\SightSrv\SightSrv` into the file-name box and press Enter. (If necessary, change the drive letter and directory name to match your installation.)

2.05 Product Registration

If "Sight" Survey has been installed as a demo, you'll need to go through the upgrade procedure to realize the full potential of "Sight" Survey. Upgrading is a fast, easy procedure that begins by selecting the **Check Registration** item under the **Config** menu. To select this item, use your mouse or press Alt G, C, C, ↵Enter. If you access the **Config** menu and you don't see a **Check Registration** item, it simply means that your copy of "Sight" Survey has already been registered.

You will be asked to provide or verify your name, company name, address and telephone number. This information, or at least portions of it, must be provided or the registration program will fail. The information provided is used in two places. Your name and/or company name will automatically appear on your job printouts, but more importantly, the information entered is used to prepare your product registration form for you. Once you have entered and/or verified your data, click on Accept, or press Alt A. You will be asked if your data is correct. If it is, click Yes, otherwise click No.

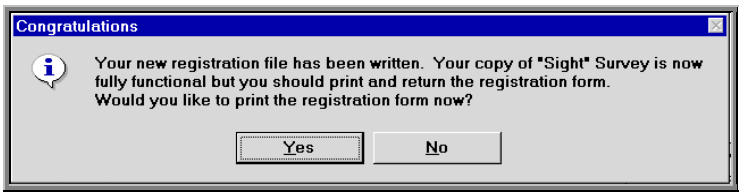
If your copy of "Sight" Survey is a demo version, you will see the **Activation Number** screen.



Call Simplicity Systems at (800) 777-7978 or (218) 773-8917 and report your upgrade code number which is shown in the dialog box. If you have not yet paid for your purchase, you will also be asked for a credit card number. You will then be given an Activation Number to enter in the data field at the bottom of the dialog

box. Once you have typed the number, click on Accept, or press Alt A, or just press ↵Enter.

If your upgrade attempt is successful, you will see the screen shown below.



At this point, we strongly suggest that you print the registration form, sign it, fold it, stamp it and mail it in. It's a quick and simple task that you are strongly urged to complete.

Product registration is important for many reasons. It provides us with updated information so that we may contact you with upgrade information, etc. ***But perhaps most important is that we will not provide support for unregistered software***.

2.06 Un-Installing "Sight" Survey

"Sight" Survey may be easily uninstalled from your computer by running the ***"Sight" Survey Setup*** program from the Simplicity Systems menu. Run the setup program and select the **Un-Install "Sight" Survey** option.

When you uninstall "Sight" Survey, your registration is written to a floppy disk for reinstallation at a later time. You will be prompted to insert a "Sight" Survey program disk at the appropriate time.

If you need to move "Sight" Survey from one computer to another, uninstall the program to the original disk set, and then re-install it on the new computer. If "Sight" Survey was properly removed, it will re-install as a full working copy. You should not have to call Simplicity for a new unlocking number.

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"Sight" Survey 3.0

Section 3
Examples

The following examples will acquaint you with "Sight" Survey features that are shared among most procedures. They serve only to demonstrate certain procedures, and are not intended to demonstrate the most efficient means of using "Sight" Survey. The knowledge you gain by working through these examples should enable you to easily manipulate all of the "Sight" Survey routines. All routines used herein have been listed in the **Routine Index** at the end of this section.

Each example is accompanied by an illustration indicating the point numbering and known data used in the problem.

Operational Note:

Throughout the examples, the instructions tell you to click on the Properties (PR) button to open and close the **Properties** window. The **Properties** window doesn't actually get closed, it simply gets moved to the background behind any other displayed windows. If the

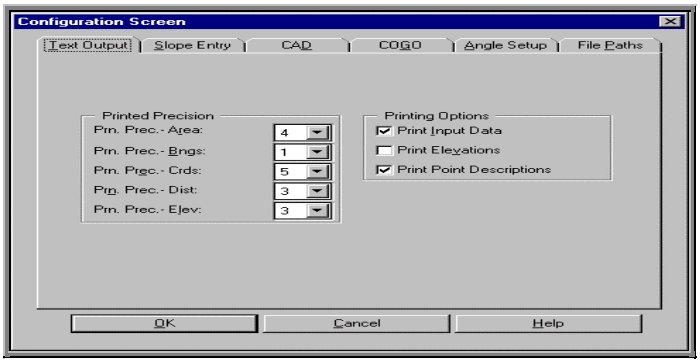
Properties window is located on the screen such that another window does not overlap it, then when you click the Properties (PR) button, the window will not disappear, it will simply no longer be the "active" window.

3.01 Example 1: Closed Traverse

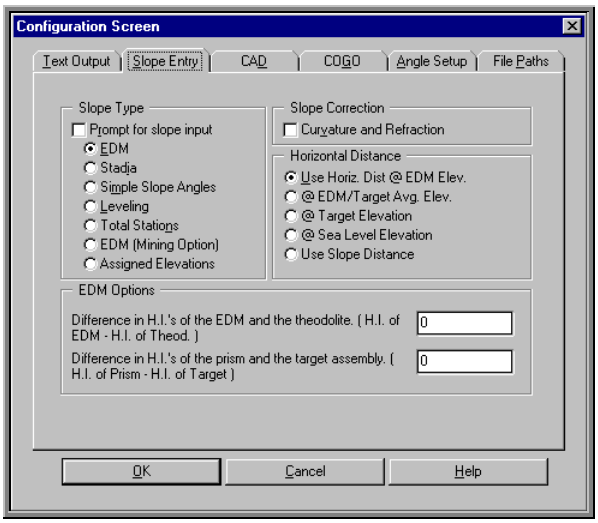
This example sets traverse points using the **Enter & Assign** (**EA**) and **Traverse** (**TR**) routines. All distances used for the purpose of corner establishment are horizontal.

Begin by loading the "Sight" Survey program.

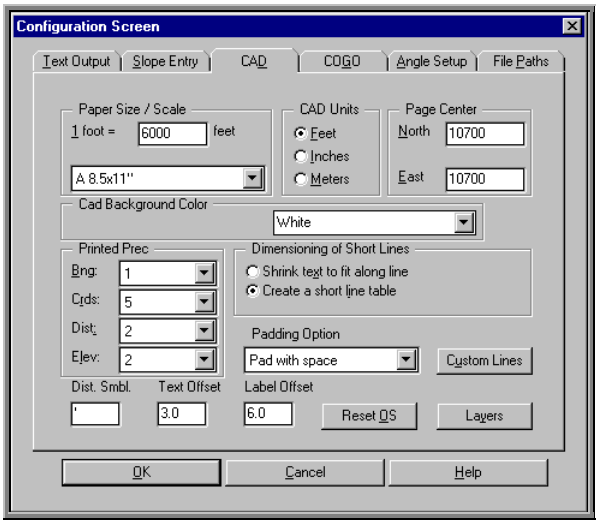
PROMPT	RESPONSE / NOTES / ETC.
Traverse: **From Point**	When the "Sight" Survey program appears, press Alt G, T to access the **Text Output Configuration Menu**. In order for your prompts and printed output to follow this manual, you must set your configuration options to match the following menu screens before running the rest of this example.



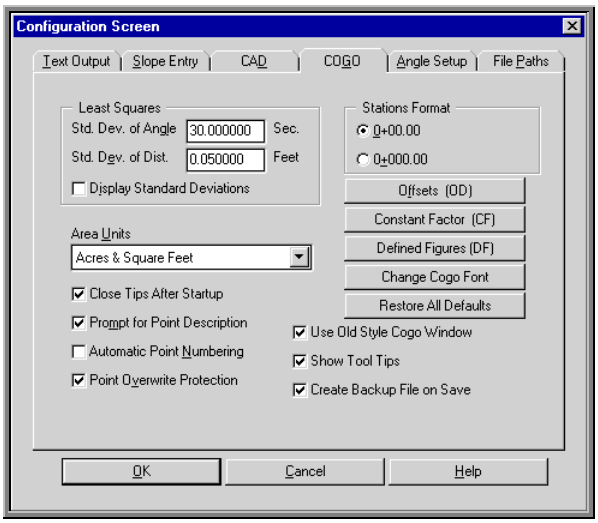
After setting your **Text Output** configuration, press Alt S to access the **Slope Entry Configuration Menu**.



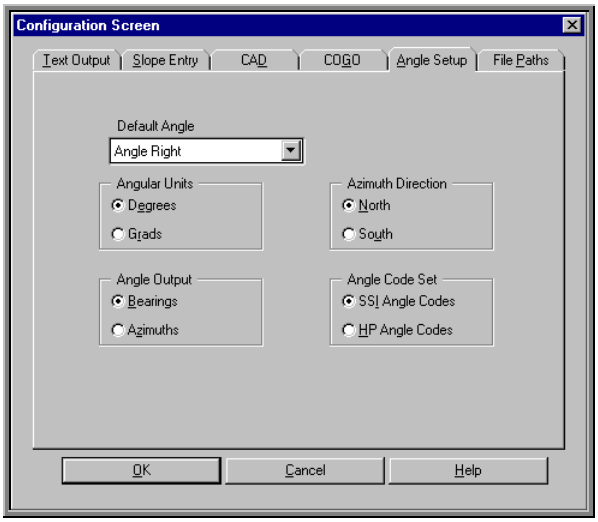
After setting your **Slope Entry** configuration, press Alt D to access the **CAD Configuration Menu**.



After setting your **CAD** configuration, press Alt G to access the **COGO Configuration Menu**.



After setting your **COGO** configuration, press Alt A to access the **Angle Setup Configuration Menu**.



When all of the items have been set to match the screens shown, press Enter or click on OK to accept the changes and return to the main "Sight" Survey program screen. (On the **Angle Setup** screen, your **Default Angle** **must** be set to `Angle Right`.)

PROMPT	RESPONSE / NOTES / ETC.

Traverse:
From Point

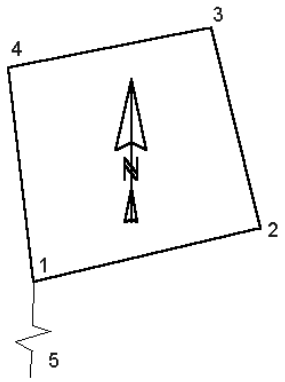
When the main "Sight" Survey program screen appears, click the **Drawing** window Properties (PR) button to display the **Properties**.

Properties

Many drawing **Properties** may be set however you wish, however, if you will be sending your drawing to a **plotter**, the **Text Font** that you choose should be a **plotter** font such as `Roman`. In addition, please set the following items as specified below.

Line Type	`Continuous`
Label Type	`Point Number`
End Point Symbol	`Dot`
Text Placement	`Dist / Bng`
Text Size	`10`

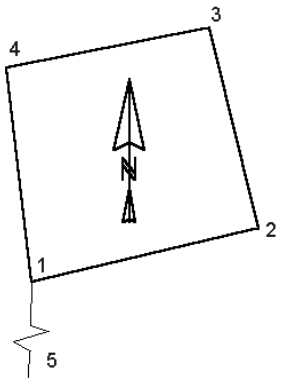
COGO Drawing Properties	
Object Color	14 - Black
LineType	Continuous
Line Width	01
Label Type	Point Number
Label Place	Quad #1
Label Angle	+0° - Horizontal
End Pt. Sym	Dot
Text Place	Dist / Bng
Text Font	Arial
Text Size	10
Text Color	08 - Blue
Text Bold	No
Text Italic	No
Text Underline	No
Text Strikeout	No
Symbols Lyr	SYMBOLS
Coords. Lyr	COORDINATES
Coord. List Lyr	COORDLIST
Elevations Lyr	ELEVATIONS
ASCII File Lyr	ASCIITEXT
Line Lyr	LINES
Pt. Name Lyr	PTNAMES
Pt. Number Lyr	PTNUMBERS
Points Lyr	POINTS
Sup. Table Lyr	SUPTABLES
Line Annot Lyr	LINETEXT
Station Lyr	STATIONS



Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

PROMPT	RESPONSE / NOTES / ETC.
	Click Properties (PR) to deselect the **Properties** window.
Traverse:	
From Point	Click on the **Text Output Window** to bring it back into view. Now, press Esc to activate the **Traverse** entry window, and then type **EA** to select the **Enter & Assign** routine.
Enter & Assign:	
Point #	Type `5` Enter to set the point number.
Northing	Type `8000` Enter.
Easting	Type `9997.57399` Enter.
Elevation	Press Enter.
Description	Type `Initial Backsight` Enter.
Enter & Assign:	
Point #	Type `1` Enter to set the point number.
Northing	Type `10000` Enter.
Easting	Type `10000` Enter.
Elevation	Press Enter.
Description	Type `SW Corner` Enter.
Enter & Assign:	
Point #	Type **IN** to select the **Inverse** routine.

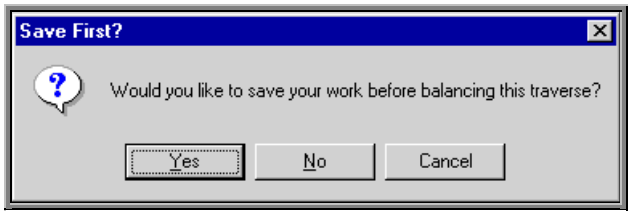


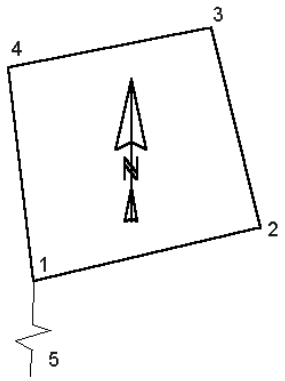
Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

PROMPT	RESPONSE / NOTES / ETC.
Inverse:	
From Point	**1** (By default).
To Point	Press ↑ to access the **From Point** prompt.
From Point	Type **5** Enter to set the occupied point.
To Point	Type **1** Enter to set the reference/backsight bearing.
Inverse:	
From Point	**1** (By default).
To Point	Type **ST** to select the **Start At** routine.
Start At Point:	
Point #	Press Enter to set the occupied point (1) as the starting point, and to clear the **Area Sum** and **Traverse Length** accumulators.
Traverse:	
From Point	**1** (By default).
To Point	Type **2** Enter to set the point number.
Bearing	Type **253** Enter to enter an angle right of 253° 00' 00".
Distance	Type **2359.24** Enter to enter the horizontal distance.
Description for Pt. 2	Type **SE Corner** Enter.
Traverse:	
From Point	**2** (By default).
To Point	Type **3** Enter to set the point number.
Bearing	Type **95.4757** Enter to enter an angle right of 95° 47' 57".

PROMPT	RESPONSE / NOTES / ETC.
Distance	Type **2559.01** ↵Enter to enter the horizontal distance.
Description for Pt. 3	Press Home Delete N ↵Enter to edit the default (last used) description to read **NE Corner** ↵Enter. (If you wish, just type **NE Corn**
Traverse:	
From Point	**3** (By default).
To Point	Type **4** ↵Enter to set the point number.
Bearing	Type **87.0909** ↵Enter to enter an angle right of 87° 09' 09".
Distance	Type **2078.42** ↵Enter to enter the horizontal distance.
Description for Pt. 4	Press Home → Delete W ↵Enter to edit the default (last used) description to read **NW Corner** ↵Enter.
Traverse:	
From Point	**4** (By default).
To Point	Type **TC** to select the **Traverse Closure** routine.
Traverse Close:	
From Point	**4** (By default).
Close to	Type **1** ↵Enter to set the closing point of the closed traverse.
Bearing	Type **88.3536** ↵Enter to enter an angle right of 88° 35' 36". ***Note: We are entering an erroneous angle on purpose, in order to illustrate the traverse editing feature.***
Distance	Type **2707.94** ↵Enter to enter the horizontal distance.
Enter closing ANGLE RIGHT at Pt. 1	
backsighting Pt. 4	
foresighting Pt. 2	
Press <Enter> if unknown	Type **78.2706** ↵Enter to enter an angle right of 78° 27' 06".

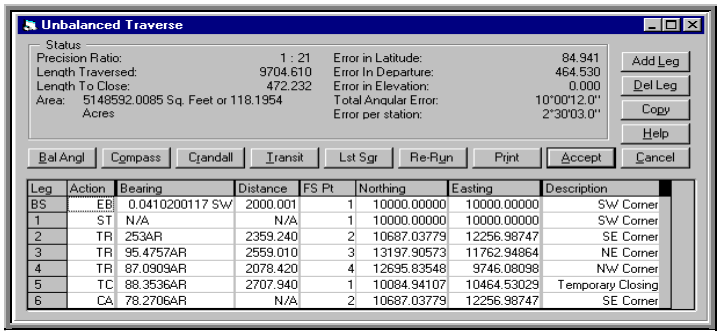




Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

PROMPT	RESPONSE / NOTES / ETC.
	Press [Y] or click [Yes] to save this job before proceeding with the traverse adjustment. *(Up to this point, your data has been saved in a temporary file called* **COGO.ZAK***. The* **COGO.ZAK** *file is used to store COGO data until the job is saved to a different file name, or until a new or different job is opened.)*
Save Job As **File Name:**	Type **`CloseTrv`** [↵Enter]. "Sight" Survey will save your file and display the **Unbalanced Traverse** window showing the current traverse statistics and your raw traverse data. The Northing and Easting of the calculated closing point, closure bearing, and distance have also been printed in the **Text Output** window.
Unbalanced Traverse	**Calculated Closing Point** **10084.94107** **10464.53029** **TC S 79°38'15.8" W** **472.232**

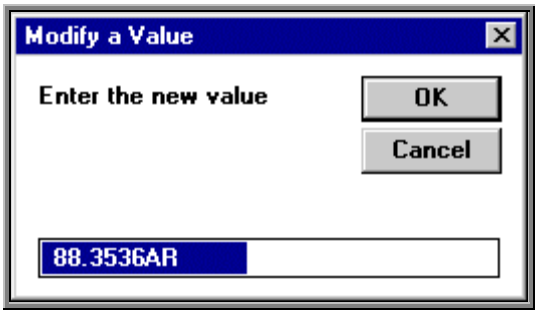


Leg	Action	Bearing	Distance	FS Pt	Northing	Easting	Description
BS	EB	0.0410200117 SW	2000.001	1	10000.00000	10000.00000	SW Corner
1	ST	N/A	N/A	1	10000.00000	10000.00000	SW Corner
2	TR	253AR	2359.240	2	10687.03779	12256.98747	SE Corner
3	TR	95.4757AR	2559.010	3	13197.90573	11762.94864	NE Corner
4	TR	87.0909AR	2078.420	4	12695.83548	9746.08098	NW Corner
5	TC	88.3536AR	2707.940	1	10084.94107	10464.53029	Temporary Closing
6	CA	78.2706AR	N/A	2	10687.03779	12256.98747	SE Corner

PROMPT	RESPONSE / NOTES / ETC.

The **Unbalanced Traverse** window allows you to easily review and edit your traverse data. Scanning the data, we see a problem in the **Bearing** column for **LEG 5**. The angle you entered as **88.3536** should have been **98.3536**. Double-click your mouse on the bad angle entry which reads **88.3536 AR**.

"Sight" Survey will present a pop-up editing box for you to make the changes.

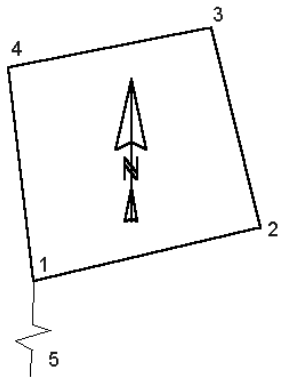


Press Home, then Delete, and then 9 to change the line to read **98.3536 AR**, then press ↵Enter or click OK. Select Re-Run with your mouse or press Alt U to accept the change and re-run the traverse using the corrected angle entry.

After computing the new coordinates based on the traverse changes, "Sight" Survey will display the **Modified Traverse** window showing the new traverse statistics and raw traverse data.

Modified Traverse

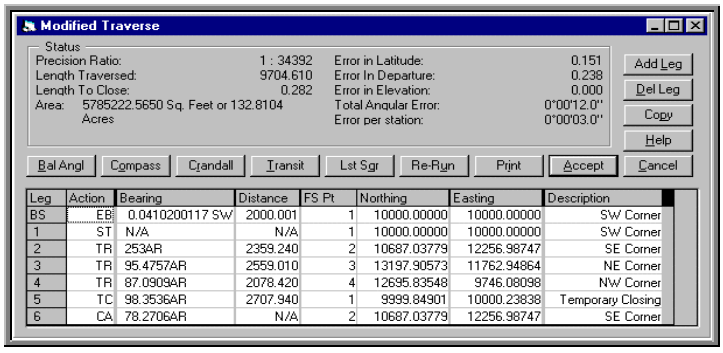
When "Sight" Survey displays the **Modified Traverse** window, all data will be identical to the previous window, except for the portion of the data that changed as a result of the modifications you made. In this example, the backsight and the first four legs are identical to the **Unbalanced Traverse** window. However, since we modified the **Bearing** value in leg five, the data from that point on has appropriately been recalculated using the modified angle.



Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

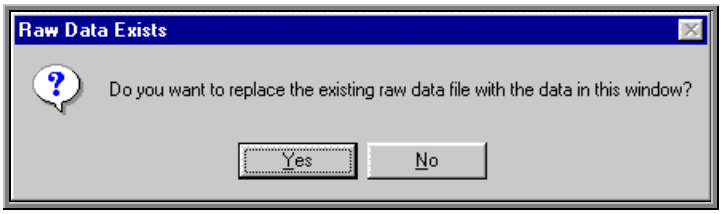
Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

PROMPT	RESPONSE / NOTES / ETC.



Select an Adjustment Option

Press Alt B or click **Bal Angl** to choose the **Balance Angles** option. Before proceeding with the adjustment, "Sight" Survey will present a **Raw Data Exists** prompt.



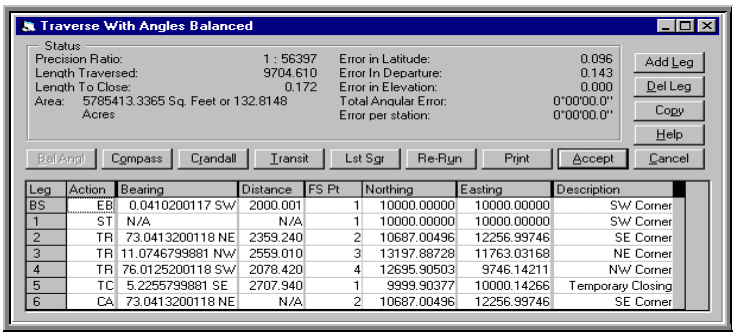
Press Y or click **Yes** to update the raw data file with the data shown in the **Modified Traverse** window, which contains the corrected angle entry. "Sight" Survey will save the revised raw data,

PROMPT	RESPONSE / NOTES / ETC.

balance the angles, and display the **Traverse with Angles Balanced** window showing the new traverse statistics and adjusted data.

Angles Balanced

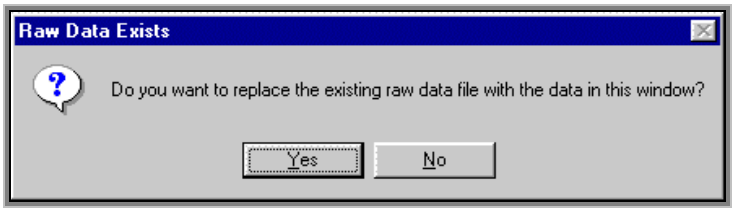
When "Sight" Survey displays the **Traverse with Angles Balanced** window, the angles have been balanced and the **Bearing** column now shows the appropriate bearing between the points instead of the raw field angles. (You may have to expand the width of the **Bearing** column to see entire entries.) The coordinates in the **Northing** and **Easting** columns have also changed accordingly.



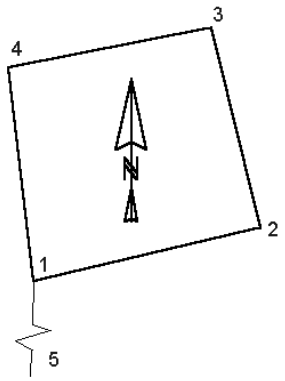
Leg	Action	Bearing	Distance	FS Pt	Northing	Easting	Description
BS	EB	0.0410200117 SW	2000.001	1	10000.00000	10000.00000	SW Corner
1	ST	N/A	N/A	1	10000.00000	10000.00000	SW Corner
2	TR	73.0413200118 NE	2359.240	2	10687.00496	12256.99746	SE Corner
3	TR	11.0746799881 NW	2559.010	3	13197.88728	11763.03168	NE Corner
4	TR	76.0125200118 SW	2078.420	4	12695.90503	9746.14211	NW Corner
5	TC	5.2255799881 SE	2707.940	1	9999.90377	10000.14266	Temporary Closing
6	CA	73.0413200118 NE	N/A	2	10687.00496	12256.99746	SE Corner

Select an Adjustment Option

Press Alt O or click **Compass** to choose the **Compass Rule Adjustment** option. Before proceeding with the adjustment, "Sight" Survey will present a **Raw Data Exists** prompt.



Press N or click **No** to indicate that you do not want to update your raw data file with balanced data that was created by the **Balance Angles** routine. *("Sight" Survey's **raw** data file may be edited using the **Edit Original Raw Data** routine.* ***If you overwrite your raw data file at this point, you will no longer have a data file with your original raw data.)***



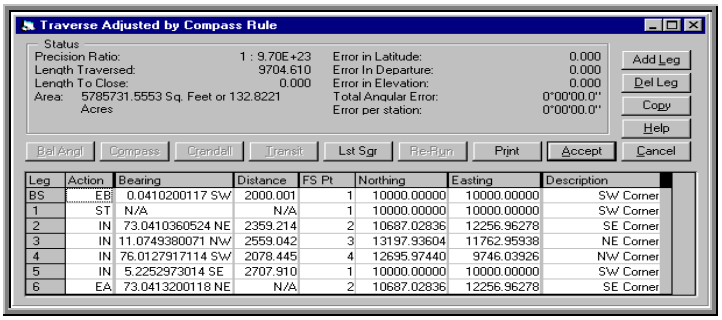
Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

PROMPT	RESPONSE / NOTES / ETC.

"Sight" Survey will continue by displaying the **Traverse Adjusted by Compass Rule** window showing the new traverse statistics and adjusted data

Compass Rule Adjustment



Leg	Action	Bearing	Distance	FS Pt	Northing	Easting	Description
BS	EB	0.0410200117 SW	2000.001	1	10000.00000	10000.00000	SW Corner
1	ST	N/A	N/A	1	10000.00000	10000.00000	SW Corner
2	IN	73.0410360524 NE	2359.214	2	10687.02836	12256.96278	SE Corner
3	IN	11.0749380071 NW	2559.042	3	13197.93604	11762.95938	NE Corner
4	IN	76.0127917114 SW	2078.445	4	12695.97440	9746.03926	NW Corner
5	IN	5.2252973014 SE	2707.910	1	10000.00000	10000.00000	SW Corner
6	EA	73.0413200118 NE	N/A	2	10687.02836	12256.96278	SE Corner

Selecting a different Adjustment Option

After performing an adjustment, you may either accept the results or try another adjustment option for comparison. For this example, we will now try the **Crandall Rule Adjustment**.

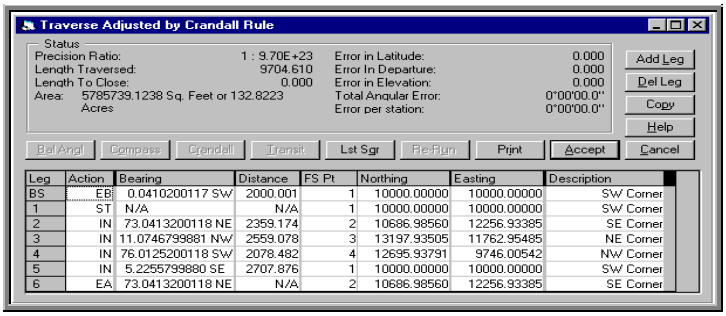
Regardless of which additional adjustment you use, you should start with the data window which is closest to the final adjustment step. For this example, we will start from the window created from the **Balance Angles** routine, since this data is the same regardless of which adjustment option we use. To start with that data, we need to establish the **Traverse with Angles Balanced** window as the active window.

PROMPT	RESPONSE / NOTES / ETC.

To activate the **Traverse with Angles Balanced** window, click your mouse anywhere on that window, or select **7 Traverse with Angles Balanced** from the **Window** pull-down menu (Alt W, 7). Once the **Traverse with Angles Balanced** window is the active window, simply press Alt R or click Crandall to choose the **Crandall Rule Adjustment** option. Before proceeding with the adjustment, "Sight" Survey will again present the **Raw Data Exists** prompt. (Prompt is not shown here.)

Press N or click No to indicate that you again do not want to update your raw data file. "Sight" Survey will continue by displaying the **Traverse Adjusted by Crandall Rule** window showing the new traverse statistics and adjusted data.

Crandall Rule Adjustment

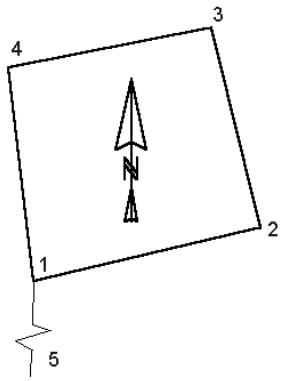


Leg	Action	Bearing	Distance	FS Pt	Northing	Easting	Description
BS	EB	0.0410200117 SW	2000.001	1	10000.00000	10000.00000	SW Corner
1	ST	N/A	N/A	1	10000.00000	10000.00000	SW Corner
2	IN	73.0413200118 NE	2359.174	2	10686.98560	12256.93385	SE Corner
3	IN	11.0746799881 NW	2559.078	3	13197.93505	11762.95485	NE Corner
4	IN	76.0125200118 SW	2078.482	4	12695.93791	9746.00542	NW Corner
5	IN	5.2255799880 SE	2707.876	1	10000.00000	10000.00000	SW Corner
6	EA	73.0413200118 NE	N/A	2	10686.98560	12256.93385	SE Corner

Comparing Adjustments

If you wish to compare the different results obtained by the **Compass** and **Crandall Rule Adjustments** on-screen, it is best to arrange the two windows so you may see both at the same time.

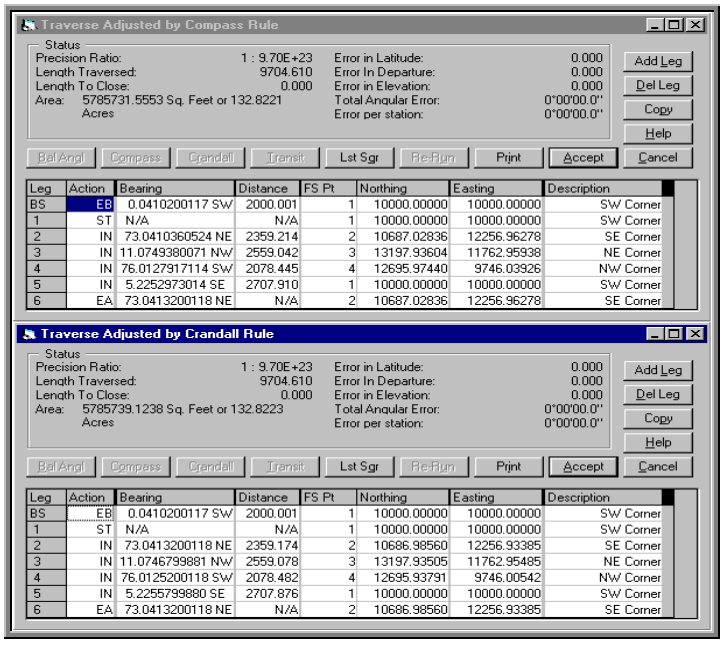
Although we won't do it in this example, you could send a copy of the adjustment data to the **Text Output** window by selecting the Print buttons in both adjustment windows. You may wish to do this as an audit trail, or to print the adjustment data (later) to your printer. Once the data has been copied to the **Text Output** window, you may print the text by activating the **Text Output** window, highlighting the desired text and using the **Print Text** routine's **Selection: Print Range** option.



Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

PROMPT	RESPONSE / NOTES / ETC.



Accepting the Adjustment

For this example, we will be saving the results of the Crandall Rule adjustment. Activate the **Traverse Adjusted by Crandall Rule** window by clicking on its title bar. Now click the **Accept** button, or press Alt A. The adjustment windows will be closed and the chosen traverse adjustment data will automatically re-run. As the

PROMPT	RESPONSE / NOTES / ETC.

traverse data is re-run, the **Drawing** and **Text Output** windows will be updated accordingly.

Saving the Data

Now would be a really good time to save your work. To save all data associated with this job, click the **Save Job** icon ( ) on the **Main** (top) toolbar (or type **SC** to **S**ave **C**oordinates).

Printing or Plotting the Drawing

To send the drawing to your printer or plotter, select **File** ➪ **Plot Drawing** ➪ **Plot to Scale**.

Printing the Text

To obtain a hard copy printout of the information in the **Text Output** window, select **File** ➪ **Print Text**, or Alt F, P. After verifying your print options, click on OK or press Enter. A copy of the final printout is presented here for your convenience.

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
Assigned points					
	5	Initial Backsight		8000.00000	9997.57399
	1	SW Corner		10000.00000	10000.00000
Go to					
	5	Initial Backsight		8000.00000	9997.57399
IN		N 0°04'10.2" E	2000.001		
	1	SW Corner		10000.00000	10000.00000
Start					
	1	SW Corner		10000.00000	10000.00000
Raw:		253 AR	2359.24		
TR		N 73°04'10.2" E	2359.240		
	2	SE Corner		10687.03779	12256.98747
Raw:		95.4757 AR	2559.01		
TR		N 11°07'52.8" W	2559.010		
	3	NE Corner		13197.90573	11762.94864
Raw:		87.0909 AR	2078.42		
TR		S 76°01'16.2" W	2078.420		
	4	NW Corner		12695.83548	9746.08098
Raw:		88.3536 AR	2707.94		
TC		S 15°23'07.8" E	2707.940		
	1	Calculated Closing Pt		10084.94107	10464.53029

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
TC		S 79°38'15.8" W	472.232		
	1	SW Corner		10000.00000	10000.00000
Angle right at Pt. 1 from 4 to 2 = AR 78°27'06.0"					
		(RAW: 78.2706)			
Database Saved: Tuesday, Novermber 02, 1999 1:36 pm.					
Entering Traverse Adjustment mode					
Precision Ratio	=	1 : 21			
Length Traversed	=	9704.610			
Length To Close	=	472.232			
Error in Latitude	=	84.941			
Error in Departure	=	464.530			
Error in Elevation	=	0.000			
Area = 5148592.0085 Sq. Feet or 118.1954 Acres					
Total Angular Error	=	10°00'12.0"			
Error Per Station	=	2°30'03.0"			
Traverse Modified					
Traverse Angles Balanced					
Traverse Adjusted by Compass Rule					
Traverse Adjusted by Crandall Rule					
Rerunning Traverse Adjusted by Crandall Rule					
Inversing Adjusted Points					
Start					
	5	Initial Backsight		8000.00000	9997.57399
IN		N 0°04'10.2" E	2000.001		
	1	SW Corner		10000.00000	10000.00000
EB		S 0°04'10.2" W		New Backsight Bng.	
Start					
	1	SW Corner		10000.00000	10000.00000
IN		N 73°04'13.2" E	2359.174		
	2	SE Corner		10686.98560	12256.93385
IN		N 11°07'46.8" W	2559.078		

	3	NE Corner		13197.93505	11762.95485
IN		S 76°01'25.2" W	2078.482		
	4	NW Corner		12695.93791	9746.00542
IN		S 5°22'55.8" E	2707.876		
	1	SW Corner		10000.00000	10000.00000

Area = 5785739.1238 Sq. Feet or 132.8223 Acres

Precision Ratio	=	1 : 9.70E+23
Length Traversed	=	9704.610
Length To Close	=	0.000
Error in Latitude	=	0.000
Error in Departure	=	0.000
Error in Elevation	=	0.000

Area = 5785739.1238 Sq. Feet or 132.8223 Acres

Total Angular Error	=	0°00'00.0"
Error Per Station	=	0°00'00.0"

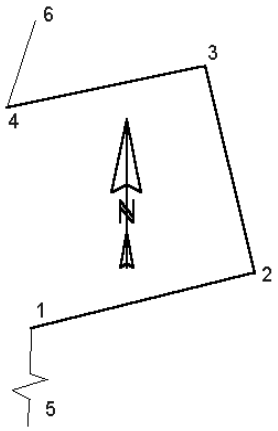
END of Example 1

3.02 Example 2: Open Traverse

This example sets traverse points using the **Enter & Assign** (**EA**) and **Traverse** (**TR**) routines. All distances used for the purpose of corner establishment are horizontal.

Begin by loading the "Sight" Survey program.

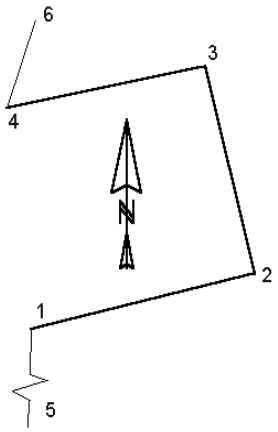
PROMPT	RESPONSE / NOTES / ETC.
Traverse: **From Point**	When the "Sight" Survey program appears, type **CM** to access the "Sight" Survey **Configuration Menu**. In order for your prompts and printed output to follow this manual, you must set your **Configuration Menu** options to match the screens shown at the beginning of ***Example 1***. When all of the items have been set to match the screens shown, press ↵Enter or click on OK to accept the changes and return to the main "Sight" Survey program screen. (On the **Angle Setup** screen, your **Default Angle** **must** be set to **Angle Right**.)
Traverse: **From Point**	When the main "Sight" Survey program screen appears, click the **Drawing** window Properties (PR) button to display the **Properties** window.
Properties	Many of the drawing **Properties** may be set to whatever you wish, however, if you will be sending your drawing to a **plotter**, the **Text Font** that you choose should be a **plotter** font such as **Roman**. In addition, please set the following items as specified below. **Line Type** **Continuous** **Label Type** **Point Number** **End Point Symbol** **Dot** **Text Placement** **Dist / Bng** **Text Size** **10** When you have finished setting properties, click Properties (PR) to deselect the **Properties** window.



Known Point	Northing	Easting
1	10000.00000	10000.00000
4	12695.00000	9745.00000
5	8000.00000	9997.57399
6	13000.00000	10000.00000

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	6	323° 53' 22"	397.56

PROMPT	RESPONSE / NOTES / ETC.
Traverse:	
From Point	After you have made all of the desired changes to the **Properties**, click on the **Text Output Window** to bring it back into view (or select **Window 1 Text Output**). Now, press Esc to activate the **Traverse** entry window, and then type **EA** to select the **Enter & Assign** routine.
Enter & Assign:	
Point #	Type **1** Enter to set the point number.
Northing	Type **10000** Enter.
Easting	Type **10000** Enter.
Elevation	Press Enter.
Description	Type **SW Corner** Enter.
Enter & Assign:	
Point #	Type **4** Enter to set the point number.
Northing	Type **12695** Enter.
Easting	Type **9745** Enter.
Elevation	Press Enter.
Description	Edit the default (last used) description to read **NW Corner** Enter.

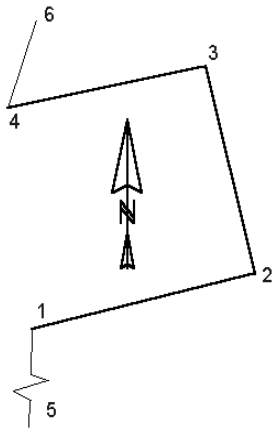


Known Point	Northing	Easting
1	10000.00000	10000.00000
4	12695.00000	9745.00000
5	8000.00000	9997.57399
6	13000.00000	10000.00000

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	6	323° 53' 22"	397.56

PROMPT	RESPONSE / NOTES / ETC.
Enter & Assign:	
Point #	Type **5** Enter to set the point number.
Northing	Type **8000** Enter.
Easting	Type **9997.57399** Enter.
Elevation	Press Enter.
Description	Type **Initial Backsight** Enter.
Enter & Assign:	
Point #	Type **6** Enter to set the point number.
Northing	Type **13000** Enter.
Easting	Type **10000** Enter.
Elevation	Press Enter.
Description	Type **Closing Backsight** Enter.
Enter & Assign:	
Point #	Type **ST** to select the **START AT** routine.
Start At Point:	
Point #	Type **1** Enter to set the occupied point (1) as the starting point, and to clear the **Area Sum** and **Traverse Length** accumulators.

PROMPT	RESPONSE / NOTES / ETC.
Traverse:	
From Point	**1** (By default).
To Point	Type **EP** to select the **Enter Backsight Point** routine.
Enter Backsight Point:	
Point #	Type **5** ↵Enter to set the backsight point number. "Sight" Survey will calculate the correct backsight bearing.
Traverse:	
From Point	**1** (By default).
To Point	Type **2** ↵Enter to set the point number.
Bearing	Type **253** ↵Enter to enter an angle right of 253° 00' 00".
Distance	Type **2359.24** ↵Enter to enter the horizontal distance.
Description for Pt. 2	Type **SE Corner** ↵Enter.
Traverse:	
From Point	**2** (By default).
To Point	Type **3** ↵Enter to set the point number.
Bearing	Type **95.4757** ↵Enter to enter an angle right of 95° 47' 57".
Distance	Type **2559.01** ↵Enter to enter the horizontal distance.
Description for Pt. 3	Press Home Delete N ↵Enter to edit the default (last used) description to **NE Corner** ↵Enter. (If you prefer, just type **NE Corner** ↵Enter.)
Traverse:	
From Point	**3** (By default).
To Point	Type **TC** to select the **Traverse Closure** routine.
Traverse Close:	
From Point	**3** (By default).
Close to	Type **4** ↵Enter to set the closing point of the open traverse.
Bearing	Type **87.0909** ↵Enter to enter an angle right of 87° 09' 09".
Distance	Type **2078.42** ↵Enter to enter the horizontal distance.
Enter the number of the Closing Foresight Pt. Press <Enter> if unknown	Type **6** ↵Enter to set the closing foresight point number.



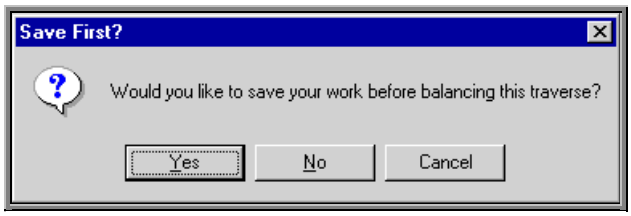
Known Point	Northing	Easting
1	10000.00000	10000.00000
4	12695.00000	9745.00000
5	8000.00000	9997.57399
6	13000.00000	10000.00000

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	6	323° 53' 22"	397.56

PROMPT	RESPONSE / NOTES / ETC.

Enter closing ANGLE RIGHT at Pt.4
backsighting Pt. 3
foresighting Pt. 6
Press <Enter> if unknown

Type **323.5322** ↵Enter to enter an angle right of 323° 53' 22" to the fixed foresight point 6.



Press Y or click **Yes** to save this job before proceeding with the traverse adjustment. *(Up to this point, your data has been saved in a temporary file called* **COGO.ZAK***. The* **COGO.ZAK** *file is used to store COGO data until the job is saved to a different file name, or until a new or different job is opened.)*

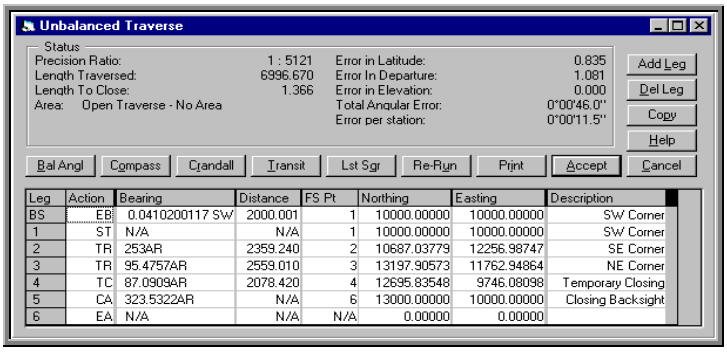
Save Job As
File Name:

Type **OpenTrav** ↵Enter. "Sight" Survey will save your file and display the **Unbalanced Traverse** window showing the current traverse statistics and your raw traverse data. The *calculated closing* point's Northing and Easting, and the closure bearing and distance have also been printed in the **Text Output** window.

PROMPT	RESPONSE / NOTES / ETC.

Unbalanced Traverse

Calculated Closing Point 12695.83548 9746.08098
TC S 52°18'00.0" 1.366



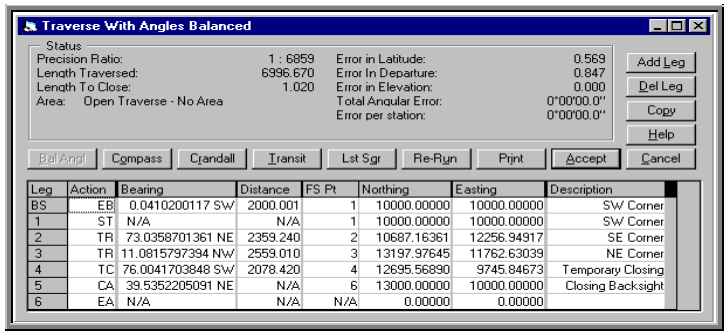
Leg	Action	Bearing	Distance	FS Pt	Northing	Easting	Description
BS	EB	0.0410200117 SW	2000.001	1	10000.00000	10000.00000	SW Corner
1	ST	N/A	N/A	1	10000.00000	10000.00000	SW Corner
2	TR	253AR	2359.240	2	10687.03779	12256.98747	SE Corner
3	TR	95.4757AR	2559.010	3	13197.90573	11762.94864	NE Corner
4	TC	87.0909AR	2078.420	4	12695.83548	9746.08098	Temporary Closing
5	CA	323.5322AR	N/A	6	13000.00000	10000.00000	Closing Backsight
6	EA	N/A	N/A	N/A	0.00000	0.00000	

The **Unbalanced Traverse** window allows you to easily review and edit your traverse data, if necessary. Depending upon your screen resolution, all the traverse data may or may not fit onto your display. If scroll bars are present either at the bottom or right side of the window, you may use them to view and/or edit the traverse data that is not shown on the immediate screen.

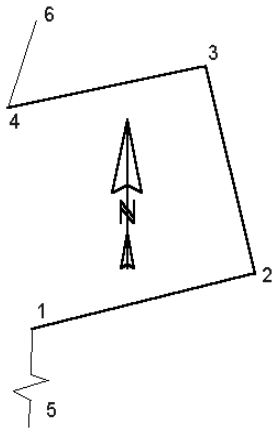
Select an Adjustment Option

Press Alt B or click **Bal Angl** to choose the **Balance Angles** option. "Sight" Survey will balance the angles and display the **Traverse with Angles Balanced** window showing the new traverse statistics and adjusted data.

Angles Balanced



Leg	Action	Bearing	Distance	FS Pt	Northing	Easting	Description
BS	EB	0.0410200117 SW	2000.001	1	10000.00000	10000.00000	SW Corner
1	ST	N/A	N/A	1	10000.00000	10000.00000	SW Corner
2	TR	73.0358701361 NE	2359.240	2	10687.16361	12256.94917	SE Corner
3	TR	11.0815797394 NW	2559.010	3	13197.97645	11762.63039	NE Corner
4	TC	76.0041703848 SW	2078.420	4	12695.56890	9745.84673	Temporary Closing
5	CA	39.5352205091 NE	N/A	6	13000.00000	10000.00000	Closing Backsight
6	EA	N/A	N/A	N/A	0.00000	0.00000	



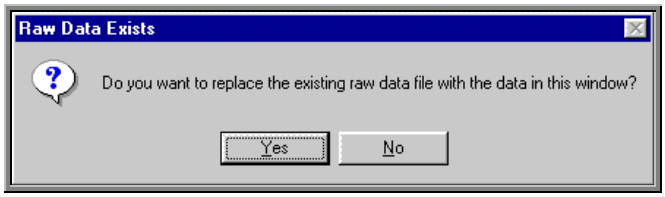
Known Point	Northing	Easting
1	10000.00000	10000.00000
4	12695.00000	9745.00000
5	8000.00000	9997.57399
6	13000.00000	10000.00000

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	6	323° 53' 22"	397.56

PROMPT	RESPONSE / NOTES / ETC.

Select an Adjustment Option

Press Alt O or click Compass to choose the **Compass Rule Adjustment** option. Before proceeding with the adjustment, "Sight" Survey will present a **Raw Data Exists** prompt.

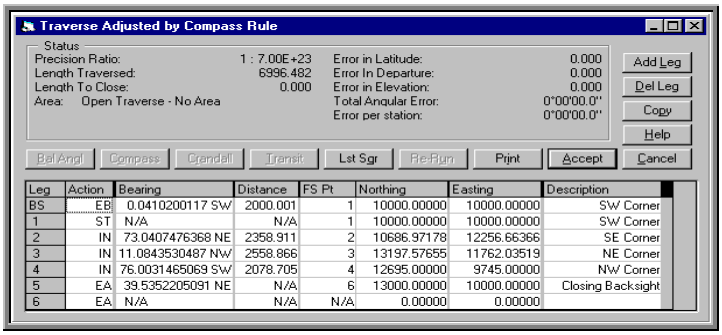


Press N or click No to indicate that you do not want to update your raw data file with balanced data that was created by the **Balance Angles** routine. *("Sight" Survey's raw data file may be edited using the* **Edit Original Raw Data** *routine.* ***If you overwrite your raw data file at this point, you will no longer have a data file with your original raw data.)***

"Sight" Survey will continue by displaying the **Traverse Adjusted by Compass Rule** window showing the new traverse statistics and adjusted data.

PROMPT	RESPONSE / NOTES / ETC.

Compass Rule Adjustment



Accepting the Adjustment

Select the Accept button with your mouse, or press Alt A. The traverse adjustment windows will be closed and the traverse adjustment data will automatically re-run. As the traverse data is re-running, the **Drawing** and **Text Output** windows will be updated accordingly.

Saving the Data

Now would be a really good time to save your work. To save all data associated with this job, click the **Save Job** icon ( ) on the **Main** (top) toolbar (or type **SC** to **S**ave **C**oordinates).

Printing or Plotting the Drawing

To send the drawing to your printer or plotter, select **File** ➪ **Plot Drawing** ➪ **Plot to Scale**.

Printing the Text

To obtain a hard copy printout of the information in the **Text Output** window, select **File** ➪ **Print Text**, or Alt F, P. After verifying your print options, click on OK or press Enter. A copy of the final printout is presented here for your convenience.

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
	Assigned points				
	1	SW Corner		10000.00000	10000.00000
	4	NW Corner		12695.00000	9745.00000
	5	Initial Backsight		8000.00000	9997.57399
	6	Closing Backsight		13000.00000	10000.00000

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
Start					
	1	SW Corner		10000.00000	10000.00000
EP		S 0°04'10.2" W	2000.001	New BS Bng. (B.S. is 5)	
Raw:		253 AR	2359.24		
TR		N 73°04'10.2" E	2359.240		
	2	SE Corner		10687.03779	12256.98747
Raw:		95.4757 AR	2559.01		
TR		N 11°07'52.8" W	2559.010		
	3	NE Corner		13197.90573	11762.94864
Raw:		87.0909 AR	2078.42		
TC		S 76°01'16.2" W	2078.420		
	4	Calc. Closing Point		12695.83548	9746.08098
TC		S 52°18'00.0" W	1.366		
	4	NW Corner		12695.00000	9745.00000

Closing Foresight Pt = 6
Angle right at Pt. 4 from 3 To fixed foresight = AR 323°53'22.0" (RAW: 323.5322)
Database Saved: Thursday, October 12, 1995 9:45 am.
Entering Traverse Adjustment mode

Precision Ratio	=	1 : 5121
Length Traversed	=	6996.670
Length To Close	=	1.366
Error in Latitude	=	0.835
Error in Departure	=	1.081
Error in Elevation	=	0.000

Open Traverse - No Area

Total Angular Error	=	0°00'46.0"
Error Per Station	=	0°00'11.5"

Traverse Angles Balanced

Traverse Adjusted by Compass Rule
Rerunning Traverse Adjusted by Compass Rule
Inversing Adjusted Points
Go to

1 SW Corner			10000.00000	10000.00000
EP	S 0°04'10.2 W	2000.001	New Backsight Bng. (B.S. is 5)	
Start				
1	SW Corner		10000.00000	10000.00000

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
IN		N 73°04'07.5" E	2358.911		
	2	SE Corner		10686.97178	12256.66366
IN		N 11°08'43.5" W	2558.866		
	3	NE Corner		13197.57655	11762.03519
IN		S 76°00'31.5" W	2078.705		
	4	NW Corner		12695.00000	9745.00000

Open Traverse - No Area

Precision Ratio	=	1 : 7.00E+23
Length Traversed	=	6996.482
Length To Close	=	0.000
Error in Latitude	=	0.000
Error in Departure	=	0.000
Error in Elevation	=	0.000

Area = Open Traverse - No Area

Total Angular Error	=	0°00'00.0"
Error Per Station	=	0°00'00.0"

END of Example 2

3.03 Example 3: Subdivision Layout

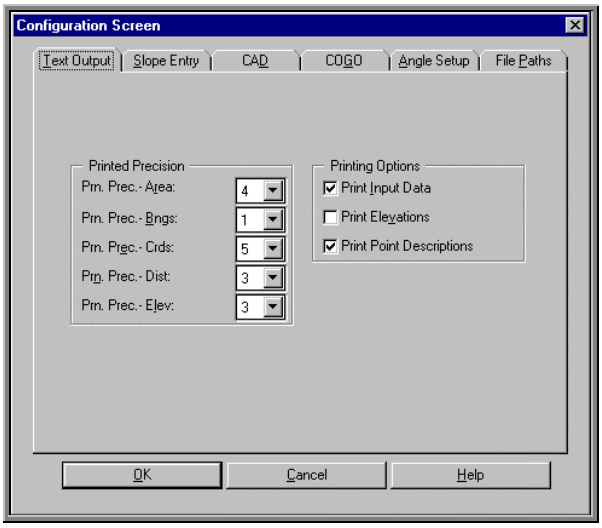
Since this is strictly a coordinate geometry problem, all distances used for the purpose of corner establishment are horizontal. Again, this example is intended only to demonstrate many different procedures performed in "Sight" Survey, and is not intended to demonstrate the most efficient means for solving this particular surveying situation.

While computing the subdivision coordinates, we will annotate all drawing lines with distance on top of the line and bearing below. Once we have designed the subdivision, we will modify the annotation and embellish the drawing with symbols and tables.

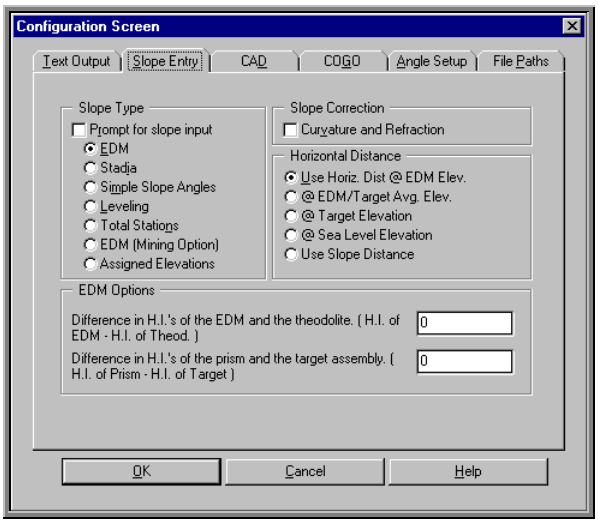
Begin by loading the "Sight" Survey program.

Traverse: From Point

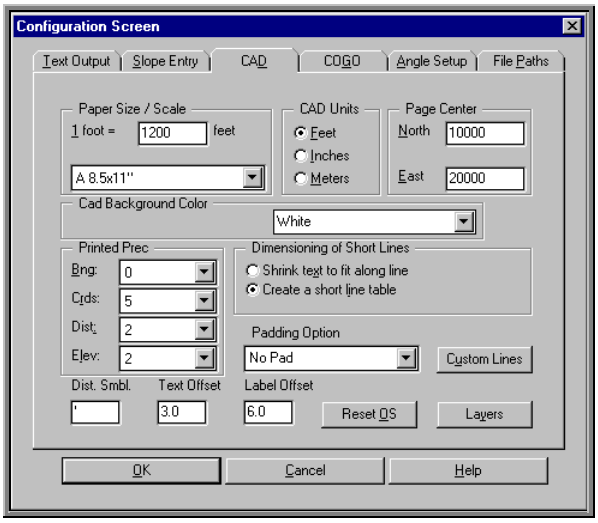
When the "Sight" Survey program appears, press Alt G, T to access the **Text Output Configuration Menu**. In order for your prompts and printed output to follow this manual, you must set your configuration options to match the following menu screens before running the rest of this example.



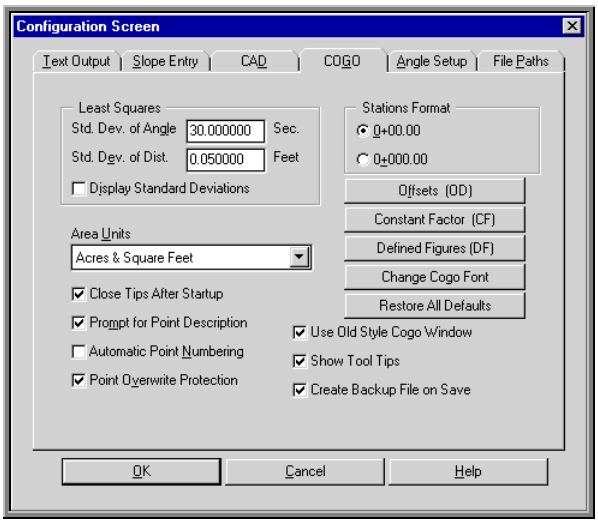
After setting your **Text Output** configuration, press Alt S to access the **Slope Entry Configuration Menu**.



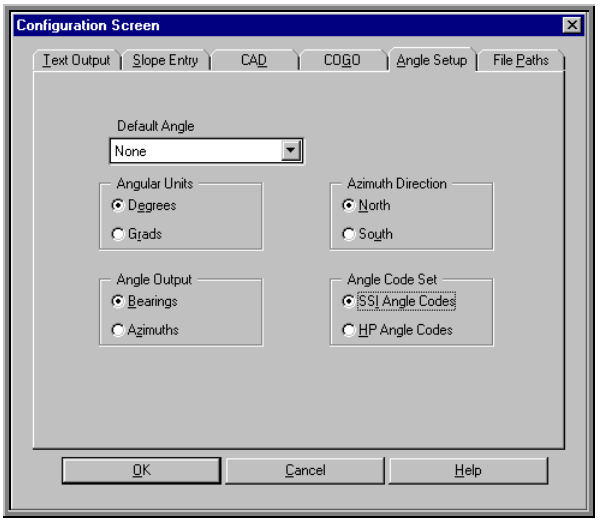
After setting your **Slope Entry** configuration, press Alt D to access the **CAD Configuration Menu**.



After setting your **CAD** configuration, press Alt G to access the **COGO Configuration Menu**.



After setting your **COGO** configuration, press Alt A to access the **Angle Setup Configuration Menu**.



When all of the items have been set to match the screens shown, press ↵Enter or click on OK to accept the changes and return to the main "Sight" Survey program screen. (On the **Angle Setup** screen, your **Default Angle** **must** be set to **None**.)

PROMPT	RESPONSE / NOTES / ETC.

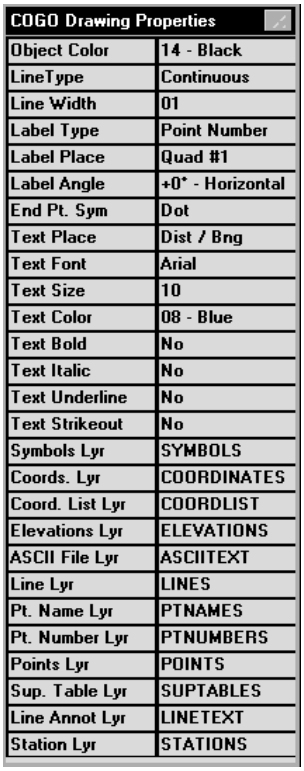
Traverse:
From Point

When the main "Sight" Survey screen appears, click the **Drawing** window Properties (PR) button to display the **Properties** window.

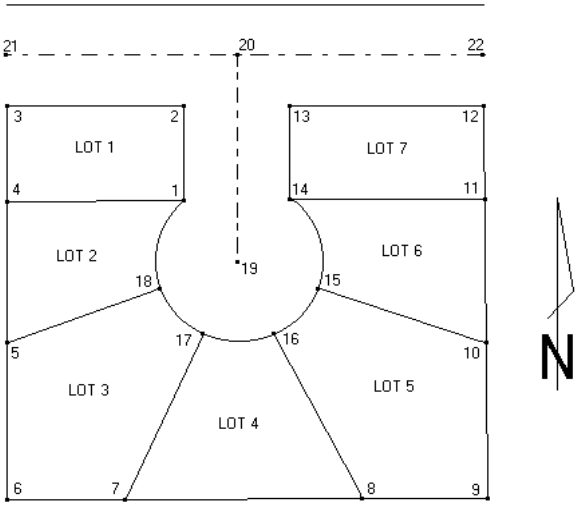
Properties

Many of the drawing **Properties** may be set to whatever you wish, however, if you will be sending your drawing to a **plotter**, the **Text Font** that you choose should be a **plotter** font such as **Roman**. In addition, please set the following items as specified below.

Line Type	**Continuous**
Label Type	**Point Number**
Label Place	**Quad #1**
End Point Symbol	**Dot**
Text Placement	**Dist/Bng**
Text Size	**10**

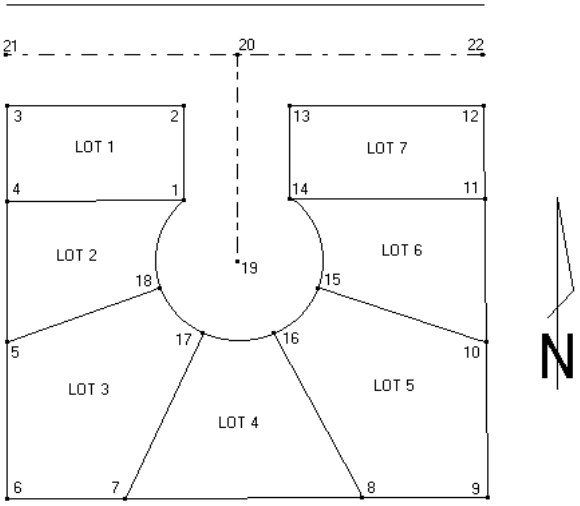


COGO Drawing Properties	
Object Color	14 - Black
LineType	Continuous
Line Width	01
Label Type	Point Number
Label Place	Quad #1
Label Angle	+0° - Horizontal
End Pt. Sym	Dot
Text Place	Dist / Bng
Text Font	Arial
Text Size	10
Text Color	08 - Blue
Text Bold	No
Text Italic	No
Text Underline	No
Text Strikeout	No
Symbols Lyr	SYMBOLS
Coords. Lyr	COORDINATES
Coord. List Lyr	COORDLIST
Elevations Lyr	ELEVATIONS
ASCII File Lyr	ASCIITEXT
Line Lyr	LINES
Pt. Name Lyr	PTNAMES
Pt. Number Lyr	PTNUMBERS
Points Lyr	POINTS
Sup. Table Lyr	SUPTABLES
Line Annot Lyr	LINETEXT
Station Lyr	STATIONS



PROMPT	RESPONSE / NOTES / ETC.
	Click Properties (PR) to deselect the **Properties** window.
Traverse:	
From Point	Click on the **Text Output Window** to bring it back into view. Now, press Esc to activate the **Traverse** entry window, and then type **EA** to select the **Enter & Assign** routine.
Enter & Assign:	
Point #	Type **3** Enter to set the point number.
Northing	Type **10126.2344** Enter.
Easting	Type **19824.4965** Enter.
Elevation	Press Enter.
Description	Type **NW Corner Lot 1** Enter.
Enter & Assign:	
Point #	Type **9** Enter to set the point number.
Northing	Type **9811.7544** Enter.
Easting	Type **20190.0472** Enter.
Elevation	Press Enter.
Description	Edit the description to read **SE Corner Lot 5** and press Enter.

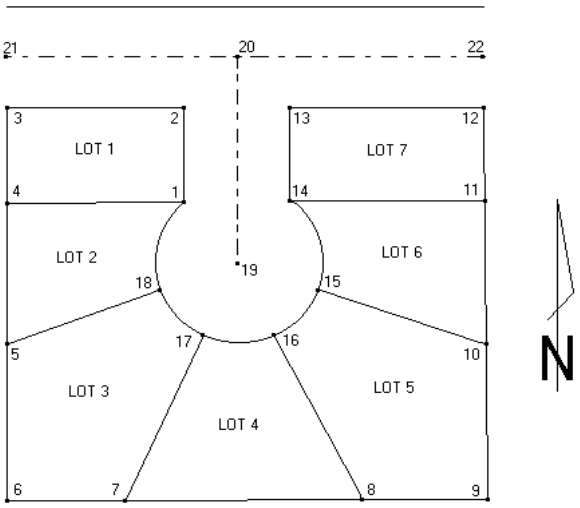
PROMPT	RESPONSE / NOTES / ETC.
Enter & Assign:	
Point #	Type **12** ↵Enter to set the point number.
Northing	Type **10126.2344** ↵Enter.
Easting	Type **20186.4565** ↵Enter.
Elevation	Press ↵Enter.
Description	Edit the description to read **NE Corner Lot 7** and press ↵Enter, or if you prefer, just type **NE Corner Lot 7** ↵Enter.
Enter & Assign:	
Point #	Type **ST** to select the **Start At** routine.
Start At Point:	
Point #	Type **3** ↵Enter to set the starting point.
Traverse:	
From Point	**3** (By default).
To Point	Type **EB** to select the **Enter Backsight Bearing** routine.
Enter Backsight Bearing:	
BS Bng	Type ***3-12** ↵Enter to recall the bearing from point 3 to point 12 and set it as the reference/backsight bearing.
Traverse:	
From Point	**3** (By default).
To Point	Type **2** ↵Enter to set the point number.
Bearing	Type **0** F6 to enter an angle right of zero degrees.
Distance	Type **135.5** ↵Enter.
Description for Pt. 2	Type **NE Corner Lot 1** ↵Enter.
Traverse:	
From Point	**2** (By default).
To Point	Type **SS** to select the **Side Shot** routine.
Side Shots:	
From Point	**2** (By default).
To Point	Type **13** ↵Enter to set the point number.
Bearing	Type **0DR** ↵Enter to enter a deflect right of zero degrees.



PROMPT	RESPONSE / NOTES / ETC.
Distance	Type `80` Enter to enter the horizontal distance.
Description for Pt. 13	Edit the description to read `NW Corner Lot 7` and press Enter.
Side Shots:	
From Point	**2** (By default).
To Point	Type `TR` to select the **Traverse** routine.
Traverse:	
From Point	**2** (By default).
To Point	Type `1` Enter to set the point number.
Bearing	Press F9 to enter an angle left of 90 degrees.
Distance	Type `75` Enter to enter the horizontal distance.
Description for Pt. 1	Edit the description to read `SE Corner Lot 1` and then press Enter, or if you prefer, just type `SE Corner Lot 1` Enter.
Traverse:	
From Point	**1** (By default).
To Point	Type `SS` to select the **Side Shot** routine.
Side Shots:	
From Point	**1** (By default).

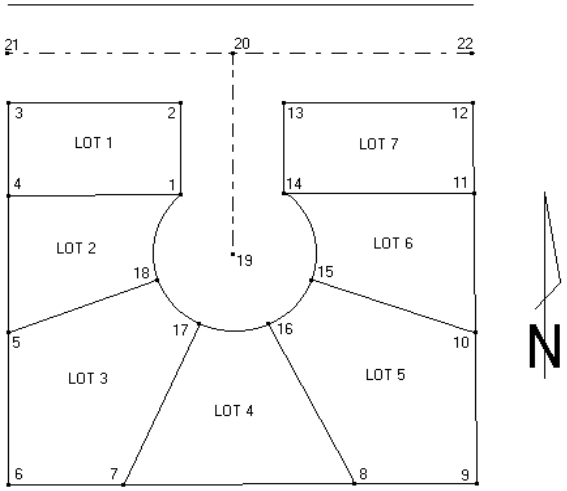
| PROMPT | RESPONSE / NOTES / ETC. |

To Point	Type **14** Enter to set the point number.
Bearing	Type **90AR** Enter to enter a 90° angle right.
Distance	Type **80** Enter to enter the horizontal distance.
Description for Pt. 14	Edit the description to read **SW Corner Lot 7** and press Enter.
	We will now set the center point of the cul-de-sac and we don't particularly want lines or annotation to that point. On the **Main** (top) toolbar, click the **Dimension Lines** icon (N45 100') and also the **Draw Lines Between Points** icon ( ) to deactivate them. (They are deactivated when a red **X** appears over the icon.)
Side Shots:	
From Point	**1** (By default).
To Point	Type **DD** to select the **Distance-Distance** routin1
PROMPT	**RESPONSE / NOTES / ETC.**
Distance-Distance Intersection:	
From Point	**1** (By default).
Distance	Type **65** Enter to set the radius length.
To Point	Type **19** Enter to set the intersection point number.
Close Distance	Type **65** Enter to set the radius length.
Close Point	Type **14** Enter to set the point number of the closing point.
Choose Intersection Point:	
B or 1 (CW) A or 0 (CCW) Cancel / Esc or 2	Press **(A)** or **(0)** to accept point , the counter-clockwise solution.
Description for Pt. 19	Type **Center of Cul-de-Sac** Enter.
Traverse:	
From Point	**14** (By default).
To Point `	Type **GT** to select the **Go To Point** routine.
Go To Point #	Type **1** Enter to set the new occupied point.
	We will now set the Southwest corner of lot 1, and we ***do*** want lines and annotation to that point. On the **Main** (top) toolbar, click the **Dimension Lines** icon (N45 100') and also the **Draw Lines Between**



PROMPT	RESPONSE / NOTES / ETC.
	Points icon ( ) to reactivate them. (They are reactivated when the red **X** no longer appears over the icon.)
Traverse:	
From Point	**1** (By default).
To Point	Type **BB** to select the **Bearing-Bearing** routine.
Bearing-Bearing Intersection:	
From Point	**1** (By default).
Bearing	Type **90** F4 to enter a bearing of 90° Northwest.
To Point	Type **4** ↵Enter to set the intersection point number.
Close Bearing	Type **0NW** ↵Enter to enter a bearing of zero degrees Northwest.
Close Point	Type **3** ↵Enter to set the point number of the closing point.
Description for Pt. 4	Type **SW Corner Lot 1** ↵Enter.
Traverse:	
From Point	**3** (By default).
To Point	Type **NO** to toggle **Point Names Output** to **OFF**. "Sight" Survey will display the message, **Prompting for point descriptions is now turned off**. Press ↵Enter to clear this message.

PROMPT	RESPONSE / NOTES / ETC.
Traverse:	
From Point	**3** (By default).
To Point	Type **GT** to select the **Go To Point** routine.
Go To Point #	Type **1** Enter to set the new occupied point.
Traverse:	
From Point	**1** (By default).
To Point	Type **TA** to select the **Traverse Arc** routine.
Traverse Arc:	
From Point	**1** (By default).
Center Point	Type **19** Enter to set the known center point.
To Point	Type **18** Enter to set the point number for the end of arc.
Value	Type **-80** Enter to enter a counterclockwise 80 foot arc.
A / C / T / D	Type **A** Enter to designate the value as the arc length.
Traverse Arc:	
From Point	**18** (By default).
Center Point	**19** (By default).
To Point	Type **BB** to select the **Bearing-Bearing** routine.
Bearing-Bearing Intersection:	
From Point	**18** (By default).
Bearing	Type ***19-18** Enter to recall bearing from point 19 to point 18.
Inter. Point	Type **5** Enter to set the intersection point number.
Close Bearing	Type **0AZ** Enter to enter a North Azimuth of zero degrees.
Close Point	Type **4** Enter to set the point number of the closing point.
	At this point the **Bearing-Bearing** routine has computed a distance of 109.95 feet from point 5 to point 4. For some reason however, we decide that we need at least 115 feet between those points. We can reset point 5 using the Traverse routine, but first we need to erase the parts of our drawing that we will not be using.
	We can erase the drawing data using several methods, however we will use the easiest (or perhaps, laziest) method for this example.



PROMPT	RESPONSE / NOTES / ETC.

Single click on the **Drawing** window toolbar's **Undo** icon ( ) ***eight*** times to undo all of the drawing commands associated with the previous **Bearing-Bearing Intersection**. The following information contains an outline of the **Undo** process.

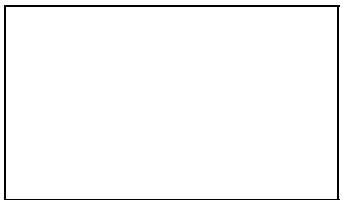
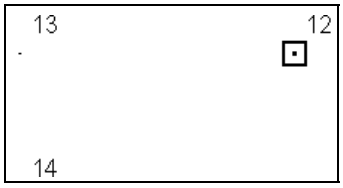
Undo #	Does this to the Drawing
1	Erases the dot at point 5
2	Erases the point number label at point 5
3	Erases the line between points 5 and 4
4	Erases the distance label between points 5 and 4
5	Erases the bearing label between points 5 and 4
6	Erases the line between points 5 and 18
7	Erases the distance label between points 5 and 18
8	Erases the bearing label between points 5 and 18

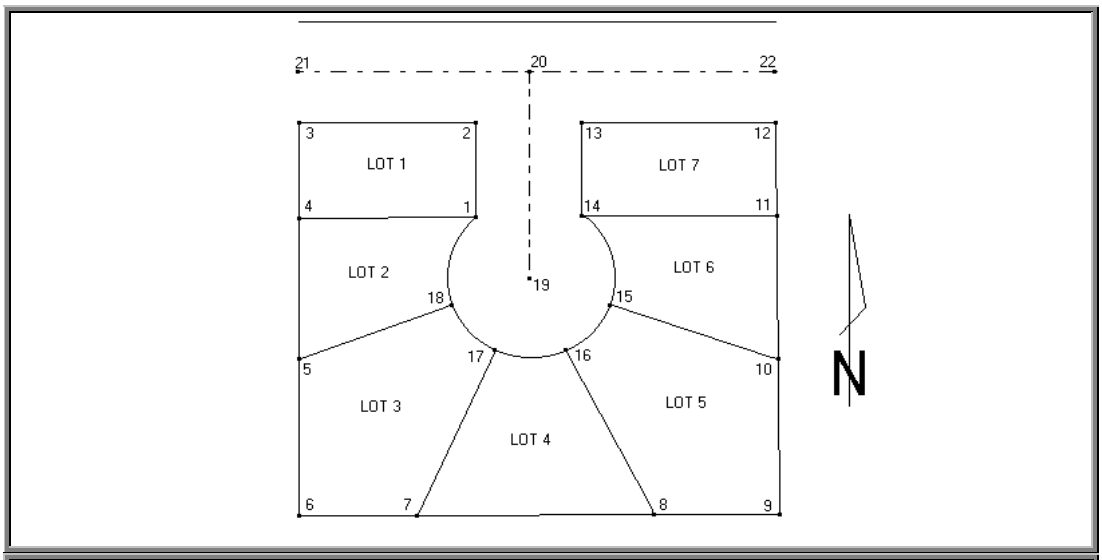
Whenever you edit a drawing, it is a good habit to issue the **Re-Draw** command to clean up the drawing. Click the **Re-draw** icon ( ) on the **Drawing** window toolbar (or type **RD**). Press Esc to activate the **Traverse** entry window.

Traverse:

From Point — **4** (By default).

To Point — Type **5*** Enter to override the point overwrite protection.

PROMPT	RESPONSE / NOTES / ETC.
Bearing **Distance**	Type **S0E** ↵Enter to enter a bearing of zero degrees Southeast. Type **115** ↵Enter to enter the horizontal distance. In some of the following routines, instead of typing in the actual point numbers, distances, or bearings, we will use the mouse to select them from the **Drawing** window.
Traverse: **From Point** **To Point**	**5** (By default). Type **BB** to select the **Bearing-Bearing** routine.
Bearing-Bearing Intersection: **From Point** **Bearing** **Inter. Point**	**5** (By default). Press ↵Enter to accept the default last entered bearing of **0.0000SE**. Type **6** ↵Enter to set the intersection point number.
Close Bearing	To select this bearing from the **Drawing** window, move the mouse cursor over the **Drawing** window and click the ***right*** mouse button. From the menu that appears, select the item **Select Bearing (SB)**.
Select the starting point for bearing calculation 	The cursor will change to the **Grab All** cursor (⊡) to allow for easier selection of drawing points. Since we want this bearing to be parallel to the bearing from point 3 to point 12, move the cursor to the upper left of the Oakwoods Subdivision near point 3. Position the cursor so that the actual coordinate location for point 3 (upper left corner of the subdivision) is located ***within*** the cursor box. Click the mouse to select the point.
Select the ending point for bearing calculation 	Next, we need to select point 12 from the drawing. Move the cursor to the upper right of the Oakwoods Subdivision. Position the cursor so that the actual coordinate location for point 12 (represented by the dot) is located ***within*** the cursor box, as shown to the left. Click the mouse to select the point. "Sight" Survey will calculate the exact bearing from point 3 to point 12 (**90.0000NE**) and enter it as the needed **Bearing**.

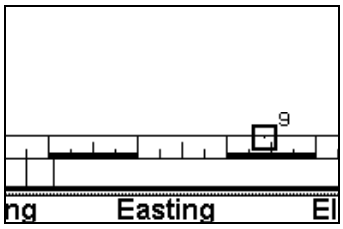


PROMPT	RESPONSE / NOTES / ETC.

Close Point

To select this point from the **Drawing** window, move the mouse cursor over the **Drawing** window and click the ***right*** mouse button. From the menu that appears, select the item **Select Point (SP)**.

Select a Point



Move the cursor toward the lower right corner of the Oakwoods Subdivision. Position the cursor so that the actual coordinate location for point 9 is located ***within*** the cursor box. Even if you do not see the actual dot which represents point 9 on your screen, it actually is on the screen, but is hidden behind the ruler at the bottom of the **Drawing** window. You may either pan the **Drawing** window upwards by clicking once in the lower half of the right scroll bar, or you may just approximate where the dot would be. To approximate the point location, position the cursor as shown to the left and click the mouse to select the point. "Sight" Survey will use point 9 as the **Close Point** and will complete the **Bearing-Bearing Intersection** calculation.

Traverse:

From Point — **9** (By default).

To Point — Type **`IN`** to select the **Inverse** routine.

PROMPT	RESPONSE / NOTES / ETC.

Inverse:

From Point	**9** (By default).
To Point	Type **SP** to indicate that we want to **Select** this **Point** from the **Drawing** window.
Select a Point	To select point 12 from the **Drawing** window, position the cursor so that the dot which represents point 12 on your screen is located ***within*** the cursor box. Click the mouse button to select the point. "Sight" Survey will use point 12 as the **To Point** and will inverse from point 9 to point 12.

Inverse:

From Point	**12** (By default).
To Point	Type **BB** to select the **Bearing-Bearing** routine.

Bearing-Bearing Intersection:

From Point	**12** (By default).
Bearing	Type **R12,9** Enter to recall the bearing from point 12 to point 9.
Inter. Point	Type **11** Enter to set the intersection point number.
Close Bearing	Type **90NW** Enter to enter a bearing of 90° Northwest.
Close Point	Type **14** Enter to set the point number of the closing point.

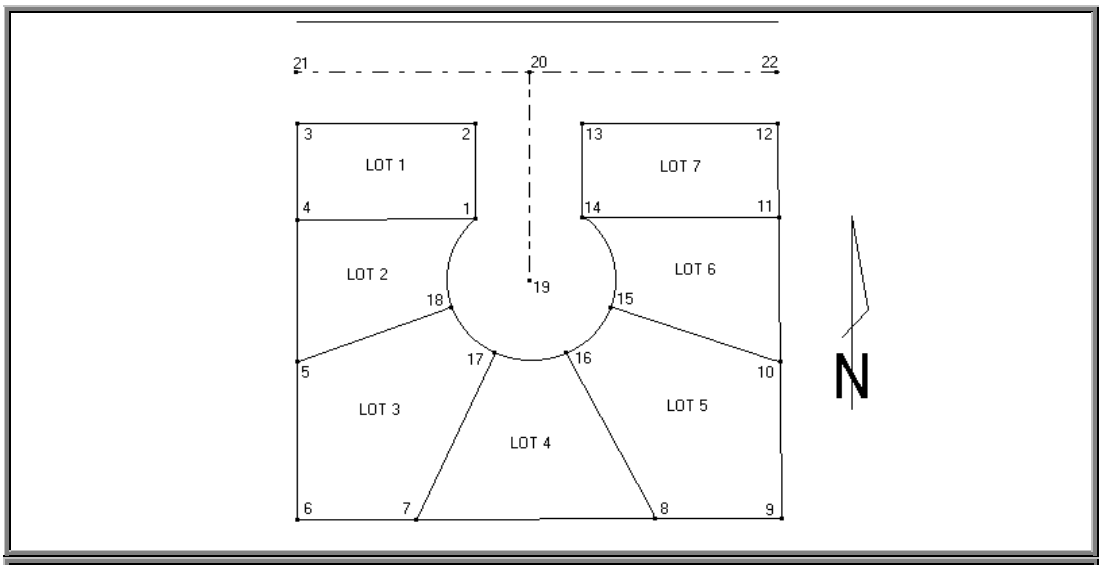
Traverse:

From Point	**14** (By default).
To Point	Type **GT** to select the **Go To Point** routine.

Go To Point #	Type **11** Enter to set the new occupied point.

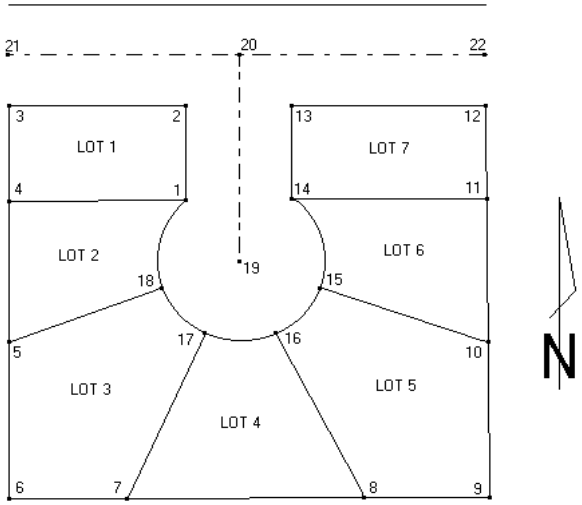
Traverse:

From Point	**11** (By default).
To Point	Type **10** Enter to set the point number.
Bearing	Type **R** Enter to indicate that you wish to recall a bearing.
Distance	Type **'R** Enter to indicate that you wish to recall a distance. ***(You must type the quote (') before you type the R or the R will be taken as part of a routine code.)***
Recall Bearing From	Type **12** Enter to set the starting point of the recalled bearing.



PROMPT	RESPONSE / NOTES / ETC.
To	Type **9** Page Dn to set the ending point of the recalled bearing. *(By pressing* Page Dn *instead of* ↵Enter*, we are able to bypass the* **Plus** *prompt and accept the entered point numbers.)*
Recall Distance	
From	Type **4** ↵Enter to set the starting point of the recalled distance.
To	Type **5** Page Dn to set the ending point of the recalled distance. *(By pressing* Page Dn *instead of* ↵Enter*, we again bypass the remaining data entry prompts and accept the entered point numbers.)*
	You can see that the right side of the drawing is now cluttered from bearings and distances overwriting each other. Since we already know that we will reconstruct the drawing once we have computed all the subdivision points, we will not make any changes to the drawing right now.
Traverse:	
From Point	**10** (By default).
To Point	Type **DA** to select the **Distance-Arc** routine.
Distance-Arc Intersection:	
From Point	**10** (By default).
Distance	Type **'R** ↵Enter to indicate that you wish to recall a distance.

PROMPT	RESPONSE / NOTES / ETC.
Inter. Point	Type **15** ↵Enter to set the intersection point number.
Arc Center Point	Type **19** ↵Enter to set the arc center point number.
Close Point	Type **14** ↵Enter to set the arc ending point number.
Recall Distance	
From	Type **10** ↵Enter to set the starting point of the recalled distance.
To	Type **19** ↵Enter to set the ending point of the recalled distance.
Plus	Type **-65** Page Dn to subtract the radius length from the recalled distance. *(By pressing Page Dn instead of ↵Enter, we are able to by-pass the* **Multiplied by** *prompt and accept the entered data.)*
Traverse:	
From Point	**14** (By default).
To Point	Type **GT** to select the **Go To Point** routine.
Go To Point #	Type **6** ↵Enter to set the new occupied point.
Traverse:	
From Point	**6** (By default).
To Point	Type **EP** to select the **Enter Backsight Point** routine.
Enter Backsight Point:	
Point #	Type **9** ↵Enter to set the backsight point number. "Sight" Survey will calculate the correct backsight bearing.
Traverse:	
From Point	**6** (By default).
To Point	Type **7** ↵Enter to set the point number.
Bearing	Type **0** ↵Enter to enter zero degrees without a directional/quad code.
Code	Type **6** ↵Enter to specify an angle right.
Distance	Type **90** ↵Enter to enter the horizontal distance.
Traverse:	
From Point	**7** (By default).
To Point	Type **8** ↵Enter to set the point number.
Bearing	Type **0DL** ↵Enter to enter a deflect left of zero degrees.
Distance	Type **181** ↵Enter to enter the horizontal distance.



PROMPT	RESPONSE / NOTES / ETC.

We will now set the two final intermediate curve points, 16 & 17, and we will reset point 18 so that it is on a radial from point 19 to point 5. Throughout this example, we have used several different procedures for setting points. In actual practice, you should use only the procedures you find most convenient.

Traverse:

From Point **8** (By default).

To Point Type **GT** to select the **Go To Point** routine.

Go To Point # Type **19** Enter to set the new occupied point.

Traverse:

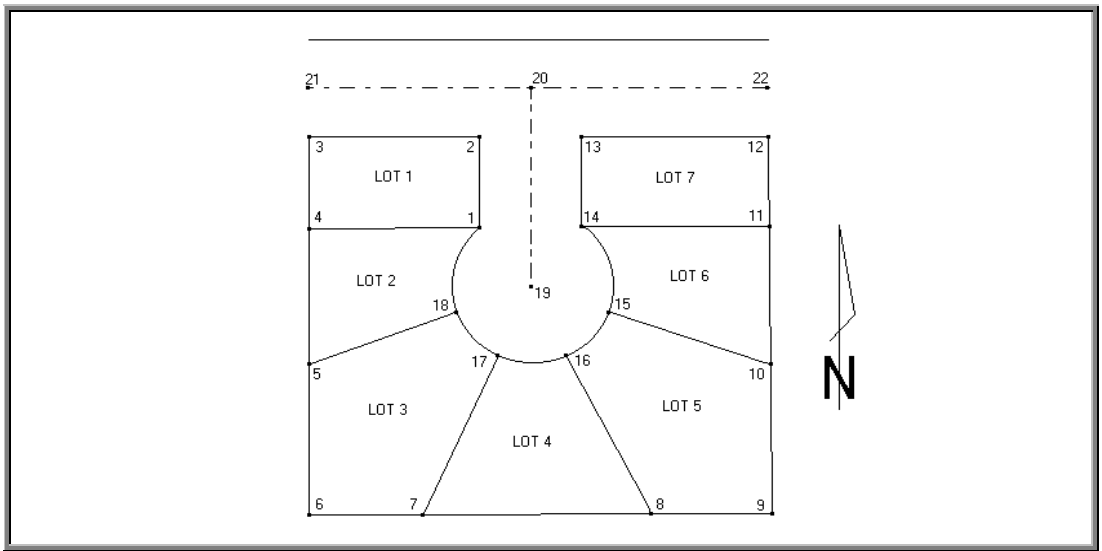
From Point **19** (By default).

To Point Type **16** Enter to set the point number.

Bearing Type **R19,8** Enter to recall the bearing from point 19 to point 8.

Distance Type **65** Enter to set the radius length.

PROMPT	RESPONSE / NOTES / ETC.
Traverse:	
From Point	**16** (By default).
To Point	Type **AD** to select the **Arc-Distance** routine.
Arc-Distance Intersection:	
From Point	**16** (By default).
Center Point	Press Enter to accept the default point 19 as the center point.
Inter. Point	Type **17** Enter to set the intersection point number.
Distance	Type ***19-7-65** Enter to recall the distance from point 19 to point 7 and subtract the 65 foot radius.
Close Point	Type **7** Enter to set the closing point.
Traverse:	
From Point	**7** (By default).
To Point	Type **GT** to select the **Go To Point** routine.
Go To Point #	Type **19** Enter to set the new occupied point.
Traverse:	
From Point	**19** (By default).
To Point	Type **18*** Enter to set the point number and override the point overwrite protection.
Bearing	Type **R19-5** Enter to recall the bearing from point 19 to point 5.
Distance	Type **65** Enter to set the radius length.
	At this point, all of the property corners for the Oakwoods Subdivision have been computed. However, we will now place some control points for the street intersection.
Traverse:	
From Point	**18** (By default).
To Point	Type **GT** to select the **Go To Point** routine.
Go To Point #	Type **13** Enter to set the new occupied point.

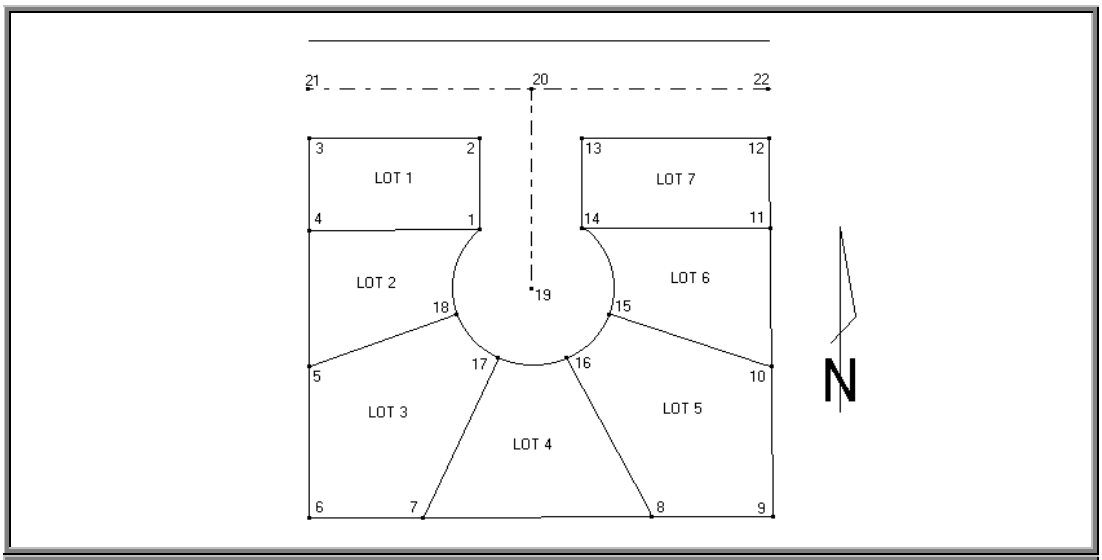


PROMPT	RESPONSE / NOTES / ETC.
Traverse:	
From Point	**13** (By default).
To Point	Type **NO** to toggle **Point Names Output** to **ON**. "Sight" Survey will display the message, **Prompting for point descriptions is now turned on**. Press Enter to clear this message.
Traverse:	
From Point	**13** (By default).
To Point	Type **OI** to select the **Offset Intersection** routine.
Offset Intersection:	
From Point	**13** (By default).
Inter. Point	Type **20** Enter to set the intersection point number.
1st Bearing	Type ***13-14** Enter to recall the parallel bearing.
1st Distance	Type **40** Enter to set the distance. (This is entered as a positive value because it lies to the right of the base line bearing from point 13 to point 14.)
2nd Bearing	Type ***13-12** Enter to recall the parallel bearing.

PROMPT	RESPONSE / NOTES / ETC.
2nd Distance	Type `-40` Enter. (This is entered as a negative value because it lies to the left of the base line bearing from point 13 to point 12.)
Description for Pt. 20	Type `Centerline Intersection Pnt` Enter.
Traverse:	
From Point	**13** (By default).
To Point	Press ↑ to access the **From Point** prompt.
From Point	Type `19` Enter to set the new occupied point.
To Point	Type `IN` to select the **Inverse** routine.
Inverse:	
From Point	**19** (By default).
To Point	Type `20` Enter to set the reference/backsight bearing.
Inverse:	
From Point	**20** (By default).
To Point	Type `OS` to select the **Offset** routine.
Offset Distance:	
Point	Type `21` Enter to set the offset point number.
Offset Distance	Type `-185.5` Enter to set a left offset.
Point	Type `22` Enter to set the offset point number.
Offset Distance	Type `186.5` Enter to set a right offset.
Point	Press Esc to exit the **Offset** routine and resume at point 20.

At this point, we will use two different methods to add **Point Names** *to points that do not have names assigned to them.*

Inverse:	
From Point	**20** (By default).
To Point	Type `ID` to select the **Identify Point** routine.
Enter & Assign:	
Point #	Type `11` Enter to set the point number.
Description	Type `SE Corner Lot 7` Enter to set the point name.



PROMPT	RESPONSE / NOTES / ETC.

Enter & Assign:
Point #

Type **EC** to select the **Edit Coordinates** routine.

Edit Coordinates:

Using your mouse, click once on the **Description** field across from point number 6. Pause for a moment and then click the mouse again on the same field. The box will change to allow you to type in a point description. Type **SW Corner Lot 3** ↵Enter to set the point name. Press ↵Enter again (or click on Accept) to accept the editing changes and return to the **Data Entry Window**.

All data points have been set. The next step is to save the job. However, as a word of caution, when you are working on your own jobs, you should not wait until you have set all your points before you save your job. We urge you to save early into the job, and then to save frequently during the job.

Enter & Assign:
Point #

To save all data associated with this job, click the **Save Job** icon ( ) on the **Main** (top) toolbar (or type **SC**).

PROMPT	RESPONSE / NOTES / ETC.

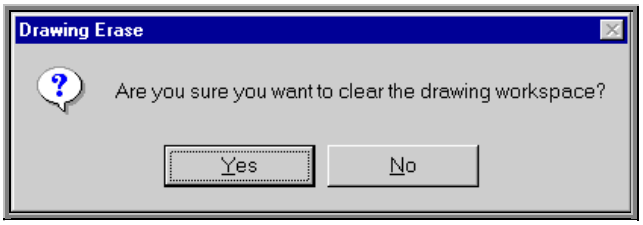
Save As
File Name:

Type `Oakwood` ↵Enter. "Sight" Survey will save your file.

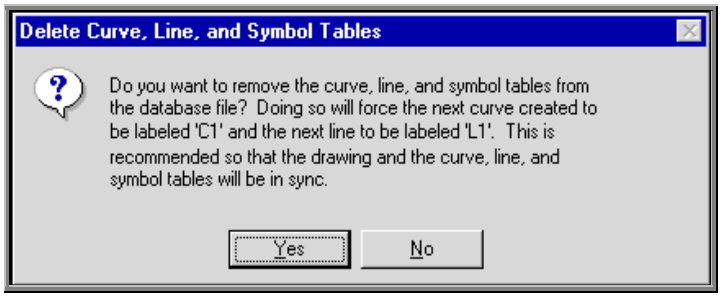
Next, we'll erase the cluttered drawing and create a simple point plot for reference.

Enter & Assign:
Point #

Type `DX` to select the **Drawing Erase** routine.

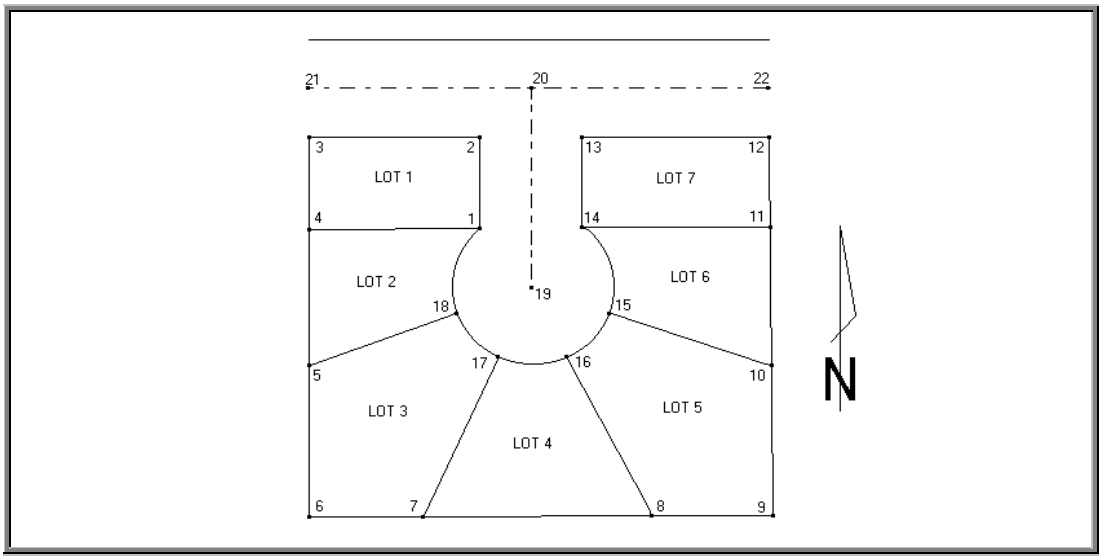


Press Y or click Yes to indicate that you are sure you want to erase the drawing. You will then be prompted:



Press Y or click Yes to indicate that you also want to erase the line, curve and symbol table files.

The **Drawing Erase** *command may be used at any time to reset the curve, line and symbol tables without erasing the drawing. To do this, simply select* No *in response to the* **Drawing Erase** *prompt, and select* Yes *in response to the* **Delete Curve, Line, and Symbol Tables** *prompt.*



PROMPT	RESPONSE / NOTES / ETC.
Enter & Assign:	
Point #	Type **PP** to select the **Point Plot** routine.
Point Plot / List Coordinates:	Click [Select all] to highlight the entire point list, then click on point **~BS1** to deselect it. Finally, click [Accept], then click [Done] to produce a point plot containing all the relavent data points.
	Now we will illustrate a typical staking procedure for the field placement of monuments, as set from the known points, 9 & 12.
Enter & Assign:	
Point #	Type **RS** to select the **Radial Stake Out** routine.
Radial Stake Out:	
From Point	**11** (By default).
Backsight Point	Press [↑] to access the **From Point** prompt.
From Point	Type **12** [↵Enter] to set the instrument location point.
Backsight Point	Type **9** [↵Enter] to set the backsight point number.
Max. Foresight Distance	Press [↵Enter] to signify no foresight limit.
To Points	Type **19** [↵Enter] to set the foresight point.

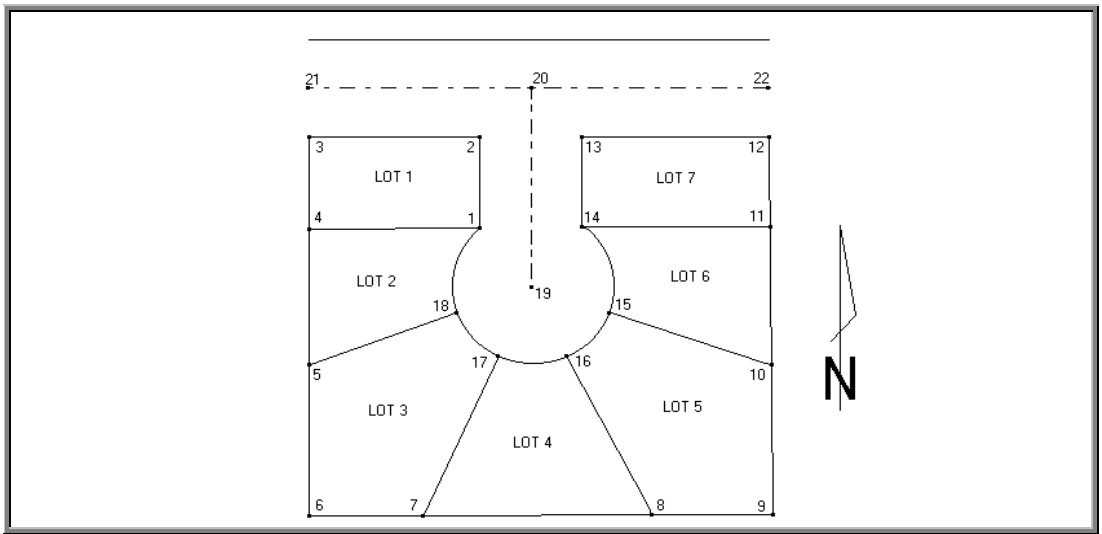
PROMPT	RESPONSE / NOTES / ETC.
Radial Stake Out:	
From Point	**12** (By default).
Backsight Point	**9** (By default).
Max. Foresight Distance	**(blank)** (By default).
To Points	Press Esc, ↑ to enter new setup information.
Radial Stake Out:	
From Point	Type `19` ↵Enter to set the instrument location point.
Backsight Point	Type `12` ↵Enter to set the backsight point number.
Max. Foresight Distance	Type `300` ↵Enter to set a foresight limit of 300 feet.
To Points	Type `A` ↵Enter to stake out, in numerical order, all of the assigned points in the file which are within 300 feet of point 19.

1. The foresight points may be entered individually such as `1` ↵Enter, `2` ↵Enter, `3` ↵Enter, *etc., or as a point string such as* `1,3,4-6` ↵Enter.

2. By carefully inspecting the point locations, you could key in a point string designed to give you all of the turned angles in an ascending fashion. In the case of Oakwoods, that string would be entered like this: `11,15,10,9,16,8,17,7,6,18,5,4,3,21,1,2, 20,13,14,22,12` ↵Enter.

The next portion of this example illustrates the area routines.

Radial Stake Out:	
From Point	**19** (By default).
Backsight Point	**12** (By default).
Max. Foresight Distance	**300** (By default).
To Points	Type `ST` to select the **Start At** routine.
Start At	Type `1` ↵Enter to set the starting point and clear the **Area Sum** and **Traverse Length Accumulators**.



PROMPT	RESPONSE / NOTES / ETC.
Traverse:	
From Point	**1** (By default).
To Point	Type **IN** to select the **Inverse** routine.
Inverse:	
From Point	**1** (By default).
To Point	Type **-14** ↵Enter to inverse all straight segments between points 1 and 14, inclusive.
Inverse:	
From Point	**14** (By default).
To Point	Type **OC** to select the **Inverse Obtuse Curve** routine.
Obtuse Curve:	
From Point	**14** (By default).
Center Point	Type **19** ↵Enter to set the curve center point.
To Point	Type **1** ↵Enter to set the end point of the cul-de-sac.
Acute / Obtuse / Interval	Press ↵Enter to accept the default of **Obtuse**, indicating that we want the large angle (from point 14 through 18 to 1) inversed, instead of just the smaller acute angle (from point 1 to 14).

PROMPT	RESPONSE / NOTES / ETC.

Obtuse Curve:

From Point — **1** (By default).

Center Point — **19** (By default).

To Point — Type **AR** to print the **Area** of the subdivision.

1. Although we have already calculated the area of the subdivision by inversing through all of the boundary points, the next section shows how to obtain the area without having the inversed bearings & distances printed.

2. The cul-de-sac, despite being made up of five (5) segments, may be broken down into fewer segments provided that each segment spans less than 180°. The following point to point area calculation has the cul-de-sac split into two parts, the first arc spans from point 14 to point 17 and the second arc spans from point 17 to point 1.

Obtuse Curve:

From Point — **1** (By default).

Center Point — **19** (By default).

To Point — Type **PA** to select the **Point To Point Area** routine.

Point to Point Area:

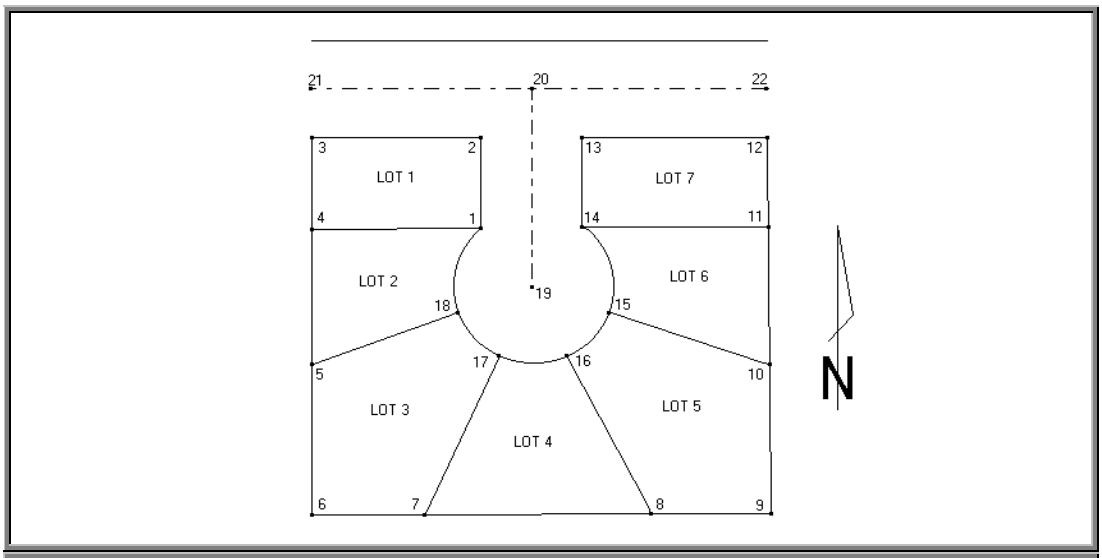
Point String — Type **1-14*19,17*19,1** Enter to enter the point string.

Do you want to print courses? — Press N or click **No** to indicate that you do not want to print the courses (bearings and distances) between points.

Instead of breaking the cul-de-sac into two curves, you may also use the greater than (>) sign to indicate that you want to get the area around the obtuse curve, as shown in the following entry:

Point to Point Area:

Point String — Type **1-14>19,1** Enter to print the **Area**.



PROMPT	RESPONSE / NOTES / ETC.

We will now use point strings to obtain the area of each lot within the Oakwoods subdivision:

Point to Point Area
Point String

Type `1-4,1` Enter to print the **Area** of lot one.

Within the **Point to Point Area** *routine, if the first and last point numbers in your string are not the same number, "Sight" Survey will automatically close back to the first point number in the string to give you a valid closed area. For example, entering* `"1-4,1"` *or* `"1-4"` *will result in the same area.*

Point to Point Area:
Point String

Type `1-4` Enter to print the **Area** of lot one.

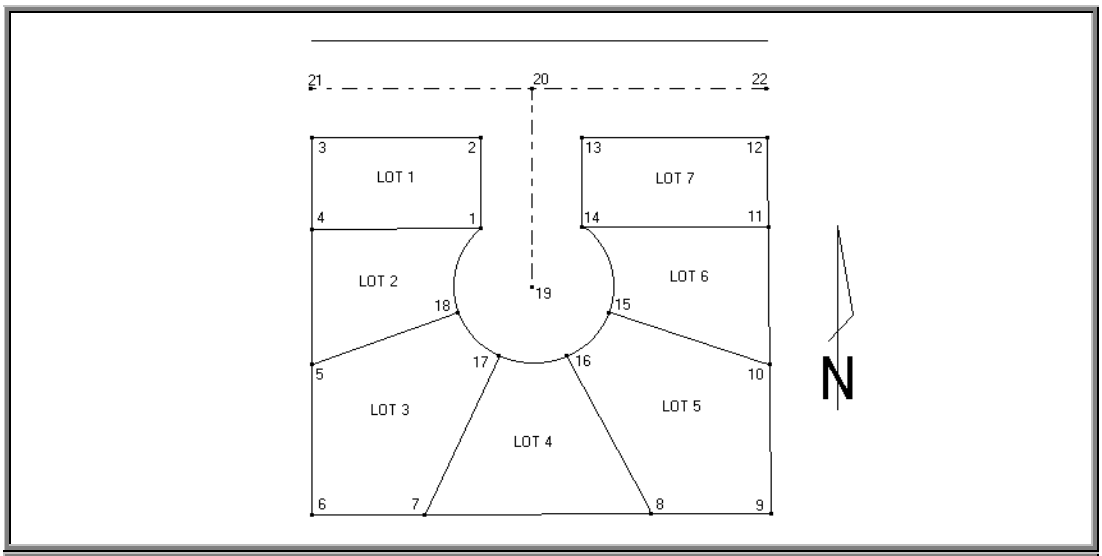
Point to Point Area:
Point String

Type `1,4,5,18*19` Enter to print the **Area** of lot two.

Point to Point Area:
Point String

Type `18,5-7,17*19` Enter to print the **Area** of lot three.

PROMPT	RESPONSE / NOTES / ETC.
Point to Point Area: **Point String**	Type **17,7,8,16*19** ↵Enter to print the **Area** of lot four.
Point to Point Area: **Point String**	Type **16,8-10,15*19** ↵Enter to print the **Area** of lot five.
Point to Point Area: **Point String**	Type **15,10,11,14*19** ↵Enter to print the **Area** of lot six.
Point to Point Area: **Point String**	Type **11-14** ↵Enter to print the **Area** of lot seven.
Point to Point Area: **Point String**	Type **LC** to select the **List Coordinates** routine.
Point Plot / List Coordinates:	Type **A** ↵Enter to list all points in the file. *The point listing is presented for your reference at the end of this example with the Oakwoods printout.*
	We will now delete the drawing file again, and construct a better looking, more complete plat drawing using "Sight" Survey's CAD features.
Point to Point Area: **Point String**	Type **DX** to select the **Drawing Erase** routine.
Drawing Erase?	When presented with the **Drawing Erase** message box, press Y or click Yes to indicate that you are sure you want to erase the drawing.
Delete Curve, Line, and Symbol Tables?	Press Y or click Yes to indicate that you are sure you want to erase the line, curve and symbol table files.
Point to Point Area: **Point String**	Type **PP** to access the **Point Plot** routine.



PROMPT	RESPONSE / NOTES / ETC.

Point Plot / List Coordinates:

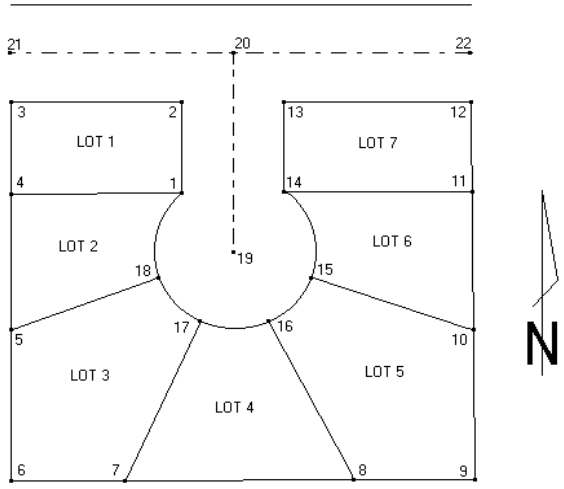
Click [Select all], then click on point `~BS1` to deselect it. Finally, click [Accept], then click [Done] to produce a point plot containing the desired points.

For the rest of this example, we do not want anything to print to the Text Output window. We also do not need to place point numbers at the points since the previous point plot has already placed them. In addition, since we now have all the drawing points on the screen, we can shut off the Auto Zooming feature to increase the drawing processing speed.

On the **Main** (top) toolbar, click the **Continuously Scale Drawing to Fit on Screen** icon ( ), the **Text Output** icon ( ), and the **Add End Point Labels** icon ( ) to deactivate them. (They are deactivated when a red **X** appears over their icons.)

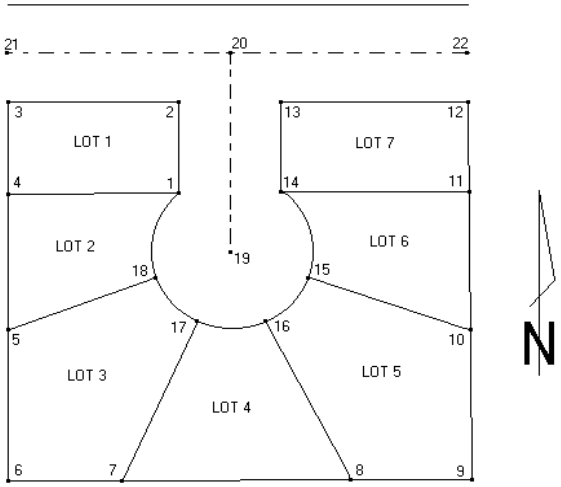
First, click once on the **Text Output** window to bring the title bar into view. Next, click once on the **Minimize** button (,or in Windows 3.1) in the upper right corner of the **Text Output** window to reduce the window to an icon. Next, use your mouse to resize

PROMPT	RESPONSE / NOTES / ETC.
	and move the **Data Entry** and **Drawing** window to their desired positions. Once your "Sight" Survey screen is setup the way you want, click Properties (PR) and set the following **Properties** as specified below: **Line Type** `Continuous` **Label Type** `Point Number` **End Point Symbol** `Dot` **Text Placement** `Dist / Bng` **Text Size** `10` Click Properties (PR) to deselect the **Properties** window. We have decided that we want distances on top of the line for all interior lot lines. However, for the subdivision boundary, we want distances on the inside and bearings on the outside. We can start by drawing these lines and labeling them with distances over bearings.
Drawing Window	Type **`ZA`** **(Zoom All)** to view the entire drawing within the **Drawing** window. Also click the **Quick Pick** icon ( ) on the **Main** (top) toolbar to activate it.
Drawing Window	Type **`IN`** to select the **Inverse** routine.
Inverse:	
From Point	**11** (By default).
To Point	Press ↑ to access the **From Point** prompt.
From Point	Click on point number **`4`**.
To Point	Click on point number **`1`**. *A line will be drawn from point 4 to point 1, and the distance & bearing will be placed along the line.*
Inverse:	
From Point	**1** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)



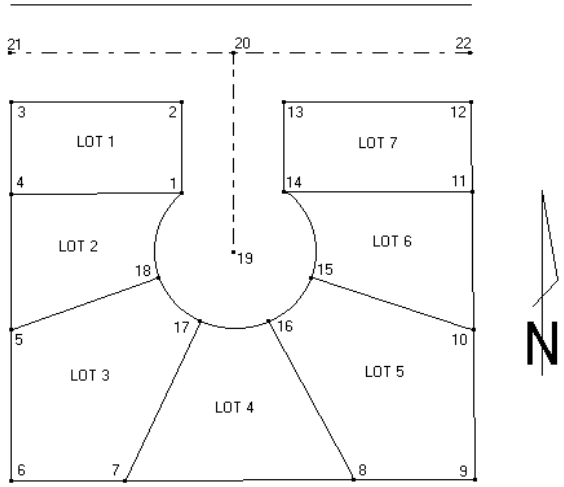
PROMPT	RESPONSE / NOTES / ETC.
From Point	Click on point number **14**.
To Point	Click on point number **11**. *A line will be drawn from point 14 to point 11, and the distance and bearing will be placed along the line.*
Inverse:	
From Point	**11** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number **18**.
To Point	Click on point number **5**. *A line will be drawn from point 18 to point 5, and the distance and bearing will be placed along the line.*
Inverse:	
From Point	**5** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)

PROMPT	RESPONSE / NOTES / ETC.
From Point	Click on point number **17**.
To Point	Click on point number **7**. *A line will be drawn from point 17 to point 7, and the distance and bearing will be placed along the line.*
Inverse:	
From Point	**7** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number **16**.
To Point	Click on point number **8**. *A line will be drawn from point 16 to point 8, and the distance and bearing will be placed along the line.*
Inverse:	
From Point	**8** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number **15**.
To Point	Click on point number **10**. *A line will be drawn from point 15 to point 10, and the distance and bearing will be placed along the line.*
Inverse:	
From Point	**10** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number **1**.
To Point	Click on point number **2**. *Since the line from point 1 to point 2 is too short for the bearing and distance to fit, the line will be labeled as* **L1** *and the information will be sent to a file for the* ***Short Line Table****.*



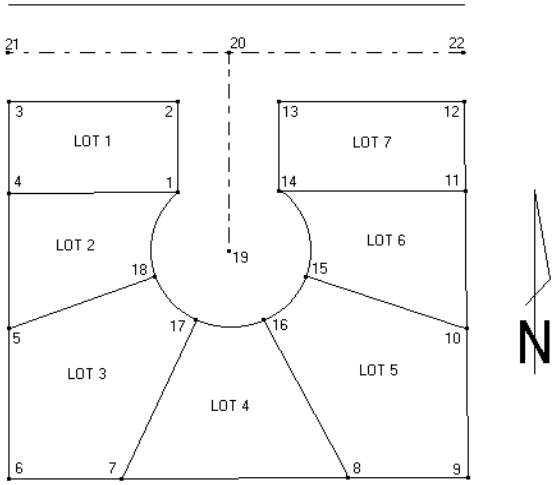
PROMPT	RESPONSE / NOTES / ETC.
Properties:	Click Properties (PR) to activate the **Properties** window.
Text Place	Select **Bng / Dist**. After making your selection, click Properties (PR) again, then press Esc to activate the **Data Entry** window.
Inverse:	
From Point	**2** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number 3.
To Point	Click on point number 2. *A line will be drawn from point 3 to point 2, and the distance and bearing will be placed along the line.*
Inverse:	
From Point	**2** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number 14.

PROMPT	RESPONSE / NOTES / ETC.
To Point	Click on point number **13**. *Since the line from point 14 to point 13 is too short for the bearing and distance to fit, the line will be labeled as **L2** and the information will be sent to a file for the **Short Line Table**.*
Inverse:	
From Point	**13** (By default).
To Point	Click on point number **12**. *A line will be drawn from point 13 to point 12, and the distance and bearing will be placed along the line.*
Properties:	Click Properties (PR) to activate the **Properties** window.
Text Place	Select **/ Dist**. After making your selection, click Properties (PR) again, then press Esc to activate the **Data Entry** window.
Inverse:	
From Point	**12** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number **3**.
To Point	Click on point number **4**. *A line will be drawn from point 3 to point 4, and the distance will be placed below (or inside) the line.*
Inverse:	
From Point	**4** (By default).
To Point	Click on point number **5**. *A line will be drawn from point 4 to point 5, and the distance will be placed below (or inside) the line.*
To Point	Click on point number **6**. *A line will be drawn from point 5 to point 6, and the distance will be placed below (or inside) the line.*
Properties:	Click Properties (PR) to activate the **Properties** window.
Text Place	Select **Dist /**. After making your selection, click Properties (PR) again, then press Esc to activate the **Data Entry** window.
Inverse:	
From Point	**6** (By default).
To Point	Click on point number **7**. *A line will be drawn from point 6 to point 7, and the distance will be placed above (or inside) the line.*
To Point	Click on point number **8**. *A line will be drawn from point 7 to point 8, and the distance will be placed above (or inside) the line.*



PROMPT	RESPONSE / NOTES / ETC.
To Point	Click on point number **9**. *A line will be drawn from point 8 to point 9, and the distance will be placed above (or inside) the line.*
To Point	Click on point number **10**. *A line will be drawn from point 9 to point 10, and the distance will be placed above (inside) the line.*
To Point	Click on point number **11**. *A line will be drawn from point 10 to point 11, and the distance will be placed above (inside) the line.*
To Point	Click on point number 12. *A line will be drawn from point 11 to point 12, and the distance will be placed above (inside) the line.*
Properties: **Text Place**	Click Properties (PR) to activate the **Properties** window. Select **Bng /**. After making your selection, click Properties (PR) again, then press Esc to activate the **Data Entry** window. Since we already have a line around the subdivision boundary, we will want to shut off the drawing of lines between points while we label the boundary with bearings. Click once on the **Draw Lines Between Points** icon ( ) on the **Main** (top) toolbar to deactivate it.

PROMPT	RESPONSE / NOTES / ETC.
Inverse:	
From Point	**12** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number **3**.
To Point	Click on point number **6**. *The bearing will be placed above the line from point 3 to point 6.*
Properties:	Click Properties (PR) to activate the **Properties** window.
Text Place	Select **/ Bng**. After making your selection, click Properties (PR) again, then press Esc to activate the **Data Entry** window.
Inverse:	
From Point	**6** (By default).
To Point	Click on point number **9**. *The bearing will be placed below the line from point 6 to point 9.*
To Point	Click on point number **12**. *The bearing will be placed below the line from point 9 to point 12.*
	You will notice that the point number at point 10 has the bearing overwritten on it. We will address this later in this example.
Properties:	Click Properties (PR) to activate the **Properties** window. Go to **Line Type** select **Center2.** After making your selection, click Properties (PR) again, then press Esc to activate the **Data Entry** window.
Line Type	
	We do not want to place annotation on these next lines, so we will need to shut **off** the annotation. However, we will also need to turn back **on** the drawing of lines between points.
	On the **Main** (top) toolbar, click the **Dimension Lines** icon ( ) to deactivate it. Also, click once on the **Draw Lines Between Points** icon ( ) to reactivate it.
Inverse:	
From Point	**12** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, from the keyboard, press ↑.)



PROMPT	RESPONSE / NOTES / ETC.
From Point	Click on point number **21**.
To Point	Click on point number **22**.
Inverse:	
From Point	**22** (By default).
To Point	Click on the text entry box next to the **From Point** prompt to access the **From Point** prompt. (Or, if you prefer to use the keyboard, press ↑.)
From Point	Click on point number **20**.
To Point	Click on point number **19**.
Properties:	Click Properties (PR) to activate the **Properties** window.
Line Type	Go to **Line Type** select **Continuous**. After making your selection, click Properties (PR) again, then press Esc to activate the **Entry Data** window.
	We have now drawn all the straight lines that are needed on this drawing. Next, we will connect the points along the cul-de-sac, but before we may do that, we need to turn back **on** the line annotation and we need to shut off quick pick.

PROMPT	RESPONSE / NOTES / ETC.

On the **Main** (top) toolbar, click once on the **Quick Pick** icon ( ) to deactivate it, and click once on the **Dimension Lines** icon ( ) to reactivate it.

Inverse:

From Point **19** (By default).

To Point Type `IC` to select the **Inverse Curve** routine.

Inverse Curve:

From Point **19** (By default).

Center Point Press ↑ to access the **From Point** prompt.

From Point Type `14` ↵Enter to set the occupied point.

Center Point Type `19` ↵Enter to set the known center point.

To Point Type `-18` ↵Enter to set the point number for the end of arc.

Acute / Obtuse / Interval Press ↵Enter to accept the default of **Acute**.

Inverse Curve:

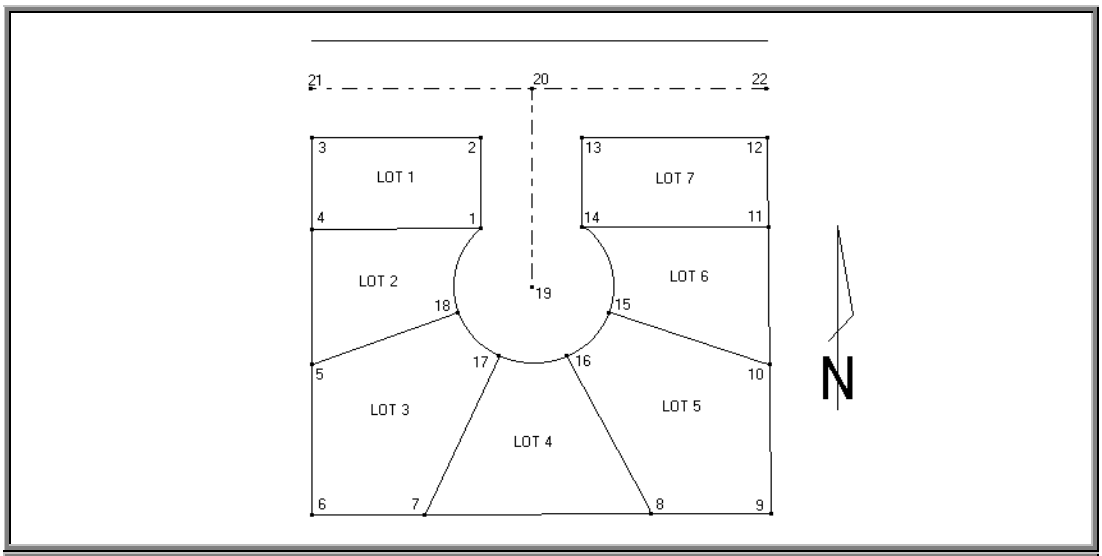
From Point **18** (By default).

Center Point **19** (By default).

To Point Type `1` Page Dn to set the point number for the end of arc and bypass the last prompt on the screen.

We have now drawn all the lines that are needed on this drawing. Next, we will change the location of some of the point numbers for a cleaner looking drawing, but first, you should click once on the **Save Job** icon ( ) to save your work.

If you notice on your drawing that some of the diagonally placed text and lines look darker or more bold than others, this is the result of Windows' screen font conversions. This is not a bug, and the text will appear correctly on your printer or plotter.



PROMPT	RESPONSE / NOTES / ETC.

The rest of this example will not use the **Traverse** window, so click once on the **Minimize** button (, or in Windows 3.1) in the upper right corner of the **Traverse** window to reduce it to an icon.

By looking at the drawing on the screen, you can see that the point numbers for some of the points should be moved to a different location to avoid being overwritten by other text or lines on the drawing. There are several ways that you may do this, but we will focus on two of them.

The easiest way, shown next, is perfect if you don't need (or want) the point numbers to be in an exact location. You simply left click on the point number and hold the button down while moving the mouse cursor to the new point number location. Then, release the mouse button to complete the move.

Drawing Window

Click (and hold) the mouse button on the point number label **15**. Now, move the mouse slightly to the left to move it (**15**) away from the **80.20'** arc length and onto the concave side of the arc, between the **C1** and **C2** arc labels. When you have the label where you want it, simply release the mouse button. (If you moved the point

PROMPT	RESPONSE / NOTES / ETC.

number too far away, or need to adjust it further, repeat this step. If you wish to put the point label back where it was, simply click the **Undo** icon ( ) on the **Drawing** window toolbar.

Drawing Window

Repeat the last procedure for the point number label at point **10**. This makes the bearing easier to read, and leads to a cleaner looking drawing. (Remember, click and hold the mouse button on the point number label, move the mouse to where you want to place the label, then release the button. Be careful when clicking on the point number so that you don't accidentally click on the bearing annotation.)

Now, use the same procedure to move the arc length label **81.67'** on the curve between points 18 and 1. Move the text just slightly downwards, away from the **N90°00'00"E** bearing annotation. By moving the arc label, the text gets too far away from the arc. We can correct this by editing the angle. Double-click on the **81.67'** arc label, then click OK at the **Edit Text Warning** message and the **Text Entry Dialog Box** will appear.

Text Entry Dialog

Click the Text Defaults >> button to display the **Set Text Defaults** window. Double-click on the **73.9** in the **Angle** text entry box, and type **85** Enter. Click on OK in the **Text Entry Dialog** box to return to the drawing. Depending upon how far you originally moved the arc label in the previous step, you may need to change the angle slightly more or slightly less than **85** to get it to an angle that looks good.

Now, use the same procedure to move the arc length label **80.20'** on the curve between points 14 and 15. Move the text just slightly downwards and to the right, away from the **N90°00'00"E** bearing annotation. This time we will change the angle of the arc label by selecting the text and rotating it right on the screen.

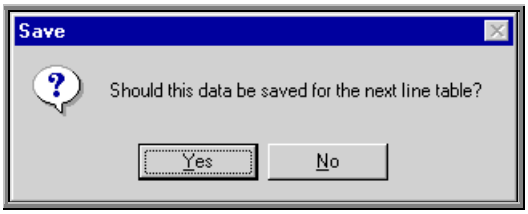
Click once on the **80.20'** arc label; the text will become highlighted with eight **handles** (■) appearing around it. There is also a rotate icon near the top center handle, but it is too small to see. Move the mouse cursor over the top center handle until the cursor is in the shape of a circular arrow ( ), then click the mouse button.

PROMPT	RESPONSE / NOTES / ETC.
Enter point to rotate to	Move your mouse to rotate the text. We recommend rotating the text so that the bottom of the text is now to the right of the screen. Since the text will be quite close to vertical, this will make the text more readable from the right side of the page,which will keep it consistent with the formatting that "Sight" Survey uses when placing text. When you are satisfied with the rotation, click your mouse again to set the position.
Drawing Window	The next few commands will show you another way to move (or add new) point labels, but first you must click once on the **Add End Point Labels** icon ( ) on the **Main** (top) toolbar to reactivate it. We will be moving the point number label at point 7 to quadrant 3.
Properties:	Click Properties (PR) to activate the **Properties** window. Go to **Label Place** select **Quad #3.** Click Properties (PR) to deselect the **Properties** window.
Drawing Window	Press and hold Ctrl as you right click on the dot that represents point **7**. *This procedure is a shortcut for the* **Get a Point** *routine, which you would normally use to capture a point off of the drawing and add it to your COGO file. However, we are using it here to do a "mini point plot" of one point, which results in the precise placement of a point label at the selected point.*
Enter & Assign: Point Number	Press Page Dn to accept the coordinates at point 7 and label it with the point number in quadrant 3. (If the **Enter & Assign** dialog box does not display a point number 7, you did not click close enough to the point. Press Esc or click Cancel, then repeat the previous step.) After completing this step, point 7 will have two point number labels so we will have to delete the original point number.
Drawing Window	First left click on the point number label **7** in the upper right quadrant of point 7. Be careful when clicking on the point number so that you don't accidentally select the line or the bearing annotation. After the point number has been selected, press Delete to delete it. If you accidentally delete something that shouldn't have been deleted, simply click the **Undo** icon ( ) on the **Drawing** window toolbar, and repeat this step. (If you ever need to delete more than one label at a time, you would select all the labels by pressing the

PROMPT	RESPONSE / NOTES / ETC.
	Ctrl key as you select them, and then press Delete once they have all been selected.)
	Before continuing, check to be certain the **Continuously Scale Drawing to Fit on Screen** *icon (* *) on the* **Main** *(top) toolbar is showing an inactive status (i.e. covered by a red* **X***).*
Drawing Window	We still need to move the point number label for point 16, but it is in the middle of text and an arc and it is not easy to select. However, if we enlarge that portion of the drawing, we should be able to select it more easily. To enlarge this part of the drawing, click on the **Zoom Window** icon ( ) on the **Drawing** window toolbar.
Zoom Window:	
Enter a corner of zoom box	Position the cursor midway between point 19 and the **C3** arc label below it, then click the mouse.
Enter second corner of rectangle	Move the cursor down and to the right until it is about a third of the way into lot 5 (Southeast lot), then click the mouse.
Drawing Window	Click (and hold) the mouse on the point number label **16**. Now, move the mouse slightly to the left and down to place the point number label in between the arc labels **C2** and **C3**. When you have the label where you want it, simply release the mouse button.
Drawing Window	Type **ZA** (**Zoom All**) to bring the entire drawing back into view.
	We will now add end point symbols to our drawing.
Properties: **End Point Symbol**	Click Properties (PR) to activate the **Properties** window. Go to **End Point Symbol** select **Iron_Pin.** Click Properties (PR) to deselect the **Properties** window.
Drawing Window	Type **PS** to access the **Point / Symbol** routine.
Select the position for the end point symbol	Place your mouse cursor over point 2. Press J Enter to jump to the exact point location and place the symbol.
Select the position for the end point symbol	Place your mouse cursor over point 13. Press J Enter to jump to the exact point location and place the symbol

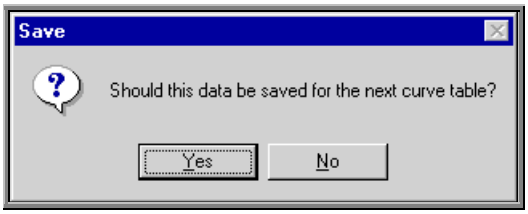
PROMPT	RESPONSE / NOTES / ETC.
Select the position for the end point symbol	Place your mouse cursor over point 1. Press J Enter to jump to the exact point location and place the symbol.
Select the position for the end point symbol	Place your mouse cursor over point 14. Press J Enter to jump to the exact point location and place the symbol.
Select the position for the end point symbol	Click on the Cancel button at the top of the **Drawing Window**.
Properties: **End Point Symbol**	Click Properties (PR) to activate the **Properties** window. Go to **End Point Symbol** select **Concrete_Mon**. Click Properties (PR) to deselect the **Properties** window.
Drawing Window	Type **PS** to access the **Point / Symbol** routine.
Select the position for the end point symbol	Place your mouse cursor over point 3. Press J Enter to jump to the exact point location and place the symbol.
Select the position for the end point symbol	Place your mouse cursor over point 12. Press J Enter to jump to the exact point location and place the symbol.
Select the position for the end point symbol	Place your mouse cursor over point 6. Press J Enter to jump to the exact point location and place the symbol.
Select the position for the end point symbol	Place your mouse cursor over point 9. Press J Enter to jump to the exact point location and place the symbol.
Select the position for the end point symbol	Click on the Cancel button at the top of the **Drawing Window**. On the **Main** (top) toolbar, click the **Save Job** icon ( ) to save your work. Also click the **Continuously Scale Drawing to Fit on Screen** icon ( ) to reactivate it. Now type **ZS** (**Zoom Sheet**) to create room on the screen for placement of supplements.
Drawing Window **Select the North arrow position**	From the **Draw** menu, select **Draw Supplemental** ➪ **North Arrow**. Indicate the position by clicking your mouse to the right of the drawing, aligned slightly below the top of the subdivision, approximately across from point 11.
Convert attributes to text during load? No/Yes	Click No or press N.

PROMPT	RESPONSE / NOTES / ETC.
Drawing Window	From the **Draw** menu, select **Draw Supplemental ➪Scale Bar ➪2 inch Scale Bar**.
Select the scale bar position	Indicate the position by clicking your mouse to the right of the drawing, below and to the left of the North arrow.
Convert attributes to text during load? No/Yes	Click **No** or press N.
Drawing Window **Select the short line table position**	Type **SL** access the **Short Line Table** supplemental routine. Indicate the position by clicking your mouse to the right of the North arrow that was previously placed.

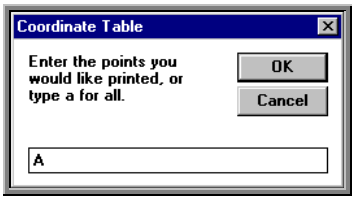


Press N or click **No** to delete the short line data. By doing this, the next short line, if any, would be labeled as **L1**. If you prefer, you may save this data, but by the time you place the short line table, you most likely are done with your drawing and the data may never be needed again.

Drawing Window **Select the curve table position**	Type **CL** access the **Curve Table** supplemental routine. Indicate the position by clicking your mouse below the short line table that was previously placed.



Press N or click **No** to delete the curve data. By doing this, the next curve, if any, would be labeled as **C1**.

PROMPT	RESPONSE / NOTES / ETC.
Drawing Window	From the **Draw** menu, select **Draw Supplemental** ➪**Coordinate List**. Press A Enter to list all the points.
	
Select the coordinate table position	Indicate the position by clicking your mouse to the right of the drawing, below the curve table.
Drawing Window	From the **Draw** menu, select **Draw Supplemental** ➪**Component Table**.
Select the component table position	Indicate the position by clicking your mouse underneath the subdivision.
Drawing Window	Right-click the **Zoom Menu** icon ( ) on the **Drawing** window toolbar to **Zoom All** and bring the entire drawing back into view. Also click once on the **Save Job** icon ( ) on the **Main** (top) toolbar to save your work.
Drawing Window **Select the page center**	Click the **Center Paper** icon ( ) on the **Main** toolbar (or type **CE**). Indicate the new center of the paper by clicking your mouse near the center of the entire drawing, including the text.
Printing or Plotting the Drawing	To send the drawing to your printer or plotter, select **File** ➪**Plot Drawing** ➪**Plot to Scale**. You will need to set your output device to a landscape mode to fit the drawing on the paper.
Printing the Text	To obtain a hard copy printout of the information in the **Text Output Window**, select **File** ➪**Print Text**, or Alt F, P. After verifying your print options, click on OK or press Enter. A copy of the final printout is presented here for your convenience. Formatting has been altered to fit the manual pages.

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
Assigned points					
Start					
	3	NW Corner Lot 1		10126.23440	19824.49650
	9	SE Corner Lot 5		9811.75440	20190.04720
	12	NE Corner Lot 7		10126.23440	20186.45650
Start					
	3	NW Corner Lot 1		10126.23440	19824.49650
Raw: *3-12					
EB		N 90°00'00.0" E		New Backsight Bng.	
Raw:		0AR	135.5		
TR		N 90°00'00.0" E	135.500		
	2	NE Corner Lot 1		10126.23440	19959.99650
Raw:		0DR	80		
SS		N 90°00'00.0" E	80.000	From Base Point 2	
	13	NW Corner Lot 7		10126.23440	20039.99650
Resuming at point 2					
	2	NE Corner Lot 1		10126.23440	19959.99650
Raw:		90.00AL	75		
TR		S 0°00'00.0" E	75.000		
	1	SE Corner Lot 1		10051.23440	19959.99650
Raw:		90AR	80		
SS		N 90°00'00.0" E	80.000	From Base Point 1	
	14	SW Corner Lot 7		10051.23440	20039.99650
Resuming at point 1					
	1	SE Corner Lot 1		10051.23440	19959.99650
From Point: 1		Distance: 65			
Inter. Point: 19		Close Dist: 65	Close Point: 14		
DD		S 37°58'47.5" E	65.000		
	19	Center of Cul-de-Sac		9999.99965	19999.99650
DD		N 37°58'47.5" E	65.000		
	14	SW Corner Lot 7		10051.23440	20039.99650
Go to					
	1	SE Corner Lot 1		10051.23440	19959.99650
From Point: 1		Bearing: 90NW			
Inter. Point: 4		Close Bng: 0NW	Close Point: 3		
BB		N 90°00'00.0" W	135.500		
	4	SW Corner Lot 1		10051.23440	19824.49650
BB		N 0°00'00.0" E	75.000		
	3	NW Corner Lot 1		10126.23440	19824.49650
Go to					

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
	1			10051.23440	19959.99650
TA To Cntr. Pt.		S 37°58'47.5" E			
	19			9999.99965	19999.99650
Calculations based on Arc (to the left)					
		Arc 80.000	Central Angle	70°31'04.4"	
		Chord 75.045	Chord Bearing	S 16°45'40.3" W	
		Radius 65.000	Bng from Cntr Pt	S 71°30'08.1" W	
		Tangent 45.953			
	18			9979.37726	19938.35465
From Point: 18		Bearing: *19-18			
Inter. Point: 5		Close Bng: 0AZ	Close Point: 4		
BB		S 71°30'08.1" W	120.061		
	5			9941.28581	19824.49650
BB		N 0°00'00.0" W	109.949		
	4			10051.23440	19824.49650
Raw:		S0E	115		
TR		S 0°00'00.0" E	115.000		
	5			9936.23440	19824.49650
From Point: 5		Bearing: 0.00000 SE			
Inter. Point: 6		Close Bng: 90.00000 NE	Close Point: 9		
BB		S 0°00'00.0" E	124.480		
	6			9811.75440	19824.49650
BB		N 90°00'00.0" E	365.551		
	9			9811.75440	20190.04720
IN		N 0°39'15.0" W	314.500		
	12			10126.23440	20186.45650
From Point: 12		Bearing: R12,9			
Inter. Point: 11		Close Bng: 90NW	Close Point: 14		
BB		S 0°39'15.0" E	75.005		
	11			10051.23440	20187.31284
BB		N 90°00'00.0" W	147.316		
	14			10051.23440	20039.99650
Go to					
	11			10051.23440	20187.31284
Bearing recalled from 12 to 9					
Distance recalled from 4 to 5					
Raw:		*12, 9	R		
TR		S 0°39'15.0" E	115.000		
	10			9936.24190	20188.62581
Distance recalled from 10 to 19 + -65					

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
From Point: 10		Distance: R			
Int. Point: 15		Arc Ctr Pt: 19	Close Point: 14		
DA		N 71°19'28.1" W	134.113		
	15			9979.18609	20061.57406
DA To Cntr. Pt.		N 71°19'28.1" W			
	19			9999.99965	19999.99650
		Arc 80.202	Central Angle	70°41'44.4"	
		Chord 75.210	Chord Bearing	N 16°40'20.3" W	
		Radius 65.000	Bng from Cntr Pt	N 37°58'47.5" E	
		Tangent 46.104			
	14			10051.23440	20039.99650
Go to					
	6			9811.75440	19824.49650
EP		N 90°00'00.0" E	365.551	New Backsight Bng. (B.S. is 9)	
Raw:		0 6	90		
TR		N 90°00'00.0" E	90.000		
	7			9811.75440	19914.49650
Raw:		0DL	181		
TR		N 90°00'00.0" E	181.000		
	8			9811.75440	20095.49650
Go to					
	19			9999.99965	19999.99650
Raw:		R19,8	65		
TR		S 26°53'58.0" E	65.000		
	16			9942.03253	20029.40420
From Point: 16		Ctr Point: 19			
Inter. Point: 17		Distance: *19-7-65	Close Point: 7		
AD To Cntr. Pt.		N 26°53'58.0" W			
	19			9999.99965	19999.99650
		Arc 58.228	Central Angle	51°19'36.3"	
		Chord 56.301	Chord Bearing	S 88°45'50.1" W	
		Radius 65.000	Bng from Cntr Pt	S 24°25'38.3" W	
		Tangent 31.231			
	17			9940.81801	19973.11651
AD		S 24°25'38.3" W	141.752		
	7			9811.75440	19914.49650
Go to					
	19			9999.99965	19999.99650
Raw:		R19-5	65		
TR		S 70°01'55.8" W	65.000		

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
	18			9977.80262	19938.90401
Go to					
	13			10126.23440	20039.99650
Offset Intersection Calculation					
OI		S 0°00'00.0" E	40.000		
OI		N 90°00'00.0" E	-40.000		
By Offset Intersection					
	20	Centerline Intersection Pnt		10166.23440	19999.99650
Resuming at Point					
	13			10126.23440	20039.99650
Go to					
	19	Center of Cul-de-Sac		9999.99965	19999.99650
IN		N 0°00'00.0" E	166.235		
	20	Centerline Intersection Pnt		10166.23440	19999.99650
OS		N 90°00'00.0" W	185.500	From Base Point 20	
	21	OS 185.5 L @ Pt. 20		10166.23440	19814.49650
OS		N 90°00'00.0" E	186.500	From Base Point 20	
	22	OS 186.5 R @ Pt. 20		10166.23440	20186.49650
Exit offsets, resume at point					
	20	Centerline Intersection Pnt		10166.23440	19999.99650
Assigned point					
	11	SE Corner Lot 7		10051.23440	20187.31284
Editing Coordinates, resuming at point 11					
	11	SE Corner Lot 7		10051.23440	20187.31284
Database Saved: Monday, December 04, 1995 3:45 pm.					
List/Plot Coordinates					
Resuming at point 11					
	11	SE Corner Lot 7		10051.23440	20187.31284
Go to					
	12	NE Corner Lot 7		10126.23440	20186.45650
Radial Stake out					
	12	NE Corner Lot 7		10126.23440	20186.45650
		Instrument Location			
	9	SE Corner Lot 5		9811.75440	20190.04720
		Backsight Point			
BS	S 0°39'15.0" E		314.500		

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
RS		56°33'21.2" AR	225.172		
	19	Center of Cul-de-Sac		9999.99965	19999.99650
Go to					
	19	Center of Cul-de-Sac		9999.99965	19999.99650
Radial Stake out					
	19	Center of Cul-de-Sac		9999.99965	19999.99650
		Instrument Location			
	12	NE Corner Lot 7		10126.23440	20186.45650
		Backsight Point			
BS	N 55°54'06.2" E		225.172		
Sight Points					
RS		266°07'06.3" AR	65.000		
	1	SE Corner Lot 1		10051.23440	19959.99650
RS		286°30'59.2" AR	132.421		
	2	NE Corner Lot 1		10126.23440	19959.99650
RS		249°49'30.8" AR	216.184		
	3	NW Corner Lot 1		10126.23440	19824.49650
RS		230°22'21.7" AR	182.826		
	4	SW Corner Lot 1		10051.23440	19824.49650
RS		194°07'49.6" AR	186.725		
	5			9936.23440	19824.49650
RS		167°05'29.5" AR	257.365		
	6	SW Corner Lot 3		9811.75440	19824.49650
RS		148°31'32.1" AR	206.752		
	7			9811.75440	19914.49650
RS		97°11'55.8" AR	211.084		
	8			9811.75440	20095.49650
RS		78°49'29.4" AR	267.499		
	9	SE Corner Lot 5		9811.75440	20190.04720
RS		52°46'25.7" AR	199.113		
	10			9936.24190	20188.62581
RS		18°48'03.2" AR	194.197		
	11	SE Corner Lot 7		10051.23440	20187.31284
RS		0°00'00.0" AR	225.172		
	12	NE Corner Lot 7		10126.23440	20186.45650
RS		321°40'48.5" AR	132.421		
	13	NW Corner Lot 7		10126.23440	20039.99650
RS		342°04'41.4" AR	65.000		
	14	SW Corner Lot 7		10051.23440	20039.99650
RS		52°46'25.7" AR	65.000		

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
	15			9979.18609	20061.57406
RS		97°11'55.8" AR	65.000		
	16			9942.03253	20029.40420
RS		148°31'32.1" AR	65.000		
	17			9940.81801	19973.11651
RS		194°07'49.6" AR	65.000		
	18			9977.80262	19938.90401
RS		304°05'53.8" AR	166.235		
	20	Centerline Intersection Pnt		10166.23440	19999.99650
RS		255°57'47.5" AR	249.087		
	21	OS 185.5 L @ Pt. 20		10166.23440	19814.49650
RS		352°23'11.1" AR	249.832		
	22	OS 186.5 R @ Pt. 20		10166.23440	20186.49650
Resuming at point 19					
	19	Center of Cul-de-Sac		9999.99965	19999.99650
Start					
	1	SE Corner Lot 1		10051.23440	19959.99650
IN		N 0°00'00.0" E	75.000		
	2	NE Corner Lot 1		10126.23440	19959.99650
IN		N 90°00'00.0" W	135.500		
	3	NW Corner Lot 1		10126.23440	19824.49650
IN		S 0°00'00.0" E	75.000		
	4	SW Corner Lot 1		10051.23440	19824.49650
IN		S 0°00'00.0" E	115.000		
	5			9936.23440	19824.49650
IN		S 0°00'00.0" E	124.480		
	6	SW Corner Lot 3		9811.75440	19824.49650
IN		N 90°00'00.0" E	90.000		
	7			9811.75440	19914.49650
IN		N 90°00'00.0" E	181.000		
	8			9811.75440	20095.49650
IN		N 90°00'00.0" E	94.551		
	9	SE Corner Lot 5		9811.75440	20190.04720
IN		N 0°39'15.0" W	124.496		
	10			9936.24190	20188.62581
IN		N 0°39'15.0" W	115.000		
	11	SE Corner Lot 7		10051.23440	20187.31284
IN		N 0°39'15.0" W	75.005		
	12	NE Corner Lot 7		10126.23440	20186.45650

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
IN		N 90°00'00.0" W	146.460		
	13	NW Corner Lot 7		10126.23440	20039.99650
IN		S 0°00'00.0" E	75.000		
	14	SW Corner Lot 7		10051.23440	20039.99650
OC To Cntr. Pt.		S 37°58'47.5" W			
	19	Center of Cul-de-Sac		9999.99965	19999.99650
		Arc 322.233	Central Angle	284°02'24.9"	
		Chord 80.000	Chord Bearing	N 90°00'00.0" W	
		Radius 65.000	Bng from Cntr Pt	N 37°58'47.5" W	
	1	SE Corner Lot 1		10051.23440	19959.99650

Area = 95871.8053 Sq. Feet or 2.2009 Acres

Point to Point Area
Boundary: 1-14*19,17*19,1

Area = 95871.8053 Sq. Feet or 2.2009 Acres

Point to Point Area
Boundary: 1-14>19,1

Area = 95871.8053 Sq. Feet or 2.2009 Acres

Point to Point Area
Boundary: 1-4,1

Area = 10162.5000 Sq. Feet or 0.2333 Acres

Point to Point Area
Boundary: 1-4

Area = 10162.5000 Sq. Feet or 0.2333 Acres

Point to Point Area
Boundary: 1,4,5,18*19

Area = 10908.2024 Sq. Feet or 0.2504 Acres

Point to Point Area

PRINTOUT	Point #	Bearing	Distance	Northing	Easting

Boundary: 18,5-7,17*19
Area = 17712.7012 Sq. Feet or 0.4066 Acres

Point to Point Area
Boundary: 17,7,8,16*19

Area = 15143.7734 Sq. Feet or 0.3477 Acres

Point to Point Area
Boundary: 16,8-10,15*19

Area = 18957.0895 Sq. Feet or 0.4352 Acres

Point to Point Area
Boundary: 15,10,11,14*19

Area = 11970.9260 Sq. Feet or 0.2748 Acres

Point to Point Area
Boundary: 11-14

Area = 11016.6128 Sq. Feet or 0.2529 Acres

List/Plot Coordinates

1	SE Corner Lot 1	10051.23440	19959.99650
2	NE Corner Lot 1	10126.23440	19959.99650
3	NW Corner Lot 1	10126.23440	19824.49650
4	SW Corner Lot 1	10051.23440	19824.49650
5		9936.23440	19824.49650
6	SW Corner Lot 3	9811.75440	19824.49650
7		9811.75440	19914.49650
8		9811.75440	20095.49650
9	SE Corner Lot 5	9811.75440	20190.04720
10		9936.24190	20188.62581
11	SE Corner Lot 7	10051.23440	20187.31284
12	NE Corner Lot 7	10126.23440	20186.45650

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
	13	NW Corner Lot 7		10126.23440	20039.99650
	14	SW Corner Lot 7		10051.23440	20039.99650
	15			9979.18609	20061.57406
	16			9942.03253	20029.40420
	17			9940.81801	19973.11651
	18			9977.80262	19938.90401
	19	Center of Cul-de-Sac		9999.99965	19999.99650
	20	Centerline Intersection Pnt		10166.23440	19999.99650
	21	OS 185.5 L @ Pt. 20		10166.23440	19814.49650
	22	OS 186.5 R @ Pt. 20		10166.23440	20186.49650
	~BS1	Automatic created BS Point		10056.84054	19968.27727

END of Example 3

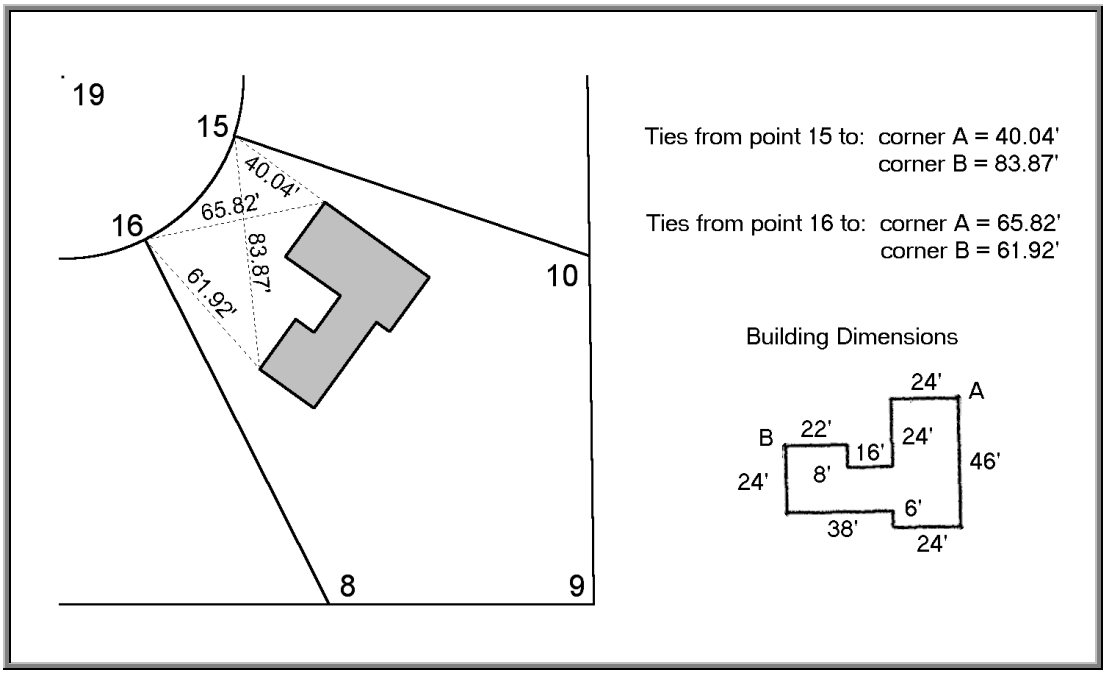
3.04 Example 4: Building Location from Two Points

This example illustrates how to place a building on a lot when you have two corners of the building tied to two lot corners. To accomplish this task, "Sight" Survey uses the macro file **DrawBldg.mac**.

Begin by loading the "Sight" Survey program, and running example 3 to construct Oakwoods Subdivision. If you have already run the example, select **File** ➪ **Open Job** and load the file **Oakwood.Zak**.

In this example, the building will be located on Lot 5. Click the **Zoom Window** icon ( ) in the **Drawing** window toolbar and enlarge the area around Lot 5.

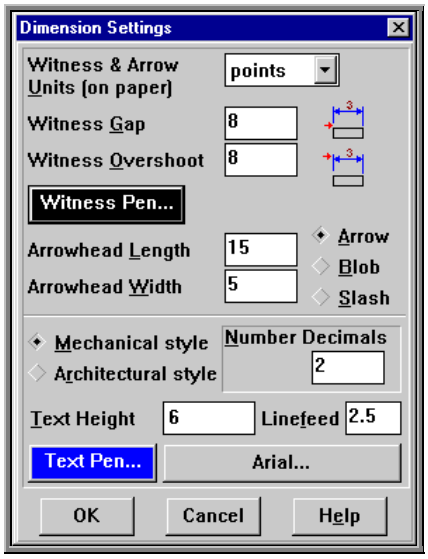
The field notes are shown below.



PROMPT	RESPONSE / NOTES / ETC.

Traverse:
From Point

Click the mouse in the **Drawing** window to activate the window. You need to set the dimension text size to a value more compatible with the small point-tie dimensions you'll be placing on the drawing. Right-click the **Dimension** icon ( ) in the **Drawing** window toolbar to activate the **Dimension Settings**.

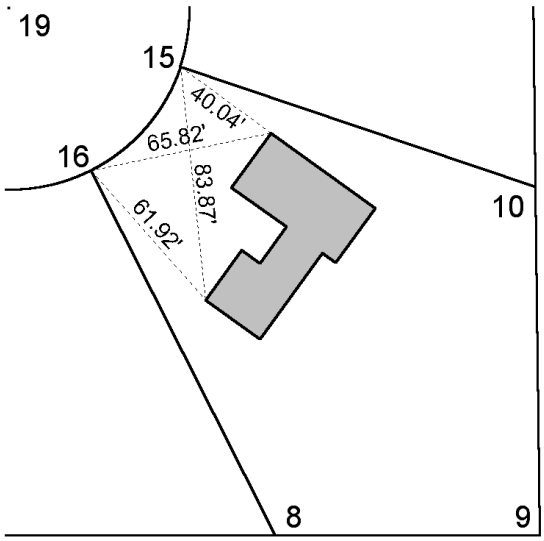


Press Alt T to select **Text Height**. Press Delete to clear the present **Text Height** value, then type `6` and click OK to close the dialog box.

Press Alt S, D, W to select **Start** ➪ **Draw** ➪ **Draw Building Location**.

If the setting for **Surveying Dimensions** is not set to **`Distance Only`**, "Sight" Survey will suggest that you change the setting. In the **Drawing** window command line, you are prompted:

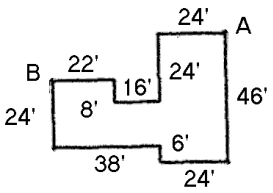
For best results, set Survey Dimension Format to Distance Only.



Ties from point 15 to: corner A = 40.04'
corner B = 83.87'

Ties from point 16 to: corner A = 65.82'
corner B = 61.92'

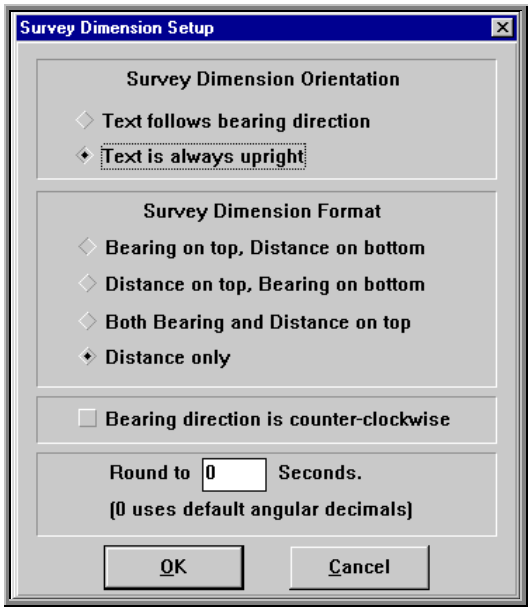
Building Dimensions



PROMPT	RESPONSE / NOTES / ETC.

Since you have measured only distances to tie the lot corners to the building corners, the bearings of the tie lines to the corners are irrelevant and should not be printed. Therefore, you should instruct "Sight" Survey to print only the distances. To change the setting for **Surveying Dimensions,** click [Yes]. The **Survey Dimensions Setup** dialog box appears:

PROMPT	RESPONSE / NOTES / ETC.



Under the **Survey Dimension Format** section, click the option **Distance only**. Click OK to close the dialog box.

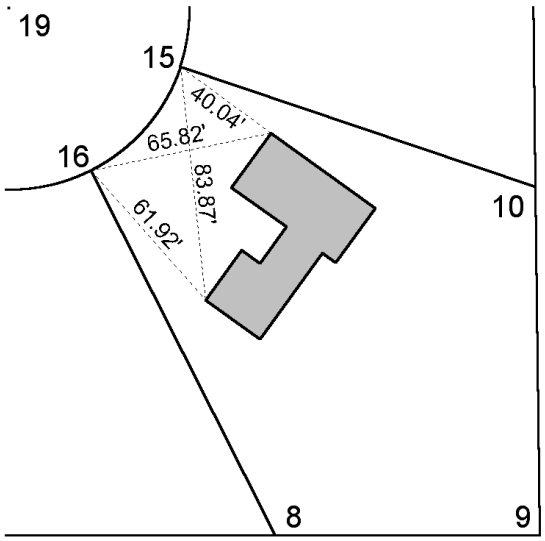
In the **Drawing** window command line, you are prompted:

Select 1st Lot Corner

The cursor has changed to the **Grab All** cursor (□). Move the cursor so point 15 is in the box and click.

?

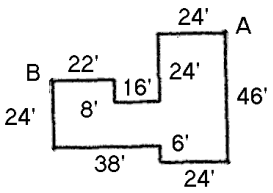
We start at point 15 and go to point 16 because the macro requires distance-distance intersections to be performed in a clockwise direction. Starting at point 16 and going to point 15 would result in the structure begin located on the other side of the lot line.



Ties from point 15 to: corner A = 40.04'
corner B = 83.87'

Ties from point 16 to: corner A = 65.82'
corner B = 61.92'

Building Dimensions



PROMPT	RESPONSE / NOTES / ETC.

In the **Drawing** window command line, you are prompted:

Enter distances to Near & Far corner separated by a space

Type **`40.04 83.87`** and press ↵Enter. These numbers represent the distance from point 15 to the near corner of the building, and the distance from point 15 to the far corner of the building. In the **Drawing** window command line, you are prompted:

Select 2nd Lot Corner

Move the **Grab All** cursor (⊡) cursor so point 16 is in the box and click. In the **Drawing** window command line, you are prompted:

Enter distances to Far & Near corner separated by a space

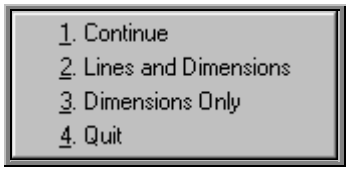
PROMPT	RESPONSE / NOTES / ETC.

Type **65.82 61.92** and press ↵Enter. These numbers represent the distance from point 16 to the far corner of the building, and the distance from point 16 to the near corner of the building.

?

Notice that in this prompt you are asked for the **Far & Near** *distances while in the previous distance prompt you were asked for* **Near & Far** *distances. The order of distance entry is crucial to the success of this macro. Distances must be properly paired. The first distance in both entries must go to the first point, and the second distance in both entries must go to the second point.*

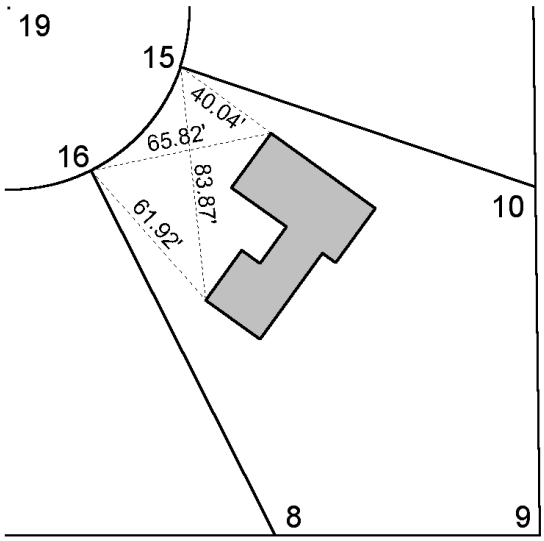
Upon successful data entry, an option menu appears in the **Drawing** window.



This menu governs how the ties and tie distances are to be shown on the drawing. The options are: **1. Continue** - continue without drawing lines or distances; **2. Lines and Dimensions** - draw dashed lines and label the distances; **3. Dimensions Only** - label the distances without drawing dashed lines; and **4. Quit** - quit the macro. For this example, press 2 or click on option two.

"Sight" Survey performs two distance-distance intersections and locates the building corners. Dashed lines are drawn from the lot corners to the building corners, and the tie distances are labeled. In the **Drawing** window command line, you are prompted:

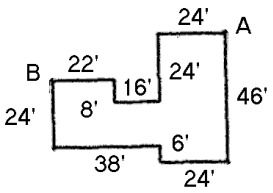
Set Building Starting Corner



Ties from point 15 to: corner A = 40.04'
corner B = 83.87'

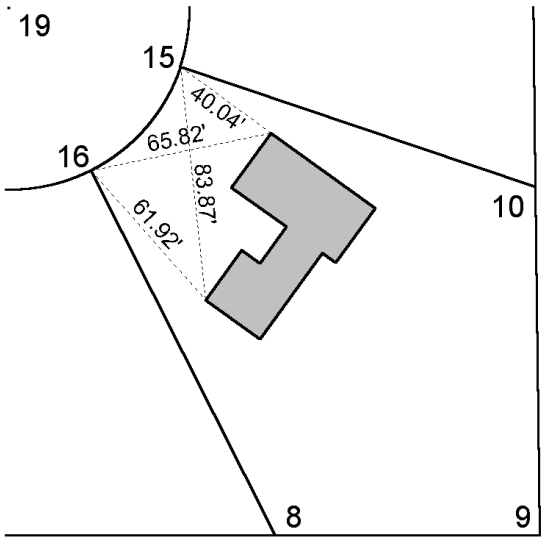
Ties from point 16 to: corner A = 65.82'
corner B = 61.92'

Building Dimensions



PROMPT	RESPONSE / NOTES / ETC.
	Move the cursor somewhere into an open area of the **Drawing** window and click or press ↵Enter. At this time, the location is unimportant. You have just set building corner **B** on the drawing. In the **Drawing** window command line, you are prompted:
Set Next Corner	
	You will now draw the building outline using the arrow keys to move the cursor measured distances. Press the right arrow (→) and a distance prompt box appears:
Move Right: How far?	Type **22** ↵Enter ↵Enter. (The first ↵Enter moves the cursor 22' to the right, the second ↵Enter sets the point.) A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	

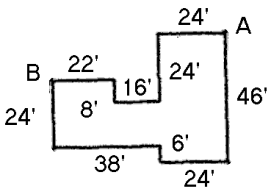
PROMPT	RESPONSE / NOTES / ETC.
	Press the down arrow (↓) and a distance prompt box appears:
Move Down: How far?	Type `8` Enter Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	
	Press the right arrow (→) and a distance prompt box appears:
Move Right: How far?	Type `16` Enter Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	
	Press the up arrow (↑) and a distance prompt box appears:
Move Up: How far?	Type `24` Enter Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	
	Press the right arrow (→) and a distance prompt box appears:
Move Right: How far?	Type `24` Enter Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	
	Press the down arrow (↓) and a distance prompt box appears:
Move Right: How far?	Type `46` Enter Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	



Ties from point 15 to: corner A = 40.04'
corner B = 83.87'

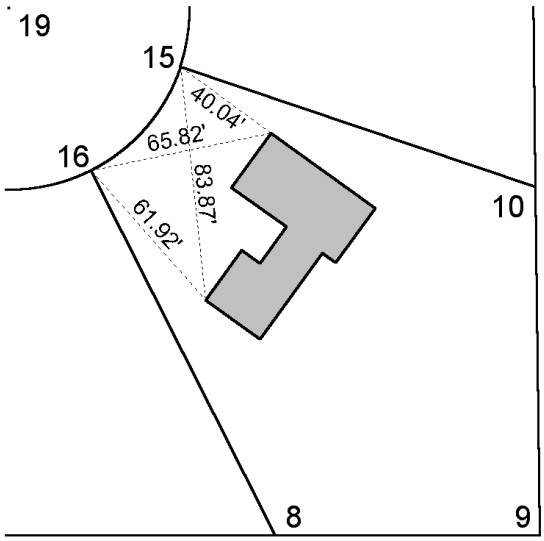
Ties from point 16 to: corner A = 65.82'
corner B = 61.92'

Building Dimensions



PROMPT	RESPONSE / NOTES / ETC.
	Press the left arrow (←) and a distance prompt box appears:
Move Left: How far?	Notice that the desired distance, **24**, is already in the response field. This is because it was the last left-right dimension entered. You do not need to retype it, just press ↵Enter ↵Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	
	Press the up arrow (↑) and a distance prompt box appears:
Move Up: How far?	Type **6** ↵Enter ↵Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	

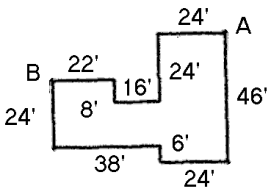
PROMPT	RESPONSE / NOTES / ETC.
	Press the left arrow (←) and a distance prompt box appears:
Move Left: How far?	Type **38** Enter Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	
	Press the up arrow (↑) and a distance prompt box appears:
Move Up: How far?	Type **24** Enter Enter. A line is drawn. In the **Drawing** window command line, you are prompted:
Enter next point of polyline	
	You have once again reached point **B**, your building has been drawn. Press Esc to cancel the building drawing operation.
Enter point that must move	
	Move the **Grab All** cursor (⊡) so building corner B is in the box and click. In the **Drawing** window command line, you are prompted:
Enter point it should move to	
	Move the **Grab All** cursor (⊡) to the point computed by the tie distances 61.92 and 83.87, and click. The building moves to the new location. In the **Drawing** window command line, you are prompted:
Enter point about which to rotate	
	The point we are at is the point around which we want to rotate. Without moving the **Grab All** cursor (⊡), press Enter or click. In the **Drawing** window command line, you are prompted:



Ties from point 15 to: corner A = 40.04'
corner B = 83.87'

Ties from point 16 to: corner A = 65.82'
corner B = 61.92'

Building Dimensions



PROMPT	RESPONSE / NOTES / ETC.

Enter angle from keyboard (else from cursor)

Since we are going to be using the other computed building corner to set our building rotation, we will not be entering the angle from the keyboard. Press [N] or click [No]. In the **Drawing** window command line, you are prompted:

Enter point that must rotate

Move the **Grab All** cursor ([·]) so building corner **A** is in the box and click. In the **Drawing** window command line, you are prompted:

Enter point it must rotate to

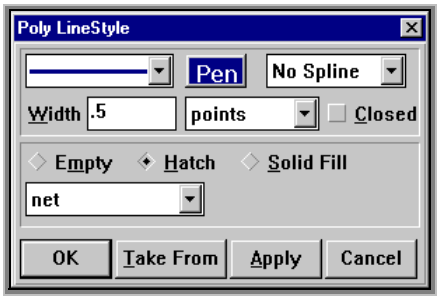
PROMPT	RESPONSE / NOTES / ETC.

Move the **Grab All** cursor (⊡) to the point computed by the tie distances 40.04 and 65.82, and click. The building rotates to the new location. In the **Drawing** window command line, you are prompted:

Enter point that must move

Press Esc to end the macro.

We will now cross-hatch the building. Since the building was constructed as polyline, "Sight" Survey can use the **Start** ➪ **Settings** ➪ **Polyline Defaults (XP)** to apply a hatch boundary. Begin by clicking the cursor on the building outline to select the building object. Type **XP** or right-click the **Draw Polyline** icon ( )on the **Drawing** window toolbar to open the **Polyline Style** dialog box.



To cross-hatch: Press Alt H or click on **Hatch**. Select a hatch pattern from the drop-down, scrollable selection menu. Press Alt A or click Apply.

OR **To fill:** Press Alt S or click on **Solid Fill**. Select a fill color by clicking on the **Solid Color** button, then selecting a color from the color palette that appears. Press Alt A or click Apply.

Do not be alarmed at the color of your fill. The color of selected items is always distorted. Once you de-select the item, the color will appear as you have selected it.

PROMPT	RESPONSE / NOTES / ETC.

Click [OK] to close the **Polyline Style** dialog box.

If you are not hatching or filling other objects at this time, you should press Alt M or click on **Empty** *before closing the dialog box. Otherwise, objects drawn with polylines may automatically be hatched or filled.*

If you have several building locations to draw, and you are hatching of filling each building, set your polyline defaults before entering the **Draw Building Location** *routine.*

When setting the polyline defaults, press Alt C or click on **Closed**. *When you do this, you do not need to enter the final building leg. Instead of entering the final leg, press Esc. The final leg will automatically be drawn and the building will be hatched/filled.*

For example, if your building was a 50' x 30' rectangle, your keystrokes to draw the building would be as follows:

Enter *(to set the starting point)*

→ 5 0 Enter Enter *(to draw 50' to the right)*

↓ 3 0 Enter Enter *(to draw 30' down)*

← Enter Enter *(to draw 50' to the left)*

Esc *(to draw the final 30' side and hatch/fill the building.)*

END of Example 4

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3.05 Example 5: Least Squares Adjustment

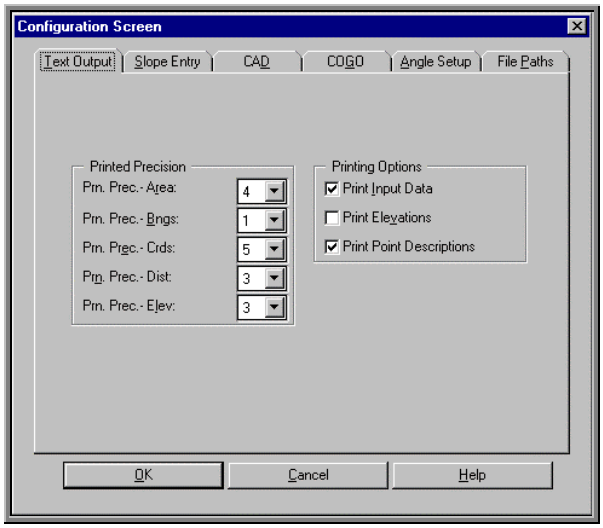
This example illustrates the closure and adjustment of a closed traverse using the Least Squares Adjustment method. This example sets traverse points using the **Enter & Assign** (**EA**) and **Traverse** (**TR**) routines, and enters cross-ties using the **Enter Diagonal** (**ED**) routine. All distances used for the purpose of corner establishment are horizontal.

Begin by loading the "Sight" Survey program.

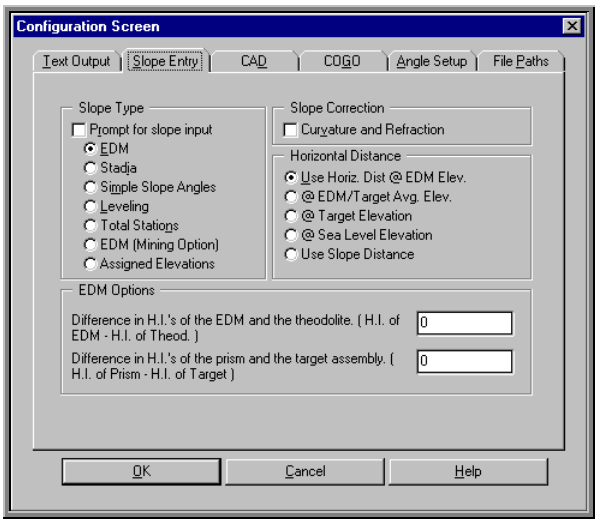
PROMPT	RESPONSE / NOTES / ETC.

Traverse:
From Point

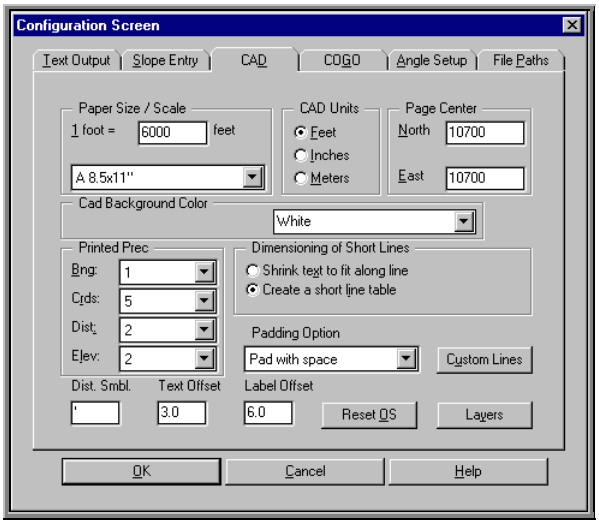
When the "Sight" Survey program appears, press Alt G, T to access the **Text Output Configuration Menu**. In order for your prompts and printed output to follow this manual, you must set your configuration options to match the following menu screens before running the rest of this example.



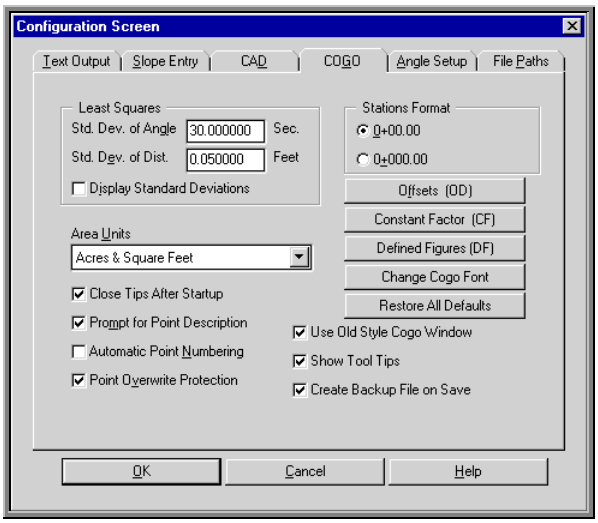
After setting your **Text Output** configuration, press Alt S to access the **Slope Entry Configuration Menu**.



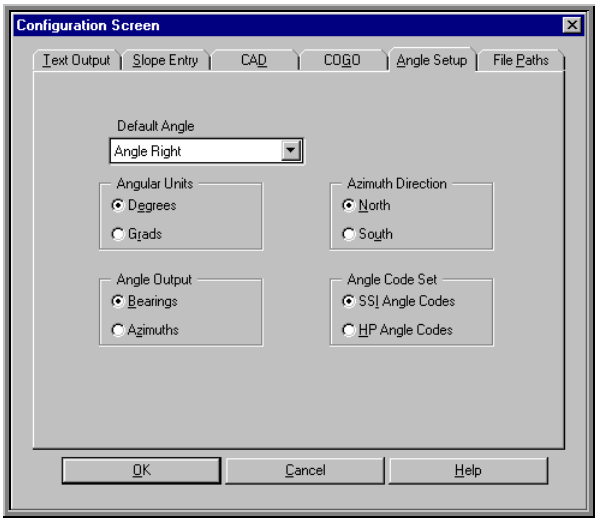
After setting your **Slope Entry** configuration, press Alt D to access the **CAD Configuration Menu**.



After setting your **CAD** configuration, press Alt G to access the **COGO Configuration Menu**.



After setting your **COGO** configuration, press Alt A to access the **Angle Setup Configuration Menu**.



When all of the items have been set to match the screens shown, press ↵Enter or click on OK to accept the changes and return to the main "Sight" Survey program screen. (On the **Angle Setup** screen, your **Default Angle** **must** be set to **`Angle Right`**.)

PROMPT	RESPONSE / NOTES / ETC.

Traverse:
From Point

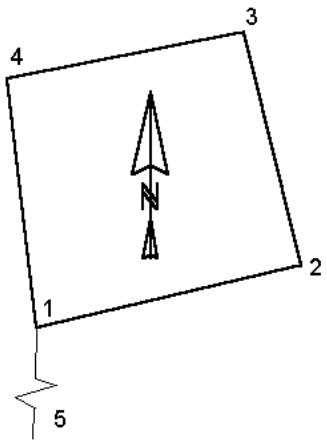
When the main "Sight" Survey program screen appears, click the **Drawing** window Properties (PR) button to display the **Properties**.

Properties

Many drawing **Properties** can be set however you wish, however, if you will be sending your drawing to a **plotter**, the **Text Font** that you choose should be a **plotter** font such as **Roman** font. In addition, please set the following items as specified below.

Line Type	**Continuous**
Label Type	**Point Number**
End Point Symbol	**Dot**
Text Placement	**Dist / Bng**
Text Size	**10**

COGO Drawing Properties	
Object Color	14 - Black
LineType	Continuous
Line Width	01
Label Type	Point Number
Label Place	Quad #1
Label Angle	+0° - Horizontal
End Pt. Sym	Dot
Text Place	Dist / Bng
Text Font	Arial
Text Size	10
Text Color	08 - Blue
Text Bold	No
Text Italic	No
Text Underline	No
Text Strikeout	No
Symbols Lyr	SYMBOLS
Coords. Lyr	COORDINATES
Coord. List Lyr	COORDLIST
Elevations Lyr	ELEVATIONS
ASCII File Lyr	ASCIITEXT
Line Lyr	LINES
Pt. Name Lyr	PTNAMES
Pt. Number Lyr	PTNUMBERS
Points Lyr	POINTS
Sup. Table Lyr	SUPTABLES
Line Annot Lyr	LINETEXT
Station Lyr	STATIONS



Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

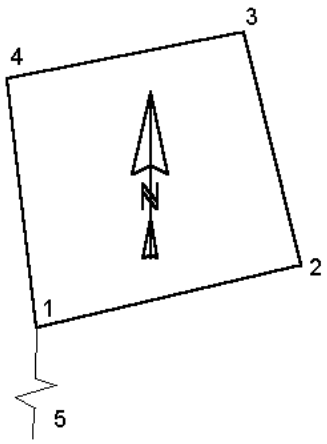
Traverse Legs

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

Diagonal Shots

Occ.Pt	BS	FS	Angle Right	Distance
1	5	3	208° 47' 51"	3651.69
2	1	4	55° 35' 35"	3215.68
3	2	1	39° 59' 51"	3651.69
4	3	2	52° 38' 18"	3215.68

PROMPT	RESPONSE / NOTES / ETC.
	Click Properties (PR) to deselect the **Properties** window.
Traverse:	
From Point	Click on the **Text Output** window to bring the full window back into view (or select **Window** ➪ **1 Text Output**). Now, press Esc to activate the **Traverse Entry** window, and then type **EA** to select the **Enter & Assign** routine.
Enter & Assign:	
Point #	Type `5` Enter to set the point number.
Northing	Type `8000` Enter.
Easting	Type `9997.57399` Enter.
Elevation	Press Enter.
Description	Type `Initial Backsight` Enter.
Enter & Assign:	
Point #	Type `1` Enter to set the point number.
Northing	Type `10000` Enter.
Easting	Type `10000` Enter.
Elevation	Press Enter.



Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

Traverse Legs

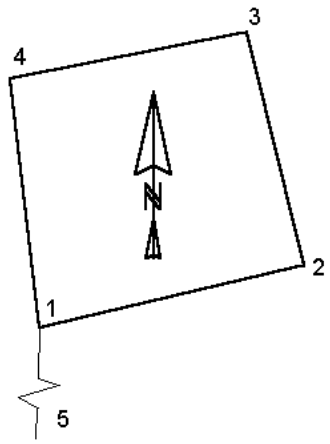
Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

Diagonal Shots

Occ.Pt	BS	FS	Angle Right	Distance
1	5	3	208° 47' 51"	3651.69
2	1	4	55° 35' 35"	3215.68
3	2	1	39° 59' 51"	3651.69
4	3	2	52° 38' 18"	3215.68

PROMPT	RESPONSE / NOTES / ETC.
Description	Type **SW Corner** Enter.
Enter & Assign:	
Point #	Type **EB** to select the **Enter Backsight Bearing** routine.
Enter Backsight:	
BS Bng	Type ***1-5** Enter to recall the bearing from point 1 to point 5 and set it as the reference/backsight bearing.
Traverse:	
From Point	**1** (By default).
To Point	Type **ST** to select the **Start At** routine.
Start At Point:	
Point #	Press Enter to set the occupied point (1) as the starting point, and to clear the **Area Sum** and **Traverse Length** accumulators.
Traverse:	
From Point	**1** (By default).
To Point	Type **ED** to select the **Enter Diagonal** routine.
Enter Diagonal:	
From Point	**1** (By default).

PROMPT	RESPONSE / NOTES / ETC.
To Point	Type **3** ↵Enter to set the point number.
Bearing	Type **208.4751** ↵Enter to enter an angle right of 208° 47' 51".
Distance	Type **3651.69** ↵Enter to enter the horizontal distance.
Enter Diagonal:	
From Point	**1** (By default).
To Point	Type **TR** to select the Traverse routine.
Traverse:	
From Point	**1** (By default).
To Point	Type **2** ↵Enter to set the point number.
Bearing	Type **253** ↵Enter to enter an angle right of 253° 00' 00".
Distance	Type **2359.24** ↵Enter to enter the horizontal distance.
Description for Pt. 2	Type **SE Corner** ↵Enter.
Traverse:	
From Point	**2** (By default).
To Point	Type **ED** to select the Enter Diagonal routine.
Enter Diagonal:	
From Point	**2** (By default).
To Point	Type **4** ↵Enter to set the point number.
Bearing	Type **55.3535** ↵Enter to enter an angle right of 55° 35' 35".
Distance	Type **3215.68** ↵Enter to enter the horizontal distance.
Enter Diagonal:	
From Point	**2** (By default).
To Point	Type **TR** to select the Traverse routine.
Traverse:	
From Point	**2** (By default).
To Point	Type **3** ↵Enter to set the point number.
Bearing	Type **95.4757** ↵Enter to enter an angle right of 95° 47' 57".
Distance	Type **2559.01** ↵Enter to enter the horizontal distance.



Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

Traverse Legs

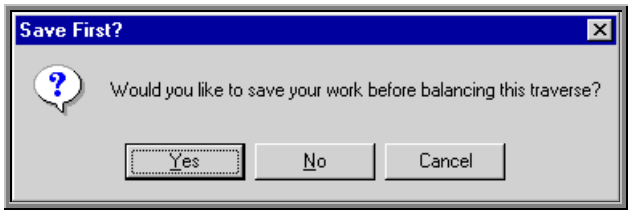
Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

Diagonal Shots

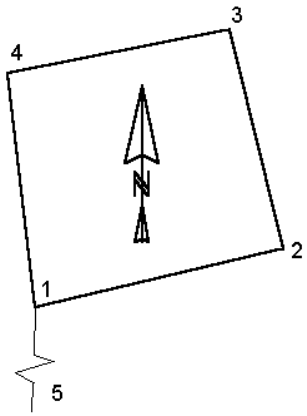
Occ.Pt	BS	FS	Angle Right	Distance
1	5	3	208° 47' 51"	3651.69
2	1	4	55° 35' 35"	3215.68
3	2	1	39° 59' 51"	3651.69
4	3	2	52° 38' 18"	3215.68

PROMPT	RESPONSE / NOTES / ETC.
Description for Pt. 3	Press Home Delete N ↵Enter to edit the default (last used) description to read **NE Corner** ↵Enter. (If you wish, just type **NE Corner** ↵Enter.)
Traverse:	
From Point	**3** (By default).
To Point	Type **ED** to select the Enter Diagonal routine.
Enter Diagonal:	
From Point	**3** (By default).
To Point	Type **1** ↵Enter to set the point number.
Bearing	Type **39.5951** ↵Enter to enter an angle right of 39° 59' 51".
Distance	Type **3651.69** ↵Enter to enter the horizontal distance.
Enter Diagonal:	
From Point	**3** (By default).
To Point	Type **TR** to select the Traverse routine.
Traverse:	
From Point	**3** (By default).
To Point	Type **4** ↵Enter to set the point number.
Bearing	Type **87.0909** ↵Enter to enter an angle right of 87° 09' 09".
Distance	Type **2078.42** ↵Enter to enter the horizontal distance.

PROMPT	RESPONSE / NOTES / ETC.
Description for Pt. 4	Press Home → Delete W ↵Enter to edit the default (last used) description to read **NW Corner** ↵Enter.
Traverse:	
From Point	**4** (By default).
To Point	Type **ED** to select the Enter Diagonal routine.
Enter Diagonal:	
From Point	**4** (By default).
To Point	Type **2** ↵Enter to set the point number.
Bearing	Type **52.3818** ↵Enter to enter an angle right of 52° 38' 18".
Distance	Type **3215.68** ↵Enter to enter the horizontal distance.
Enter Diagonal:	
From Point	**4** (By default).
To Point	Type **TC** to select the **Traverse Closure** routine.
Traverse Close:	
From Point	**4** (By default).
Close to	Type **1** ↵Enter to set the closing point of the closed traverse.
Bearing	Type **98.3536** ↵Enter to enter an angle right of 98° 35' 36".
Distance	Type **2707.94** ↵Enter to enter the horizontal distance.
Enter closing ANGLE RIGHT at Pt. 1 backsighting Pt. 4 foresighting Pt. 2 Press <Enter> if unknown	Type **78.2706** ↵Enter to enter an angle right of 78° 27' 06".



Press Y or click **Yes** to save this job before proceeding with the traverse adjustment. *(Up to this point, your data has been saved in a temporary file called* **COGO.ZAK**, *used to store COGO data until the job is saved to a different file name, or a new job is opened.)*



Known Point	Northing	Easting
1	10000.00000	10000.00000
5	8000.00000	9997.57399

Traverse Legs

Occ.Pt	BS	FS	Angle Right	Distance
1	5	2	253° 00' 00"	2359.24
2	1	3	95° 47' 57"	2559.01
3	2	4	87° 09' 09"	2078.42
4	3	1	98° 35' 36"	2707.94
1	4	2	78° 27' 06"	2359.24

Diagonal Shots

Occ.Pt	BS	FS	Angle Right	Distance
1	5	3	208° 47' 51"	3651.69
2	1	4	55° 35' 35"	3215.68
3	2	1	39° 59' 51"	3651.69
4	3	2	52° 38' 18"	3215.68

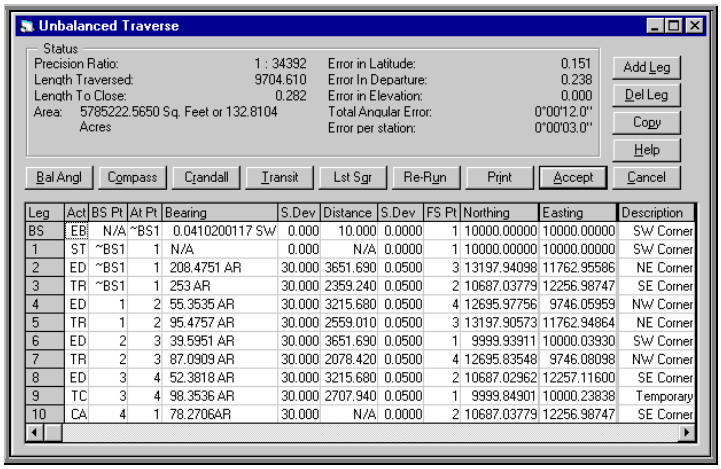
PROMPT	RESPONSE / NOTES / ETC.

Save As
File Name:

Type **LstSqrs** Enter. "Sight" Survey will save your file and display the **Unbalanced Traverse window** showing the current traverse statistics and your raw traverse data. The Northing and Easting of the Calculated Closing Point, closure bearing, and distance have also been printed in the **Text Output window**.

Unbalanced Traverse

Calculated Closing Point **9999.84901** **10000.23838**
TC N 57°38'55.9" W **0.282**



Leg	Act	BS Pt	At Pt	Bearing	S.Dev	Distance	S.Dev	FS Pt	Northing	Easting	Description
BS	EB	N/A	~BS1	0.0410200117 SW	0.000	10.000	0.0000	1	10000.00000	10000.00000	SW Corner
1	ST	~BS1	1	N/A	0.000	N/A	0.0000	1	10000.00000	10000.00000	SW Corner
2	ED	~BS1	1	208.4751 AR	30.000	3651.690	0.0500	3	13197.94098	11762.95586	NE Corner
3	TR	~BS1	1	253 AR	30.000	2359.240	0.0500	2	10687.03779	12256.98747	SE Corner
4	ED	1	2	55.3535 AR	30.000	3215.680	0.0500	4	12695.97756	9746.05959	NW Corner
5	TR	1	2	95.4757 AR	30.000	2559.010	0.0500	3	13197.90573	11762.94864	NE Corner
6	ED	2	3	39.5951 AR	30.000	3651.690	0.0500	1	9999.93911	10000.03930	SW Corner
7	TR	2	3	87.0909 AR	30.000	2078.420	0.0500	4	12695.83548	9746.08098	NW Corner
8	ED	3	4	52.3818 AR	30.000	3215.680	0.0500	2	10687.02962	12257.11600	SE Corner
9	TC	3	4	98.3536 AR	30.000	2707.940	0.0500	1	9999.84901	10000.23838	Temporary
10	CA	4	1	78.2706AR	30.000	N/A	0.0000	2	10687.03779	12256.98747	SE Corner

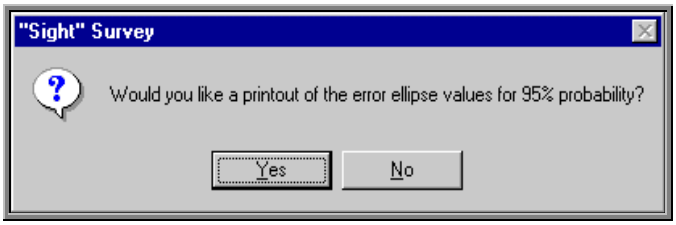
PROMPT	RESPONSE / NOTES / ETC.

The **Unbalanced Traverse** window allows you to easily review and edit your traverse data. More importantly, however, it allows you to manipulate the weighting of the Standard Deviations for **angles** and **distances**. Please refer to Standard Deviations in **Section 9.16** for more information.

If you make any modifications to this window, you must press Alt U or click Re-Run to recalculate the data before proceeding with an adjustment.

Select an Adjustment Option

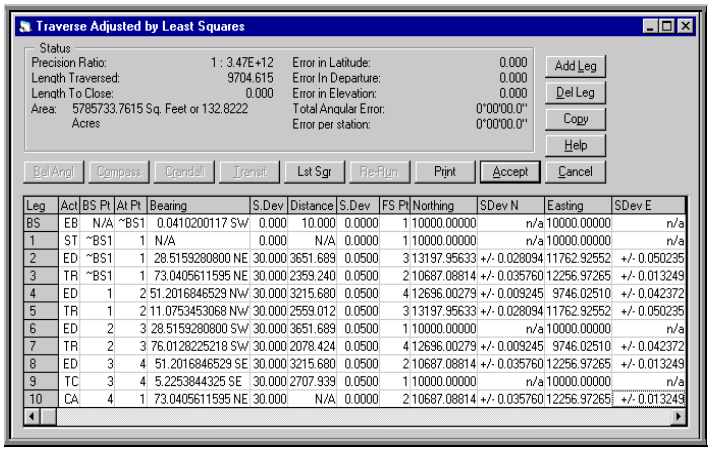
Press Alt Q or click Lst Sqr to choose the **Least Squares** option. "Sight" Survey will automatically save the raw data and display:



Click Yes.

Reviewing the Adjustment

Depending upon your video resolution, you may need to increase the width of the adjustment window to view the entire window.



Leg	Act	BS Pt	At Pt	Bearing	S.Dev	Distance	S.Dev	FS Pt	Northing	SDev N	Easting	SDev E
BS	EB	N/A	~BS1	0.0410200117 SW	0.000	10.000	0.0000	1	10000.00000	n/a	10000.00000	n/a
1	ST	~BS1	1	N/A	0.000	N/A	0.0000	1	10000.00000	n/a	10000.00000	n/a
2	ED	~BS1	1	28.5159280800 NE	30.000	3651.689	0.0500	3	13197.95633	+/- 0.028094	11762.92552	+/- 0.050235
3	TR	~BS1	1	73.0405611595 NE	30.000	2359.240	0.0500	2	10687.08814	+/- 0.035760	12256.97265	+/- 0.013249
4	ED	1	2	51.2016846529 NW	30.000	3215.680	0.0500	4	12696.00279	+/- 0.009245	9746.02510	+/- 0.042372
5	TR	1	2	11.0753453068 NW	30.000	2559.012	0.0500	3	13197.95633	+/- 0.028094	11762.92552	+/- 0.050235
6	ED	2	3	28.5159280800 SW	30.000	3651.689	0.0500	1	10000.00000	n/a	10000.00000	n/a
7	TR	2	3	76.0128225218 SW	30.000	2078.424	0.0500	4	12696.00279	+/- 0.009245	9746.02510	+/- 0.042372
8	ED	3	4	51.2016846529 SE	30.000	3215.680	0.0500	2	10687.08814	+/- 0.035760	12256.97265	+/- 0.013249
9	TC	3	4	5.2253844325 SE	30.000	2707.939	0.0500	1	10000.00000	n/a	10000.00000	n/a
10	CA	4	1	73.0405611595 NE	30.000	N/A	0.0000	2	10687.08814	+/- 0.035760	12256.97265	+/- 0.013249

PROMPT	RESPONSE / NOTES / ETC.

To review the adjustment, look closely at values computed in the columns entitled **SDev N** and **SDev E** to determine if the adjustment results are satisfactory.

Printing Adjustment Data

The **Standard Deviation** values are not a part of the normal text printout in the **Text Output** window, and therefore do not get printed when the [Print] function is selected. However, if you do want to print these values, you can highlight the desired column(s) or the entire grid and click the [Copy] button (or press Alt P) to copy the highlighted data to the Windows Clipboard. Then you can Paste the copied data into "Sight" Survey's **Text Output** window, into your favorite word processor, or into the Microsoft **Excel**® spreadsheet program.

To copy the entire **Traverse Adjustment** *grid, click on the* **Leg** *column heading (first column) to highlight the entire grid and then click the* [Copy] *button (or press* Alt P*). Next, use the* **Paste** *function to paste the data into the desired program.*

When ***copying*** *information from any of the* **Traverse Adjustment** windows*, you must use the* [Copy] ***BUTTON*** *(or press* Alt P*).* ***DO NOT*** *use the* **Copy** *routine from the* **Edit** *pull-down menu.*

Accepting the Adjustment

Click the [Accept] button, or press Alt A to accept the adjustment data. The adjustment windows will be closed and the traverse adjustment data will automatically re-run. As the traverse data is re-run, the **Drawing** and **Text Output Windows** will be updated accordingly.

Saving the Data

Now would be a really good time to save your work. To save all data associated with this job, click the icon on the toolbar (or type **SC**, or select **File** ➪ **Save**).

Listing the Final Coordinates

Type **LC** to select the **List Coordinates** routine. Press A ↵Enter to list all the coordinates in the file. After the coordinate list has been

PROMPT	RESPONSE / NOTES / ETC.
	sent to the **Text Output** window, you will regain control at the "Sight" Survey **Data Entry** window.
Printing or Plotting the Drawing	To send the drawing to your printer or plotter, select **File** ➪ **Plot Drawing** ➪ **Plot to Scale**.
Printing the Text	To obtain a hard copy printout of the information in the **Text Output Window**, select **File** ➪ **Print Text**, or Alt F, P. After verifying your print options, click on OK or press Enter. A copy of the final printout is presented here for your convenience.

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
Assigned points					
Start					
	5	Initial Backsight		8000.00000	9997.57399
	1	SW Corner		10000.00000	10000.00000
Raw:		*1-5			
EB		S 0°04'10.2" W		New Backsight Bng.	
Start					
	1	SW Corner		10000.00000	10000.00000
Raw:		208.4751 AR	3651.69		
ED		N 28°52'01.2" E	3651.690	From Base Point 1	
	3			13197.94098	11762.95586
Resuming at point 1					
	1	SW Corner		10000.00000	10000.00000
Raw:		253 AR	2359.24		
TR		N 73°04'10.2" E	2359.240		
	2	SE Corner		10687.03779	12256.98747
Raw:		55.3535 AR	3215.68		
ED		N 51°20'14.8" W	3215.680	From Base Point 2	
	4			12695.97756	9746.05959
Resuming at point 2					
	2	SE Corner		10687.03779	12256.98747
Raw:		95.4757 AR	2559.01		
TR		N 11°07'52.8" W	2559.010		
	3	NE Corner		13197.90573	11762.94864

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
Raw:		39.5951 AR	3651.69		
ED		S 28°51'58.2" W	3651.690	From Base Point 3	
	1			9999.93911	10000.03930
Resuming at point 3					
	3	NE Corner		13197.90573	11762.94864
Raw:		87.0909 AR	2078.42		
TR		S 76°01'16.2" W	2078.420		
	4	NW Corner		12695.83548	9746.08098
Raw:		52.3818 AR	3215.68		
ED		S 51°20'25.8" E	3215.680	From Base Point 4	
	2			10687.02962	12257.11600
Resuming at point 4					
	4	NW Corner		12695.83548	9746.08098
Raw:		98.3536 AR	2707.94		
TC		S 5°23'07.8" E	2707.940		
	1	Calculated Closing Point		9999.84901	10000.23838
TC		N 57°38'55.9" W	0.282		
	1	SW Corner		10000.00000	10000.00000

Angle right at Pt. 1 from 4 to 2 = AR 78°27'06.0" (RAW: 78.2706)
Database Saved: Tuesday, September 17, 1996 1:36 pm.

Entering Traverse Adjustment mode

Precision Ratio	=	1 : 34392
Length Traversed	=	9704.610
Length To Close	=	0.282
Error in Latitude	=	0.151
Error in Departure	=	0.238
Error in Elevation	=	0.000

Area = 5785222.5650 Sq. Feet or 132.8104 Acres

Total Angular Error	=	00°00'12.0"
Error Per Station	=	0°00'03.0"

Traverse Adjusted by Least Squares

PRINTOUT	Point #	Bearing	Distance	Northing	Easting
Rerunning Traverse Adjusted by Least Squares					
Inversing Adjusted Points					
Go to					
	1	SW Corner		10000.00000	10000.00000
EP		S 0°04'10.2" W	10.000	New Backsight Bng. (B.S. is ~BS1)	
Start					
	1	SW Corner		10000.00000	10000.00000
RI		N 28°52'01.1" E	3651.689	From Base Point 1	
	3	NE Corner		13197.94093	11762.95361
Resuming at point 1					
	1	SW Corner		10000.00000	10000.00000
Raw:		73.0407659598 NE	2359.2418755079		
TR		N 73°04'07.7" E	2359.242		
	2	SE Corner		10687.06614	12256.98080
RI		N 51°20'15.1" W	3215.680	From Base Point 2	
	4	NW Corner		12696.00198	9746.05029
Resuming at point 2					
	2	SE Corner		10687.06614	12256.98080
Raw:		11.0751773612 NW	2559.0144761166		
TR		N 11°07'51.8" W	2559.014		
	3	NE Corner		13197.94093	11762.95361
RI		S 28°52'01.1" W	3651.689	From Base Point 3	
	1	SW Corner		10000.00000	10000.00000
Resuming at point 3					
	3	NE Corner		13197.94093	11762.95361
Raw:		76.0129699905 SW	2078.4228856051		
TR		S 76°01'29.7" W	2078.423		
	4	NW Corner		12696.00198	9746.05029
RI		S 51°20'15.1" E	3215.680	From Base Point 4	
	2	SE Corner		10687.06614	12256.98080
Resuming at point 4					
	4	NW Corner		12696.00198	9746.05029
IN		S 5°22'51.9" E	2707.936		
	1	SW Corner		10000.00000	10000.00000

PRINTOUT	Point #	Bearing	Distance	Northing	Easting

Area = 5785734.0746 Sq. Feet or 132.8222 Acres

Precision Ratio	=	1 : 9.80E+11
Length Traversed	=	9704.615
Length To Close	=	0.000
Error in Latitude	=	0.000
Error in Departure	=	0.000
Error in Elevation	=	0.000

Area = 5785734.0746 Sq. Feet or 132.8222 Acres

Total Angular Error	=	0°00'00.0"
Error Per Station	=	0°00'00.0"

Database Saved: Tuesday, September 17, 1996 1:36 pm.

List/Plot Coordinates

1	SW Corner	10000.00000	10000.00000
2	SE Corner	10687.06614	12256.98080
3	NE Corner	13197.94093	11762.95361
4	NW Corner	12696.00198	9746.05029
5	Initial Backsight	8000.00000	9997.57399
~BS1	*Automatic created BS point	9990.00001	9999.98787

- A backsight point is automatically created when the **Enter Backsight Bearing** (`EB`) routine is used. If you wish to avoid having these points created, use the **Enter Backsight Point** (`EP`) routine instead.

END of Example 5

3.06 Routine Index

This index only covers routines used in the examples. A comprehensive index is contained at the end of the **COGO Reference Manual** and also the **Drawing Window Reference Manual**.

"Sight" Survey 3.0

Section 4
Data Entry Basics

4.01 General Data Entry Procedures

All "Sight" Survey routines have been standardized to accept data entries in a manner which is common throughout the program. This section deals with the nature of the data entry as it pertains to points, bearings, distances, stations, coordinates, and point names.

Backup Your Data

When you close a "Sight" Survey session, you're given an opportunity to save your data. However, you can save your data at any time by selecting the **File** ➪ **Save Job** option by typing Alt F, S or the two letter code **SC** (for **S**tore **C**oordinates).

A very important habit to maintain involves taking the time to back up your data. The price of an extra disk is a small amount to pay to insure yourself against the loss of many hours of labor. If you are using floppy disks, keep in mind that they are somewhat fragile and data loss can be caused in the blink of an eye by dust, moisture, fingerprints, bending, etc. You can back up your data files using the **File** ➪ **Copy Job** routine (Alt F, J). If you regularly store your jobs on a hard drive, you should periodically back them up to a floppy disk or a tape drive.

4.02 Point Identifiers

"Sight" Survey is designed to allow point entry in a wide variety of convenient methods. While a point number (numeric or alphanumeric) is a required element for all points, you also have the option of referring to points by names or by station numbers.

Point Numbers

Entering point numbers into "Sight" Survey is as easy as typing them on your keyboard. Any number is a valid number, from **0** up to **99999999**, as is any alphanumeric combination up to eight characters long. We hate to admit it, but "Sight" Survey does have

a limit on the number of points it can accept, albeit one we think you can live with it. What's the limit? ***"Sight" Survey can accept over 3.5 trillion points!*** (3,512,479,453,392 to be exact, disk storage space permitting.)

"Sight" Survey includes optional **Automatic Point Numbering**. In most COGO routines that compute and set a data point, automatic point numbering may be used to seek out the next available point number. To activate or deactivate automatic point numbering, type in **AN** (or Alt G, G, Alt N, Enter) at any data entry prompt.

Alphanumeric Point Numbers

"Sight" Survey allows the use of numeric or alphanumeric point numbers, up to 8 characters in length. To use an alphanumeric point number, press the single quote (**'**) ***before*** typing any alphabetic characters. For example, to use point number 100A, type **100'A** or **'100A**, and to use point number NECORNER, type **'NECORNER**.

Because "Sight" Survey uses alphabetic characters for routine codes, you must press the single quote (**'**) to notify the program that the characters you will type are not routine codes. After pressing the single quote, the status bar at the bottom of the screen will display the message:

Entering alphanumeric data - Automatic Routine Jumping Turned Off.

If you have accidentally press the quote key, simple press it again and the status bar at the bottom of the screen will display:

Entering numeric data - Automatic Routine Jumping Turned On.

You will not see the single quote on the screen. It is simply a toggle code and is not part of the actual point number.

Select Point

Points may also be entered through the **Select Point** function. The **Select Point** function is used to pick a point from the drawing to be used as data entry into a point number field. The point that is selected must be an existing COGO point.

To access **Select Point** from the keyboard, use the command **SP** or press Alt D, P. The **Drawing** window command line prompts:

```
Select a point
```

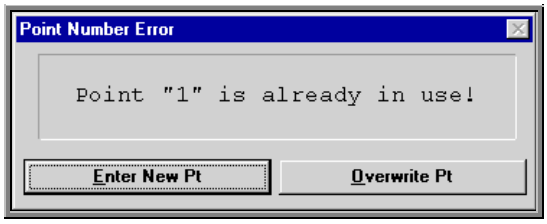
Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the point to be picked. You don't have to be exact, but the point must lie within the **Grab All** cursor box or you may not get the point you want. The point number of the selected point will be automatically entered into the point field in the **Data Entry** window.

? *Before using the **Select Point** feature, be certain your cursor is located in a point entry field in the **Data Entry** window.*

Point Overwrite Protection

"Sight" Survey includes **Point Overwrite Protection**. To activate or deactivate this feature, type **CM** and then press Alt G, Alt V, ↵Enter (or Alt G, G, Alt V, ↵Enter).

If you attempt to reuse an existing point while the overwrite protection is off, ***the old point will be overwritten with no warning***. If you attempt to reuse a point while the overwrite protection is on, you will receive this warning window:



The warning window offers two options, **Enter New Point**, or **Overwrite Point**. Select an option with your mouse or keyboard.

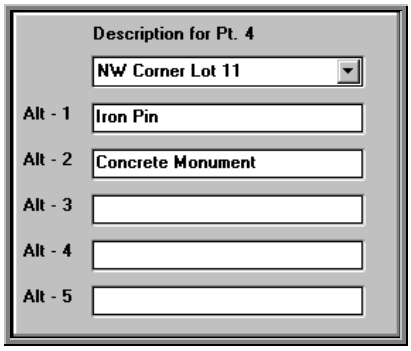
*You may manually override the **Point Overwrite Protection** by placing an asterisk (*****) immediately after the point number, such as **45*** ↵Enter. Using the manual override method will suppress the warning message.*

Point Names

Naming a point may be done at any request for a point number, or by using the **Identify Point** routine. Call this routine by typing **ID** (or Alt P, I) at any data entry prompt. Point names may be up to 28 characters in length.

Description Dialog Box

When you enter a point name, the description dialog box appears:

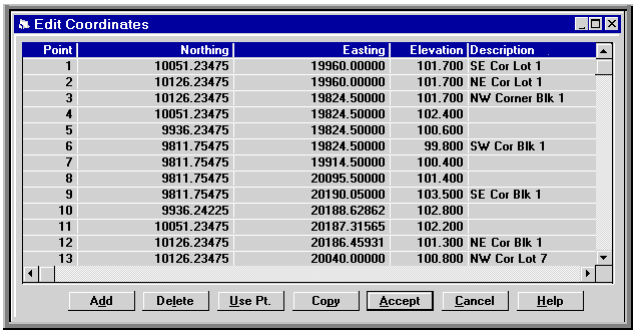


From this dialog box, you have several options. You can:

- Enter a point description by typing the description into the top line and pressing Enter.
- Enter point descriptions into any of the alternate description fields for later use. If you press Enter after typing the description into an alternate field, the description will also be used as the current description. You can fill all the alternate fields while the dialog box is open by using your mouse to move between fields. If you fill alternate fields but do not want to enter a point description for the current point, delete any text in the top description field and press Enter. The descriptions entered into the five alternate description fields are retained between "Sight" Survey sessions.
- Select an alternate descriptions by pressing Alt followed by the description number and Enter, such as: Alt 3 Enter;
- Click the down arrow and select one of the previously entered descriptions. All descriptions entered during a "Sight" Survey session are accumulated in the drop-down menu for easy re-use, however the descriptions are not retained between sessions.

Edit Coordinates Window

You can also add, edit or delete a point name from within the **Edit Coordinates** (**EC**) window.



In this window you can edit points and descriptions, renumber points, add points, delete points, select a point to use, and copy a point or block of points.

To add, edit or delete a point name, click your mouse on the chosen description. If you are adding or replacing a description, simply begin typing to overwrite the contents of the existing line. To delete an existing description, press Space Bar ↵Enter.

To edit a description, click your mouse on the description again. The field color will change from dark gray to white and the text cursor will move to the front of the text. Use your mouse, or the ← or → keys to position the cursor at the edit point. Make your editing changes and press ↵Enter.

If you frequently use point names in COGO, you can instruct "Sight" Survey to automatically prompt for names (**CM** Alt G, Alt M) and include them in all printouts by activating the **Names Output** toggle (**NO**). This on/off switch is actuated by typing **NO** at any data entry prompt.

Stations

When "Sight" Survey computes stations, they are formatted in an ***English*** or ***metric*** format as specified in the **Config** ➘**COGO Configuration** menu, (**CM** Alt G or Alt G, M, Alt G). Stationing precision matches the distance precision, from 0 to 6 decimal places, as specified in the **Config** ➘**Text Output Configuration** menu, (**CM** Alt T or Alt G, T).

Entering Stations

When **Traversing with Stations** and when computing **Circular Curves** (by deflections, tangent, or chord offset methods), **Vertical Curves and Alignment**, and **Spiral Curves**, you will be required to enter station data. Enter the station in a format as shown in the following examples:

ENGLISH UNITS

Station Distance	Enter as Station
25.0 feet	`0.25` or `0+25`
600.0 feet	`6` or `6+00`
1675.0 feet	`16.75` or `16+75`
1550.4 feet	`15.504` or `15+50.4`
12535.3 feet	`125.353` or `125+35.3`

Care must be taken to avoid entering an erroneous station. For example, entering 1+50 as `150` results in a station of 150+00. The station should be entered as `1+50` or `1.50`.

METRIC UNITS

Station Distance	Enter as Station
25.0 meters	`0.025` or `0+025`
600.0 meters	`.6` or `0+600`
1675.0 meters	`1.675` or `1+675`
1550.4 meters	`1.5504` or `1+550.4`
12535.3 meters	`12.5353` or `12+535.3`

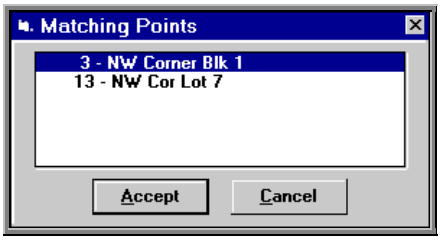
Care must be taken to avoid entering an erroneous station. For example, entering a station at 150 meters as `150` results in a station of 150+000. The station should be entered as `.150` or `0+150`.

4.03 Searching For A Point By Name

As previously stated, the COGO program requires the assignment, of point numbers. However, COGO is also capable of searching for a particular point if it has been given a description or name.

To search for a point by name, type a ? followed by a point name, or a portion thereof. This type of entry results in a search for a partial match. That is, even if you only have a portion of the name, or wish to see which points may share a common element of a name, the routine will still work.

For example, with the ***Oakwoods*** file loaded, a point entry of **?NW** results in the **Matching Points** window shown below:



These are the two points in the file that contain names starting with the characters **NW**. Use your mouse or ↑ and ↓ keys to highlight a point and then press ↵Enter or click Accept. If you don't see the point you want, check to see if the selection window has a scroll bar on the right side. If it has a scroll bar, scroll down through the list. If you want to cancel the operation, press Esc or click Cancel.

*Searches are not **case sensitive**. In other words,* **NW** = **nw** = **Nw** = **nW**.

Wildcard Characters

Point name searching allows the use of the wildcard characters * and ? within the specified description. (A ? used ***within*** the description is different from a ? at the ***beginning*** of the description where it calls the search mode.) A ? replaces a single character while the * replaces any number of characters.

For example: in the ***Oakwoods*** file, a search for the name **?*n?e** will return only point **19**, whose description is **Center of Cul-de-Sac**. This is because you are asking "Sight" Survey to search for any point name containing an "**n**" followed by any other character, which is followed by an "**e**". (Ce**nte**r) Similarly, an entry of **?*cor** will return eight points that contain the characters **cor**.

An entry of **?** *or* **?*** *will return a list of the points having a description of any kind. The list will display a maximum of 200 points at a time.*

4.04 Point Ranges

In "inverse" type coordinate geometry routines, (routines that *measure between* points, rather than routines that *compute* points), you may speed your data entry by entering a point range instead of a single point at a time. For example, suppose you wanted to inverse the outside boundary of the Oakwoods subdivision. In a single entity entry scheme, you would press the following keys:

S T, 1 ↵Enter, I N, 2 ↵Enter, 3 ↵Enter, 4 ↵Enter, 5 ↵Enter, 6 ↵Enter, 7 ↵Enter, 8 ↵Enter, 9 ↵Enter, 1 0 ↵Enter, 1 1 ↵Enter, 1 2 ↵Enter, 1 3 ↵Enter, 1 4 ↵Enter, I C, 1 9 ↵Enter, 1 5 ↵Enter ↵Enter, 1 6 ↵Enter ↵Enter, 1 7 ↵Enter ↵Enter, 1 8 ↵Enter ↵Enter, 1 ↵Enter ↵Enter

Contrast that entry sequence of 61 key presses with one incorporating point ranges and using only 23 key presses:

S T, 1 ↵Enter, I N, − 1 4 ↵Enter, I C, 1 9 ↵Enter, − 1 8 ↵Enter, − 1 ↵Enter ↵Enter

The results for the second sequence are the same as the first, yet you've used less than 40% of the key presses. Not only that, but your time savings are even greater.

It's even more dramatic if you have a larger point list to inverse through. For example, say you have a meander line containing 200 points, consecutively numbered. Method one requires 696 key presses to inverse through 199 legs. Even streamlining the first method by replacing each point number with a + key requires 404 key presses. However with method 2, "Sight" Survey requires only 11 key presses: S T, 1 ↵Enter, I N, − 2 0 0 ↵Enter.

1. *A point range may cross over from one routine into another. For example, a point string may automatically change between the* **Inverse** *and* **Inverse Curve** *routine. See the* **Point Strings** *discussion below.*
2. ***Point ranges are not allowed when working with alphanumeric point numbers.***

Point Strings

You may group points into point strings called **Defined Figures**. Defined figures can be accessed as a single entity, such as `Lot 1`, allowing for much greater ease of data entry. Defined figures are discussed in detail beginning on page 249 of this manual.

Using a point string or defined figure, you can cross over from the line-inverse routines into the arc-inverse routines and vice-a-versa. For example, assuming you are already in the Inverse routine, the string `2,1*19,18,5-7,17>19,14,1` goes from **Inverse** (`IN`) **to Inverse Curve** (`IC`) back to **Inverse** (`IN`) and into **Inverse Obtuse Curve** (`OC`) and back to **Inverse** (`IN`). When used within a point string, the `*` character signals "Sight" Survey to run **Inverse Curve** (`IC`) and the character `>` signals "Sight" Survey to run **Inverse Obtuse Curve** (`OC`). The data entry rules for point strings are listed on page 252 of this manual.

4.05 Directional Entries

When entering angular data, both horizontal and vertical, enter all angular data in one of two user-selected formats: ***degrees*** (as **D.MMSS**), or ***grads***. The format selection is made through the use of the **Config** ➪ **Angle Configuration** window which is discussed on page 408.

The D.MMSS Format

Enter angular entries in the D.MMSS format by separating the degrees value from the remainder of the entry with a decimal. For example; enter 45° 30' 50" as `45.3050`. There is no need to enter any trailing values if the values are zero. For instance, 45° 30'

00” may be entered as **45.30** (or **45.3**). Likewise, an even 55° should be entered simply as **55**.

In the D.MMSS format, you must not use decimal points on fractional seconds entries. Simply omit the decimal point. An angle entry of 45° 25’ 35.65” should be entered as **45.253565** and not as **45.2535.65** or the bearing entry will be interpreted as “zero”.

The Grads Format

The grad is a unit of measure equivalent to 1/400th of a circle. Grads are expressed as decimal values and may be formatted in “Sight” Survey with up to 6 decimal places.

Angle Codes & Function Keys

In the degrees format, directional entries may be in the form of bearings, angles left or right, deflection angles left or right, or as North or South referenced azimuths. In the grads format, while entries may be made as bearings, they will always be output as North or South referenced azimuths.

The information that identifies the directional type is referred to as the ***angle code***. Angle codes may be entered by number, by two letter alpha codes, or by pressing function keys. “Sight” Survey provides angle codes in two flavors, largely as a result of keyboard changes over the years, and also as an attempt to provide you with compatibility to other COGO programs you may also be using. These **Angle Code Sets** are shown below. The desired **Angle Code Set** is selected in the **Config** ➪ **Angle Configuration** menu.

SSI (Simplicity Systems) Angle Code Set

Angle Code	Alpha Code	Numeric Code	Function Key
Northeast	**NE**	**1**	F1
Southeast	**SE**	**2**	F2
Southwest	**SW**	**3**	F3
Northwest	**NW**	**4**	F4
Azimuth	**AZ**	**5**	F5
Angle Right	**AR**	**6**	F6
Angle Left	**AL**	**7**	F7
Deflect Right	**DR**	**8**	*none*
Deflect Left	**DL**	**9**	*none*
90° Right	**90AR**	*none*	F8
90° Left	**90AL**	*none*	F9

HP (Hewlett Packard) Angle Code Set

Angle Code	Alpha Code	Numeric Code	Function Key
Northeast	**NE**	**1**	F1
Southeast	**SE**	**2**	F2
Southwest	**SW**	**3**	F3
Northwest	**NW**	**4**	F4
Azimuth	**AZ**	**5**	F5
Angle Left	**AL**	**6**	F6
Angle Right	**AR**	**7**	F7
Deflect Left	**DL**	**8**	*none*
Deflect Right	**DR**	**9**	*none*
90° Left	**90AL**	*none*	F8
90° Right	**90AR**	*none*	F9

(*The Hewlett Packard code set is so named to recognize the numeric codes used by HP and some other manufacturers.)*

If you are using grads, **90°AR** *and* **90°AL** *will be renamed to* **100g AR** *and* **100g AL**.

Combining Angle Entries and Codes

In "Sight" Survey, all directional data may be incorporated into a single entry by simply adding an **alphabetic** or **numeric** angle code immediately following the angular data, before pressing ↵Enter, or by completing your entry by pressing a function key.

For example, in the **D.MMSS** or **Grads** entry modes, the same entry may be input as **37.0845NW**, or as **N37.0845W**, or as **37.0845-4**, or finally as **37.0845** F4.

In any mode, a space between the numeric entry and an angle code will not cause a problem.

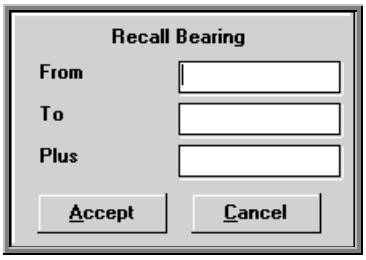
Recalling Bearings

"Sight" Survey contains the ability to recall a bearing between any two points residing in the memory for use in the forthcoming calculation. To recall any bearing, enter an asterisk (*****) or the letter **R** followed by a beginning and ending point (separated by a comma or a hyphen) at any **Bearing** or **Angle** prompt. For example:

***15-21** (or ***15,21**, or **R15-21**, or **R15,21**)

will input the bearing as it lies from point 15 to point 21. If you omit one or both of the point numbers and simply enter * Enter or R Enter at a bearing request, you will be prompted for them. After you make a distance entry, "Sight" Survey will prompt you for the point numbers through the use of a **Recall Bearing** window.

Enter the point numbers one at a time pressing Enter or Tab after each number. The recalled bearing will travel in a direction from the first point to the second point.



The **Recall Bearing** window contains one other optional entry, a **Plus** text entry box. Use this box to enter a value (in the chosen D.MMSS or grads format) that will be added to the recalled bearing. Enter negative numbers to subtract a value from the recalled bearing. For example, suppose the bearing from point 1 to point 5 is 45° NW. To enter the recalled bearing from point 1 to point 5 plus 10° 15' 25", (in a D.MMSS format) enter `10.1525` in the **Plus** box which results in a bearing entry of 34° 44' 35" NW.

Mathematical functions may also be performed using the **In-Line Calculator**. To make an in-line calculation, simply type the expression ending with the = key.

Multiplication and division are not allowed in angular entries.

?

*The angular entry is treated as a **deflection** from the recalled course, with positive entries deflecting to the right, and negative entries deflecting to the left.*

Recalling the Last Used Bearing

A second method of recalling a bearing is to recall the value last used. In "Sight" Survey this is an automatic function. For example, suppose you traverse from point 20 to point 21 at a bearing of 10NW and a distance of 75.5. After traversing to point 21, you want to continue on and set three more points along the same bearing and at the same distance. As you proceed to the next point, both the bearing and distance are retained from the last calculation. All you have to do is accept them, not re-enter them. The quickest way to accomplish this is to press Page Dn after typing in the target point number.

Select a Bearing from the Drawing

The **Select Bearing** function is used to pick a bearing from the drawing which will be used as data entry into a bearing field. The bearing picked is actually calculated by "Sight" Survey, so you must have two existing COGO points to use this routine.

To access **Select Bearing** from the keyboard, use the command **SB** or press Alt D, B. The **Drawing** window command line prompts:

> **Select the starting point for bearing calculation**

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the first point to be used in the calculation. The prompt bar prompts:

> **Select the ending point for bearing calculation**

Again, using the **Grab All** cursor (⊡) in the **Drawing** window, click on the ending point to be used in the calculation. "Sight" Survey will compute the bearing between the points and enter the value into the field.

? *Before using the* **Select Bearing** *feature, be certain your cursor is located in a* ***bearing entry field*** *in the* **Data Entry** window.

4.06 The Reference Bearing

After the first traverse or inverse procedure in the COGO program, a bearing will be retained in the memory as a ***reference*** (or backsight) ***bearing***. The reference bearing is simply the reverse of the bearing which you traveled on to get to the point which is now occupied. The reference bearing is the bearing referenced every time you enter an angle or deflection to the right or left. You may change this bearing through the use of the **Enter Backsight Bearing** (**EB**) or **Enter Backsight Point** (**EP**) routine. Enter a backsight bearing in the same manner as you would enter any other bearing. You can even recall a bearing, or **Select a Bearing** (**SB**) from the **Drawing** window.

4.07 Horizontal Distance Entry

In all "Sight" Survey routines, horizontal distances are entered just as if you were keying data into a calculator. Trailing zeros need not be entered.

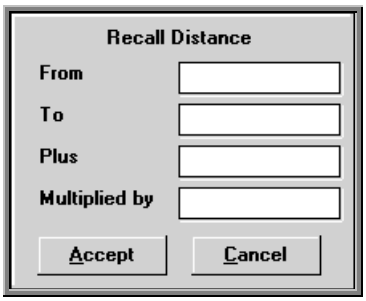
Recalling Distances

"Sight" Survey allows you to recall a distance between any two points residing in the memory for use in the forthcoming calculation. To recall any distance, enter an asterisk ***** or an apostrophe followed by the letter **R** followed by a beginning and ending point (separated by a comma or hyphen) at any **Distance** prompt. For example:

***15-21** (or ***15,21**, or **'R15-21**, or **'R15,21**)

will input the distance as it lies from point 15 to point 21. If you omit one or both of the point numbers and simply enter * Enter or ' R Enter at a distance request, the program will prompt you for the point numbers through the use of a **Recall Distance** window.

"Sight" Survey also allows you to enter a recalled distance with an addition, subtraction, multiplication or division operator (**+**, **-**, *****, **/**). This may be done either through the **In-Line Calculator**, or through the **Recall Distance** window.



In the **Recall Distance** window, you can add, subtract, multiply or divide against a recalled value by completing the appropriate **Plus** or **Multiplied by** text-entry boxes. Of course if you want to subtract and/or divide you'll have to use negative and reciprocal values respectively.

Mathematical functions with a recalled distance may also be performed using the **In-Line Calculator**. To make an in-line calculation, simply type the expression ending with the ↵Enter key. ***(Do not use the = key in this instance.)*** For example, to enter the distance from point 1 to point 5 less 150.25 feet, enter `*1,5-150.25` ↵Enter. When you press the ↵Enter key, the value is computed and used, but it is not entered into the text entry box.

Recalling the Last Used Distance

A second method of distance recall involves recalling the value last used. In "Sight" Survey this is an automatic function. For example, suppose you traverse from point 20 to point 21 at a bearing of 10NW and a distance of 75.5. After traversing to point 21, you want to continue on and set three more points along the same bearing and at the same distance. As you proceed to the next point, both the bearing and distance are retained from the last calculation. All you have to do is accept them, not re-enter them.

Additionally, whenever you are prompted for a distance entry within COGO, the function keys F1 through F9 will be predefined to the following values (where `L` is the last used distance):

F1 = `L` ↵Enter		F5 = `L/8` ↵Enter	
F2 = `L/2` ↵Enter		F6 = `L*2` ↵Enter	
F3 = `L/3` ↵Enter		F7 = `L*3` ↵Enter	
F4 = `L/4` ↵Enter		F8 = `L*4` ↵Enter	

Select a Distance from the Drawing

The **Select Distance** function is used to pick a distance from the drawing which will be used as data entry into a distance field. The distance picked is actually calculated by "Sight" Survey, so you must have two existing COGO points to use this routine.

To access **Select Distance** from the keyboard, use the command **SD** or press Alt D, D. The command line at the top of the **Drawing** window prompts:

> **Select the starting point for distance calculation**

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the first point to be used in the calculation. The command line prompts:

> **Select the ending point for distance calculation**

Again, using the **Grab All** cursor (⊡) in the **Drawing** window, click on the ending point to be used in the calculation. "Sight" Survey will compute the distance between the points and enter the value into the field.

?

Before using the **Select Distance** *feature, be certain your cursor is located in a* ***distance entry field*** *in the* **Data Entry** window.

4.08 The In-Line Calculator

"Sight" Survey contains a second type of calculator in addition to the pop-up surveying calculator. This second calculator is an ***in-line calculator***. This calculator has already been briefly discussed under **Recalling Bearings** and **Recalling Distances**. It is however, more powerful than those discussions indicated.

The in-line calculator is a one-line entry calculator. In other words, you may enter an expression at a bearing or distance prompt

and "Sight" Survey will calculate and use your result as the entry to the prompt.

For example, suppose that you are traversing to a point and you do not know the polar distance, but you do know the X and Y components (75 and 382 respectively) of the distance in question. Knowing that the polar distance equals the square root of the quantity ($X^2 + Y^2$), you can compute this value by entering the expression **`SQR((75^2)+(382^2))=`**. "Sight" Survey will calculate the result and enter 389.293 into the program as your response.

? *Note the extra parenthesis in the equation above. It is important that you enclose each term in parenthesis or the command line calculator may not function correctly.*

"Sight" Survey includes many trigonometric and conversion functions that are available to the command line calculator.

Aside from the standard ***addition***, ***subtraction***, ***multiplication*** and ***division***, "Sight" Survey supports many additional math functions, scientific notation and three constants: **`pi`** (3.14159); **`L`** (the last used distance); and **`DEG`** (pi/180). You may also use parenthesis, but be sure they are matched pairs or an error will result.

A list of supported operations follows. Included in the list is a reference example of the correct syntax. For illustration, we will use variables **`N1`** and **`N2`** as the objects of the operator.

? *Notice that each example equation begins with a single quote (**`'`**) ends with an equal sign (**`=`**). The quote tells "Sight" Survey that you are not entering a two-letter command, while the equal sign is used to close out the equation and return the result. Do not forget to add these to your in-line equation.*

Math Functions

`+` **Function:** Addition
Example: **`'N1+N2=`**

`-` **Function:** Subtraction
Example: **`'N1-N2=`**

`*`	**Function:**	Multiplication
	Example:	`'N1*N2=`
`/`	**Function:**	Division
	Example:	`'N1/N2=`
`\`	**Function:**	Integer Division
	Example:	`'N1\N2=`
`^`	**Function:**	Exponent
	Example:	`'N1^N2=`
`ABS`	**Function:**	Absolute Value
	Example:	`'ABS(N1)=`
`INT`	**Function:**	Integer
	Example:	`'INT(N1)=`
`SQR`	**Function:**	Square Root
	Example:	`'SQR(N1)=`

Trigonometric Functions

`ATN`	**Function:**	Arc Tangent
	Example:	`'ATN(N1)=` where `N1` is a number and the result is in radians.
	or **Example:**	`'DMS(ATN(N1))=` where `N1` is a number and the result is in D.MMSS.
`COS`	**Function:**	Cosine
	Example:	`'COS(N1)=` where `N1` is in radians
	or **Example:**	`'COS(RAD(N1))=` where `N1` is in D.MMSS
`SIN`	**Function:**	Sine
	Example:	`'SIN(N1)=` where `N1` is in radians
	or **Example:**	`'SIN(RAD(N1))=` where `N1` is in D.MMSS
`TAN`	**Function:**	Tangent
	Example:	`'TAN(N1)=` where `N1` is in radians
	or **Example:**	`'TAN(RAD(N1))=` where `N1` is in D.MMSS

Internally, "Sight" Survey uses radians when computing trig functions. For example, when you compute a **SIN, COS**, *or* **TAN** *of an angle* **N1**, *"Sight" Survey expects* **N1** *to be in radians. Likewise, when you compute the* **ATN** *function of value* **N1, N1** *is assumed to be in radians. To make life easier for you, "Sight" Survey contains the functions* **RAD** *and* **DMS**. *These functions let you use D.MMSS values in your calculations so you don't have to make manual conversions.*

Conversion Functions

RAD **Function:** Convert D.MMSS to Radians
Example: `'RAD(N1)=` where **N1** is in D.MMSS

DMS **Function:** Convert Radians to D.MMSS
Example: `'DMS(N1)=` where **N1** is in radians

For these two functions:

1. *In the RAD function,* **N1** *must be a numeric value such as 45.2738, not an equation such as 45.2738+10.5002.*
2. *The DMS function must be the most outside function, not enclosed by brackets.*

Logarithmic Functions

LOG10 **Function:** Common Log (base 10)
Example: `'LOG10(N1)=`

EXP **Function:** Exp (or e^x)
Example: `'EXP(N1)=`

LOG **Function:** Natural Log (base *e*)
Example: `'LOG(N1)=`

4.09 Vertical And Zenith Angles

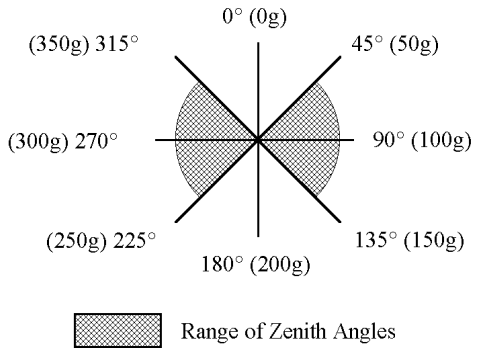
All ***vertical angles*** and ***zenith angles*** must be entered in the same format as horizontal angles. The routines contained in "Sight" Survey are set up to accept either vertical or zenith entries, with the

program determining your intent by using break points set at every 45 degree (50 grad) point from the horizontal plane. The illustrations that follow indicate how the data entries will be treated.

To enter a zenith angle in the range of -45° to 45°, 135° to 225°, or 315° to 360°, preface your angle entry with the letter "Z", for example "Z44.2835".

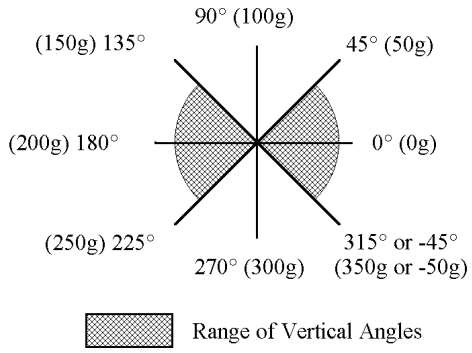
Zenith Angles

All values between 45 and 135 degrees (50 and 150 grads), and all values between 225 and 315 degrees (250 and 350 grads).



Vertical Angles

Any value lying between 0 and 45 degrees (0 and 50 grads), between -45 and 0 degrees (-50 and 0 grads), between 315 and 360 degrees (350 and 400 grads), and between 135 and 225 degrees (150 and 250 grads).



4.10 Slope Entries & Slope Types

When entering distances in the COGO routines, (except within the Intersection and Offset routines), you may be prompted for a **Slope Angle**. This may either be a ***zenith*** or a ***vertical*** angle as discussed in **Section 4.09**. The angle entry rules found in **Section 4.05** also apply to slope angle entries. If you are entering a horizontal distance with no slope distance, simply press the Enter key at the prompt for the slope angle.

On "Sight" Survey's **Config ➪ Slope Entry Configuration** menu you will be given the opportunity to select whether or not you want to be prompted for the slope angle after every distance entry. If the majority of your distances were taken without the use of a slope angle, you might wish to disable the automatic prompt. If the **Prompt for slope input** option is disabled, a slope angle may still be entered by placing a `/` or `\` immediately after the distance, for example, `1250.44/` or `1250.44\`. (Slashes are used because they are sloping lines, and should be easily remembered. The two-letter command **SA** may also be used to toggle slope prompting on and off.)

In "Sight" Survey, there are five available methods for entering elevations and slope distances and reducing the entered data to horizontal and vertical distances. Two additional methods exist for those instances when you are using horizontal distance data along with plus/minus readings or elevations. The methods are:

1. by Assigned Elevations;
2. by EDM Slope distances;
3. by EDM Slope distances - Mining Option;
4. by Levels (plus and minus shots);
5. by Simple Slope Angles;
6. by Stadia distances;
7. by Total Station.

The desired method is selected from the **Config ➪ Slope Entry Configuration** menu (CM Alt S). A discussion of each method follows, including data entry instructions. Refer to these instructions whenever you see the **Slope Angle** prompt.

Assigned Elevations

The **Assigned Elevations** method is actually not a slope reduction method at all, but rather just a convenient way for you to enter the known elevation at each target point. Type the elevation and press ↵Enter. If you do not know the elevation for a particular point, just press (zero) 0 ↵Enter. Pressing ↵Enter without first typing in an elevation value causes "Sight" Survey to use the "last used" elevation.

EDM

Upon entering the **EDM** reduction routine, you will be asked to provide certain information regarding your instrument and target setups. These are:

H.I. Theod. (or **Height of the Theodolite**) - Type the actual height of the scope of the theodolite above the point of known elevation and press ↵Enter. ***This is not an elevation!***

H.I. Target (or **Height of the Target**) **-** Type the actual height of the target (sighted by the theodolite) above the target point and press ↵Enter. ***This is not an elevation!***

The **Height of the Distance Meter** and the **Height of the Prism Assembly** are set in the **Config ⇨ Slope Entry Configuration** menu under **EDM Options**.

After entering the required data, "Sight" Survey computes the horizontal distance based on the elevation selected on the **Config ⇨ Slope Entry Configuration** menu under the **Horizontal distance** option.

If you have activated the **Curvature and Refraction** *slope correction on the* **Config ⇨ COGO Configuration Menu ⇨ Slope Entry** *sub-menu, all EDM computations are corrected for curvature and refraction through the use of the formula* $C + R = (0.574)(K2)$ *where K is the distance measured in miles.*[1]

EDM (Mining Option)

The **EDM (Mining Option)** reduction routine, is functionally equivalent to the regular EDM routine. The only difference being that the instrument H.I.'s are measured down from the roof of the mine instead of up from the floor. Refer to the **EDM Slope Reductions** section for a discussion of the prompts.

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[1]. BOUCHARD, H. and MOFFITT, F. H. *Surveying*.: International Textbook Company, Scranton, PA, 1965.

Leveling

The **Leveling** method is not actually a valid method for handling slope distances. Instead, this routine is only to be used for setting the elevations of points by using plus and minus shots. Upon entering the levels routine, you will be asked to provide certain information regarding your instrument and target setups. These are:

Instr. Ht. (or **Height of the Instrument**) - Type the actual height of the scope of the instrument above the point of known elevation and press ↵Enter. ***This is not an elevation!***

Rod Reading - Type the actual rod reading at the foresight point and press ↵Enter. ***This is not an elevation!***

"Sight" Survey assumes that the original distance entered is not a slope distance at all, but rather it is a horizontal distance. The only effect that the H.I. and rod readings have on the leg in question, is in establishing the elevation at the foresight point.

When you are computing the locations and elevations of several points using the **Side Shot** *routine, after your initial height of the instrument entry, the program will present the HI for your confirmation. Simply press* ↵Enter *to bypass the prompt and proceed to the* **Rod Reading** *prompt.*

Simple Slope Angles

A **Simple Slope Angle** is the only entry required for this method. Basically, the program assumes that the H.I.'s of your EDM, theodolite, target and prism assembly are relatively equal and any differences lying therein do not adversely affect the distance reduction.

Stadia Reductions

Upon entering the **Stadia Reductions** routine, you will be asked to provide certain information regarding your instrument and target setups. These are:

Instr. Ht. (or **Height of the Instrument**) - Type the actual height of the scope of the instrument above the point of known elevation and press ↵Enter. ***This is not an elevation!***

Reading - Type the actual rod reading (middle stadia hair) at the foresight point and press ↵Enter. ***This is not an elevation!***

The **Stadia Interval Constant (K)** and the **Distance from Center of Instrument to Principal Focus (C)** are set in **Config** ➪ **Slope Entry Configuration** menu under **Stadia Options**.

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To utilize **Stadia** *reductions, the program prompts you to enter the* **Interval** *(the difference between the top and bottom stadia hairs) as the actual distance entry. Entering an actual distance instead of the interval at the* **Interval** *prompt will result in a warning message. The program will require verification of any interval value greater than 9.*

Total Stations

The **Total Stations** option is another slope reduction method that does not actually reduce a slope distance. Instead, "Sight" Survey assumes that the distance entered is a horizontal distance. You are then asked to supply additional information regarding your setup, after which an elevation is computed.

Instr. Ht. (or **Height of the Instrument**) - Type the actual height of the scope of the instrument above the point of known elevation and press Enter. ***This is not an elevation!***

Vert. Dist. (or **Vertical Distance**) - Type the actual measured vertical distance and press Enter. Enter this value as a negative if you are shooting downhill. ***This is not an elevation!***

Prism Height - Type the actual height of the prism center above the target point and press Enter. ***This is not an elevation!***

After the first time you enter this data, the program will retain the H.I.'s of the total station and also the prism. In each subsequent access this information is presented for your approval. If the setup information has not changed, simply press Enter to accept each entry. Otherwise, type the correct values before pressing Enter.

4.11 Entering Coordinates

When entering coordinate values into the "Sight" Survey routines, you will most often use the **Enter & Assign** routine. Whenever this

routine is called, it may or may not have coordinate values shown in the entry fields. This depends upon whether or not the point number you entered already has coordinates.

If the routine's entry fields show coordinates, you can clear each field by simply typing the correct value over the value shown. Then press Enter or Tab until you have corrected and/or completed all of the entries. In "Sight" Survey you will have three or four entries to complete, these being the **Northing**, the **Easting**, the **Elevation**, and possibly the **Point description**.

Whether or not you are prompted for the point description depends upon the setting for the **Prompt for point description** *item on the* **Config**→**COGO Configuration Menu**. *See page 401.*

4.12 Correcting Your Entered (Raw) Data

Despite using the utmost care in gathering and entering data, it is inevitable that mistakes will be made. "Sight" Survey contains features and routines to help you easily correct errors.

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Raw data files are not saved between sessions. You must correct your raw data during the session in which it was entered into "Sight" Survey.

The data correction procedure is illustrated in **Section 3 - Example 1**, which covers the construction, correction and balancing procedures for a small closed traverse. Before continuing, please review **Example 1** for basic instructions.

Welcome back! Certain features of the data correction window were not included in **Example 1**, so they are covered here. You already learned how to edit a bearing or a distance, and you can apply those principles to the **Action**, **Point Number**, **Coordinates**, **Slope Reduction Data**, and **Description** fields as well. You also saw how to balance angles and adjust your traverse. The following features were not discussed: **Adding a Leg** (Add Leg); **Deleting a**

Leg (Del Leg); **Copying to the Clipboard** (Copy); and **Resizing the Data Presentation Grid**.

Adding a Leg

To add a leg, position your mouse cursor at the insertion point and click. For example, it you want to insert a leg between leg **2** and **3**, click your cursor on leg **3**. Now click Add Leg. Click Yes when you are asked to confirm your action. The highlighted leg is re-produced as a new leg. In other words, you now have two leg **3** entries. Don't worry about the leg numbers, they will be corrected automatically when you **Re-Run** the traverse. However, you do need to correct the data in the first leg **3**, cell by cell.

Deleting a Leg

To delete a leg, position your mouse cursor on the target leg and click. For example, it you want to delete leg **2**, click your cursor on leg **2**. Now click Del Leg. Click Yes when you are asked to confirm your action. The highlighted leg is deleted and your leg numbers now read **1**, **3**, etc. Don't worry about the leg numbers, they will be corrected automatically when you **Re-Run** the traverse.

Copy to the Clipboard

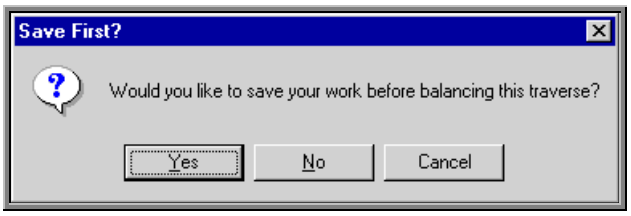
To copy a leg's data to the Windows Clipboard, position your mouse cursor on the target leg and click. For example, if you want to copy the information for leg **2**, click your cursor on leg **2**. Now click Copy.

Resizing the Grid

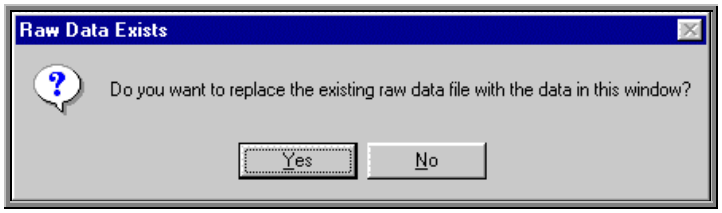
Depending upon your screen resolution, you may want to resize the columns in the data grid. You can accomplish this by using your mouse to drag the column borders to new locations. For example, to move the right-side border of the **DISTANCE** column about two digits to the left, place your mouse cursor in the column headings on the line between **DISTANCE** and **POINT**. Your cursor will look like ↔. Click and hold your mouse while dragging it to the left. A dotted line will appear to mark the changing position of the column border. When you are satisfied with the new location, release the mouse button.

Balancing Long Traverses

If you are balancing a long traverse that will take more than one session to complete, run the **Adjust Traverse** (**AT**) routine before you exit the "Sight" Survey program. When you are prompted:

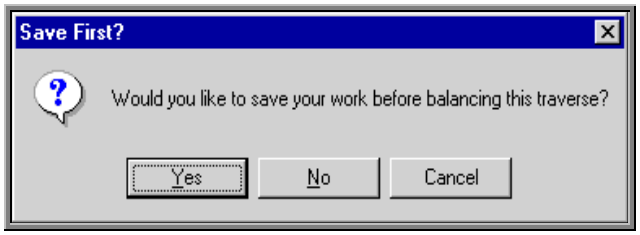


Press Enter (or Y) or click on Yes. When the **Unbalanced Traverse** window appears, press Alt U or click the Re-Run button. This important step forces "Sight" Survey to save your raw data file with your coordinate file so that you can begin your next session right where you left off. If you already have an existing raw data file, you will be prompted:



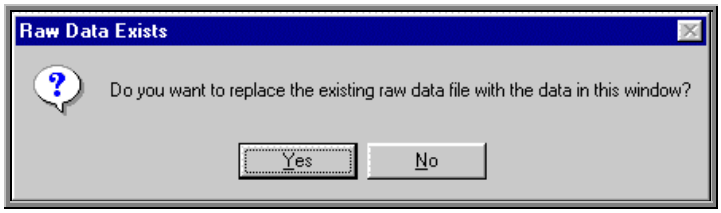
Press Enter (or Y) or click on Yes. When the **Modified Traverse** window appears, press Alt C or click on Cancel to close it. Next, close the **Unbalanced Traverse** window by pressing Alt C or by clicking on Cancel. You can now exit "Sight" Survey without losing your raw data file.

When you begin your new session, run the **Edit** ➪ **Edit Original Raw Data** (**ER**) routine. You will be prompted:



Since you are just re-running an existing file from disk, press N or click on No. When the **Raw Data** window appears, press Alt U

or click the Re-Run button. This important step will force "Sight" Survey to internally re-run your raw traverse data up to the point where you previously left off. You will be prompted:



Since you are just re-running an existing file from disk, you do not want to overwrite the raw data so press N or click on No. When the **Modified Traverse** window appears, press Alt A or click on Accept to accept the data and close the **Traverse Adjustment** windows. Your entire traverse will be reconstructed up to the point where you previously left off and areas and distances will be properly accumulated. When the traverse re-run is finished, you can continue entering your traverse data.

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1. *Use extreme caution when overwriting existing raw data files. Only overwrite raw data files when you are absolutely certain that the raw angles and distances that are showing in the **ACTIVE** Traverse Adjustment window are the ones that you want to keep as your "original raw data file". Once you overwrite a raw data file, you cannot recover the previous raw data file.*
2. *The Start At (ST) routine resets the area and length accumulators. If you use the Start At (ST) routine **WITHIN** a traverse, the traverse **Length** and **Area** will be incorrect.*
3. ***"Sight" Survey version 2.0 & 3.0 raw data files are not backwards-compatible with "Sight" Survey version 1.0** due to a major change in the file format. This does not apply to the coordinate points - they are fully interchangeable between the two versions. However, if you load a version 2.0 or 3.0 file into version 1.0 and attempt to use the Edit Edit Original Raw Data (ER) routine, "Sight" Survey will likely issue an unforeseeable error or may even crash.*

4.13 Rounding Errors

"Sight" Survey uses up to 16 significant digits for internal calculations. However, despite this high degree of accuracy, there may be times when you experience rounding errors. Generally these errors manifest themselves somewhere in the second or third decimal place, or beyond. But in almost every case except accumulated stationing, ***these are not errors generated by the program's handling of data. They are user-introduced errors.***

Introduced Errors

We are often asked what data items will produce the best solution. For example, in terms of curve solutions it seems that many users believe that a curve solution based on certain parameters may be more accurate than that same solution based on a different set of parameters. ***Actually, the parameter type makes no difference at all. The accuracy of any solution is based on the precision of the data entered.*** Once this fact is understood, you will have an easier time of selecting the best data to be entered.

For example, suppose that you have the following curve data:

Delta	*Radius*	*Arc*	*Tangent*	*Chord*
35°00'00"	*750.00*	*458.15*	*236.47*	*451.06*

Depending upon which two parameters you use to compute the other values, you will generate slightly different curve data every time as seen in the table below:

Parameters Used	Delta & Radius	Radius & Chord	Tangent & Chord	Arc & Radius
Delta	**35°00'00"**	35°00'00.4"	34°59'33.6"	35°00'00.3"
Radius	**750.00**	**750.00**	750.154506	**750.00**
Arc	458.148929	458.150293	458.147245	**458.15**
Tangent	236.474092	236.474841	**236.47**	236.474681
Chord	451.058699	**451.06**	**451.06**	451.059721

As you can see in the above table, the precision of the data directly affects the accuracy of the solution. Only the first solution based on the delta and radius is exact, as every other solution failed to produce the exact same delta and radius. ***Remember: For the most accurate solution, use the most precise data that you have.***

"Sight" Survey Examples

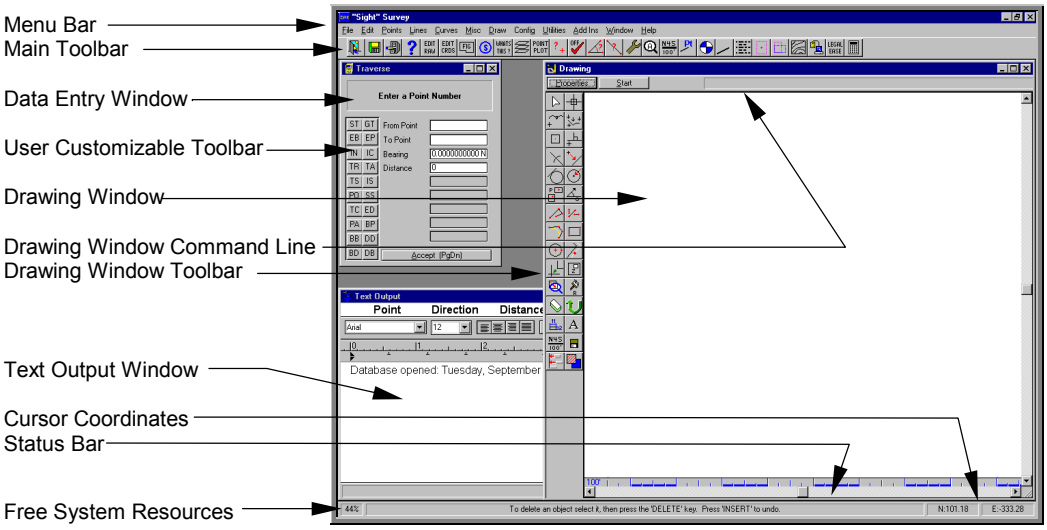
When you work through the example solutions presented in this manual, you may experience slight deviations from the printed results. This is not uncommon, and can be traced to the methods used to establish the given data. Generally, if you use the **Enter & Assign** (**EA**) routine to assign the given points, you will have greater success in matching the printouts.

"Sight" Survey 3.0

Section 5
Windows Everywhere

5.01 "Sight" Survey's Main Screen

Not only is "Sight" Survey a Windows program, it has its own windows as well. Three main windows make up the "Sight" Survey screen as shown below. The windows are: the **Data Entry** window; the **Drawing** window; and the **Text Output** window. A fourth window, the **Properties** window, appears and disappears when you click Properties (PR) at the top of the **Drawing** window.



All three main windows can be sized and arranged to best fit your monitor's optimum resolution. The arrangement shown above was captured on a 1024x768 resolution which is a good resolution for "Sight" Survey operation. A 1024x768 or 1280x1024 resolution monitor will easily display all three windows. However, if you are using a monitor smaller than 17", 1280x1024 is generally too small for comfortable viewing. If your monitor's resolution is 800x600 or lower (such as a standard VGA resolution of 640x480) you may find it easier to minimize the **Text Output** window.

Minimizing a Window

To minimize a **Windows 3.1** window, click on the button in the upper right corner of the window.

To minimize a **Windows 95/98/NT** window, click on the button in the upper right corner of the window.

Maximizing a Window

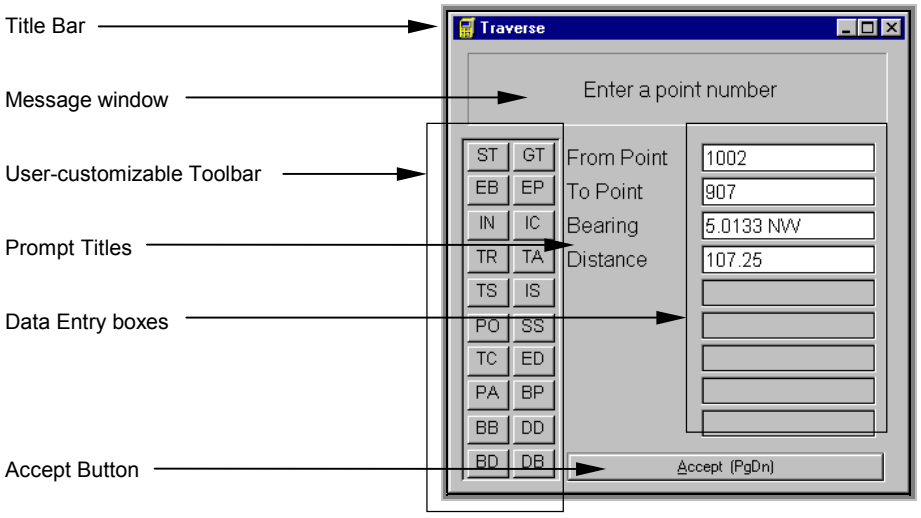
To enlarge a window stored as a **Windows 95/98/NT** icon, double-click on the icon, or click on the button inside the icon. The window will return to its previous size and position.

To maximize a window stored as an icon, click on the button inside the icon. The window will fill the entire screen.

To enlarge a **Windows 3.1** window stored as an icon, double-click the icon.

5.02 The Data Entry Window

"Sight" Survey's **Data Entry** window is your interactive link to the COGO program. The window contains six parts as shown below.



Title Bar

The **Title Bar** displays the name of the routine in progress. It serves as a reminder in the event that you have jumped between windows in the middle of a routine.

Message Window

The **Message Window** contains prompt-sensitive instructions to assist you with data entry. Typical information includes items such as angular quad code entries, mathematical operators for in-line calculations, and specific prompt instructions.

User Customizable Toolbar

The **User Customizable Toolbar** contains buttons giving you one-click access to your most commonly used routines. Instructions for setting up your own tool bar are contained on page 411.

Prompt Titles

The **Prompt Titles** area displays all data entry prompts needed by the routine named in the **Title Bar**. These prompts change from routine to routine.

Data Entry Boxes

To proceed through the **Prompt Titles**, you must type data into the **Data Entry Boxes**. After typing the data, move to the next prompt by pressing Enter, Tab, or the ↓ key. To correct any entry before final acceptance, use the ↑ key or press Shift Tab to move back up through the prompts, or simply click your mouse in any data entry box that needs correction.

Accept Button

When you have completed all required data entry fields, there are four ways to continue: press Enter immediately after the last data entry box has been filled; press Alt A; press Page Dn; or click the Accept (PgDn) button.

Help

To access "Sight" Survey's on-line **Help** feature, right-click your mouse anywhere on the **Data Entry** window, except within the **Data Entry Boxes**. This will activate a small menu containing five options.

Contents — Press C to activate the **Help** system's **Table of Contents**.

Current Topic — Press T (or F1) to get *context sensitive* help on the current routine or prompt.

Search for Help On ... — Press S to **Search** the **Help System** for a specific topic.

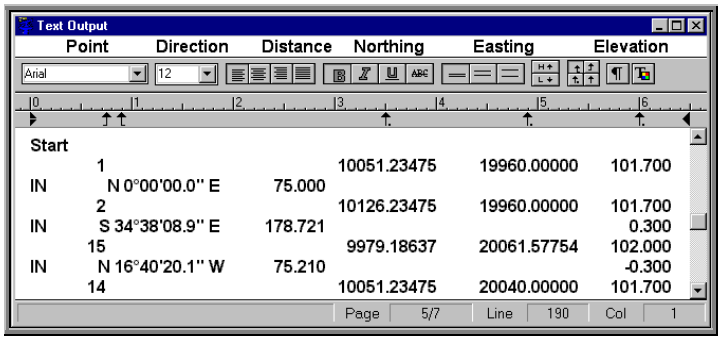
How to Use Help — Press H for **instructions** on using the **Help** system.

System Information (SI)

Press [I] (or `SI`) for **System Information**, which is presented in three screens as shown below. These are information screens only and are not editable.

5.03 The Text Output Window

"Sight" Survey's **Text Output** window is a fully-editable, scrollable window that contains all of the text data generated by "Sight" Survey.



Editing Text

Click anywhere in the **Text Output** window to activate the window. Notice the prompt in the "Sight" Survey **Status Bar** reads:

Text Output Window (press "Insert" to edit)

Press [Insert] to activate the text editing features and the prompt changes to:

Text Output Window (editing turned on)

The [Insert] key acts as a toggle switch. To turn off the editing features press [Insert] or jump to another "Sight" Survey window.

Moving the Cursor

To place the text cursor at a specific location, click on the location with your mouse, or use the [↑], [↓], [←], [→], [Page Up], [Page Dn], [Home], and [End] keys. Do not use the backspace key ([Bk Spc] or [←] while in edit mode) or you will erase text.

Selecting Text

To change any existing text, you must first select the text by following these simple Windows conventions.

To Select a Word

Mouse: Double-click anywhere on that word.

Keyboard: Place the mouse cursor at the beginning (or end) of the word and press Ctrl Shift → (or Ctrl Shift ←).

To Select a Line

Mouse: Place the mouse cursor at the beginning (or end) of the line. Click and drag the mouse to the right (or left) until the line is highlighted.

Keyboard: Place the mouse cursor at the beginning (or end) of the line and press Shift ↓ (or Shift ↑), or Shift End (or Shift Home).

To Select Everything

Mouse: Place the mouse cursor at the beginning (or end) of the document. Click and drag the mouse down and to the right (or up and left) until the entire document is highlighted.

Keyboard: Press Ctrl Home (or Ctrl End) to jump to the beginning or end of the document. Now press Ctrl Shift End (or press Ctrl Shift Home) to highlight the entire document.

To Select Everything from the Cursor Point

Mouse: Click and drag the mouse down and to the right (or up and left) until the desired portion of the document is highlighted.

Keyboard: Press Ctrl Shift End (or press Ctrl Shift Home) to highlight from the cursor to the end (or beginning) of the document.

To Select a Paragraph

Mouse: Place the mouse cursor at the beginning (or end) of the paragraph. Click and drag the mouse down and to the right (or up and left) until the paragraph is highlighted.

Keyboard: Place the mouse cursor at the beginning of the first line of the paragraph. Press Shift ↓ to highlight each line in the paragraph.

The Editing Menu

To gain access to the **Text Output** window's editing commands, activate the menu by right-clicking anywhere within the **Text**

Output window. To use any menu item, press the item's hot key (underlined character).

Undo — Right-click to activate the menu, then press U to **Undo** the last text operation. ***You can only undo your last operation***.

Cut — Right-click to activate the menu, then press C to **Cut** selected text. **Cut** may also be performed from the keyboard by pressing Ctrl X (or Shift Delete). The selected text is removed from its present location and sent to the clipboard.

Copy — Right-click to activate the menu, then press Y to **Copy** selected text. **Copy** may also be performed from the keyboard by pressing Ctrl Insert. The selected text is copied (but not removed) from its present location and sent to the clipboard.

Paste — Locate the text cursor at the desired insertion point, right-click to activate the menu, then press then press P to **Paste** text from the clipboard. You can also paste from the keyboard by pressing Ctrl V (or Shift Insert).

Select All — Right-click to activate the menu, then press E to **Select** the entire document.

Delete Selected — Right-click to activate the menu, then press S to **Delete Selected** text. You can also **Delete Selected** text from the keyboard by pressing Delete. The selected text is removed from its present location but it is not sent to the clipboard. Text deleted in this manner may only be recovered by immediately using the **Undo** function.

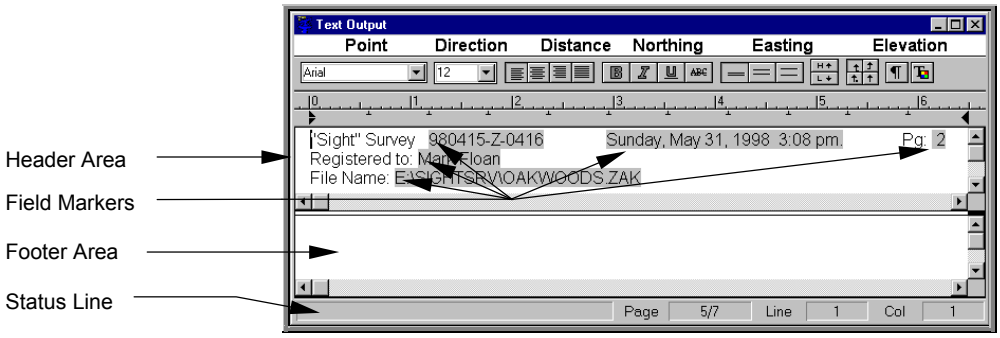
Insert Page Break — Right-click to activate the menu, then press I to **Insert a Page Break** into your document. The break will be inserted immediately below the line containing the cursor. To remove a page break, place the cursor on the line immediately above the existing page break and select **Insert a Page Break** again.

Under normal conditions, "Sight" Survey will fill a page before issuing a page break. Use this feature to issue a page break at any other location.

Page breaks may also be added or deleted by pressing Ctrl Enter. All text is repaginated before a **Print Preview**.

View Headers/Footers

When "Sight" Survey prints a page of information, it may add a header and/or footer to the page. Headers and footers are lines of informational text that typically are used to include the job name, program name and version, date, page numbers, and standard headings. To activate the **Header/Footer** split window, right-click to activate the menu, then press H Enter.



Edit the **Header/Footer** areas just as though they were regular text windows. The only exceptions to this rule are the **field markers** (**??**), which hold positions for data that is automatically inserted when printing. To identify what each field marker represents, position the cursor in the middle of the question marks and read the field type on the **Text Output** window's **Status Line**.

When you have finished editing your headers and footers, close the **Header/Footer** split window the same way you opened it.

?

If you delete a field marker, you may not be able to replace it. Rather than deleting the markers, you may want to line them all up in a single row, or at the end of a row, and set the text color to "white" so the text won't print.

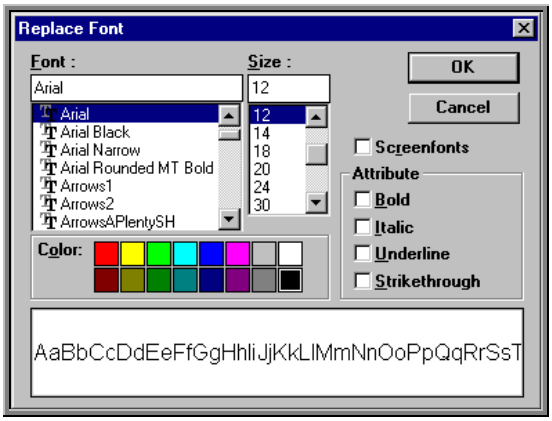
Print — Right-click to activate the menu, then press R to **Print** your document. This command is covered in detail on page 202.

Print Preview — Right-click to activate the menu, then press V to activate the **Print Preview** feature. This command is covered in detail on page 201.

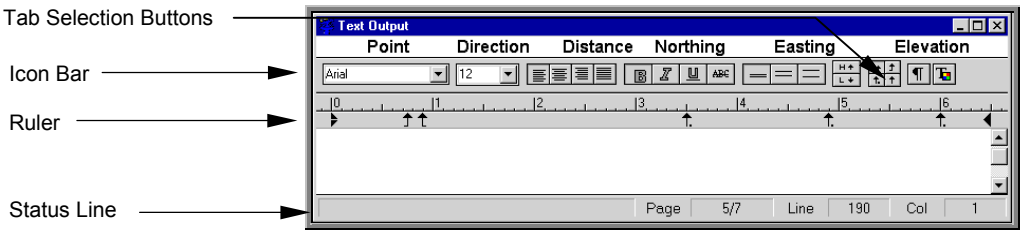
Export Text — Right-click to activate the menu, then press X to **Export Text** to another file. This command is covered in detail on page 220.

Select Global Font — Right-click to activate the menu, then press G to **Select a Global Font** for the **Text Output** window (including headers and footers). This action is essentially the same as selecting the entire document then changing the text formatting just as you would for selected text as described under **Select Font for Selected**.

Select Font for Selected — Right-click to activate the menu, then press F to **Select a Font for Selected** text. A **Replace Font** dialog box appears, from which you may set: **Font** style; font **Size**; font **Color**; and text **Attributes**.

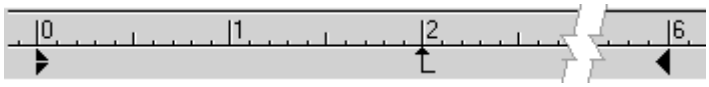


Properties ▸ — Right-click to activate the menu, then use your mouse or arrow keys to access the **Properties** item. The ▸ symbol indicates the presence of a sub-menu. From the sub-menu, select **Ruler**, **Icon Bar**, or **Status Line**. Each of these items toggles the display of the named item.



Ruler

When displayed, the **Ruler** not only provides a graphical representation of the size of your paper, but it also allows you to format paragraphs and set tabs.



To Format Paragraphs

To format the left paragraph margin, click on the bottom half of the left paragraph marker (▶) and drag the marker to its new location.

To set a hanging first line, click on the top half of the left paragraph marker (▶) and drag the marker to its new location.

To format the right paragraph margin, click on the bottom half of the left paragraph marker (◀) and drag the marker to its new location.

To Set Tabs

Select the type of tab desired by using the **Tab Selection** buttons on the **Icon Bar**. Now, on the bottom half of the **Ruler**, click on the desired tab location.

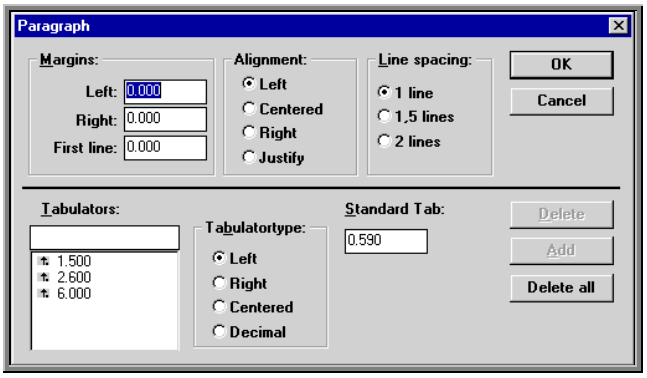
To move an existing tab, click and drag the tab marker to a new location.

To erase a tab, click and drag the tab marker straight up through the top half of the **Ruler**.

The Paragraph Dialog Box

The **Paragraph Dialog Box** offers a convenient selection method for all paragraph and tab formatting. To activate this dialog box, double-click anywhere in the numeric portion (the top half) of the **Ruler**.

Paragraph formatting done in this manner will apply to the paragraph in which the cursor is located. All subsequent, but currently not existing, paragraphs will be formatted in the same style. All other existing paragraphs will retain their existing formats. (Text entered as the result of COGO calculations *will not* retain **tab** and **margin** settings, but *will* retain **font** and **spacing** information.)



Icon Bar

When displayed, the **Icon Bar** provides you with a full set of formatting commands. By clicking on the various fields and buttons you can: format text; change your paragraph layout; and vary the line spacing.

Click the next to the scrollable **Font Name** menu to change the font of the selected text. Scroll through the font list and select the desired font.

Click the next to the scrollable **Font Size** menu to change the font size of the selected text. Scroll through the size list and select the desired size.

The **Justification** buttons control text justification. Your choices are: **Left**; **Center**; **Right**; and **Full**.

Paragraph justification done in this manner will apply to the paragraph in which the cursor is located. All subsequent, but currently not existing, paragraphs will be formatted in the same style. All other existing paragraphs will retain their existing formats.

The **Text Attribute** buttons are toggle switches. Click on them to: Bold and un-bold text; change text to and from italics; underline words and characters, or cancel an underline; strike-through text or remove a strike-through.

The **Line Spacing** buttons control the spacing of the text lines. Your choices are: **Single**; **One and a half**; and **Double**.

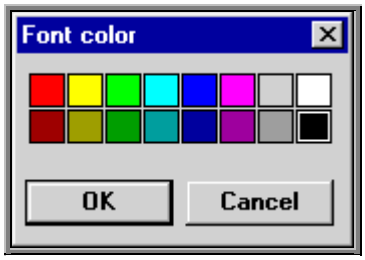
Line spacing done in this manner will apply to the paragraph in which the cursor is located. All subsequent, but currently not existing, paragraphs will be formatted in the same style. All other existing paragraphs will retain their existing formats.

The **Superscript** (H↑) and **Subscript** (L↓) buttons are used to raise and lower selected text by two points.

The **Tab Selection** buttons are used to set your tabs as: **Left**; **Right**; **Decimal Point Centered**; and **Centered**.

Click the format indicator to show or hide text formatting characters that are contained in your text file. These characters are for reference only, and will not print. The characters represent: tabs (→), spaces (•); and paragraph markers (¶).

Click on the text color button to change the text color of the selected text. Select your new text color by double-clicking on the new color.



Status Line

When displayed, the **Status Line** displays the page number, a total page count, the cursor's position by line (relative to the top of the page) and column, and occasionally some messages relevant to the currently accessed feature. For example, the **Status Line** shown

below indicates that the cursor is on page 1 of 8 pages, on line 1, in column 21.

Help

Right-click to activate the menu, then press H H Enter to activate the **Help** file. The help file will open to the topic "**Additional Text Features**."

5.04 The Drawing & Properties Windows

"Sight" Survey's **Drawing** and **Properties** windows are discussed in detail in the ***Drawing Window Reference Manual***.

"Sight" Survey 3.0

Section 6

The FILE Menu

The **File** menu contains all commands related to transferring information. Here you will find commands to do things like create a new job, print or plot your drawing, and make a backup file.

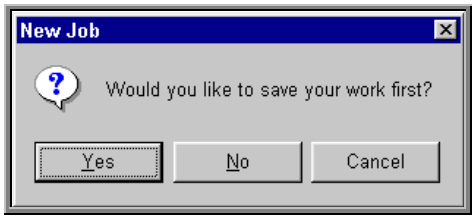
All commands are discussed in the order in which they appear on the menu. You can access menu routines by using your mouse on the pull-down menu. Therefore, this selection method will not be mentioned in each routine's discussion. Keyboard shortcuts to each routine will be noted.

6.01 New Job (NJ)

FUNCTION: The **New Job** function is used to close the current job and start a new job.

To access **New Job** function, click the **Tool Bar** icon, or use the keyboard command **NJ**, or press Alt F, N.

If you have any unsaved work, "Sight" Survey prompts:



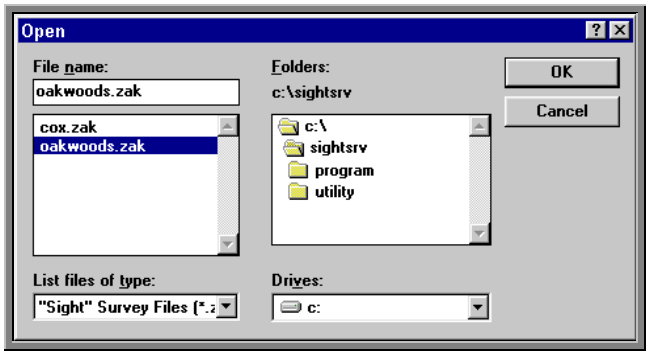
Click Yes or No, or click Cancel to quit the **New Job** routine. If you select Yes or No, "Sight" Survey will close the current job and you may begin a new job from scratch, or by using the **File** ➪ **Open Job** or **File** ➪ **Import** ➪ **Coordinates** command.

You do not need to issue a **New Job** *command before using the* **Open Job** *command to start a new job.*

6.02 Open Job (LO)

FUNCTION: The **Open Job** function is used to open an existing "Sight" Survey (or Survey 4.0) job.

To access **Open Job** from the keyboard, use the command **LO** or press Alt F, O. The dialog box title bar will display: **Open**.



Opening Files

Anytime an **Open Job**, **Import**, **Copy Job**, or **Delete Job** command is issued, you'll see a **Filename Dialog Box**. To open a file:

1. If the file you want to open is on a different drive, select the drive you want from the **Drives** box.
2. In the **Directories** box, choose the directory you want to open. (Double-click the directory, or press the ↑ or ↓ arrows to select the directory, and then press Enter.)
3. Windows displays the names of all files in that directory that are of the type selected in the **List Files Of Type** box. To display a different type of file, select the type you want from the **List Files Of Type** box.
4. From the list of files, select the file you want to open.
5. Click OK or Open.

6.03 Save Job (SC)

FUNCTION: The **Save Job** function is used to save a "Sight" Survey job (COGO and drawing), using the same file name it was opened under.

To access **Save Job** from the keyboard, use the command **SC** (**S**tore **C**oordinates) or press Alt F, S.

1. *If the job was never named, i.e. started from scratch, use the* **Save Job As** *instructions.*
2. *Whenever you save a drawing, a backup copy of the drawing, with the extension* **.BAK** *is automatically made. This copy is stored in the same directory that the drawing is saved in.*

É *When you save a drawing that contains a bitmap,* ***the bitmap is not stored in the drawing****. Only a reference to the bitmap is stored.* ***It is therefore important that you do not delete the bitmap****. If you delete the bitmap or move it to another directory, an error message will appear next time you try to load any drawings containing the bitmap.*

Saving Files

The **File** menu contains two commands for saving files: **Save Job** and **Save Job As**. **Copy Job** and **Export** also use the **Save Job As** box. The **Save Job** command is used to save changes to an existing file. The **Save Job As** command is used to name and save a new file or to save an existing file under a new name. For example, you might want to make changes to a file, yet keep a copy of the file as it existed before you began working on it. By using the **Save Job As** command, you can save another copy of the original file by giving it a different name.

Save an Existing File

To save an existing file under the same name:

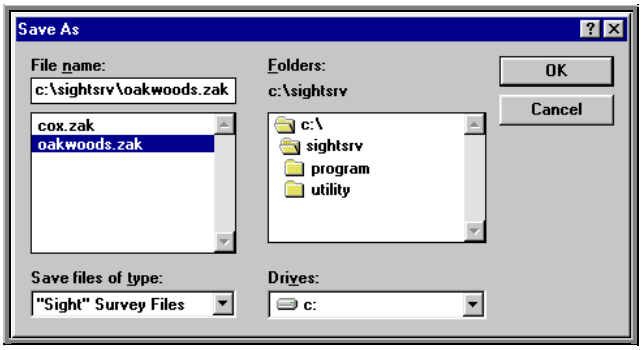
1. Click on the disk icon on the **Main** toolbar ( ), or press Alt F, S, or type **SC** (to **S**tore **C**oordinates).

2. If the file has previously been named, the file will automatically be saved. Otherwise follow the instructions for the **Save Job As** command shown below.

Save Job As a New File

To Save a Job As a new file or to save an existing file under a new name:

1. From "Sight" Survey's **File** menu, choose **Save Job As**. The **Save As** dialog box appears.



2. If you want to save the file on a different drive, select the drive you want from the **Drives** box.
3. In the **Folder and File Selection** menu, choose the folder you want to open. (Double-click the folder, or press the ↑ or ↓ arrows to select the folder, and then press ↵Enter.
4. If you need to create a new folder, you must use the **Windows Explorer**. Access **Explorer** using the Start button.
5. In the **File Name** box, type a name for the file. If you don't specify a filename extension, "Sight" Survey will add "**.zak**".

É *Never use a* **BAK** *extension when naming files or you may overwrite data you want to keep. Also, never rename a file to have a* **BAK** *extension!*

6. Click Save (or OK).

When you save a file, "Sight" Survey can create a backup file of the previous coordinate data. The backup coordinate file will have a **.ZBK** *extension. To reload backup file, rename the file to have* **.ZAK** *extension. Automatic file backup creation is set on the* **COGO Configuration Menu**. *See page 401.*

6.04 Save Job As

FUNCTION: The **Save Job As** function is used to save a "Sight" Survey job using a different file name than what it was opened under.

To access **Save Job As** from the keyboard, press Alt F, A. The dialog box title bar will display: **Save As**

Follow the instructions for saving a file under a new name as contained in **Section 6.03**.

6.05 Print Preview/Adjust Margins

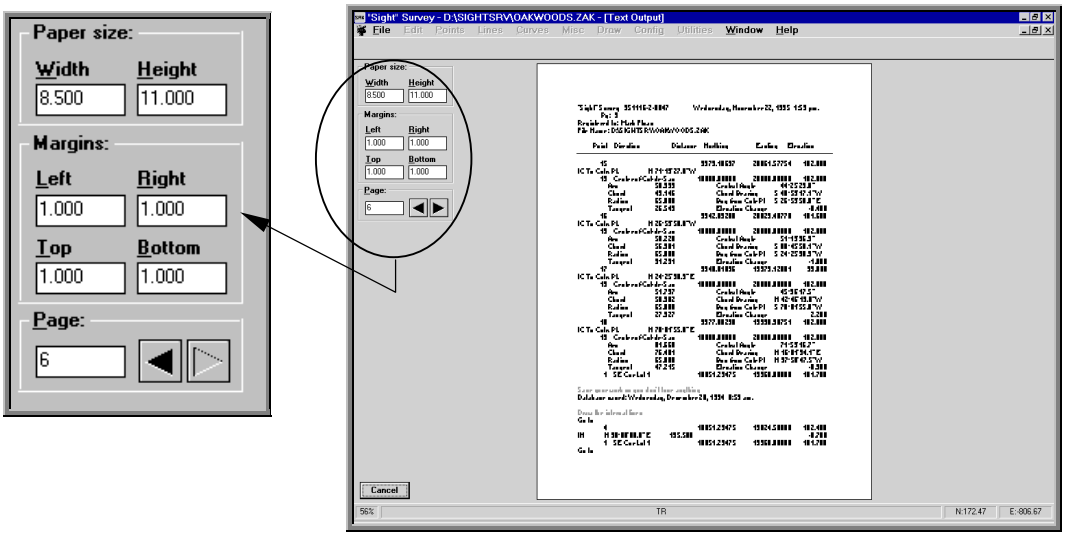
FUNCTION: **Print Preview/Adjust Margins** is used to set page size and margins, and to show you just how your printed text (***not*** *drawings*) will appear when you print it out. You can also select your output device using this routine.

To access **Print Preview/Adjust Margins** from the keyboard, press Alt F, V. The "Sight" Survey print preview screen (shown on the next page) will appear.

The center of the display contains an image of your output as it will appear when printed. Depending upon the size and resolution of your monitor, you may be able to read the page, although that is unlikely.

The upper left portion of the display contains a control pad. Use this control pad to set the page size and margins. You may also use the **Page** ◀ and ▶ buttons to step through the printout page-by-page.

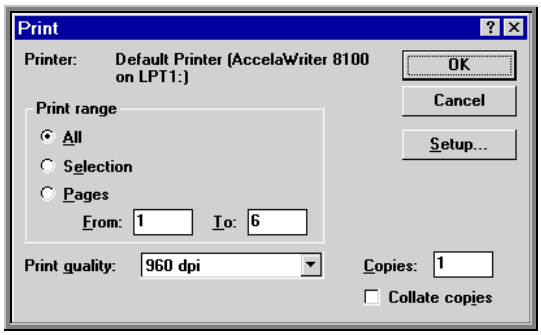
To switch back to "Sight" Survey's normal view, press Alt F, V, or click Cancel.



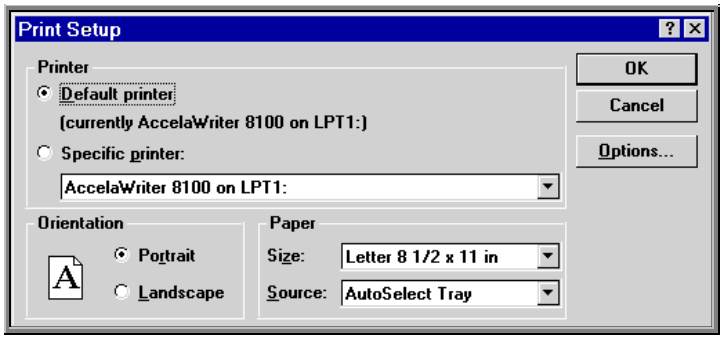
6.06 Print Text

FUNCTION: **Print Text** is used to print the contents of "Sight" Survey's **Text Output** window.

To access **Print Text** from the keyboard, press Alt F, P. A standard Windows **Print** dialog box will appear: *(Windows 95/98 box shown.)*



Verify or select your **Print range**, **Print quality**, number of **Copies**, and **Printer** and click [OK]. If you need to adjust your printer settings, click [Setup...] and the **Print Setup** window will appear: *(Windows 95/98 box shown.)*



Due to the many printers supported by Windows, setting up your printer is beyond the scope of this manual. Please refer to your Windows and printer documentation for this information.

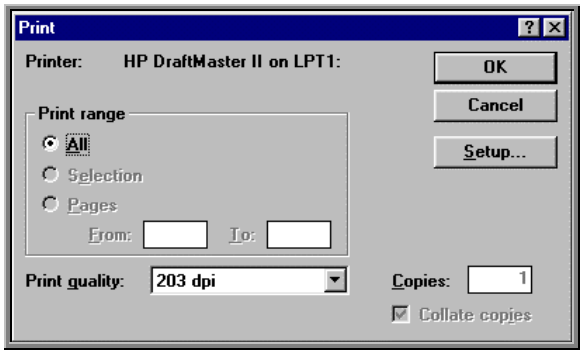
6.07 Plot Drawing ➪Fit to Page

FUNCTION: The **Plot Drawing ➪Fit to Page** routine plots your drawing at a size that will fit on a pre-selected page size.

To access **Plot Drawing ➪Fit to Page**, press Alt F, L, ↵Enter (or F).

1. *In Windows, both printers and plotters are classified under the general heading **"Printers",** and printing refers to both printing and plotting. For information on how to install printers and on how to select the default printer, see your Windows documentation.*
2. *You can output bitmaps to printers, but not to vector (pen type) plotters.*

When you select **Plot Drawing** ➪**Fit to Page**, the following appears:



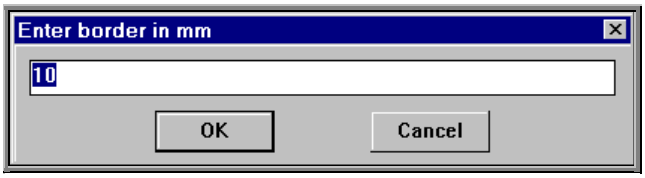
É *If you are outputting to a vector (pen) plotter, you should use one of the plotter fonts, **Modern, Roman, Script,** or some type of **stroke font** for your text and dimensions. **(HPGL Users** - if you use any other font on your drawing it will be converted for the plotter but all your text will be plotted horizontally, regardless of its orientation on the drawing.)*

When you click [OK], the prompt bar at the top of the **Drawing** window command line prompts:

Plot to Fit? (else at exact scale)

If you click [No], you can specify the exact scale at which your drawing will be printed. Please continue at **Plot Drawing** ➪**Plot to Scale** on page 209.

If you click Yes, "Sight" Survey will read the paper size and orientation of your printer or plotter and will print your drawing so that it fits onto the paper exactly. You'll be prompted:



Type the width of the border you want around your drawing, then click OK or press Enter. The **Drawing** window command line prompts:

Satisfied with zoom?

The part of your drawing that will be printed or plotted appears on the screen enclosed by dashed lines indicating the edges of the paper. If you are satisfied with what is to be printed or plotted, click Yes. If you are not satisfied, click No button. The **Drawing** window command line prompts:

Enter new center of zoom box

Move the zoom box to a new position and press Enter or click your mouse. The **Drawing** window command line prompts:

Satisfied with zoom?

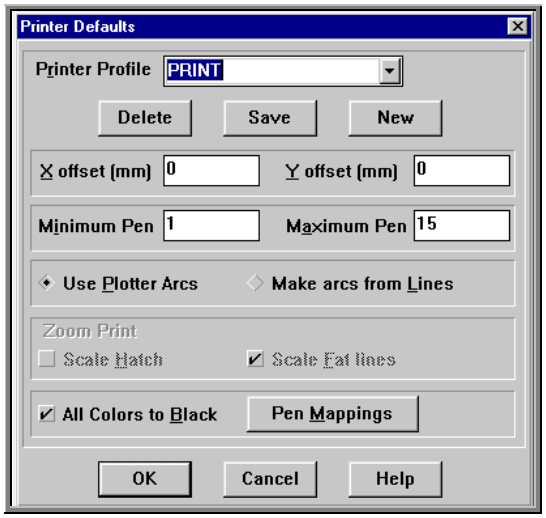
Continue until you are satisfied with the plot, or abort **Plot Drawing** **Fit to Page** by pressing the Space Bar.

After you are satisfied with the orientation of the drawing, the **Drawing** window command line prompts:

Enter point for compass insertion (space bar for no compass)

Press the Space Bar if you do not want a North arrow on your drawing. If you want a North arrow, position your cursor at the chosen location and press ↵Enter or click your mouse.

If you have rotated your print/plot, the message **Transforming plot back again** *will appear. Click* OK*. Your drawing will return to the orientation it was at prior to rotation.*



X and Y offset

The **X** and **Y offset** boxes allow you to offset the drawing (relative to its current position) on the paper. The offset is measured in mm. The **X offset** box displaces the drawing to the right if a positive value is entered, and to the left if a negative value is entered. The **Y offset** box displaces the drawing downwards if a positive value is entered and upwards if a negative value is entered.

Minimum Pen, Maximum Pen

The **Minimum Pen** and **Maximum Pen** boxes allow you to specify the range of pens with which to plot when you are outputting to a plotter. The minimum pen is 1 and the maximum pen is 15. ***These boxes may be grayed out if they are not applicable to your setup.***

If you are using a plotter with less than 15 pens, such as a six pen plotter, but you have used more than the first six colors in the **Pen Selection Area** (red, olive, yellow, lime, green and teal counting downwards from the top), you should specify minimum and maxi-

mum pens 1 and 15. If you do not, the parts of your drawing that are drawn with other colors will not be plotted.

Use Plotter Arcs / Make Arcs from Lines

If the **Use Plotter Arcs** option is checked, "Sight" Survey will plot arcs created by your plotter driver. If the **Make Arcs from Lines** option is checked, "Sight" Survey will plot arcs made out of very small lines.

If no arcs appear when you try to plot, or if arcs are plotted incorrectly, use the **Make Arcs from Lines** option.

Zoom Print - Scale Hatch Scale Fat Lines

Selecting either the **Scale Hatch** or **Scale Fat Lines** options under the **Zoom Print** heading tells "Sight" Survey to scale line weight and/or hatch patters accordingly when you change the scale on your drawing. ***These boxes may be grayed out if they are not applicable to your setup.***

All Colors to Black

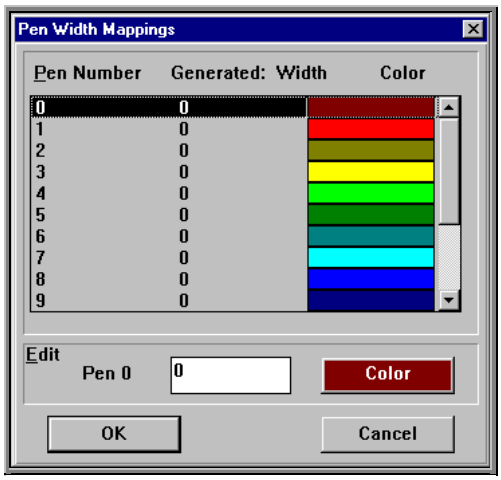
If your printer prints colors as different shades of grey, meaning that some colors are printed very faintly, check this option. All colors will then be printed as black.

Pen Mappings

This function allows you to use a printer such as an inkjet or laser printer as though it was a pen plotter. It does this by letting you map each color on the screen to a different line width on the printer. For example you could make red lines print at 0.3 mm, green lines print at 0.7 mm etc.

When you click on the Pen Mappings button, the **Pen Width Mappings** dialog box (shown on the next page) appears.

The pens are listed on the left hand side of the box and are numbered from 0 to 15, where 0 is the top color in the **Pen Selection Area** at the right of the screen and 15 is the bottom color. Click on a pen to which you want to assign a width. The pen's number appears in the **Edit** part of the dialog box. Type a width (measured in mm) into the white part of the dialog box.



Now click on another pen to which you want to assign a width. The width associated with the first pen you edited appears next to that pen's number in the dialog box, and the second pen's number appears in the **Edit** area. Assign a width to the second pen and repeat until you have assigned a width to each pen. Then click on OK.

Pen mappings only affect those lines with a width of 0. For example, if you map the red pen to print at 0.3 mm, and there is a red line on the drawing that you have given a width of 0.7 mm using the **Line Defaults** *dialog box, then that red line will print at 0.7 mm even though you have mapped the red pen to print at 0.3 mm.*

This function is very useful for thickening dimension ***witness lines*** *(see* **Section 30.11 - Dimension Defaults***) which often print very faintly on modern high resolution inkjet printers. To thicken witness lines, set aside one color and draw all your witness lines in that color. Map that color to the desired thickness.*

Busy printing

When you click OK, the message **Busy printing** appears while your drawing is printed or plotted.

Change Pens in Plotter

If you specified a maximum pen greater than the number of pens your plotter driver provides for, you will get the message **Change Pens in Plotter**. Simply click on OK after changing them.

6.08 Plot Drawing ➪Plot to Scale

FUNCTION: This routine plots your drawing at a specified scale. There are two ways to **Plot to Scale**: from the **File** menu, and from the **Plot Drawing ➪Fit to Page** routine.

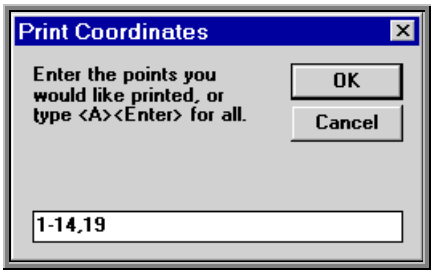
To access **Plot Drawing ➪Plot to Scale**, press Alt F, L, P.

☞ *The instructions for* **Plot Drawing ➪Plot to Scale** *are identical to the instructions for* **Start ➪File ➪Zoom Print**, *contained in* **Section 22.12** *of the* ***Drawing Window Reference Manual***.

6.09 Print Coordinates

FUNCTION: The **Print Coordinates** routine simply sends a coordinate listing to your printer.

To access **Print Coordinates**, press Alt F, C and the **Print Coordinates** dialog box will appear.



In the text entry box, type the point numbers you want to list. In the sample shown above, "Sight" Survey will list points 1 through 14, and then point 19. When you have entered your point numbers, click OK and the **Print** dialog box (shown on page 203) appears.

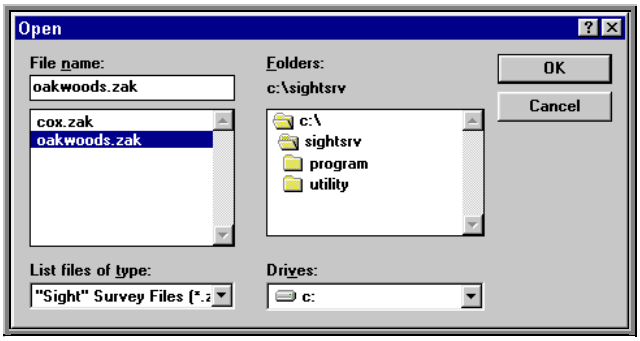
Notice the **Print Range**, **Collate Copies**, and **Print to File** sections of the dialog box are grayed out. At this time these settings are not relevant.

When you click OK, "Sight" Survey will print the specified co-ordinate list to your output device.

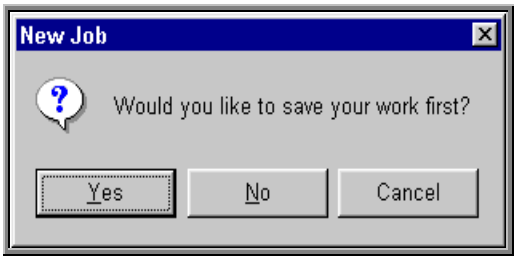
6.10 Import Coordinates

FUNCTION: The **Import Coordinates** routine is used to import coordinates from a "Sight" Survey, Survey 4.0, or third party data file. The **Import Coordinates** process replaces your current job file. This routine is most commonly used to begin a new "Sight" Survey job from a third party data file. To add coordinates from another file to your current job file, use **Import Merge Coordinates** (see page 214).

To **Import Coordinates**, press Alt F, I, Enter (or C). The **Open** dialog box appears. *(Windows 95/98 version shown.)*

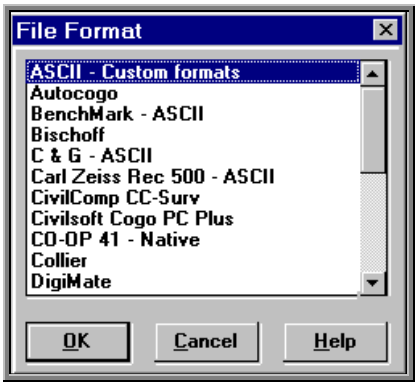


Follow basic Windows procedures for opening a file and select the coordinate data file you wish to import. When you click OK or Open, you may see the dialog box:



This box will only appear if you have existing, unsaved data. Click Yes to save your data, No to proceed with the import without saving your data, or Cancel to exit this routine.

"Sight" Survey will automatically recognize files in a "Sight" Survey or Survey 4.0 format. However, if you are importing a third party file, you must choose the correct file type from the **File Format** dialog box.



At this time, "Sight" Survey directly supports several file formats as listed on the next page. (List subject to change without notice.)

The most common type of ASCII file is a comma delimited file. While this does not appear on the menu, the Lewis & Lewis selection is a comma delimited file.

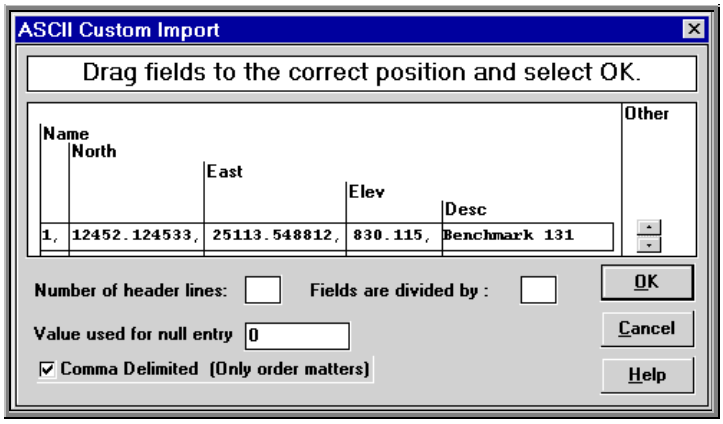
ASCII - Custom Formats
Autocogo
Benchmark - ASCII
Bischoff
C & G ASCII
Carl Zeiss Rec 500* - ASCII
CivilComp CC-Surv
CivilSoft Cogo PC Plus
CogoMate ~
CO-OP 41 - Native
Collier
DCA (Softdesk) ~
DigiMate*
GEM - SDF File
Geodimeter* - ASCII
Houseman PC-Cad
HP-71 Surveying Pac* - Text
Lewis & Lewis
LI Contour
Lietz SDR Comms/Text/Map
MapTech - Native
Micromate*
MTI 3000
Nikon* - ASCII
NOAA State Plane
PacSoft
Pentax* - ASCII
Plus III - ASCII
Simplicity "Sight" Survey
Simplicity Survey 2
Simplicity Survey 3
Simplicity Survey 4
Star*Net*
Surfer ~
Surv-A-Soft
Surv-A-Soft Ver. 4
Surveyor II
SurveySoft
Technical Advisors
TopCon* - ASCII
Traverse PC
Tri-Pod Data Sys.* - ASCII
WildSoft - ASCII
* *Import Only*
~ *Export Only*

The **Import** ➪ **Coordinates** *routine contains* **Point Overwrite Protection** *identical to the* **Import** ➪ **Merge Coordinates** *routine described on page 214.*

ASCII Custom Formats

Almost every COGO program currently on the market will export its coordinate data into an ASCII style format. If the format you need is not directly supported by "Sight" Survey, you can probably import it by using the **ASCII - Custom Formats** option.

To define a custom format, select the **ASCII - Custom Formats** option. This will open the **ASCII - Custom Import** dialog box which will contain the first line of the specified data file. This is where you will define the actual data file format.



Drag Fields

In the **Drag Fields** box, move the **Name**, **North**, **East**, **Elev**, **Desc**, and **Other** fields to indicate the various elements of the data line. To move a field, click and drag the field name to a new location. Position the fields so the vertical separator line falls before the data in the field, as illustrated above.

Number of header lines

Some ASCII files contain header lines that typically identify the filename, and other job information. If the first line in the file does not contain coordinate data, use the ▲ and ▼ buttons to count the number of header lines. Stop when you reach the first data line and type the number of header lines into this entry box.

Value used for null entry

Many programs use a value other than zero to signify a null entry. Often this is a number such as `99999`. If your data file uses a value other than zero, type the number into this entry box.

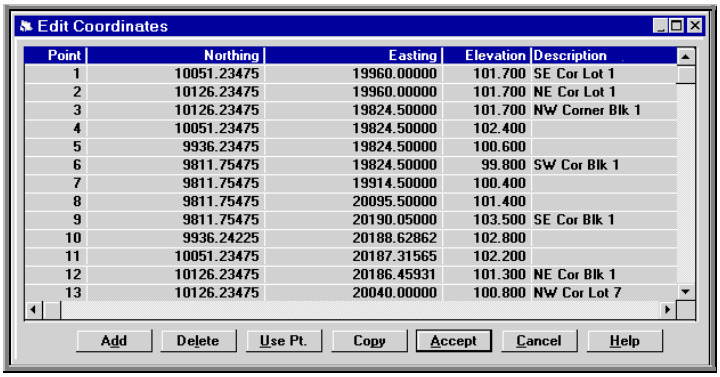
Comma Delimited

Most programs produce ASCII data files with comma delimited fields. If this applies to your data file, activate this checkbox. In a comma delimited file, the exact start column for each data field is ignored. The **Drag Fields** items need only be in the correct order.

Fields are divided by

If your data file is not comma delimited, you must type the delimiting character into this entry box.

When your data file format has been established, click [OK] and the data will be imported. You will then be presented with the **Edit Coordinates** window.



You may now review the data to check its accuracy. When you are satisfied, click [Accept].

6.11 Import ➪Text

FUNCTION: The **Import ➪Text** routine is used to import any text file into "Sight" Survey's **Text Output** window.

To **Import ➪Text**, press Alt F, I, T.

The **File Open** dialog box will appear. Following basic Windows procedures for opening a file, select the text file you wish to import and click OK or Open. Text files are imported using a mono-spaced font for best formatting results.

A more convenient method of importing text is to use Windows' Cut(or Copy) & Paste functions to paste text from a text editor into "Sight" Survey.

To import text into a drawing, use the **Start ➪File ➪Import ASCII Text** *function described in* **Section 22.08** *in the* **Drawing Window Reference Manual.**

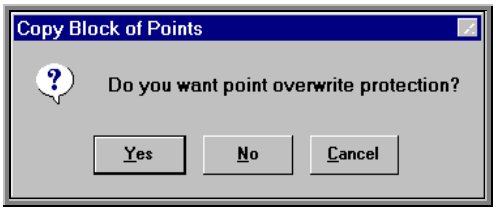
6.12 Import ➪Merge Coordinates

FUNCTION: The **Import ➪Merge Coordinates** routine is used to merge an ***existing coordinate file*** into the current data file.

The difference between the **Import ➪Coordinates** *and the* **Import ➪Merge Coordinates** *routines is that* **Import ➪Merge Coordinates** *merges the points into the* ***CURRENT*** *job, and* **Import ➪Coordinates** *places the points into a* ***NEW*** *job.*

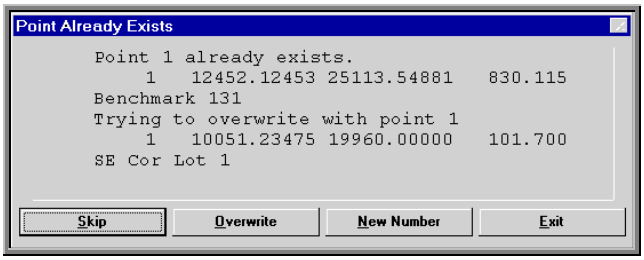
To **Import ➪Merge Coordinates**, press Alt F, I, M. The **Open** dialog box will appear. Following basic Windows procedures for

opening a file, select the coordinate file you wish to merge and click OK or Open. "Sight" Survey will display:



To preserve your existing points, click Yes, otherwise click No. Click Cancel to end this routine.

If you have activated the point overwrite protection, the **Point Already Exists** dialog box appears whenever an existing point is about to be overwritten.



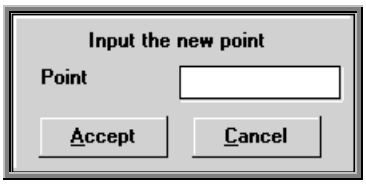
To **skip** the point press Alt S or click Skip. The incoming point will not be merged into the file.

To **overwrite** the old point with the point from the merging file press Alt O or click Overwrite.

To **assign a new point number** to the point from the merging file press Alt N or click New Number.

To **exit** this routine at any time press Alt E or click Exit.

If you choose to **assign a new point number** to the point from the merging file, enter a point number into the **New Point** dialog box and click Accept or press Alt A.



When you have finished the merging operation, you will find that "Sight" Survey produced a report in the **Text Output** window. An example report is shown below:

Merging with coordinates from D:\SIGHTSRV\OAKWOODS.ZAK
Skipping point 1
Renumbering point 2 with 60
Overwriting point 4

The report tells you which points were skipped, renumbered, and overwritten. Any point number not specifically placed into the report was merged without incident.

É *If you merge files using* **Point Overwrite Protection**, *and you choose to* **Overwrite**, **Skip**, *or enter a* **New Number** *for any of the incoming points: If those points are referenced in any* ***defined figures****, you must be aware that your figures may now be incorrect. When points are overwritten, renumbered, or skipped, a list is sent to the* **Text Output** *window. We recommend checking this list for point numbers referenced in your defined figures.*

Defined Figures

When importing coordinate files from ***Survey 3.0*** and ***Survey 4.0***, both of these routines will convert the **defined figures (`.FIG`)** file into "Sight" Survey, provided that a `.FIG` file exists for the file that is being imported. If an incoming defined figure contains the letters `R` (for acute curve) or `O` (for obtuse curve), they will be changed to the `<` and `>` symbols, respectively, so that they will not be interpreted as alphanumeric point numbers. When merging files, if an incoming coordinate file has a figure name that exactly matches a figure name in the existing file, the incoming figure name will have the prefix "`Imported:`" attached to it. For example, `Lot One` would become `Imported: Lot One`. (If

the prefix causes the figure name to become longer than 65 characters, the name will be truncated.)

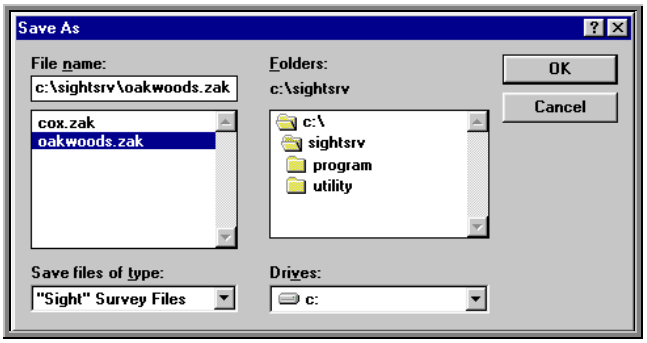
É *If you merge files using* **Point Overwrite Protection**, *and you choose to* **Overwrite**, **Skip**, *or enter a* **New Number** *for any of the incoming points: If those points are referenced in any* ***defined figures***, *you must be aware that your figures may now be incorrect. When points are overwritten, skipped, or renumbered, a list is sent to the* **Text Output** *window. We recommend checking this list for point numbers referenced in your defined figures.*

6.13 Export Coordinates

FUNCTION: The **Export Coordinates** routine is used to export all the coordinates from an existing "Sight" Survey job to a different data file. The target file may be a third party format or a "Sight" Survey format.

To **Export Coordinates**, press Alt F, E, ↵Enter (or C).

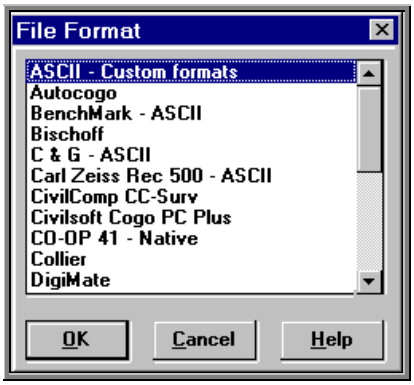
The **Save As** dialog box will open and allow you to enter the name of the target file.



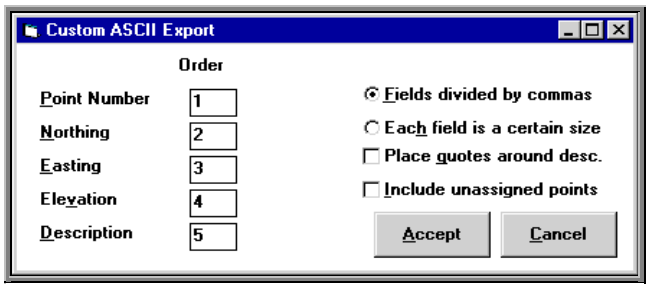
In the **Save file as type** box, you have three choices:

Select the file type to which you want to save. If you want to save to a file type other than a Simplicity file type, select **All files** and enter a filename extension other than or **.zak**. If you select a file type other than **"Sight" Survey** or **Survey 4**, the **File Format** dialog box will appear, and you must choose the export file type. If the format you need is not directly supported by "Sight" Survey, you can probably export it using the **ASCII - Custom Formats** option.

If you do not specify an extension, "Sight" Survey adds a default extension of ".CRD" to the end of your filename. If you don't want an extension on the filename, append a "." to the end of the file name. For example: Entering "Oakwoods" will give a file name of Oakwoods.crd, while entering "Oakwoods." will give a file name of Oakwoods.



If you choose to use an **ASCII Custom Format**, the **Custom ASCII Export** dialog box appears. When it first appears, the option button **Fields divided by commas** is marked as active, and the **Field Size** column of text entry boxes is not present. (Field size is only relevant when fields are structured in length and not separated by commas. If this matches your situation, click on the option button designated **Each field is a certain size**.) First set the field order, the order in which the data fields are placed into the file. Then type in values (number of characters) for the field sizes, if necessary.

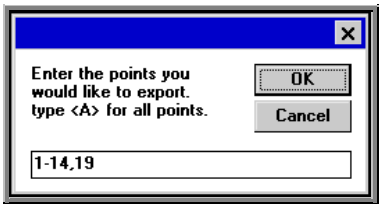


The **Custom ASCII Export** routine also allows you to specify the number of digits printed after the decimal, as well as the total size of the field. To create a field that is 10 characters wide and has 3 characters displayed after the decimal simply enter **10.3** in the field width dialog box.

If you need to place quotes around the point description, click the **Place quotes around desc.** checkbox to enable it. If you have also enabled the option designating **Each field is a certain size**, be sure to include the two quotes as part of the **Description** length.

To include all unassigned point numbers in the exported file, even those points which have zero coordinate values for their Northing, Easting, and elevation, click the **Include unassigned points** checkbox to enable it. For example, let's assume you have coordinates assigned for points 1, 2, 5, and 10. If you enable this checkbox, your ASCII file will contain TEN points, numbered 1 through 10; if you do not enable this checkbox, your file will contain only the FOUR points 1, 2, 5, and 10.

When you have completed the dialog box, click Accept. You must now specify the points you wish to export into the new file.

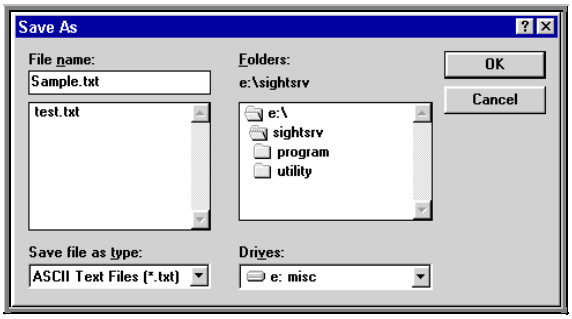


Specify the point string or press A for all points. When you click OK, the routine will run to its completion.

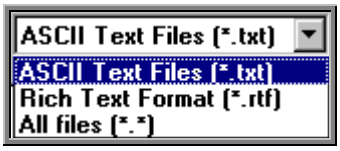
6.14 Export Text

FUNCTION: The **Export Text** routine is used to export the contents of the **Text Output** window to a different file.

To **Export Text**, press Alt F, E, T. The **Save As** dialog box opens to allow you to enter the name and location of the target file.



In the **Save files of type** box, you have three choices:



To preserve formatting information use the **.rtf** extension. When you click OK, the routine will run to its completion.

6.15 Copy Job

FUNCTION: The **Copy Job** routine is used to copy a "Sight" Survey job (including all associated files) to a different location on your hard disk, or to a floppy disk. Essentially this routine utilizes the **Open** routine to retrieve the subject job's file name, and the **Save Job As** routine to save the job to its new location.

To access **Copy Job**, press Alt F, J. The **Open** dialog box will open and allow you to enter the name of the job you want to copy. Follow general Windows procedures for opening a file.

When you click OK, the **Save As** dialog box will open and allow you to enter the new name and location for the job. Follow general Windows procedures for saving a file.

When you click OK, the **Copy Job** routine will copy (and optionally rename) the job to its new location.

If you are running an existing job and you need to use the **Copy Job** *routine, you do not need to close your currently running job.* **Copy Job** *does not affect your current job in any way. However, if you want to copy the current job you will have to close the job before copying it.*

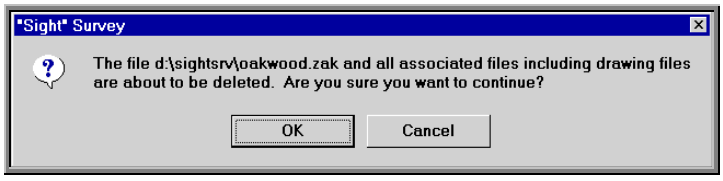
6.16 Delete Job

FUNCTION: The **Delete Job** routine is used to erase a "Sight" Survey job (and all associated files) from your disk. This routine utilizes the **Open** routine to retrieve the file name of the job to be deleted.

To access **Delete Job**, press Alt F, D.

The **Open** dialog box will open and allow you to enter the name of the job you want to delete.

When you click OK, a dialog box will open to ask for confirmation of your intent



When you click OK, the specified job will be erased.

If you are running an existing job and you need to use the **Delete Job** *routine, you do not need to close your currently running job.* **Delete Job** *does not affect your current job in any way.* ***You cannot delete the current job.***

6.17 Last Used Job List

FUNCTION: The **Last Used Job List** contains names of the last four jobs you have work on. You may use this list for fast loading of any job shown.

To activate a job using this list, simply press Alt F, 1 (2, 3 or 4) where the number corresponds to the job you want to open, or click on the filename with your mouse.

6.18 Exit (SY)

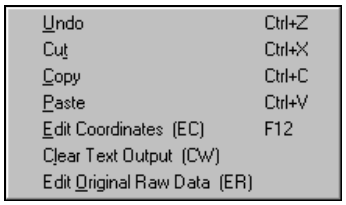
FUNCTION: The **Exit** function closes all files and exits the "Sight" Survey program.

To **Exit** "Sight" Survey, type **SY** (or **QU** to **QU**it), or press Alt F, X (or Alt F4), or click the **Exit** icon ( )on the **Main** toolbar.

You will be given the opportunity to save any unsaved data before "Sight" Survey closes all job files and discontinues operations.

"Sight" Survey 3.0

Section 7
The EDIT Menu



The **Edit** menu contains options for modifying work that you have already done. Here you will find commands that will allow you to change the values of current coordinates, undo changes that were made in error, and Transfer information between "Sight" Survey and other Windows programs.

All commands are discussed in the order in which they appear on the menu. You can access menu routines by using your mouse on the pull-down menu. Therefore, this selection method will not be mentioned in each routine's discussion. Keyboard shortcuts to each routine will be noted.

Section 7

*The **Cut**, **Copy**, and **Paste** items deal with the **Windows clipboard**. The Windows clipboard is a temporary storage location for information you cut or copy. Information in the clipboard remains there until you either copy another piece of information to the clipboard, or until you exit Windows.*

7.01 Undo Ctrl Z

FUNCTION: The **Undo** function is used to remove an error that was entered.

Activate the **Undo** function by pressing Ctrl Z or Alt E, U.

Undo will undo multiple layers of changes to the **Drawing** Window, or to the **Text Output** window, however it's "Undo-ability" is limited to these types of things. It cannot, for example undo a traverse adjustment.

When the **Drawing** window is active, **Undo** operates on drawing elements. When the **Text Output** is active, **Undo** operates on text elements within the **Text Output** window.

7.02 Cut Ctrl X

FUNCTION: The **Cut** function is used to move selected objects to the Windows clipboard. When an object is cut, it is removed from the active window and placed in the clipboard.

Activate the **Cut** function by pressing Ctrl X or Alt E, T.

***Cut** is a drawing command which has been included on this menu as a convenience. The instructions are contained in* **Section 23.03** *in the* **Drawing Window Reference Manual**.

7.03 Copy Ctrl C

FUNCTION: The **Copy** function is used to copy selected objects to the Windows clipboard. When an object is copied, it remains in the active window and a copy of it is placed in the clipboard.

Activate the **Copy** function by pressing Ctrl C or Alt E, C.

***Copy** is a drawing command which has been included on this menu as a convenience. The instructions are contained in* **Section 23.04** *in the* **Drawing Window Reference Manual**.

7.04 Paste Ctrl V

FUNCTION: The **Paste** function is used to place into the active window a copy of the object in the Windows clipboard. When an object is pasted from the clipboard, a copy of it still remains in the clipboard.

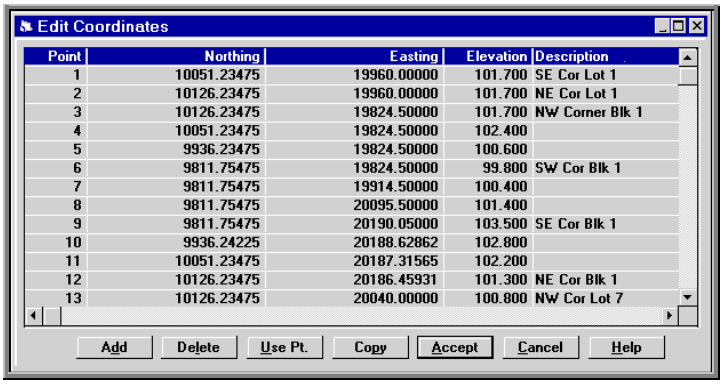
Activate the **Paste** function by pressing Ctrl V or Alt E, P.

☞ **Paste** *is a drawing command which has been included on this menu as a convenience. The instructions are contained in* **Section 23.05** *in the* **Drawing Window Reference Manual**.

7.05 Edit Coordinates (EC) F12

FUNCTION: The **Edit Coordinates** function is used to display and modify all aspects of the points in the current file.

Activate the **Edit Coordinates** function by pressing F12 or Alt E, E, or by typing **EC** at any data entry prompt. "Sight" Survey will display a listing of all points in the current file, as well as the points Northing, Easting, Elevation, and Description. "Sight" Survey will also display the point's Station, if stationing is in use.



Any aspect of a point can be changed from this window. Simply select the point you would like to change, then click on the property with the mouse to enter the edit mode, or just start typing to overwrite the current property.

A point can be added by clicking on the Add button. After selecting Add you will be prompted with the **Enter & Assign** pop-up window (see page 231).

To **edit** point numbers, descriptions, coordinates, stations, or elevations, click your mouse on the field you want to edit, pause a moment, then click again. Make your editing changes and press ↵Enter.

You can select multiple points by moving the cursor to the far left of the point name column. When the mouse changes into a check mark (✓), click on the point name that you would like to select or delete.

After selecting points you may:

- Delete the selected points by clicking on the Delete button.
- Click the Copy button to copy the points to the clipboard. From there they may be pasted into any windows program that supports the clipboard. For example, you could bring the points into your word processor, or you could bring them into a spreadsheet for further manipulation.
- Click on the Accept button to close the **Edit Coordinates** window and print the name of the selected point into the last used text box. This allows you to easily retrieve a point name to be used in a calculation such as a distance - distance intersection.

7.06 Clear Text Output (CW)

FUNCTION: The **Clear Text Output** function is used to erase the **Text Output** window.

Activate the **Clear Text Output** function by pressing Alt E, L, or by typing **CW** at any data entry prompt.

Clearing the **Text Output** window permanently deletes all text currently in the window. Unless you have saved your work, there will be no way to recover this data. ***Use this routine with caution.***

7.07 Edit Original Raw Data (ER)

FUNCTION: The **Edit Original Raw Data** function is used to correct errors in initial data entry.

Activate the **Edit Original Raw Data** function by pressing Alt E, O, or by typing **ER** at any data entry prompt.

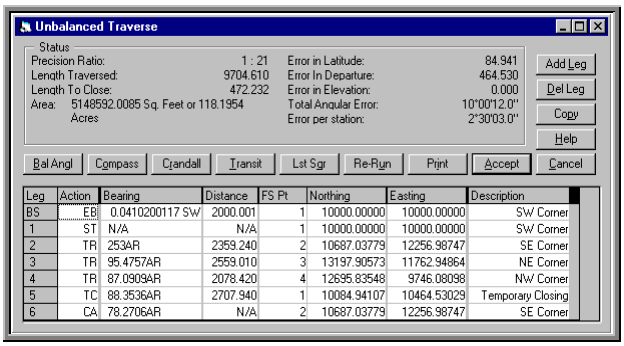
Despite using the utmost care in gathering and entering data, it is inevitable that mistakes will be made. "Sight" Survey contains features and routines to help you easily correct errors.

?

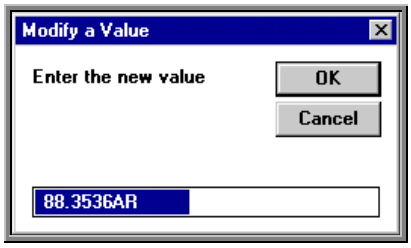
Raw data files are not saved between sessions. You must correct your raw data during the session in which it was entered into "Sight" Survey.

The data correction procedure incorporates the use of the **Unbalanced Traverse** window which allows you to easily review and edit your traverse data.

To illustrate the use of this window, suppose we see a problem in the **Bearing** column for **LEG 4**. The angle you entered as **88.3536** should have been **98.3536**. Double-click your mouse on the bad angle entry which reads **88.3536 AR**.



"Sight" Survey will present a pop-up editing box for you to make the changes.



Press Home, then Delete, and then 9 to change the line to read **98.3536 AR**, then press ↵Enter or click OK. Select Re-Run with your mouse or press Alt U to accept the change and re-run the traverse using the corrected angle entry.

In a similar manner, you can change the **Action** (routine code), **Point Number**, **Coordinates**, **Slope Reduction Data**, and **Description** fields of any point.

After computing new coordinates based on the traverse changes, "Sight" Survey will display a **Modified Traverse** window showing the new traverse statistics and raw traverse data.

Adding a Leg

To add a leg, position your mouse cursor at the insertion point and click. For example, it you want to insert a leg between leg **2** and **3**, click your cursor on leg **3**. Now click Add Leg. Click Yes when you are asked to confirm your action. The highlighted leg is re-produced as a new leg. In other words, you now have two leg **3** entries. Don't worry about the leg numbers, they will be corrected

automatically when you **Re-Run** the traverse. However, you do need to correct the data in the first leg **3**, cell by cell.

Deleting a Leg

To delete a leg, position your mouse cursor on the target leg and click. For example, it you want to delete leg **2**, click your cursor on leg **2**. Now click [Del Leg]. Click [Yes] when you are asked to confirm your action. The highlighted leg is deleted and your leg numbers now read **1**, **3**, etc. Don't worry about the leg numbers, they will be corrected automatically when you **Re-Run** the traverse.

Copy to the Clipboard

To copy a leg's data to the Windows clipboard, position your mouse cursor on the target leg and click. For example, if you want to copy the information for leg **2**, click your cursor on leg **2**. Now click [Copy].

Resizing the Grid

Depending upon your screen resolution, you may want to resize the columns in the data grid. You can accomplish this by using your mouse to drag the column borders to new locations. For example, to move the right-side border of the **DISTANCE** column about two digits to the left, place your mouse cursor in the column headings on the line between **DISTANCE** and **POINT**. Your cursor will appear as a double-headed arrow (↔). Click and hold your mouse while dragging it to the left. A dotted line will appear to mark the changing position of the column border. When you are satisfied with the new location, release the mouse button.

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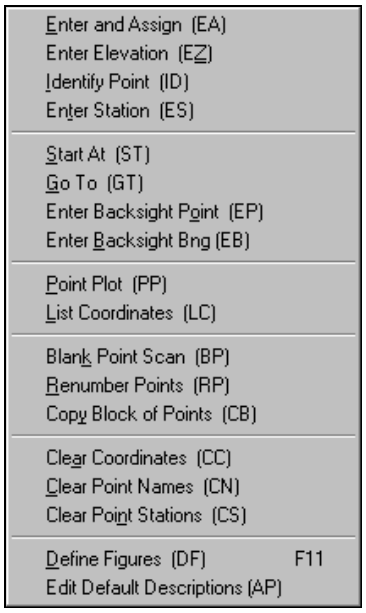
"Sight" Survey 3.0

Section 8
The POINTS Menu



The **Points** menu contains commands that generally deal only with an individual point and not with that point's relationship to other points. Here you will find commands to change aspects of a point, such as the point's coordinates or station, as well as commands to change information about the currently held position.

Section 8

8.01 Enter and Assign (EA)

FUNCTION: The **Enter and Assign** routine is used to assign Northing, Easting, and elevation coordinates to a point, or to edit coordinates of an existing point. Point descriptions may also be added or changed using this function.

Activate the **Enter and Assign** routine by pressing Alt P, E, or by typing **EA** at any data entry prompt.

To enter a point and assign coordinates to it, simply complete the data entry window.

Point # Type the number of the point and press ↵Enter.

Northing *Type* the Northing *coordinate* for this point and press ↵Enter.

Easting *Type* the Easting *coordinate* for this point and press ↵Enter.

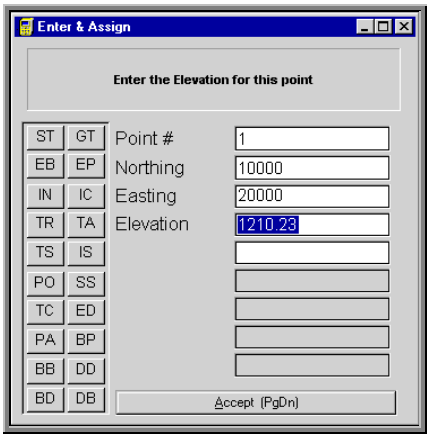
Elevation *Type* the elevation for this point and press ↵Enter.

Upon the conclusion of the data entry for each point, click the Accept (PgDn) button or simply press Page Dn. "Sight" Survey will display the point number, ID, and its Northing, Easting and elevation in the **Text Output** window (if it is active). You will be returned to the **Enter & Assign Point #** prompt.

8.02 Enter Elevation (EZ)

FUNCTION: The **Enter Elevation** routine is used to assign (or change) an elevation to an existing point.

Activate the **Enter Elevation** routine by pressing Alt P, Z, or by typing **EZ** at any data entry prompt.



Point # Type the number of the point you wish to assign an elevation to and press ↵Enter. If the point exists, the **Elevation** field will contain

a blinking cursor (or it will be highlighted), waiting for you to type in a new value. However, if the point has not been previously assigned coordinates, the entry field for the **Northing** will be the highlighted field, and you may treat the data entry as though you were in the **Enter & Assign** routine

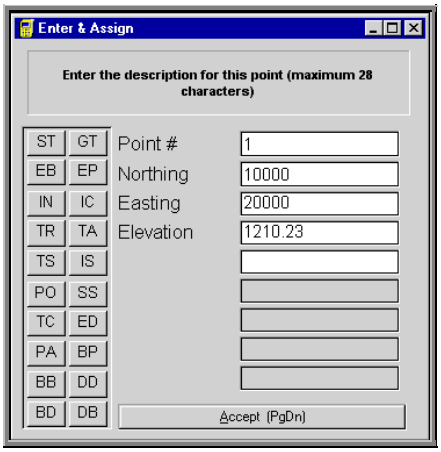
Elevation

Type the elevation for this point and press ↵Enter. "Sight" Survey will display the point number, ID, and its Northing, Easting and elevation in the **Text Output** window (if it is active). You will be returned to the **Enter & Assign Point #** prompt.

8.03 Identify Point (ID)

FUNCTION: The **Identify Point** routine is used to add or change an identifying name on a previously assigned point.

Activate the **Identify Point** routine by pressing Alt P, I, or by typing **ID** at any data entry prompt.



To enter or change the elevation at a point and assign coordinates to it, simply complete the data entry window.

Point #

Type the number of the point you wish to assign a description to and press Enter.

If the point has not been previously assigned coordinates, the entry field for the Northing will be the highlighted field, and you may treat the data entry as though you were in the **Enter & Assign** routine.

Description

If the point exists, the **Description** dialog box will appear, awaiting your description entry.

8.04 Enter Station (ES)

FUNCTION: The **Enter Station** routine is used to change stationing information on a previously assigned point.

Activate the **Enter Station** routine by pressing Alt P, T, or by typing **ES** at any data entry prompt. If you are not currently occupying a point, you will be prompted for a point number. The **Enter Station** dialog box will appear, showing the occupied point number.

Station

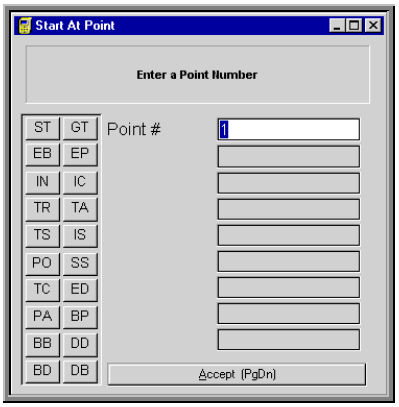
Type the number of the point you wish to assign a station to and press Enter or click Accept. Type the station designation using the stationing format as shown in the prompt. You may change the stationing format using the **Config** ➪ **General Configuration Menu**.

When you accept your data entry, "Sight" Survey will display the point number, station, and its Northing, Easting and elevation in the **Text Output** window (if it is active).

8.05 Start At (ST)

FUNCTION: The **Start At** routine is used to introduce a new currently occupied point into the COGO routines. This routine should be used before inversing for area calculation to clear the **Area Sum** and **Traverse Length** accumulators.

Activate the **Start At** routine by pressing Alt P, S, or by typing **ST** at any data entry prompt. The **Data Entry** window will display:



Point #

Type the number of the point you start at and press Enter or click the **Accept (PgDn)** button.

If the point has not yet been assigned coordinates, the program will request them. Follow the **Enter and Assign** procedure to assign coordinates and a description to the point.

"Sight" Survey will display the word **START** followed by the point number, ID, Northing, Easting and elevation in the **Text Output** window (if it is active).

1. *This routine is the only routine that clears the **Area Sum** and **Traverse Length** accumulators.*
2. *You must use this routine when you begin a new traverse that you intend to balance.*

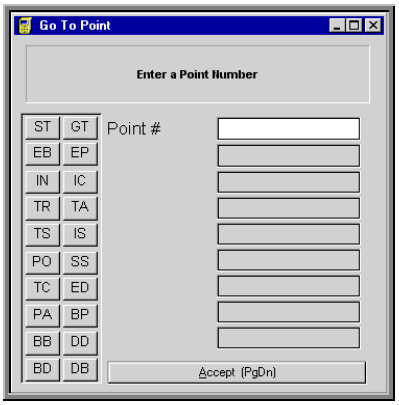
?

DO NOT *use the* **Start At** *routine in the middle of an area calculation or your area will be cleared. Use the* **Go To** *routine instead.*

8.06 Go To (GT)

FUNCTION: The **Go To** routine is used to introduce a new currently occupied point into the COGO routines without clearing the **Area Sum** and **Traverse Length** accumulators.

Activate the **Go To** routine by pressing Alt P, G, or by typing **GT** at any data entry prompt. The **Data Entry** window will display the **Go To Point** prompt.



Point #

Type the number of the point you start at and press Enter or click the **Accept (PgDn)** button.

If the point has not yet been assigned coordinates, the program will request them. Follow the **Enter and Assign** procedure to assign coordinates and a description to the point.

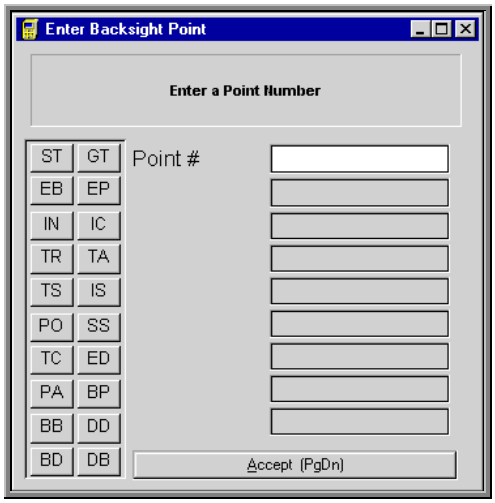
"Sight" Survey will display the word **GO TO** followed by the point number, ID, Northing, Easting and elevation. You will regain control at the **Traverse** routine.

1. *This routine **DOES NOT** clear the **Area Sum** and **Traverse Length** accumulators.*
2. *The **Go To** routine should only be used before the running of a routine that does not increment the **Area Sum** and **Traverse Length** accumulators.*

8.07 Enter Backsight Point (EP)

FUNCTION: The **Enter Backsight Point** routine is used to change the backsight point.

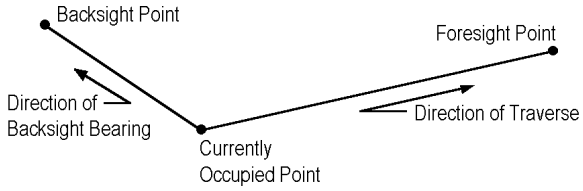
Activate the **Enter Backsight Point** routine by pressing Alt P, O, or by typing **EP**. The **Data Entry** window prompts:



Point #

Type the number of the point you want to become your new backsight point and press Enter or click the **Accept (PgDn)** button.

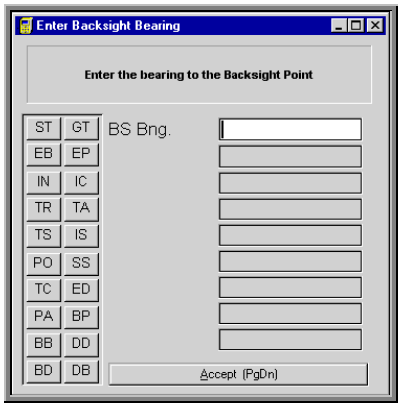
1. *This routine **DOES NOT** clear the **Area Sum** and **Traverse Length** accumulators.*
2. *The **Enter Backsight Point** routine should be used when you want to change the backsight bearing without having to Inverse from the backsight point to the currently occupied point.*



8.08 Enter Backsight Bearing (EB)

FUNCTION: The **Enter Backsight Bearing** routine is used to change the value of the reference bearing.

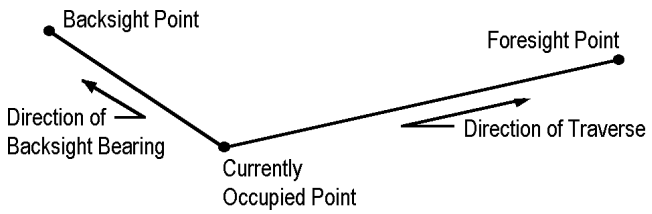
Activate the **Enter Backsight Bearing** routine by pressing Alt P, B, or by typing **EB** at any data entry prompt. The **Data Entry** window prompts:



BS Bng.

Type the bearing, angle, deflection or , or recall a bearing between any two points in memory and press ↵Enter or click **Accept (PgDn)**. You will regain control at the **Traverse** routine.

1. *This routine **DOES NOT** clear the **Area Sum** and **Traverse Length** accumulators.*
2. *The **Enter Backsight Bearing** routine should be used when you want to change the backsight bearing without having to inverse from the backsight point to the currently occupied point. The backsight bearing must be entered such that the bearing proceeds from the currently occupied point to the backsight point.*



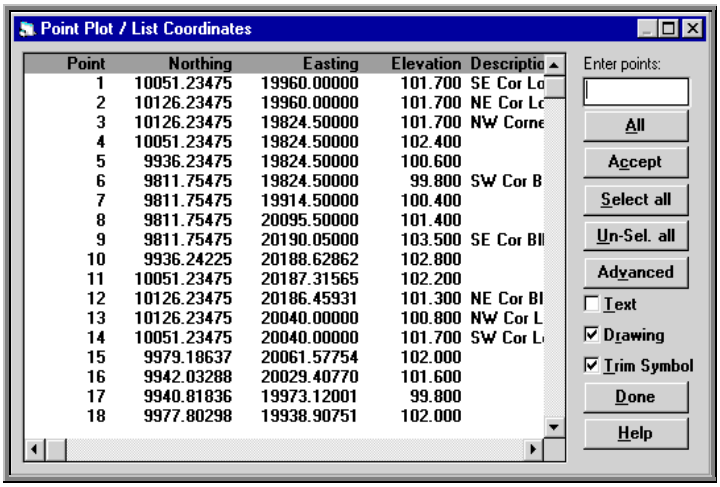
8.09 Point Plot (PP)

FUNCTION: The **Point Plot** routine is used to plot a listing of points which have been assigned coordinates.

Activate the **Point Plot** routine by pressing Alt P, P, or by typing **PP** at any data entry prompt. The **Point Plot/List Coordinates** point selection window appears.

From this window you can add a list of coordinates to the **Text Output** window or plot points in the **Drawing** window. You may list and/or plot all of the points, a single point, or anything in between. You can also use the **Text** and **Drawing** check boxes to output to the **Text Output** window, the **Drawing** window, or both.

When the **Point Plot / List Coordinates** window first opens, the cursor is located in a text entry box in the upper right portion of the window, above the [All] button.



To select a sequential and/or comma delimited list of points

Type in your list here and click on the button. Your list can include individual points and point ranges. For example, the entry: `1-10,15,18,31-50` will list points 1 through 10, point 15, point 18, and points 31 through 50.

To select all of the points

Click on the [All] button and then on the button, or press A Enter.

To select a random group of points

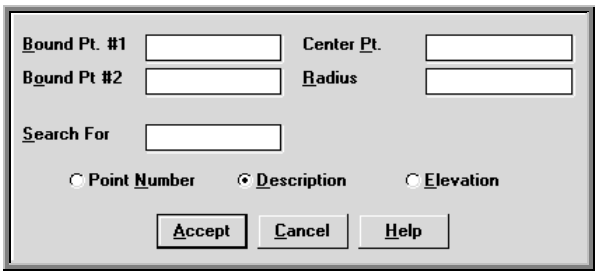
Click on each point you want to include. To clear an individual point selection, click on the selected point.

To clear all point selections

Click on the [Un-Sel. all] button.

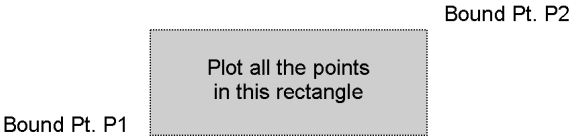
Advanced Point Selection

You can also list and/or plot special point sets. Click on the [Advanced] button on the **Point Plot / List Coordinates** window to open the **Advanced Point Selection** window.



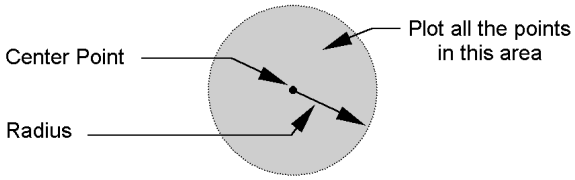
Range Bounded by a Rectangle

From this window you can list and/or plot **a range of points bounded by a rectangle** defined by two corner points: **Bound Pt. #1**; and **Bound Pt. #2**. Type in each point number and click on the button.



Range Within a Radius of a Point

If you want to list and/or plot all the points within a certain radius of a particular point, specify the point and radius in the **Center Pt.** and **Radius** entry box. Then click on the button.



Range Matching a Search Field

You can also list and/or plot all the points matching a particular search field. Enter the selection criteria in the **Search for** entry box and click on the option button matching the type of data you are searching for. Then click on the Accept button.

Text

The **Text** check box lets you choose whether or not you want to list the coordinate points in the **Text Output** window. By default, this box will be checked when you have activated the **Point Plot / List Coordinates** window by using the **List Coordinates** routine. If you do not wish to list the coordinate points in the **Text Output** window,

disable the listing by clicking on the check box to remove the ✓ or **X** *before you place any points using this routine.*

Drawing

The **Drawing** check box lets you choose whether or not you want to plot the coordinate points in the **Drawing** window. By default, this box will be checked when you have activated the **Point Plot / List Coordinates** window by using the **Plot Points** routine. If you do not wish to plot the coordinate points in the **Drawing** window, disable the listing by clicking on the check box to remove the ✓ or **X** *before you place any points using this routine.*

Trim Symbol

Trim Symbol lets you choose whether or not you want to trim under symbols when they are placed using the **Point Plot** routine. When the **Point Plot / List Coordinates** window first opens, the **Trim Symbol** check box is enabled. If you do not wish to trim under the symbols, disable the trimming by clicking on the check box to remove the ✓ or **X** *before you place any points using this routine.*

Done

To plot and/or list the points you have selected, click on the Done button.

8.10 List Coordinates (LC)

FUNCTION: The **List Coordinates** routine is used to display a listing of points which have been assigned coordinates.

Activate the **List Coordinates** routine by pressing Alt P, L, or by typing **LC** at any data entry prompt.

The **List Coordinates** routine functions exactly like the **Point Plot** routine. Please refer to the instructions for the **Point Plot** routine described in **Section 8.09**.

8.11 Blank Point Scan (BP)

FUNCTION: The **Blank Point Scan** routine reads through the data file and reports all unused point numbers.

Activate the **Blank Point Scan** routine by pressing Alt P, K, or by typing **BP** at any data entry prompt.

"Sight" Survey will report all unused point numbers found. Reported points are presented in a linear fashion, not in a column. Where applicable, points will be reported in ranges consisting of a beginning point, a dash to indicate a range of points, and an ending point. Ranges presented in this manner are all inclusive, that is the beginning and ending points specified have also been found to be blank. A typical report may look something like: **12, 15, 57-155, 175-5000**

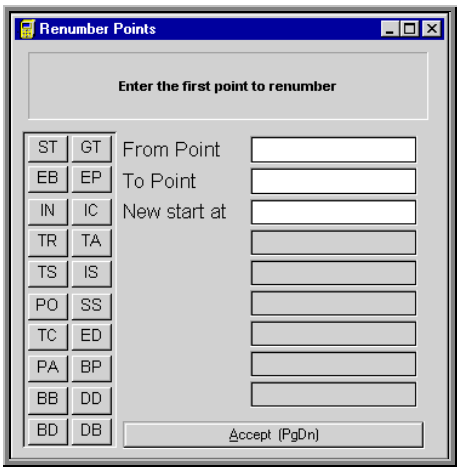
8.12 Renumber Points (RP)

FUNCTION: The **Renumber Points** routine is used to relocate a block of points from their current numerical basis to some other numerical basis. The original point numbers are cleared.

Activate the **Renumber Points** routine by pressing Alt P, R, or by typing **RP** at any data entry prompt.

After you are given an option to save your work, "Sight" Survey automatically performs a **Blank Point Scan** (listing the results in the **Text Output** window). This listing is provided as a guide for use in determining the target range for point relocation.

The **Data Entry** window displays the **Renumber Points** prompts.



From Point

Enter the number marking the start of the point range you wish to renumber and press and press ↵Enter.

To Point

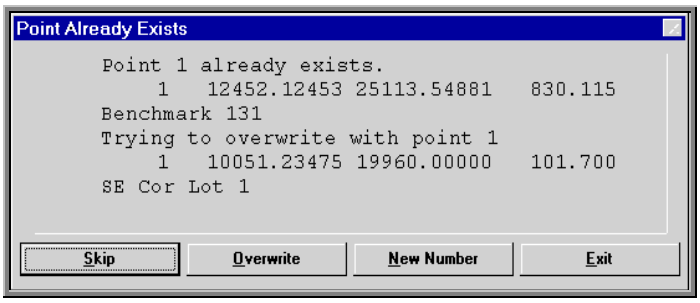
Enter the number marking the end of the point range you wish to renumber and press ↵Enter, or just press ↵Enter if you want to renumber only a single point.

New Start At

Enter the new starting point number and press ↵Enter. It is this value that marks the beginning of the **targeted range**. The targeted range extends from this point to a point number equal to the value of this point plus the difference between the starting and ending points previously entered.

Do you want Point Overwrite protection?

If your **Point Overwrite** protection is disabled, you are given an opportunity to reinstate it. Overwrite protection guards against the accidental erasure of point data as "Sight" Survey renumbers points and it is strongly suggested. Answer by pressing Y or N. At this time, "Sight" Survey will begin renumbering the given point(s).



If you are using overwrite protection, you may from time to time see a request for instructions on how to handle a point overwrite situation. The point numbers are given in the prompt, along with each point's coordinates and name, if available. You may also exit the renumbering process at this prompt, but be aware that any points accessed before this message have been renumbered.

From Point

At the conclusion of the renumber routine, you are returned to the initial **Start at** prompt. If you do not want to continue this routine, type the next routine code, or select the routine from the pull-down menus.

É *This routine may overwrite points that lie within the target range.* ***Use this routine with caution!***

8.13 Copy Block of Points (CB)

FUNCTION: The **Copy Block of Points** routine is used to copy a block of points from their current numerical basis to some other numerical basis, while not erasing original points.

Activate the **Copy Block of Points** routine by pressing Alt P, Y, or by typing **CB** at any data entry prompt. After you are given an option to save your work, "Sight" Survey automatically performs a **Blank Point Scan** (listing the results in the **Text Output** window). This listing is provided as a guide for use in determining the target range for point reproduction.

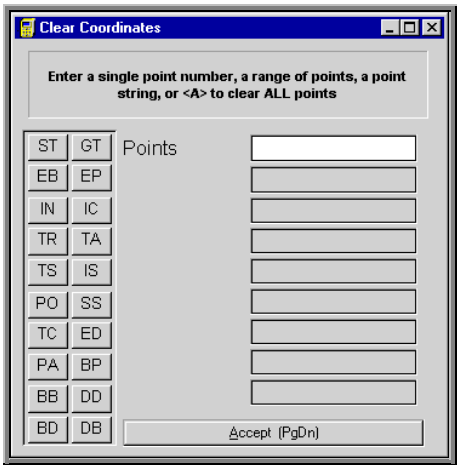
The **Copy Block of Points** routine works identically to the **Renumber Points** routine except that the original points are not erased. Please refer to the **Renumber Points** instructions in **Section 8.12**.

8.14 Clear Coordinates (CC)

FUNCTION: The **Clear Coordinates** routine is used to erase all coordinate point data from a point or range of points.

Activate the **Clear Coordinates** routine by pressing Alt P, A, or by typing `CC` at any data entry prompt.

After you are given an option to save your work, "Sight" Survey's **Data Entry** window displays the **Clear Coordinates** prompt.



Points

Enter any of the following:

1. A single point number, such as `5` Enter;
2. A comma delimited string of points, such as `3,5,7` Enter;
3. A range of points separated by a dash, such as `3-17` Enter;
4. A combination of methods 2 & 3, such as `1,3-7,9` Enter;

5. Press A Enter to clear **ALL** of your data points.

The coordinates and point names will be cleared from each point in the specified range including the starting and ending points.

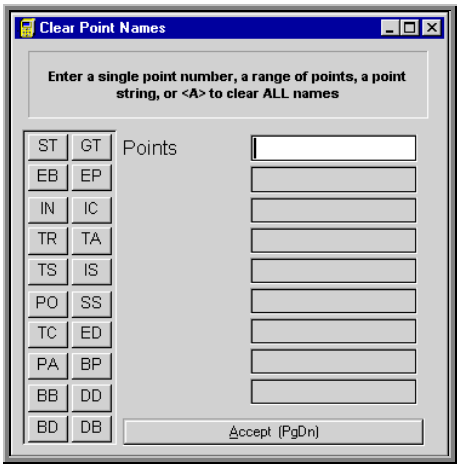
The clearing routine is bi-directional. You may clear from a lower point number to a higher point number or vice versa.

8.15 Clear Point Names (CN)

FUNCTION: The **Clear Point Names** routine is used to erase point names from a point or range of points.

Activate the **Clear Point Names** routine by pressing Alt P, C, or by typing **CN** at any data entry prompt.

After you are given an option to save your work, "Sight" Survey's **Data Entry** window displays the **Clear Point Names** prompt.



Points

Enter any of the following:

1. A single point number, such as **5** Enter;
2. A comma delimited string of points, such as **3,5,7** Enter;

3. A range of points separated by a dash, such as `3-17` Enter;
4. A combination of methods 2 & 3, such as `1,3-7,9` Enter;
5. Press A Enter to clear **`ALL`** of your data points.

The point names will be cleared from each point in the specified range including the starting and ending points.

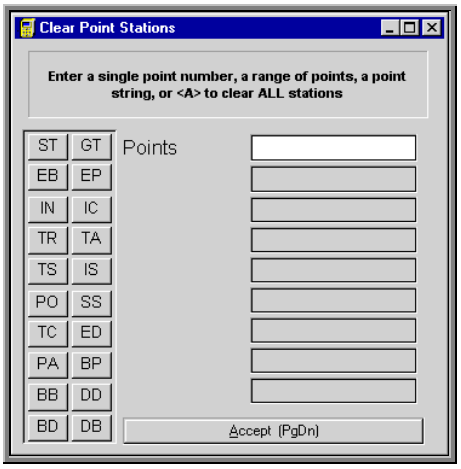
The clearing routine is bi-directional. You may clear from a lower point number to a higher point number or vice versa.

8.16 Clear Point Stations (CS)

FUNCTION: The **Clear Point Stations** routine is used to erase point stations from a point or range of points.

Activate the **Clear Point Stations** routine by pressing Alt P, N, or by typing **`CS`** at any data entry prompt.

After you are given an option to save your work, "Sight" Survey's **Data Entry** window displays the **Clear Point Stations** prompt.



Points

Enter any of the following:

1. A single point number, such as `5` ↵Enter;
2. A comma delimited string of points, such as `3,5,7` ↵Enter;
3. A range of points separated by a dash, such as `3-17` ↵Enter;
4. A combination of methods 2 & 3, such as `1,3-7,9` ↵Enter;
5. Press A ↵Enter to clear **`ALL`** of your data points.

The stations will be cleared from each point in the specified range including the starting and ending points.

The clearing routine is bi-directional. You may clear from a lower point number to a higher point number or vice versa.

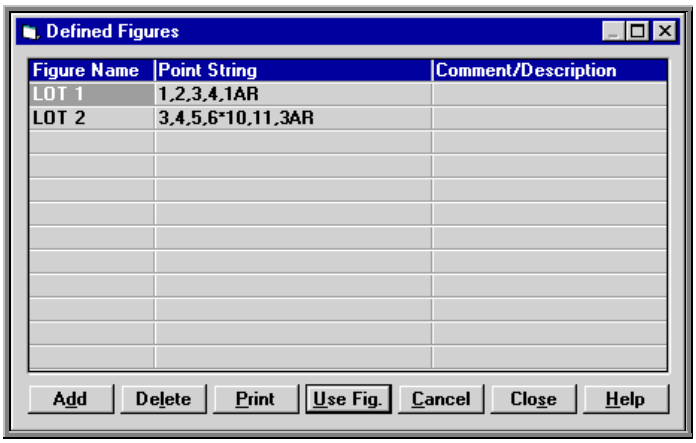
8.17 Define Figures (DF) F11

FUNCTION: The **Defined Figures** routine is used to group points to function as a single, named entity.

Activate the **Defined Figures** routine by any of the following methods:

- Type **`DF`**
- Press F11
- Press Alt P, D
- Click the **Define Figures** icon (FIG) on the **Main** toolbar.
- Click Defined Figures (DF) on the **Config**➪**COGO Configuration Menu**.

Selecting the **Defined Figures** routine will open the **Defined Figures** edit window. Using this window, you can add, edit, delete, and print groups of points known as defined figures. A **defined figure** is a list of random and/or sequential point numbers which you access as a single entity, thus saving you from having to enter the particular point string each time you want to access it.



The **Defined Figures** edit window will accommodate an unlimited number of figure entries, turning into a scrolling menu as needed. The figures are displayed in alphabetical order by **Figure Name**. Figures that are added to the end of the list are sorted into their correct alphabetical order the next time the routine is executed.

Unlike most other **Configuration** *items,* **Defined Figures** *must be set up for each job in which you want to use them.*

Adding Figures

To **add** an entry, click the Add button, or press Alt D. The **Figure Name** field in the first available row will be highlighted, awaiting your entry. A figure name can be any combination of letters, numbers and spaces, up to 65 characters in length. Type in a name for your figure and press Tab.

The **Point String** field becomes highlighted, awaiting your entry. Point strings can be any combination of letters, numbers and spaces, up to 125 characters in length. Type in the point string (no point descriptions are allowed) according to the rules and examples found below and press Tab.

A point string can include individual points and point ranges. Enter a point string by typing the point numbers separated by a comma, or a dash to indicate a range. For example, to define a

figure from point 1 to 2 to 7 to 9 to 10 to 11 to 12 to 13 and back to 1, enter the string: **1,2,7,9-13,1**
Curves may also be included in a point string by the addition of a center point identifier character immediately preceding the number of the curve's center (or radius) point. Use the characters ***** or **<** to mark the center point of an ***acute*** curve (delta less than 180° or 200 grads). Use the character **>** to mark the center point of an ***obtuse*** curve (delta angle greater than or equal to 180° or 200 grads). For example, to inverse from point 1 to 2 to 7 (a PC) and then around an obtuse curve whose center point is 8 to 9 (the PT) to 10 to 11 and back to 1, enter the string: **1,2,7>8,9-11,1**

Multiple consecutive curves, having the same center point, may be addressed individually, or in a range. For example, to inverse from point 1 through 7 (a PC) and then around four acute curves whose curve points are 10, 15, 16 and 17, and then on a line back to 1, enter the string in any one of the four following ways:

1-7*8-10*8,15*8,16*8,17,1 or
1-7*8,10*8,15*8-17,1 or
1-7<8-10<8,15<8,16<8,17,1 or
1-7<8,10<8,15<8-17,1

*Point ranges are not allowed when working with **alpha-numeric** point numbers. Each point number must be entered individually, separated by commas. For example:*

NECorL1,SECorL1,NWCorL2,NWCorL1

Defined figures can also call ***other*** defined figures, overcoming any potential limitation of the 125 character point string length. For example, suppose the figure ***BLOCK 1*** contains the points 1, 7, 9, 5*8, 6 and figure ***BLOCK 2*** contains additional points that you would like to append to ***BLOCK 1***. Simply define ***BLOCK 1*** as:
1,7,9,5*8,6,F:BLOCK 2

When figure ***BLOCK 1*** has been completed, figure ***BLOCK 2*** will be run automatically. Keep in mind though, that because figures can call other figures, it is possible to lock your computer into an endless loop. For example, ***BLOCK 1*** may call ***BLOCK 2*** which may call ***BLOCK 3*** which may call ***BLOCK 1***, and so on. Use care when calling other figures as to avoid lock-ups.

Another time saving feature allows you to place the code **AR** for **AR**ea after a defined figure point string, which sends the program to the Area routine to report the area enclosed by the figure. A comma should be placed ***after*** the last point number in the point string, and ***before*** the **AR** code. For example: **1-4,1,AR**

If you wish, you may use the **Comment** field to store additional information about the figure. This field can contain up to 255 characters and is provided strictly for your own information since it is not used anywhere else in "Sight" Survey. To add another figure, press Alt D or Tab Enter. To exit the routine, click Close or press Alt S.

RULES FOR DEFINED POINT STRINGS

1. Separate single points by a comma, for example: **1**,**3**,**5**,**7**
2. Separate a consecutive range of ***numeric*** point numbers by a dash, for example: **1-7**
3. Enter all ***alphanumeric*** point numbers individually and separate them by a comma, for example: **PT1**,**PT3**,**PC8**,**NCorL1**
4. Preface any radius points with an asterisk (*****) or less than size (**<**) for acute curves or a greater than sign (**>**) for obtuse curves, and use only the *****, **<**, or **>** to separate the PC and the radius point of a curve, for example **5*10**,**8** sets the acute curve from 5 through center point 10 to end point 8; and **5>10**,**8** sets the obtuse curve from 5 through center point 10 to end point 8. Don't place a comma after the 5.
5. Curve points may be entered in ranges, if desired, for example: **1-7*8,10*8,15*8-17,1** is the same as **1-7*8-10*8,15*8,16*8,17,1**.
6. **DO NOT** start your point string with a radius point (***** or **>**) designation.
7. Preface any referenced figures with an **F:** and do not add any points after the referenced figure.

Use care when entering your point string since the program will not attempt to screen your entry for illegal characters or unassigned points.

Deleting Figures

To select a figure to **delete**, move your mouse to the left of the **Figure Name** until the cursor becomes a check mark (✓). Click your mouse cursor (✓) on the figure(s) you want to delete and then click on the [Delete] button or press Alt L. If you delete a figure by accident, you can click [Cancel] to cancel all deletions and editing.

Printing Figures

To **print a listing** of all the defined figures in the current job, click your mouse on the [Print] button or press Alt P. When the **Print** dialog box appears, click [OK] to send the figure list to your printer and the **Text Output** window, or click [Cancel] to send the list only to the **Text Output** window.

Editing Figures

To **edit** the **Figure Name**, **Point String**, or **Comment** fields for any figure, click your mouse on the field you want to edit, pause a moment, then click again. If the field is longer than the display allows, the field will open and scroll downwards, allowing you to see the entire field. Make your editing changes and press ↵Enter. Click [Close] or press Alt S to exit the routine.

Using Figures in the COGO Routines

If the **Defined Figures** edit window is *not* open, press F11 or type **DF** or **F:** to open it. To move quickly through the edit window, press and hold Ctrl while typing the first letter of the desired **Figure Name**. The cursor will move to the first figure which begins with that letter. Use your mouse or the ↓ or ↑ keys to make your selection and then click the [Use Fig.] button or press Alt U. The **Point String** will automatically be placed into the current text box in the COGO window. (The *current text box* is the field where the **Defined Figures** routine was executed.) Modify the point string if desired, and press e to use the selected point string.

Within the **Point Plot** (**PP** - page 239) *and* **List Coordinates** (**LC** - page 242) *routines, you can only access* **Defined Figures** *by pressing* F11 .

Canceling Changes

To **cancel** all changes or deletions that you have made, click on the Cancel button or press Alt C. This will cancel ***everything*** that you have done since the **Defined Figures** edit window was last opened. If you made some changes that you wanted to keep, you will need to rerun the routine and make those changes again.

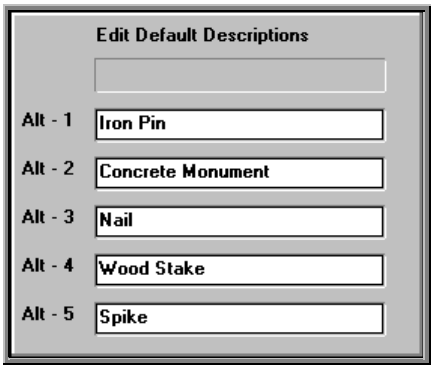
Exit & Save Changes

To **exit** this routine and **save** any changes that you have made, click on the Close button or press Alt S. If you closed the **Defined Figures** edit window by accident and had made changes that you did not wish to save, you can reload the job file (without saving) to get the figures back from the original file on disk. However, once you have saved the current COGO job file, the figure changes have also been saved.

8.18 Edit Default Descriptions (AP)

FUNCTION: The **Edit Default Descriptions** routine is used to enter and edit a list of alternate point name descriptions.

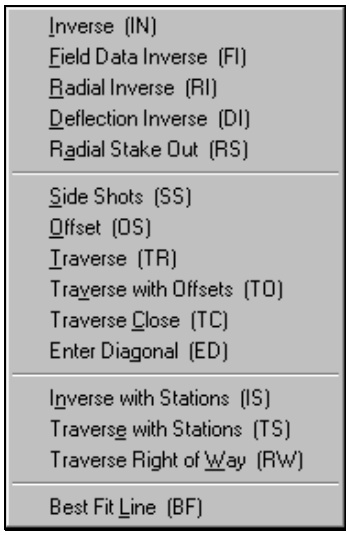
Activate the **Edit Default Descriptions** routine by typing **AP**.



Enter point descriptions into any of the alternate description fields. You can fill all the alternate fields while the dialog box is open by using your mouse or Tab to move between fields. Press Enter to quit and accept the changes, or press Esc to quit and discard the changes. All descriptions entered into the alternate description fields are retained between "Sight" Survey sessions.

"Sight" Survey 3.0

Section 9
The LINES Menu



The **Lines** menu contains functions that define one point's position, in relation to another point. Routines such as traverse and inverse are located here, as are several routines that deal with stations and offsets. The traverse closure and traverse adjustments routines are also accessed menu, as are the radial stakeout and radial inverse routines.

9.01 Inverse (IN)

FUNCTION: The **Inverse** routine is used to compute and report the bearing, horizontal distance and difference in elevation between any two points of known coordinates.

Access the **Inverse** routine by pressing Alt L, I, or by typing **IN** at any data input prompt.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

To Point

Enter an individual foresight point number. If the foresight point has not been assigned coordinates, the program will prompt for them and you must respond as you would to a standard coordinate entry request.

What Happens Next

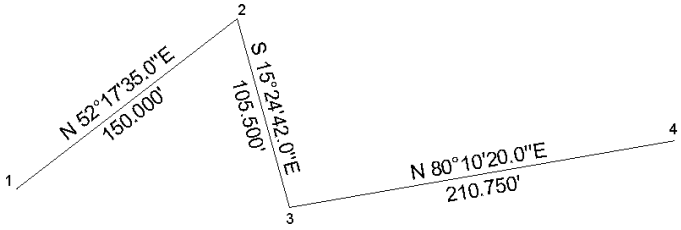
"Sight" Survey will respond to an accepted foresight point by printing the computed bearing and the horizontal and vertical distances from the currently occupied point to the foresight point, the foresight point number, ID, and its Northing, Easting and elevation. The foresight point becomes the currently occupied point and the reference bearing becomes the bearing just inversed.

To inverse from your point through a series of consecutive points, enter your **To Point** as the negative value of the last point number in

the series. For example, you are at point 3 and you want to inverse to 4, 5, 6, 7, 8, 9, and 10. In the **To Point** text box, type `-10` Enter. To inverse through all points in a consecutive manner, type `A` Enter.

Example

Enter & Assign points 1-4, then **Inverse** from point 1 to 2 to 3 to 4.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			10000.00000	20000.00000	0.000
2			10091.74344	20118.67241	0.000
3			9990.03708	20146.70929	0.000
4			10026.00941	20354.36659	0.000
Start					
1			10000.00000	20000.00000	0.000
IN	N 52°17'35.0" E	150.000			
2			10091.74344	20118.67241	0.000
IN	S 15°24'42.0" E	105.500			
3			9990.03708	20146.70929	0.000
IN	N 80°10'20.0" E	210.750			
4			10026.00941	20354.36659	0.000

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9.02 Field Data Inverse (FI)

FUNCTION: The **Field Data Inverse** routine is used to compute and report the field angle (as turned to the right from the previous backsight), horizontal distance and the difference in elevation between any two points of known coordinates.

Access the **Field Data Inverse** routine by pressing Alt L, F, or by typing `FI` at any data input prompt.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

To Point

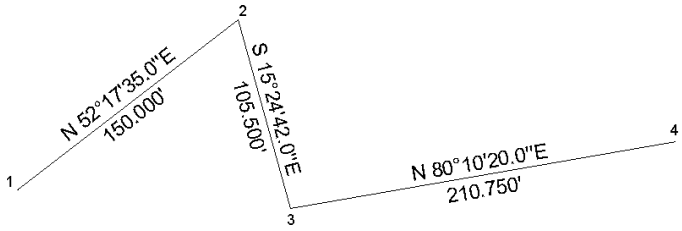
Enter an individual foresight point number. If the foresight point has not been assigned coordinates, the program will prompt for them. Respond as you would to a standard coordinate request.

What Happens Next

"Sight" Survey will respond to an accepted foresight point by printing the computed angle right and the horizontal and vertical distances from the currently occupied point to the foresight point, the foresight point number, ID, and its Northing, Easting and elevation. The foresight point becomes the currently occupied point and the reference bearing becomes the bearing just inversed.

Example

Enter & Assign points 1-4, then perform a **Field Data Inverse** from point 1 to 2 to 3 to 4.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			10000.00000	20000.00000	0.000
2			10091.74344	20118.67241	0.000
3			9990.03708	20146.70929	0.000
4			10026.00941	20354.36659	0.000
Start					
1			10000.00000	20000.00000	0.000
FI	152°07'15.0" AR	150.000			
2			10091.74344	20118.67241	0.000
FI	292°17'43.0" AR	105.500			
3			9990.03708	20146.70929	0.000
FI	95°35'02.0" AR	210.750			
4			10026.00941	20354.36659	0.000

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9.03 Radial Inverse (RI)

FUNCTION: The **Radial Inverse** routine is functionally similar to the **Inverse** routine except the ***Currently Occupied Point*** is held constant throughout the routine. This routine computes and reports the bearing, horizontal distance and the difference in elevation between the currently occupied point and a series or range of foresight points of known coordinates.

Access the **Radial Inverse** routine by pressing Alt L, R, or by typing `RI` at any data input prompt.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

To Point

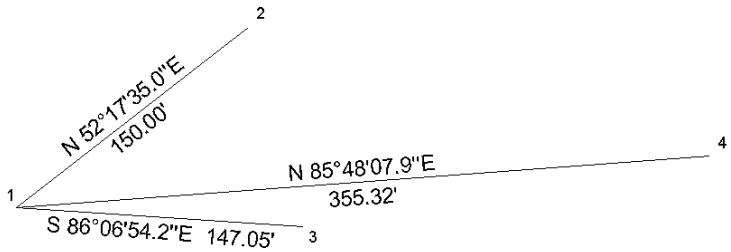
Enter an individual foresight point number. If the foresight point has not been assigned coordinates, the program will prompt for them and you must respond as you would to a standard coordinate entry request.

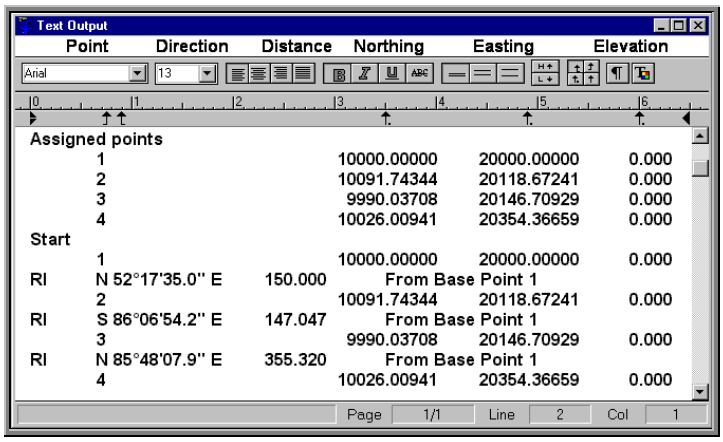
What Happens Next

"Sight" Survey will respond to an accepted foresight point by printing the computed bearing and the horizontal and vertical distances from the currently occupied point to the foresight point, the foresight point number, ID, and its Northing, Easting and elevation. The currently occupied point and the reference bearing are left unchanged. The backsight bearing is retained for use when or if you resume a routine requiring one.

Example

Enter & Assign points 1-4, then perform **Radial Inverse** from base point 1 to points 2, 3, and 4.





Section 9

9.04 Deflection Inverse (DI)

FUNCTION: The **Deflection Inverse** routine is used to compute and report the deflection angle (from the forward extension of the previous bearing), horizontal distance, and the difference in elevation between any two points of known coordinates.

Access the **Deflection Inverse** routine by pressing Alt L, D, or by typing **DI** at any data input prompt. This routine is performed in an identical manner to the **Inverse** routine described on page 255.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

To Point

Enter an individual foresight point number. If the foresight point has not been assigned coordinates, the program will prompt for them and you must respond as you would to a standard coordinate entry request.

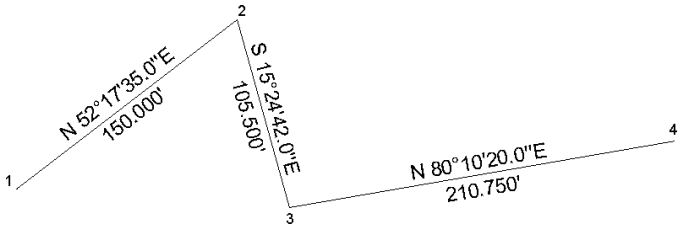
What Happens Next

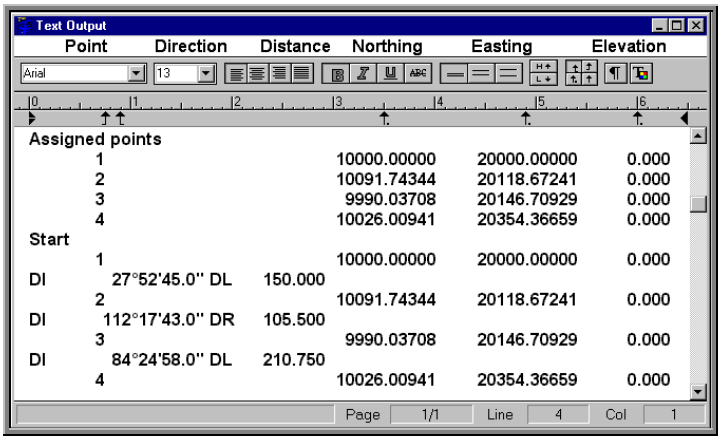
"Sight" Survey will respond to an accepted foresight point by printing the computed deflection angle and the horizontal and vertical distances from the currently occupied point to the foresight

point, the foresight point number, ID, and its Northing, Easting and elevation. The currently occupied point and the reference bearing are left unchanged. The backsight bearing is retained for use when or if you resume a routine requiring one.

Example

Enter & Assign points 1-4, then perform a **Deflection Inverse** from point 1 to 2 to 3 to 4.





9.05 Radial Stake Out (RS)

FUNCTION: The **Radial Stake Out** routine is used to compute and report an angle (as turned to the right, from a known backsight point), the horizontal distance and difference in elevation between the currently occupied point and a series or range of foresight points of known coordinates. The currently occupied point and backsight bearing are held constant throughout this routine.

Access the **Radial Stake Out** routine by pressing Alt L, A, or by typing **RS** at any data input prompt.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine. Enter the instrument point location.

B.S. Point

Enter the number of the backsight point.

Max FS Dist.

Enter the maximum foresight distance desired from this set up. If you want all of the points in the data file to be included, press Enter without entering any distance value.

To Points

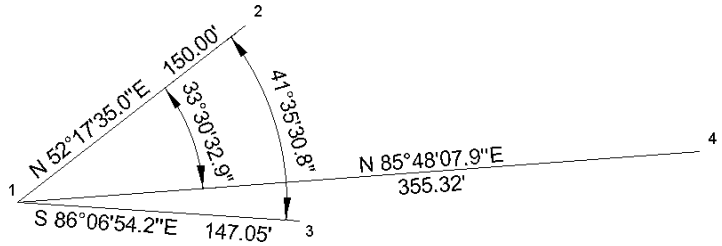
Enter the individual foresight point number(s), a point number string, or the letter **A** (for all points).

What Happens Next

The program will respond to an accepted foresight point by printing the instrument and backsight points and their respective coordinates then printing the angle right (as turned from the backsight) and the horizontal and vertical distances from the currently occupied point to the foresight point, the foresight point number, ID, Northing, Easting and elevation.

Example

Enter & Assign points 1-4, then perform a **Radial Stake Out** from base point 1 to points 3 and 4, backsighting point 2.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			10000.00000	20000.00000	0.000
2			10091.74344	20118.67241	0.000
3			9990.03708	20146.70929	0.000
4			10026.00941	20354.36659	0.000
Start					
1			10000.00000	20000.00000	0.000
Radial Stake out					
1	Instrument Location		10000.00000	20000.00000	0.000
2	Backsight Point		10091.74344	20118.67241	0.000
BS	N 52°17'35.0" E	150.000			
Sight Points					
RS	41°35'30.8" AR	147.047			
3			9990.03708	20146.70929	0.000
RS	33°30'32.9" AR	355.320			
4			10026.00941	20354.36659	0.000

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9.06 Side Shots (SS)

FUNCTION: The **Side Shots** routine is similar to a **Traverse** routine (see page 265) in that it is used to compute the coordinates for a point(s) when given a bearing (or angle from a backsight) and a distance from the currently occupied point. Both the currently occupied and the backsight bearing are held constant throughout the computation of all side shot points relative to a particular occupied point.

Access the **Side Shots** routine by pressing Alt L, S, or by typing **SS** at any data input prompt.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

To Point

Enter the number of the foresight point to which you are shooting.

Bearing

Enter the bearing, angle, deflection or azimuth in your chosen format, recall a bearing between any two points in memory, or compute the correct data using the in line calculator.

Distance

Enter the distance, or recall a distance between two existing points.

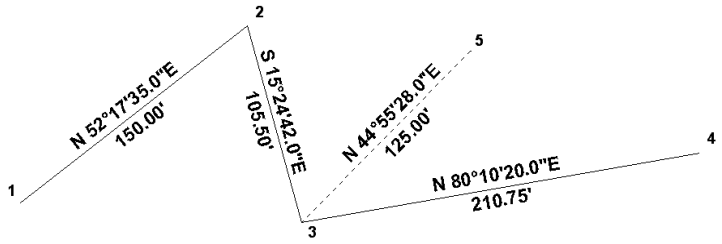
What Happens Next

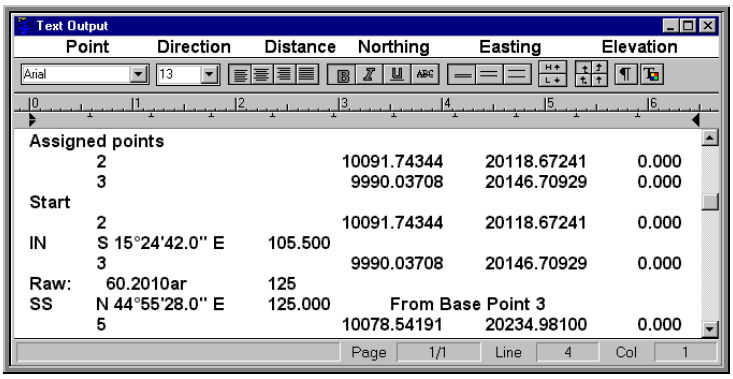
If the **Slope Angle** prompt is active you will also be prompted for the data that is necessary for slope reduction according to the method you have specified on the **Slope Entry Configuration Menu**.

Following a correct distance entry, the program will print the bearing, horizontal and vertical distances from the currently occupied point to the side shot point, and also the point number, ID, Northing, Easting and elevation of the side shot point. The currently occupied point, and the reference bearing remain unchanged.

Example

Enter & Assign points 2 and 3, **Inverse** from point 2 to point 3, then set a **Side Shot** to point 5 at `60°20'10"AR` and `125` feet.

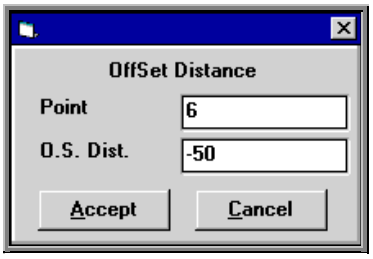




9.07 Offset (OS)

FUNCTION: The **Offset** routine is similar to a **Side Shot** routine in that it is used to compute the coordinates for a point(s) while holding both the currently occupied point and the backsight bearing. Offsets are set perpendicular to the current bearing, with left (negative)/right (positive) directions relative to the foresight.

Access the **Offset** routine by pressing Alt L, O, or by typing **OS** at any data input prompt.



Point Enter a number for the offset point.

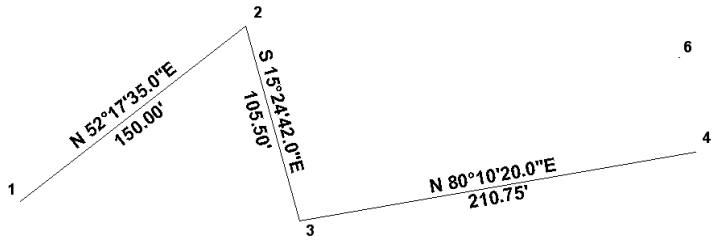
O.S. Dist. Enter the distance from the offset point to the point of offset. If the offset is to the left of the line, relative to the direction of the foresight, enter the distance as a negative value.

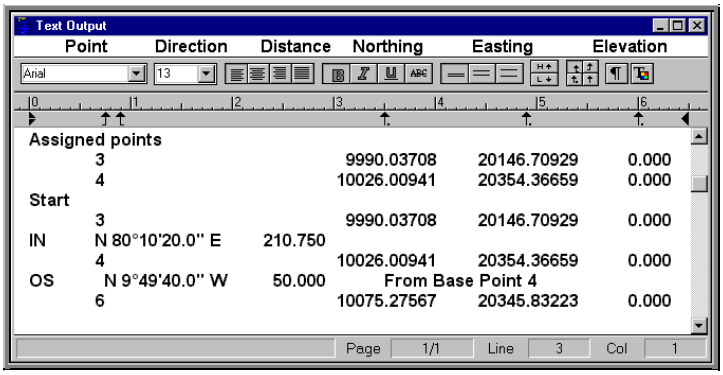
What Happens Next

Following a correct offset entry. "Sight" Survey will print the bearing and distance to the offset point, the offset point number, description, and coordinates.

Example

Enter & Assign points 3 and 4, **Inverse** from point 3 to point 4, then set an **Offset** left (point 6) at **50** feet.





Section 9

9.08 Traverse (TR)

FUNCTION: The **Traverse** routine is used to compute the coordinates of a new point along a line of known bearing and distance from the currently occupied point.

Access the **Traverse** routine by pressing Alt L, T, or by typing **TR** at any data input prompt.

From Point This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

To Point Enter the number of the point to which you are traversing.

Bearing Enter the bearing, angle, deflection or azimuth, recall a bearing between any two points in memory, or compute the correct data using the in-line calculator.

Distance Enter the distance, or recall a distance between two existing points.

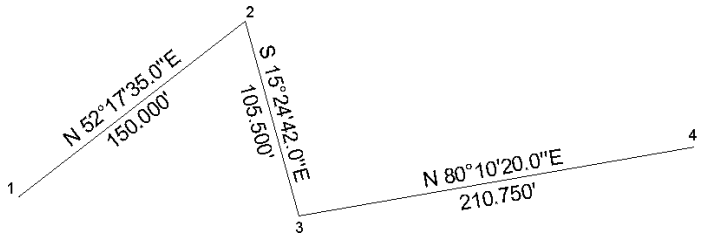
What Happens Next

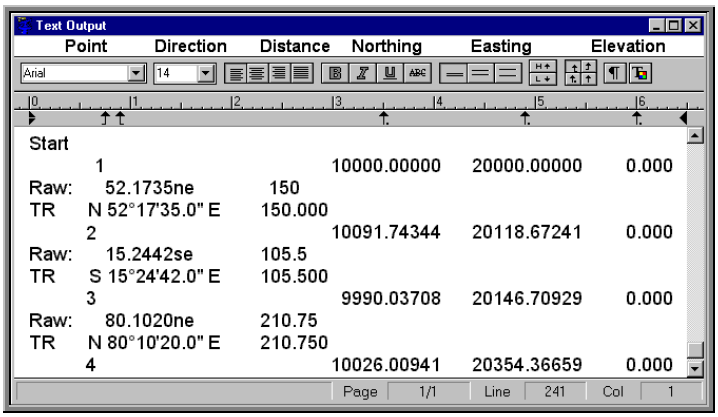
If the **Slope Angle** prompt is active you will also be prompted for the data that is necessary for slope reduction according to the method you have specified on the **Slope Entry Configuration Menu**.

Following a correct distance entry, the program will print the bearing, horizontal and vertical distances from the currently occupied point to the new point number, and also the point number, point ID, and the Northing, Easting and elevation of the new point. The new point becomes the currently occupied point, and the reference bearing becomes the bearing just traversed.

Example

Enter & Assign points 1, then **Traverse** from point 1 to 2 to 3 to 4.





9.09 Traverse with Offsets (TO)

FUNCTION: The **Traverse with Offsets** routine is used to compute the coordinates of a new point along a line of known bearing and distance from the currently occupied point, and then set perpendicular offset points at the foresight point.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

To Point

Enter the number of the point to which you are traversing.

Bearing

Enter the bearing, angle, deflection or azimuth, recall a bearing between any two points in memory, or compute the correct data using the in-line calculator.

Distance

Enter the distance, or recall a distance between two existing points.

What Happens Next

If the **Slope Angle** prompt is active you will also be prompted for the data that is necessary for slope reduction according to the method you have specified on the **Slope Entry Configuration Menu**.

If an offset table has been defined "Sight" Survey will use the table values to set the offset points. If you are not using an offset table, you will be prompted with the offset dialog box.

Following a correct distance entry, the program will print the bearing, horizontal and vertical distances from the currently occupied point to the new point number, and also the point number, point ID, and the Northing, Easting and elevation of the new point. The new point becomes the currently occupied point, and the reference bearing becomes the bearing just traversed.

Offsets are not handled within the traverse balancing routines, therefore you should balance your traverse data before entering any offset information.

Example

This routine functions similar to the **Offset** routine in **Section 9.07**, except you **Traverse** (not **Inverse**) to the foresight point.

9.10 Traverse Close (TC)

FUNCTION: The **Traverse Close** routine is used to determine the length and direction of the linear error and the amount of angular error in a traverse. This routine must be used prior to traverse adjustment routines.

Procedural Order for TRAVERSE CLOSURE

1. Enter a starting point using the **Start At** routine (**ST** - page 235).
2. Enter a backsight bearing using the **Enter a Backsight Bearing** routine (**EB** - page 238).
3. Using the **Traverse** routine (**TR** - page 265), traverse the courses up to, but not including, the final leg.
4. Specify **Traverse Closure** by typing pressing Alt L, C or by typing **TC**, and proceed with the data entry for the closing leg as discussed in the instructions that follow.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Close to — Enter the number of the point to which you are closing.

Bearing — Enter the bearing, angle, deflection or azimuth, recall a bearing between any two points in memory, or compute the correct data using the in-line calculator.

Distance — Enter the distance, or recall a distance between two existing points.

If the **Slope Angle** prompt is active you will also be prompted for the data that is necessary for slope reduction according to the method you have specified on the **Configuration Menu**.

What Happens Next — Following a correct distance entry, the program will print the bearing, horizontal and vertical distances from the currently occupied point to a temporary point, and then inverse the bearing, distance and elevation from the temporary point to the closing point to obtain the **Closure Error**. The inversed bearing, distance and elevation of the error will be printed along with the **Precision Ratio**.

Example — The **Traverse Closure and Adjustment** routine is illustrated in the **Quick Start** manual, **Section 3 - Examples**.

9.11 Traverse Adjustment - Balance Angles

FUNCTION: The **Traverse Adjustment - Balance Angles** routine is used to spread the angular error of a traverse across the stations of the traverse.

Example — The **Balance Angles** routine is illustrated in the **Quick Start** manual, **Section 3 - Examples**.

9.12 Traverse Adjustment - Compass Rule

FUNCTION: The **Traverse Adjustment - Compass Rule** routine is a procedure used to adjust a traverse network.

The **Compass** (Bowditch) **Rule Adjustment** is a traverse adjustment procedure that yields good results when distances and angles are measured with equal precision. It assumes no correlation and that all measurements are of equal weight.

Example

The **Compass Rule Adjustment** routine is illustrated in the **Quick Start** manual, **Section 3 - Examples**.

9.13 Traverse Adjustment - Crandall Rule

FUNCTION: The **Traverse Adjustment - Crandall Rule** routine is a procedure used to adjust a traverse network.

The **Crandall Rule Adjustment** is a traverse adjustment procedure best used when adjusting stadia traverses, or other traverses where the distances most likely contain larger random errors than the angles. The angular error is first distributed equally to all angles and the distances then receive all the remaining corrections.

Example

The Crandall Rule **Adjustment** routine is illustrated in the **Quick Start** manual, **Section 3 - Examples**.

9.14 Traverse Adjustment - Transit Rule

FUNCTION: The **Traverse Adjustment - Transit Rule** routine is a procedure used to adjust a traverse network.

Example

The **Transit Rule Adjustment** routine is illustrated in the **Quick Start** manual, **Section 3 - Examples**.

9.15 Traverse Adjustment - Least Squares

FUNCTION: The **Traverse Adjustment - Least Squares** routine is a procedure used to adjust a traverse network.

Background Information

Least Squares Adjustment is an iterative procedure whereby the previously calculated coordinates are used for the next calculation, and those new coordinates are then used for the next calculation, etc. In "Sight" Survey, the calculations continue in this manner until the largest difference between successive coordinate calculations is "negligibly small" (less than .000005 units), or until a total of 5 iterations have been performed.

A good survey adjustment takes a series of imperfect measurements and derives more reliable estimates of the true values of the quantities measured in the field. The **Crandall Rule Adjustment** (see page 270) is best used when adjusting stadia traverses, or other traverses where the distances most likely contain larger random errors than the angles. The angular error is first distributed equally to all angles and the distances then receive all the remaining corrections. The **Compass Rule** (or Bowditch) **Adjustment** (see page 270) gives good results when distances and angles are measured with equal precision. It assumes no correlation and that all measurements are of equal weight. Least squares adjustment, on the other hand, imposes no restrictions and adjusts angles and distances simultaneously.

Least squares is not an exact solution. It gives the solution that is the most probable with the given data. This means that for any individual point or station in a traverse network there may be a better solution than the one arrived at, however, for the whole overall network, the solution found is the best.

The computed least squares estimate is always the simple mean of the observations, as long as they are uncorrelated and of equal precision (weight). When the measurements are uncorrelated but unequal in precision, the weighted mean is used.

Diagonals

To properly perform a least squares adjustment, diagonals or redundancies are necessary. The more redundancies you have, the better the chances are that the solution obtained is the best. In a

traverse with no redundancies, performing a least squares adjustment will give comparable results to the Crandall Rule Adjustment. With enough redundancies, a leg that has a major blunder will not have as much effect on the entire traverse. For example, if you have five measurements to a particular point, and four of them correspond but one is way off, the erroneous measurement will not carry much weight because of the other four, good measurements.

Example

The **Least Squares Adjustment** routine is illustrated in the **Quick Start** manual, **Section 3 - Examples**.

9.16 Enter Diagonal (ED)

FUNCTION: The **Enter Diagonal** routine is used to enter diagonal shots into your traverse network for least squares adjustment.

Diagonals can be entered within a traverse network using the **Lines** ➪ **Enter Diagonal** (**ED**) routine. They can also be added directly into the **Traverse Adjustment** window using the Add Leg option, although it is much more cumbersome to use this method. We strongly recommend that you run the **Least Squares Adjustment** (see page 271) example to familiarize yourself with the data entry procedure for diagonals within a traverse.

When entering diagonals into the **Traverse Adjustment** window *(i.e. not using the* **Enter Diagonal** *routine), you must be sure that the leg you add has the correct Backsight Point, At (occupied) Point, and Foresight Point.*

The **Enter Diagonal** routine is similar to the **Side Shot** (see page 262) routine in that it computes coordinates for a point when given a bearing (or angle from a backsight) and a distance from the currently occupied point, while both the currently occupied point and the backsight bearing are held constant throughout the computations. However, the **Enter Diagonal** routine is different in the fact that it can accumulate several bearing and distance

references to the same point number, without overwriting the actual coordinates for that point which normally are calculated using the **Traverse** (see page 265) routine. These multiple bearing and distance values are then manipulated with the **Least Squares Adjustment** routine to arrive at the best possible coordinates for each point in the network.

To enter a diagonal into your traverse network, select the **Enter Diagonal** routine by pressing Alt L, G, or type **ED**.

From Point

The **From Point** is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. If you wish to change the **From Point**, press ↑ and enter the new occupied point number. Changing the **From Point** is equivalent to running the **Go To** routine. Be aware that if you change the occupied point, the previous backsight bearing is retained and may not be correct for your new setup. If necessary, enter a new backsight point or backsight bearing using either **Enter Backsight Point** (**EP**- page 237) or **Enter Backsight Bearing** (**EB** - page 238).

Click on the **Status** *toolbar icon* ? *to display the currently occupied point, the backsight point, and the current backsight bearing.*

To Point

Enter the number of the foresighted diagonal point.

Bearing

Enter the bearing, angle, deflection or azimuth to the diagonal point.

Distance

Enter the distance to the diagonal point.

If **Slope Angle Prompting** is on you will also be prompted for the data that is necessary for slope reduction according to the method you have specified on the **Slope Entry Configuration Menu** (see page 390).

What Happens Next

The program will print the bearing, horizontal and vertical distances from the currently occupied point to the diagonal point, and also the point number, point ID, and the Northing, Easting and elevation of the diagonal point. The currently occupied point and the reference bearing remain unchanged.

1. *If the backsight point for a diagonal is not the same point that you traversed from to get to the occupied point, you must use either the* **Enter Backsight Point** (**EP**) *(see page 237) or* **Enter Backsight Bearing** (**EB**) *(see page 238) routine to set the correct backsight before you use the* **Enter Diagonal** (**ED**) *(see page 272) routine to enter the diagonal shot. Using the* **EP** *routine usually produces better results than the* **EB** *routine because the* **EP** *routine ties the entered angle to an actual point within the network, whereas the* **EB** *routine results in only a reference bearing which is not directly tied to a third point within the network.*
2. *Points* ***DO NOT*** *have to be set by the* **Traverse** *routine before they can be used in the* **Enter Diagonal** (**ED**) *(see page 272) routine. However, the* **Enter Diagonal** *routine does not actually add a new point to the data file like the* **Traverse** *routine does.*
3. *It is not standard procedure to* **Balance Angles** *before performing a* **Least Squares Adjustment**.

Example

The **Least Squares Adjustment** routine is illustrated in the **Quick Start** manual, **Section 3 - Examples**.

Other Considerations

Averaging

If you ever sight your traverse points more than once and use the average of your shots as the actual input measurement, "Sight" Survey's least squares adjustment procedure can give you more accurate results. The results are more accurate because instead of using a simple average of those redundant shots, least squares weights those shots based on how they fit in with the entire traverse network. For example, assume your field technician takes three shots and obtains the following results:

Shot #1:	45.2343AR	100.10 feet;
Shot #2:	45.0055AR	100.20 feet;
Shot #3:	40.4234AR	105.00 feet;
Average:	43.4224AR	101.77 feet.

Given the data shown above, the simple average of the angles is 43.4224AR, however, common sense tells us that the true angle is

more than likely closer to 45 degrees. The simple average of the distances is 101.77 feet, but common sense tells us that the true distance is more than likely closer to 100 feet. However, nothing guarantees that the two similar shots are the correct ones. The least squares adjustment routine not only weights each of the shots against each other, but also weights them based upon the entire network solution.

Redundant shots such as those just previously discussed are entered into "Sight" Survey using the **Traverse** (**TR**) routine for one of the shots and the **Enter Diagonal** (**ED**) routine for the other two shots. It really doesn't matter which shot(s) are entered using which routine, as long as you enter the two legs using the **Enter Diagonal** routine before you enter the one traverse leg. (If you enter the traverse leg first, your occupied point and backsight bearing will change, and you will need to go through a couple more steps to produce the same results.) You must enter **one** of them, and **only one** of them, using the **Traverse** routine.

If you take three shots to each point, the following steps explain the procedure to follow for entering this data into "Sight" Survey:

1. If you have not already done so, use the **Enter & Assign** (**EA**) routine to assign coordinates to the starting point and backsight point for your traverse.
2. If you are just beginning to construct your traverse network, use the **Start At** (**ST**) routine to occupy the starting point of your traverse, and then use the **Enter Backsight Point** (**EP**) or **Enter Backsight Bearing** (**EB**) routine to set the reference bearing.
3. Use the **Enter Diagonal** (**ED**) routine to enter the first shot to the foresight point. (Be sure to note the point number that you use since the same point number must be entered for all three shots). Your occupied point and reference bearing will remain unchanged.
4. Use the **Enter Diagonal** (**ED**) routine to enter the second shot to the foresight point. (Enter the same point number that you entered in Step 3). Your occupied point and reference bearing will remain unchanged.

5. Use the **Traverse** (**TR**) routine to enter the final shot to the foresight point. (Enter the same point number that you entered in Steps 3 & 4). The foresight point becomes the currently occupied point and the reference bearing becomes the reverse of the bearing just traversed.
6. Repeat Steps 3, 4 and 5 for each point in the traverse. When you are ready to close the traverse, perform Steps 3 & 4 for the closing point, and then perform Step 5 using the **Traverse Close** (**TC**) routine instead of the **Traverse** (**TR**) routine.

Stationary Points

Points which have been introduced into the traverse network using the **Start At Point** (**ST**), **Enter & Assign** (**EA**), and as the **Close To** point within the **Traverse Close** (**TC**) routine are considered control points and will remain stationary. These points are shown in the **At Pt** column of the **Unbalanced Traverse** **window**.

If you wish to designate specific coordinate points within the network as stationary points, you must define them based on two other stationary points, preferably at the very start of your traverse network. The following procedure outlines the necessary steps to hold an internal traverse point stationary.

1. If you have not already done so, use the **Enter & Assign** (**EA**) routine to assign coordinates to the starting point for your traverse.
2. If you have not already done so, use the **Enter & Assign** (**EA**) routine to assign coordinates to another known, stationary point, most likely this would be your known backsight point.
3. If you have not already done so, use the **Enter & Assign** (**EA**) routine to assign coordinates to the point(s) in the traverse that you will want to hold stationary.
4. If you are just beginning to construct your traverse network, use the **Start At** (**ST**) routine to occupy the starting point of your traverse. ***However, if you are in the middle of your traverse network, it is extremely***

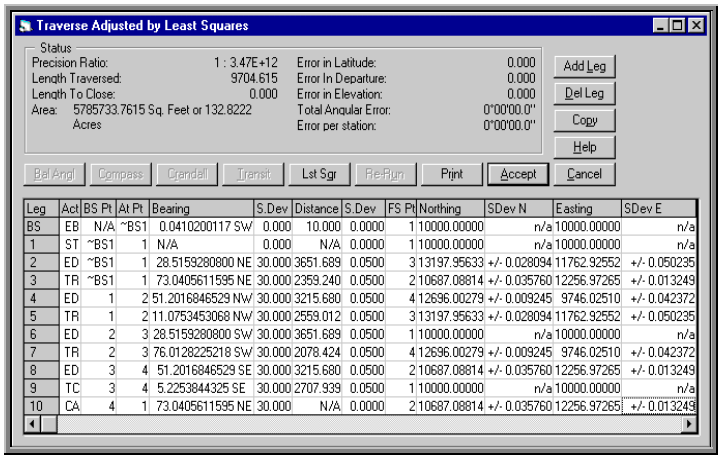
important that you use the* Go To Point (GT) *routine instead.

5. Use the **Enter Backsight Point** (**EP**) routine to set the other known point as your backsight point.
6. Use the **Enter Diagonal** (**ED**) routine to enter a cross-tie to the point(s) *within the traverse network* which you want to hold stationary. At the **Bearing** and **Distance** prompts, simply recall the bearing from the starting point to the foresight point.
7. Complete the traverse network as usual, using the **Traverse** (**TR**), **Enter Diagonal** (**ED**) and **Traverse Close** (**TC**) routines.
8. Upon closing the traverse, edit the **angle** and **distance Standard Deviation** columns in the **Unbalanced Traverse** window for the legs you wish to hold stationary. Change the values from the default values to **0** (zero).
9. Click the Re-Run button with your mouse or press Alt U to accept the change and re-run the traverse. After re-running the traverse changes, "Sight" Survey will display the **Modified Traverse** window.
10. Click the Lst Sqr button with your mouse or press Alt Q to choose the **Least Squares Adjustment** option.

Traverse Adjustment

Least Squares Adjustment is accessed from "Sight" Survey's **Traverse Adjustment** window. The **Traverse Adjustment** window is displayed automatically after completion of the **Traverse Closure** (**TC**) routine, or upon executing the **Edit Raw Data** (**ER**) or **Adjust Traverse** (**AT**) routines. To perform a **Least Squares Adjustment**, click on the Lst Sqr button or press Alt Q when the **Traverse Adjustment** window is displayed.

The **Traverse Adjustment** window contains additional fields, which will not always appear. These are: **BS Pt**, **At Pt**, **S.Dev** (for angles), **S.Dev** (for distances), **SDev N** (for Northings), **SDev E** (for Eastings).



Leg	Act	BS Pt	At Pt	Bearing	S.Dev	Distance	S.Dev	FS Pt	Northing	SDev N	Easting	SDev E
BS	EB	N/A	~BS1	0.0410200117 SW	0.000	10.000	0.0000	1	10000.00000	n/a	10000.00000	n/a
1	ST	~BS1	1	N/A	0.000	N/A	0.0000	1	10000.00000	n/a	10000.00000	n/a
2	ED	~BS1	1	28.5159280800 NE	30.000	3651.689	0.0500	3	13197.95633	+/- 0.028094	11762.92552	+/- 0.050235
3	TR	~BS1	1	73.0405611595 NE	30.000	2359.240	0.0500	2	10687.08814	+/- 0.035760	12256.97265	+/- 0.013249
4	ED	1	2	51.2016846529 NW	30.000	3215.680	0.0500	4	12696.00279	+/- 0.009245	9746.02510	+/- 0.042372
5	TR	1	2	11.0753453068 NW	30.000	2559.012	0.0500	3	13197.95633	+/- 0.028094	11762.92552	+/- 0.050235
6	ED	2	3	28.5159280800 SW	30.000	3651.689	0.0500	1	10000.00000	n/a	10000.00000	n/a
7	TR	2	3	76.0128225218 SW	30.000	2078.424	0.0500	4	12696.00279	+/- 0.009245	9746.02510	+/- 0.042372
8	ED	3	4	51.2016846529 SE	30.000	3215.680	0.0500	2	10687.08814	+/- 0.035760	12256.97265	+/- 0.013249
9	TC	3	4	5.2253844325 SE	30.000	2707.939	0.0500	1	10000.00000	n/a	10000.00000	n/a
10	CA	4	1	73.0405611595 NE	30.000	N/A	0.0000	2	10687.08814	+/- 0.035760	12256.97265	+/- 0.013249

BS Pt & At Pt

To save space in the **Traverse Adjustment** window, the **Backsight Point** and **At (Occupied) Point** columns are displayed only if you have used the **Enter Diagonal** (**ED**) routine within the current traverse or if you elect to add or delete a traverse leg. You can manually toggle the display of these columns between **on** and **off** by double-clicking on the **FS Pt** column heading.

If you add or delete a leg in the middle of your traverse, you will need to edit the **Backsight Point**, **At (Occupied) Point**, and **Foresight Point** columns for the leg preceding, and for one or more of the legs which follow the added or deleted leg.

Standard Deviations

Standard Deviation is a statistic used as a measure of the dispersion or variation in a distribution, equal to the square root of the arithmetic mean of the squares of the deviations from the arithmetic mean. If you were to draw a graph of a measurement versus the number of measurements to that station and you had a *perfect* sample, the graph would be shaped like a bell. If you then found the highest point on the graph, that point would be called the mode. If the sample fit the model perfectly, that point would also be the average (i.e. both sides of the mode would have the same number of measurements.) If you then moved away from the mode (average) the same distance in both directions until the area enclosed contained 73% of the sample, the standard deviation would be the distance from the edge of the area to the mode.

The **Traverse Adjustment** window contains four new columns which represent the Standard Deviations of angles, distances, Northings, and Eastings.

S.Dev

The Standard Deviations for angles and distances are displayed if you enabled the **Display Standard Deviations** check box on the **COGO Configuration Menu** (**CM**). You can also toggle the Standard Deviation columns display between **on** and **off** by double-clicking on the **Bearing** or **Distance** column headings.

The Standard Deviation values for angles and distances will initially appear as either **0** (zero) or as the values that you specified on the **COGO Configuration Menu** (**CM**).

The Standard Deviation values will initially appear as 0 for all legs which contain the following routine actions: **Enter & Assign** (**EA**), **Enter Backsight Bearing** (**EB**), **Enter Backsight Point** (**EP**), **Start At** (**ST**), **Go To Point** (**GT**), **Inverse** (**IN**), and **Side Shot** (**SS**).

The Standard Deviations will initially appear as the default values (specified on the **Configuration Menu**) for all legs which contain the following routine actions: **Enter Diagonal** (**ED**), **Traverse** (**TR**), **Traverse Close** (**TC**), and **Closing Angle** (**CA**).

A value of **0** (zero) for the Standard Deviation means that the foresight point will be held stationary, or as close to stationary as possible. Therefore, the higher that your confidence is in the angle and distance measured for each leg, the lower that the angle and distance Standard Deviation values should be. For **Enter Diagonal** (**ED**), **Traverse** (**TR**), **Traverse Close** (**TC**), and **Closing Angle** (**CA**) legs, you can change the default values based upon your confidence in the angles and distances you measured.

Decreasing the Standard Deviation value(s) causes "Sight" Survey to place more weight on the angles and/or distances and therefore adjusts them less. Likewise, **increasing** the Standard Deviation value(s) causes "Sight" Survey to place less weight on the angles and/or distances and therefore adjusts them more. To understand this more clearly, it may help to think of the Standard Deviation value as the amount of variance that the measurement may have in it. If you are extremely confident in any measurement and do not

want that measurement to change, change the Standard Deviation for that measurement to `0` (zero).

The Standard Deviation values are very important if they vary within the traverse. A leg with a smaller standard deviation will carry more weight that a leg with a larger standard deviation. Also, a leg which has a small angle Standard Deviation and a large distance Standard Deviation will, when adjusted, have its distance adjusted more than the angle. However, the other legs in the neighboring area will also have an effect on this leg.

SDev N & SDev E

The Standard Deviation (or error) values for the Northings and Eastings are displayed only after you have selected the Least Squares Adjustment option. These values are calculated during the adjustment process, and as such, cannot be changed directly by editing the fields.

These overall values are indicative of the accuracy of your survey network. The lower the values are, the more accurate your survey network is; and likewise, the higher the value, the less accurate it is. A Northing or Easting Standard Deviation value of:

+/-4.40E-5 (or +/-0.000044)

indicates an extremely accurate coordinate position, whereas a value of:

+/-4.40E+5 (or +/-440000.0)

indicates an extremely large blunder at this coordinate position or an adjacent coordinate position. If a specific Northing has a Standard Deviation value of +/-0.05000, it indicates that there is a 73% chance that the true Northing for that point lies within five one-hundredths (5/100ths) of a foot (or meter, depending upon your units) from the Northing shown in the preceding column.

You must determine for yourself what is an acceptable closure for your traverse, and then determine if the adjusted network is acceptable to you. For example, if you expect a certain angle to have a Standard Deviation of 1 second, yet the adjustment process modifies the angle by 30 seconds, you are justified to conclude that there is a blunder in one or more of the entered measurements.

Printing

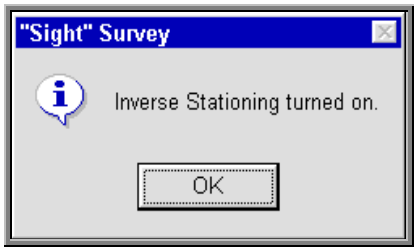
The Standard Deviation values are not a part of the normal text printout in the **Text Output** window, and therefore do not get printed when the [Print] function is selected. However, if you do want to print these values, you can highlight the desired column(s) and click the [Copy] button (or press Alt P) to copy the highlighted data to the Windows Clipboard. Then you can Paste them into "Sight" Survey's **Text Output** window or into your favorite word processor.

If you wish to copy the entire **Traverse Adjustment** grid, click on the Leg column heading (first column) to select the entire grid and then click the [Copy] button (or press Alt P). Next, use the Windows Paste function to copy the data into the "Sight" Survey **Text Output** window or to any other Windows program. (The data pastes perfectly into Microsoft's Excel® spreadsheet program.)

9.17 Inverse with Stations (IS)

FUNCTION: The **Inverse with Stations** routine is used to toggle a stationing mode on and off. When active, the stationing mode computes horizontal stationing data along the inversed course. Stationing always proceeds in an increasing fashion.

To compute and print stationing while inversing lines and arcs, type **IS** in any text box. A message box will open and display:



Click [OK]. The **IS** command is actually a toggle switch. If the current status of the inverse with stationing routine is **OFF**, it will

be turned **ON**. Likewise, if the current status of the inverse with stationing routine is **ON**, it will be turned **OFF**.

After turning the stationing feature on, each straight leg (and/or arc) inversed will also have a station computed. This station will be carried along with the point. Consequently, to begin with a particular station, you must assign a station value to your starting point by using the **Enter Station** routine (**ES** - page 234), or use the **Start At** routine (**ST** - page 235) to place an existing station value into the computer's memory.

As is also the case with the **Traverse with Stationing** mode, you should follow these steps to successfully begin your stationing.

1. Use **Enter Station** (**ES** - page 234) to set a station at your beginning point, if the point has not yet been stationed.

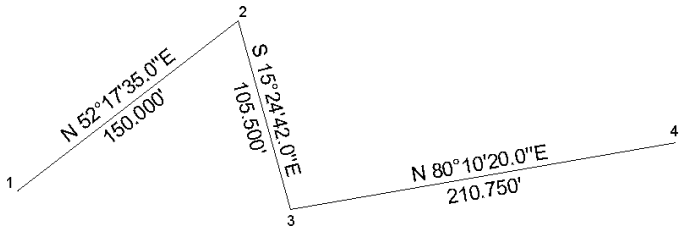
2. Turn on the stationing mode using the **IS**, (**TS**, if using **Traverse**), command.

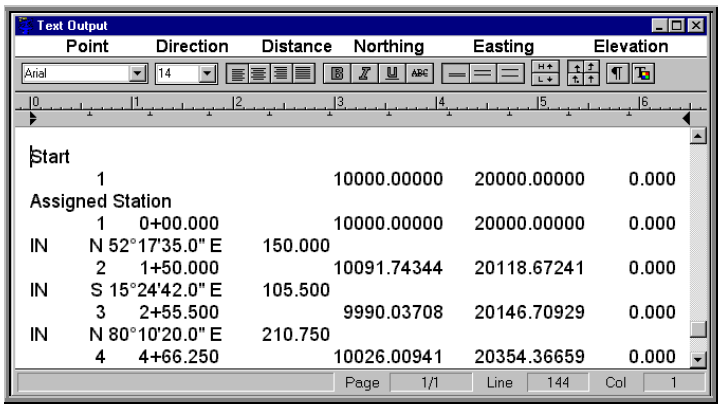
3. Use the **Start At** command (**ST** - page 235) to set the initial point.

4. Enter the **Inverse** command (**IN** - page 255) to begin inversing, (**TR**, - page 265, if using **Traverse**).

Example

Enter & Assign points 1-4, then **Enter Station** 0+00 at point 1 and **Inverse with Stations** from point 1 to 2 to 3 to 4.



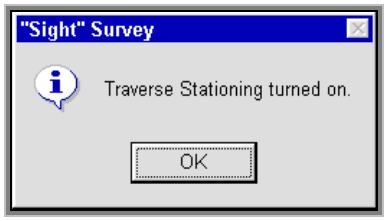


Section 9

9.18 Traverse with Stations (TS)

FUNCTION: The **Traverse with Stations** routine is used to toggle a stationing mode on and off. When active, the stationing mode computes horizontal stationing data along the traversed course. Stationing always proceeds in an increasing fashion.

To compute and print stationing while traversing lines and arcs, type **TS** in any text box, or press Alt L, E. A message box will open and display:



Click OK. The **TS** command is actually a toggle switch. If the current status of the traverse with stationing routine is **OFF**, it will be turned **ON**. Likewise, if the current status of the traverse with stationing routine is **ON**, it will be turned **OFF**.

After turning the stationing feature on, each traverse leg computed will also have a station computed. This station will be carried along with the point. Consequently, to begin with a particular station, you must assign a station value to your starting point by using the **Enter Station** routine (**ES** - page 234), or use the **Start At** routine (**ST** - page 235) to place an existing station value into the computer's memory.

CURVES: *The stationing routine handles horizontal curves in the* **Traverse Arc** *routine by assuming that the currently occupied point is the PC point. The PI point will be computed and printed. Stationing of the PT will be computed by adding the length of curve to the PC station.*

As is also the case with the **Inverse with Stationing** mode, you should follow these steps to successfully begin your stationing.

1. Use **Enter Station** (**ES** - page 234) to set a station at your beginning point, if the point has not yet been stationed.

2. Turn on the stationing mode using the **TS**, (**IS**, if using **Inverse**), command.

3. Use the **Start At** command (**ST** - page 235) to set the initial point.

4. Enter the **Traverse** command (**TR** - page 265) to begin inversing, (**IN**, - page 255, if using **Inverse**).

Example

This routine functions similar to the **Inverse with Stations** routine in **Section 9.17**, except you **Traverse** (not **Inverse**) to the foresight point.

9.19 Traverse Right of Way (RW)

FUNCTION: The **Traverse Right of Way** routine functions as a multiple offset intersection routine to lay out one or two lines parallel to a centerline.

To access the **Traverse Right of Way** routine, type **RW** in any text box, or press Alt L, W.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

B.S. Point

This is the current backsight point. If you already have a backsight point, this box will be filled for you.

Left Offset

Enter the offset distance to the left. If you do not want to set a right-of-way on the left side, just press Enter. The direction left, refers to the position of the line with respect to the forward direction of travel.

Right Offset

Enter the offset distance to the right. If you do not want to set a right-of-way on the right side, just press Enter. The direction right, refers to the position of the line with respect to the forward direction of travel.

Next Point

Type in individual point numbers, pressing Enter after each number. You may also type in a point string and press Enter.

What Happens Next

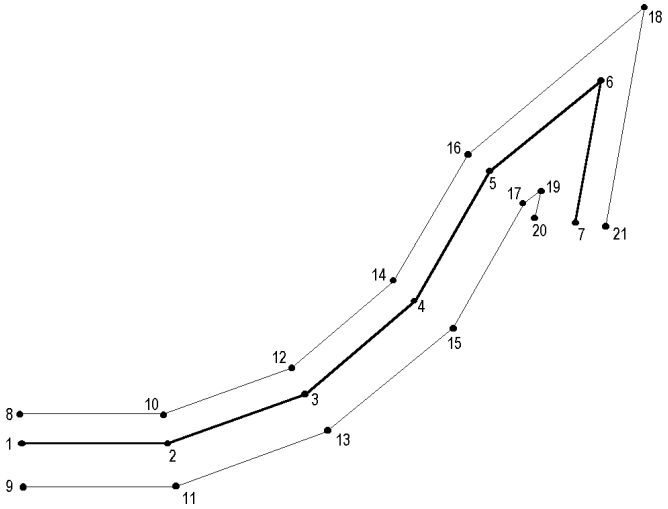
"Sight" Survey will respond to each accepted right-of-way point by computing and printing the offset point coordinates and a point name. Offset point numbers are automatically assigned. "Sight" Survey will also update the data entry screen by correctly displaying the current point and the correct backsight point.

If the backsight point specified is the same as the occupied point, the offsets will be placed perpendicular to the leg extending from the occupied point to the foresight point.

If the foresight point specified is the same as the occupied point, the offsets will be placed perpendicular to the leg extending from the backsight point to the currently occupied point.

Example

Enter and Assign the coordinate data for points 1 through 7 as shown below, then **Traverse a Right-of-Way** with a 40 foot left offset and a 60 foot right offset.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			1000.00000	2000.00000	0.000
2			1000.00000	2200.00000	0.000
3			1068.40400	2387.93850	0.000
4			1196.96160	2541.14740	0.000
5			1370.16660	2641.14740	0.000
6			1498.72420	2794.35630	0.000
7			1301.76260	2759.62670	0.000

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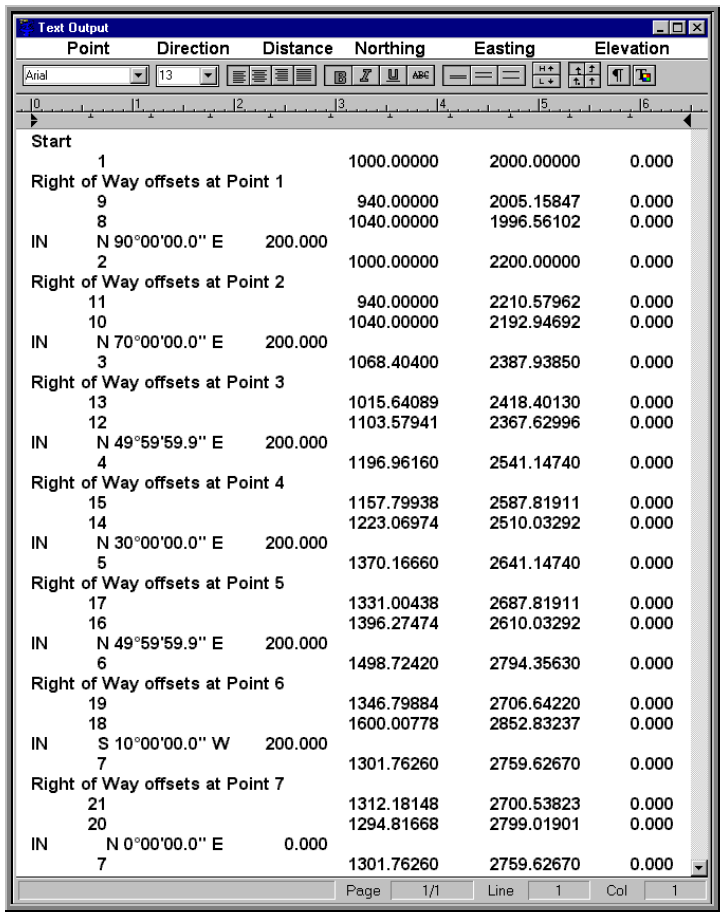


9.20 Best Fit Line (BF)

FUNCTION: The **Best Fit Line** routine is used to compute the bearing and end point coordinates of a line which best fits the coordinates of any three or more known points.

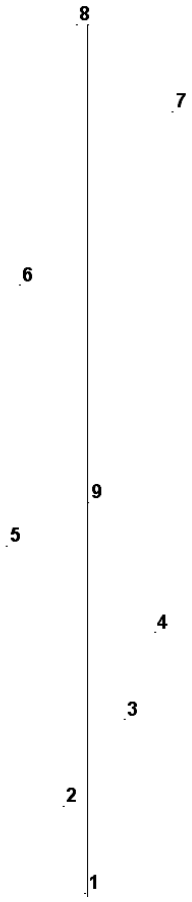
To access the **Best Fit Line** routine, type **BF** in any text box, or press Alt L, L.

Points Type in individual point numbers or a point string and press ↵Enter.

Point on Line Type in a point number that will be assigned to a location through which the best fit line will pass, and press ↵Enter.

What Happens Next "Sight" Survey will respond by computing and printing the bearing of the best fit line, and the coordinates of a point through which the line passes.

Example **Enter & Assign** the coordinate data for points 1 through 8 as shown below, then compute a **Best Fit Line** through point 9.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			1000.00000	2000.00000	0.000
2			1100.00000	1975.00000	0.000
3			1200.00000	2045.00000	0.000
4			1300.00000	2080.00000	0.000
5			1400.00000	1910.00000	0.000
6			1700.00000	1925.00000	0.000
7			1900.00000	2100.00000	0.000
8			2000.00000	1990.00000	0.000
Best fit to a line for all points					
Bearing: S 0°01'38.5" E					
Through point:					
9			1450.00000	2003.12500	0.000

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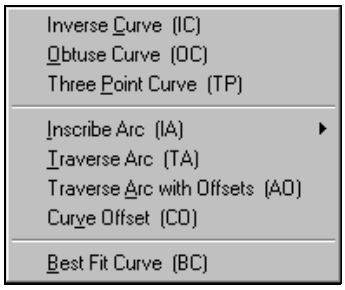
"Sight" Survey 3.0

Section 10

The CURVES Menu



The **Curves** menu contains functions that are used to define the relationship of points based on curves. Here you will find routines such as **Inverse Curve**, **Traverse Arc**, **Inscribe Arc**, **Curve Offsets**, and **Best Fit Curve**. The **Inscribe Arc** sub-menu includes options for tangent and non-tangent curves.

10.01 Inverse Curve (IC)

FUNCTION: The **Inverse Curve** routine is used to calculate and report the measurement data along an acute circular arc, having a delta angle of less than 180° (or 200 grads). This routine calculates the central angle, arc length, chord, chord bearing, tangent and radius of a curve when given the coordinates of the point of curvature (PC), the circle's center point and the curve's end point.

To access the **Inverse Curve** routine, type `IC` in any text box, or press Alt C, C.

From Point

This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point

Enter the circle's center point number.

To Point

Enter the point number of the circle's end point. If the end point has not been assigned coordinates, the program will prompt for

them and you must respond as you would to a standard coordinate entry request.

1) A 2) O 3) I

Enter an **A** or a **1** if you want the calculations to be based on an acute central angle. Enter an **O** or a **2** for the obtuse angle, and enter an **I** or a **3** to divide the arc into a desired number of intervals.

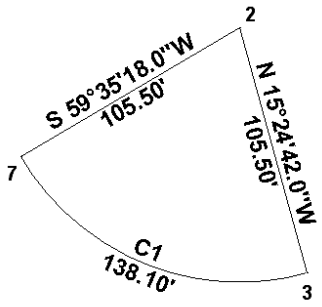
What Happens Next

"Sight" Survey will respond to an accepted end point by first checking for a radii match. If the measured difference in radii is greater than 0.01 feet, the message **RADII DO NOT MATCH**, will be displayed.

If the radii match successfully, the program will compute and print the Central Angle, Radius, Arc Length, Tangent, Chord, and Chord Bearing from the P.C. to the end point. The end point becomes the currently occupied point and the bearing from the end point to the center point becomes the reference bearing for use in the next calculation.

Example

Enter & Assign points 2, 3 and 7, then perform an **Inverse Curve** from point 3 to point 7, centered at point 2.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Start					
3			9990.03708	20146.70929	0.000
IC To Cntr. Pt.	N 15°24'42.0" W				
2			10091.74344	20118.67241	0.000
Arc	138.099		Central Angle	75°00'00.0"	
Chord	128.449		Chord Bearing	N 67°54'42.0" W	
Radius	105.500		Bng from Cntr Pt	S 59°35'18.0" W	
Tangent	80.953		Elevation Change	0.000	
7			10038.33835	20027.68809	0.000

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The **C1** *designation of the arc in the drawing signifies a curve listed in the curve table constructed by "Sight" Survey. Curve tables are placed by the* **Draw ⇨ Draw Supplemental ⇨ Curve Table** *function (*`CL` *- page 379.)*

10.02 Obtuse Curve (OC)

FUNCTION: The **Obtuse Curve** routine is used to calculate and report the measurement data along a circular arc, having a delta angle of greater than or equal to 180° (or 200 grads). This routine calculates the central angle, arc length, chord, chord bearing and radius of a curve when given the coordinates of the point of curvature (PC), the circle's center point and the curve's end point.

To access the **Obtuse Curve** routine, type OC in any text box, or press Alt C, O.

From Point

This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point

Enter the circle's center point number.

To Point

Enter the point number of the end point. If the end point has not been assigned coordinates, the program will prompt for them and you must respond as you would to a standard coordinate entry request.

1) A 2) O 3) I

Enter an A or a 1 if you want the calculations to be based on an acute central angle. Enter an O or a 2 for the obtuse angle, and enter an I or a 3 to divide the arc into a desired number of intervals.

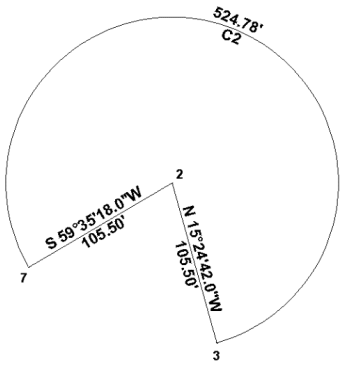
What Happens Next

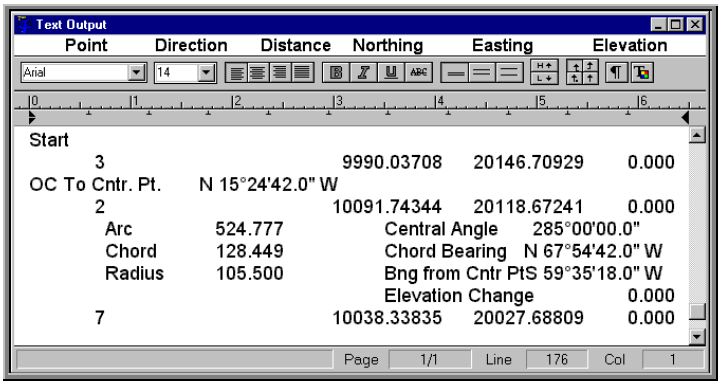
"Sight" Survey will respond to an accepted end point by first checking for a radii match. If the measured difference in radii is greater than 0.01 feet, the message **RADII DO NOT MATCH**, will be displayed.

If the radii match successfully, the program will compute and print the Central Angle, Radius, Arc Length, Tangent, Chord, and Chord Bearing from the PC. to the end point. The end point becomes the currently occupied point and the bearing from the end point to the center point becomes the reference bearing for use in the next calculation.

Example

Enter & Assign points 2, 3 and 7, then perform an **Inverse Obtuse Curve** from point 3 to point 7, centered at point 2.





*The **C2** designation of the arc in the drawing signifies a curve listed in the curve table constructed by "Sight" Survey. Curve tables are placed by the **Draw** ➪ **Draw Supplemental** ➪ **Curve Table** function (**CL** - page 379.)*

10.03 Three Point Curve (TP)

FUNCTION: The **Three Point Curve** routine is used to compute the center point of a curve that passes through three known points.

To access the **Three Point Curve** routine, type **TP** in any text box, or press Alt C, P.

1st Crv Point Enter the number of the first point on the curve.

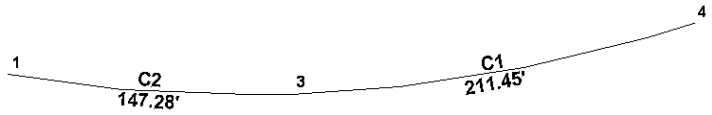
2nd Crv Point Enter the number of the second point on the curve.

3rd Crv Point Enter the number of the third point on the curve.

Cntr Point — Enter the number you want to assign to this point.

What Happens Next — "Sight" Survey will respond to your completed point entries by calculating the coordinates of the center point of an (acute) arc that passes through the three known points. The center point number and coordinates will be printed in the **Text Output** window. Use the **Inverse Curve** routine (`IC` - page 289) to view the curve data.

Example — **Enter & Assign** points 1, 3 and 4 using the coordinates shown below, then calculate a **Three Point Curve** passing through points 1, 3, and 4. Make the curve's center point 8.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
4			10026.00941	20354.36659	0.000
IC To Cntr. Pt.	N 17°54'37.9" W				
8			10739.13880	20123.88730	0.000
Arc	211.451		Central Angle	16°09'55.8"	
Chord	210.750		Chord Bearing	S 80°10'20.0" W	
Radius	749.449		Bng from Cntr Pt	S 1°44'42.1" E	
Tangent	106.432		Elevation Change	0.000	
3			9990.03708	20146.70929	0.000
IC To Cntr. Pt.	N 1°44'42.1" W				
8			10739.13880	20123.88730	0.000
Arc	147.284		Central Angle	11°15'35.8"	
Chord	147.047		Chord Bearing	N 86°06'54.2" W	
Radius	749.449		Bng from Cntr Pt	S 9°30'53.7" W	
Tangent	73.880		Elevation Change	0.000	
1			10000.00000	20000.00000	0.000

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*The **C1** and **C2** designations of the arcs in the drawing signifies a curve listed in the curve table constructed by "Sight" Survey. Curve tables are placed by the **Draw** ➪ **Draw Supplemental** ➪ **Curve Table** function (`CL` - page 379.)*

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10.04 Inscribe Arc Tangent from the PC

FUNCTION: The **Inscribe Arc Tangent from the PC** routine is used to compute the center point and tangent point from a known point of curvature.

To access the **Inscribe Arc Tangent from the PC** routine, type **IA** and select the item from the menu, or press Alt C, I, T.

This routine may be solved by any of the following criteria:

Delta & Chord known;	*Chord & Tangent known;*
Delta & Arc known;	*Chord & Radius known;*
Delta & Tangent known;	*Arc & Radius known;*
Delta & Radius known;	*Tangent & Radius known.*

Enter data for at least two of these known items. If you have additional data, you may enter it but it is not necessary to do so. Insufficient data will result in an incorrect solution.

P.C. This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point Enter the desired point number.

End Point Enter the desired point number.

Delta Enter the delta angle. If unknown, just press Enter.

Chord Enter the chord length. If unknown, just press Enter.

Arc Enter the arc length. If unknown, just press Enter.

Tangent Enter the tangent length. If unknown, just press Enter.

Radius Enter the radius length. If unknown, just press Enter.

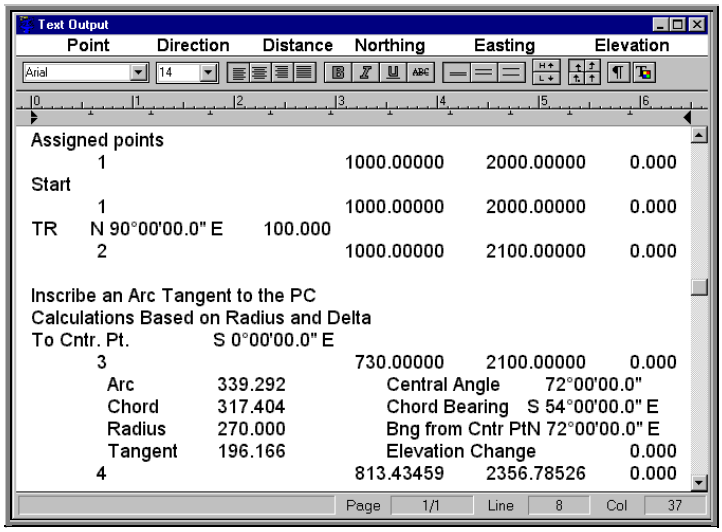
Enter Curve Direction Press 0 if the curve proceeds to the left, otherwise press 1. The direction of the curve is relative to the forward direction of travel.

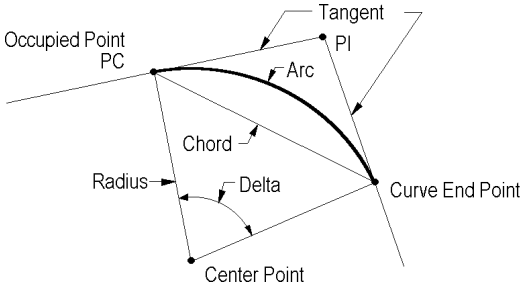
What Happens Next

"Sight" Survey will respond to correct and sufficient data by computing the arc center point and end point, and then printing the center point number and coordinates, the central angle, arc, radius, tangent, chord length and chord bearing; and the arc end point number and coordinates.

Example

Enter & Assign point 1, then **Traverse** to point 2 which becomes the PC. **Inscribe an Arc Tangent from the PC** through center point 3 to PT point 4. Use a delta of **72°** and a radius of **270** feet. Curve to the right.





Section 10

10.05 Inscribe Arc Tangent from the PI

FUNCTION: The **Inscribe Arc Tangent from the PI** routine is used to compute the PC, center point, and end point of a tangent arc from a known point of intersection.

To access the **Inscribe Arc Tangent from the PI** routine, type **IA** and select the item from the menu, or press Alt C, I, A.

This routine may be solved by any of the following criteria:

Delta & Chord known;
Delta & Arc known;
Delta & Tangent known;
Delta & Radius known;
Chord & Tangent known;
Chord & Radius known;
Arc & Radius known;
Tangent & Radius known.

Enter data for at least two of these known items. If you have additional data, you may enter it but it is not necessary to do so. Insufficient data will result in an incorrect solution.

P.I. This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

P.C. Enter the desired point number.

Center Point Enter the desired point number.

End Point Enter the desired point number.

Delta Enter the delta angle. If unknown, just press Enter.

Chord Enter the chord length. If unknown, just press Enter.

Arc Enter the arc length. If unknown, just press Enter.

Tangent Enter the tangent length. If unknown, just press Enter.

Radius Enter the radius length. If unknown, just press Enter.

Enter Curve Direction

Press 0 if the curve proceeds to the left, otherwise press 1. The direction of the curve is relative to the forward direction of travel.

What Happens Next

"Sight" Survey will respond to correct and sufficient data by computing the arc's PC, center point, and end point; and then printing the PC point number and coordinates; the center point number and coordinates; the central angle, arc, radius, tangent, chord length and chord bearing; and the arc end point number and coordinates.

Example

For an **Inscribe Arc** example, see page 295.

10.06 Inscribe Arc ➪Non-Tangent from the PC

FUNCTION: The **Inscribe Arc ➪Non-Tangent from the PC** routine is used to compute the center point and end point of a non-tangent arc from a known point of curvature.

To access the **Inscribe Arc ➪ Non-Tangent from the PC** routine, type **IA** and select the item from the menu, or press Alt C, I, N.

This routine may be solved by any of the following criteria:

Delta & Chord known;	*Chord & Tangent known;*
Delta & Arc known;	*Chord & Radius known;*
Delta & Tangent known;	*Arc & Radius known;*
Delta & Radius known;	*Tangent & Radius known.*

Enter data for at least two of these known items. If you have additional data, you may enter it but it is not necessary to do so. Insufficient data will result in an incorrect solution.

P.C.

This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point

Enter the desired point number.

End Point

Enter the desired point number.

Delta Enter the delta angle. If unknown, just press ↵Enter.

Chord Enter the chord length. If unknown, just press ↵Enter.
Arc Enter the arc length. If unknown, just press ↵Enter.

Tangent Enter the tangent length. If unknown, just press ↵Enter.

Radius Enter the radius length. If unknown, just press ↵Enter.

Enter Curve Direction Press 0 if the curve proceeds to the left, otherwise press 1. The direction of the curve is relative to the forward direction of travel.

Enter the Chord Bearing Enter the chord bearing.

What Happens Next "Sight" Survey will respond to correct and sufficient data by computing the arc's center point and end point; and then printing the center point number and coordinates; the central angle, arc, radius, tangent, chord length and chord bearing; and the arc end point number and coordinates.

Example For an **Inscribe Arc** example, see page 295.

10.07 Inscribe Arc Tangent from the PC with Offsets

FUNCTION: The **Inscribe Arc Tangent from the PC with Offsets** routine is used to compute the center point and tangent point of a tangent arc from a known point of curvature, and then set radial offsets to the curve end point.

To access the **Inscribe Arc Tangent from the PC with Offsets** routine, type **IA** and select the item from the menu, or press Alt C, I, O.

This routine may be solved by any of the following criteria:

Delta & Chord known;
Delta & Arc known;
Delta & Tangent known;
Delta & Radius known;
Chord & Tangent known;
Chord & Radius known;
Arc & Radius known;
Tangent & Radius known.

Enter data for at least two of these known items. If you have additional data, you may enter it but it is not necessary to do so. Insufficient data will result in an incorrect solution.

P.C. This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point Enter the desired point number.

End Point Enter the desired point number.

Delta Enter the delta angle. If unknown, just press ↵Enter.

Chord Enter the chord length. If unknown, just press ↵Enter.

Arc Enter the arc length. If unknown, just press ↵Enter.

Tangent Enter the tangent length. If unknown, just press ↵Enter.

Radius Enter the radius length. If unknown, just press ↵Enter.

Enter Curve Direction Press 0 if the curve proceeds to the left, otherwise press 1. The direction of the curve is relative to the forward direction of travel.

Point Enter a number for the offset point.

O.S. Dist. Enter the distance from the curve to the offset. Enter the distance as a negative value to offset to the left, relative to the direction of travel.

Point Enter another offset point, or click Cancel if you have finished entering offset points.

What Happens Next "Sight" Survey will respond to correct and sufficient data by computing the arc's center point and end point; and then printing the center point number and coordinates; the central angle, arc, radius, tangent, chord length and chord bearing; and the arc end point number and coordinates.

Following a correct offset entry, "Sight" Survey will print the bearing and distance to the offset point, the offset point number, description, and coordinates.

Example For an **Inscribe Arc** example, see page 295.

10.08 Inscribe Arc Tangent from the PI with Offsets

FUNCTION: The **Inscribe Arc Tangent from the PI with Offsets** routine is used to compute the point of curvature, center point and end point of a tangent arc from a known point of intersection, and then set radial offsets to the curve end point.

To access the **Inscribe Arc Tangent from the PI with Offsets** routine, type **IA** and select the item from the menu, or press Alt C, I, F.

This routine may be solved by any of the following criteria:

Delta & Chord known;	*Chord & Tangent known;*
Delta & Arc known;	*Chord & Radius known;*
Delta & Tangent known;	*Arc & Radius known;*
Delta & Radius known;	*Tangent & Radius known.*

Enter data for at least two of these known items. If you have additional data, you may enter it but it is not necessary to do so. Insufficient data will result in an incorrect solution.

P.I. This is the currently occupied point, which is also the PI. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

P.C. Enter the desired point number.

Center Point Enter the desired point number.

End Point Enter the desired point number.

Delta Enter the delta angle. If unknown, just press ↵Enter.

Chord Enter the chord length. If unknown, just press ↵Enter.

Arc Enter the arc length. If unknown, just press ↵Enter.

Tangent Enter the tangent length. If unknown, just press ↵Enter.

Radius Enter the radius length. If unknown, just press ↵Enter.

Enter Curve Direction Press 0 if the curve proceeds to the left, otherwise press 1. The direction of the curve is relative to the forward direction of travel.

Point Enter a number for the offset point.

O.S. Dist. Enter the distance from the curve to the offset, as a negative value to offset to the left, relative to the direction of travel.

Point Enter another offset point, or click Cancel if you have finished entering offset points.

What Happens Next

"Sight" Survey will respond to correct and sufficient data by computing the arc's PC, center point, and end point; and then printing the PC point number and coordinates; the center point number and coordinates; the central angle, arc, radius, tangent, chord length and chord bearing; and the arc end point number and coordinates.

Following a correct offset entry, "Sight" Survey will print the bearing and distance to the offset point, the offset point number, description, and coordinates.

Example

For an **Inscribe Arc** example, see page 295.

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10.09 Inscribe Arc ➪Non-Tangent from the PC with Offsets

FUNCTION: The **Inscribe Arc ➪Non-Tangent from the PC with Offsets** routine is used to compute the center point and end point of a non-tangent arc from a known point of curvature, and then set offsets to the curve end point.

To access the **Inscribe Arc ➪ Non-Tangent from the PC with Offsets** routine, type **IA** and select the item from the menu, or press Alt C, 1, S.

P.C. This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point Enter the desired point number.

End Point Enter the desired point number.

Delta Enter the delta angle. If unknown, just press ↵Enter.

Chord Enter the chord length. If unknown, just press ↵Enter.

Arc Enter the arc length. If unknown, just press ↵Enter.

Tangent Enter the tangent length. If unknown, just press ↵Enter.

Radius Enter the radius length. If unknown, just press ↵Enter.

Enter Curve Direction Press 0 if the curve proceeds to the left, otherwise press 1. The direction of the curve is relative to the forward direction of travel.

Enter the Chord Bearing Enter the chord bearing.

Point Enter a number for the offset point.

O.S. Dist. Enter the distance from the curve to the offset. Enter the distance as a negative value to offset to the left, relative to the direction of travel.

Point Enter another offset point, or click Cancel if you have finished entering offset points.

What Happens Next "Sight" Survey will respond to correct and sufficient data by computing the arc's center point and end point; and then printing the center point number and coordinates; the central angle, arc, radius, tangent, chord length and chord bearing; and the arc end point number and coordinates.

Following a correct offset entry, "Sight" Survey will print the bearing and distance to the offset point, the offset point number, description, and coordinates.

Example

For an **Inscribe Arc** example, see page 295.

10.10 Traverse Arc (TA)

FUNCTION: The **Traverse Arc** routine is used to compute the coordinates of a point lying along an arc when given the coordinates of the point of curvature, the coordinates of the center point of the arc and one other of the following four parameters: the arc length; the chord length; the tangent length; or the central angle (delta) of the arc.

To access the **Traverse Arc** routine, type **TA** from the menu, or press Alt C, T.

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From Point

This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point

Enter the number of the center point of the arc.

To Point

Enter the number of the point you which you are traversing.

Value

Enter the known item of data, (Arc, Chord, Tangent or Delta). The numeric sign of the data entered determines the direction to be traversed. If you are traversing in a CLOCKWISE direction, enter your data as POSITIVE value. Use a NEGATIVE value if you are traversing COUNTER-CLOCKWISE.

Select one of the following Options
1) Arc 2) Chord
3) Tangent 4) Delta

Enter 1, 2, 3, or 4 to indicate the type of data entered in the previous prompt.

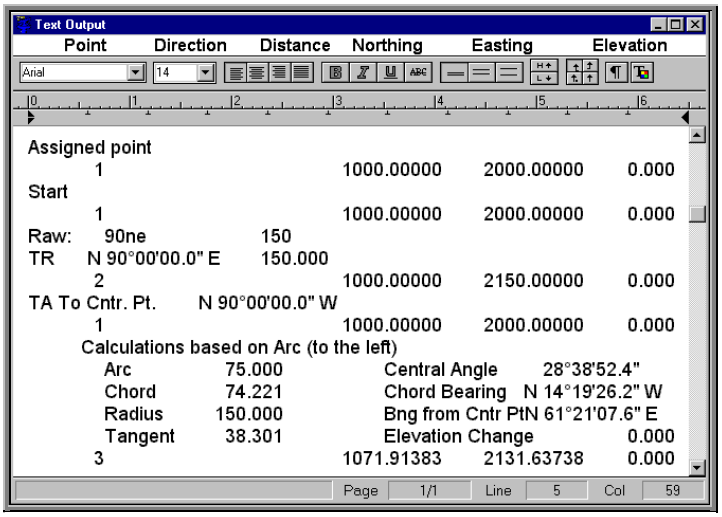
What Happens Next

The program will compute the coordinates for the new PT point, print the Central Angle, Radius, Arc, and Tangent Length, Chord and Chord Bearing from PC to the PT.

At this point, two events have occurred. The PT has become the currently occupied point, which is also the new PC should you continue to traverse along the arc. Also, the bearing from the PT back to the Center Point is now the reference bearing, if one is needed for the next calculation. Therefore, to proceed away from the PT tangent to the traversed arc, you would enter the **Traverse** routine (**TR** - page 265) and input an angle of **90** degrees **AR** or **AL** as the case may be.

Example

Enter & Assign point 1 (the arc center point) and **Traverse** to point 2 (the PC). **Traverse Arc** from point 2 to point 3 using a 75 foot arc. Enter the arc length as **-75** to make the arc curve to the left.



10.11 Traverse Arc with Offsets (AO)

FUNCTION: The **Traverse Arc with Offsets** routine is used to compute the coordinates of a point lying along an arc when given the coordinates of the point of curvature, the coordinates of the center point of the arc and one other of the following four parameters: the arc length; the chord length; the tangent length; or the central angle (delta) of the arc. This routine will also set offset points at the curve end point.

To access the **Traverse Arc with Offsets** routine, type **AO** from the menu, or press Alt C, A.

From Point

This is the currently occupied point, which is also the PC. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point

Enter the number of the center point of the arc.

To Point

Enter the number of the point to which you are traversing.

Value

Enter the known item of data, (Arc, Chord, Tangent or Delta). The numeric sign of the data entered determines the direction to be traversed. If you are traversing in a CLOCKWISE direction, enter your data as POSITIVE value. Use a NEGATIVE value if you are traversing COUNTER-CLOCKWISE.

Select one of the following Options
1) Arc 2) Chord
3) Tangent 4) Delta

Enter 1, 2, 3, or 4 to indicate the type of data entered in the previous prompt.

Point

Enter a number for the offset point.

O.S. Dist.

Enter the distance from the curve to the offset. Enter the distance as a negative value to offset to the left, relative to the direction of travel.

Point

Enter another offset point, or click Cancel if you have finished entering offset points.

Section 10

What Happens Next

The program will compute the coordinates for the new PT point, print the Central Angle, Radius, Arc, and Tangent Length, Chord and Chord Bearing from PC to the PT.

At this point, two events have occurred. The PT has become the currently occupied point, which is also the new PC should you continue to traverse along the arc. Also, the bearing from the PT back to the Center Point is now the reference bearing, if one is needed for the next calculation. Therefore, to proceed away from the PT tangent to the traversed arc, you would enter the **Traverse** routine (**TR** - page 265) and input an angle of **90** degrees **AR** or **AL** as the case may be.

Following a correct offset entry, "Sight" Survey will print the bearing and distance to the offset point, the offset point number, description, and coordinates.

Example

Except for placing offset points, this routine functions similar to the **Traverse Arc** routine discussed in the previous section. Refer to the **Traverse Arc** example.

10.12 Curve Offset (CO)

FUNCTION: The **Curve Offset** routine is used to set radial offsets to a point on a curve.

?

This routine requires that a curve be current in memory. *You may only run this routine* ***immediately*** *after setting or accessing a point through the* **Traverse Arc** *(***TA** *- page 303),* **Inverse Curve** *(***IC** *- page 289) or* **Inverse Obtuse Curve** *(***OC** *- page 291) routines. You must currently be in one of these routines to use the* **Curve Offset** *routine.*

To set curve offset points, type **CO** ↵Enter at the prompt for the next curve point.

Point

Enter a name for the offset point.

O.S. Dist.

Enter the distance from the curve to the offset. Enter the distance as a negative value to offset to the left, relative to the direction of travel.

Point

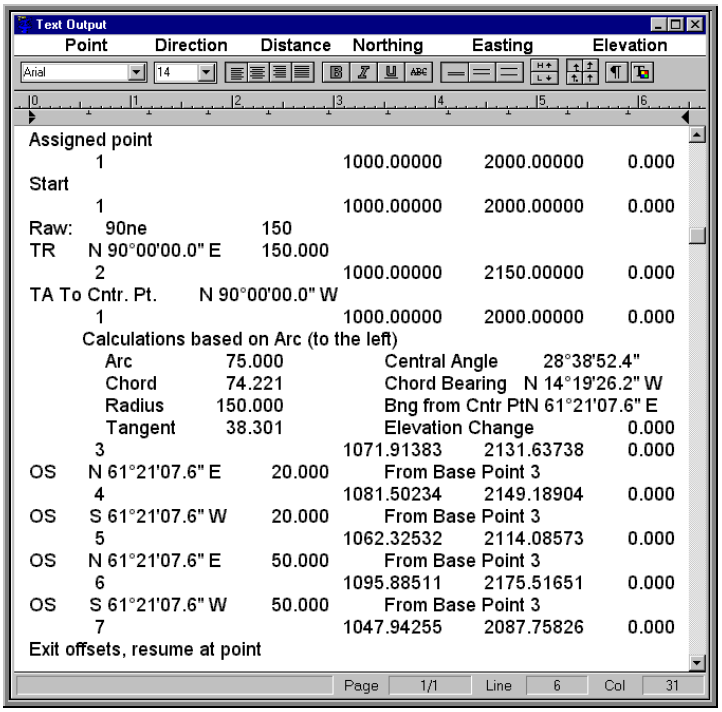
Enter another offset point, or click Cancel if you have finished entering offset points.

What Happens Next

Following a correct offset entry. "Sight" Survey will print the bearing and distance to the offset point, the offset point number, description, and coordinates.

Example

After running the curve in the **Traverse Arc** routine (page 303), set curve offsets **20'** left and **50'** right at the PT.



10.13 Best Fit Curve (BC)

FUNCTION: The **Best Fit Curve** routine is used to compute the center point of a curve that best fits a series of points.

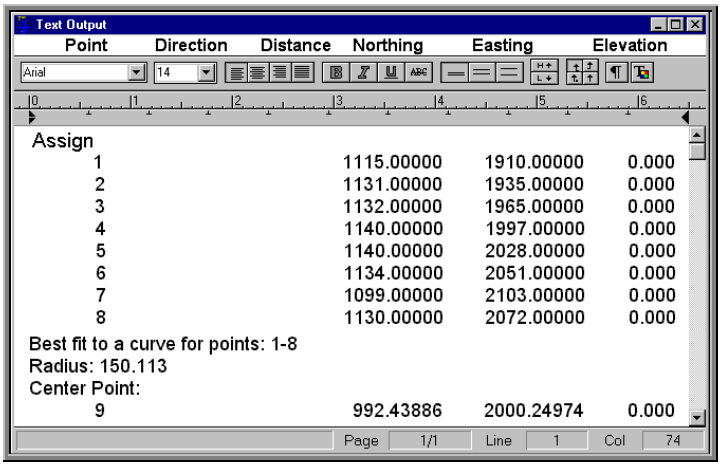
To access the **Best Fit Curve** routine, press Alt C, B, or type **BC**.

Points — Type in individual point numbers or a point string and press Enter.

Point on Line — Type in a point number that will be assigned to a location marking the center point of the best fit curve, and press Enter.

What Happens Next — "Sight" Survey will respond by computing and printing the coordinates of the best fit curve center point, and the radius length of the curve.

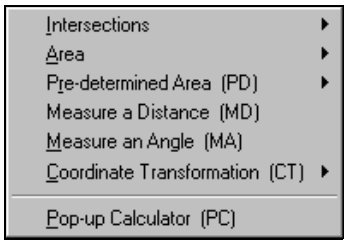
Example — **Enter and Assign** the coordinate data for points 1 through 8 as shown below, then compute a **Best Fit Curve** through curve center point 9.



"Sight" Survey 3.0

Section 11

The MISC Menu



The **Misc** menu contains many functions that generally don't fit into one of the other menu categories. Here, among other things, you will find the intersection routines, area and pre-determined area routines, and routines used to rotate and scale coordinates.

11.01 Intersections ➪ Arc-Arc (AA)

FUNCTION: The **Arc-Arc Intersection** routine is used to calculate the coordinates of a point generated by the intersection of two arcs.

To access the **Arc-Arc Intersection** routine, type **AA** in any text box, or press Alt M, I, A.

From Point — This is the currently occupied point, also the arc PC. If you have an occupied point, this box will automatically be filled. Changing the **From Point** is equivalent to running the **Go To** routine.

1st Cntr Pt — Enter the center point of the first arc. After the acceptance of a point number the program will inverse the distance from the first center point to the PC to establish the first radius distance.

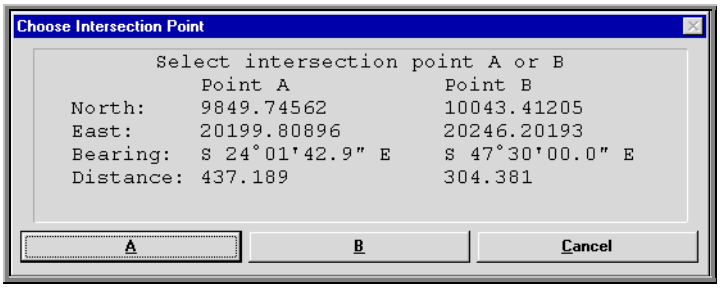
Inter. Point — Enter the number of the intersection point.

2nd Cntr Pt — Enter the center point of the second arc. After the acceptance of a point number the program will inverse the distance from the second center point to the PT to establish the second radius distance.

Close Point — Enter the number of the closing point.

What Happens Next — "Sight" Survey will calculate the solution(s). If there are two solutions to the problem, you will be prompted to select the desired

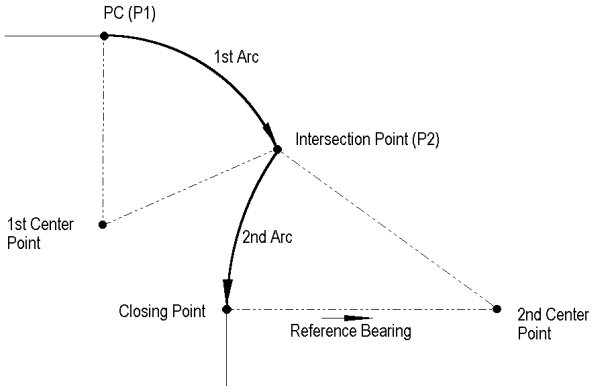
solution by pressing or clicking A or B. The bearing and distance given in the solution is for the chord.

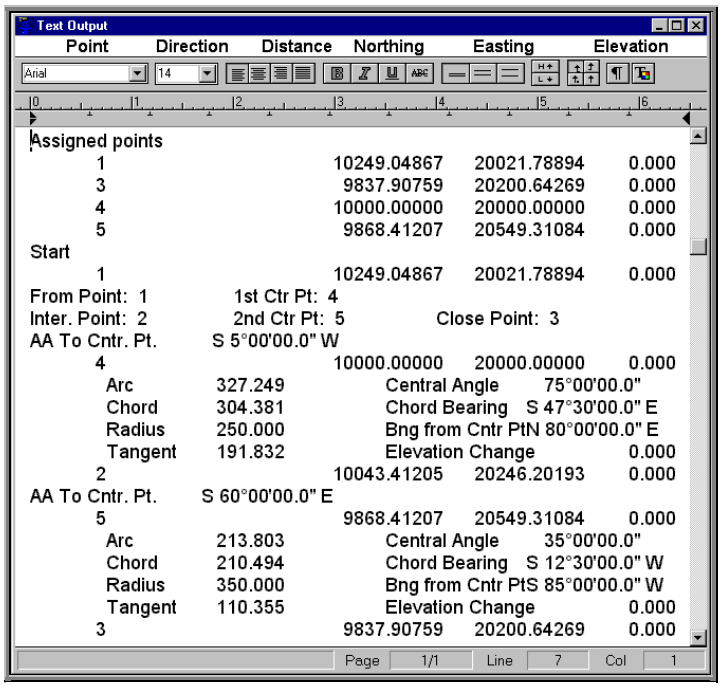


"Sight" Survey will print the Central Angle, Radius, Arc, Tangent Length, Chord and Chord Bearing from the PC to the intersection point, the intersection point number, ID, Northing and Easting, and the Central Angle, Radius, Arc, Tangent Length, Chord and Chord Bearing from the intersection point to the closing point. The closing point becomes the currently occupied point (P1), and the bearing from the closing point to the center point of the second arc becomes the reference bearing.

Example

Enter & Assign point 1 (PC - point P1 below), point 3 (closing point), point 4 (1st center point), and point 5 (2nd center point). **Start** at point 1 and perform an **Arc-Arc Intersection** to determine point 2. Select solution **B**.





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11.02 Intersections ➪Arc-Bearing (AB)

FUNCTION: The **Arc-Bearing Intersection** routine is used to calculate the coordinates of a point generated by the intersection of an arc with a line of known bearing.

To access the **Arc-Bearing Intersection** routine, type **AB** in any text box, or press Alt M, I, R.

From Point

This is the currently occupied point, in this case the PC of the arc. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Center Point

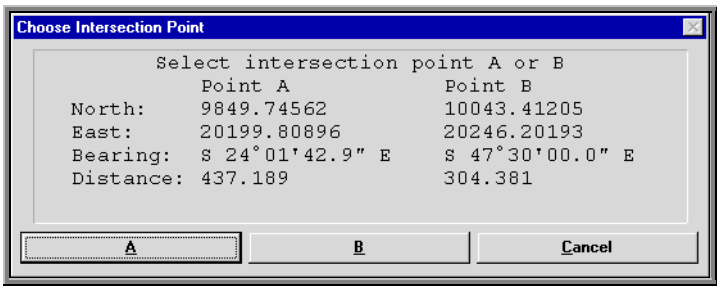
Enter the center point of the arc.

Inter. Point Enter the number of the intersection point.

Bearing Enter a bearing, angle, deflection or azimuth, or recall a bearing between any two points in memory

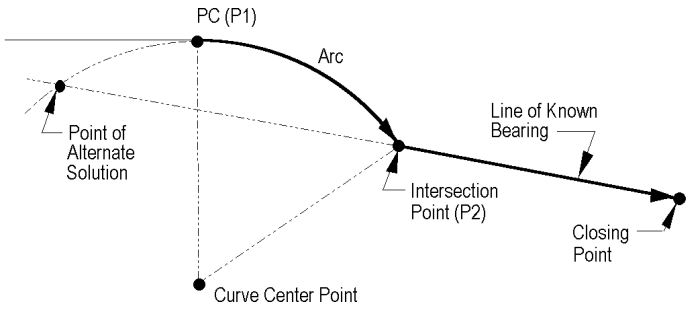
Close Point Enter the number of the closing point of the intersection.

What Happens Next "Sight" Survey will calculate the solution(s). If there are two solutions to the problem, you will be prompted to select the desired solution by pressing or clicking A or B. The bearing and distance given in the solution is for the chord.



"Sight" Survey will print the Central Angle, Radius, Arc, Tangent Length, Chord and Chord Bearing from the PC to the intersection point, the intersection point number, ID, Northing and Easting, and the bearing and horizontal distance from the intersection point to the closing point. The closing point becomes the currently occupied point (P1), and the bearing from the intersection point to the closing point becomes the reference bearing.

Example **Enter & Assign** point 1 (PC - point P1 below), point 4 (curve center point), and point 5 (closing point). **Start** at point 1 and perform an **Arc-Bearing Intersection** to determine point 2. Use a bearing of **60°SE**. Select solution **B**.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			10249.04867	20021.78894	0.000
3			9837.90759	20200.64269	0.000
4			10000.00000	20000.00000	0.000
5			9868.41207	20549.31084	0.000
Start					
1			10249.04867	20021.78894	0.000
From Point: 1		Center Point: 4			
Inter. Point: 2		Bearing: 60se		Close Point: 5	
AB To Cntr. Pt.		S 5°00'00.0" W			
4			10000.00000	20000.00000	0.000
Arc	327.249		Central Angle	75°00'00.0"	
Chord	304.381		Chord Bearing	S 47°30'00.0" E	
Radius	250.000		Bng from Cntr Pt	N 80°00'00.0" E	
Tangent	191.832		Elevation Change		0.000
2			10043.41208	20246.20193	0.000
AB	S 60°00'00.0" E	350.000			
5			9868.41207	20549.31084	0.000

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11.03 Intersections ➪Arc-Distance (AD)

FUNCTION: The **Arc-Distance Intersection** routine is used to calculate the coordinates of a point generated by the intersection of an arc with a line of known distance.

To access the **Arc-Bearing Intersection** routine, type **AD** in any text box, or press Alt M, I, B.

From Point This is the currently occupied point, in this case the PC of the arc. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

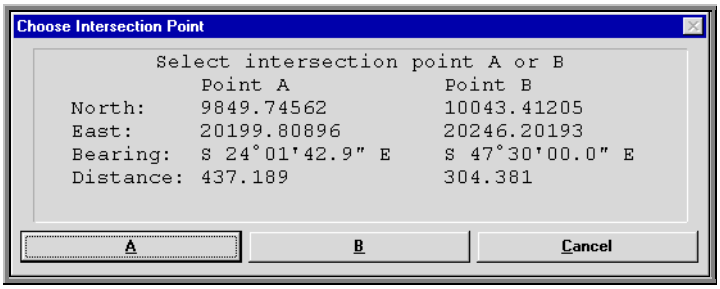
Center Point Enter the center point of the arc.

Inter. Point Enter the number of the intersection point.

Distance Enter the horizontal distance, or recall a distance between two existing points. Do not enter a slope distance.

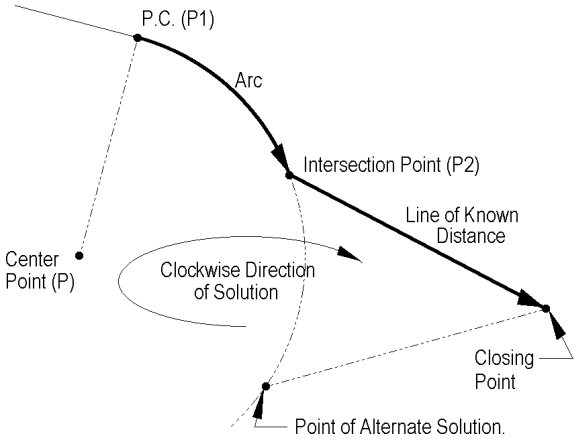
Close Point Enter the number of the closing point of the intersection problem.

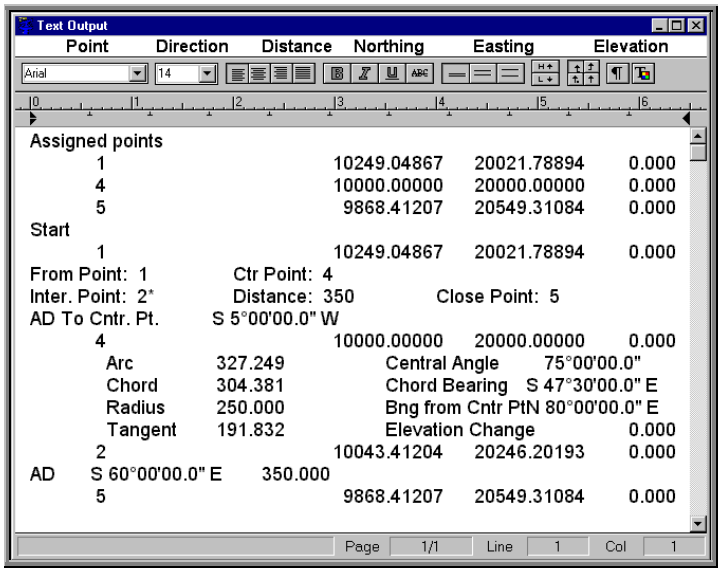
What Happens Next "Sight" Survey will calculate the solution(s). If there are two solutions to the problem, you will be prompted to select the desired solution by pressing or clicking [A] or [B]. The bearing and distance given in the solution is for the chord.



"Sight" Survey will print the Central Angle, Radius, Arc, Tangent Length, Chord and Chord Bearing from the PC to the intersection point, the intersection point number, ID, Northing, Easting and elevation, and the bearing, horizontal distance, and difference in elevation from the intersection point to the closing point. The closing point becomes the currently occupied point, and the bearing from the intersection point to the closing point becomes the reference bearing.

Example **Enter & Assign** point 1 (PC - point P1 below), point 4 (curve center point), and point 5 (closing point). **Start** at point 1 and perform an **Arc-Distance Intersection** to determine point 2. Use a distance of **350'**. Select solution **B**.





Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			10249.04867	20021.78894	0.000
4			10000.00000	20000.00000	0.000
5			9868.41207	20549.31084	0.000
Start					
1			10249.04867	20021.78894	0.000
From Point: 1		Ctr Point: 4			
Inter. Point: 2*		Distance: 350		Close Point: 5	
AD To Cntr. Pt.		S 5°00'00.0" W			
4			10000.00000	20000.00000	0.000
Arc	327.249		Central Angle	75°00'00.0"	
Chord	304.381		Chord Bearing	S 47°30'00.0" E	
Radius	250.000		Bng from Cntr Pt	N 80°00'00.0" E	
Tangent	191.832		Elevation Change		0.000
2			10043.41204	20246.20193	0.000
AD	S 60°00'00.0" E	350.000			
5			9868.41207	20549.31084	0.000

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11.04 Intersections ➪Bearing-Arc (BA)

FUNCTION: The **Bearing-Arc Intersection** routine is used to calculate the coordinates of a point generated by the intersection of a line of known bearing with an arc.

To access the **Bearing-Arc Intersection** routine, type **BA** in any text box, or press Alt M, I, B.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Bearing

Enter the bearing, angle, deflection or azimuth in your pre-specified format, or recall a bearing between any two points in memory.

Inter. Point

Enter the number of the intersection point.

Center Point

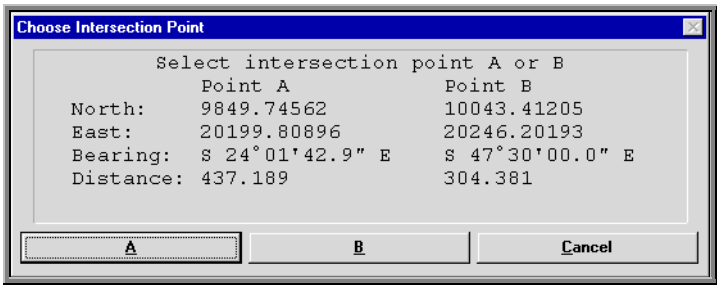
Enter the center point of the arc.

Close Point

Enter the number of the closing point of the intersection problem.

What Happens Next

"Sight" Survey will calculate the solution(s). If there are two solutions to the problem, you will be prompted to select the desired solution by pressing or clicking A or B. The bearing and distance given in the solution is for the chord.

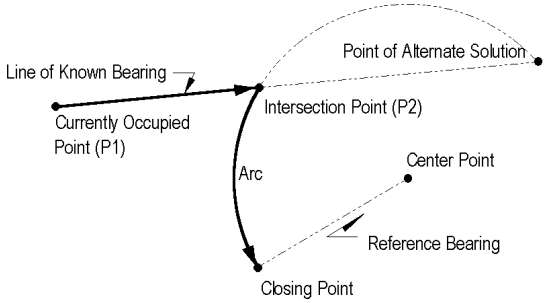


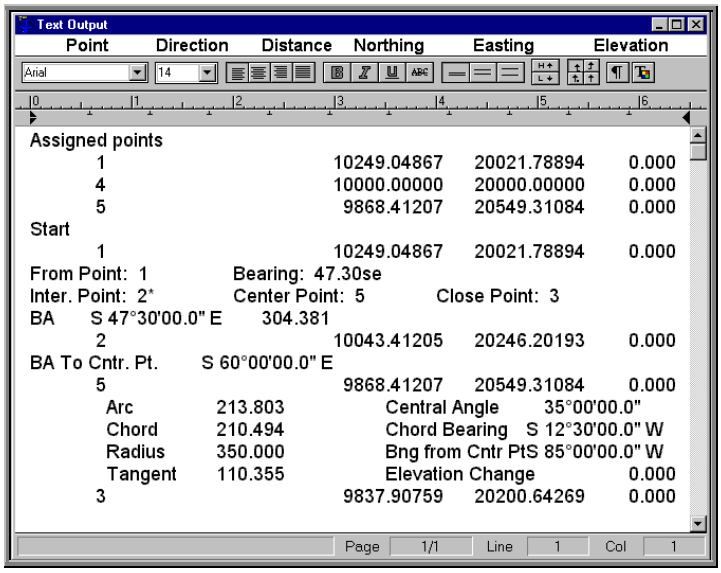
"Sight" Survey will print the Central Angle, Radius, Arc, Tangent Length, Chord and Chord Bearing from the PC to the intersection point, the intersection point number, ID, Northing and Easting, and

the bearing and horizontal distance from the intersection point to the closing point. The closing point becomes the currently occupied point, and the bearing from the intersection point to the closing point becomes the reference bearing.

Example

Enter & Assign point 1 (point P1 below), point 3 (closing point), and point 5 (arc center point). **Start** at point 1 and perform an **Bearing-Arc Intersection** to determine point 2. Use a distance of **47°30'SE**. Select solution **B**.





11.05 Intersections ➔Bearing-Bearing (BB)

FUNCTION: The **Bearing-Bearing Intersection** routine is used to calculate the coordinates of a point generated by the intersection of two lines of known bearing.

To access the **Bearing-Bearing Intersection** routine, type **BB** in any text box, or press Alt M, I, E.

From Point — This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Bearing — Enter the bearing, angle, deflection or azimuth in your pre-specified, or recall a bearing between any two points in memory.

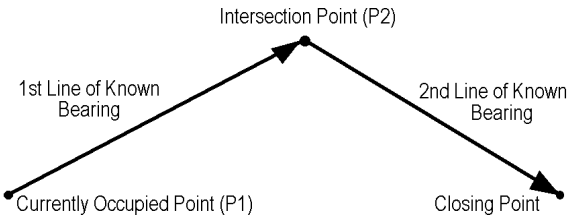
Inter. Point — Enter the number of the intersection point.

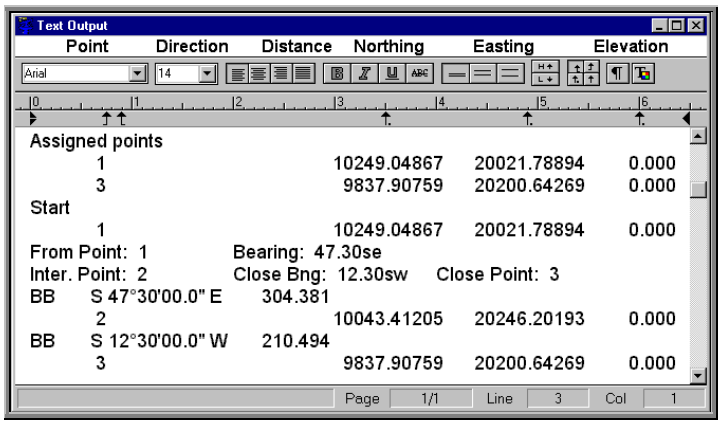
Close Bng — Enter the bearing, angle, deflection or azimuth in your pre-specified, or recall a bearing between any two points in memory.

Close Point — Enter the number of the closing point of the intersection problem.

What Happens Next — "Sight" Survey will print the bearing and horizontal distance from the currently occupied point to the intersection point, the intersection point number, ID, Northing and Easting, and the bearing and horizontal distance from the intersection point to the closing point. The closing point becomes the currently occupied point, and the bearing from the intersection point to the closing point becomes the reference bearing.

Example — **Enter & Assign** point 1 (point P1 below) and point 3 (closing point). **Start** at point 1 and perform an **Bearing-Bearing Intersection** to determine point 2. Use an initial bearing of **47°30'SE**., and a final bearing of **12°30'SW**.





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11.06 Intersections Bearing-Distance (BD)

FUNCTION: The **Bearing-Distance Intersection** routine is used to calculate the coordinates of a point generated by the intersection of a line of known bearing with a line of known distance.

To access the **Bearing-Distance Intersection** routine, type **BD** in any text box, or press Alt M, I, I.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

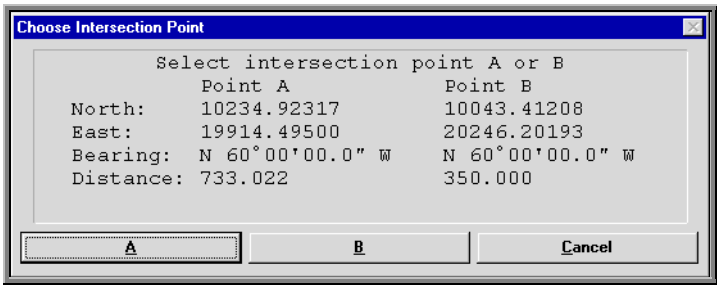
Bearing Enter the bearing, angle, deflection or azimuth in your pre-specified format, or recall a bearing between any two points in memory.

Inter. Point Enter the number of the intersection point.

Close Dist Enter the horizontal distance, or recall a distance between two existing points. Do not enter a slope distance.

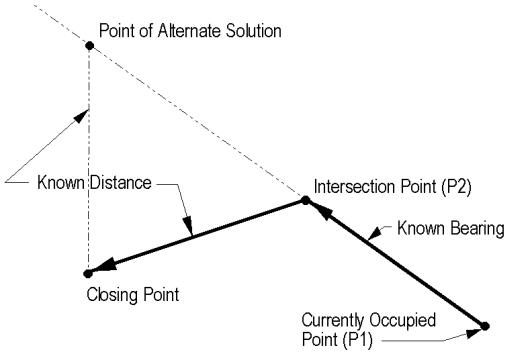
Close Point Enter the number of the closing point of the intersection problem.

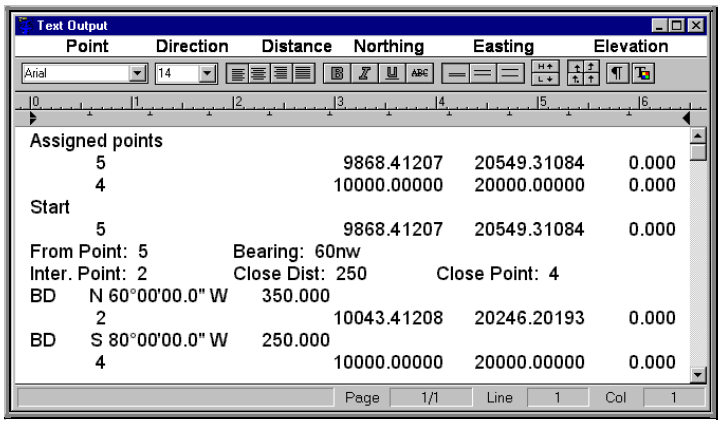
What Happens Next "Sight" Survey will calculate the solution(s). If there are two solutions to the problem, you will be prompted to select the desired solution by pressing or clicking A or B.



"Sight" Survey will print the bearing and horizontal distance from the currently occupied point to the intersection point, the intersection point number, ID, Northing and Easting, and the bearing and horizontal distance from the intersection point to the closing point. The closing point becomes the currently occupied point, and the bearing from the intersection point to the closing point becomes the reference bearing.

Example **Enter & Assign** point 5 (point P1 below) and point 4 (closing point P3). **Start** at point 5 and perform an **Bearing-Distance Intersection** to determine point 2. Use an initial bearing of **60°NW**, and a distance of **250'**. Select solution **B**.





Section 11

11.07 Intersections ➪ Distance-Arc (DA)

FUNCTION: The **Distance-Arc Intersection** routine is used to calculate the coordinates of a point generated by the intersection of an arc with a line of known bearing.

To access the **Distance-Arc Intersection** routine, type **DA** in any text box, or press Alt M, I, D.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

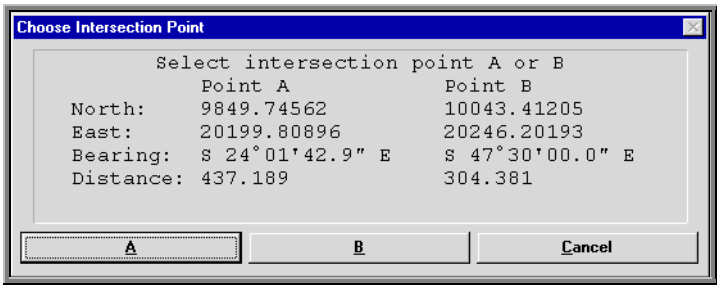
Distance Enter the horizontal distance, or recall a distance between two existing points. Do not enter a slope distance.

Inter. Point Enter the number of the intersection point.

Arc Cntr Pt Enter the center point of the arc.

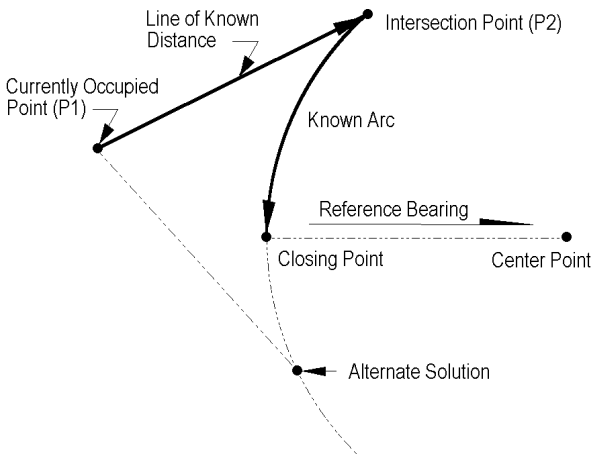
Close Point Enter the number of the closing point of the intersection problem.

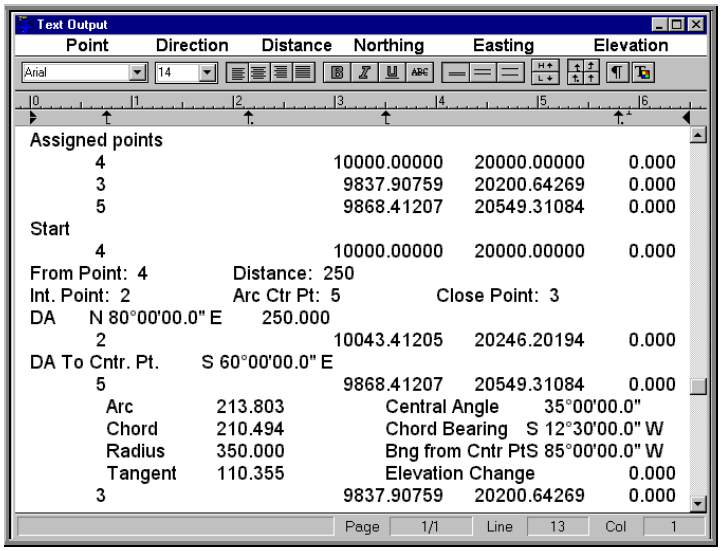
What Happens Next "Sight" Survey will calculate the solution(s). If there are two solutions to the problem, you will be prompted to select the desired solution by pressing or clicking A or B.



"Sight" Survey will print the bearing, horizontal distance, and the difference in elevation from the currently occupied point to the intersection point, the intersection point number, ID, Northing, Easting and elevation, and the Central Angle, Radius, Arc, Tangent, Chord and Chord Bearing from the intersection point to the closing point. The closing point becomes the currently occupied point, and the bearing from the closing point to the center point of the arc becomes the reference bearing.

Example **Enter & Assign** point 4 (point P1 below) and point 3 (closing point), and point 5 (arc center point). **Start** at point 4 and perform a **Distance-Arc Intersection** to determine point 2. Use a distance of **250'**. Select solution **B**.





Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
4			10000.00000	20000.00000	0.000
3			9837.90759	20200.64269	0.000
5			9868.41207	20549.31084	0.000
Start					
4			10000.00000	20000.00000	0.000
From Point: 4		Distance: 250			
Int. Point: 2		Arc Ctr Pt: 5		Close Point: 3	
DA	N 80°00'00.0" E	250.000			
2			10043.41205	20246.20194	0.000
DA To Cntr. Pt.	S 60°00'00.0" E				
5			9868.41207	20549.31084	0.000
Arc	213.803	Central Angle	35°00'00.0"		
Chord	210.494	Chord Bearing	S 12°30'00.0" W		
Radius	350.000	Bng from Cntr Pt	S 85°00'00.0" W		
Tangent	110.355	Elevation Change	0.000		
3			9837.90759	20200.64269	0.000

Page 1/1 Line 13 Col 1

11.08 Intersections ➔Distance-Bearing (DB)

FUNCTION: The **Distance-Bearing Intersection** routine is used to calculate the coordinates of a point generated by the intersection of a line of known distance with a line of known bearing.

To access the **Distance-Bearing Intersection** routine, type **DB** in any text box, or press Alt M, I, S.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Distance

Enter the horizontal distance, or recall a distance between two existing points. Do not enter a slope distance.

Inter. Point

Enter the number of the intersection point.

Close Bng

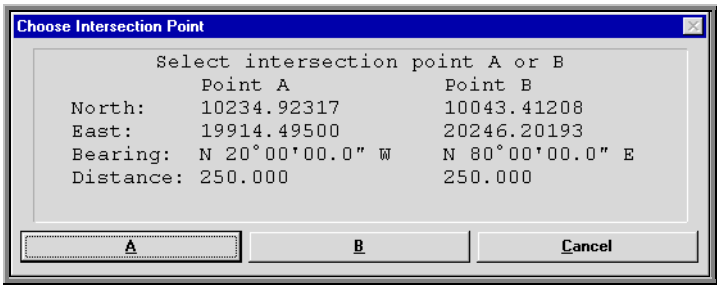
Enter the bearing, angle, deflection or azimuth, or recall a bearing between any two points in memory.

Close Point

Enter the number of the closing point of the intersection problem.

What Happens Next

"Sight" Survey will calculate the solution(s). If there are two solutions to the problem, you will be prompted to select the desired solution by pressing or clicking A or B.

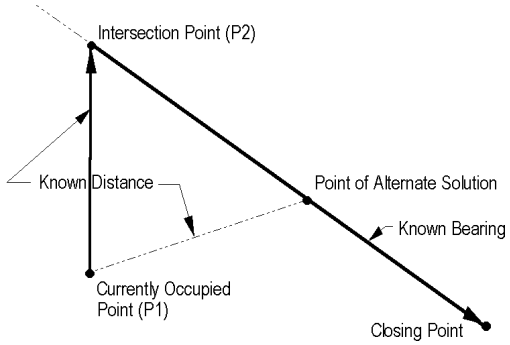


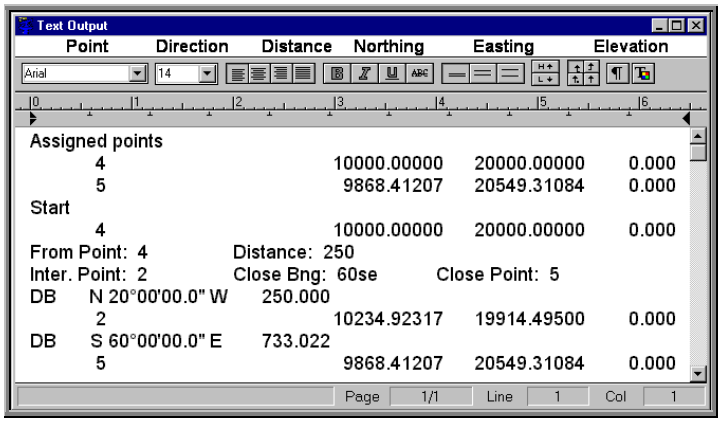
"Sight" Survey will print the bearing, horizontal distance, and the difference in elevation from the currently occupied point to the intersection point, the intersection point number, ID, Northing,

Easting and elevation, and the bearing, horizontal distance, and the difference in elevation from the intersection point to the closing point. The closing point becomes the currently occupied point, and the bearing from the intersection point to the closing point becomes the reference bearing.

Example

Enter & Assign point 4 (point P1 below) and point 5 (closing point). **Start** at point 4 and perform a **Distance-Bearing Intersection** to determine point 2. Use a distance of **250'**, and a bearing of **60°SE** Select solution **A**.





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11.09 Intersections ➔Distance-Distance (DD)

FUNCTION: The **Distance-Distance Intersection** routine is used to calculate the coordinates of a point generated by the intersection of to lines of known distance.

To access the **Distance-Distance Intersection** routine, type **DD** in any text box, or press Alt M, I, T.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Distance

Enter the horizontal distance, or recall a distance between two existing points. Do not enter a slope distance.

Inter. Point

Enter the number of the intersection point.

Close Dist

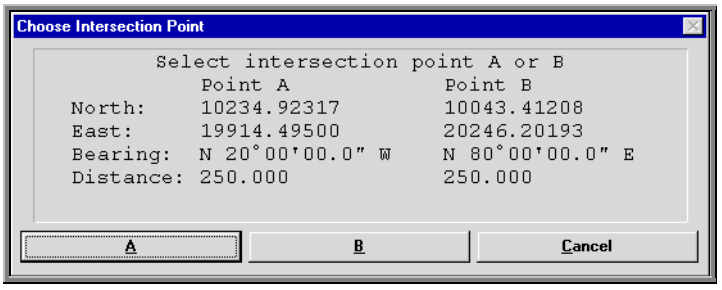
Enter the horizontal distance, or recall a distance between two existing points. Do not enter a slope distance.

Close Point

Enter the number of the closing point of the intersection problem.

What Happens Next

"Sight" Survey will calculate the solution(s). If there are two solutions to the problem, you will be prompted to select the desired solution by pressing or clicking A or B.

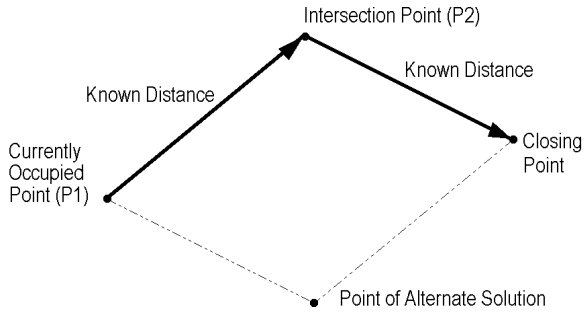


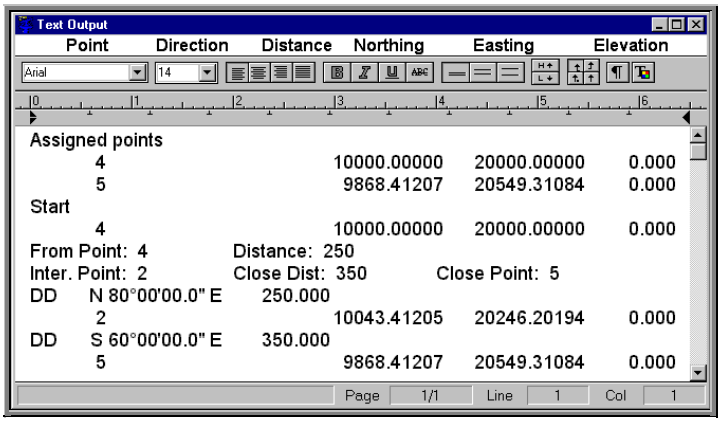
"Sight" Survey will print the bearing, horizontal distance, and the difference in elevation from the currently occupied point to the intersection point, the intersection point number, ID, Northing, Easting and elevation, and the bearing, horizontal distance, and the

difference in elevation from the intersection point to the closing point. The closing point becomes the currently occupied point, and the bearing from the intersection point to the closing point becomes the reference bearing.

Example

Enter & Assign point 4 (point P1 below) and point 5 (closing point). **Start** at point 4 and perform a **Distance-Distance Intersection** to determine point 2. Use distances of **250'** and **350'** Select solution **B**.





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11.10 Intersections ➔ Perpendicular Offset (PO)

FUNCTION: The **Perpendicular Offset** routine is used to calculate the right angle offset horizontal distance from a point (or points) to a known baseline. The horizontal distance along the baseline from the currently occupied point to the point(s) of intersection is also calculated.

To access the **Perpendicular Offset** routine, type **PO** in any text box, or press Alt M, I, P.

Base Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **Base Point** is equivalent to running the **Go To** routine.

Bearing

Type the bearing of the baseline as it travels away from the base point. This bearing may also be a recalled bearing.

Offset Pts

Type a point number or point string.

What Happens Next

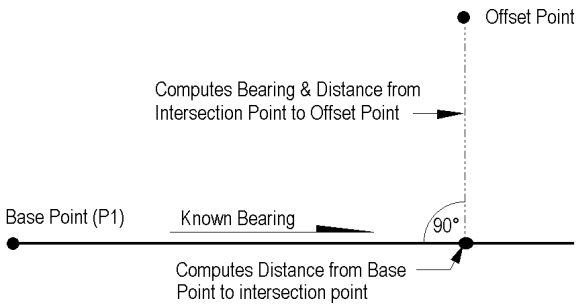
"Sight" Survey will compute report the baseline and offset distance. Continue entering points as needed. If you have entered a point string and the routine encounters an undefined point, the point will be skipped.

Coordinates of the last intersection point are not retained. You can enter this point using **Edit Coordinates** (**EC** - page 225).

The tolerance used to determine if a point should be considered to be on the line during a perpendicular offset is user-defineable. An entry labeled **POBNGDIFF** *in the* **COGO.INI** *file controls the tolerance. If the difference between the input bearing and the bearing from the base point to the OS point is less than this value, the point is considered to be on the line. The default value for* **POBNGDIFF** *is 0.000001 degrees. If you wish to change this default, you must use a text editor to do so.*

Example

Except for stationing, this routine functions identically to the **Line Station & Offset Intersection** discussed on page 331.



11.11 Intersections ➪ Offset Intersection (OI)

FUNCTION: The **Offset Intersection** routine is used to calculate the location of a point generated by the intersection of two lines lying at known perpendicular distances from two lines of known bearing.

To access the **Offset Intersection** routine, type `OI` in any text box, or press Alt M, I, O.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Inter. Point

Enter the number of the intersection point.

1st Bng

Enter the bearing, angle, deflection or azimuth, or recall a bearing between any two points in memory.

1st Dist.

Enter a positive or negative horizontal offset distance. The sign of the offset distance is determined by facing the same direction as the 1st bearing and noting whether the intersection point will lie to the right or left of the line. Do not enter a slope distance.

2nd Bng

Enter the bearing, angle, deflection or azimuth, or recall a bearing between any two points in memory. The 2nd offset bearing must lie clockwise from the 1st bearing at an angle of less than 180 degrees.

2nd Dist.

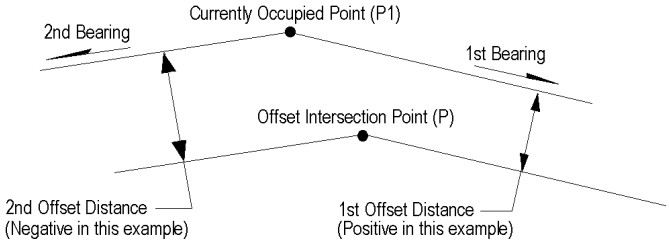
Enter a positive or negative horizontal offset distance. The sign of the offset distance is determined by facing the same direction as the 2nd bearing and noting whether the intersection point will lie to the right or left of the line. Do not enter a slope distance.

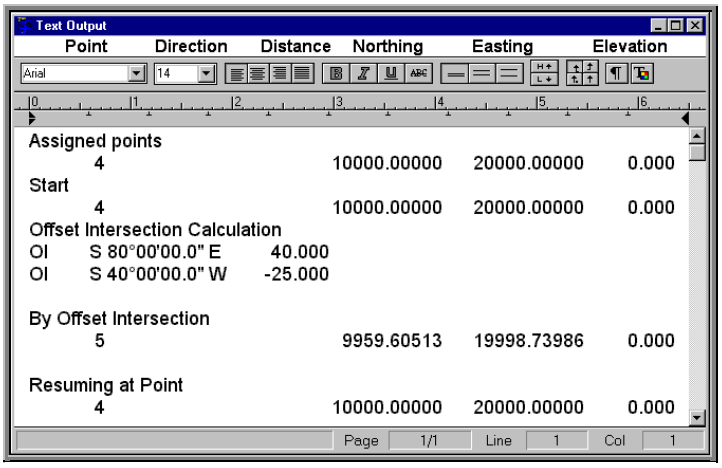
What Happens Next

"Sight" Survey will print the Northing and Easting of the offset intersection point, along with the intersection point number and ID. As a matter of record, the program will also print the 1st and 2nd offset bearings and distances, and also the Northing, Easting and elevation of the point used to set the intersection, along with its point number and ID.

Example

Enter & Assign point 4 (point P1 below). **Start** at point 4 and perform an **Offset Intersection** to determine point 2. Your first bearing and offset are **`80°SE`** and **`40'`** right. Your second bearing and offset are **`40°SW`** and **`-25'`** left.





11.12 Intersections ➪ Line Station and Offset (LS)

FUNCTION: The **Line Station and Offset** routine computes the perpendicular offset distance from a point to a defined baseline and also the baseline station at the point of perpendicular intersection.

To access the **Line Station and Offset** routine, type **LS** in any text box, or press Alt M, I, L.

Base Point

Enter the point number of the beginning of the baseline. This point should also contain the beginning station number as a part of the point name. If no stationing data is available, the station will be assumed to be **0+00**. Stationing may be entered through the **Enter Station** routine (**ES** - page 234). This point defaults to the currently occupied point. Changing the **Base Point** is equivalent to running the **Go To** routine.

Bearing

Enter the bearing of the baseline as it travels away from the base point. This bearing may also be a recalled bearing.

Offset Pts

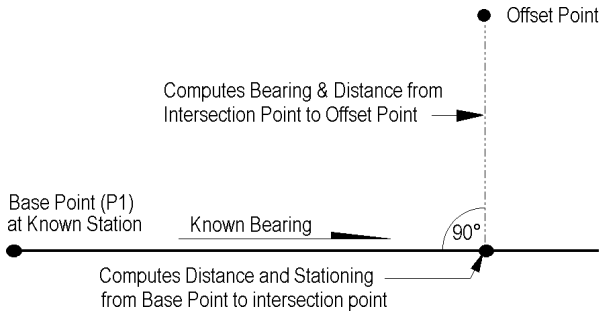
Enter a point number or point string.

What Happens Next

"Sight" Survey will print the station and offset distance. Continue entering points as needed.

Example

Enter & Assign points 1 through 4. **Start** at point 1 and perform a **Line Station & Offset Intersection** to determine the station and offset at points 2, 3 and 4. Your base bearing is **88°NE**.



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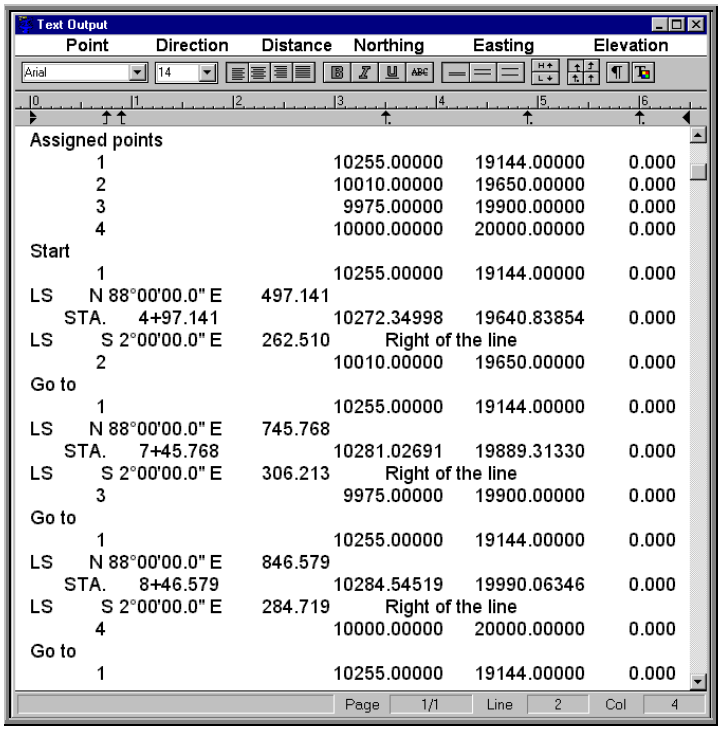


11.13 Intersections ➪Arc Station and Offset (AS)

FUNCTION: The **Arc Station and Offset** routine computes the perpendicular offset distance from a point to a defined arc and also the baseline station at the point of intersection normal to the arc.

To access the **Arc Station and Offset** routine, type **AS** in any text box, or press Alt M, I, N.

Base Point

Enter the point number of the beginning of the arc baseline and press enter. This point should also contain the beginning station number as a part of the point name. If no stationing data is available, the station will be assumed to be **0+00**. Stationing may

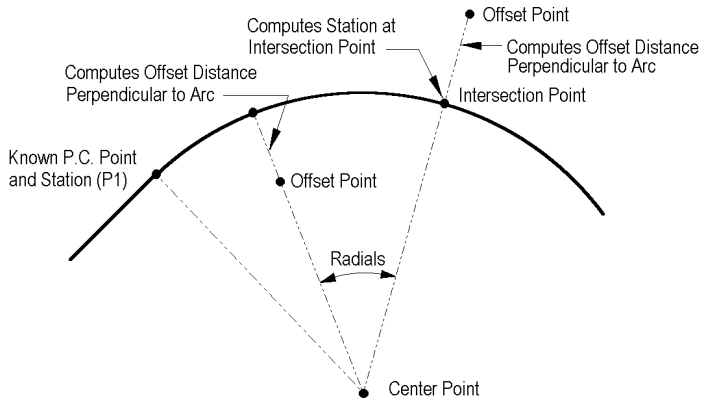
be entered through the **Enter Station** routine (**ES** - page 234). This point defaults to the currently occupied point. Changing the **Base Point** is equivalent to running the **Go To** routine.

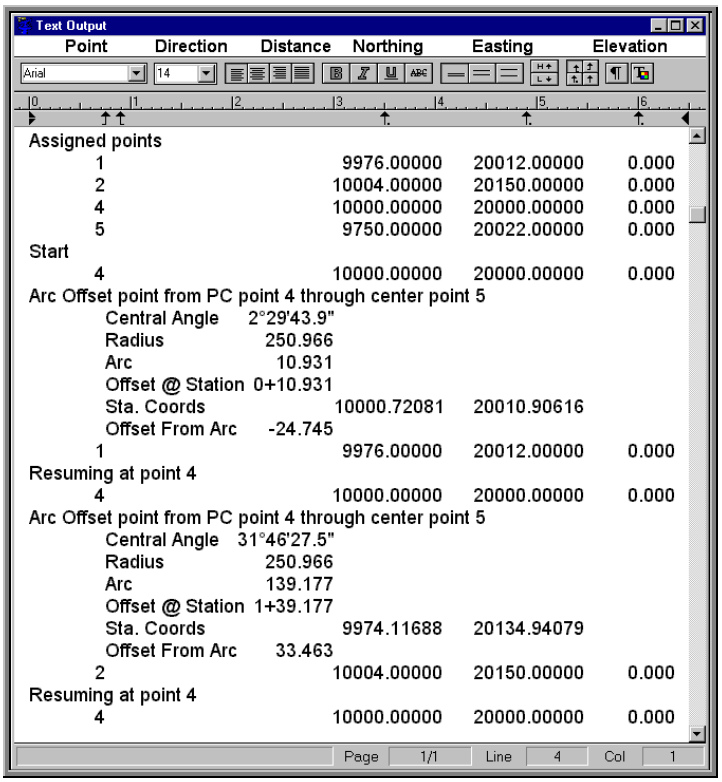
Center Point Enter the point number of the center point of the arc.

Offset Pts Enter a point number or point string.

What Happens Next "Sight" Survey will print the station, offset distance, offset point elevation, and the curve data to the arc station point. The curve data includes the delta angle, arc length and radius. Continue entering points as needed.

Example **Enter & Assign** points 1, 2, 4 (PC - point P1 below), and 5 (center point). **Start** at point 4 and perform an **Arc Station & Offset Intersection** to determine the station and offset at points 1 and 2.





11.14 Area ➪ Area Print Out (AR)

FUNCTION: The **Area Print Out** routine is used to obtain the area in square feet (or meters) of a closed plane figure.

To access the **Area Print Out** routine, type **AR** in any text box, or press Alt M, A, A.

What Happens Next

If you have specified your units of area measurement as **Acres & Square Feet** (on the **COGO Configuration Menu**) the program will print the area in square feet and acres. Likewise, you may choose to report the area in **Hectares & Square Meters** or in **Cuerdas & Square Meters**.

After reporting the area, the internal area accumulator is cleared to make ready for the next calculation. The starting point for the next routine is the same as the last point number entered prior to calling the area routine. If you wish to begin from a different point, use the **Start At** routine (**ST** - page 235).

You may obtain the area of any closed figure, including curves, provided you began your traversed and/or inversed path with the **Start At** routine.

If the subject figure contains any curved segments having a central angle of greater than 180 degrees, you must use the **Inverse Obtuse Curve** routine (**OC** - page 291).

É ***Area calculations are valid only for closed figures.*** *If the Northing and Easting coordinates of your starting point do not match the Northing and Easting coordinates of your ending point, the area calculated and reported by this routine will be grossly inaccurate.*

If you want to place the area text inside a polygon, use the **Start** ➪ **Tools** ➪ **Polygon Area** *function described in* **Section 28.16** *in the* **Drawing Window Reference Manual**.

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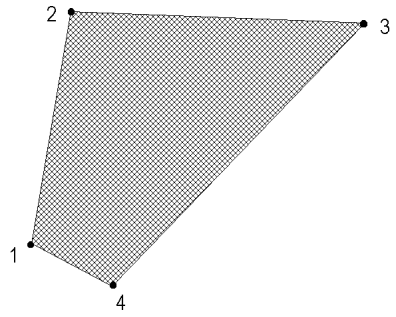
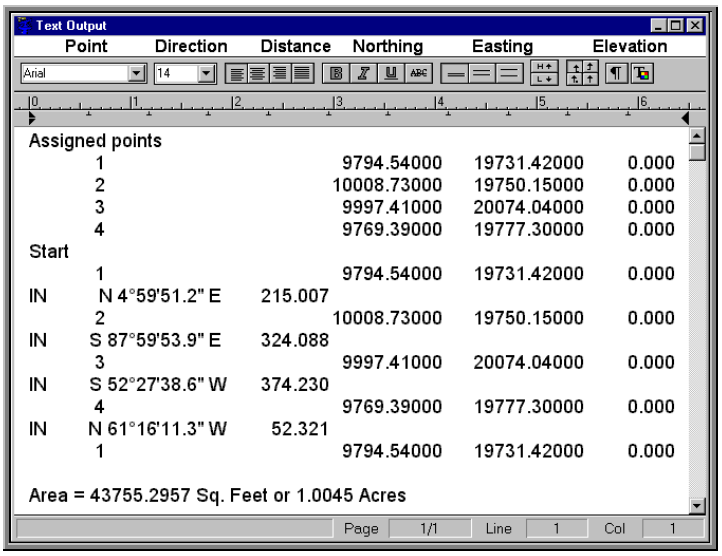
Example

Enter & Assign points 1, 2, 3, and 4. **Start** at point 1 and **Inverse** through points 2, 3, and 4, then back to 1. Type **AR** to get the area.





11.15 Area ➪Point to Point Area (PA)

FUNCTION: The **Point to Point Area** routine is functionally similar to the **Area Printout** routine, except it is used to obtain an enclosed area without printing out the bearings and distances of the boundaries.

To access the **Point to Point Area** routine, type **PA** in any text box, or press Alt M, A, P.

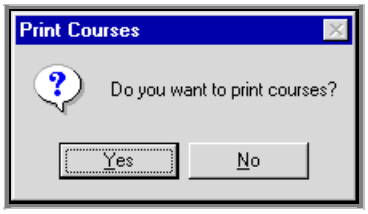
Point String

Type in a point number string and press enter. ***You cannot key in individual points during this routine.*** All entries must be in the form of a point number string.

Unless your last leg is an arc, it is not necessary that your ending point be the same as your starting point, since "Sight" Survey will automatically return to the starting point. If your last leg is an arc, you must include a reference to the starting point after the arc. For example, in the string **7,2,9,8*6,7**, the final **7** tells "Sight" Survey where to stop the arc. If you were obtaining the area of a four

sided tract **1,2,3,4**, you do not need to place a reference to point **1** after the **4**.

Each time you enter this routine, after entering the first point string you will be prompted:



Click **Yes** to print courses, or **No** to just print the point string and area. If you elect to print the courses, this routine is no different from the **Area Print Out** routine. After you have answered this question once, the setting remains in effect until you exit the routine.

What Happens Next

If you have specified your units of area measurement as **Acres & Square Feet** (on the **COGO Configuration Menu**) the program will print the area in square feet and acres. Likewise, you may choose to report the area in **Hectares & Square Meters** or in **Cuerdas & Square Meters**.

After reporting the area, the internal area accumulator is cleared to make ready for the next calculation.

You may obtain the area of any closed figure, including curves, provided you began your inversed path with the **Start At** routine (**ST** - page 235).

?

If the subject figure contains any curved segments having a central angle of greater than 180 degrees, you must inverse through intermediate points along the arc to break down all curves into segments of less than 180 degrees. This may require the assignment and calculation of intermediate points along the arc. Intermediate points may be calculated by using the **Traverse Arc** *routine (**TA** - page 303).*

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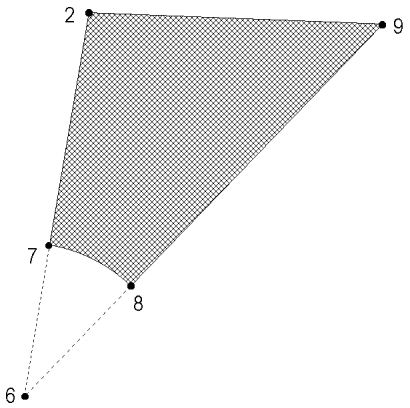
If you want to place the area text inside a polygon, use the **Start ➪ Tools ➪ Polygon Area** *function described in* **Section 28.16** *in the* **Drawing Window Reference Manual**.

Example

Enter & Assign points 2, 6, 7, 8, and 9. Note that you have a curving side from point 7 to point 8. Use **Point to Point Area** with the point string **`7,2,9,8*6,7`** to calculate the area.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
2			10008.72490	19750.15230	0.000
6			9729.79040	19725.74870	0.000
7			9794.54300	19731.41380	0.000
8			9769.39430	19777.29020	0.000
9			9997.41440	20074.04130	0.000

Point to Point Area
Boundary: 7,2,9,8*6,7

Area = 43560.0014 Sq. Feet or 1.0000 Acres

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11.16 Pre-Determined Area 2 Sides Parallel

FUNCTION: The **Pre-Determined Area 2 Sides Parallel** routine is used to compute the length of three sides of a four sided tract of known area. This routine requires the subject tract to have two sides that are parallel. Additionally, the directions of the non-parallel sides and the coordinates of the end points of one of the parallel line segments must be known.

To access the **Pre-Determined Area 2 Sides Parallel** routine, type **PD2** in any text box, or press Alt M, R, 2.

1st Base Point — Enter a point number which defines one end of the base line lying between points P1 and P2.

2nd Base Pt — Enter the point number which defines the other end of the base line.

Pt on line #1 — Enter an identifying point number which will lie on the first line

Pt on line #2 — Enter an identifying point number which will lie on the second line

1st Bearing — Enter the bearing, angle, deflection or azimuth, recall a bearing between any two points in memory, or compute the correct data using the in-line calculator.

2nd Bearing — Enter the bearing, angle, deflection or azimuth, recall a bearing between any two points in memory, or compute the correct data using the in-line calculator.

Req'd Area — Enter the required data in square feet (or square meters if metric).

What Happens Next — If a solution is possible, "Sight" Survey will print the bearing and distance data. The required area will also be printed.

Example — **Enter & Assign** points 1 and 2. Use the **Predetermined Area - Two Sides Parallel** routine to compute a tract having an area of **76230.00** sq. ft., bounded by these lines: Bearing from P2 to P3 - **5°NE**; Bearing from P1 to P4 - **15°NE**.

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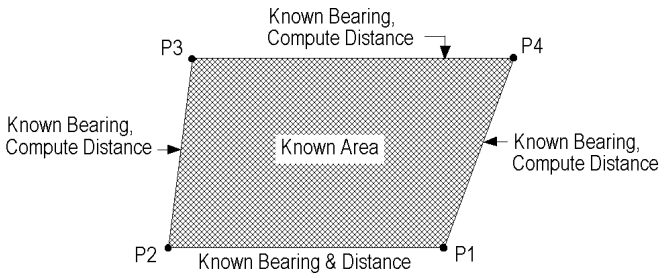

Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			10000.00000	20000.00000	0.000
2			10008.72490	19750.15230	0.000
Predetermined Area					
1			10000.00000	20000.00000	0.000
IN	N 88°00'00.0" W	250.000			
2			10008.72490	19750.15230	0.000
IN	N 15°00'00.0" E	357.351			
4			10353.89967	19842.64160	0.000
IN	S 88°00'00.0" E	187.861			
3			10347.34338	20030.38861	0.000
IN	S 5°00'00.0" W	348.670			
1			10000.00000	20000.00000	0.000

Area = 76230.0000 Sq. Feet or 1.7500 Acres

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11.17 Pre-Determined Area ⇘Line Through a Point

FUNCTION: The **Pre-Determined Area ⇘Line Through a Point** routine is used to compute the length of two sides of a three sided tract of known area. This routine requires the coordinates of the end points of one of the line segments and also the direction of one of the other two line segments.

To access the **Pre-Determined Area ⇘Line Through a Point** routine, type **PDL** in any text box, or press Alt M, R, L.

1st Base Point Enter a point number which defines one end of the base line.

2nd Base Pt — Enter the point number which defines the other end of the base line.

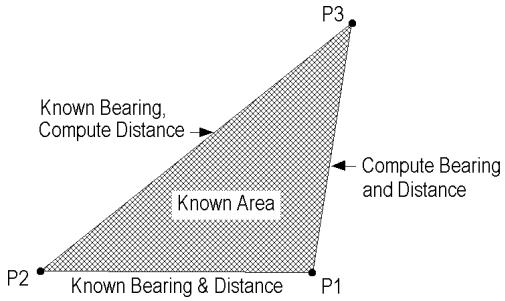
Pt on line #2 — Enter an identifying point number which will lie on the line extending from the second base point.

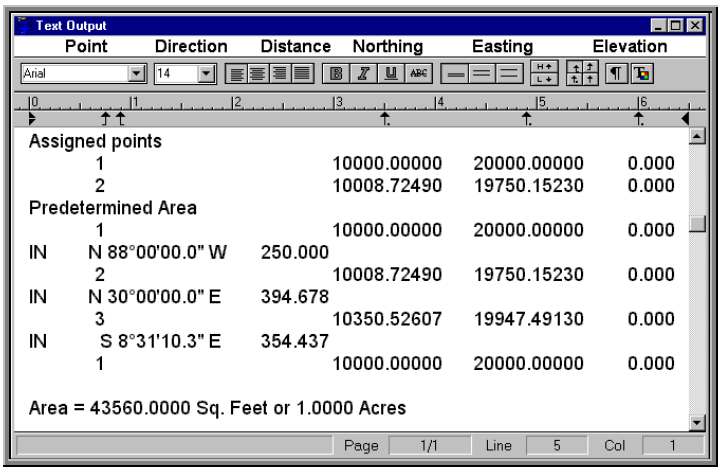
Bearing — Enter the bearing, angle, deflection or azimuth from the second base point to the point on line #2, recall a bearing between any two points in memory, or compute the correct data using the in-line calculator.

Req'd Area — Enter the required data in square feet (or square meters if metric).

What Happens Next — If a solution is possible, "Sight" Survey will print the bearing and distance data. The required area will also be printed.

Example — **Enter & Assign** points 1 and 2. Use **Predetermined Area - Line Through a Point** to compute a tract having an area of **43560.00** sq. ft., bounded by Line 1:2 and a Bearing from P2 to P3 of **30°NE**.





11.18 Pre-Determined Area ➪Radial Sides

FUNCTION: The **Pre-Determined Area ➪Radial Sides** routine is used to compute the three unknown sides of a four sided tract of known area, when the tract has a curved side of known radius. This routine requires the coordinates of the end points of one of the line segments and also the direction of the straight line segment lying adjacent to the known line segment. The coordinates of the center point of the arc must also be known.

To access the **Pre-Determined Area ➪Radial Sides** routine, type **PDR** in any text box, or press Alt M, R, R.

1st Base Point Enter a point number which defines one end of the base line.

2nd Base Pt Enter the point number which defines the other end of the base line.

Pt on line #2 Enter an identifying point number which will lie on the line extending from the second base point.

Pt on Arc #1 Enter an identifying point number which will lie on the arc extending from the first base point.

Radius Point Enter center point number which defines the arc extending from point the first base point to the point on arc #1.

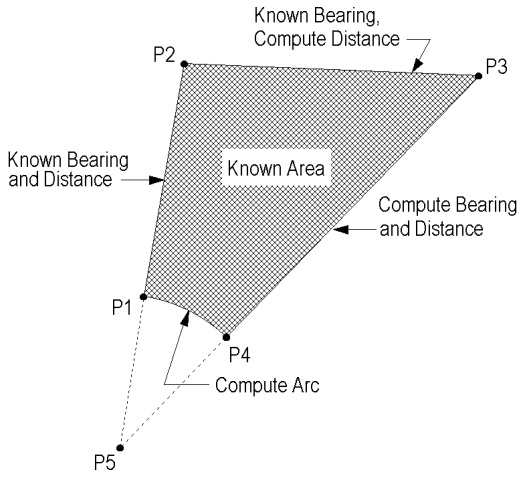
Bng line #2 Enter the bearing, angle, deflection or azimuth from the second base point to the point on line #2, recall a bearing between any two points in memory, or compute the data using the in-line calculator.

Req'd Area Enter the required data in square feet (or square meters if metric).

What Happens Next If a solution is possible, the program will compute and print the bearing and distance data. The required area will also be printed.

The radial sides solution to a predetermined area problem is actually a trial and error solution which may require from 20 to 35 incremental calculations. The program assumes that the calculation is completed when the generated area is within 0.0001 square units of the desired area.

Example **Enter & Assign** points 1 (P1 below), 2 (P2), and 5 (P5 - arc center point). Use **Predetermined Area - Radial Sides** to compute a tract having an area of **43560.00** sq. ft., bounded by Line 1:2 and a Bearing from P2 to P3 of **88°SE**.



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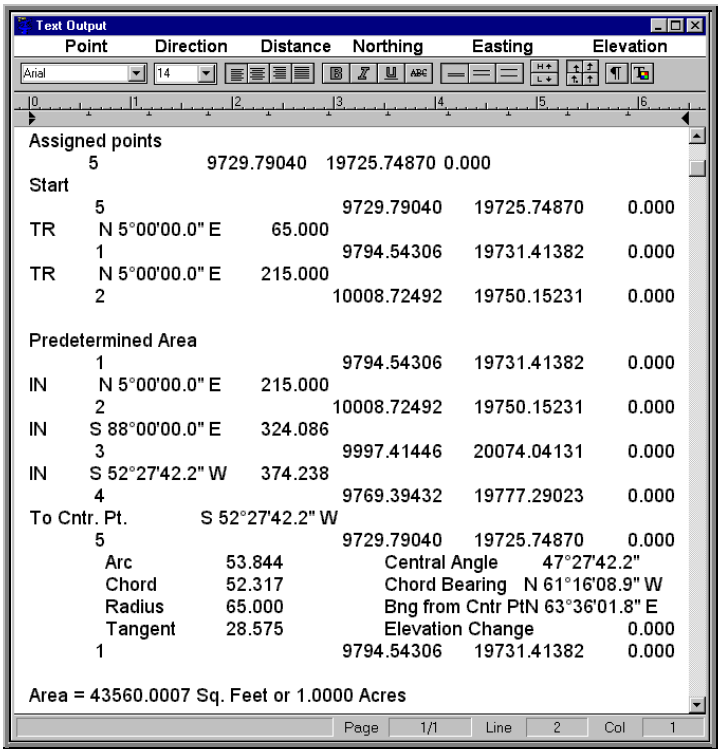


11.19 Pre-Determined Area 2 Lines Through a Point

FUNCTION: The **Pre-Determined Area 2 Lines Through a Point** routine is used to compute the two unknown sides of a three sided tract of known area. This routine requires the coordinates of the intersection point of two of the line segments and also the direction of the two line segments that intersect at the know point.

To access the **Pre-Determined Area 2 Lines Through a Point** routine, type **PDT** in any text box, or press Alt M, R, T.

1st Base Point

Enter the point number of the intersection of the two lines of known bearing.

Bng of line #1 Enter the bearing, angle, deflection or azimuth from the first base point to the point on line #1, recall a bearing between any two points in memory, or compute the correct data using the in-line calculator.

Pt on line #1 Enter an identifying point number which will lie on the first line extending from the base point.

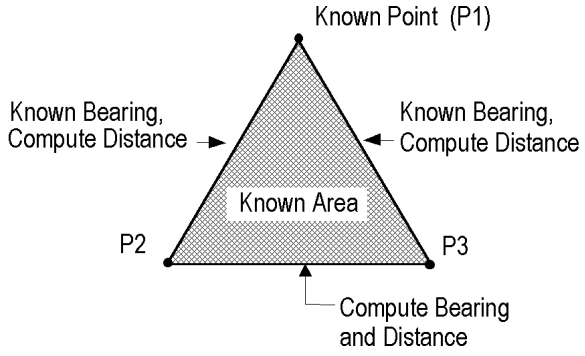
Bng of line #2 Enter the bearing, angle, deflection or azimuth from the first base point to the point on line #2, recall a bearing between any two points in memory, or compute the correct data using the in-line calculator.

Pt on line #2 Enter an identifying point number which will lie on the second line extending from the base point.

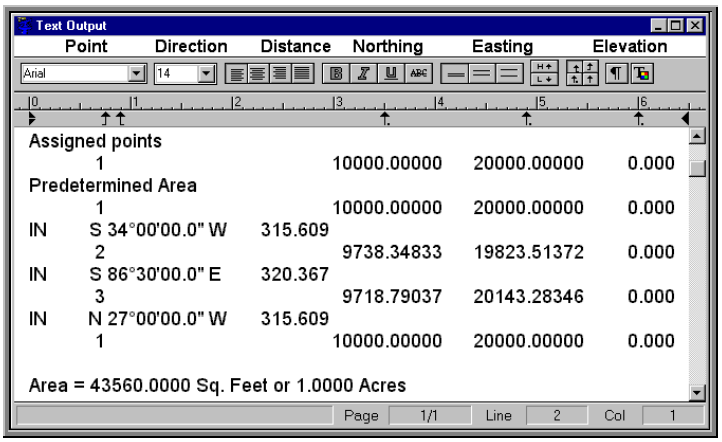
Req'd Area Enter the required data in square feet (or square meters if metric).

What Happens Next If a solution is possible, "Sight" Survey will print the bearing and distance data. The required area will also be printed.

Example **Enter & Assign** point 1(P1 below). Use **Predetermined Area - 2 Lines Through a Point** to compute a tract having an area of **43560.00** sq. ft., bounded by Line 1:2 at a Bearing of **34°SW**, and by Line 1:3 at a Bearing of **27°SE**.



Section 11



11.20 Measure a Distance (MD)

FUNCTION: The **Measure a Distance** routine is used to compute and report the value of a distance defined by any two points in the **Drawing** window.

To access **Measure a Distance**, type **MD**, or press Alt M, M.

Measure a Distance is a **Drawing** window function, therefore the prompts appear in the **Drawing** window command line.

Distance .. enter first point (Space bar to exit)

This routine measures the distance between ANY two points, even points that don't actually exist. It actually measures between any two cursor positions. You may want to set your snap mode to **Point** *mode ( ) by clicking on the* **Point** *mode icon ( ) in the* **Drawing** *window toolbar*

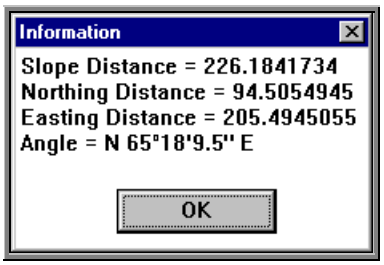
Click the cursor on the first point. "Sight" Survey prompts:

Second point

Click the cursor on the first point.

What Happens Next

"Sight" Survey will respond by displaying an information box containing the measured distance, the difference in Northing, the difference in Easting, and the bearing between the points.



Click OK. "Sight" Survey prompts:

Distance .. enter first point (Space bar to exit)

Click the cursor on another point, or cancel this routine by pressing Esc, or the Space Bar.

Section 11

11.21 Measure an Angle (MA)

FUNCTION: The **Measure an Angle** routine is used to compute and report the value of an angle defined by any three points of known coordinates. This routine may be called as a stand alone routine, or as a computational tool when prompted for an angle or bearing.

To access the **Measure an Angle** routine, type **MA** in any text box, or press Alt M, M.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Enter the number of the point theoretically occupied by the instrument. This is the point at which you are measuring the angle. If the entered point has not been assigned coordinates, the program will prompt for them and you must respond as you would to a standard coordinate entry request.

B.S. Point

Enter the backsight point. If the entered point has not been assigned coordinates, the program will prompt for them and you must respond as you would to a standard coordinate entry request.

F.S. Point

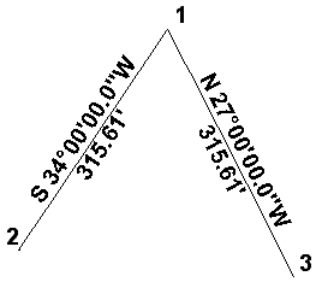
Enter the individual foresight point number(s) or a point number string.

What Happens Next

"Sight" Survey will respond to an accepted foresight point(s) by printing the computed angle(s) right. This routine will also report the distance between the occupied point and each foresight point.

Example

Enter & Assign points 1, 2, and 3. Use **Measure an Angle** to compute the angle 2:1:3 and also the angle 3:1:2.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			10000.00000	20000.00000	0.000
2			9738.34833	19823.51372	0.000
3			9718.79037	20143.28346	0.000
Measure Angle at point 1, backsighting point 2					
MA	Foresighting point 3	299°00'00.0" AR		315.609	
Measure Angle at point 1, backsighting point 3					
MA	Foresighting point 2	61°00'00.0" AR		315.609	

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11.22 Coordinate Transformation ➪ Rotation Angle & Point Known

FUNCTION: The **Coordinate Transformation** routine is used to project the coordinates of one plane onto another plane through the use of rotation, translation and/or scaling. The option for **Rotation Point & Angle Known** is used when the base point and angle of rotation around that base point are known.

To access the **Coordinate Transformation ➪ Rotation Point & Angle Known** routine, type **CTR** in any text box, or press Alt M, C, R.

Base Point

Enter the number of the point which is to serve as the basis for the transformation option. The specified point will be the point around which other points will be rotated, and the difference between the old and new coordinates of the specified point will serve as the basis for translation.

New North

If you intend to change the base point coordinates as part of your coordinate transformation proceedings, enter a new Northing.

New East

If you intend to change the base point coordinates as part of your coordinate transformation proceedings, enter a new Easting.

New Elev.

If you intend to change the base point coordinates as part of your coordinate transformation proceedings, enter a new elevation.

Rotation

You can either enter a rotation angle or rotate to a bearing. Rotation angles are entered as turned to the right, but left angles may be entered as negative values.

Enter a rotation angle by:

1. Entering the angle in your chosen angle entry format; or
2. Recalling a value from the calculator memory; or

You can rotate to a bearing by:

1. Entering the bearing in your chosen angle entry format, including the quad code; or
2. Recalling a bearing by point numbers.

If you choose to rotate to a bearing, you will also need to supply a **Foresight Point** number. This point sets the initial (un-rotated) bearing from the base point.

Scale

If you want to enter a scale factor, for example to adjust to a state plane coordinate system, enter the factor.

If you do not want to enter a scale factor, simply enter **1**.

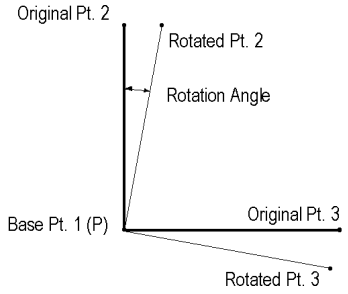
You can also enter a scale factor by using "Sight" Survey's in-line calculator function. For example, suppose you want to rotate a coordinate base and convert your coordinates from a local datum of approx. 600 feet elevation to sea level elevation. Given that the mean radius of the earth at average latitude is 20,906,000 feet, you could apply a scale factor of 20906000/(20906000+600) or 0.999971301. To calculate an exact scale factor, you could use the in-line calculator. At the **Scale Factor** prompt, enter the equation you want to calculate followed by an equal sign (**=**). For this example you would enter **(20906000/(20906000+600)) =**

Points

Enter a single point number or the point numbers between which you wish to transform (separating them with a comma or dash), and press enter.

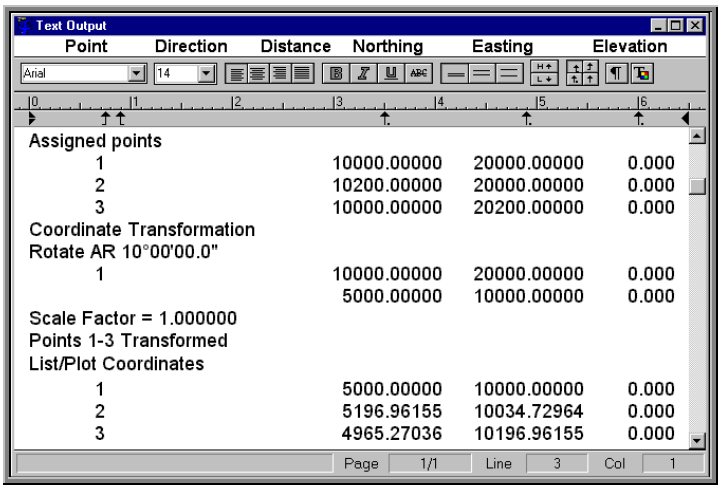
What Happens Next

"Sight" Survey prints the translation parameters and transforms the specified points. After the transformation has been completed, you will be returned to the **Transform Points** prompt. Transformed coordinates may be viewed by using the **List Coordinates** routine (**LC** - page 242) or the **Edit Coordinates** window (**EC** - page 225).



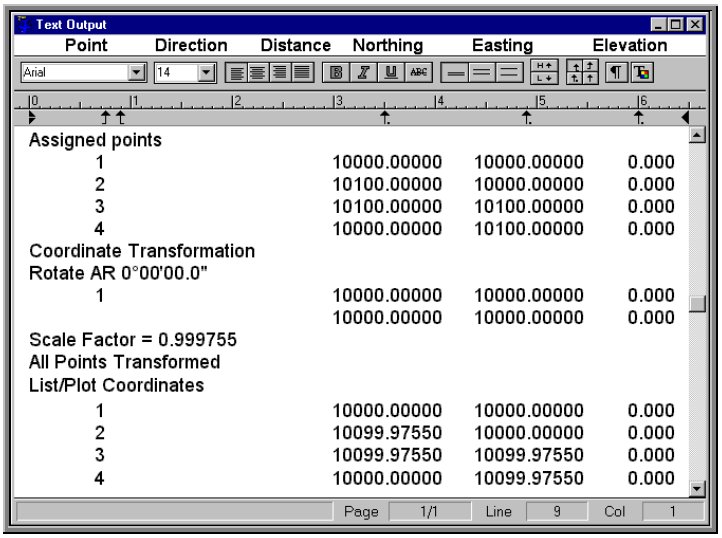
Example #1

Enter & Assign points 1, 2, and 3. Rotate points 2 & 3 by **10°** (to the right) around point 1 and translate all points to a new basis of **5000**, **10000**. Use a scale factor of **1**.



Example #2

Enter & Assign points 1, 2, 3, and 4. Translate points 1-4 using only a scale factor or **0.999755** with no rotation. Translate around base point 1 and retain your original coordinate basis.



Section 11

11.23 Coordinate Transformation ➪ Two Points in Each System Known

FUNCTION: The **Coordinate Transformation** routine is used to project the coordinates of one plane onto another plane through the use of rotation, translation and/or scaling. The option for **Two Points in Each System Known** is used to transform points when two corresponding points are known in each system.

To access the **Coordinate Transformation ➪ Two Points in Each System Known** routine, type **CTT** in any text box, or press Alt M, C, T.

1st Base Pt — Enter the number of the point which is to serve as the basis for the transformation option.

New North — Enter the Northing for the point in the second system that corresponds to the base point.

New East — Enter the Easting for the point in the second system that corresponds to the base point.

New Elev. — Enter the elevation for the point in the second system that corresponds to the base point.

2nd Base PT — Enter the number of the second known point in the first system.

New East — Enter the Northing for the point in the second system that corresponds to the first system's second known point.

New North — Enter the Easting for the point in the second system that corresponds to the first system's second known point.

New Elev. — Enter the elevation for the point in the second system that corresponds to the first system's second known point.

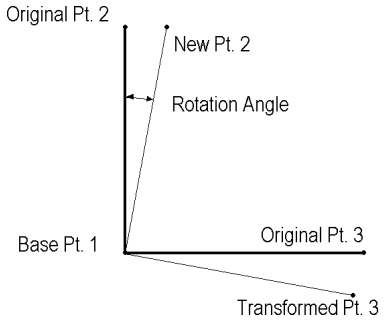
Points — Enter a single point number or the point numbers between which you wish to transform (separating them with a comma or dash).

What Happens Next

The rotation angle and scale factor are calculated from the coordinate values of the four known points. "Sight" Survey prints the translation parameters and transforms the specified points. After the transformation has been completed, you will be returned to the **Transform Points** prompt. Transformed coordinates may be viewed by using the **List Coordinates** routine (**LC** - page 242) or the **Edit Coordinates** window (**EC** - page 225).

Example #2

Enter & Assign points 1, 2, and 3. Translate points 1-3 to a new basis where point **1** is at coordinates **5000**, **10000**, and point **2** is at coordinates **5196.9916**, **10034.7296**. Use the new point 1 and 2 coordinates for rotation and scale information.



Text Output

Point	Direction	Distance	Northing	Easting	Elevation
Assigned points					
1			10000.00000	20000.00000	0.000
2			10200.00000	20000.00000	0.000
3			10000.00000	20200.00000	0.000
Coordinate Transformation					
Rotate AR 9°59'54.6"					
1			10000.00000	20000.00000	0.000
			5000.00000	10000.00000	0.000
2			10200.00000	20000.00000	0.000
			5196.99160	10034.72960	0.000
Scale Factor = 1.000148					
Points 1-3 Transformed					
List/Plot Coordinates					
1			5000.00000	10000.00000	0.000
2			5196.99160	10034.72960	0.000
3			4965.27040	10196.99160	0.000

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Section 11

11.24 Coordinate Transformation ➪ US Survey Feet to Meters

FUNCTION: The **Coordinate Transformation** routine is used to project the coordinates of one plane onto another plane through the use of rotation, translation and/or scaling. The option for **US Survey Feet to Meters** is used to convert between the two coordinate systems.

To access the **Coordinate Transformation ➪US Survey Feet to Meters** routine, type **CTU** in any text box, or press Alt M, C, U.

Points

Enter a single point number or the point numbers between which you wish to transform (separating them with a comma or dash).

What Happens Next

"Sight" Survey transforms the specified points. The conversion factor used is:

1m = 39.37" or 1' = 0.304800609601219m

After the transformation has been completed, "Sight" Survey will print a message in the Text window that the transformation procedure has been performed.

Coordinate Transformation
Converting US Survey Feet to Meters
Scale Factor = .304800609601219
Points 1-30 Transformed

You will be returned to the **Points** prompt. Transformed coordinates may be viewed by using the **List Coordinates** routine (**LC** - page 242) or the **Edit Coordinates** window (**EC** - page 225).

Example

Since this is only a unit conversion, no example is included.

11.25 Coordinate Transformation ➪ US Survey Feet to Int'l Feet

FUNCTION: The **Coordinate Transformation** routine is used to project the coordinates of one plane onto another plane through the use of rotation, translation and/or scaling. The option for **US Survey Feet to Int'l Feet** is used to convert between the two coordinate systems.

To access the **Coordinate Transformation ➪US Survey Feet to Int'l Feet** routine, type **CTS** in any text box, or press Alt M, C, S.

Points

Enter a single point number or the point numbers between which you wish to transform (separating them with a comma or dash).

What Happens Next

"Sight" Survey transforms the specified points. The conversion factor used is:

1' (US) = 1.000002000004' (Int'l)

After the transformation has been completed, "Sight" Survey will print a message in the Text window that the transformation procedure has been performed.

Coordinate Transformation
Converting US Survey Feet to International Feet
Scale Factor = 1.000002000004
Points 1-30 Transformed

You will be returned to the **Points** prompt. Transformed coordinates may be viewed by using the **List Coordinates** routine (**LC** - page 242) or the **Edit Coordinates** window (**EC** - page 225).

Example

Since this is only a unit conversion, no example is included.

Section 11

11.26 Coordinate Transformation ➪ Meters to US Survey Feet

FUNCTION: The **Coordinate Transformation** routine is used to project the coordinates of one plane onto another plane through the use of rotation, translation and/or scaling. The option for **Meters to US Survey Feet** is used to convert between the two coordinate systems.

To access the **Coordinate Transformation ➪ Meters to US Survey Feet** routine, type **CTM** in any text box, or press Alt M, C, M.

Points

Enter a single point number or the point numbers between which you wish to transform (separating them with a comma or dash).

What Happens Next

"Sight" Survey transforms the specified points. The conversion factor used is:

1m = 39.37" or 3.28083333333333'

After the transformation has been completed, "Sight" Survey will print a message in the Text window that the transformation procedure has been performed.

Coordinate Transformation
Converting Meters to US Survey Feet
Scale Factor = 3.28083333333333
Points 1-30 Transformed

You will be returned to the **Points** prompt. Transformed coordinates may be viewed by using the **List Coordinates** routine (**LC** - page 242) or the **Edit Coordinates** window (**EC** - page 225).

Example

Since this is only a unit conversion, no example is included.

11.27 Coordinate Transformation ➪ Meters to International Feet

FUNCTION: The **Coordinate Transformation** routine is used to project the coordinates of one plane onto another plane through the use of rotation, translation and/or scaling. The option for **Meters to Int'l Feet** is used to convert between the two coordinate systems.

To access the **Coordinate Transformation ➪ Meters to Int'l Feet** routine, type **CTE** in any text box, or press Alt M, C, E.

Points

Enter a single point number or the point numbers between which you wish to transform (separating them with a comma or dash).

What Happens Next

"Sight" Survey transforms the specified points. The conversion factor used is:

1m = 3.28083989501312'

After the transformation has been completed, "Sight" Survey will print a message in the Text window that the transformation procedure has been performed.

Coordinate Transformation
Converting Meters to International Feet
Scale Factor = 3.28083989501312
Points 1-30 Transformed

You will be returned to the **Points** prompt. Transformed coordinates may be viewed by using the **List Coordinates** routine (**LC** - page 242) or the **Edit Coordinates** window (**EC** - page 225).

Example

Since this is only a unit conversion, no example is included.

Section 11

11.28 Coordinate Transformation ➪ International Feet to Meters

FUNCTION: The **Coordinate Transformation** routine is used to project the coordinates of one plane onto another plane through the use of rotation, translation and/or scaling. The option for **Int'l Feet to US Survey Feet** is used to convert between the two coordinate systems.

To access the **Coordinate Transformation ➪ Int'l Feet to US Survey Feet** routine, type **CTI** in any text box, or press Alt M, C, I.

Points

Enter a single point number or the point numbers between which you wish to transform (separating them with a comma or dash).

What Happens Next

"Sight" Survey transforms the specified points. The conversion factor used is:

$$1' = 0.3048m$$

After the transformation has been completed, "Sight" Survey will print a message in the Text window that the transformation procedure has been performed.

Coordinate Transformation
Converting International Feet to Meters
Scale Factor = .3048
Points 1-30 Transformed

You will be returned to the **Points** prompt. Transformed coordinates may be viewed by using the **List Coordinates** routine (**LC** - page 242) or the **Edit Coordinates** window (**EC** - page 225).

Example

Since this is only a unit conversion, no example is included.

11.29 Coordinate Transformation ➪ International Feet to US Survey Feet

FUNCTION: The **Coordinate Transformation** routine is used to project the coordinates of one plane onto another plane through the use of rotation, translation and/or scaling. The option for **Int'l Feet to US Survey Feet** is used to convert between the two coordinate systems.

To access the **Coordinate Transformation ➪ Int'l Feet to US Survey Feet** routine, type **CTN** in any text box, or press Alt M, C, N.

Points

Enter a single point number or the point numbers between which you wish to transform (separating them with a comma or dash).

What Happens Next

"Sight" Survey transforms the specified points. The conversion factor used is:

1' (int'l) = 0.999998' (US)

After the transformation has been completed, "Sight" Survey will print a message in the Text window that the transformation procedure has been performed.

Coordinate Transformation
Converting International Feet to US Survey Feet
Scale Factor = .999998
Points 1-30 Transformed

You will be returned to the **Points** prompt. Transformed coordinates may be viewed by using the **List Coordinates** routine (**LC** - page 242) or the **Edit Coordinates** window (**EC** - page 225).

Example

Since this is only a unit conversion, no example is included.

Section 11

11.30 Pop-Up Calculator (PC)

FUNCTION: The **Pop-Up Calculator** is provided as a tool for intermediate computations.

To access the **Pop-Up Calculator**, type **PC**, or press Alt M, P., or click the **Calculator** icon ( ) in the Main toolbar.

The **Calculator** will appear on your monitor, allowing you to perform intermediate calculations.

The **Calculator** contains many features, including:

- A four register stack with HP-style Reverse Polish Notation (RPN) data entry;
- Four function math: +, -, ∗ and ÷;
- Reciprocals;
- *x y* register swap;
- Change sign;
- Exponential math including y^x;
- Trigonometric functions for Sine, Cosine and Tangent;
- Inverse trigonometric functions for ArcSine, ArcCosine and ArcTangent;
- Squares and square roots;
- The ability to work in various angular formats such as a calculator style D.MMSS format, a decimal degrees format, radians and grads;
- Conversions for radians to and from degrees;
- Angular formatted math including DMS+, DMS-, DMS∗ and DMS÷.

The Keyboard

The keyboard keys are keys are basically organized into two groups: those with ***hot keys***; and those without.

The numeric keys and math function keys have not been assigned hot keys, but instead correspond to the numeric keypad on your computer keyboard. In order for these numeric keys to function properly, your keyboard **Num Lock** must be engaged.

The remainder of the keys have been assigned hot keys for an alternate method of access. Normally, you'll simply click your mouse on a key to activate its function, but you can also activate the key by simultaneously pressing Alt and the hot key. The hot key is indicated by an underscore on one of the characters on the key name. For example, the hot key for the **Tan**(gent) key is **T**. To activate this key, press Alt T. The **ENTER** key corresponds to your keyboard's ↵Enter key.

Using Your Mouse

To press any key with your mouse, simply point the mouse cursor at the key and press either the left or right mouse button. To avoid multiple key presses, keep your button presses quick and do not double click.

Correcting Entry Errors

If, while typing in a value, you discover that you have made an entry error and you have not yet pressed ↵Enter, press the ← key (Bk Spc) and correct your error. If you have already pressed ↵Enter, click the **Del** key, and re-enter your value. (Note: There is no hot key for the **Del** key.)

Clearing Registers

Clear everything by pressing the **Clr** key (Alt L). You may also use the **Drp** (Drop) key (Alt P) to clear the x register and drop the other registers down.

Setting Decimal Places

Internally, the calculator works with double precision accuracy. The display however, is variable. Set the number of visual decimal places with the **Fix** key (Alt L), preceded by the number of places you want to display. For example, set the display to 6 decimal places by pressing 6 Alt L.

Manipulating the Stack

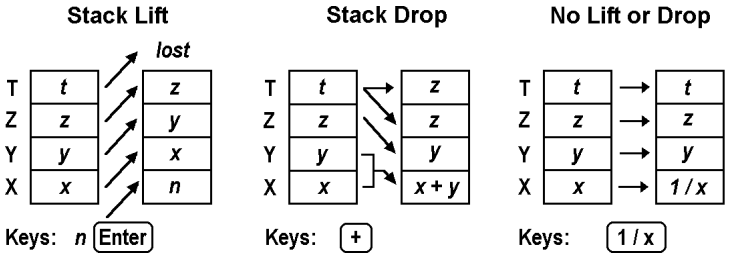
In the style of Hewlett Packard calculators, the calculator employs an operating logic known as "Reverse Polish Notation", or RPN. This mathematical logic type was first developed as "Polish Notation" by Polish mathematician Jan Lukasiewicz (1878-1956). Unlike conventional algebra which places operators *between* variables, Polish notation placed operators *before* the variables when evaluating algebraic expressions. To optimize calculator entries, HP reversed the process, placing the operators *after* the variables, thus the term "Reverse Polish Notation".

RPN calculators use a four register stack, (*X*, *Y*, *Z* and *T*) , to manipulate the entry and computation of algebraic data. The

procedure results in the elimination of parenthesis by retaining and displaying the intermediate results of your calculations.

Lifts and Drops

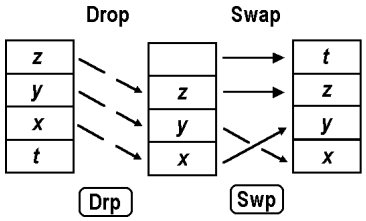
When you enter a number into the calculator, your entry is placed into the *X* register, causing the contents of the registers to lift. The original *X* value is placed into the *Y* register, *Y* is placed into *Z*, *Z* is placed into *T* and *T's* original contents are lost. This **stack lift** occurs any time a new value is placed into the *X* register.



Illustrated above are the "**stack drop**" and "**no lift or drop**" operations. Stack drops occur whenever the contents of two registers are combined through an addition, subtraction, multiplication or division. No lift or drop of the stack occurs in operations that act solely upon the *X* register. These functions include: **1/x**; **x²**; **√x**; and all trigonometric functions.

Drop and Swap

When you need to access a value that is not in register *X*, you have two choices: **drop down**; or **x y swap**. Swap, the contents of the *X* and *Y* registers by pressing the **Swp** key (Alt W). Drop the registers down one level by pressing the **Drp** key (Alt P).



Solving Equations

The four register stack lends powerful equation solving capabilities to the pop-up calculator. Through the use of the stack, you have the ability to solve complex equations, with the stack registers

replacing the parenthesis in your equations. Equations which use the stack to hold intermediate results are called nested equations.

To solve a nested equation, solve the terms in their nested order, beginning with the most deeply nested term. For example, to solve the equation: **145[4+18(9.15/3)]**, you would begin by solving the term (9.15/3), multiply that result by 18, add 4 and multiply by 145. Your keystrokes and register contents would look like:

Keys	X Register
9.15	9.15
↵Enter	9.15
3	3.00
/	3.05
18	18.00
*	54.90
4	4.00
+	58.90
145	145.00
*	8540.50

Angular Mathematics

The calculator lets you work in one of three formats: Decimal degrees (**Deg**); Degrees-minutes-seconds (**DMS**); or Radians (**Rad**). To cycle through the choices, click the button just below the right corner of the register display. The current choice will appear on the button.

For the purposes of the remainder of this section, we will assume that the chosen format is DMS.

Trig Functions

The calculator contains standard trigonometric functions for Sine (**Sin**), Cosine (**Cos**), Tangent (**Tan**), ArcSine (**Asin**), ArcCosine (**Acos**), and ArcTangent (**Atn**). These functions are designed to work in any angular format supported by the calculator, freeing you from the burden of conversions to and from decimal degrees. For example, to find the sine of 45° 37' 52.5", key in **45.37525** and press the **Sin** key (Alt S) to reveal the result of **0.714854**. Or, suppose that you have a sine value of 0.428864 and you need to find the angular value. Key in **0.428864** and press the **Asin** key (Alt A) to reveal the result of **25.234376**, or 25° 23' 43.76".

Conversion Functions

The calculator contains conversion functions for decimal degrees to and from the D.MMSS format, and degrees (decimal) to and from radians.

To convert from decimal degrees to D.MMSS, key in the value and click the **D->** key (Alt>). To convert from a D.MMSS format to decimal degrees, key in the value and press the **->D** key (Alt-).

To convert from radians to degrees in your chosen format, key in the value and press the **R>D** key (AltR). To convert from degrees to radians, key in the value and press the **D>R** key (AltD).

Angular Arithmetic

You can add and subtract formatted angles without first converting them to decimal values. You may also multiply and divide angular values by any other (non-angular) value, without conversions. For example, suppose that you have three angular values and you want to find the average value. The values are 75° 13' 52", 75° 14' 07 and "75° 13' 36". Key in the first value of **75.1352** and press Enter. Key in the next value of **75.1407** and press the **DMS+** key (F5). You should see an intermediate result of **150.2759**. Now key in the final value of **75.1336** and press the **DMS+** key (F5). You should see an intermediate result of **225.4135**. Now find the average of the three angles by pressing 3 and the **DMS÷** key (F8) to reveal the average angle of **75.135167** or 75° 13' 51.67".

É *Do not confuse the angular math functions with regular +, -, /, and * functions or errors in your calculations will result!*

Other Math Functions

In addition to trigonometric, standard and angular math functions, the pop-up calculator offers six other math functions. These are: ***x squared***; ***square root***; ***y to the x power***; ***reciprocal of x***; ***change sign***; and ***exponential math***.

x Squared

To obtain the square of the value contained in the *X* register, press the **X^2** key (Alt2). This operation does not affect the stack.

Square Root of *x*

To obtain the square root of the value contained in the *X* register, press the **Sqrt** key (AltQ). This operation does not affect the stack.

Y raised to the *x* power

To raise the value contained in the *Y* register to the *X* power, type the first value and press Enter to place it into the *Y* register. Then type in the *X* value and press ^ key (Alt -). This operation does not affect the stack.

Reciprocal of *x*

To obtain the reciprocal of the value contained in the ***x*** register, press the **1/X** key (R). This operation does not affect the stack.

Change Sign

To change the sign of the value contained in the *X* register, press the **+/-** key (U). This operation does not affect the stack.

Exponential Math

To enter a value raised to any power of 10, type in the value, press the **Eex** key (Alt X), type in the power of 10 and press Enter. This operation does not affect the stack.

Using a Calculated Value

To insert a value you have calculated into a data entry field in the **Data Entry** window, follow these steps.

1. Press the **Swp** key (Alt W).
2. Press the **Drp** key (Alt P) to drop the value to the bottom of the calculator window.
3. Double-click the value to select it.
4. Press Ctrl Insert to copy the value.
5. Click the mouse in the desired data entry field.
6. Press Shift Insert to paste the value into the field.

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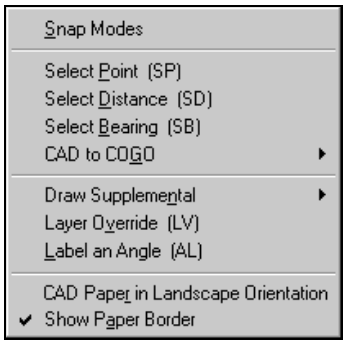
"Sight" Survey 3.0

Section 12

The DRAW Menu



The **Draw** menu contains functions relating to the transfer of data from the **Drawing** window to COGO. This menu can be accessed by clicking the right mouse button anywhere on the **Drawing** window.

Snap Modes are used to tell the drawing cursor how to act when clicked near lines, points, etc.

The three "**Select**" items, are used to transfer information from the drawing back into corresponding prompts in the **Data Entry** window.

The **CAD to COGO** item contains four "**Get**" items used to pick a drawing object and then enter the coordinates of the object's control points into the data file and also into the **Text Output** window. The drawing objects you may select from are: an arc; a line; and a point; and a point series. Generally, these objects will be manually-created objects, whose control points are not yet part of the COGO file.

Why would you want to use these "**Get**" functions? Well, suppose you are preparing a site plan for an apartment complex. Your lot corners are already part of the data file, but you have created an outline of the building. Dragging and rotating the outline, you determine where it should be placed. You also add a parking lot, sidewalks, and a pool. Using these routines, you can insert into your data file, the coordinates of the control points for all the manually created objects. You can now generate **Radial Stake Out** information for all of the building corners, parking lot corners, sidewalks, etc. You'll find this is much faster than manually computing the coordinates and adding the objects to your drawing.

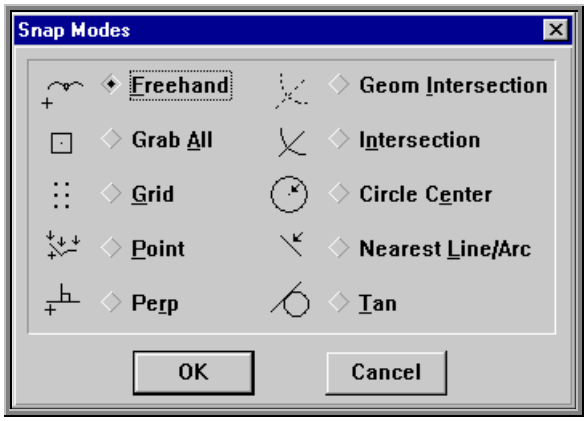
The **Draw Supplemental** menu allows you to add certain "extra" elements to your drawings, including line and curve tables, legends, North arrows, etc.

12.01 Snap Modes

FUNCTION: The **Snap Mode** function is used to select a snap mode for the **Drawing** window cursor.

To access the **Snap Mode** function from the **Draw** menu, press Alt D, S.

When you access **Snap Mode**, "Sight" Survey prompts:



To select a **Snap Mode**, click on the mode you want to use and then click OK.

Snap modes cause the cursor to behave in a particular way each time you click or press Enter. Snap modes are discussed in detail in **Section 30.05** in the **Drawing Window Reference Manual**.

12.02 Select Point (SP)

FUNCTION: The **Select Point** function is used to pick a point from the drawing to be used as data entry into a point number field. The point that is selected must be an existing COGO point.

To access the **Select Point** routine, type **SP** or press Alt S, P. The **Drawing** window command line prompts:

> **Select a point**

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the point to be picked. You don't have to be exact, but the point must lie within the **Grab All** cursor box or you may not get the point you want.

? *Before using the* **Select Point** *feature, be certain your cursor is located in a point entry field in the* **Data Entry** window.

What Happens Next

The point number of the selected point will be automatically entered into the point field in the **Data Entry** window.

Select Point *allows you to choose one point each time you activate the function. If you want to select several points, for example while inversing, use the* **Quick Pick** *function as described on page 377.*

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12.03 Select Distance (SD)

FUNCTION: The **Select Distance** function is used to pick a distance from the drawing which will be used as data entry into a distance field. The distance picked is actually calculated by "Sight" Survey, so you must have two existing COGO points to use this routine.

To access **Select Distance** from the keyboard, use the command **SD** or press Alt S, D. The **Drawing** window command line prompts:

> **Select the starting point for distance calculation**

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the first point to be used in the calculation.

Select the ending point for distance calculation

Again, using the **Grab All** cursor (⊡) in the **Drawing** window, click on the ending point to be used in the calculation.

? *Before using the* **Select Distance** *feature, be certain your cursor is located in a* ***distance entry field*** *in the* **Data Entry** window.

What Happens Next

After you select the starting and ending points of the line to be measured, "Sight" Survey will calculate the distance between the two points, then place the calculated distance into the last occupied text box.

12.04 Select Bearing (SB)

FUNCTION: The **Select Bearing** function is used to pick a bearing from the drawing which will be used as data entry into a bearing field. The bearing picked is actually calculated by "Sight" Survey, so you must have two existing COGO points to use this routine.

To access **Select Bearing** from the keyboard, use the command **SB** or press Alt S, B. The **Drawing** window command line prompts:

Select the starting point for bearing calculation

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the first point to be used in the calculation.

Select the ending point for bearing calculation

Select the ending point for bearing calculation

Again, using the **Grab All** cursor (⊡) in the **Drawing** window, click on the ending point to be used in the calculation.

?

Before using the **Select Bearing** *feature, be certain your cursor is located in a* ***bearing entry field*** *in the* **Data Entry** window.

What Happens Next

After you select the starting and ending points of the line to be evaluated, "Sight" Survey will calculate the bearing between the two points. "Sight" Survey will then place the calculated bearing into the last occupied text box.

12.05 Get an Arc (GA)

FUNCTION: The **Get an Arc** function is used to add the coordinates of an arc's end points and radius point into the data file and **Text Output** window.

To access **Get an Arc** from the keyboard, use the command **SB** or press Alt S, A. The **Drawing** window command line prompts:

Select an arc

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the target object.

What Happens Next

"Sight" Survey will compute coordinates for the arc's starting, ending, and center point, and offer the point computations for approval through the use of a **Point Information** window.

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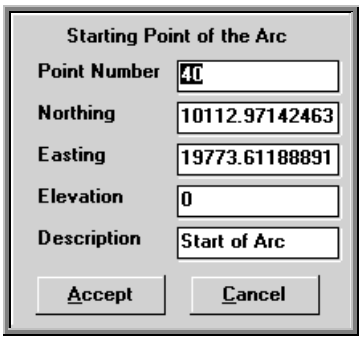


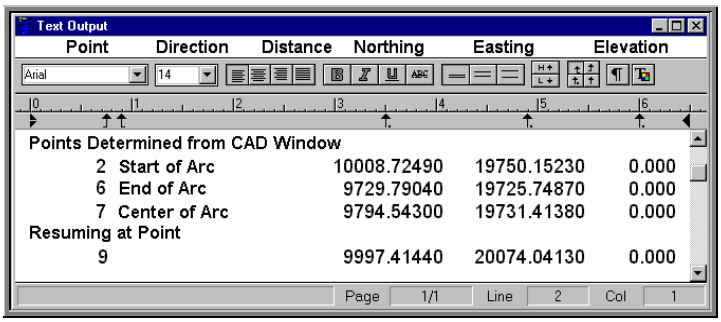
All the data boxes in the **Point Information** window are actually text entry boxes. This means that you can edit any of the text in the boxes. For example you can change the **Point Number**, add a **Description**, and add an **Elevation**.

The **Point Information** window has **three critical fields that must be filled in** before the data will be accepted: the **Point Number** field; the **Northing** field; and the **Easting** field.

The Cancel button may be used when you don't want to add a particular point to the COGO file. For example, if you only wanted to keep an arc's center point you can use the Cancel button when the **Point Information** window is showing either of the arc's end points.

É ***While you can edit the actual coordinate values, DON'T DO IT!*** *Changing the values will not change the object's position on the drawing but it will place incorrect data into your data file.*

After you have approved the points, "Sight" Survey will add the points to your COGO file, label the points in the **Drawing** window (if point labeling is active), and add a coordinate listing in the **Text Output** window (if the window is active).



1. *After examining the points in the* **Enter and Assign** *box you may save or discard the points.*
2. *"Sight" Survey's* **Grab All** *cursor will automatically snap onto the closest point or intersection enclosed within the cursor box. "Sight" Survey searches within the box in the following order:*
   - *A. If a point (e.g. a point, the end of a line, the end of an arc, an arc or circle center) is found within the box, take the nearest one.*
   - *B. If a geometry intersection is found in the box, take the nearest one.*
   - *C. If any other intersection is found in the box, take the nearest one.*
   - *D. If none of the above are found, "Sight" Survey will return coordinates for the exact point selected.*
3. *If the point selected is already in the coordinate file, you will be able to edit the properties of the point on file.*

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12.06 Get a Line (GL)

FUNCTION: The **Get a Line** function is used to add the coordinates of a line's end points into the data file and **Text Output** window.

To access **Get a Line** from the keyboard, use the command **GL** or press Alt S, L. The **Drawing** window command line prompts:

Select a line

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the target object.

What Happens Next

"Sight" Survey will compute coordinates for the line's starting and ending point, and offer the point computations for approval through the use of a **Point Information** window (see **Get an Arc**).

After you have approved the points, "Sight" Survey will add the points to your COGO file, label the points in the **Drawing** window (if point labeling is active), and add a coordinate listing in the **Text Output** window (if the window is active).

1. *After examining the points in the* **Enter and Assign** *box you may save or discard the points.*
2. *"Sight" Survey's* **Grab All** *cursor will automatically snap onto the closest point or intersection enclosed within the cursor box. "Sight" Survey searches within the box in the following order:*
   - A. *If a point (e.g. a point, the end of a line, the end of an arc, an arc or circle center) is found within the box, take the nearest one.*
   - B. *If a geometry intersection is found in the box, take the nearest one.*
   - C. *If any other intersection is found in the box, take the nearest one.*
   - D. *If none of the above are found, "Sight" Survey will return coordinates for the exact point selected.*
3. *If the point selected is already in the coordinate file, you will be able to edit the properties of the point on file.*

12.07 Get a Point (GP)

FUNCTION: The **Get a Point** function is used to add a point's coordinates into the data file and **Text Output** window.

To activate this function from the keyboard, type **GP** or press Alt S, G. The **Drawing** window command line prompts:

Select a point

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the target object.

What Happens Next

"Sight" Survey will compute coordinates for the point, and offer the point computations for approval through the use of a **Point Information** window (see **Get an Arc** on page 371).

After you have approved the point, "Sight" Survey will add the point to your COGO file, label the point in the **Drawing** window (if point labeling is active), and add a coordinate listing in the **Text Output** window (if printing is active).

1. *After examining the points in the* **Enter and Assign** *box you may save or discard the points.*
2. *"Sight" Survey's* **Grab All** *cursor will automatically snap onto the closest point or intersection enclosed within the cursor box. "Sight" Survey searches within the box in the following order:*
   - A. *If a point (e.g. a point, the end of a line, the end of an arc, an arc or circle center) is found within the box, take the nearest one.*
   - B. *If a geometry intersection is found in the box, take the nearest one.*
   - C. *If any other intersection is found in the box, take the nearest one.*
   - D. *If none of the above are found, "Sight" Survey will return coordinates for the exact point selected.*
3. *If the point selected is already in the coordinate file, you will be able to edit the properties of the point on file.*

4. **Get a Point** *can be used to quickly find intersection points between lines and arcs. This is a viable alternative to the intersection routines.*
5. *If the point selected is already in the coordinate file, you will be able to edit the properties of the point on file.*

12.08 Get a Point Series (GS)

FUNCTION: The **Get a Point Series** function is used to compile a string or series of point numbers for use in a data entry box, usually the **To Point** box.

To activate this function from the keyboard, type **GS** or press Alt S, S. The **Drawing** window command line prompts:

Use String

Using the **Grab All** cursor (⊡) in the **Drawing** window, click on the target points. When you have select all of the points you want to place in the point series, press ↵Enter or click the Use String button.

What Happens Next

"Sight" Survey will insert the string you have defined into the data entry window.

1. *The* **Grab All** *cursor automatically snaps onto the closest point or intersection enclosed within the cursor box, searching within the box in the following order:*
   - *A. If a point (e.g. a point, the end of a line, the end of an arc, an arc or circle center) is found within the box, take the nearest one.*
   - B. If a geometry intersection is found in the box, take the nearest one.
   - *C. If any other intersection is found in the box, take the nearest one.*
   - *D. If none of the above are found, "Sight" Survey will return coordinates for the exact point selected.*

12.09 Quick Pick CAD → COGO (QP)

FUNCTION: The **Quick Pick CAD → COGO** routine is a toggle which enables or disables the ability to quickly pick points, bearings, or distances off an existing drawing to be used as entry into ***any*** COGO routine. When **Quick Pick** is enabled, every mouse click in the **Drawing** window will input the data found at the mouse cursor into the **Data Entry** window as the entry for the current text box.

This function waits for you to use your mouse cursor to select an entity from your **Drawing** window. It is extremely useful when inversing between points to draw and annotate lines. You simply start the **Inverse** (**IN** - page 255) routine, and then click on the points or point numbers on the drawing screen to draw the lines and annotate them (based upon the settings for **Text Placement** and **Line Type**).

To run this routine, type **QP** (or Alt S, Q) or click your mouse on the **Quick Pick** icon ( ) on the **Main** tool bar. When enabled, the **Quick Pick** tool bar button will contain the word **ON**, and any click of the mouse on the **Drawing** window will attempt to select an entity for input into the current text box in the **Data Entry** window.

Select Points

When **Quick Pick** is enabled, click on a **point** or **point number** in the **Drawing** window to use the point number as your input into the **Data Entry** window. Simply position the mouse cursor on or very near a point or point number and click the left button.

If you do not click close enough to a defined point or actual point number, some other drawing entity may be selected and input into the **Data Entry** window. So, if you really wanted to enter a point number of **L1**, you could actually click on an L1 short line label. Then, if a point numbered as L1 has already been assigned coordinates, L1 would be entered into the current point number field.

This is similar to using the **Select Point** (**SP** - page 368) routine, but is quicker and easier to use because it eliminates the need to type a routine code or select a routine from the pull-down menu.

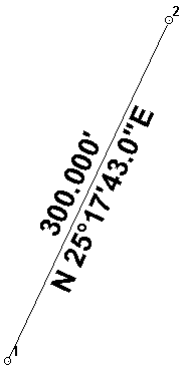
Select Distances

Whenever **Quick Pick** is enabled, you can single click on a **line** in the **Drawing** window to use the line length/distance as your input into the **Data Entry** window. Simply position the mouse cursor on or very near a line and click the left button.

This is similar to the **Select Distance** (**SD** - page 369) routine, but is quicker and easier to use because it eliminates the need to type in the routine code or select the routine from the pull-down menu.

Select Bearings

Whenever **Quick Pick** is enabled, you can single click on a **line** in the **Drawing** window to use the bearing of that line as your input into the **Data Entry** window. Simply position the mouse cursor on or very near a line and click the left button.



The actual bearing direction is determined by the end of the line that was closest when you clicked on it. For example, the bearing from point 1 to point 2, as shown to the left, is 25°17'43" NE. **If you click closer to point 2,** the bearing will be entered as if you were recalling the bearing *from point 1 to point 2*, or as 25°17'43" **NE**. **If you click closer to point 1,** the bearing will be entered as if you were recalling the bearing *from point 2 to point 1*, or as 25°17'43" **SW**.

This is similar to using the **Select Bearing** (**SB** - page 370) routine, but is quicker and easier to use because it eliminates the need to type in a routine code or select a routine from the pull-down menu.

1. *The* **Quick Pick** *routine stays active until you shut it off by typing* **QP** *or by again clicking the* **Quick Pick** *icon (* ON *) on the* **Main** *tool bar. If you have trouble selecting items from the* **Drawing** window*, check the status of the* **Quick Pick** *button.*
2. *If a line is moved a small distance and then a* **CAD2COGO** *routine is run on that line, the coordinates of the original points might come in as well as the original point number. The variable* **CAD2COGORange** *in the* **COGO.INI** *file allows you to set the window size for the CAD2COGO routines. Currently it defaults to 0.5 units (feet or meters). If you wish to change this default, you must use a text editor to do so.*

12.10 Draw Supplemental ➪Short Line Table

FUNCTION: The **Short Line Table** routine is used to add a table of linear data to your drawing. "Sight" Survey adds items to the **Short Line Table** whenever the length of a line is too short to support the annotation. The line is marked with an identifier, and the annotation is placed into a table.

To add a **Short Line Table** to your drawing, type **SL**, or press Alt D, N, S. The **Drawing** window command line prompts:

Select the short line table position

Position the **Grab All** cursor (⊡) in the **Drawing** window where you want to place the table and click your mouse or press ↵Enter.

The short line table contains the following information: a line identifier **L*n*** where ***n*** is an assigned number; the line's bearing; and the line's distance. After you have placed the short line table into your drawing, Sight" Survey prompts:

Should this data be saved for the next short line table?

Click Yes to save the table with line numbering continuing from the last used number. If you click No, the table will be deleted from the job file and a new table will begin with the leg **L1**.

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12.11 Draw Supplemental ➪Curve Table

FUNCTION: The **Curve Table** routine is used to add a table of curve data to your drawing. "Sight" Survey adds items to the **Curve Table** when COGO creates an arc. The arc is identified, and the curve data is placed into a table.

To add a **Curve Table** to your drawing, type **CL**, or press Alt D, N, C. The **Drawing** window command line prompts:

Select the short line table position

Position the **Grab All** cursor (⊡) in the **Drawing** window where you want to place the table and click your mouse or press ↵Enter.

The curve table contains the following information: a curve identifier **C*n*** where ***n*** is an assigned number; the delta angle; the radius, arc, chord, and tangent distances; and the chord bearing. After you have placed the curve table into your drawing, Sight" Survey prompts:

Should this data be saved for the next curve table?

Click Yes and the table will be saved with the curve numbering continuing from the last used number. If you click No, the table will be deleted from the job file and a new table will begin with the curve **C1**.

12.12 Draw Supplemental ➪Scale Bar

FUNCTION: The **Scale Bar** routine is used to add a scale bar to your drawing. You can choose from a **2** inch, **3** inch or 5cm **Metric** scale bar.

To choose a **2** inch bar press Alt D, N, E, 2. To choose a **3** inch bar press Alt D, N, E, 3. To choose a **Metric** scale bar press Alt D, N, E, M.

The **Drawing** window command line prompts:

Select the scale bar position

Position the cursor in the **Drawing** window where you want to place the scale bar and click your mouse or press ↵Enter.

12.13 Draw Supplemental ➪North Arrow

FUNCTION: The **North Arrow** routine is used to add a **North arrow** to your drawing.

Add a **North Arrow** to your drawing by pressing Alt D, N, N. The **Drawing** window command line prompts:

Select the North arrow position

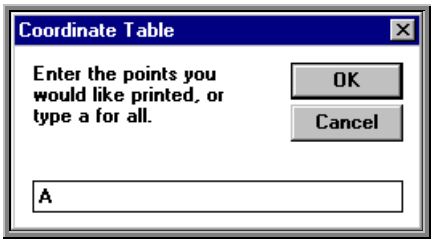
Position the cursor in the **Drawing** window where you want to place the **North arrow** and click your mouse or press ↵Enter.

12.14 Draw Supplemental ➪Coordinate List

FUNCTION: The **Coordinate List** routine is used to add a coordinate point listing to your drawing.

Add a **Coordinate List** to your drawing by pressing Alt D, N, L. "Sight" Survey will prompt for a list of the coordinate points you want placed in the table.

Type in the point numbers and/or ranges and press ↵Enter or click OK. For example, an entry of `1,3,5-17,24,30-50` would list points **1, 3, 5** ***through*** **17, 24,** and **30** ***through*** **50**.



After you have entered your points, the **Drawing** window command line prompts:

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Select the coordinate list position

Position the cursor in the **Drawing** window where you want to place the list and click your mouse or press Enter.

The coordinate list is a listing of the point number, Northing, Easting, elevation, and description of selected points in your COGO file.

12.15 Draw Supplemental ➔ Component Table

FUNCTION: The **Component Table** routine is used to add a **symbols legend** to your drawing.

Add a **Component Table** to your drawing by pressing Alt D, N, T. The **Drawing** window command line prompts:

Select the component table position

Position the cursor in the **Drawing** window where you want to place the table and click your mouse or press Enter.

The component table is a legend of all the end point symbols used in your drawing. Graphical representations of each symbol are included, along with a descriptive label.

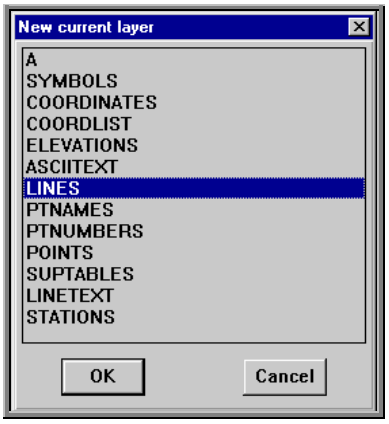
12.16 Layer Override (LV)

FUNCTION: The **Layer Override** routine is used to establish the current drawing layer.

To access the **Layer Override** function, press Alt D, V.

When you first start off with "Sight" Survey, only one layer, **0**, *will appear in this dialog box. To add further layers or to rename layer* **0**, *see* **Layer Control**. *You can save default layers in* **STARTUP.DRG**.

Whatever you draw is placed on the **current layer**. When you select **Layer Override**, the following dialog box appears.



Click on the layer that must become the current layer. The new current layer will be highlighted. Click OK to exit.

"Sight" Survey displays the name of the current layer in the **Drawing** *window title bar. When* **Layer Override** *is active,* **(OVERRIDE)** *appears after the layer name.*

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12.17 Label an Angle (AL)

FUNCTION: The **Label an Angle** routine is used to dimension an angle in your drawing as defined by three points.

To access the **Label an Arc** routine, type **AL** in any text box, or press Alt M, L.

From Point

This is the currently occupied point. If you have an occupied point, this box will automatically be filled for you. Changing the **From Point** is equivalent to running the **Go To** routine.

Vertex Point

Enter the vertex, or center point. If the entered point has not been assigned coordinates, the program will prompt for them and you must respond as you would to a standard coordinate entry request.

To Point
1) A 2) O

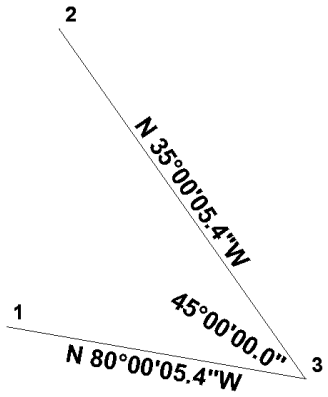
Enter the foresight point.
Enter 1 or A to indicate that the angle is acute (less than 180°/200 grads). Enter 2 or O if the angle is obtuse (equal to or greater than 180°/200 grads).

What Happens Next

"Sight" Survey calculates the angular dimension and annotates the angle at a point that bisects the actual angle.

Example

Enter & Assign points 1, 2, and 3. Label the angle 1:3:2.



This routine requires the use of data points to define the angle and does not add witness (leader) lines and arrowheads. To dimension an angle from within the drawing, using drawing elements only, use the **Start ➪ Annotate ➪ Angular Dimension** *routine (see* **Section 27.12***) in the* **Drawing** *window. Set up your witness (leader) line color, arrowheads, and dimension text font using the* **Start ➪ Settings ➪ Dimension Defaults** *routine (see* **Section 30.11***) .*

To measure an angle without labeling it, use the **Misc** ➪ **Measure an Angle** *routine (*~~MA~~ *- page 347).*

12.18 CAD Paper in Landscape Orientation

FUNCTION: The **CAD Paper in Landscape Orientation** function is used as a toggle switch to change the orientation of your drawing paper.

To access the **CAD Paper in Landscape Orientation** function, press Alt D, R, or click the **Paper Orientation** icon ( ) in the **Main** toolbar.

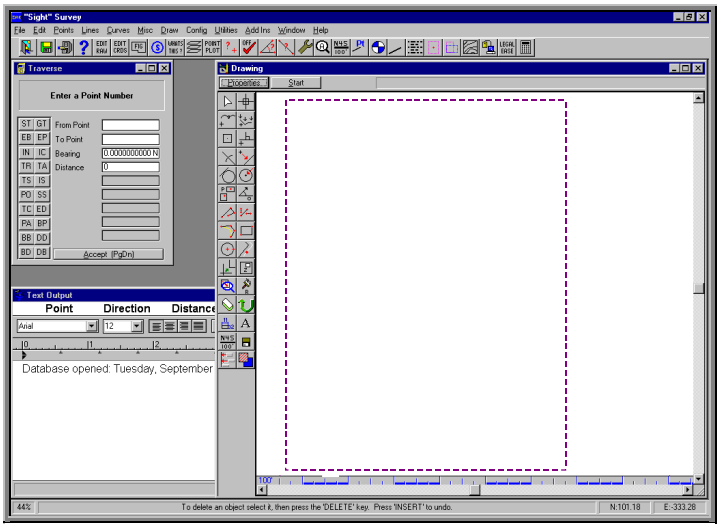
Your drawing is oriented in one of two ways: portrait; or landscape. In portrait orientation, your paper is taller than it is wide. In landscape orientation, your paper is wider than it is tall.

12.19 Show Paper Border

FUNCTION: The **Show Paper Border** function is used as a toggle switch to show and hide the paper border.

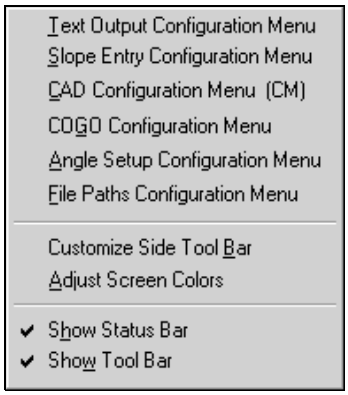
To access the **Show Paper Border** function, press Alt D, A.

The paper border is represented in the **Drawing** window by a magenta colored dashed rectangle.



"Sight" Survey 3.0

Section 13
The CONFIG Menu



The **Config** menu contains commands used to tailor the way "Sight" Survey works. There are commands to allow you to work in grads or South azimuth, commands to change the color of "Sight" Survey, and commands to control how information is stored. Nearly every aspect of the operation of "Sight" Survey is controlled from one of the configuration menus.

13.01 Config Menu Basics

All of the "Sight" Survey configuration routines use a variety of data entry fields. These fields are:

Check Boxes

☑ Item Active ☐ Item Inactive

Check Boxes are toggle switches. Check box items are active when the box contains a ✓ or an X. If a *group* of check box items is displayed, you may select as many as you need.

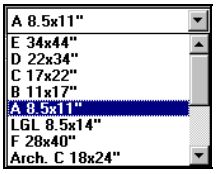
Option Buttons

⦿ Item Active ○ Item Inactive

Option Buttons are toggle switches. Option items are active when the button contains a smaller dot. Option buttons are used to present mutually exclusive options. In other words, if a *group* of option button items is displayed, you may select only one.

Selection Lists

Selection Lists are marked by a ▼ button (or ⤓ in Windows 3.1) on the right side of the entry field, which already contains a selection. Click your mouse on the ▼ button, then make your choice by using the ↑ or ↓ keys or your mouse. Press Esc to exit a list without making a choice. Depending upon how you choose an item, you may need to press ↵Enter.



Scrollable selection lists are indicated by the presence of a scroll bar along the right side of the list. Scrollable lists contain more selections than can be shown in the selection list at one time. You can scroll the list by using your ↑ and ↓ keys, or by clicking your mouse on the ▲ and ▼ arrows on the scroll bar. You may also click and hold your mouse on the button in the scroll bar while you slide the button up and down.

Text Entry Boxes

Text Entry Boxes are simply boxes into which you type text. Position the cursor in the box using your mouse or the Tab key. Type the data requested and press Enter. If a highlighted value exists in a text entry box, the data you type will replace the existing data.

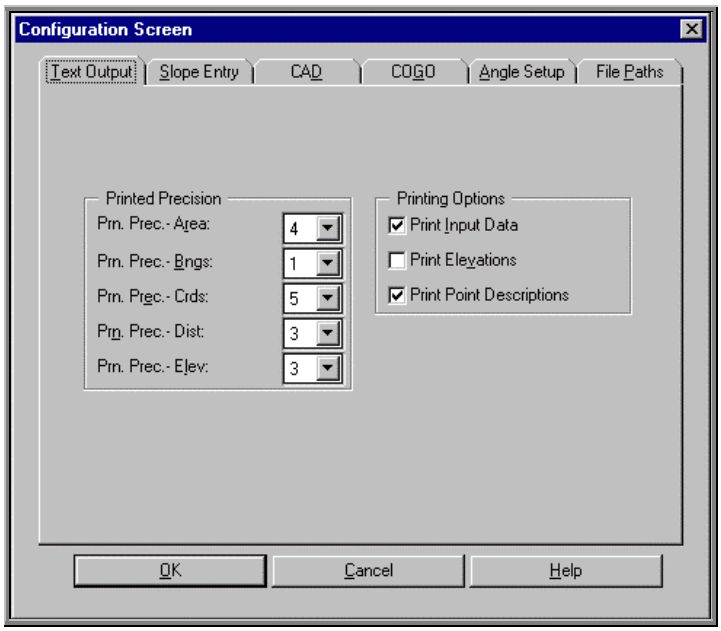
Response Buttons

Response Buttons function as simple push buttons. Activate a response button in one of two ways: either by clicking your mouse on the button; or (in this example) by pressing Alt H, where the letter following the Alt key corresponds to the underlined letter on the button. (Occasionally, you may need to press Enter after using an Alt key combination.)

13.02 Text Output Configuration Menu

FUNCTION: The **Text Output** configuration menu controls the **Printed Precision** for "Sight" Survey's **Text Output** window and other printing options.

To access this screen from the keyboard, press Alt G, M.



Printed precision

Printed precision is nothing more than the number of places that your printed numerical data will be carried out to, ***in the text output***. (Printed precision in drawings is set elsewhere.) It has nothing to do with internal precision. Your choices are: **Area** - 0 to 6; **Bearings** - 0 to 3 (seconds value) in degrees, or 0 to 6 in grads; **Coordinates** - 0 to 8; **Distances** - 0 to 6; **Elevations** - 0 to 6.

Printing Options

The **Printing Options** section contains three items which may be enabled or disabled with check boxes.

Print Input Data

Print Input Data, when checked, includes your exact data entries in your text output. This is often helpful when entering field data for the first time, allowing you to spot data entry errors as they may occur.

The two-letter code **PI** *can be used to toggle* **Print Input Data** *between* **On** *and* **Off**.

Print Elevations

Print Elevations, when checked, includes point elevations and differences in point elevations in your text output.

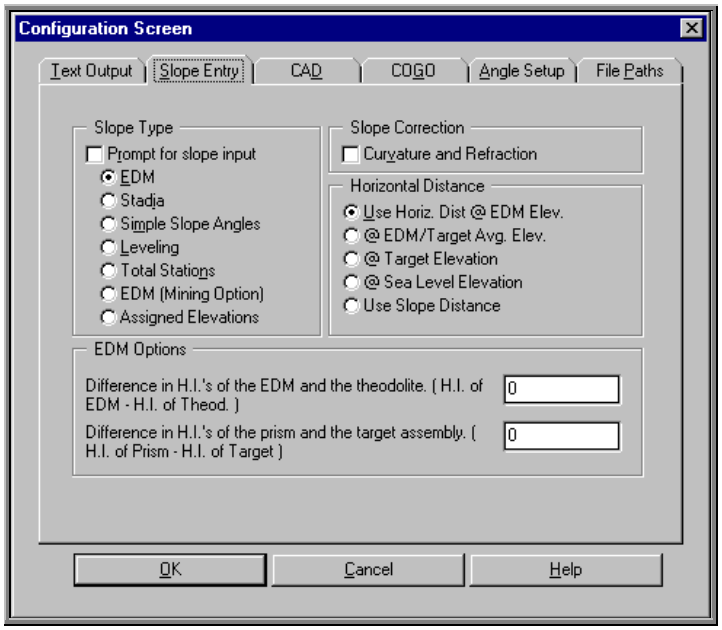
Print Point Descriptions

Print Point Descriptions, when checked, includes 28 character point descriptions in your text output. (See also the **Prompt for Desc.** setting in the **Config** ➪ **COGO** sub-menu.)

13.03 Slope Entry Configuration Menu

FUNCTION: The **Slope Entry** configuration menu controls **Slope Type**, **Slope Correction**, **Horizontal Distance**, **EDM Options**, and/or **Stadia** options.

To access this screen from the keyboard, press Alt G, R, Alt S, or CM Alt S.



Prompt for slope input

The *check box* option, **Prompt for slope input**, acts to turn on slope reduction automatically. When **Prompt for slope input** is active, every distance you enter will be met with a request for data in accordance with the slope type selected. If you only have an occasional slope distance, leave this item off. You can manually alert

"Sight" Survey to a slope distance by placing a slash (either **/** or ****) immediately after the typed distance before pressing ↵Enter, such as **150.55/** ↵Enter. An easy way to remember this is to think of the slash as a ***sloping line***.

The two-letter code **SA** *can be used to toggle* **Slope Angle Prompting** *between* **On** *and* **Off**.

Slope Type

Slope Type offers seven *option button* selections and one *check box* selection. The option buttons control the type of slope reduction that "Sight" Survey will use when reducing slope distances to horizontal. Your choices are: **EDM**; **Stadia**; **Simple Slope Angles** (angle only, no instrument values); **Leveling**; **Total Stations**; **EDM (Mining Option)**; and **Assigned Elevations**.

Three of the slope type selections, **EDM**, **Stadia**, and **EDM (Mining Option)**, include additional setup options.

Slope Type - Stadia

If you have selected **Stadia** as your **Slope Type**, you may now enter values for:

Stadia Interval Constant (K) - Type the stadia interval constant into the text entry box. This value is retained between sessions, and you will not need to re-enter it unless your instrument setup changes.

Distance from Center of Instrument to Principal Focus (C) - Type the value for **C** into the text entry box. This value is retained between sessions, and you will not need to re-enter it unless your instrument setup changes.

Slope Type - EDM

If you have selected **EDM** or **EDM (Mining Option)**, you may now enter values for: two **EDM Options**; a **Slope Correction** option; and a **Horizontal Distance** option. The **EDM Options** are:

Difference in H.I.'s of the EDM and the theodolite.
(H.I. of EDM - H.I. of Theod.)
and
Difference in H.I.'s of the prism and the target assembly.
(H.I. of Prism - H.I. of Target)

Simply type in a value for each text entry box. The default value for each is **0** (zero).

Slope Correction

Next select or de-select **Slope Correction** by **Curvature and Refraction** by using the check box provided.

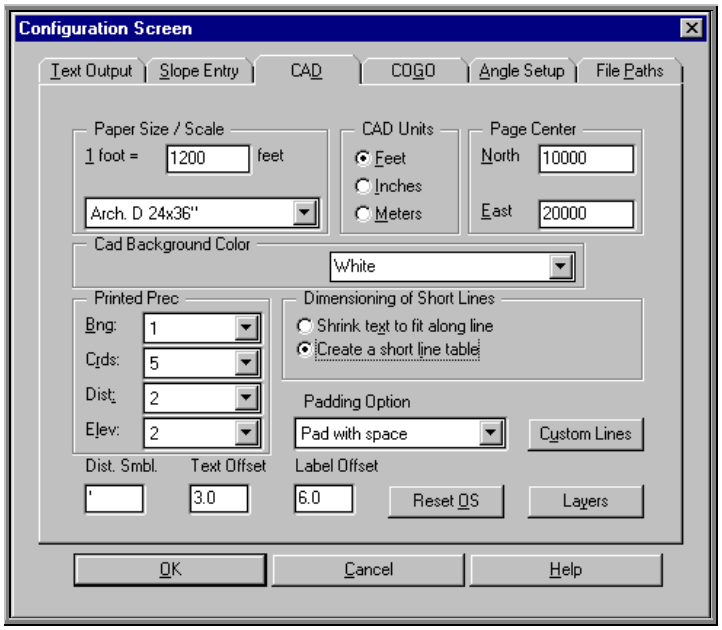
Horizontal Distance

Finally, use the **Horizontal Distance** option buttons to select the elevation at which your horizontal distance is computed.

13.04 CAD Configuration Menu (CM)

FUNCTION: The **CAD** configuration menu controls **Drawing Scale**, **Paper Size**, **CAD Units**, **Printed Precision** on the drawing, **Padding Options**, **Page Center Coordinates**, **Dimensioning of Short Lines**, and the **Distance Symbol**.

To access this screen from the keyboard, press Alt G, C, or type **CM**.



Drawing Scale

The **Paper Size / Drawing Scale** section is where you set the output scale of your drawing which determines such things as text size and symbol size. Set the scale by entering a value in the text box. Be sure to notice the **CAD Units** and enter an appropriate value. Scaling is very straight forward, but may be slightly different than what you might be used to. For example, standard engineering scales encourage you to think of 1" = so many feet, let's say 100'. "Sight" Survey's **Drawing Scale** is shown to be 1 foot = so many feet. Since their are 12 inches to the foot, the correct entry would be `1' = 1200'`. Likewise for a 60 scale drawing where 1" = 60'. The entered scale would be `1' = 720'` (60' x 12").

Paper Size

Staying in the **Paper Size / Drawing Scale** section we now use the scrollable selection list to select our paper size. "Sight" Survey offers 10 US paper sizes (in inches) including:

A - 8½" x 11"
Legal - 8½" x 14"
B - 11" x 17"
C - 17" x 22"
D - 22" x 34"
E - 34" x 44"
F - 28" x 40"
Architectural C - 18" x 24"
Architectural D - 24" x 36"
Architectural E - 36" x 48"

Four metric paper sizes (in mm) are also offered. These sizes are:

A0 - 841mm x 1189mm
A1 - 594mm x 841mm
A2 - 420mm x 594mm
A3 - 297mm x 420mm

CAD Units

Begin by setting your **CAD Units**. You have a choice of three units: **Feet**; **Inches**; and **Meters**. Select a unit of measure by clicking on the option button next to it. In most cases, unless you are preparing small details, your choice will be either **Feet** or **Meters**. Depending upon your choice, two other elements on the **CAD** submenu may change: the units in the drawing **Scale**; and the **Distance Symbol**.

Page Center Coordinates

The **Page Center Coordinates** section lets you set the actual coordinates of the center of the page. Use the text boxes to specify these coordinates. "Sight" Survey uses the specified coordinates to orient the paper border over your drawing.

The two-letter code `CE` *can be used to* **Re-Center the Paper** *on your drawing.*

CAD Background Color

CAD Background Color controls the background color of the **Drawing** window.

Changing the color in the middle of a drawing will render invisible any drawing objects that match the background color. However, while you cannot see them, they will still print, except for white. Remember to set object colors accordingly.

Printed Precision

Printed Precision controls the number of places to which numerical data will be printed ***on your drawing***. It has nothing to do with internal precision, nor does it have anything to do with the **Printed Precision** portion of the **Text Output** configuration. Your choices are: **Coordinates** - 0 to 6; **Distances** - 0 to 6; **Elevations** - 0 to 3; and **Bearings** - 0 to 3 (seconds value) in degrees, or 0 to 6 in grads. If you are using **Bearings** you may also elect to have your bearings rounded to the nearest **Minute**, or rounded to the nearest **Degree**.

Dimensioning of Short Lines

Dimensioning of Short Lines controls text placement on lines that are physically too short to accommodate text. Check an option button to either: **Shrink the text to fit along the line**; or **Create a short line table**. If you choose the later, short lines will be marked by an identifier that corresponds to an entry in the short line table. To import the short line table use the menu item **Draw** ➪ **Supplemental** ➪ **Short Line Table**, or enter the two-letter command **SL**.

Padding Options

The **Padding Options** section uses a selection list to control the characters placed before any degrees entry that is less than 10. You can **Pad with a space** (e.g. N 5°E); **Pad with a 0** (e.g. N05°E); **Pad with a space and a 0** (e.g. N 05°E); or **No Pad** (e.g. N5°E). *(When you are set for azimuths, the padding option is irrelevant and will not be shown.)*

Distance Symbol

The **Distance Symbol** section is a text box whose initial setting corresponds to the selected **CAD Units**. You can print any character(s) you want behind the distances in your drawing by changing this entry. For example, you may want to use **ft.** instead of **'** or **in.** instead of **"**.

Text Offset Distance

The **Text Offset** box allows you to control the distance that annotations are offset from the lines on your drawings. This

setting is used when text (bearings, distances, etc.) is placed along a line on your drawing. (Point labels are selected in the **Properties** window within the **Label Type** property.)

Each whole number unit represents 1/100th of an inch on the paper when the drawing is printed at the specified scale. For example, the entry of 3.0 shown in the above screen would place bearings and distances 3/100^{ths} of an inch from the lines when the drawing is printed at the specified drawing scale of 1:1200 (shown in the **Paper Size / Scale** field). If the drawing is plotted at a scale other than what it was created at, the offset distance will not match the selected setting.

*The **Text Offset Distance** is offset from **center** of the line, regardless of the **Line Width**. You may wish to slightly increase the **Text Offset Distance** before placing thick lines.*

Label Offset Distance

The **Label Offset** text box allows you to control the distance that point labels are offset from the actual coordinate location on your drawings. This setting is used when a point label is placed on your drawing. (Point labels are selected in the **Properties** window within the **Label Type** property.)

Each whole number unit represents 0.01" on the paper when the drawing is printed at the specified scale. For example, the entry of 6.0 shown in the above screen would place the point numbers, elevations, etc., 6/100^{ths} of an inch away from the actual coordinate point location when the drawing is printed at the specified drawing scale of 1:1200 (shown in the **Paper Size / Scale** field). If the drawing is plotted at a scale other than what it was created at, the offset distance will not match the selected setting.

Reset Offset Distances

Selecting the Reset OS button resets the **Text Offset** and **Label Offset** values to "Sight" Survey's built-in default values which are 3.0 and 6.0, respectively.

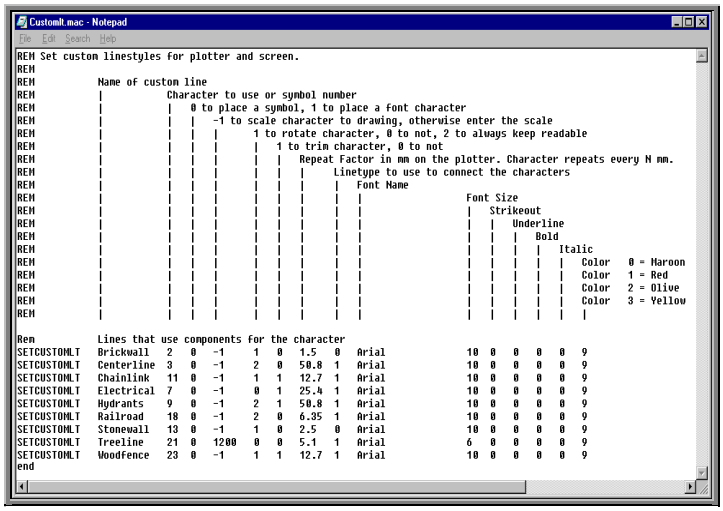
Layers

Selecting the Layers button opens the **Layer Editing Box**. Using this window, you can add, edit, delete, hide, lock and highlight drawing layers. Layering is discussed in detail beginning in **Section 30.17** in the **Drawing Window Reference Manual**.

The two-letter code **EL** (**Edit Layers**) *can also be used to access the* **Layer Editing Box**.

Custom Lines

Selecting the Custom Lines button will open the custom line type file, **CustomLT.Mac** within the Windows Notepad. From here, you can edit, delete, or add custom lines. Each custom line is defined by 16 columns of information. The file is a free format space-delimited ASCII file. Each column must be separated from the others by one or more spaces.



The custom lines defined here may only be selected through the **Properties** *window* ***for use with COGO routines****. These lines are not accessible when using* **Drawing** *window commands, nor can they be placed in the* **Linetype.Mac** *file. Drawing window linetypes are set using* **Start** ➪ **Settings** ➪ **Line Defaults**.

EXCEPTION

There is one exception to this rule. You can use custom line types with the command **LI** *(or click*  *) which draws a chained line. (Custom line types* ***do not*** *work with the* **Start** ➪ **Draw** ➪ **Line (Chained)** *command.)*

Deleting Custom Lines

To delete a custom line, highlight the line and press Delete twice. If you want to keep the line for possible later use, you can prevent it from showing in the **Line Type** selection list in the **Properties** window by adding **REM** followed by a space to the front of the line (i.e. **REM SETCUSTOMLT**).

Adding Custom Lines

To add a new custom line, copy one of the existing lines and modify it to match the desired settings for your new line. Use the normal Windows commands for highlighting, copying, and pasting. Refer to your Windows documentation for assistance. Be sure to save the file when you exit Notepad. You must also exit and restart "Sight" Survey for the new line(s) to be available in the **Line Type** selection list in the **Properties** window.

Editing Custom Lines

To edit an existing custom line, simply change the columns to match your desired settings for that line. Be sure to save the file when you exit Notepad. You must also change the Line Type selection in the **Properties** window to update "Sight" Survey with the new custom line settings. Let's look at each of the columns individually.

Active vs. Inactive

Each ***active*** custom line must have the word SETCUSTOMLT for the first column. Only active custom lines are displayed in the **Line Type** property of the **Properties** window. You can keep the **Line Type** selection list uncluttered by REMarking or deleting custom lines that you do not need (or want). Each ***Inactive*** line must begin with **REM** followed by a space (i.e. **REM SETCUSTOMLT**).

Name of Line

The second column contains the name of the custom line. This name appears in the **Line Type** selection list in the **Properties** window. ***Do not use any spaces in the name.***

Character

The third column contains the actual alphabetic character (or its equivalent ASCII character code) or the number of the end point symbol to place along the line. For example, to place the letter **R** along the line, enter either an **R** or the number **82** into this column. The actual character format is determined by the entries in the other column entries such as the font name, size, and color.

To place an **Iron_Pin** symbol along the line, enter the number **10**. Symbols are numbered alphabetically, starting at two (**2**). Symbol numbers greater than **23** are invalid unless you have added

additional symbols to the **DMCustom.Sym** file (in which case the numbers listed in the following table may be incorrect).

The pre-defined "Sight" Survey symbols and their equivalent numbers are shown in the following table:

2		Brickwall	13		Manhole
3		Centerline	14		Power_Pole
4		Concrete_Monument	15		Solid_Square
5		Cross	16		Storm_Inlet
6		Dot	17		Telephone_Box
7		Electric_Box	18		Tic_Mark
8		Gas_Riser	19		Traverse_Point
9		Hydrant	20		Tree_(Large)
10		Iron_Pin	21		Tree_(Small)
11		Iron_Pipe	22		Valve_Box
12		Light_Pole	23		Wood_Stake

Character Type

The fourth column identifies the character type shown in column three. Enter a **0** (zero) if column three contains a symbol number, or enter a **1** if column three contains a font character. If you enter a **0** (zero for a symbol), remember that numbers **2** through **23** are the only valid numbers for column three unless you've added symbols to "Sight" Survey. If column three contains an invalid symbol number, you will receive one or more "**Symbol not found**" messages when the line is placed.

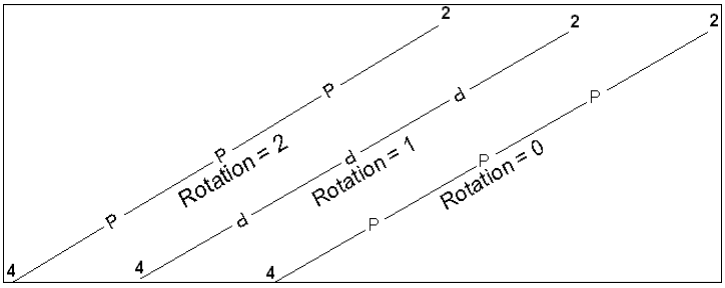
Scale Factor

The fifth column contains the scale factor for the character. Enter **-1** to scale the character to match the drawing scale, otherwise enter the exact scale (in CAD units) that you'd like to use. For example, if your drawing scale is **1:1200**, enter **-1** if you want to match that scale. If you'd like the characters placed twice as large

as they would normally be placed, enter `600` as the scale. Likewise, enter `2400` to make them half the size.

Rotation

The sixth column contains the desired character rotation. Enter `0` to never rotate the character; enter `1` to rotate the character to match the line angle; or enter `2` to rotate the character to match the line ***but to also be readable***. The rotation affects only the symbol, or in this case the character, which is placed along the line. Notice the effect of the three different rotation options on the character `P` in the sample powerlines in the following diagram.



Trimming

The seventh column contains the desired trimming option. Enter a `0` (zero) to indicate no trimming, or enter a `1` to trim all lines under the characters.

Repeat Factor

The eighth column contains the repeat factor or interval, in millimeters, for the character placement. Enter a number based upon how often you want to see the character on the **printed output**. For example, enter the number `15` to place a symbol every `15` millimeters on the printed/plotted output.

Line Type

The ninth column contains the line style to use. Enter the number corresponding to the **Line Type** you wish to use as the underlying line between the characters. When a custom lines is specified for a rectangle, circle, or random curve, the line type specified in this column will be placed instead of the custom line.

Line Type are numbered as follows: `0`-No Line; `1`-Continuous; `2`-Dashed; `3`-Hidden; `4`-Center2; `5`-Phantom2; `6`-Dot2; `7`-Dot; `8`-Border2; `9`-Border; `10`-Divide2; `11`-Divide.

If column four contains a **0** *(zero for symbol), the remaining seven columns are ignored; however, they must still contain something (anything) to maintain the proper format.*

Font Name The tenth column contains the name of the font to use for the character specified in column three. Enter the exact name of the desired font. Usable fonts are shown in the **Text Font** property of the **Properties** window. If the font name has spaces in it, you must either replace the spaces with the underscore character (_) or enclose the font name in double quotes. For example, enter **Courier New** as either `Courier_New` or "`Courier New`".

Font Size The eleventh column contains the font size. Enter the desired size (in points) for the character specified in column three.

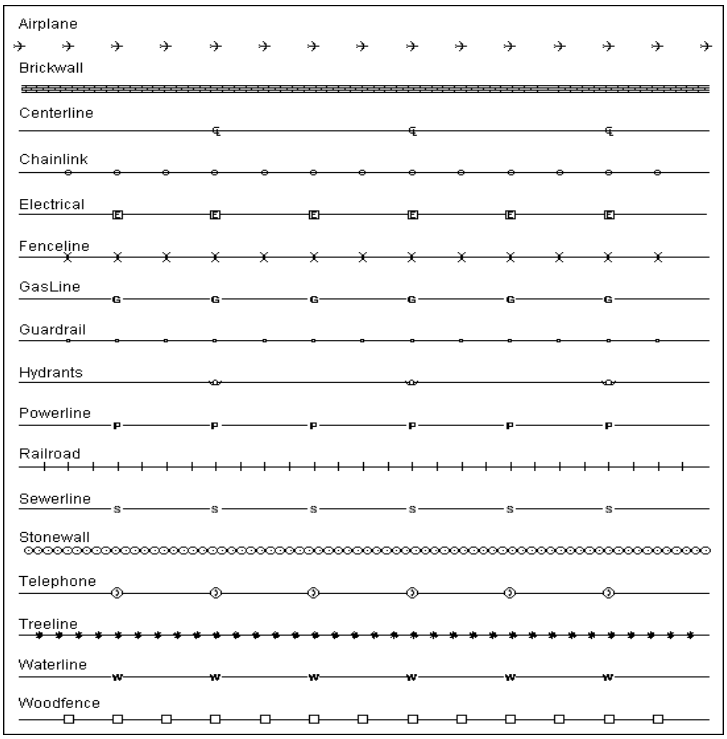
Font Strikeout The twelfth column contains the strikeout setting for the character specified in column three. Enter a `0` (zero) for a regular character, or enter a `1` to ~~strikeout~~ the character.

Font Underline The thirteenth column contains the underline setting for the character specified in column three. Enter a `0` (zero) for a regular character, or enter a `1` to underline the character.

Font Bold The fourteenth column contains the bold setting for the character specified in column three. Enter a `0` (zero) for a regular character, or enter a `1` to **embolden** the character with a strikeout line.

Font Italic The fifteenth column contains the italic setting for the character specified in column three. Enter a `0` (zero) for a regular character, or enter a `1` to *italicize* the character.

Color The last column contains the color setting for the line specified in column nine and the character specified in column three. Enter the number corresponding to the desired color. Colors are numbered as follows: `0`-Maroon; `1`-Red; `2`-Olive; `3`-Yellow; `4`-Lime; `5`-Green; `6`-Teal; `7`-Aqua; `8`-Blue; `9`-Navy; `10`-Purple; `11`-Fuschia; `12`-White; `13`-Gray; `14`-Black; `15`-Silver; `16`-By Layer.

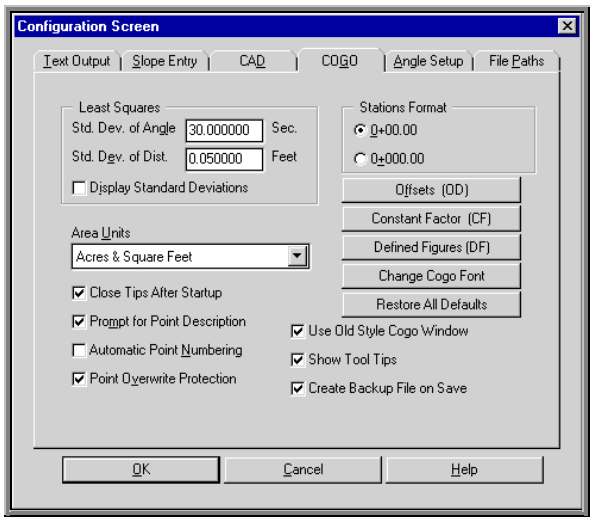


Custom lines furnished with "Sight" Survey (Not to scale)

13.05 COGO Configuration Menu

FUNCTION: The **COGO Configuration Menu** controls **Drawing Save Format**, **Stations Format**, **Offsets**, **Constant Factor**, **Area Units**, **Point Overwrite Protection**, **Automatic Point Numbering**, and the **Prompting for** (point) **Descriptions**.

To access this screen from the keyboard, press Alt G, G.



Least Squares

The **Least Squares** section allows you set the standard deviation values for use within the least squares adjustment procedure. Set the **Standard Deviation of Angles** and the **Standard Deviation of Distances** to the exact error values stated in your instrument's manual or as calibrated by your measurement samples. "Sight" Survey uses `30.0` as the default for the **Standard Deviation of Angles** and `0.050` for the **Standard Deviation of Distances**, but you will need to change these defaults to appropriate values for your equipment.

Standard Deviation of Angles

If **Angular Units** is set to **Degrees**, the **Standard Deviation of Angles** must be entered in ***seconds***. If **Angular Units** is set to **Grads**, the **Standard Deviation of Angles** must be entered in ***grads***. The **Angular Units** setting is shown on the **Angle Setup** tab of the **Configuration Menu**.

Standard Deviation of Distances

The **Standard Deviation of Distances** consists of two parts: a constant error and a proportional error, usually referenced in ppm (parts per million). Your instrument documentation may reference this in a format such as: ±(5 mm + 4 ppm). If **Area Units** is set to

Acres & Square Feet, the **Standard Deviation of Distances** must be entered in ***feet***. If **Area Units** is set to either **Cuerdas & Square Meters** or **Hectares & Square Meters**, the **Standard Deviation of Distances** must be entered in ***meters***.

"Sight" Survey uses the ***additive*** method to compute standard deviations, so you must add the two error parts together and enter their sum as the **Standard Deviation of Distances**. To determine the correct entry for this field, you must first convert the given values to the units you are working in (feet or meters) if they are different from what the documentation shows. Next, you must multiply the proportional error times an average survey distance for the current COGO job and then add that amount to the constant error.

Using an instrument error of **±(5 mm + 4 ppm)** as an example, the 5 millimeters constant error converts to 0.016 feet or 0.005 meters. The 4 ppm proportional error for a survey with average distances of 500 feet (roughly 152 meters) equals 0.002 feet (4 ft / 1,000,000 ft * 500 ft) or 0.0006 meters (4 m / 1,000,000 m * 152 m). Adding the constant and proportional errors together gives us a total distance error of 0.018 feet or 0.0056 meters. This is the value that you would enter for the **Standard Deviation of Distances**.

If you want to display the **Standard Deviation** columns for angles and distances while the **Traverse Adjustment** window is open, enable the **Display Standard Deviations** check box. When these columns are displayed you will be able to edit them, if desired. If you have no need to edit the values, we recommend that you disable this check box to save screen space within the **Traverse Adjustment** window.

When the **Traverse Adjustment** window *is open, double-clicking on the* **Bearing** *or* **Distance** *column headings will toggle the display of the* **Standard Deviation** *columns between* on *and* off.

Stations Format

Stations Format lets you choose between **0+00.00** (a US stationing format) and **0+000.00** (a metric stationing format).

Area Units

The **Area Units** selection list allows you to choose among three unit types: **Acres & Square Feet**; **Cuerdas and Square Meters**; and **Hectares and Square Meters**.

Close Tips After Startup

Close Tips After Startup is a check box option. When checked, the **Tip of the Day** window will automatically close after "Sight" Survey has finished its startup procedures.

Prompt for Point Description

Prompt for Point Description is a check box option. If active, whenever you enter or compute a new point you will be asked to supply a point name or description of up to 28 characters in length. If you leave this option disabled, you may manually enter a point name using the **Points**⇨**Identify Point** function (**ID**).

The two-letter code **NO** *can be used to toggle the* **Prompt for Point Description** *setting* **On** *and* **Off**.

Automatic Point Numbering

The **Automatic Point Numbering** check box will enable or disable automatic point numbering. Use the **AN** routine code to toggle **Automatic Point Numbering** between **On** or **Off**.

When **Automatic Point Numbering** is **On**, "Sight" Survey will seek out the first available point number beyond the occupied point number, with one exception. If you are setting **Side Shots**, "Sight" Survey will seek out the first available point number beyond the point number of the last side shot.

Point Overwrite Protection

The **Point Overwrite Protection** check box will enable or disable automatic protection of already used points.

When **Point Overwrite Protection** is **On**, you are warned when you are about to overwrite an existing point. You may choose to overwrite the point or enter a new point number. You may manually override **Point Overwrite Protection** by placing an asterisk (*****) immediately after the point number, such as **45*** Enter. Using the manual override method will suppress the warning message.

Use Old Style COGO Window

The **Use Old Style COGO Window** check box will enable or disable the 20 user-defined buttons in the **Data Entry** window. When checked, the user-defined buttons are visible and active. When unchecked, the user-defined buttons disappear and you can reshape the window into a more horizontal format.

In addition to enabling and disabling the 20 user-defined buttons in the **Data Entry** window, this setting also controls the mode of resizing for the **Data Entry** window.

When this checkbox is unchecked, the text boxes in the **Data Entry** window always maintain their original size, but fill the window

with the boxes from left to right and from top to bottom. Depending upon how you size the window, you can make your **Data Entry** window into a horizontal entry form, perhaps better utilizing screen space.

When this checkbox is checked, the text boxes grow in proportion to the size of window.

Show Tool Tips

Tool tips are little memo boxes that appear as you hover your mouse above a toolbar item. The memo box tells you what the function the button will perform when clicked. If the button has both left and right mouse click functions, the tool tip will show both options separated by a slash.

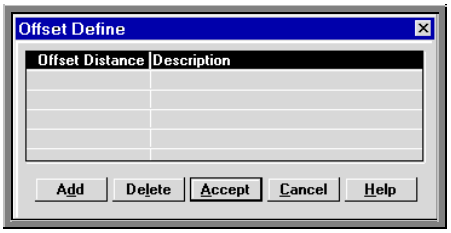
For example, in the illustration shown to the left, a left-click would **Save** the job under the current name, while a right-click would let you **Save As** a different job name.

Create Backup File on Save

Selecting this setting causes "Sight" Survey to create a backup file of the previous coordinate data. The backup coordinate file will have a **.zbk** extension. To reload backup file, rename the file to have **.zak** extension.

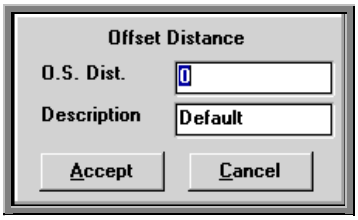
Offsets

Selecting the Offsets (OD) button opens an **Offset Define** window. Using this window, you can add or delete offset values to be automatically used during **Traverse with Offset** routines (both line and arc).



The two-letter code **OD** *can be used to access the* **Offset Define** *routine.*

The **Offset Define** window will accommodate an unlimited number of offset entries, turning into a scrolling menu as needed. To add an entry, click [Add] to activate the **Offset Distance** dialog box.



Type a value for the **O.S. Dist.** (offset distance). Positive numbers offset to the right and negative numbers offset to the left, all relative to the foresight direction. Press [Tab] or [Enter] to highlight the **Description** entry. Now type a new description, or leave this entry set to **`Default`**, and click on [Accept].

When the description field shows a **`Default`** setting, your description will read something similar to: **`OS 25 R @ Pt. ?`**

You can **replace** the default description by clicking your mouse on the description in the **Offset Define** window and then typing over it. To **erase** the description, press [Space Bar] [Enter]. To **edit** the default description, click your mouse on the description, wait a moment and then click again. The text entry cursor will relocate to the beginning of the line and you can edit as you wish.

Unlike other **Config** *items, an* **Offset Define** *table must be set up for each job on which you want to use it.*

Constant Factor

Selecting the [Constant Factor (CF)] button opens a text box into which you may enter a numerical constant that will be applied to each entered distance. Use constant factors for things such as: to convert feet to meters (or any unit to another); to apply correction factors for steel tape measurements; to apply a grid factor, etc.
To invoke the constant factor on a particular distance, preface your distance entry with a slash (**`/`**) or semicolon (**`;`**). For example, if the multiplier is **`0.90`** and the measured distance is **`300.00`**, an entry of **`/300`** or **`;300`** would yield a distance entry of **`270.00`**, which equals **0.90 * 300**.

To clear a **Constant Factor**, issue the **CF** command and enter a value of **1**.

The **Constant Factor** *has two pre-programmed applications.*

A. A multiplier followed by the letter **A***, signals the computer that you are going to create a correction factor for the atmospheric effect on distances measured with an infrared EDM. The monitor will accept the first entry as a temperature in deg. F., (or deg. C. if working in metric units), and then request a pressure which is in inches of Hg. (or mm. Hg. if working in metric units). The correction factor will be computed as:*

1+(278.45-((10.5P)/(1+(T*0.002175)))) (English units)

1+(278.45-((0.3865P)/(1+(T*0.003661)))) (Metric units)

where P is the pressure in inches (or mm.) Hg, and T is the temperature in degrees F, (or deg. C.). Check this factor against the specifications of your EDM before using.

B. *A value followed by the letter* **T** *will cause the correction factor to become a temperature correction for steel tapes. For example, the entry* **88T** *will convert to a factor for 88 degrees F. of 1+0.0000065∗(88-68), (1+0.000001161∗(T-20) in metric units). The number entered may be the temperature in deg. F., or deg. C., (if working in metric units). The formula assumes the tape was standardized at 68 deg. F., (or 20 deg. C.).*

1. *The two-letter code* **CF** *can be used to access the* **Constant Factor** *routine.*
2. *Unlike other* **Config** *items, the* **Constant Factor** *is not retained between sessions and must be set up for each session in which you want to use it.*

Define Figures

Selecting the Defined Figures (DF) button activates the **Define Figures** function. See **Section 3.17** on page 249 for information on entering **Defined Figures**.

Change COGO Font

Selecting the Change Cogo Font button allows you to change the font used in the **Data Entry** window. Select a new font using a modified Windows font selection dialog box. You will not be able to set a font color, and any font formatting, i.e. bold, italic, etc., will be ignored. Font colors may be adjusted using the **Adjust Screen Colors** function described on page 414.

Restore All Defaults

Selecting the Restore All Defaults button resets all "Sight" Survey settings to the installation defaults.

13.06 Angle Setup Configuration Menu

FUNCTION: The **Angle Setup** configuration menu controls the **Default Angle**, **Angular Units**, **Angle Output** format, **Azimuth Direction**, and the **Angle Code Set**.

To access this screen from the keyboard, press Alt G, R, Alt A, or CM Alt A. (The menu is shown on the next page.)

Default Angle

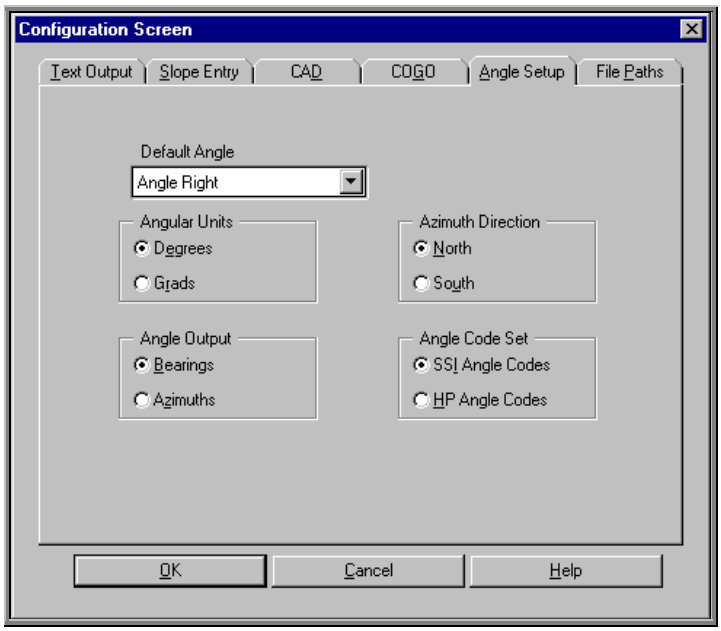
The **Default Angle** is the angle format that is applied to your data entry when it does not contain a specific format. For example, if you select **Angle Right** as the default, you could enter all of your angle right entries as something like **47.3325** Enter. You can still use codes to specify a different type of angle, such as **47.3325 AL** Enter, which is the same value, but it is turned to the left. Select the **Default Angle** through a selection list containing four choices: **None**; **Azimuths**; **Angle Right**; and **Deflect Right**.

Angular Units

The **Angular Units** option buttons allow you to choose to have your angular data entered and output in either **Degrees** or **Grads**.

Angle Output

The **Angle Output** option buttons allow you to choose to have your angle output in either **Bearings** or **Azimuths**.



Azimuth Direction

The **Azimuth Direction** option buttons allow you to choose to have your azimuth referenced **North** or **South**.

Angle Code Set

The **Angle Code Set** option buttons allow you to choose between **SSI Angle Codes** and **HP Angle Codes**.

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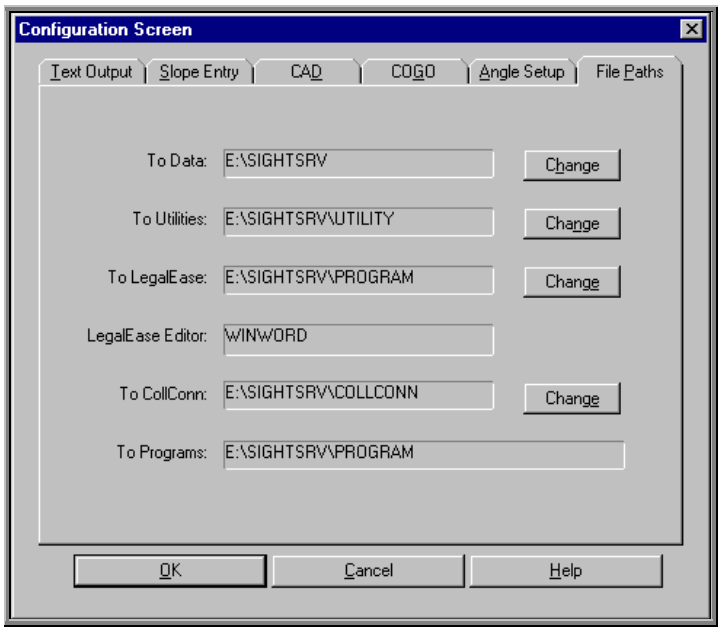
13.07 File Paths Configuration Menu

FUNCTION: The **File Paths** configuration sub-menu controls the path names for various files, including: **Data Files**, **Utility Files**, **LegalEase Files**, and **Program Files**.

To access this screen from the keyboard, press Alt G, R, Alt P, or CM Alt P.



"Sight" Survey sets path names during installation. Unless you move files or rename folders (or Windows 3 directories), ***DON'T CHANGE THESE PATH NAMES!*** If you do change them and "Sight" Survey no longer functions, your path names are incorrect.

The path **To Programs** *is not changeable. It is shown only as an informational item.*

To change a path name, *if you must*, click on the Change button next to the path name you want to change. This will open a path selection box.

The top portion of the box contains the current path name. The lower selection list shows the current drive.

To Change Drives

Click on the drive selection list, or on the ▼ button. The drop-down list may or may not be scrollable. Click on the new drive.

To Change Directories

Set the file path in the upper box by clicking your mouse on directories and subdirectories until you have located the correct directory.

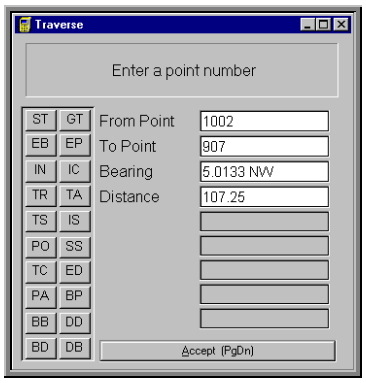
When you are done, click on Accept or press Alt A.

13.08 Customize Side Tool Bar

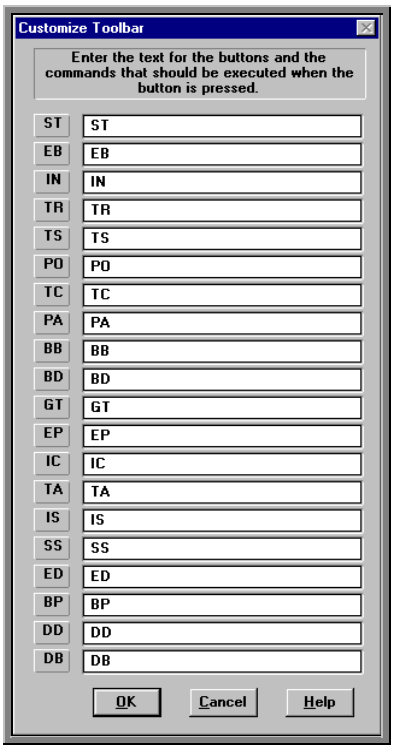
FUNCTION: The **Customize Side Tool Bar** function allows you to assign a command string to each of the 20 buttons on the left side of the **Data Entry** window, which can be used to call up commonly used routines or execute other commands.

To access this screen from the keyboard, press Alt G, S.

You will be presented with a window containing 20 buttons in a row on the left side and 20 text entry boxes on the right. The buttons on the left represent the 20 buttons on the side tool bar of the data entry screen and the text entry boxes contain the commands that will be executed when the button is selected.



Data Entry Window showing Side Tool Bar



The buttons are arranged as follows: The top 10 buttons make up the left column, and the bottom 10 buttons make up the right column.

Changing a Button Caption

1. Click your mouse on the button for which you would like to change the caption.
2. Type the new caption. Any text you type will replace the old text. (Only about 2 or 3 characters will fit on the button's face.)
3. The button caption is editable using the arrow keys and the backspace key.
4. Click your mouse on the next button which you would like to modify or on a text entry box.

You can click Cancel to abort any changes, or click the OK button to accept the changes made.

Changing a Button Command

1. Click your mouse on the text entry box to the right of the button you wish to modify.
2. Enter the command (or command string) that should be executed when the button is clicked.
3. Select a different text entry box or button to modify.

Valid Command Strings

Command strings can contain :

1. Any number of two letter commands;
2. Numeric data to be placed into a text box;
3. A pipe symbol (" | "), which is interpreted as pressing ↵Enter;
4. A caret symbol ("^ "), which instructs "Sight" Survey to clear the current field;
5. Extra spaces which are ignored by "Sight" Survey.

Examples

Command: `ST`
Result: "Sight" Survey will jump into the **Start** routine

Command: `ST ^ 2 |`
Result: Run the start routine, enter 2 as the starting point, and hit enter.

Command: `ST ^1| in 2| SS ^90 -6| ^65| TA ^1| ^45| |`
Result: **Start** at point 1, **Inverse** to point 2, **Side Shot** 90° angle left a distance of 65 feet, and **Traverse an Arc** through center point 1 with a delta angle of 45°

*The `-6` in the third term: `SS ^90 -6`, indicates an angle left if you are using the **Simplicity Systems, Inc. Angle Code Set**. Under the **HP Angle Code Set** it would be an angle right. See page 163 for a discussion on angle codes.*

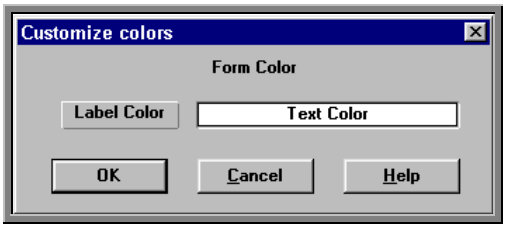
Creating a command string takes time and patience. You need to think how you would do it manually, then recreate the steps.

13.09 Adjust Screen Colors

FUNCTION: The **Adjust Screen Colors** command is used to adjust the background and label colors for "Sight" Survey's **Data Entry** and window.

To access this screen from the keyboard, press Alt G, A.

After selecting the **Adjust Screen Colors** routine you will be presented with a window containing three options: **Form Color**; **Label Color**; and **Text Color**.



Text Color

To change the color of the text used in all text boxes click your mouse on the **Text Color** box.

Label Color

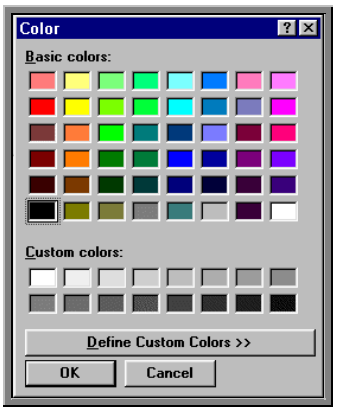
To change the **Label Color**, the color used for text in all labels or prompts, click your mouse on the raised label.

Form Color

To change the **Form Color**, the color of the background used in the **COGO**, **Config**, and **Properties** windows, click your mouse on the background of the window (not on the label or text box).

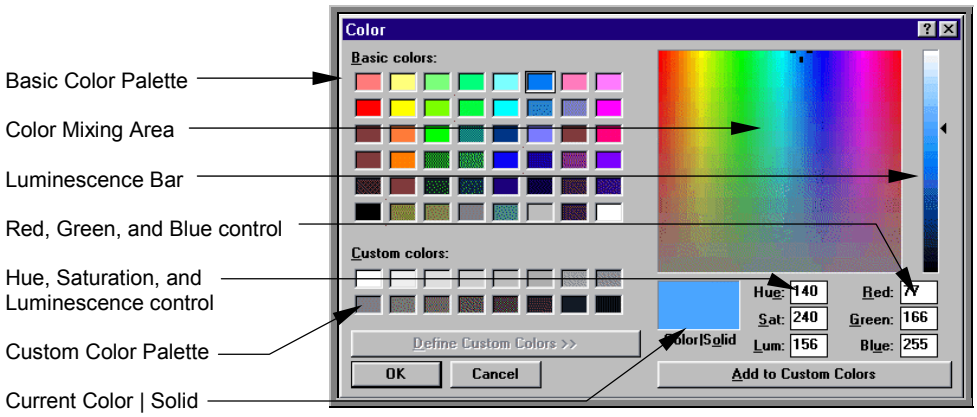
When you select an item to change, a color selection window will appear, allowing you to choose the color to be used for the screen background.

In the color selection window, the current color is outlined for easy identification. To select a new color, you may click on a **Basic Color**, an already defined **Custom Color**, or the **Define Custom Colors** button which allows you to create a new color.



When you elect to **Define** (a new) **Custom Color**, the **Color** menu expands to include: a **Color Mixing Area**; a **Luminescence Bar**; a **Current Color | Solid** box; **Red**, **Green**, and **Blue** control boxes; and **Hue**, **Saturation**, and **Luminescence** control boxes.

To create a new color, begin by clicking on one of the 16 color boxes in the **Custom Colors** area. The box you choose will be the storage location for your new color.



Color Mixing Area & Luminescence Bar

To create a color in the mixing area, use your mouse cursor to drag the crosshair marker around the mixing area to find the desired shade. As you move the crosshairs, notice the changing values in the **Color Control** boxes as well as the changing colors in the **Current Color | Solid** box. The **Current Color** is the actual shade of the

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chosen **Solid Color**. The difference between the two colors is controlled by the **Luminescence Bar**. Slide the ● arrow up and down the **Luminescence Bar** to control the relative lightness of the pure color.

Color Control boxes

To create a color with the control boxes, simply enter the values into the text entry boxes. **Red**, **Green**, and **Blue** control the actual strength of each respective color component. **Hue** is the actual pure color number and **Saturation** is a measure of the strength of the **Hue**. **Luminescence** controls the relative lightness of the color.

Saving Custom Colors

When you have successfully designed your new custom color, click [Add to Custom Colors] to save it. Now click [OK] to activate your new color and close the color selection window.

The color you select or create may not always be supported by your video setup. When this occurs, the closest allowable color match will be used.

13.10 Show Status Bar

FUNCTION: The **Show Status Bar** item is a toggle switch that displays and hides the status bar at the bottom of the "Sight" Survey screen.

To access this screen from the keyboard, press Alt G, H.

Simply click your mouse on the **Show Status Bar** item to turn it **On** and **Off**.

The status bar contains four areas. On the left is a **System Resources** indicator which reports the percentage of free system resources you have available. When Windows starts, it automatically allocates a portion of memory for system resources. This

memory is used by Windows to keep track of open windows, programs in use, icons, program groups, etc. However, Windows doesn't manage this memory very well. When a program is started under Windows, a chunk of system resource memory is used. When the program is closed, the program is supposed to give all the memory back, but almost all programs steal some.

É ***When your free resources drop to below 25% you are skating on thin ice. Proceed at your own risk.*** We strongly suggest you save your data, exit and restart Windows. ***When your free resources drop to below 10%, a Windows crash is imminent. Save your data and restart Windows. If Windows crashes, you'll lose all your unsaved work.***

The second box consumes the majority of the status bar and contains context sensitive help and tips.

The third and fourth boxes, on the right of the screen, contain the Northing and Easting coordinates at the tip of the drawing cursor. These values are relative to the page center coordinates discussed on page 393.

13.11 Show Tool Bar

FUNCTION: The **Show Tool Bar** item is a toggle switch which displays and hides the **Main** tool bar which lies just under the pull-down menu bar at the top of the "Sight" Survey screen.

To show or hide this screen from the keyboard, press Alt G, W.

Click your mouse on the item to turn it on and off. (The bar shown below has been split into four sections to enhance detail.)

The tool bar buttons represent routines or commonly used functions. To activate a tool bar button point to it with your mouse and click on it. Many buttons have functions for both left and right clicks. The icons and their functions are described below.

Left: Exit (quit) "Sight" Survey 222
Right: File Path Configuration 409

Left: Save Job 199
Right: Save Job As 201

Left: New Job 197
Right: Open Job 198

Left: Status - Display point and backsight bearing.
Right: System Information 460

Left: Edit Original Raw Data 227

Left: Edit Coordinates 225
Right: List Coordinates 242

Left: Define Figure 249

Left: Define Offsets 405
Right: Constant Factor 406

Left: Query Entity 751
Right: Selection Filter 560

Left: **Layer Control** 839
Right: **Layer Override** 849

Left: **Point Plot** ..... 239 / 242
Right: **Print Coordinates** 209

Left: **Get Point** 375
Right: **Get a Point Series** (String) 376

Left: **Select Points** 377

Left: **Measure an Angle** 347
Right: **Angle Configuration Menu** 408

Left: **Measure a Distance** 346
Right: **Slope Configuration Menu** 390

Left: **CAD Configuration Menu** 392
Right: **COGO Configuration Menu** 392

Left: **Auto Scaling** of image in **Drawing** window, **X** when inactive.
Right: **Zoom Scaled** 574

Left: **Annotate Lines** - On/Off toggle, **X** when inactive 490

Left: **Annotate Points** - On/Off toggle, **X** when inactive 484

Left: **Add Symbols** - On/Off toggle, **X** when inactive 487
Right: **View Symbols** ..... 525 / 613

Left: **Draw Lines** - Toggle line drawing when computing COGO points. When inactive, **X** overlays the icon.

Left: **Text Output** - Activate/deactivate **Text Output** window.
Right: **Text Output Configuration Menu** 388

Left: **Re-center Paper** 803
Right: **Show/Hide Paper Border** 385

Left: Portrait/Landscape Paper Orientation 385

Left: Contour It! 449

Left: Collector Connector: Send Data 451
Right: Collector Connector: Receive Data 451

Left: LegalEase 453
Right: Write a Legal File 453

Left: Pop-Up Calculator 360

13.12 Check Registration

FUNCTION: The Check Registration command is used to upgrade a demo copy of "Sight" Survey to a full working copy.

The check registration command is only available when "Sight" Survey is currently working as a demo.

If "Sight" Survey is currently a full working copy and you would like to change your registration information, click on the ***Change Registration*** icon () located in the Simplicity Systems group of the **Program Manager**.

After invoking the Check Registration command, "Sight" Survey will load the ***Change Registration*** program. This program will allow you to add or modify personal information that is used by "Sight" Survey and is also used in the registration form that you should send back to Simplicity Systems, Inc. After the ***Change Registration*** program is exited, "Sight" Survey will again check to see if it should be running as a demo or a full copy.

To upgrade your program from a demo version to a full working copy, select Check Registration and call Simplicity Systems at (218) 773-8917.

"Sight" Survey 3.0

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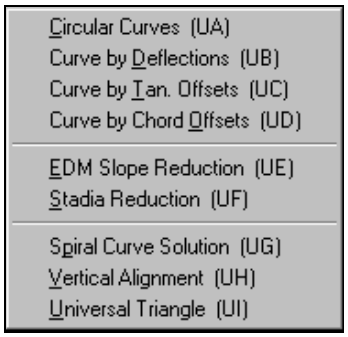
The UTILITIES Menu



The **Utilities** menu contains a number of stand-alone programs used in solving field staking problems. Here you'll find various types of solutions for circular and spiral curves, field note reduction, triangle solutions and vertical alignment solutions.

? *If you access a utility program from "Sight" Survey's* **Utilities** *menu,* ***DO NOT*** *print your results. Save them to a file and paste them into "Sight" Survey's* **Text Output** *window and print them from there.*

14.01 Circular Curve (UA)

FUNCTION: The **Circular Curve** routine will solve a circular curve given any one pair of the 29 possible parameters.

When sending output to an ASCII text file, the name of the file created by this routine is **CIRCULAR.DOC**.

Parameters

This routine will solve a circular curve when given any one of the 29 possible conditions shown below.

- ***KNOWN Central Angle and:*** *Long Chord; Arc Length; Tangent; Mid Ordinate; External; Sector Area; Radius; Degree of Curve-Arc; or Degree of Curve-Chord.*
- ***KNOWN Degree of Curve-Arc and:*** *Long Chord; Arc Length; Tangent; Mid Ordinate; External; or Sector Area.*
- ***KNOWN Degree of Curve-Chord and:*** *Long Chord; Arc Length; Tangent; Mid Ordinate; External; or Sector Area.*

- ***KNOWN Radius and:*** *Long Chord; Arc Length; Tangent; Mid Ordinate; External; or Sector Area.*
- ***KNOWN Long Chord &*** *Tangent*
- ***KNOWN Arc Length &*** *Sector Area*

To compute a circular curve solution, type **UA** or press Alt U, C at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **Circular Curve** icon in the Simplicity Systems group.

Select First Parameter:
< 1 > Central Angle Known
< 2 > Radius Known
< 3 > Degree of Curve Known - Arc
< 4 > Degree of Curve Known - Chord
< 5 > Long Chord Known
< 6 > Arc Length Known
< E > EXIT

Select the known parameter by pressing the number denoting the first parameter known, or press E or F10 to exit this routine. You will then be prompted for the value of the chosen parameter. Type in the data requested and press Enter.

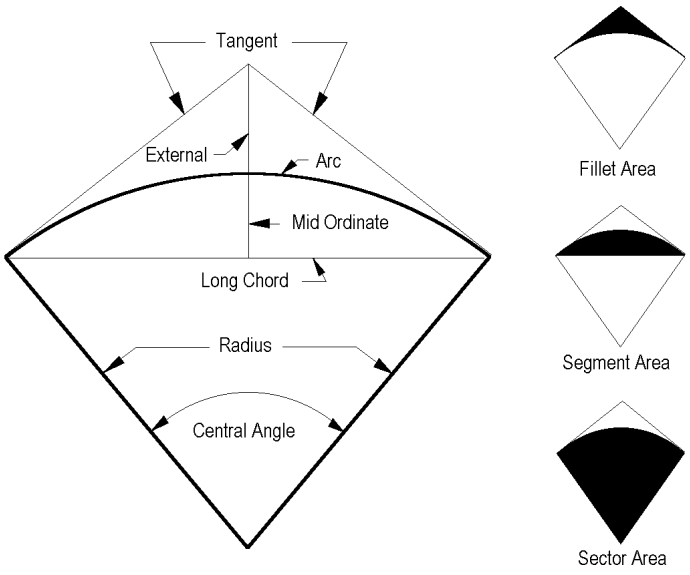
After an acceptable data entry, the program will issue a menu of the available second parameter entries. Since the exact parameter list is dependent upon the first parameter selected, no secondary parameter listing will be reproduced in this manual. Select the known second parameter by pressing the number denoting the parameter known, or press R to return to the first parameter menu. You will again be prompted for the value of the chosen parameter. Type the data requested and press Enter. After your final entry, the program will solve for the remainder of the circular curve data.

1. *All angles entered must be in a D.MMSS format.*
2. *If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read,* **< 2 > Exit**.

Select:
< 1 > Next Problem or
< 2 > Return to COGO

Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem. If you select option **< 2 > Return to COGO**, you will be returned to "Sight" Survey.

Circular Curve Solution		
Central Angle	=	37° 15’ 20.0”
Deg. Curve Arc	=	11° 27’ 33.0”
Deg. Cur. Chord	=	11 °28’ 42.0”
Radius	=	500.000
Arc Length	=	325.116
Arc by Chd. Def.	=	324.573
Long Chord	=	319.419
Tangent	=	168.538
Mid Ordinate	=	26.193
External	=	27.641
Fillet Area	=	2990.234
Sector Area	=	81279.014
Segment Area	=	5607.618



14.02 Curve by Deflections (UB)

FUNCTION: The **Curve by Deflections** routine will generate staking notes for a circular curve based on the deflection angle from the tangent to each station.

When sending output to an ASCII text file, the name of the file created by this routine is **DEFLECT.DOC**.

To compute a deflection layout for any circular curve, type **UB** or press Alt U, D at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **Curve by Deflections** icon in the Simplicity Systems group.

Central Angle

Type the central angle (**D.MMSS**) and press Enter.

Select Known Item:
< 1 > Radius
< 2 > Degree of Curve - Arc
< 3 > Degree of Curve - Chord

Select the known item by pressing 1, 2 or 3, or press F10 to exit the routine. Type the requested radius or the requested degree of curve and press Enter. If you select **Degree of Curve - Chord**, the curve calculations will be based on a chord definition.

Offset (Enter = 0.00)

Type the offset value and press Enter, or just press Enter for a **0** offset. To offset inside the curve, enter a negative offset value.

Select Option:
< 1 > Station of P.I. Known
< 2 > Station of P.C. Known

Select the appropriate option by pressing 1 or 2, or press F10 to exit the routine.

Station of PI (or PC)

If you select the PC option, pressing Enter without entering any data will result in a station entry of **0+00** (or **0+000** metric). Otherwise type the station and press Enter.

Stationing Interval

Type the distance between stations and press Enter.

Curving to the LEFT or to the RIGHT? (L/R)

If your curve proceeds to the left, press L, otherwise press R. Your response sets the proper orientation for the deflection angles. After answering this prompt, the solution is computed for you and displayed on your screen.

From time to time you will see the message **Press < Enter > to Continue** whenever the display screen is full. These delays are programmed at specific intervals to allow you to view the data on the monitor during the running of the program. To continue with the solution, simply press ↵Enter. (These delays do not occur if you have chosen to print directly to the printer.)

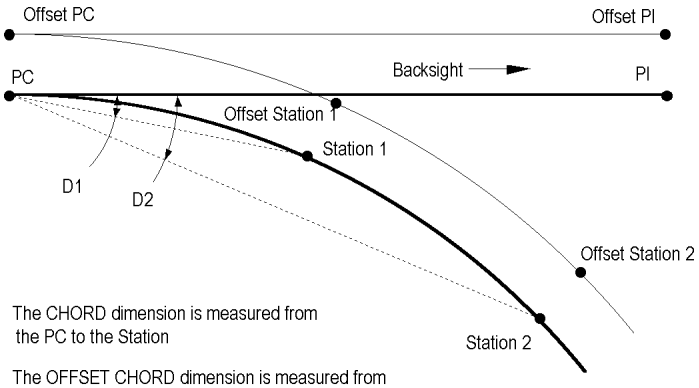
Additional Stations

After completion of the problem, you will be given an opportunity to compute curve data for any intermediate station on the curve. To compute any extra stations, type the desired station and press ↵Enter, and the deflection angle and chord length will be computed. The short chord, offset chord and offset short chord are not computed for additional stations. If you need additional information for these stations, re-run the problem using a stationing interval small enough to include these stations.

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

Select:
< 1 > Next Problem or
< 2 > Return to COGO

Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem. If you select option **< 2 > Return to COGO**, you will be returned to "Sight" Survey.



The CHORD dimension is measured from the PC to the Station

The OFFSET CHORD dimension is measured from the Offset PC to the Offset Station

The DEFLECTION ANGLES (D1, D2, ...) are the deflection angles for each successive Station and Offset Station

Circular Curve Layout by Deflections

Central Angle	75° 45' 30.0"
Degree of Curve - Arc	20° 50' 05.4"
Degree of Curve - Chord	20° 57' 04.9"
Radius	275.000
Arc Length	363.614
Chord Length	337.699
Tangent Length	213.921
Offset	3.000
Deflection/Foot in Minutes	6.250

Sub Arc	Deflection	Chord	Offset Chord
25.000	2° 36' 15.7"	24.991	25.264
50.000	5° 12' 31.3"	49.931	50.476
75.000	7° 48' 47.0"	74.768	75.583
100.000	10° 25' 02.7"	99.450	100.535
125.000	13° 01' 18.4"	123.927	125.279
150.000	15° 37' 34.0"	148.147	149.764
175.000	18° 13' 49.7"	172.062	173.939
200.000	20° 50' 05.4"	195.621	197.755

Station	Deflection	Chord	Short Chord	Offset Chord	Offset S.Chord
P.C.					
0+72.50	0° 00' 00.0"	0.000	0.000	0.000	0.000
1+00.00	2° 51' 53.2"	27.489	27.489	27.788	27.788
2+00.00	13° 16' 55.9"	126.361	99.450	127.740	100.535
3+00.00	23° 41' 58.6"	221.068	99.450	223.480	100.535
4+00.00	34° 07' 01.3"	308.487	99.450	311.852	100.535
4+36.11	37° 52' 45.0"	337.699	36.088	341.383	36.482
P.T.					

14.03 Curve by Tangent Offsets (UC)

FUNCTION: The **Curve by Tangent Offsets** routine will generate staking notes for a circular curve based on the offsets from the tangent to each station.

When sending output to an ASCII text file, the name of the file created by this routine is **TANGENT.DOC**.

To compute a tangent offset layout for any circular curve, type **UC** or press Alt U, T at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **Curve by Tangent Offsets** icon in the Simplicity Systems group.

Station of PI

Type the station of the P.I. and press Enter.

Central Angle

Type the central angle (**D.MMSS**) and press Enter.

Select Known Item:
< 1 > Radius
< 2 > Degree of Curve - Arc
< 3 > Degree of Curve - Chord

Select the known item by pressing 1, 2 or 3, or press F10 to exit the routine. Type the requested radius or the requested degree of curve and press Enter. If you select **Degree of Curve - Chord**, the arc length will be based on a chord definition.

Stationing Interval

Type the distance between stations and press Enter. After answering this prompt, the solution is computed for you and displayed on your screen.

From time to time you will see the message **Press < Enter > to Continue** whenever the display screen is full. These delays are programmed at specific intervals to allow you to view the data on the monitor during the running of the program. To continue with the solution, simply press Enter. (These delays do not occur if you have chosen to print directly to the printer.)

Additional Stations

After completion of the problem, you will be given an opportunity to compute curve data for any intermediate station on the curve. To compute any extra stations, type in each desired station and press Enter, and the curve data will be computed. At any time you wish to exit the program, press F10.

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

Select:
< 1 > Next Problem or
< 2 > Return to COGO

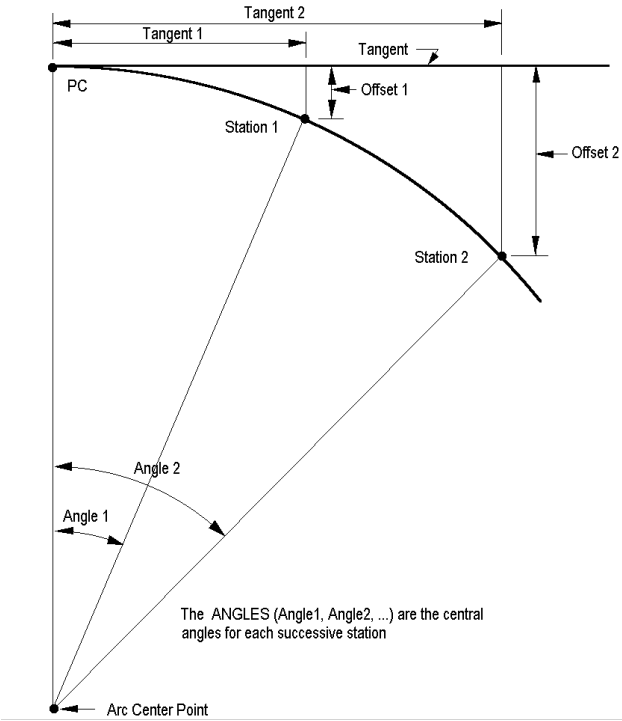
Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem. If you select option **< 2 > Return to COGO**, you will be returned to "Sight" Survey.

Circular Curve Layout by Tangent Offsets

Central Angle = 75° 30' 45.0"
Curve Radius = 100.000
Station of P.I. = 5+00.00
Sta. Interval = 25

Station	Central Angle	Tangent	Offset
P.C. 4+22.55	0° 00' 00.0"	0.000	0.000
4+25.00	1° 24' 04.7"	2.446	0.030
4+50.00	15° 43' 30.9"	27.102	3.743
4+75.00	30° 02' 57.1"	50.074	13.440
4+88.45	37° 45' 22.5"	61.230	20.938
P.T. 5+54.35	0° 00' 00.0"	0.000	0.000
5+50.00	2° 29' 29.4"	4.347	0.095
5+25.00	16° 48' 55.6"	28.929	4.276
5+00.00	31° 08' 21.8"	51.712	14.409
4+88.45	37° 45' 22.5"	61.230	20.938

External Distance = 26.483



14.04 Curve by Chord Offsets (UD)

FUNCTION: The **Curve by Chord Offsets** routine will generate staking notes for a circular curve based on the offset from the tangent and long chord to each station.

When sending output to an ASCII text file, the name of the file created by this routine is **CHORD.DOC**.

To compute a chord offset layout for any circular curve, type **UD** or press Alt U, O at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **Curve by Chord Offsets** icon in the Simplicity Systems group.

Central Angle

Type the central angle (**D.MMSS**) and press Enter.

Select Known Item:
< 1 > Radius
< 2 > Degree of Curve - Arc
< 3 > Degree of Curve - Chord

Select the known item by pressing 1, 2 or 3, or press F10 to exit the routine. Type the requested radius or the requested degree of curve and press Enter. If you select **Degree of Curve - Chord**, the arc length will be based on a chord definition.

Select Option:
< 1 > Station of P.I. Known
< 2 > Station of P.C. Known

Select the appropriate option by pressing 1 or 2, or press F10 to exit the routine.

Station of PI (or PC)

If you have selected the PC option, pressing Enter without entering any data will result in a station entry of **0+00** (or **0+000** metric). Otherwise type the station and press Enter.

Stationing Interval

Type the distance between stations and press Enter. The solution is computed for you and displayed on your screen.

From time to time you will see the message **Press < Enter > to Continue** whenever the display screen is full. Delays are programmed at specific intervals to allow you to view the data on the monitor during execution of the program. To continue with the solution, simply press Enter. (Delays do not occur if you have chosen to print directly to the printer.)

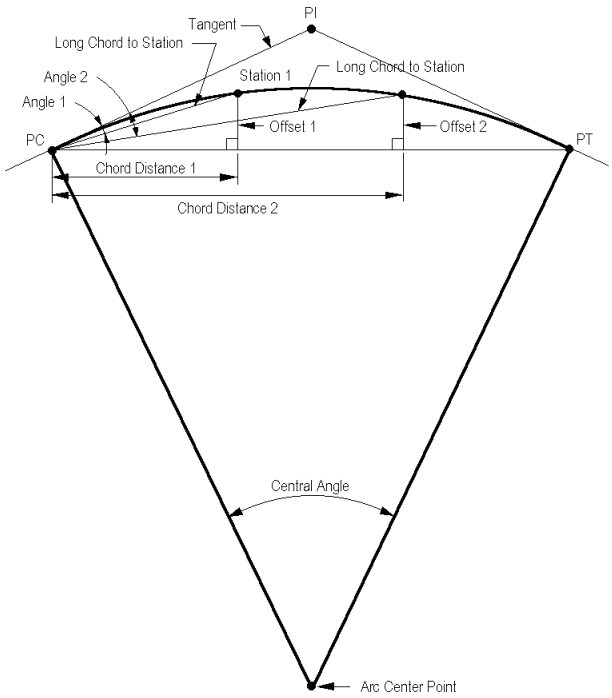
Additional Stations

After completion of the problem, you will be given an opportunity to compute curve data for any intermediate station on the curve. To compute any extra stations, type in each desired station and press ↵Enter.

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

Select:
< 1 > Next Problem or
< 2 > Return to COGO

Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem. If you select option **< 2 > Return to COGO**, you will be returned to "Sight" Survey.



Circular Curve Layout by Chord Offsets

Central Angle	75° 00' 00.0"
Curve Radius	250.000
Station of P.C.	0+00.000
Arc Length	327.249
Chord Length	304.381
Tangent Length	191.832

Station	Deflection	Long Chord	Chord Offset	Chord
P.C.				
0+00.000	0° 00' 00.0"	0.000	0.000	0.000
0+50.000	5° 43' 46.5"	49.917	26.282	42.437
1+00.000	11° 27' 33.0"	99.335	43.609	89.250
1+50.000	17° 11' 19.4"	147.760	51.290	138.572
2+00.000	22° 55' 05.9"	194.709	49.020	188.438
2+50.000	28° 38' 52.4"	239.713	36.888	236.858
3+00.000	34° 22' 38.9"	282.321	15.378	281.902
3+27.249	37° 30' 00.0"	304.381	0.000	304.381
P.T.				

14.05 EDM Slope Reduction (UE)

FUNCTION: The **EDM Slope Reduction** routine will reduce EDM slope measurements to horizontal and vertical components. Horizontal distances are available for four different elevations: at the EDM; at the target; at an average elevation; and at sea level.

When sending output to an ASCII text file, the name of the file created by this routine is **EDM.DOC**.

To reduce EDM slope data, type **UE** or press Alt U, E at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **EDM Slope Reduction** icon in the Simplicity Systems group.

Leg Number

Type in any numeric designation, 1-999, and press Enter. The leg number is for identification only and is not required. In fact, you may bypass the leg number entry by simply pressing Enter.

Slope Distance

Type the measured slope distance and press Enter.

Section 14

Angle (1) or Elev. of Inst. & Target (2) known (1 or 2)

Select the known option by pressing 1 or 2. Continue with the appropriate instructions.

Option 1 - Slope Angle Known

Angle

Type the slope angle (**D.MMSS**) and press ↵Enter. If you are shooting level, simply press ↵Enter.

*This can be either a **zenith** angle or a **vertical** angle.*

Elevation at the Instrument

Type the elevation at the instrument station and press ↵Enter. If this elevation is unchanged from a previous problem, simply pressing ↵Enter will re-enter the previous value.

Height of the Distance Meter

Type the height of the distance meter above the elevation of the occupied point and press ↵Enter. ***This is not an elevation!***

Height of the Prism Assembly

Type the height of the prism above the elevation of the target station and press ↵Enter. ***This is not an elevation!***

Height of the Theodolite

Type the height of the theodolite above the elevation of the occupied point and press ↵Enter. ***This is not an elevation!***

Height of the Target

Type the height of the target above the elevation of the target station and press ↵Enter. ***This is not an elevation!***

After the required height values have been entered, the results will be shown in a display similar to the first one shown in the example that follows. Skip to the section, **Common to Both Options**, which follows Option 2.

Option 2 - Elevations Known

Elevation at the Instrument

Type the elevation at the instrument and press ↵Enter.

Height of the Distance Meter

Type the height of the distance meter above the elevation of the occupied point and press ↵Enter. ***This is not an elevation!***

Elevation at the Target Station

Type the target station elevation and press ↵Enter.

Height of the Prism

Type the height of the prism above the elevation of the target station and press ↵Enter. ***This is not an elevation!*** After the required value has been entered, the results will be shown in a display similar to the second one shown in the example on the next page.

Common to Both Options

Compute a Horizontal Distance at an Elevation of ? (Press F1 for Next Shot or F2 to Change Setup)

Type in any elevation at which you wish to compute the horizontal distance and press ↵Enter. The computed distances will be printed. You may repeat this sequence for any number of elevations.

To enter another shot from this same setup, press F1. To change the setup and continue this routine, press F2. To end, press F10.

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

Select: < 1 > Next Problem or < 2 > Return to COGO

Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem.

Option 1

Leg	Slope Distance	Zenith Angle	Elevation at EDM	EDM Height	Prism Height	Theod. Height	Target Height
1	10582.880	87°40' 44.0"	4462.420	5.470	5.400	5.470	5.400

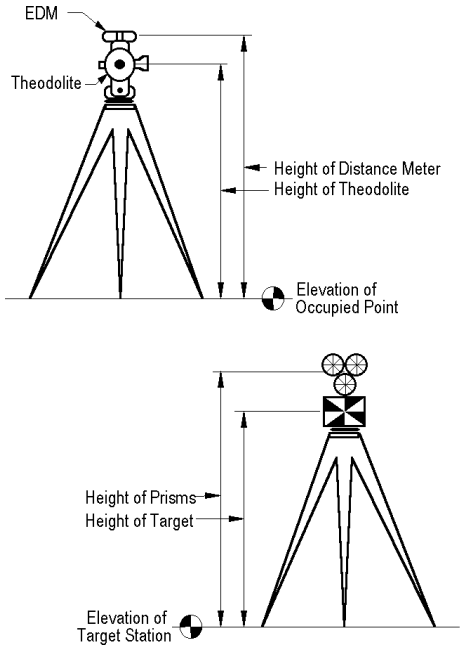
H. Dist @ EDM	H. Dist @ Target	H. Dist @ Average	H. Dist @ Sea Level	Uncor. Elev @ Target	Curv/Ref Correction
10573.995	10574.213	10574.104	10571.738	4891.094	2.297

Corrected Target Elev
4893.392

Option 2

Leg	Slope Distance	Elevation at EDM	Instrument Height	Elevation at Target	Prism Height
1	5113.550	551.250	5.510	675.880	4.750

Horiz. Dist. at EDM Elev.	Horiz. Dist. at Target Elev.	Horiz. Dist. at Average Elev.	Horiz. Dist. at Sea Level Elev.
5112.034	5112.065	5112.049	5111.899



14.06 Stadia Reduction (UF)

FUNCTION: The **Stadia Reduction** routine will reduce stadia measurements to horizontal and vertical components.

When sending output to an ASCII text file, the name of the file created by this routine is **STADIA.DOC**.

To perform stadia reductions, type **UF** or press Alt U, S at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **Stadia Reduction** icon in the Simplicity Systems group.

Stadia Interval Constant K (Default = 100)

Type the stadia interval constant and press ↵Enter. If the constant is equal to 100, simply press ↵Enter.

? *If you want to enter measured distances instead of stadia intervals, answer the* **Stadia Interval Constant** *prompt by typing* M ↵Enter. *The program will skip to the* **Starting Elevation** *request. Additionally, instead of requesting an* **Interval**, *the program will request a* **Distance**. *Type the slope distance and press* ↵Enter *at each distance prompt.*

Distance from Center of Instrument to Principal Focus C (Default = 0.0)

Type the value for **C** and press ↵Enter. If **C** equals zero, simply press ↵Enter.

Starting Elevation (Default = 100)

Type the elevation of the instrument station and press ↵Enter.

Height of the Instrument

Type the height of the instrument above the elevation of the occupied point and press ↵Enter.

Point Number

Type in a point designation and press ↵Enter. This designation may be in alphanumeric form, up to 12 characters in length. To continue without entering any designation, just press ↵Enter.

Angle

Type the slope angle (**D.MMSS**) and press ↵Enter. If you are shooting level, simply press ↵Enter.

This can be either a ***zenith*** *angle or a* ***vertical*** *angle.*

Reading

Type the rod reading (middle stadia hair) and press ↵Enter.

Interval

Type the rod interval (difference between the top and bottom stadia hairs) and press ↵Enter. The program will respond by printing the point designation, the slope angle, the rod interval, the rod reading, the vertical and horizontal distances and the elevation of each

point. The program will return to a request for the next point number. To end this routine, press F10.

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

Select:
< 1 > Next Problem or
< 2 > Return to COGO

Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem. If you select option **< 2 > Return to COGO**, you will be returned to "Sight" Survey.

Stadia Reduction

Stadia Interval Constant K	100.000
Distance from Center of Instrument to Principal Focus C	0.000
Starting Elevation	830.000
Height of the Instrument	4.330

Point	Slope Angle	Interval	Reading	Vertical	H. Dist	Elevation
1	Z 84°00' 00.0"	5.250	6.340	54.577	519.264	882.567
2	Z 81°30' 00.0"	4.770	4.850	69.731	466.579	899.211

Note: Z = Zenith Angle

14.07 Spiral Curve Solution (UG)

FUNCTION: The **Spiral Curve** routine will generate staking notes for a Euhler spiral curve, either from the Tangent to Spiral or from the PI of the spiral's tangents.

When sending output to an ASCII text file, the name of the file created by this routine is **SPIRAL.DOC**.

Data Entry window

To compute a spiral curve layout for any circular curve, type **UG** (or press Alt U, P) at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **Spiral Curve Solution** icon in the Simplicity Systems group.

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Length of Spiral

Type the spiral length and press ↵Enter.

Select Known Item:
< 1 > Radius
< 2 > Degree of Curve - Chord
< 3 > Degree of Curve - Arc

Select the known item by pressing 1, 2 or 3, or press F10 to exit the routine. Type the requested radius or the requested degree of curve and press ↵Enter. If you select **Degree of Curve - Chord**, the arc length will be based on a chord definition.

Select:
< 1 > Station of TS Known
< 2 > Station of PI Known

Select the known item by pressing 1 or 2, or press F10 to exit the routine.

Station of PI (or TS)

Type the requested station value and press ↵Enter.

Stationing Interval on Spiral
Stationing Interval on Curve

Type the distance between stations along the spiral and press ↵Enter. Type the distance between stations along the circular curve and press ↵Enter. To use a value equaling the spiral interval, just press ↵Enter.

Intersection Angle of Tangents at P.I.

Type the intersection angle (**D.MMSS**) and press ↵Enter.

Curving to the LEFT or to the RIGHT? (L/R)

If your curve proceeds to the left, press L, otherwise press R. Your response to this prompt sets the proper orientation for the deflection angles.

Select:
< 1 > Stake from TS & ST Stations
< 2 > Stake from PI

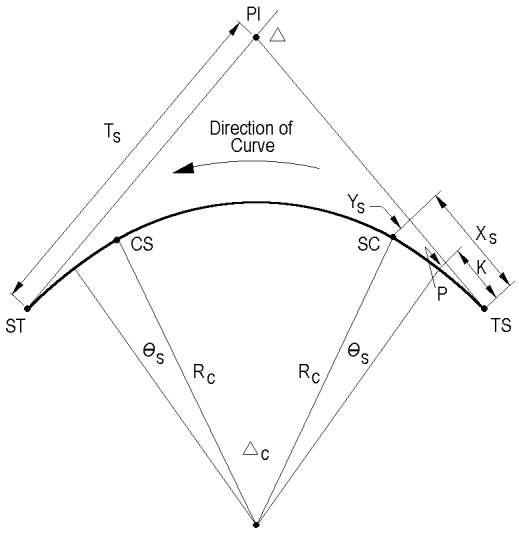
The curve may be laid out in one of two ways. Option 1, assumes that your transit will be set up twice, once at the TS, or ***Tangent to Spiral***, and again at the ST, or ***Spiral to Tangent***. Both setups assume that you are backsighting the ***Point of Intersection*** (PI) of the tangents. Option 2 assumes that your transit will be set up at the ***Point of Intersection*** (PI) of the tangents and that you will be backsighting the ***Tangent to Spiral*** (TS) and the ***Spiral to Tangent*** (ST). Enter the chosen staking method by pressing 1 or 2.

After selecting the staking method, the program will compute and display the solution. From time to time you will see the message **Press < Enter > to Continue** whenever the display screen is full. These delays are programmed at specific intervals to allow you to view the data on the monitor during the running of the program. To continue with the solution, simply press ↵Enter. (These delays do not occur if you have chosen to print directly to the printer.)

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

Select:
< 1 > Next Problem
< 2 > Return to COGO
< 3 > ReStake from New Station

After completion of the problem, you'll be given an opportunity to re-compute the curve data using the other available staking method. Make your selection by pressing 1, 2 or 3. If you choose option 3, the problem solution will be repeated assuming a staking method which is the opposite of the previous solution.



TS = Tangent to Spiral
SC = Spiral to Curve
CS = Curve to Spiral
ST = Spiral to Tangent
θ_S = Total Spiral Angle
Δ = Intersection Angle of Tangents at the PI
Δ_C = Central Angle of Circular Curve
Y_S = Tangent Offset at SC
X_S = Tangent Distance from TS at SC
R_C = Radius of Osculating Circle
P = Offset from Tangent to PC of Osculating Circle
K = Tangent Distance from TS to Shifted PC
T_S = Total Tangent Distance from the PI to the ST (or TS)

Spiral Curve Layout

Length of Spiral	150.000
Curve Radius	380.000
Station of P.I.	8+50.000
Stationing Interval on Spiral	50.000
Stationing Interval on Curve	100.000
Intersection Angle of Tangents at P.I.	105° 00' 00.0"
Tangent Dist from PI to TS	573.339
OS from TS to PC of Circle (p)	2.464
Offset to the shifted PC (k)	74.903
Direction of Curvature	Right

Deflections from Transit at T.S. & S.T. Stations, backsighting the P.I.

Station	Deflection	L.Chord	S.Chord	Tangent	Offset
T.S.					
2+76.66	0° 00' 00.0"	0.000	0.000	0.000	0.000
3+00.00	0° 05' 28.5"	23.339	23.339	23.339	0.037
3+50.00	0° 54' 03.9"	73.332	49.996	73.323	1.153
4+00.00	2° 32' 53.5"	123.241	49.984	123.120	5.479
4+26.66	3° 46' 05.6"	149.740	26.656	149.417	9.841
S.C.					
4+26.66	3° 46' 05.6"	149.740	0.000	149.417	9.841
5+00.00	8° 03' 06.1"	221.688	73.225	219.503	31.051
6+00.00	14° 47' 17.0"	316.419	99.712	305.938	80.764
6+99.85	21° 52' 40.6"	405.588	99.567	376.377	151.134
S.T.					
11+23.05	0° 00' 00.0"	0.000	0.000	0.000	0.000
11+00.00	0° 05' 20.4"	23.047	23.047	23.047	0.036
10+50.00	0° 53' 38.1"	73.040	49.996	73.031	1.140
10+00.00	2° 32' 10.2"	122.951	49.985	122.830	5.441
9+73.05	3° 46' 05.6"	149.740	26.948	149.417	9.841
C.S.					
9+73.05	3° 46' 05.6"	149.740	0.000	149.417	9.841
9+00.00	8° 01' 59.0"	221.406	72.935	219.233	30.940
8+00.00	14° 46' 03.7"	316.150	99.712	305.706	80.587
7+00.00	21° 52' 02.8"	405.462	99.712	376.288	151.019
6+99.85	21° 52' 40.6"	405.588	0.146	376.377	151.134

Apex Distance = 248.265

14.08 Vertical Alignment (UH)

FUNCTION: The **Vertical Alignment** routine will calculate the stationing and elevations along a combination of vertical curves and uniform grades.

When sending output to an ASCII text file, the name of the file created by this routine is **VERTICAL.DOC**.

?

*All **Entry** and **Exit** grades are entered as percents. For example, a 0.025 slope would be entered as a percent grade of 2.50 percent, preceded by a minus sign if necessary.*

Data Entry window

To calculate vertical alignments, type **UH** (or press Alt U, V) at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **Vertical Alignment** icon in the Simplicity Systems group.

Select Mode:
< 1 > Vertical Curve
< 2 > Uniform Grade

Select the type of leg to be calculated by pressing 1 or 2. Proceed with the appropriate instructions for the solution mode chosen.

Mode 1 - Vertical Curve

% Entry Grade (Default = *nn.nnn*%)

Type the percent entry grade and press Enter, or simply press Enter to accept the default value (***nn.nnn***) displayed in the prompt. If the current segment is a continuation of a prior segment, the default value (***nn.nnn***) will be equal to the last exit grade.

% Exit Grade (Default = 0%)

Type the percent exit grade and press Enter, or simply press Enter to accept the default value of 0%.

Select Option:
< 1 > Station of P.I. Known
< 2 > Station of P.C. Known

Select the appropriate option by pressing 1 or 2, or press F10 to exit the routine.

Station of PI (or PC)

Type the station and press Enter, or accept any default station offered by simply pressing Enter. If you have selected the PC option, a default response of station ***x+xx*** will be offered in the prompt. If

the segment you are now computing is a continuation of a prior segment, the value of the default station (***x+xx***) will be the value of the final station of the last segment.

Elevation at PI (or PC) Station

Type the requested elevation and press Enter, or accept any default elevation offered by simply pressing Enter. If you have selected the PC option, a default response of elevation *zzz.zzz* will be offered in the prompt. If the current segment is a continuation of a prior segment, the value of the default elevation (*zzz.zzz*) will be the value of the elevation at the final station of the last segment.

Select Known Option:
< 1 > Length of Curve
< 2 > High (or Low) Elevation
< 3 > Station and Elevation

You are now offered a choice of three conditions. Select the known condition by pressing 1, 2 or 3, and proceed with the instructions for the option chosen.

Mode 1 - Option 1 - Length of Curve Known

Length of Curve

Type the curve length and press Enter.

Stationing in feet (meters)

Please continue with the instructions for the response to this prompt which follow the discussion for **Mode 1 - Option 3**.

Mode 1 - Option 2 - High (or Low) Elevation Known

High (or Low) Elevation

Type the value of the elevation and press Enter.

The Computed Length is *yyyy.yyy*.

The program will now compute a length of curve (***yyyy.yyy***) and display it for your approval. Please continue with the instructions for the response to this prompt which appear in the discussion for **Mode 1 - Option 3**.

Mode 1 - Option 3 - Station and Elevation Known

Known Station

Type the known station and press ↵Enter.

Elevation at Known Station

Type the known elevation and press ↵Enter. The program will now compute a length of curve and display:

The Computed Length is *yyyy.yyy*. Press <Enter> if correct or enter corrected length

The program will now compute a length of curve (***yyyy.yyy***) and display it for your approval. If the displayed length is acceptable, press ↵Enter, if not, type the correct value and press ↵Enter.

Mode 1 - All Options

Stationing in feet (meters)

Type the distance between stations and press ↵Enter. At this point, the vertical curve solution will be generated.

From time to time you will see the message **Press < Enter > to Continue** whenever the display screen is full. These delays are programmed at specific intervals to allow you to view the data on the monitor during the execution of the program. To continue with the solution, simply press ↵Enter. (These delays do not occur if you have chosen to print directly to the printer.)

After completion of the problem, you will be given an opportunity to compute data for any intermediate station or elevation along the curve. You will see the message:

Enter a station to compute an elevation, OR enter an elevation (followed by an *, such as 752*) to compute the station(s), OR press key F1 to CONTINUE

You may now enter any station and the elevation will be computed, or you may enter an elevation and compute the station.

Press F1 to continue with another segment in your vertical alignment solution. You will be returned to the **Select Mode** prompt which is described at the beginning of the instructions for this routine. To end the routine, press F10.

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

Select:
< 1 > Next Problem or
< 2 > Return to COGO

Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem. If you select option **< 2 > Return to COGO**, you will be returned to "Sight" Survey.

Mode 2 - Uniform Grade

% Entry Grade
(Default = *nn.nnn*%)

Type the percent entry grade and press Enter, or simply press Enter to accept the default value (***nn.nnn***) displayed in the prompt. If the current segment is a continuation of a prior segment, the default value (***nn.nnn***) will be equal to the last exit grade.

*To enter the **beginning** and **ending elevations** instead of a grade, type the beginning elevation followed by an asterisk (*****), or simply type * Enter to accept the last elevation of zzz.zzz. If the current segment is a continuation of a prior segment, the default value (zzz.zzz) will be equal to the ending elevation of the last station. After accepting the beginning elevation entry, the program will ask for the ending elevation. Type the elevation and press Enter.*

Beginning Station
(Default = *x+xx*)

Type the station and press Enter, or accept the default station offered (***x+xx***) by simply pressing Enter. If the segment you are now computing is a continuation of a prior segment, the value of the default station (***x+xx***) will be the value of the final station of the last segment.

Elevation at Beginning
Station (Default = *zzz.zzz*)

Type the requested elevation and press Enter, or accept the default elevation offered by simply pressing Enter. If the segment you are now computing is a continuation of a prior segment, the value of the default elevation (*zzz.zzz*) will be the value of the elevation at the final station of the last segment.

Length of Segment

Type the segment length and press Enter.

Stationing in feet (meters)

Type the distance between stations and press Enter. At this point, the vertical alignment solution will be generated.

From time to time you will see the message **Press < Enter > to Continue** whenever the display screen is full. These delays are programmed at specific intervals to allow you to view the data on the monitor during execution of the program. To continue with the solution, simply press Enter. (These delays do not occur if you have chosen to print directly to the printer.)

After completion of the problem, you will be given an opportunity to compute data for any intermediate station or elevation along the curve. You will see the message:

Enter a station to compute an elevation, OR enter an elevation (followed by an *, such as 752*) to compute the station(s), OR press key F1 to CONTINUE

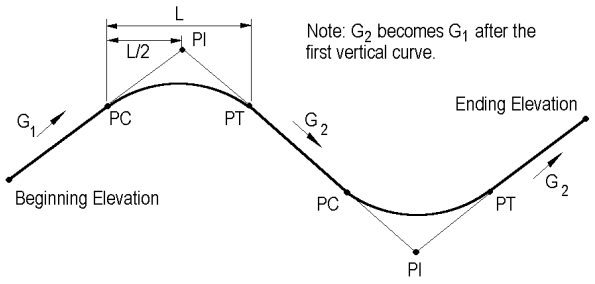
You may now enter any station and the elevation will be computed, or you may enter an elevation and compute the station.

Press F1 to continue with another segment in your vertical alignment solution. You will be returned to the **Select Mode** prompt which is described at the beginning of the instructions for this routine. To end the routine, press F10.

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

Select:
< 1 > Next Problem or
< 2 > Return to COGO

Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem. If you select option **< 2 > Return to COGO**, you will be returned to "Sight" Survey.



Vertical Alignment Solution

Uniform Grade = 2.500% Segment Length = 300.000'

STATION	ELEVATION
0+00.00	100.000
0+50.00	101.250
1+00.00	102.500
1+50.00	103.750
2+00.00	105.000
2+50.00	106.250
3+00.00	107.500

Grade In = 2.500% Grade Out = -3.000% Curve Length = 200.000'

STATION	ELEVATION	
4+00.00	110.000	P.I.
3+00.00	107.500	P.C.
3+50.00	108.406	
3+90.91	108.636	HIGH POINT
4+00.00	108.625	
4+50.00	108.156	
5+00.00	107.000	P.T.

Uniform Grade = -3.000% Segment Length = 300.000'

STATION	ELEVATION
5+00.00	107.000
5+50.00	105.500
6+00.00	104.000
6+50.00	102.500
7+00.00	101.000
7+50.00	99.500
8+00.00	98.000

14.09 Universal Triangle (UI)

FUNCTION: The **Universal Triangle** routine will solve for the unknown sides and/or angles of a triangle when one set of five possible parameters is known.

When sending output to an ASCII text file, the name of the file created by this routine is **TRIANGLE.DOC**.

Parameters

This routine will solve a triangle when given any one of the five possible conditions shown below.

Three Sides Known (SSS)
Two Sides and the Included Angle Known (SAS)
Two Sides and the Opposite Angle Known (SSA)
Two Angles and the Included Side Known (ASA)
Two Angles and the Opposite Side Known (AAS)

To calculate any triangle, type **UI** (or press Alt U, U) at any prompt in the **Data Entry** window. If you are not running "Sight" Survey, you may select the **Universal Triangle** icon in the Simplicity Systems group.

Select Solution:
< 1 > Side - Side - Side
< 2 > Side - Angle - Side
< 3 > Side - Side - Angle
< 4 > Angle - Side - Angle
< 5 > Angle - Angle - Side

Select the desired option by pressing any number, 1 through 5, then answer the distance and/or angle queries as they appear on the monitor. Press ↵Enter after each data entry.

Select:
< 1 > Acute Solution
< 2 > Obtuse Solution

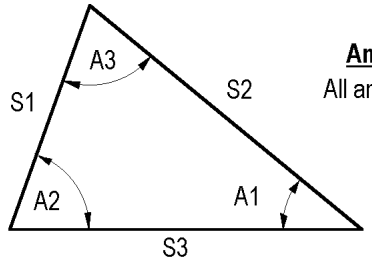
If the problem has two solutions, you will also be asked to select the acute solution, or the obtuse solution. Press 1 or 2. An ***acute*** solution is one in which all of the included angles are less than 90 degrees. An ***obtuse*** solution is one in which one of the included angles has a value lying between 90 degrees and 180 degrees.

"Sight" Survey will now solve the triangle, or report that no solution can be made from the data given.

If you didn't enter this routine from within "Sight" Survey, option 2 in the next prompt will read, **< 2 > Exit**.

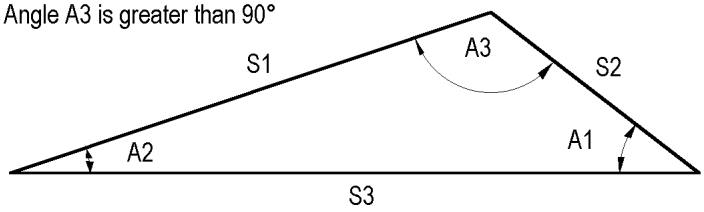
Select:
< 1 > Next Problem or
< 2 > Return to COGO

Make your selection by pressing 1 or 2. If you choose option **< 1 > Next Problem**, this routine will repeat the prompts as previously described, allowing you to compute another problem. If you select option **< 2 > Return to COGO**, you will be returned to "Sight" Survey.



An ACUTE Triangle
All angles are less than 90°

An OBTUSE Triangle
Angle A3 is greater than 90°



Universal Triangle Solution

1st Side =	175.255	
	Included Angle =	42° 58' 01.6"
2nd Side =	341.262	
	Included Angle =	29° 16' 52.8"
3rd Side =	244.225	
	Included Angle =	107° 45' 05.5"
1st Side		

Area = 20381.8813 Sq. Ft. or 0.4679 Acre

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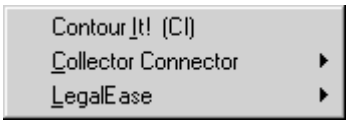
Section 15

The ADD-INS Menu



The **Add-Ins** menu is your gateway to add-on programs for "Sight" Survey. Currently, the menu contains interfaces to three programs: **Contour It!**, a contouring and volumes module; **Collector Connector**, a data collector interface; and **LegalEase**, a legal description writer.

The modules shown in the menu are not included with your "Sight" Survey program. They must be purchased separately. Once installed on your computer, "Sight" Survey will know they are available, and the item will appear in black print. Any items that appear grayed or washed out are not installed, and therefore are not available.

This section of the manual does not contain instructions for the operation of any of these modules, other than what is needed to activate the module. However, some information regarding these modules appears in this section.

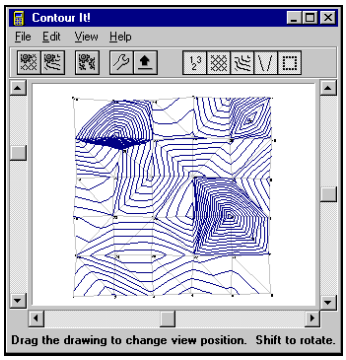
15.01 Contour It! (CI)

FUNCTION: The **Contour It!** module is used to create a contour map of your existing topo data. Additionally, **Contour It!** allows you to compute the volume between two contoured surfaces.

To access the **Contour It!** module, type **CI** (or **MC** for Make Contours) in any text box, or press Alt A, I.

About Contour It!

Contour It! is a simple, easy to use "Sight" Survey integrated module designed to generate contour maps and surface modeling from coordinate data.



Besides the ease of use and speed of **Contour It!** for general contour mapping and surface modeling, **Contour It!** includes fast, accurate and easy volumetric capabilities. Since volume calculations are direct comparisons between two surface models, intermediate grid cell or cross sections are not required to produce volume calculations and greater accuracy is maintained. Calculated volumes contain no provision for cut/fill ratio or shrink/swell percentage.

Northing, Easting, and elevation coordinates may be entered either by hand or loaded from coordinate files previously stored on disk.

The field surface is modeled using the triangulation method. **Contour It!'s** triangulated digital terrain model is extremely accurate. Nevertheless, breaklines may be defined for any areas on the surface model that require adjustment.

Contour It!'s graphics are fast, accurate and flexible. All maps may be previewed on your monitor prior to printing, plotting or transferring to CAD programs.

Contour line smoothing is achieved by the latest advanced algorithm, custom designed to handle the special properties of contour lines, while honoring the actual data points.

Contour It! Features...

- Unlimited data point capacity;
- Surface modeling using the Triangulation method;
- Breakline capabilities;
- Ability to calculate the volumetric difference between two surfaces. Output includes the total cut and fill amounts;
- Powerful 2-D and 3-D graphics;
- Advanced contour line smoothing;
- In-line contour labels;
- Support for English or Metric units;
- Output to any printer or plotter supported by Windows;
- DXF file transfer from "Sight" Survey to TrueCAD, AutoCAD, or virtually any other DXF capable CAD;
- DWG file transfer from "Sight" Survey to AutoCAD (using v12 format);
- DRG file transfer from "Sight" Survey to TrueCAD;
- Ability to graph point labels on maps.

Use Contour It! for:

- Contour maps;
- Digital terrain models;
- Stock pile and pit volumes;
- Site design earthwork volumes;
- Any application needing to compare an existing surface model to a proposed surface model, to calculate the difference in volume between the surfaces.

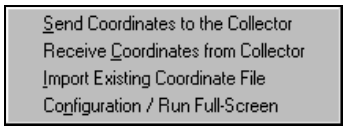
Contour It! is perfect for Land Surveyors, Civil Engineers, Architects, Contractors, Mining Engineers and many others. In fact, if you do only one contour map a year, **YOU NEED CONTOUR IT!**

Contact Simpl*icity Systems at 1-800-777-7978*

15.02 Collector Connector

FUNCTION: The **Collector Connector** module provides communications between your PC and your data collector.

To access the **Collector Connector** module, press Alt A, C. This will activate the Collector Connector menu.



This command is only available if you have **Collector Connector** installed on your computer. Instructions for the actual usage of **Collector Connector** are contained in the **Collector Connector** manual.

To send coordinates to the data collector, press S.
To receive coordinates from the data collector, press C.
To import an existing coordinate file, press I.
To configure **Collector Connector**, press N.

About Collector Connector

Collector Connector for Windows is a low cost replacement for high-priced OEM (Original Equipment Manufacturer) software. **Collector Connector** provides you with accurate PC to data collector communications all wrapped up in a quick, convenient, menu-driven, easy to use package.

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Collector Connector allows you to easily download/ upload ASCII data from your data collector to your PC, transferring both raw data files and coordinate lists!

Automatically format downloaded coordinate files for use with your favorite COGO program! Convert data collector coordinate files already on your PC into files compatible with your favorite COGO program! Select data collector and file types from a menu!

Compatible with Win 3.1, 95, 98, and NT, **Collector Connector** can run as a stand-alone product, or as an add-on module to **"Sight" Survey**, where it is accessed using the **Add-Ins** pulldown menu. With **Collector Connector** you can:

- MERGE an incoming file with an existing COGO data file, with full point-overwrite protection;
- Send (export) a RANGE of points to the data collector, instead of the entire file.
- Easily ABORT File Transfers.
- Copy or delete an existing file through pulldown menu options.
- Select files using File Selection fields with full Windows File Browser capabilities.
- Use the serial ports COM 1, COM 2, COM 3, or COM 4, at baud rates up to 115200 (depends upon your data collector's capabilities).

Collector Connector also lets you tweak Advanced Communications options to eliminate overflow errors, speed up file transfers, and improve control over file transfers. You can:

- Modify Input & Output Buffer Sizes;
- Modify Hand-shaking or Flow Control of the transfer;
- Enter an SDR Scale Factor for Lietz/ Sokkia data collectors;
- Use an improved SDR CheckSum File Verification algorithm for Lietz/Sokkia file transfers;
- Save temporary files that get created during a Receive or Send;
- Cancel the file transfer if a connection is not made within a specified # of seconds; Automatically end the file transfer if communication stops for a specified # of seconds.

Fast, accurate, flexible and simple to operate. All the qualities you want in your data collector communications software, in a very affordable program!

Supported Collectors

D'Zign HP48 Survey Packet 1 (NE or NEZD); Lietz/Sokkia SDR 2, 20, 22 & 24; Nikon ^; Pentax SC-5 ^; SMI HP 48 SC/SCE, AC/ACE, or DC/DCE or CVCE; Sokkia SDR 31 or 33 (4 char. numeric point Ids or 14 char. alpha point IDs); SURVcalc HP 48 SX/GX; TDS HP 48; Topcon FC-4; Topcon FC-48; Trimble TDC1, TSC1 (Sokkia emulation); and Wild GRE-3 ^.
(^ using Lietz emulation)

Supported File Formats

Simplicity "Sight" Survey for Windows; Simplicity Survey 3.0, Lite, & 4.0; Simplicity Survey! - Ver. 2; Direct transfer (send/receive only); ASCII custom formats; Autocogo; Bench-Mark (ASCII); Bischoff; C & G (ASCII); CivilComp CC-Surv Version 3 & 4; CivilSoft Cogo PC Plus; Collier Version 4 & older; DCA (generic import); GEM (SDF format); Generic CADD 6 Batch (receive/convert only); Houseman PC-Cad; Lewis & Lewis; LI Contour; Maptech; Micromate (send only); MTI 3000; NOAA State Plane Record; PacSoft; Plus III (ASCII); Simplicity CogoMate 2.x (receive/ convert only); Simplicity DigiMate (send only); Star*Net Coordinate File (send only); Surv-A-Soft Version 4 & older; Surveyor II; SurveySoft; Tech-nical Advisors; Traverse PC; and WildSoft (ASCII).

List of supported collectors and file formats was current as of July 1998, and is subject to change without notice. Call Simplicity Systems at (218) 773-8917 for current information.

15.03 LegalEase ➪ Write a LegalEase File (LF)

FUNCTION: The **Write a LegalEase File** routine is used to create a file that can be used by ***LegalEase*** to create a legal description.

To access the **Write a LegalEase File** routine, type **LF** in any text box, or press Alt A, L, W.

This command is only available if you have **LegalEase** installed on your computer. Instructions for the actual usage of **LegalEase** are contained in the **LegalEase** manual.

To write a **LegalEase** file, press W.
To activate the **LegalEase** processor, press L.
To process a **LegalEase** file, press P.

About LegalEase

LegalEase is an easy to use legal description processor which runs right inside of **"Sight" Survey**. It will let you write a completely finished legal description with over 30 calls in as little as five minutes! And, your finished document will be loaded into your favorite word processor and written in your own customary style with no chance of numerical error! LegalEase makes writing a legal description as simple as inversing around the subject property by entering point numbers. ***You can even access Defined Figures or select the points right off the "Sight" Survey drawing screen!***

LegalEase is designed to automatically handle several geometric conditions in both closed and open ended traverses, including:

- ✔ Point of Beginning followed by a tangent leg;
- ✔ Point of Beginning followed by a curving leg;
- ✔ Tangent, non-tangent, reverse & compound curves at the POB;
- ✔ Tangent, non-tangent, reverse and compound curves;
- ✔ Curve-to-line and line-to-curve intersections.

LegalEase is very flexible, offering you several configuration options that work hand in hand with your "Sight" Survey configuration to provide total control over your legal description preparations. LegalEase offers a wide selection of geometric phrases for you to select from and/or edit, as well as a choice of customizable captions and ending phrases. If you wish, you may even write and save the phrases using your own wording. The end result is a perfect legal description every time, in your own customized style that is always consistent with the high standards you set for your work!

In the time you spent reading this page, you could have written your first LegalEase description! If you can write a legal description that fast, what will that do for you and your bottom line? Every time you use LegalEase, you could be freeing up to an hour of your time, maybe more. Use that time to complete other jobs. Or, use that time to take on new jobs and ***increase your revenue without putting in more hours.*** Take a moment to think about that, but don't take too long. After all, time is money.

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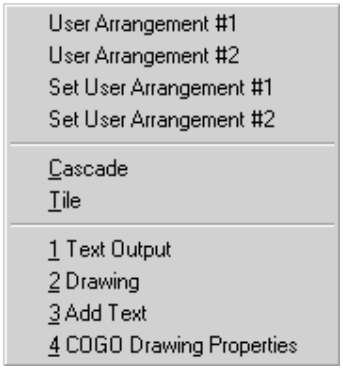
Section 16

The WINDOWS Menu



The **Windows** menu is where you'll find window arrangement options, and immediate access to any "Sight" Survey's windows.

16.01 User Arrangement #1 & #2

FUNCTION: The **User Arrangement** functions are used to restore the screen display to a user defined window layout.

To access **User Arrangement #1** or **User Arrangement #2**, click the item with your mouse.

When accessed, this functions restore the screen layout saved using the **Set User Arrangement #1** and **#2** items.

16.02 Set User Arrangement #1 & #2

FUNCTION: The **Set User Arrangement** functions are used to restore the screen display to a user defined window layout.

To access **Set User Arrangement #1** or **Set User Arrangement #2**, click the item with your mouse.

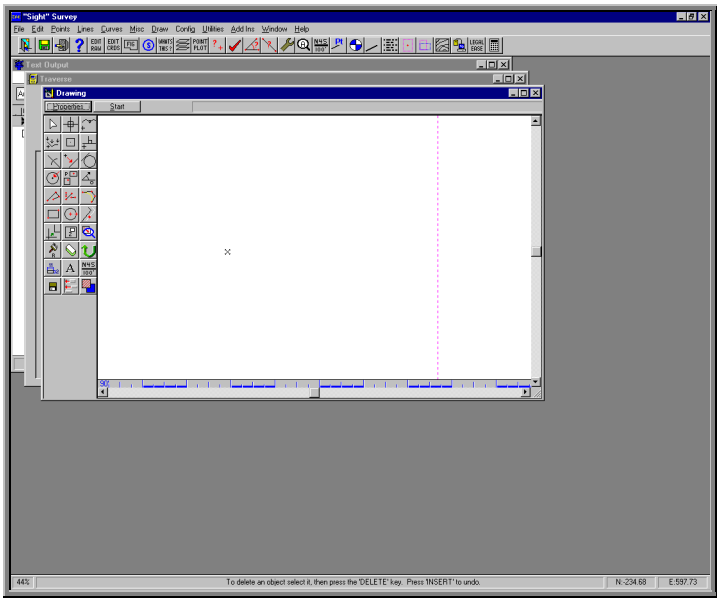
When accessed, this functions the current screen layout for later use with the **User Arrangement #1** and **#2** items.

16.03 Cascade

FUNCTION: The **Cascade** function is used to arrange "Sight" Survey's windows in a cascading fashion.

To access the **Cascade** function, press Alt W, C.

"Sight" Survey will cascade the windows similar to the illustration below.

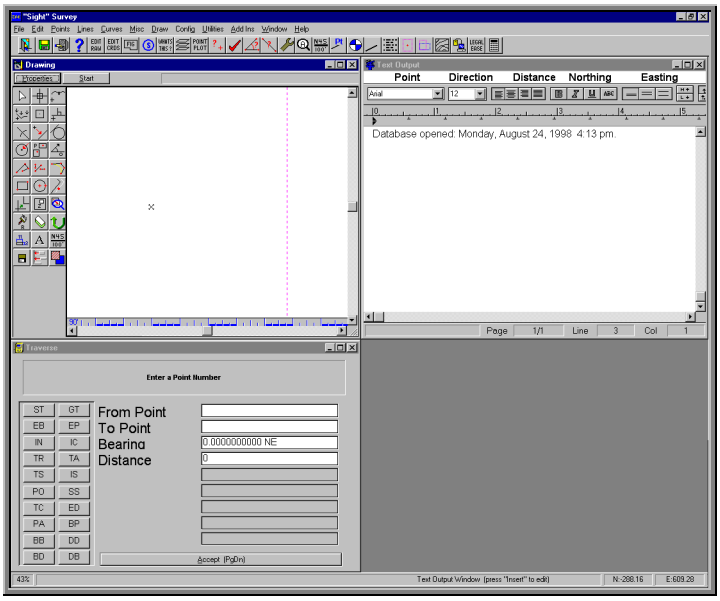


16.04 Tile

FUNCTION: The **Tile** function is used to arrange "Sight" Survey's windows in a tiled fashion.

To access the **Tile** function, press Alt W, T.

"Sight" Survey will tile the windows similar to the illustration below.



16.05 1 Text Output, 2 Drawing, 3 Data Entry, 4 Properties

FUNCTION: The numbered window names are used to activate any "Sight" Survey window.

From time to time you may want to minimize or maximize a "Sight" Survey window. Such an action is likely to obscure the window, or other windows. To activate any specific window, press Alt W, **#** where **#** is the window's identifying number: 1; 2; 3; or 4.

The menu name for Item number 3 will vary depending upon the current function of the **Data Entry** *window.*

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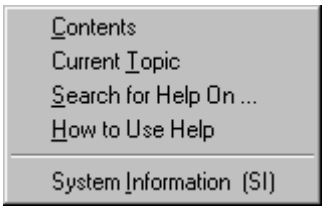
Section 17

The HELP Menu



The **Help** menu is where you'll find access to the on-line help system.

17.01 Contents

FUNCTION: The **Contents** command is used to list the table of contents for the "Sight" Survey help file.

To access the **Help** ➪**Contents** window, press Alt H, C.

To access any item in the **Contents** window, double click the item.

You can return to the table of contents while you are using the help file simply by clicking on the button at the top of the help screen that says "Contents".

17.02 Current Topic

FUNCTION: The **Current Topic** command is used to show help for the routine currently being accessed in "Sight" Survey.

To access the **Current Topic** window, press Alt H, T.

Use this command if you are working on a particular routine and are not sure what information "Sight" Survey is asking you for.

17.03 Search for Help On ...

FUNCTION: The **Search for Help On ...** command is used to search the help files index for a particular subject.

To access the **Search for Help On ...** window, press Alt H, S.

You can start a new search while using the help file by selecting the button labeled "Help" located at the top of the help screen.

17.04 How to Use Help

FUNCTION: The **How to Use Help** command is used to access the Help File help.

To access the **How to Use Help** window, press Alt H, H.

The Help File help is a file created by Microsoft in order to acquaint people with the help engine. It contains information about using help files.

17.05 System Information (SI)

FUNCTION: The **System Information** command is used to display information about "Sight" Survey and also about the computer being used.

To access the **System Information** window, press Alt H, I.

After selecting this routine, "Sight" Survey will display a window containing information about itself and the system being used.

When first activated, the **About** window is displayed.
To access the **System Information** window, click the tab or press Alt S.

Pentium, 686 & 586 users: Do not be alarmed if the CPU type indicates 486.

To access the **Project Information** window, click the tab or press Alt P.

Among other things, this window displays the **serial number** for your copy of "Sight" Survey. This information will become important if you require technical support.

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"Sight" Survey 3.0

Section 18
Getting Support

18.01 Help!

Simplicity Systems, Inc., provides support free of charge (but ***not*** toll-free) for 90 days from date of purchase, provided the user has returned a signed software registration form.

Experience demonstrates that well over 80% of the support calls we receive could be avoided if the caller would first look in the manual. Many long hours have gone into the preparation of this manual in an effort to provide all of the information necessary to the operation of this program. So please check the manual before you call.

Telephone support is available **ONLY** at the following numbers:

Voice: **1-218-773-7966**
Fax: **1-218-773-3849**
E-mail: **support@simsystems.com**

Support hours are 8:00am to 5:00pm (Central time), Monday through Friday, exclusive of holidays. If all incoming support lines are busy, your call will be answered by our answering service and you will be given an option to leave your name and number, or you may wish to simply try your call again later. Messages on the answering service will be returned *collect*, in the order they are received with the exception that customers on an **Unlimited Support Plan** will always be given top priority.

If at all possible, please be at your computer when you call for support. This way a support technician will be able to step you through the procedure in question, which will save you the frustration of trying to remember our instructions at a later time. It will also be helpful for the technician to know the exact procedural steps you were following when you encountered the problem.

Raw Data files and **Text Output** printouts are especially helpful for this.

If your question or problem does not require an immediate answer, please write down your problem and mail or fax it to the Simplicity technical support department including printouts, data disks, etc. Include your program serial number, your phone and fax numbers, and the hours/days you may be available. A support technician will solve your problem and provide you with the solution by mail, fax, or telephone.

You are encouraged to become as familiar with the operation of your computer as possible. When helping you, we will often ask you to perform certain functions such as: Copying a disk; Formatting a disk; Checking the contents of a disk, directory or folder; and Copying, Renaming, and Moving files. It is not within the scope of our technical support plans to assist you with, or tutor you on the use of Windows. Therefore, it is to your advantage to be familiar with these commands before you call.

If you are having a problem such as constant input/output (I/O) errors, etc., chances are good that the problem is hardware or media related. Please contact your hardware dealer first.

18.02 Support Plans

The subject of charging a fee for technical support is a controversial subject across the software industry. However, when you compare the initial product cost, it appears that many of the companies that do *not* charge for technical support have actually built a prepaid support charge into the price of their software package. If you are like most people, you don't want to pay for something that you may never use.

At Simplicity, we pride ourselves on dependable, practical, and perhaps best of all, *affordable* software solutions. We have not "built-in" a prepaid support charge into the price of our software. You get a great program with well-written documentation and up to 90 days of free support. We do not charge you "up front" for software support that you may never need.

After the initial period of free support, users who feel they will need additional help are encouraged to subscribe to one of our support plans. A technical support order form was enclosed with the shipment of this program. Please refer to this form for prices and updated information on the following support plans.

Customers who do not subscribe to a support plan will be automatically transferred to the Basic Service when their 90 days of free support has expired.

Free Support

Simplicity Systems, Inc., provides **FREE** (but **not** toll-free) technical support during the software warranty period, provided the user has returned a signed software registration form**.** *Free support is provided with initial purchases of our products; it is not included with revisions or site licenses.*

*Customers who do not subscribe to the **One Year Unlimited** support plan will be automatically transferred to the **Basic Support** plan when their warranty has expired.*

Call Backs

If all support lines are busy when you call for support, you have the option of trying your call again later or leaving a message for a technician to return your call. We will be happy to return the call to your toll-free (800 or 888) number, if you have one. If you do not leave your toll-free number, we will call you back direct, but you will be charged a **$15 call back fee**.

Billing Terms

We do not maintain an accounts receivable, and as such, we do not normally allow "on receipt" billing terms. If you absolutely do not have or do not wish to use a credit card for support charges, we will invoice your company under *Net 10 Days* terms (from invoice date) **with the addition of a $10 processing fee**. However, if your account is not in good standing, you may be denied future support unless you bring your account up-to-date and place future charges on a credit card.

Basic Support

The **Basic Support** plan provides technical support at a flat rate of **$45 per incident**. You will be charged once for each support incident, regardless of the time required to solve the problem. This

plan is designed for the user who rarely needs support and can use Visa, MasterCard, or American Express for the billing.

One Year Unlimited

The **One Year Unlimited** plan provides priority technical support for **one person** for one full year for $199. A multiple user support plan for one full year is $279. Any person who calls for technical support who is not covered under the **One Year Unlimited** plan will be charged the **Basic Support** plan rate, or may be added to the original support plan for $80.

18.03 Updates & Upgrades

It is Simplicity's policy to regularly maintain and update our software programs. Occasionally, (approximately once each quarter), "Sight" Survey may undergo *slight* changes such as minor enhancements, bug fixes, etc. which we refer to as software ***revisions*** or ***updates***.

These changes may or may not result in a change of the internal version number of this program. For example, the first *revision* or ***update*** of **"Sight" Survey Professional 3.0** after its initial release will most likely be referred to as **Version 3.01**. The next revision/update would most likely be **Version 3.02**, etc. These changes are available either for a nominal fee on disk, or at no charge if downloaded from our web site at **www.simsystems.com**.

Much less frequently, this program may undergo *major* changes such as the addition of new routines, etc., which may or may not require the addition of a manual addendum. These changes will always result in the change of the version number. For example, the next ***upgrade*** of "Sight" Survey will most likely be referred to as **"Sight" Survey Professional 4.0**. These changes are available for a fee commensurate with the changes that have been made.

Whether you choose to update and/or upgrade this program is strictly optional. Depending on the changes that have been made during each release, you may choose to purchase every update, or you may choose to "skip" any update and purchase the next one when the changes may be more substantial. Either way, the choice is *yours*.

"Sight" Survey 3.0

Section 19
Troubleshooting

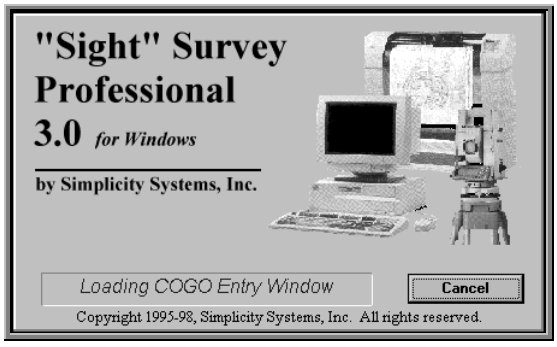
19.01 Startup & Loading Problems

Running "Sight" Survey Across a Network

If "Sight" Survey is being run across a local area network (LAN), it is important that all users have read/write access to the Program sub-directory. If users do not have access to this directory, an error will occur when they try to load the program. The most common error to occur under this situation is an "Access Denied" error, but the exact error will vary depending upon your system setup. The user will not be able to run the program until he has access rights to the "Sight" Survey Program sub-directory. The default name that the installation program uses for this directory is: ***Drive*:\SightSrv\Program**, where ***Drive*** is replaced by the drive letter where the program is installed.

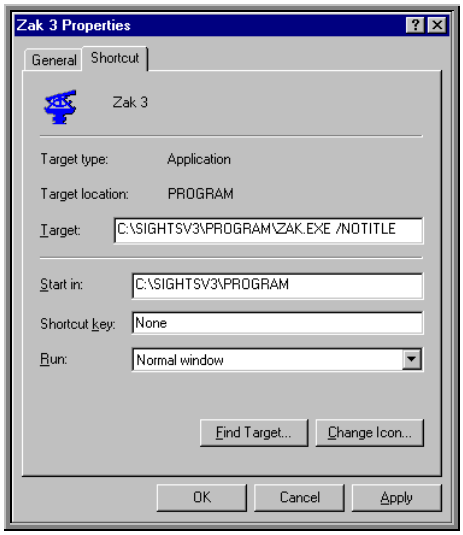
Loading "Sight" Survey Without Splash Screen

The **Splash Screen** is the graphic (shown below) that displays the program title and copyright statement when "Sight" Survey is being loaded into memory. (The Splash Screen only appears if the **Startup Tips Close after loaded** checkbox is enabled.)



To disable both the Splash Screen and the Startup Tips box in Windows 95/98/NT, you must first create a shortcut to the **ZAK.EXE** application file in the "Sight" Survey Program sub-directory. You must then edit the **Properties** for the shortcut so that

the command line contains the **/NOTITLE** switch, as shown below in the **Short-cut to Zak Properties** window. Accept the changes and start the program using the new shortcut. These are basic Windows 95/98/NT procedures with which you should already be familiar. Refer to your Windows documentation or on-line help if you need additional information.



To disable only the Splash Screen in Windows 95/98/NT, follow the same procedures as discussed in the previous paragraph, but apply them to the **SIGHTSRV.EXE** file in the **SightSrv** directory instead of the **ZAK3.EXE** file in the **SightSrv\Program** sub-directory.

To disable only the Splash Screen in Windows 3.1, you must edit the Properties for the "Sight" Survey program icon. Do this by highlighting the program icon and selecting **Properties** from the **File** pull-down menu. Next, add the **/NOTITLE** switch to the end of the **Command Line** box. Accept the changes and use the icon to start the program. This is a basic Windows 3.1 procedure with which you should already be familiar. Refer to your Windows documentation or on-line help if you need additional help.

To disable both the Splash Screen and the Startup Tips box in Windows 3.1, follow the same procedures as discussed in the

previous paragraph, but change the name of the startup executable file to the **ZAK3.EXE** file in the **SightSrv**Program sub-directory before adding the **/NOTITLE** switch.

"Sharing Violation" Error

If "Sight" Survey issues a **Sharing Violation** error when it first attempts to load into memory, it is most likely because neither the **DOS SHARE.EXE** or Windows **VSHARE** is loaded into memory. If you allowed "Sight" Survey's Setup/Installation program to install the **VShare** device, you simply need to restart your computer for **VShare** to be loaded into memory, then restart "Sight" Survey. If you did not allow "Sight" Survey to install **VShare**, you will either need to install it manually or re-install "Sight" Survey and allow it to load the **VShare** statement for you. To install **VShare** manually, you must edit the Windows **SYSTEM.INI** configuration file located in the Windows directory.

To edit the SYSTEM.INI file when using Windows 3.1, open the Windows File Manager program and double-click on the **SYSTEM.INI** file located in the Windows directory. **To edit the configuration file when using Windows 95,** open the Windows Explorer program and double-click on the **SYSTEM** (.INI) configuration file in the Windows directory.

The file should open up in the Windows Notepad or WordPad editor. Under the **[386Enh]** section, add the following line:

```
DEVICE=VSHARE.386
```

Save the changes, exit, and restart Windows. You should now be able to run "Sight" Survey.

"Invalid Property Value" Error

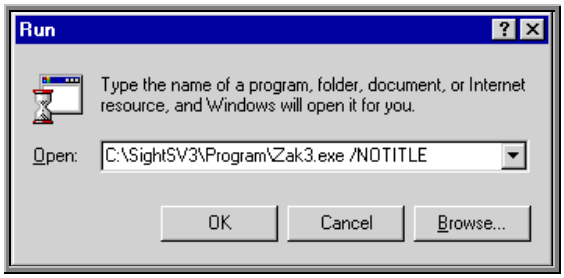
If "Sight" Survey issues an **Invalid Property Value** error when it first attempts to load into memory, it is most likely because it is trying to use a text font that is not installed on your computer. To avoid this error, you must force "Sight" Survey to use a different font by manually editing the **COGO.INI** configuration file located in the "Sight" Survey Program sub-directory. Refer to the sub-section **Change COGO Font** found on page 408 of this manual.

"Sight" Survey Appears To Hang When It Starts

If "Sight" Survey appears to hang or "lock up" when it first loads into memory, there is most likely an error message that is displayed on the screen, but is hidden behind the Splash Screen. The actual problem can't be resolved until the error message can be seen. To see the error message, you will need to start the program with the Splash Screen disabled.

If you are running "Sight" Survey within Windows 3.1, use your mouse to select **File** ➪ **Run** (or press Alt F, R) and then type: **`C:\SIGHTSRV\PROGRAM\ZAK.EXE /NOTITLE`** Enter.

If you are running "Sight" Survey within Windows 95/98/NT, use your mouse to select Start **Run...** (or press Alt S, R), then type: **`C:\SIGHTSRV\PROGRAM\ZAK.EXE /NOTITLE`** Enter.



Once the error appears, you should be able to resolve the problem based upon the error message that appears. If you need additional help, contact our Technical Support office at (218) 773-7966.

Layer Names Disappear

The layer names that appear in the **Edit Layers** window when "Sight" Survey first loads into memory or when a **New Job** (**`NJ`**) is started are the layers that have been defined and saved in the **`StartUp.Drg`** file. The file is located in the **..\SightSrv\Program** directory. If you define layers and want them to be available for all new jobs, you must store those layers in the **`StartUp.Drg`** file. To do this, start a **new, unnamed** job, define the layers, and then use the **Start** ➪ **File** ➪ **Save Dawing As** routine to export the drawing as **`StartUp.Drg`** into the **Program** sub-directory of the **..\SightSrv** directory.

19.02 Helpful LegalEase Information

Automatic Processing of a LegalEase File

You can run LegalEase completely in the background by using the **Process a LegalEase File** (**PL**) routine. When running in this automatic/seamless mode, your description is processed "in the background" without the LegalEase screens being displayed on your monitor. When the description has been written, your normal word processor will pop-up on top of the "Sight" Survey screen and your description will be loaded for you to review, edit or format to your preference.

If your word processor is already running when "Sight" Survey issues the command to start your word processor and load the legal file, you may end up with two instances of your word processor loaded into Windows. This may or may not occur, depending upon which word processor you use.

Before you attempt to run LegalEase in "automatic" mode, you must first run LegalEase the "regular" way, using the **LegalEase Processor** (**LE**) *routine to setup the LegalEase configuration settings, custom phrases and captions to your preferences.*

Lock-ups

Even though you don't actually see the LegalEase program when you are running in automatic mode, it is still running in the background as a reduced icon. If your computer appears to lock-up when running in automatic mode, simply press Enter (once) or double-click on the **LGLEASE** icon to display the LegalEase screen. The program may be prompting you for the curve direction of an obtuse curve, or an error condition may exist. In addition, if you are running Windows in **Standard** mode **(WIN /S)**, you will need to press e (once) or double-click the icon to give Windows the "jump start" it needs to switch programs. You may or may not need to manually close the **LGLEASE** window afterwards.

The description file output ***(filename.DSC)*** from LegalEase can be loaded into the "Sight" Survey **Text Output** window using the **File** ➪ **Import** ➪ **Text** menu option.

The description file output (**filename.DSC**) from LegalEase can also be loaded into the "Sight" Survey Drawing **window** using the **Draw** ➪ **Draw Supplemental** ➪ **ASCII Text File** menu option.

19.03 Drawing, Printing, & Plotter Problems

Parts of Drawing Can't be Selected

If you can't select some parts of your drawing, the solution will most likely be found in either the **Selection Filter** (**SF**) or **Edit Layers** (**EL**) routines.

The **Selection Filter** can cause items to be omitted when you try to select them using **Select by Polygon, Select All**, etc. For example, if **Current Color** is enabled (checked), only elements in the current color will be selected. If Lines is not enabled, lines will not be selected, etc. Display **the Selection Filter** by typing **SF** and check which filters are enabled. If you wish to select *everything* on your drawing, the **Allow All** filter should be enabled and the **Current Color**, **Current LineType**, and **Current Layer** filters should be disabled.

If a drawing layer is locked, you won't be able to select anything on it. Display the **Edit Layers** dialog box by typing **EL** and look for the letter **L** to the left of the sample linestyle. If an **L** appears in any row, that layer is locked. For help unlocking a layer, refer to the sub-section **Editing One Layer** which begins on page 843 of the **Drawing Window Reference Manual**.

Another reason you may not be able to select drawing entities could be that the (operate on) **Current Layer Only** option is enabled in the **Edit Layers** dialog box. When this option is enabled, you can only select items which are actually drawn on the **Current Layer**. If you wish to select items on other layers, type **EL** to display the **Edit Layers** dialog box and enable the (operate on) **All Unlocked Layers** option instead.

Items Disappear On the Screen

If parts of your drawing are missing or seem to have disappeared, the solution is most likely that one or more drawing layers are not visible. If a drawing layer is not visible, it is considered hidden, and you won't be able to see any of the entities contained on it.

Display the **Edit Layers** dialog box by typing **EL** and look for rows that do not have the letter **V** to the left of the sample linestyle. If a **V** does not appear in a row, that layer is not visible. For help making a layer visible, refer to the sub-section **Editing One Layer** which begins on page 843 of the **Drawing Window Reference Manual**.

Another reason you may not be able to see drawing entities could be that the entities are the same color as the background color you are using. Try changing the background color to black or to white since they are the most likely colors to ensure you can see the whole drawing. For more information, refer to the sub-section **CAD Background Color** which begins on page 394 of this manual.

Text Disappears or Displays as Boxes

"Sight" Survey's **Drawing** window automatically draws boxes to represent text that is too small to read. If you zoom in on, or magnify your text, you should find that it is there in full detail. This function is performed to speed up drawing redraws.

Small Items on Drawing Disappear

"Sight" Survey's **Drawing** window automatically draws boxes or lines to represent objects that are too small to see properly. If you magnify the drawing or zoom in on the section of the drawing, you should find that the objects appear in full detail. This function is performed to speed up drawing redraws.

Imported DXF/DWG File is Missing Parts

If parts of AutoCAD **DWG** or **DXF** drawing are missing when you import it into "Sight" Survey, it is likely that the missing parts are the same color as the background color you are using, so you just can't see them. Try changing the background color to black or to white since they are the most likely ones to ensure you can see the whole drawing. You should also use the **Start** ➪ **Settings** ➪ **DXF/DWG Conversion** (**XG**) routine to determine if you properly configured the **DXF/DWG Pen to CADControl Pen** conversion settings.

Imported Drawing File Scale Incorrect

When a TrueCAD drawing file (**.DRG**) is imported into "Sight" Survey using the **Start** ➪ **File** ➪ **Load** Drawing routine, the **Drawing Scale**, **Page Center**, and **Paper Size** appear as if they were not imported. This is an "appearance only" problem, and can be resolved by immediately using the **File** ➪ **Save Job** routine to save the drawing and create an associated "Sight" Survey (**.zak**) file. Then, simply reload the "Sight" Survey file using the **File** ➪ **Open**

Job (**LO**) routine and the **Scale**, **Page Center** and **Paper Size** will now be correct.

Floating Point error in Truectrl.dll

When an attempt to plot a drawing results in a **Floating Point error in module Truectrl.dll**, it is usually caused by a corrupt item in the drawing database. Most often you can fix this error by running the **Start** ➪**File** ➪**Repair Drawing File (FD)** routine.

How to Permanently Change Symbol Colors

If you want to permanently change the color of the end point symbols on the **Drawing** window, the following information briefly describes the steps involved in making this change.

1. Make a backup copy of the **DMCUSTOM.SYM** and **SYMBOL.DRG** files which are located in "Sight" Survey's Program sub-directory.
2. Run "Sight" Survey and load the **SYMBOL.DRG** drawing file.
3. Use the **Start** ➪**Settings** ➪**Drawing Settings** and set the **Scale Ratio** to **1:1**.
4. Change the colors of all of the symbols in the file: Select everything on the screen then use the **Start** ➪**Settings** ➪**Line Defaults** routine to change the Pen color. After selecting the desired color, click on Apply and then click on OK.
5. Save the drawing file: Use the **Start** ➪**File** ➪**Save Drawing** routine.

After completing the above steps, the symbols will be placed in "Sight" Survey using the new color.

"Sight" Survey 3.0

Section 20

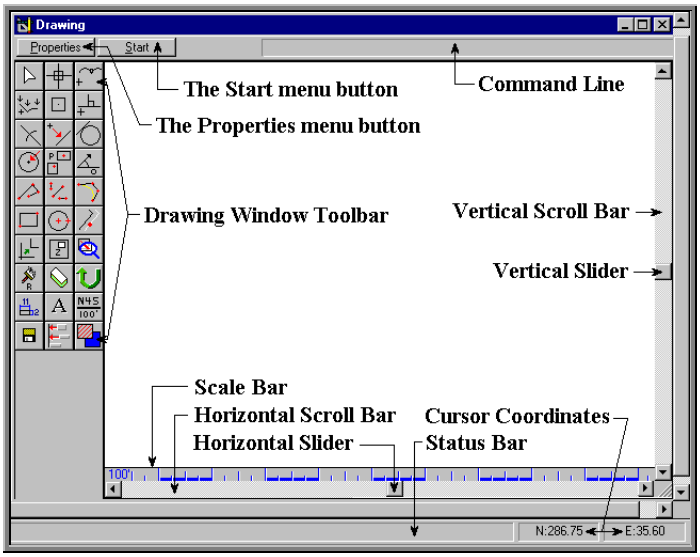
The DRAWING Window

The "Sight" Survey **Drawing** window is where the action is. In this window, your drawing will be constructed as you perform your COGO data reductions and subsequent design. You can also work within this window to add other elements to enhance and complete your drawing.

20.01 The Drawing Window

The illustration shown below is a screen capture of the **Drawing** *window and a portion of the* **Status Bar** *which lies below it. The* **Status Bar** *area is included because it contains the cursor coordinate display. The screen was captured at a resolution of 800 x 600, the minimum suggested operating resolution for "Sight" Survey.*

The **Drawing** window consists of several areas, as shown below:



20.02 The Command Line

The **Command Line** displays prompts for **Drawing** window functions. Typically, these prompts have to do with point location, or they are Yes/No type questions. In the later case, [Yes] and [No] buttons will be made available for you to click. When a **Drawing** window routine requires a text or numeric answer, a prompt window will be used.

20.03 Scroll Bars & Sliders

The **Drawing** window is scrollable vertically, as indicated by a scroll bar along the right side of the window, and horizontally, as indicated by a scroll bar along the bottom of the window. Scroll the window vertically by clicking your mouse on the ▲ and ▼ arrows on the scroll bar. Horizontally scroll the window by clicking your mouse on the ◄ and ► arrows on the scroll bar. You may also click and hold your mouse on the slider button in the scroll bar while you slide the button up and down, or left and right.

20.04 The Status Bar

The **Status Bar** contains four areas. On the left is a **System Resources** indicator which reports the percentage of free system resources available. When Windows starts it automatically allocates a portion of memory for system resources which is used to keep track of open windows, programs in use, icons, program groups, etc. However, Windows doesn't manage this memory very well. When a Windows program is started some system resource memory is used. When the program is closed, it is supposed to give all the memory back, but almost all programs steal some.

É ***If your free resources drop to below 25%, proceed at your own risk. If your free resources drop below 10%, a Windows crash is imminent. Save your data and restart Windows!***

The second box consumes the majority of the status bar and contains context sensitive help and tips.

The third and fourth boxes, on the right of the screen, contain the Northing and Easting coordinates at the tip of the drawing cursor. These values are relative to the page center coordinates. The **Config** ➪ **Show Status Bar** (Alt G, H) item is a toggle switch that displays and hides the status bar at the bottom of the screen.

20.05 The Scale Bar

The **Scale Bar** provides a visual guide to the drawing scale. Toggle the scale bar display **On** and **Off** using the **Ruler** setting in **Start** ➪ **Settings** ➪ **View Settings** (Alt S, S, V - page 799).

20.06 The Drawing Window Toolbar

The **Drawing** window toolbar contains 30 icons (buttons) that activate 52 different functions. Most every button activates two functions, one when left-clicked and another when right-clicked.

*You must finish active drawing routines (by pressing Esc or clicking Cancel at the top of the **Drawing** window) before you can select another drawing command from the **Drawing** window toolbar. Snaps and Zooms are always available.*

Select Cursor
Left: **Select** single entity 552
Right: **Selection Filters** 560

Select Nodes Cursor
Left: **Select Nodes** 568
Right: **Clear Selection** 567

Freehand Cursor
Left: **Freehand** mode, no snaps 806
Right: **Selection Filters** 560

Point Cursor
Left: **Snap to Nearest Point** mode 807
Right: **Snap Point** settings menu 804

Grab All Cursor
Left: **Grab All Snap** mode 806
Right: **Snap Point** settings menu 804

Perpendicular
Left: **Draw Perpendiculars** 622
Right: **Dimension Perpendiculars** 703

Intersection
Left: **Intersection** snap mode 807
Right: **Snap Point** settings menu 804

Nearest Element
Left: **Nearest Element** snap mode 808
Right: **Snap Point** settings menu 804

Tangent
Left: **Tangent** snap mode 809
Right: **Snap Point** settings menu 804

Center Circle/Arc
Left: **Circle Center** snap mode 808
Right: **Snap Point** settings menu 804

Pan
Left: **Pan** 581
Right: **Long Pan** 581

Polar Move
Left: Move to a **Polar Location** 504
Right: Move to **Exact Coordinates** 504

Line (Chained)
Left: Draw a **Chained Line** 585
Right: Set **Line Defaults** 810

Line (Pt to Pt)
Left: Draw unconnected **Line Segments** 586
Right: Set **Line Defaults** 810

Polyline

Left: Draw a **Polyline** 610
Right: Set **Polyline Defaults** 812

Rectangle

Left: Draw a **Rectangle** 588
Right: Draw a **Polygon** 611

Circle

Left: Draw a **Circle by two points** 593
Right: Draw a **3 Point Arc** 589

Parallel Lines

Left: Draw multiple **Parallel Lines** 597
Right: Draw single **Parallel Line** 599

Trim

Left: **Trim** 2 lines/arcs 638
Right: **Trim** one line onto another 638

Zoom

Left: Access a **Zoom** mode via menu ..... n/a
Right: **Zoom All** 573

Zoom Window

Left: **Zoom** into an area, or **Window** 571
Right: **Zoom Last**, return to previous zoom 572

Refresh Drawing

Left: **Redraw** the drawing screen 582
Right: **Zoom Sheet**, show the whole page 574

Delete Selected

Left: **Delete Selected** items 551
Right: **Clear Drawing Window** 584

Undo

Left: **Undo** up to 1000 previous drawing operations .. 547
Right: **Redo** up to 1000 undos..... 548

Dimension
Left: Access a **Dimension** selection menu..... n/a
Right: Set **Dimension Defaults** 826

Text
Left: Add **Text** from the keyboard 659
Right: Set **Text Defaults** 820

Survey Dimensions
Left: Add **Survey Dimensions** to the drawing 697
Right: Set **Survey Dimension Defaults** 830

Save
Left: **Save** the **Drawing** (not the Job)..... 515
Right: **Open** a new **Drawing** (not a New Job) 510

Align
Left: **Align** selected objects..... 671
Right: Set **Alignment Defaults**..... 668

Hatch/Fill
Left: **Enter Hatch/Solid Fill** 716
Right: **View Hatch Patterns** 716

20.07 The Start Menu Button

The **Drawing** window Start (SM) button opens the main drawing functions menu. The menu items are described in detail within their own sections of the manual.

File	**Section 22**	509
Edit	**Section 23**	547
View	**Section 24**	571
Draw	**Section 25**	585
Modify	**Section 26**	623
Annotate	**Section 27**	659
Tools	**Section 28**	727
Objects	**Section 29**	765
Settings	**Section 30**	789

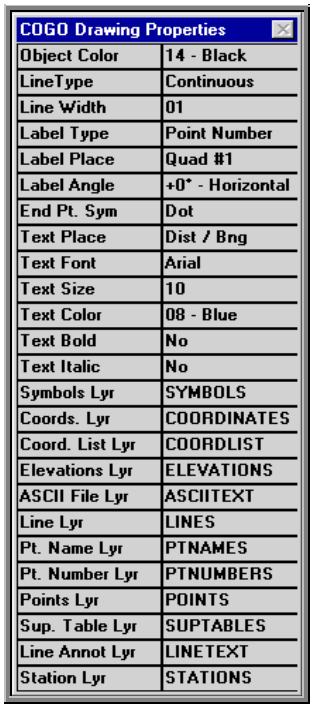
20.08 The Properties Menu Button

The **Drawing** window Properties (PR) button opens the **COGO Properties** menu. These items that affect the appearance of your drawing ***for objects and text placed by COGO operations only!***

?

Settings changed here do not change settings made in **Start Settings Line** *and* **Start Settings Text.**

The **Properties** window allows you to tailor "Sight" Survey's drawing options to your own preference. "Sight" Survey uses these settings to create your drawing in the **Drawing** window. For example, when "Sight" Survey draws a line, it creates the line using the values set for the **Object Color**, **LineType**, **Line Width** and **Line Layer** properties. ***You cannot change or edit existing entities by changing the values in the Properties window. Edit existing entities using the routines on the Start Edit menu.***



COGO Drawing Properties	
Object Color	14 - Black
LineType	Continuous
Line Width	01
Label Type	Point Number
Label Place	Quad #1
Label Angle	+0° - Horizontal
End Pt. Sym	Dot
Text Place	Dist / Bng
Text Font	Arial
Text Size	10
Text Color	08 - Blue
Text Bold	No
Text Italic	No
Symbols Lyr	SYMBOLS
Coords. Lyr	COORDINATES
Coord. List Lyr	COORDLIST
Elevations Lyr	ELEVATIONS
ASCII File Lyr	ASCIITEXT
Line Lyr	LINES
Pt. Name Lyr	PTNAMES
Pt. Number Lyr	PTNUMBERS
Points Lyr	POINTS
Sup. Table Lyr	SUPTABLES
Line Annot Lyr	LINETEXT
Station Lyr	STATIONS

Setting Values

To set a **Value** for any **Property**, follow these general instructions:

1. Select a **Property** by clicking your mouse anywhere on the **Property's** name or in its **Value** box. A **Settings box** will replace the **Value box** .

2. Use your ↑ and ↓ arrows to scroll through the available settings, or click the ▼ next to the **Settings box** to pull down a settings menu.

3. Select the desired setting with your mouse, or use your ↑ and ↓ arrows to highlight the desired setting and then press ↵Enter.

4. When you are done making selections in the **Properties** window, click the **Drawing** window Properties (PR) button to close the **Properties** window.

If you prefer, you can leave the **Properties** window *open and drag it to another screen location. Use the standard Windows technique for dragging windows to a new location.*

Object Color

The **Object Color** property is used to specify the color of the object (lines, arcs, etc., but not symbols or text) to be drawn.

The actual color shown on your display is governed by your video card; however, the main function of this menu item is to control the pen selection on a multi-pen plotter. For example, color two corresponds to pen number two on the plotter.

If you have already placed a line and/or text in the **Drawing** window and you want to change it, double-click on the line or text to activate an editing dialog box. Follow the instructions for **Line Defaults** on page 810, and **Text Defaults** on page 820.

When the **Object Color** property is set to **`BY LAYER`**, "Sight" Survey will draw all lines in the pen color associated with the layer that is currently assigned to the line layer. For more information please refer to the sub-section **"BY LAYER" Layering** beginning on page 848 of this manual.

Attention PLOTTER USERS:
Whether you have a single- or multi-pen plotter, you'll get much better results in line quality if you control the width and / or color of lines on your drawings by mapping the object colors to your plotter pens. For example, if you want a thicker line and you have a multi-pen plotter, set the object color to the number of the pen that you use for the desired thickness. When plotting that line, the appropriate pen will be retrieved. ***(This does not apply to color printers.)***

Line Type

The **Line Type** property is used to specify the type of line to be drawn between points. Several line types are available, ranging from a solid line to various dash, dot, and dash-dot patterns.

When **Line Type** is set to **`BY LAYER`**, "Sight" Survey will draw all lines in the **Line Style** associated with the layer currently assigned to the **Line Layer**. For more information, refer to the sub-section **"BY LAYER" Layering** beginning on page 848 of this manual.

Custom Lines

"Sight" Survey is distributed with several pre-defined custom lines including a centerline, brick wall, fence line, power line, water line, and more. Custom lines can be drawn using any of the COGO routines and the **`LI`** and **`AC`** routine codes. Custom Lines are not accessible when using **Drawing** window commands, with the exceptions of the **Draw Chained Lines** ( ) and **Draw 3 Point Arc** (right-click) icons. Custom lines are selected using the **Line Type** property of the **Properties** window. They all appear at the top of the **Line Type** selection list and are preceded by an asterisk (**`*`**).

Custom lines are not drawn for circles, rectangles, or random curves. If a custom line is selected when one of the aforementioned entities is drawn, the entity will be drawn in the line type assigned to the selected custom line. (Line types are assigned to custom lines in the **`CustomLT.mac`** file under the column titled Linetype to use to connect the characters. See **Custom Lines** in **Section 13.04** for information on custom line types.

Custom lines do not appear in the **LineStyle** selection lists for CAD-related functions such as the **Start** ➪ **Settings** ➪ **Set Arrow**

Defaults, **Start** ➪ **Draw** ➪ **Parallel Lines,** and **Start** ➪ **Settings** ➪ **Layer Control** routines.

The pre-defined custom lines are shown in **Section 13.04**. To view a drawing containing each of the pre-defined line types, begin a **New Job** (**NJ**) and use the **Start** ➪ **File** ➪ **Open Drawing** routine (Alt S, F, O - page 510) to import the **CustomLT.drg** drawing file. This file was installed when you installed "Sight" Survey.

To edit, add, or delete custom lines, refer to the **Custom Lines** sub-section in **Section 13.04** and also in **Section 33 - Line Types**.

Line Width

The **Line Width** property is used to specify the width of line that is drawn between points. The available values range from **1** to **10**, where the unit is in tenths of a millimeter.

If you have already placed a line in the **Drawing** window and you want to change its type, color, and/or width, double-click on the line to activate the **Line Style** dialog box. Follow the instructions for **Line Defaults** on page 810.

1. *Instead of specifying a line width greater than* **01 (Thin)**, *it is recommended that you map your object and text colors to your plotter pens. You will get much better results in line quality when plotting in this manner.*
2. *If you are using a color printer, you cannot map line widths and colors to pens and you should make these settings within "Sight" Survey, using the* **Line Width** *property.*

Label Type

The **Label Type** property is used to specify how to label the ending point. The available label types are:

None	**Label**
Coordinates	**Point Number**
Description	**PtNum & Elev**
Elevation	**Station**

Coordinates When **Coordinates** is the selected label, the ending point will be labeled with the Northing and Easting coordinate values for that point. The location of the coordinates is determined by the **Label Place** item.

Description When **Description** is the selected label, the ending point will be labeled with the description or point name for that point, if one has been assigned. The location of the description is determined by the **Label Place** item.

Elevation When **Elevation** is the selected label, the ending point will be labeled with the elevation for that point. The location of the elevation is determined by the **Label Place** item.

Label When **Label** is the selected label, the program will pause to allow you to enter your own text as the point label. The location of the label is determined by the **Label Place** item.

None Select **None** if you do not want to label the ending point.

To avoid labeling points, click on the **Add End Point Labels** *icon (*  *) in the* **Tool Bar**. *When this icon is deactivated, it will contain a large red* **X** *over the image.*

Point Number When **Point Number** is the selected label, the ending point will be labeled with the point number of that point. The location of the point number is determined by the **Label Place** item.

Pt. # & Elevation The **Pt. # & Elevation** label is provided as a convenient labeling choice for point plots and topo plots. When **Pt. # & Elevation** is the selected label, the ending point will be labeled with the point number and the elevation for that point, separated by a semi-colon. The location of the label is determined by the **Label Place** item.

Station

When **Station** is the selected label, the ending point will be labeled with the station number of that point, if one exists. The location of the station number is determined by the **Label Place** item.

1. *The label is placed at the ending point only. Thus, in order to label your starting point, you must actually enter that point number as an ending point at one time within the drawing. This can be done either by drawing to that point or by just starting at the point and drawing to the same point number.*
2. *A label will also be placed at the point whenever the* **Enter & Assign** *or* **Point Plot** *routines are used with the label active.*

Label Place

The **Label Placement** property is used to specify where the point label will be placed around the point. The following five locations are available: **Quad 1**, **Quad 2**, **Quad 3**, **Quad 4**, and **Decimal**.

Quad 1 refers to the Northeast or upper right corner of the point.

Quad 2 refers to the Southeast or lower right corner of the point.

Quad 3 refers to the Southwest or lower left corner of the point.

Quad 4 refers to the Northwest or upper left corner of the point.

When **Label Placement** is set to **Decimal**, the point label will be placed with the decimal point (if one exists in the label value) at the actual coordinates of the point location. If a label does not contain a decimal point, "Sight" Survey begins the label at the point location, i.e. it left-aligns it.

The actual placement of the decimal point depends somewhat upon the **Text Font** and **Text Size**. You can obtain the best results by using a proportionally spaced font, such as Arial or Times New Roman with a text size of 10 points. Less desirable results occur when using a monospaced font such as Courier.

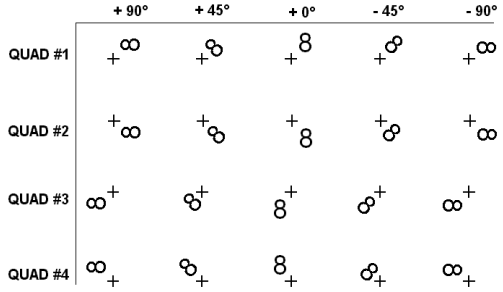
This option is typically used to create **topo plots** with the decimal point of the elevation in the actual point location. To create this type of topo plot, set the **Label Type** to `Elevation`; the **Label**

Placement to **Decimal**; and the **End Point Symbol** to **Cross**, **Dot** or **None**. Then run the **Point Plot** (**PP**) routine.

Label Angle

The **Label Angle** property is used to vary the rotation angle at which point labels are placed on your drawing. This setting is used each time a point label is placed. The default angle is zero degrees, and the rotation angle increases in a counter-clockwise direction from the 3 o'clock position. The choices are: **0° (Horizontal)**, **+10°**, **+20°**, **+30°**, **+40°**, **+45°**, **+50°**, **+60°**, **+70°**, **+80°**, **+90°**, **-10°**, **-20°**, **-30°**, **-40°**, **-45°**, **-50°**, **-60°**, **-70°**, **-80°**, **-90°**.

The following diagram shows the effect of the **Label Angle** on labels in the various quadrants selected for **Label Placement**.



End Point Symbol

The **End Point Symbol** property is used to specify the symbol that you would like placed at the ending point. When the **End Point Symbol** property is set to anything other than **None**, a symbol will be placed at the ending point within most every COGO routine. Symbols can also be placed using the **Point Plot** routine, with or without trimming, or the **Start**➪**Draw**➪**Symbol** routine which automatically trims. Symbols may also be placed using the **PS** routine code or the **Point/Symbol (PS)** item on the **Draw** pulldown menu. These are the quickest methods. However, placing symbols using **Start**➪**Draw**➪**Symbol** allows you to scale and/or rotate each symbol as it is placed.

The (**Add Symbols**) tool bar icon allows you to quickly activate and deactivate the placement of symbols at ending points without setting the **End Point Symbol** property to **None**. When symbol placement is inactive, a large red **X** overlays the icon.

"Sight" Survey includes 22 pre-drawn symbols as shown on the next page. Four additional symbols also exist: a North arrow; a two inch scale bar; a three inch scale bar; and a five centimeter scale bar. These components are accessed through the **Draw** ➪ **Draw Supplemental** command as described in **Section 12.11** through **Section 12.14**.

	Brickwall		**Manhole**
	Centerline		**Power_Pole**
	Concrete_Monument		**Solid_Square**
+	**Cross**		**Storm_Inlet**
.	**Dot**	T	**Telephone_Box**
E	**Electric_Box**	|	**Tic_Mark**
G	**Gas_Riser**		**Traverse_Point**
	Hydrant		**Tree_(Large) ***
	Iron_Pin		**Tree_(Small) ***
	Iron_Pipe		**Valve_Box**
∅	**Light_Pole**		**Wood_Stake**

* Large trees plot to a 20 foot scaled diameter. Small trees plot to a 7 foot scaled diameter.

You may notice a dot within **Centerline** *symbols on the* **Drawing** *window. This is actually the center point of the arc that represents the letter* **C** *within the symbol. The dot shows on the display only and will not appear on the printed or plotted drawing.*

Custom Symbols

Using "Sight" Survey, you can create custom symbols for use within "Sight" Survey. The following steps briefly describe how to create symbols and make them accessible to "Sight" Survey.

1. Make a backup copy of the **DMCUSTOM.SYM** and **SYMBOL.DRG** files which are located in the "Sight" Survey Program sub-directory.

2. Start "Sight" Survey and load the **SYMBOL.DRG** drawing file using **Start** ➪**File** ➪**Open Drawing** (Alt S, F, O - page 510). Under **Start** ➪**Settings** ➪**Drawing Settings** (Alt S, S, D - page 789), set the **Scale Ratio** to **1:1**.

3. Draw any new symbols that you want added to the file.

4. Group the new symbols as actual "Sight" Survey symbols using the **Start** ➪**Objects** ➪**Make Symbol** routine (Alt S, O, M - page 774): Group each new symbol separately. When prompted, enter a name for the symbol and then select the entities that make up the symbol. Next, specify the lower left and upper right corners of the trimming region. Finally, enter the coordinates of the hook point.

5. Save the drawing file: Use the **Start** ➪**File** ➪**Save Drawing** routine (Alt S, F, S - page 515).

6. List the symbol patterns to disk for use with "Sight" Survey: Type **XX** and at the **TrueCAD command** prompt, type **ListPat** and press ↵Enter. Click on Yes to include all layers, click on Yes to include area and perimeter calculations.

7. Save the file as **DMCUSTOM.SYM**. Use the **Start** ➪**File** ➪**Save Drawing As** routine (Alt S, F, A - page 515), and be sure that the file is saved into the "Sight" Survey Program sub-directory.

After completing the above steps, the new symbols should be listed in the **End Point Symbol** properties box the next time you load "Sight" Survey.

Symbols do not have to be drawings. You can also save commonly used notes, certificates, etc. as symbols.

Trimming

When a symbol is placed using the **Point Plot** routine, you can enable or disable the trimming of lines and text under a symbol using the **Trim Symbol** check box. However, when a symbol is placed using the **Draw** ➪ **Point / Symbol** (**PS**) routine, "Sight" Survey ***always*** automatically trims under the symbol. When a symbol is placed using any of the COGO routines (such as **Traverse** (**TR**), **Inverse** (**IN**), etc.), "Sight" Survey ***never*** trims under the symbol. This is because trimming is performed when the symbol is actually placed on your drawing. Therefore, if we trimmed symbols within the COGO routines, all incoming lines would be trimmed but outgoing lines would not be trimmed.

Text Place

The **Text Placement** property is used to specify how you want "Sight" Survey to annotate lines or place text on the drawing. The available options are:

/ Bng — Annotates lines with the bearing below the line.

/ Bng Dist — Annotates lines with both bearing and distance below the line.

/ Dist — Annotates lines with the distance below the line.

/ Label — Annotates lines with a label below the line. After you enter the label, "Sight" Survey will use that label for all lines drawn until a different text placement option is selected.

Bng / — Annotates lines with the bearing above the line.

Bng / Dist — Annotates lines with the bearing above the line and distance below the line.

Bng Dist / — Annotates lines with both bearing and distance above the line.

Dist / — Annotates lines with the distance above the line.

Dist / Bng Annotates lines with the distance above the line and the bearing below the line.

Label / Annotates lines with a label above the line. After you enter the label, "Sight" Survey will use that label for all lines drawn until a different text placement option is selected.

None Shuts off the line and arc annotation.

To avoid line annotation, click on the **Dimension Lines** *icon (**) in the* **Tool Bar**. *When this icon is deactivated, it will contain a large red* **X** *over the image.*

SUPER SHORTCUT - THREE AT ONCE!!!

To draw only points (with no lines, point labeling, or annotation) double-click on any of these **Tool Bar** *icons:* **Add End Point Labels** (); **Dimension Lines** (); *or* **Draw Line Between Points** (). *Double-click on any of the icons again to restore all three settings.*

The top and bottom of the text line is determined by the angle of the text, not by the order of the starting and ending points. "Sight" Survey keeps a drawing readable by placing all text facing either left to right or bottom to top. This way, a person reading the drawing can easily read the text when the map is placed normally or when turned to the right. To this end, the cut-off points for text placed left to right is 10° NW and 10° SE.

Text Font The **Text Font** property is used to specify the text style you want to use for the text on your drawing. You may choose from any font installed in Windows.

Double-clicking on the **Text Font** *property (or current value) will display a* **Windows Font Dialog Box** *allowing you to set the font type, style (*regular, *italic,* **bold**, *or* ***bold-italic***),*size, color, and effects (*<u>underline</u> *or* ~~strikethrough~~.*).*

Windows 3.1 and Windows 95/98 are supplied with three types of fonts: **TrueType** fonts, **Screen** fonts and **Plotter** (or Stroke) fonts.

If you are going to obtain output using a printer, you should use **TrueType** fonts, or **Printer** fonts that are native to your particular printer.

If you are going to obtain output using a plotter, you should use **Plotter** fonts, such as the **Stroke Font** collection (for Windows NT & 95/98) available from Simplicity Systems. *Call 1-800-777-7978 for details.*

É *If you are outputting to a vector (pen) plotter, you should use one of the plotter fonts, **Modern, Roman, Script,** or some type of **stroke font** for your text and dimensions. **(HPGL Users** - if you use any other font on your drawing it will be converted for the plotter but all your text will be plotted horizontally, regardless of its orientation on the drawing.)*

TrueType fonts are preceded by a or icon in the list of fonts in the **Font Dialog Box**. They look the same on your screen as they do when they are output to your printer. TrueType fonts scale smoothly to any size on almost any Windows-supported screen and printer (but not daisy-wheel printers or plotters). Extra TrueType fonts can be purchased, and those supplied with other packages can be used.

Screen fonts (if they appear at all) are preceded by an icon representing a screen and usually have the suffix **WN** on the list of fonts in the **Font Dialog Box**. These are the fonts that Windows uses for the text that appears in dialog boxes on the screen, among other things. The font that you see on the screen will be approximated by your printer, so text written using screen fonts may look slightly different on the screen than when printed.

Plotter fonts are not preceded by an icon. They are vector fonts (i.e. they are made up of lines) and are the fonts you should choose if you are going to output to a plotter.

Printer fonts are usually preceded by a printer icon ( ). These fonts are installed to Windows when you install a new printer.

Text Size

The **Text Size** property is used to specify the size of the text to be placed on your drawing. Sizes range from 1 to 72 points, where a point equals $^{1}/_{72}$ of an inch.

The actual plotted text size is determined entirely by the final scale that the drawing is plotted at. If you plot the final drawing at a scale that is different from what you entered for a final scale when you started the drawing in "Sight" Survey, your text size will not be correct. For example, if you enter the final scale as 100 within "Sight" Survey, but you actually plot the drawing within CAD at a 50 scale, your text (and components) will be double their expected size.

When a line being annotated is too short to support the text being placed on it, "Sight" Survey will react in one of two ways: text will either be squished to fit on the line; or a label will be assigned to the line and placed above the line. The label will begin with the letter **"L"** and follow with a number that represents that line in the **Short Line Table** which can later be placed on your drawing.

"Sight" Survey's course of action depends upon the **Dimensioning of Short Lines** setting in the **CAD Configuration** menu (page 392.)

Text Color

The **Text Color** property is used to specify the color of the text to be drawn. **Text Color** operations are basically identical to setting the **Object Color** (see page 482).

When the **Text Color** property is set to **`BY LAYER`**, "Sight" Survey will place all text in the Pen color associated with the layer that is currently assigned to the layer for the type of text being placed. For example, **Point numbers** are placed in the color assigned to the **Point Numbers Layer**; **Bearings** are placed in the color assigned to the **Line Annotation Layer**, etc.)

Specific text entities and the layer that they are associated with are shown in the table on page 849 of this manual.

For more information please refer to the sub-section **"BY LAYER" Layering** beginning on page 848 of this manual.

Text Bold

The **Text Bold** property is used to specify whether or not you want the drawing text to be placed in a bold typeface. When **Text Bold** is **On**, text will be placed in a darker, bold typeface. When **Text Bold** is **Off**, the text will be placed in a regular typeface.

Text Italic

The **Text Italic** property is used to specify whether or not you want the drawing text to be placed in an italic typeface. When **Text Italic** is **On**, text will be placed in an italic typeface. When **Text Italic** is **Off**, the text will be placed in a regular typeface.

Symbols Layer

The **Symbols Layer** property is used to specify the name of the layer for the end point symbols, component table, North arrow, and scale bar. (Symbols drawn as part of a custom line are placed on the **Lines Layer**.) The default name for this layer is **SYMBOLS**.

For any of the **Layer** *properties, if the layer you wish to use has not yet been defined, add it by selecting the* **<New Layer>** *option and then entering the new layer name. New layers that are added in this manner (versus using* **Edit Layers***) are only created and saved in the drawing file if they contain data or are set as the current value for a layer… property when the file is closed. Layering is discussed in detail, beginning on page 839.*

Coords. Layer

The **Coordinates Layer** property is used to specify the name of the layer for Northings & Eastings when **Coordinates** is the selected **Label Type**. The default name for this layer is **COORDINATES**.

Coord. List Layer

The **Coordinate List Layer** property is used to specify the name of the layer for the coordinate list containing point numbers, Northings, Eastings, elevations and descriptions. The default name for this layer is **COORDLIST**.

Elevations Layer

The **Elevations Layer** property is used to specify the name of the layer for Elevations when they are the selected **Label Type**. The default name for this layer is **ELEVATIONS**.

ASCII File Layer

The **ASCII File Layer** property is used to specify the name of the layer for imported ASCII text files. The default name for this layer is **ASCIITEXT**.

Line Layer

The **Line Layer** property is used to specify the name of the layer for lines, arcs, random curves, circles, rectangles, and custom lines (including text and symbols placed along custom lines). The default name for this layer is **LINES**.

Pt. Name Layer

The **Point Name Layer** property is used to specify the name of the layer for point Descriptions and labels when they are the selected **Label Type**. The default name for this layer is **PTNAMES**.

Pt. Number Layer

The **Point Number Layer** property is used to specify the name of the layer for Point Numbers and Pt # & Elevations when they are the selected **Label Type**. The default name for this layer is **PTNUMBERS**.

Points Layer

The **Points Layer** property is used to specify the name of the layer for dots and crosses. The default name for this layer is **POINTS**.

Sup. Table Layer

The **Supplemental Table Layer** property is used to specify the name of the layer for the curve and short-line tables. The default name for this layer is **SUPTABLES**.

Line Annot Layer

The **Line Annotation Layer** property is used to specify the name of the layer for bearings, distances, curve lengths, curve labels, and short-line labels. (Text characters drawn as a part of a custom line are placed on the **Lines Layer**.) The default name for this layer is **LINETEXT**.

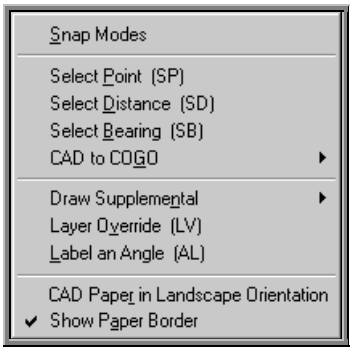
Station Layer

The **Station Layer** property is used to specify the name of the layer for Stations when they are the selected **Label Type**. The default name for this layer is **STATIONS**.

*Some drawing entities do not have a special layer property and are instead drawn on the **Current Layer** at the time of placement. They are:* **Parallel Lines**; **Leader Lines & Arrows**; **Text Lines**; *and* **Angle Labels***; as well as most items placed from within the* **Drawing** *window such as:* **Dimensions***; (any type)* **Hatches***;* **Fills***;* **Bitmaps***;* **Arc & ASCII Text***; etc.*

20.09 The Right-Click Draw Menu

When you right-click the mouse anywhere in a blank area of the **Drawing** window, "Sight" Survey's **Draw** menu appears. This is the same menu that appears when you select the **Draw** menu from the menu bar that lies across the top of the program screen.



You can select functions from this menu while you are working in the **Drawing** window.

"Sight" Survey 3.0

Section 21

Accurate Placement

"Sight" Survey contains features that make it easy to produce accurate drawings. These features include: **Jumps**; **Precise Cursor Movements**; **Grids**; **Ortho Snaps**; and **Calculations**.

21.01 Jumps & Snaps

FUNCTION: **Jumps** and **Snaps** are used to quickly move the cursor to a precise existing location.

"Sight" Survey has two ways of moving exactly onto an existing part of a drawing: **Jumps** and **Snap Modes**. Drawing jumps and snap modes can only be issued while "Sight" Survey's **Drawing** window is prompting you for a point. (i.e. The prompt bar at the top of the **Drawing** window must be prompting for a point.) These commands will not work when the **Drawing** window shows the default **Select** cursor (▷).

A **Jump** moves your cursor exactly onto an existing part of the drawing, for example onto the end of a line. If you want to accept the point that you have jumped to, such as for the first point of a line or as a point through which a traverse line must pass, you must first enable the **Quick Pick** (`QP`) toggle or use one of the following **Select** routines: **Select Point** (`SP`), **Select Bearing** (`SB`) or **Select Distance** (`SD`). Usually, you must press ↵Enter or click the left mouse button to actually set the point at the jump location. By combining jumps with the **Quick Pick** (`QP`) routine, an accurate "move and accept" is performed each time you press ↵Enter or click your left mouse button. However, if you move your mouse before you press ↵Enter or click the left mouse button, the point will be lost and you will have to perform the jump again.

Within "Sight" Survey, when you implement a **Snap Mode**, it sets the cursor snap mode for the next selected point. Changing the default snap mode is useful when you must exactly snap onto a

point or other entity in a congested part of the drawing. The snap mode overrides the jump mode and allows more accurate entity selection. For example, if you jump to a point where a cross has been placed, the default **Grab All** cursor (⊡) will jump to the nearest entity within the cursor box. By enabling a **Nearest Intersection** snap mode, it forces the center of the cross to be selected instead of an end point of one of the lines of the cross.

The quick reference guide below lists jumps and snap modes. More detailed information on jumps follows the guide.

JUMPS & SNAP MODES - QUICK REFERENCE

Locks & Toggles

K **Locks** cursor to the **exact bearing/angle** of an entity.

+ **Toggles Ortho** (parallel/perpendicular). Mode on and off.

Cursor Snap Modes

Shift F Enables **Freehand** cursor ( ) snap mode - Cancels **Jump/Snap** mode.

Shift A Enables **Grab All** cursor (⊡) snap mode.

Shift J Enables **Nearest Point** cursor ( ) snap mode.

Shift N Enables **Nearest Line/Arc** cursor ( ) snap mode.

Shift Y Enables **Nearest Intersection** cursor ( ) snap mode.

Shift E Enables **Nearest Center Point** cursor ( ) snap mode.

Precision Jump Codes

A Jumps to **any point in the cursor box**.

J Jumps to the **nearest point**. (Identical to clicking your mouse while a point lies within the cursor box.)

N Jumps to the **nearest line or arc**.

Y Jumps to the **nearest intersection**.

E Jumps to the **center point of the nearest arc or circle**.

T Jumps to the **midpoint of a line**.

O Jumps an **exact distance and bearing**.

C Jumps to an **exact coordinate location**.

H Jumps **to the center of the Drawing** window.

Directional Jump Codes

↑	Jumps **upwards** a set number of vertical units.
Shift ↑	Jumps **upwards the last set number** of vertical units.
↓	Jumps **downwards** a set number of vertical units.
Shift ↓	Jumps **downwards the last set number** of vertical units.
←	Jumps to the **left** a set number of horizontal units.
Shift ←	Jumps to the **left the last set number** of horizontal units.
→	Jumps to the **right** a set number of horizontal units.
Shift →	Jumps to the **right the last set number** of horizontal units.
Home	Jumps **diagonally up and left** a set number of units.
Page Up	Jumps **diagonally up and right** a set number of units.
End	Jumps **diagonally down and left** a set number of units.
Page Dn	Jumps **diagonally down and right** a set number of units.
Ctrl T	Jumps to an exact **ratio distance** such as 0.5.

Drawing Zoom Shortcuts (These work anytime)

Ctrl M	**Magnify** the drawing at the cursor location.
Ctrl D	**De-Magnify** the drawing at the cursor location.
Ctrl A	**Zoom All** of the drawing onto the screen.
Ctrl W	Initiates the **Zoom Window** command.
[	Initiates the **Split Window** command when used ***within*** the **Zoom Window** command.
]	Closes **Split Windows** when used ***within*** the **Zoom Window** command.

?

Jumps only position the cursor. Jumps do not accept the point jumped to for use in drawing routines. After you jump to a point, you must press ↵Enter *to accept (or fix) the point.*

The available jump codes and jumps are:

A **Jump to Grab All**: Jump to any point in the cursor box. This jump is only operational when you are in the **Grab All** snap mode.

J **Jump Point:** (Also, clicking your mouse while a point lies within the **Grab All** snap mode cursor box will cause "Sight" Survey to jump to that point.)

N **Jump Near Element:** Jumps to the nearest line or arc.

Y **Jump Intersection:** Jumps to the nearest intersection.

E **Jump Circle Center:** Jumps to the nearest circle (or arc) center point.

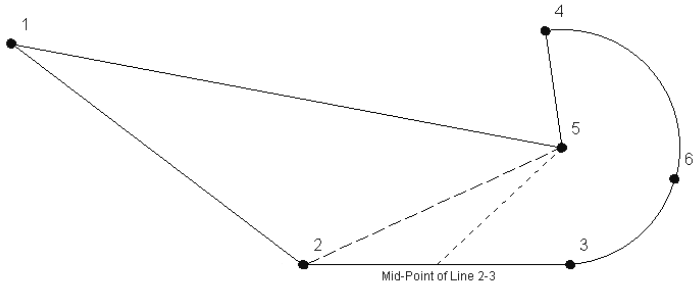
T **Midpoint Jump:** Jumps to the midpoint of a line.

G **Jump Grid:** Jump to the nearest grid point.

X **Last Fixed Jump:** Jumps to the last *fixed* point, accepted by pressing ↵Enter or clicking the mouse.

Ctrl **T** **Ratio Jump:** Jumps to a particular distance along a line or between two points. Prompts for a ratio, for example 0.33 to jump a third of the way.

To illustrate the usage of jumps, consider the illustration below:



In a new "Sight" Survey session, type **LI** to draw a line from **1** to **2** to **3**. "Sight" Survey will prompt (in the **Drawing** window command line):

Enter first point of line

Click your cursor at the location for point **1**.

Enter next point of line

Click your cursor at the location for point **2**. The line is "rubber-banded" so you can see it as you draw.

Enter next point of line

Click your cursor at the location for point **3**.

Enter next point of line

Press Esc to cancel line drawing.

Type **AC** to draw a three point arc. "Sight" Survey prompts:

Enter first point of arc

Move the **Grab All** cursor (⊡) near point **3** and press J↵Enter to jump to the nearest point and mark it as the first point. "Sight" Survey prompts:

Enter point on arc

Move the cursor to a point on the arc and click. (This is shown as point **6** in the example drawing on page 500). "Sight" Survey prompts:

Enter last point of arc

Move the cursor to the end point on the arc and click. (This is shown as point **4** in the example drawing). The arc will be drawn. Press Esc to cancel arc drawing.

Now we'll use a jump to identify the arc center point and draw a line to it from point **4**. Type **LI** to draw a line. "Sight" Survey prompts:

Enter first point of line

Press X Enter to jump to the last fixed point and mark it as the first point. "Sight" Survey prompts:

Enter next point of line

Press E Enter to jump to the arc center point and mark it as the next point. A line will be drawn from point **4** to point **5** and "Sight" Survey prompts:

Enter next point of line

Now we'll try a few other jumps, but we won't draw the lines. Move the cursor to a point near **Line**$^{2\text{-}3}$ and press T (but not Enter) to jump to the midpoint of **Line**$^{2\text{-}3}$. Now move the cursor a little bit toward point **2** and press Y (but not Enter) to jump to the intersection point of **Line**$^{1\text{-}2}$ and **Line**$^{2\text{-}3}$. Now move the cursor to point **1** and press J Enter to set **Line**$^{5\text{-}1}$. Press Esc to cancel line drawing.

21.02 Precise Cursor Movements

FUNCTION: **Precise cursor movements** are used to quickly move the cursor to a precise new location.

"Sight" Survey is capable of several types of precise cursor movements. To make a precise cursor movement, just press the corresponding arrow or key at any **Drawing** window command line prompt for a point.

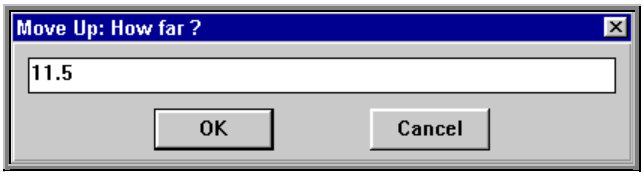
? *Precise cursor movements only position the cursor. They do not accept the point location for use in drawing routines. After you move to a point, press* ↵Enter *to accept (or fix) the point.*

*Precise cursor movements **cannot** be issued unless "Sight" Survey's* **Drawing** *window command line is prompting you for a point.*

Precise cursor movements are jumps of a specified number of units; jumps to exact coordinates; and jumps established by angle and distance. As with the previously described set of jumps, you can use any of these jumps whenever "Sight" Survey's **Drawing** window command line is prompting you for a point. After performing each movement, you must press ↵Enter to actually set the point at the new location.

Left, Right, Up, Down

Press ↑, ↓, ←, or → to jump up, down, left, or right a set number of units. You will be asked to specify the number of units up, down, left, or right that you want to move.



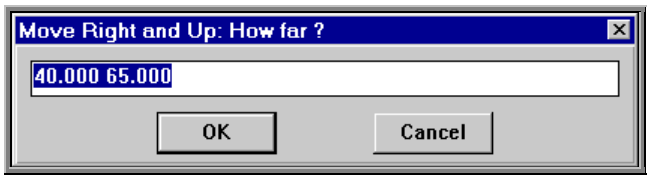
Type in a value and press ↵Enter or click OK. The value is in the drawing units specified in **Start** ⇨ **Settings** ⇨ **Unit Settings** (Alt S, S, U - page 797) .

Shift [Left, Right, Up, Down]

Press Shift ↑ (or Shift ↓) to jump up (or down) the last set number of vertical units. Press Shift ← (or Shift →) to jump left (or right) the last set number of horizontal units.

Diagonals

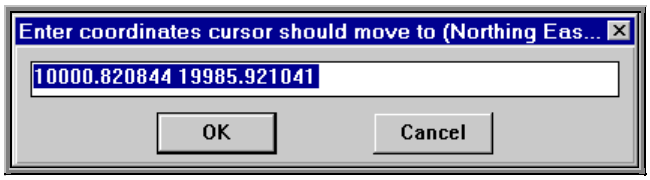
Press Home, Page Up, Page Dn, or End to jump diagonally up and left, up and right, down and right, or down and left a set number of units. You must specify the number of units you want to move.



Type both values separated by a space and press Enter or click OK.

Move to Exact Coordinates

Press C or right-click the **Polar Move** icon ( ) to jump to an exact coordinate location. You will be asked to specify the **Northing** and **Easting** that you want to jump to.

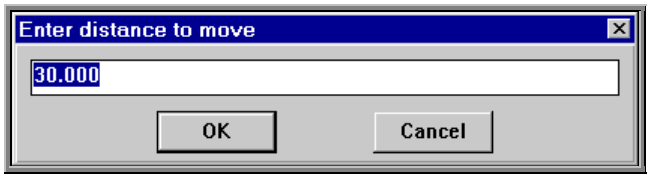


Type both values separated by a space and press Enter or click OK.

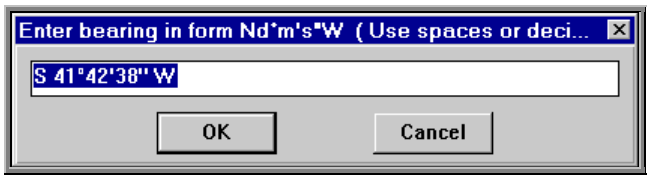
? *The order in which coordinates are displayed and entered depends on the way you have set up Northings and Eastings in the* **Surveyor Setup** *section of* **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

Move to a Polar Location

Press O or click the **Polar Move** icon ( ) to jump to an exact location specified by a distance and angle. You will be asked to specify the distance and angle that you want to jump to.



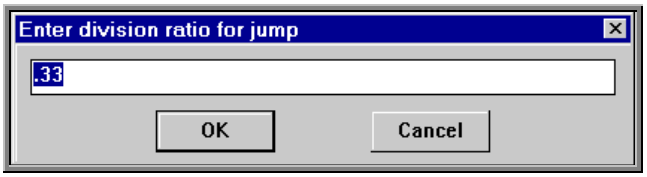
Type in a distance value and press Enter or click OK.



Type in a bearing value (in the format shown) and press Enter or click OK. For faster data entry, you may separate the DMS values with spaces or periods, for example: **41°42'38"** may be entered as **41 42 38**, or as **41.42.38**.

To a Ratio Distance

Press Ctrl T to jump to an exact ratio distance such as 0.5, 0.33, etc. You will be asked to specify the defining points and ratio that you want to jump.



Type in a ratio value and press Enter or click OK. "Sight" Survey prompts:

Would you like to jump to a ratio point on line, (else between two points).

Click Yes or press Enter or Y if you want to set a point at the ratio distance and on a line connecting two other points.

If you want to set the point between two unconnected points, click No or press N. "Sight" Survey prompts:

Enter first point

Click on (or jump to and set) a point. "Sight" Survey prompts:

Enter next point

Click on (or jump to and set) the next point. "Sight" Survey moves to a point at the ratio distance. Press ↵Enter ↵Enter to set the point.

21.03 Ortho Snaps

FUNCTION: **Ortho Snaps** are used to construct lines and/or text parallel and/or perpendicular to an existing object.

Using **Ortho Snaps**, it is easy to construct lines or write text parallel or perpendicular to a reference direction. The reference direction is set by identifying the line and pressing K. (**K** stands for loc**K**.)

Drawing Lines

For example, suppose you have just drawn a line at a bearing of S 10° E. Now you want to draw a line parallel to the last line. Position the cursor near one of the end points of the line. Type **LI** to draw a line. At the prompt,

Enter first point

position the cursor near the midpoint of the line and press T to jump to the actual midpoint. Press K to lock in the angle, then press + to activate the **Ortho** mode.

?

Use the + key from the numeric keypad.

Move the cursor to the desired distance from the first line and click or press ↵Enter. "Sight" Survey prompts:

Enter next point of line

Press + again. Now as you move the cursor, notice that the line can only be drawn perpendicularly through the point, or through the point on a path parallel to the first line. Draw your line and click or press ↵Enter.

To turn the **Ortho** mode off, press Esc to exit the line drawing mode.

Placing Text

When you access the **Start** ➪**Annotate** ➪**Text Line Entry** function (Alt S, A, Y - page 659), "Sight" Survey prompts:

> **Enter text position**

Position the cursor on the line to which you want to align text. ***DO NOT click the cursor.*** Instead, press K to lock the cursor to the angle of the line. Now move the cursor to the desired text location and click. Then enter text just as before.

> *If you want text perpendicular to the line, press U after you have pressed K.*

Text will stay locked at the angle until you exit the **Text Line Entry** function. The next time you enter the function, text will default to horizontal.

21.04 Grids

> **FUNCTION:** **Grids** serve as guideline functions for precise movement.

Grids allow you to place a user-defined grid onto the screen. The grid points can be snapped to using the **Grid Snap** mode or **Jump Grid**. The grid may also be turned on and off.

Grids are discussed in **Section 9.14 - Start** ➪**Tools** ➪**Grid** (Alt S, T, D - page 747) .

21.05 Calculations

FUNCTION: Calculations may be entered when "Sight" Survey prompts for a distance.

?

The calculations referred to in this section apply only to prompts that appear during Drawing *window functions.* ***This section does not apply to data entered into COGO's*** Data Entry ***window.***

Whenever "Sight" Survey prompts you to enter a distance, be it diameter, radius, length etc. you can enter that distance as an arithmetic expression, for example `(518-212)/3`.

This expression is evaluated when you click OK, or press ↵Enter after typing the expression, resulting in the correct distance being used.

You can use the following functions:

`*` multiply (use the `*` on the numeric keypad).

`/` divide (use the `/` on the numeric keypad).

`-` minus (use the `-` on the numeric keypad).

`+` plus (use the `+` on the numeric keypad).

`^` power, e.g. 10^2 (ten to the power of two).

sqrt(x) square root, for example: sqrt(100) (square root of 100).

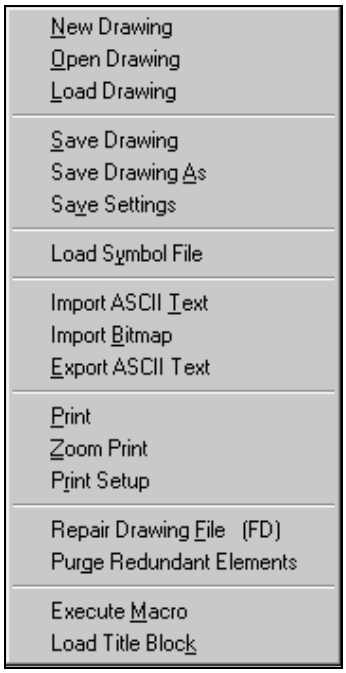
The functions **sin(x)**, **cos(x)**, **tan(x)**, **asin(x)**, **acos(x)**, **atan(x)**, **atan2(y:x)**, **int(x)**, **abs(x)**, **log(x)** and **ln(x)** are also available.

Standard mathematical hierarchy applies, and brackets can be used to force the sequence of operations. The correct use of brackets when using `+` and `-` in combination with `*` and `/` is essential.

"Sight" Survey 3.0

Section 22

Start Menu - FILE



The **FILE** menu accessed from the [Start] button in the **Drawing** window is where you'll find commands relating to the loading, saving, and plotting of drawings. The menu also contains commands for importing and exporting ASCII text, drawing repair, and for loading of custom title blocks.

22.01 New Drawing

FUNCTION: The **New Drawing** function is used to erase the current drawing and start a new drawing.

To select the **New Drawing** function, press Alt S, F, N, or click the **File Open** icon ( ) on the **Drawing** window tool bar.

If you select **New Drawing** and you have not saved the drawing that is currently on the screen, a dialog box appears asking you whether you want to save the current drawing.

To save your drawing, click [Yes]. To continue loading a new drawing without saving, click [No].

The **Drawing** window screen will be cleared and the new drawing will be loaded.

22.02 Open Drawing

FUNCTION: The **Open Drawing** function is used to load a new ***drawing*** into the **Drawing** window. The drawing may be a "Sight" Survey or TrueCAD drawing, an AutoCAD drawing (version 10-12, including LT), or a DXF file.

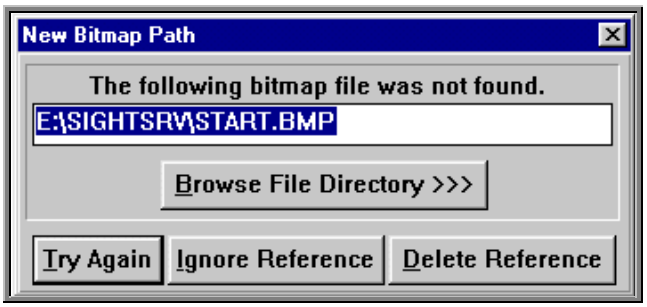
To access the **Open Drawing** function, press Alt S, F, O.

When you select **Open Drawing**, the Windows **Load** dialog box is activated.

The default drawing type, the format "Sight" Survey uses, is **CADControl DRG**. To choose a different type of drawing file, DWG or DXF, use the **Select Files of Type** list box at the bottom left of the dialog box. Select the drawing you want, then click OK.

Missing Bitmaps

When you save a drawing containing bitmaps, the bitmaps are not stored with the drawing. Only a reference to them is stored. If you delete or rename a bitmap or move it to another directory, "Sight" Survey will not be able to find the referenced bitmap the next time the drawing is loaded.



If you have moved the bitmap to another directory, click Browse File Directory >>> in the dialog box to locate the bitmap so "Sight" Survey will be able to find it. Then click Try Again.

If you click Ignore Reference, "Sight" Survey loads the drawing without the missing bitmap. If you click Delete Reference, "Sight" Survey deletes the reference to the bitmap and loads the drawing.

DWG and DXF Support

"Sight" Survey supports all AutoCAD 10, 11 and 12 DXF and DWG data except Shapes, 3D Faces, X-References or anything in Paper Space. If you bring 3D information into "Sight" Survey, the z coordinates may be dropped.

To get an AutoCAD 13 or 14 drawing into "Sight" Survey, save it as an AutoCAD 12 file from within AutoCAD 13 or 14.

Pen colors

DXF and DWG colors appearing in "Sight" Survey are controlled by the **DXF/DWG Conversion Settings** dialog box (Alt S, S, X - page 835).

Fonts

AutoCAD does not use standard Windows fonts, but "Sight" Survey does. Therefore, you need to convert DXF and DWG fonts to CADControl equivalents. Fonts are controlled by the **DXF/DWG Conversion Settings** dialog box box (Alt S, S, X - page 835).

1. *If you are using a pen plotter you should use* **DXF/DWG Conversion Settings** *to translate DXF and DWG fonts into the equivalent Windows pen plotter fonts. These are Modern, Roman, and Script.*
2. *If the DXF or DWG file you are converting contains an AutoCAD font you don't know the name of, use the* **UNKNOWNNAME** *setting in the* **For DXF Font** *section of the* **DXF/DWG Conversion Settings** *dialog box. Then select the CADControl font you want to convert it to in the* **Use TrueCAD** *section.*
3. *If the fonts you want to convert to or from do not appear in the list of fonts in the* **DXF/DWG Conversion Settings** *dialog box, you can add more fonts by loading the* **`TRUECAD.INI`** *file into a word processor and adding the required font names to the existing listing.*

Line Types

By default, DXF and DWG line types should appear correctly in "Sight" Survey. However, the way that DXF and DWG line types appear in "Sight" Survey is controlled by the editable **`LINETYPE.MAC`** file. See **Section 33 - Line Types**.

Part of the drawing is missing

If you have loaded a DXF or a DWG file and part of your drawing seems to be missing, use **Start** ➪ **Settings** ➪ **View Settings** (Alt S, S, V - page 799) and change the background color of your drawing. It is possible that the missing portions of the drawing are simply the same color as the background.

Drawing Origin

Since AutoCAD's origin point (0, 0) is at the bottom left and "Sight" Survey's is at the center of the paper, you may have to use **Start** ➪ **Settings** ➪ **Re-center Paper** (click or press Alt S, S, A - page 803) to center your drawing on the paper.

Scale

AutoCAD usually functions at a scale of 1:1. You may want to change the scale in "Sight" Survey to a more normal setting, for example 1:50, using **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

Attributes

AutoCAD attributes are converted to "Sight" Survey as follows. AutoCAD has two types of attribute: **Attdef** (attribute definition, only found inside blocks) and **Attribute** (solidified Attdef, produced when you insert a block). An Attdef has three text strings: prompt, tag and default. These are stored in a TrueCAD data item as `prompt:tag=default`. An Attribute has two text strings: tag and value. These are stored in a TrueCAD data item as `tag=value`. The TrueCAD data items are converted back to Attdefs and Attributes when you save the drawing as a DWG file.

Dimensions

AutoCAD has two ways of putting text into a dimension: either blank or some text. If the AutoCAD dimension is blank, "Sight" Survey inserts its own text, based on the current dimension settings. If the AutoCAD dimension has text in it, "Sight" Survey copies it exactly.

Slow Loading DXF or DWG

DXF and DWG drawings often contain unreferenced blocks which can slow them down drastically. You can purge these blocks using **Start** ➪ **File** ➪ **Purge Redundant Elements** (Alt S, F, G - page 544).

22.03 Load Drawing

FUNCTION: The **Load Drawing** function is used to load or merge a new ***drawing*** into the **Drawing** window. The drawing may be a "Sight" Survey or TrueCAD drawing, an AutoCAD drawing (version 10-12, including LT), or a DXF file.

To access the **Load Drawing** function, press Alt S, F, L, or right-click the **File Open** icon ( ) on the **Drawing** window tool bar.

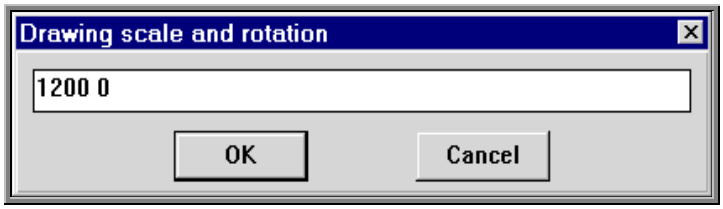
Load Drawing operates in the same manner as **Open Drawing** (Alt S, F, L - page 510) except that the new drawing is merged into the existing drawing.

When loading a DWG or DXF file into an existing drawing, the new drawing is positioned on the existing drawing according to its

coordinates, for example a point at coordinate 1000, 2000 on the new drawing will be placed at coordinate 1000, 2000 on the existing drawing. This also occurs when loading a "Sight" Survey or TrueCAD drawing into an existing drawing while working in the **Surveyor** coordinate system.

If you are using the **Cartesian** coordinate system when loading a "Sight" Survey or TrueCAD drawing, "Sight" Survey prompts:

Position the cursor at that position in the existing drawing where you want the new drawing to be loaded and click the mouse, or press ↵Enter. The origin point (0, 0) of the new drawing will be placed at the specified point and will assume the coordinates of the existing drawing. "Sight" Survey prompts:



Type a scale and rotation for the drawing you are loading, separated by a space, and click OK. For example, if you type `1200 0`, the new drawing will be loaded at 1" = 1200" (or 100') with no rotation.

When scaling a drawing, the number you enter is a multiplier. For example, a scale entry of 1 will load the drawing at the same size as it was created. An entry of 2, doubles the size of the drawing, etc.

If your drawing contains bitmaps you may be required to enter additional information, such as the path to the bitmap, etc. See **Missing Bitmaps** on page 510 for more information.

22.04 Save Drawing

FUNCTION: The **Save Drawing** function is used to save a ***drawing***. The drawing will be saved as a CADControl or TrueCAD drawing, "Sight" Survey's native drawing format.

To access the **Save Drawing** function, press Alt S, F, S., or click the **Save Drawing** icon ( ) on the **Drawing** window tool bar.

If the drawing has been previously saved, selecting **Save Drawing** will use the drawing's existing filename.

If the drawing has not been previously saved, **Save Drawing** will function like the **Save Drawing As** command as described in the next section.

22.05 Save Drawing As

FUNCTION: The **Save Drawing As** function is used to save a ***drawing*** under a new filename, or as an AutoCAD drawing (version 10-12, including LT) or DXF file.

To access the **Save Drawing As** function, press Alt S, F, A., or right-click the **Save Drawing** icon ( ) on the **Drawing** window tool bar.

If the drawing has been previously saved, selecting **Save Drawing** will use the drawing's existing filename.

If the drawing has not been previously saved, **Save Drawing** will function like the **Save Drawing As** command as described in the next section.

Under most conditions, you should save drawings as CADControl (TrueCAD) DRG files. This is "Sight" Survey's native format. To transfer a drawing to AutoCAD, save your drawing as a DWG file. To transfer a drawing to any other CAD program, save your drawing as a DXF file.

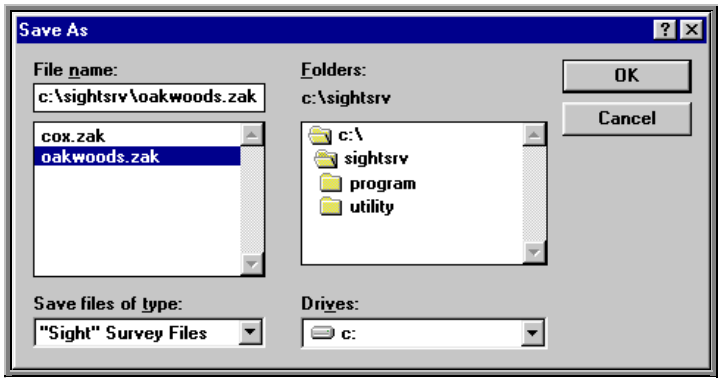
DXF is a standard AutoCAD file format. "Sight" Survey's DXF is designed to read and write this standard. Compatibility between "Sight" Survey and other CAD programs depends on whether those programs can read and write standard DXF files correctly.

DWG and DXF Conversion

If you are saving a drawing as a DWG or DXF file, you can select which version of AutoCAD the DWG or DXF file should be compatible with: 10, 11 or 12. Use the **To DXF/DWG Conversion Settings** dialog box (Alt S, S, X - page 835) to make this selection. This dialog box also controls the appearance of colors and fonts in AutoCAD or DXF files. Line type is controlled by the **LINETYPE.MAC** file. See **Section 33 - Line Types**.

Save Drawing As

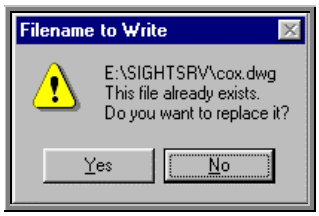
When you select **Save Drawing As**, the Windows **Save** dialog box appears.



Choose the type of file you want to save (**DRG**, **DWG** or **DXF**) and specify the drive and directory for the file location. Type a filename (without and extension) and click OK.

If the file already exists...

If a drawing with the file name you have chosen already exists, you will be warned. You may then choose to proceed or cancel the save operation.



Click Yes to continue the operation. Click No or press ↵Enter to cancel the save operation.

Saving an AutoCAD file

If you are saving an AutoCAD DWG file or a DXF file, "Sight" Survey prompts:

Write everything? (else just selected)

Click Yes to save the whole drawing as a DWG or DXF file. To save only those items on the drawing that have been selected, click No.

DWG and DXF Conversion

If you are saving a drawing as a DWG or DXF file, you can select which version of AutoCAD the DWG or DXF file should be compatible with: 10, 11 or 12. Use the **To DXF/DWG Conversion Settings** dialog box (Alt S, S, X - page 835) to make this selection. This dialog box also controls the appearance of colors and fonts in AutoCAD or DXF files. Line type is controlled by the **LINETYPE.MAC** file. (See page 877.)

Fonts

"Sight" Survey uses standard Windows fonts, AutoCAD does not. You'll need to convert "Sight" Survey 's fonts to AutoCAD equivalents. Use the **To DXF/DWG Conversion Settings** dialog box (Alt S, S, X - page 835) to make this selection.

If the fonts you want to convert to or from do not appear in the list of fonts in **DXF/DWG Conversion Settings**, *you can add further fonts by loading the* **TRUECAD.INI** *file into a word processor and adding the required font names to the existing listing.*

Bitmaps

Older versions of AutoCAD do not support bitmaps. If your drawing contains bitmaps, AutoCAD may crash when the DXF or DWG file is loaded into it.

?

*When you save a drawing that contains a bitmap, **the bitmap is not stored in the drawing**. Only a reference to the bitmap is stored. **It is therefore important that you do not delete the bitmap**. If you delete the bitmap or move it to another directory, an error message will appear next time you try to load any drawings containing the bitmap.*

Scales

If you have layers at different magnifications on your drawing, AutoCAD may crash when the DXF or DWG file is loaded into it.

Backup Copies

When you save a "Sight" Survey drawing, a backup copy of the drawing (with a **.BAK** extension) is automatically created in the same directory that the drawing is saved in.

The Drawing Office Manager

If the **Use Drawing Office Manager** box is checked in the **Save Settings** (Alt S, F, V - page 523), the **Drawing Office Manager** file will be updated each time you save.

The **Drawing Office Manager** (**DOM** for short) allows you to keep track of each drawing: its description; the name of the draftsperson drawing it; the department it is being drawn in; the paper size, scale and units used; the number of hours spent on it; the date it was last updated; the date it was last plotted; etc. (See table for full details of information stored).

All this information is stored in an ASCII file called **DOM.TXT** every time you save your drawing. **DOM.TXT** resides in your **SightSrv** directory and is updated each time you save a drawing. It can be loaded into any database that reads a comma delimited ASCII file, and can also be edited in any text editor such as Windows Notepad or the DOS Editor.

Each record in the file refers to a particular drawing and is stored on a single line, with fields separated by commas. It looks something like this (but all on one line):

```
"SAMPLE","\SIGHTSRV\JOBS\","C:","MFLOAN",
"SAMPLE SUBDIVISION","","A1",100,1000.0,
"SOUTH", 2538.093,17971.396,"","200",
19880929,19880929,,,"","","","","","","EKKE"
, ,0.12,,,,,,,,0.033,,,,
```

All fields included in the **DOM** are listed below, together with:

- The type of field (Type): Text (C); Numbers (N); Date (D).
- The number of characters allocated to the field (Len.).
- The number of decimals allocated to the field (Dec.).
- Whether the field is automatically filled in by CADControl. Fields that are automatically filled in by CADControl are marked with a *. You can fill in the non-automatic fields yourself using any text editor, provided that each field is separated by commas and that text character fields are enclosed in double quotes.

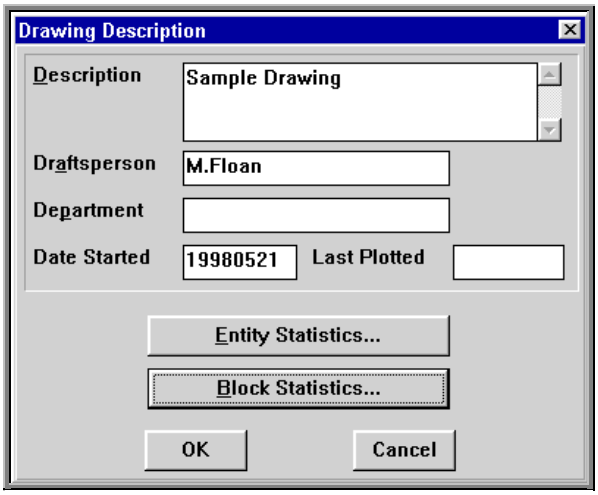
Field Name	Type	Len.	Dec.	Auto	Comments
FILE_NAME	C	8	0	*	Drawing name.
DIRECTORY	C	40	0	*	Directory drawing is stored in, for example \Ally\.
DRIVE	C	4	0	*	Drive directory is on, for example C:.
DISK_VOL	C	12	0	*	Disk volume label.
DESCRIPTN	C	40	0	*	Drawing description entered automatically from TrueCAD, for example CONCRETE RESERVOIR.
MORE_DESCR	C	40	0		You can type extra descriptive information into this field if you wish.
PAPER_SIZE	C	4	0	*	Paper size, for example A1.
SCALE	N	8	1	*	Scale, for example 100. This would mean that the scale was 1:100.

Field Name	Type	Len.	Dec.	Auto	Comments
UNITS	N	9	2	*	Units, represented in mm. If the drawing units are mm, this figure is 1; if they are inches, this figure is 25.4; if they are meters, this figure is 1000 etc.
COORD_SYS	C	10	0	*	Coordinate system. SOUTH for Southern Hemisphere; NORTH for Northern Hemisphere.
DRG_ORIG_Y	N	12	3	*	Y coordinate of drawing origin.
DRG_ORIG_X	N	12	3	*	X coordinate of drawing origin. If you are using Cartesian coordinates, this is 0. If you are using Surveyor coordinates it is the Surveyor Origin you enter into the Drawing Settings dialog box in the Settings Menu.
DEPARTMENT	C	10	0	*	Department responsible for the drawing.
CHOI_VERSN	C	6	0	*	Version of TrueCAD used.
DATE_START	D	8	0	*	Date the drawing was started.
LASTUPDATE	D	8	0	*	Date the drawing was last updated.
LASTPLOT	D	8	0	*	Date the drawing was last plotted.
DATE_DUE	D	8	0		Date the drawing is due to be finished.
CUSTOMER	C	20	0		Customer.
JOB_NO	C	20	0		Job Number.
CATEGORY	C	10	0		Drawing category.
DRAWING_NO	C	15	0		Drawing number.
DRG_NO_B	C	15	0		Another drawing number.
STATUS	C	5	0		Drawing Status
DRAUGHTSM1	C	10	0		Another Draughtsman
COST_HOUR	N	7	2		Cost charged per hour of drawing.
TOT_TIME	N	7	2	*	Total time spent on drawing in decimal hours, for example 0.5 is half an hour.
JAN	N	6	2	*	Time spent on drawing per month.
FEB	N	6	2	*	
MAR	N	6	2	*	
APR	N	6	2	*	
MAY	N	6	2	*	
JUN	N	6	2	*	

Field Name	Type	Len.	Dec.	Auto	Comments
JUL	N	6	2	*	
AUG	N	6	2	*	
SEP	N	6	2	*	
OCT	N	6	2	*	
NOV	N	6	2	*	
DEC	N	6	2	*	

Drawing Description

This screen only appears if you have checked **Use Drawing Office Manager** in **Save Settings**. It only appears the ***first time*** you save a drawing.



The information that you type into the box will be added to the **Drawing Office Manager** (see page 518), allowing you to keep track of the number of hours you work on the drawing, the date you last plotted it etc.

You can type a **Description**, and the name and **Department** of the **Draftperson**.

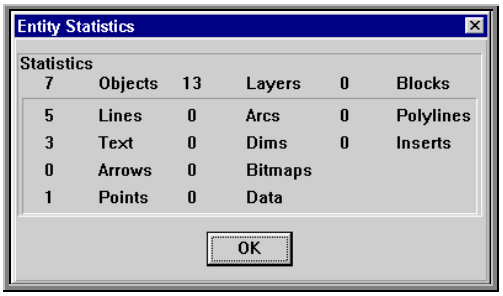
The date the drawing was started is automatically entered into the **Date Started** box in the order year, month, day. It cannot be edited.

In the example shown, the drawing was started in 1998 (1998), in May (05), on the twenty-first (21).

Similarly, you cannot edit the **Last Plotted** box. This box will automatically be updated with the date each time you plot.

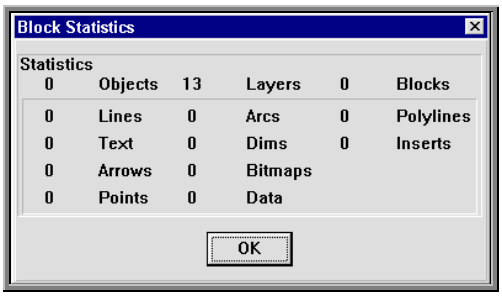
Entity Statistics

This button displays the number of primitives, objects and layers on your drawing. It also shows the number of blocks (including unreferenced blocks) and the number of block inserts. Blocks and block inserts are only relevant to drawings that have been imported from AutoCAD.



Block Statistics

This button is only relevant to drawings that have been imported from AutoCAD. It displays statistics about AutoCAD blocks hidden within the drawing structure. The numbers of different primitives shown are not the numbers of primitives on the drawing but the number of primitives contained within the AutoCAD blocks, some or all of which may be unreferenced. The insert figure shows the number of blocks inserts. The reason why there may seem to be a lot of CAD objects among the blocks is that CADControl automatically gives each block an object name.

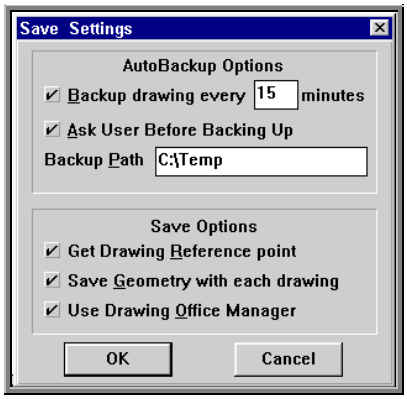


If you use **Start** ➪ **File** ➪ **Purge Redundant Elements** (Alt S, F, G - page 544) the number of blocks shown will probably decrease dramatically, as will the file size of your drawing. If you use **Start** ➪ **Objects** ➪ **Explode Objects** (Alt S, O, Esc - page 770) to explode all the block inserts on the drawing, all the blocks will become unreferenced and can be removed using **Purge Redundant Elements**.

22.06 Save Settings

FUNCTION: The **Save Settings** function is used to set drawing save parameters and autobackup intervals for drawings.

To access the **Save Settings** function, press Alt S, F, V.



From this screen you can select **AutoBackup Options** and other save options. To select or deselect an option, simply click the mouse on the check box associated with the option.

Autobackup is only used for saving your drawing. "Sight" Survey actively saves your data as you work, so a data backup is not needed.

Backup drawing every ? minutes

This selection tells "Sight" Survey how often to automatically backup your drawing. To use this option, click the selection box first. Then press Tab and type in the autobackup interval in minutes.

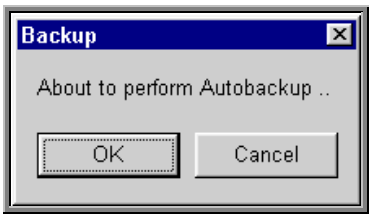
?

*When you save a drawing that contains a bitmap, **the bitmap is not stored in the drawing**. Only a reference to the bitmap is stored. **It is therefore important that you do not delete the bitmap**. If you delete the bitmap or move it to another directory, an error message will appear next time you try to load any drawings containing the bitmap.*

"Sight" Survey will store the drawing in the file **ABACKUP1.DRG**. At the same time, it will copy the old **ABACKUP1.DRG** into a file called **ABACKUP2.DRG**. This means you will always have two backups of your work: an older backup called **ABACKUP2.DRG** and a newer backup called **ABACKUP1.DRG**.

Ask User Before Backing Up

This selection tells "Sight" Survey to ask permission before each automatic backup. If you check the **Ask User Before Backing Up** box, "Sight" Survey will warn you when it is about to backup. When the warning appears, click OK to backup, or on Cancel to abort the backup.



Backup Path

This selection tells "Sight" Survey where to save the backup files **ABACKUP1** and **ABACKUP2**. Type in a drive and directory such as **C:\Temp** or **C:\SightSrv\Backups**. Note there is **no backslash** at the end of the path. The directory must exist whenever an autobackup takes place or an **Invalid Backup Path** error message will result.

Get Drawing Reference point

This selection is a TrueCAD setting and is not used by "Sight" Survey. *This item should be selected.*

Save Geometry with each drawing

This selection is a TrueCAD setting and is not used by "Sight" Survey. *This item should be selected.*

22.07 Load Symbol File

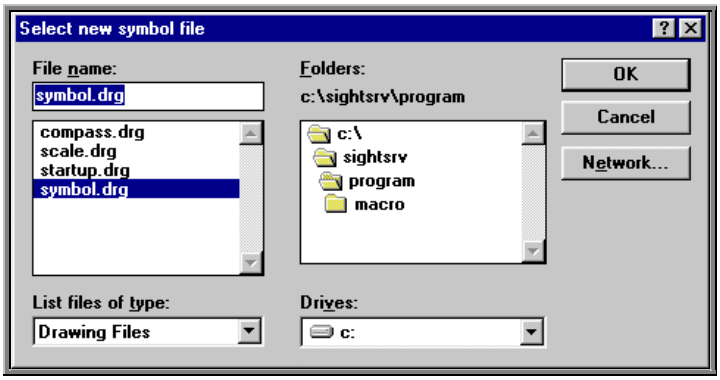
FUNCTION: The **Load Symbol File** function is used to load a new symbol file for use in the **Drawing** window.

To access the **Load Symbol File** function, press Alt S, F, Y.

Symbol construction is covered in **Section 29.06, Make Symbol**, *on page 774.*

Before any symbol may be used, the library file containing the symbol must be loaded. A symbol file is simply a drawing containing symbols (objects) that may be used repeatedly.

When you select **Load Symbol File**, a standard Windows **Load** dialog box appears.



Select the symbol file you need and click OK.

Symbol Scaling

You must specify if the symbols should be loaded at their absolute size, or to scale.

Do you want symbols to be absolute (else to scale)

In almost every case the drawings you will be working on will be drawn to scale. The symbols furnished with "Sight" Survey are drawn at actual size and are meant to be drawn to scale, not to their absolute size. If you create your own symbols library, you should create your symbols in the same manner. To load symbols to be plotted to scale, click No.

Symbol Attributes

One more question remains before you can use your symbols. "Sight" Survey prompts:

Convert Attributes to text during load?

If you click Yes, any attributes attached to the symbols you want to insert will be written as text next to the symbols. If you click No, attributes will remain invisible.

22.08 Import ASCII Text

FUNCTION: The **Import ASCII Text** routine is used to import any ASCII text file into "Sight" Survey's **Drawing** window. The imported text file becomes an actual part of the "Sight" Survey drawing.

To access the **Import ASCII Text** function, press Alt S, F, T.

You can also import text by pasting it in from another Windows application using the **Paste** *function in the* **Start** ➪ **Edit Menu** *(Alt S, E, P - page 550).*

The appearance of the imported text is determined by the settings in the **Set Text Defaults** *dialog box in the* **Start** ➪ **Settings Menu** *(right-click A or press Alt S, S, E - page 820).*

Import ASCII Text begins with a standard Windows **Load** dialog. Select the ASCII file you want to import, then click OK. "Sight" Survey prompts:

Enter position textblock should start

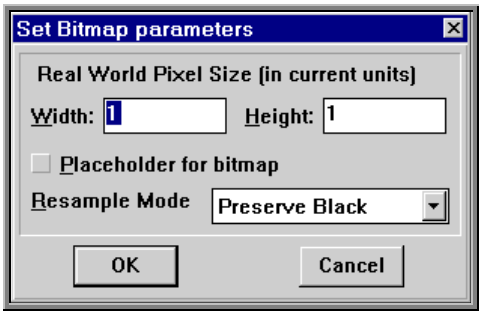
Position the cursor on the drawing at the position where the text should appear and click or press ↵Enter. The ASCII file will be imported and the text will appear.

Where the text will appear in relation to the cursor position you specify depends on where you have set the position of the **text label origin**. See **Start** ➪ **Settings** ➪ **Set Text Defaults** (Alt S, S, E - page 820).

22.09 Import Bitmap

FUNCTION: The **Import Bitmap** routine is used to import a bitmap (**BMP**) file into "Sight" Survey's **Drawing** window. This powerful feature can be used to insert aerial photos, area maps, pictures, etc. into your drawing.

To use the **Import Bitmap** function, press Alt S, F, B. The **Open** dialog box will appear, titled as **Select file to load**. Following the usual methods for opening a file, select the bitmap file you wish to import and click OK or Open. "Sight" Survey will display the **Set Bitmap parameters** box.



Real World Pixel Size

Each bitmap is made up of small squares or **pixels**. You need to type the width and height that each pixel should be into the dialog box. Width and height are measured in the units you have set up in **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

For example, if you have scanned in a map that represents an area measuring 1200' x 1200' on the ground, and in its bitmap form this map measures 600 x 600 pixels, then the real world pixel size is 2' in both width and height.

If you need to change the **Real World Pixel Size** of a bitmap once you have loaded it into your drawing, double click on the bitmap. This brings up the **Set Bitmap Parameters** dialog box again, which can then be edited.

Placeholder for Bitmap

If you check the **Placeholder for Bitmap** box, the bitmap will not appear on the screen and on your printouts, but instead will be marked with a placeholder. The placeholder appears as a purple cross-hatched rectangle with the name of the bitmap written across it. Displaying bitmaps as placeholders speeds up redraws.

If the **Placeholder for Bitmap** box is unchecked, the bitmap will be displayed in full detail.

You can change a bitmap from a placeholder to full detail or vice versa at any stage after loading by double clicking on it, which brings up the **Set Bitmap Parameters** dialog box for editing. You can also view all the bitmaps on your drawing as placeholders, or all of them in full detail. See **Start** ➪ **Settings** ➪ **View Settings** (Alt S, S, V - page 799).

Resample Mode

The resample mode dictates how your bitmap will be displayed on the screen when you demagnify the screen or scale the bitmap to make it smaller.

*The **Resample Mode** option affects the way your bitmap appears on the screen, but does not affect the way it is printed.*

Preserve Black - "Sight" Survey will display fewer pixels than previously. Black pixels will be displayed at the expense of other pixels.

Preserve White - "Sight" Survey will display fewer pixels than previously. White pixels will be displayed at the expense of other pixels.

Thin Pixels - All the pixels in your bitmap will be displayed, but they will be smaller than previously.

The default setting, **Preserve Black**, seems to work best for most images. However, for scanned maps and photographs you might want to try the **Thin Pixels** setting. Experiment with the settings to see how they affect your bitmaps as you zoom in and out.

To change the **Resample Mode** after loading the bitmap, double click on the bitmap. This will bring up the **Set Bitmap Parameters** dialog box so you can edit it.

When you have finished setting the parameters, click OK. "Sight" Survey prompts:

Select position for upper-left corner of bitmap

Use your mouse to position the **Freehand Cursor** ( ) at the desired insertion point and click your mouse to insert the bitmap.

Once you have loaded the bitmap, you can select and drag it, move it, stretch it, scale it, copy it, rub it out etc. However, you cannot edit the pixels within it. You can print bitmaps, but you cannot plot them (unless your plotter is an inkjet type, raster-image plotter).

1. *The number of pixels across the bitmap must be a multiple of 8, otherwise the bitmap may fail to load.*
2. *If you need to move the bitmap so it is behind other elements on the drawing, use* **Start** ➪ **Edit** ➪ **Move to Back** *(Alt S, E, B - page 570).*

?

When you save a drawing that contains a bitmap, ***the bitmap is not stored in the drawing****. Only a reference to the bitmap is stored.* ***It is therefore important that you do not delete the bitmap****. If you delete the bitmap or move it to another directory, an error message will appear next time you try to load any drawings containing the bitmap.*

22.10 Export ASCII Text

FUNCTION: The **Export ASCII Text** function is used to export text from a ***drawing*** into an ASCII text file.

To access the **Export ASCII Text** function, press Alt S, F, ↵Enter.

You can also export text by using the **Copy** *(Alt S, E, C - page 549) or* **Cut** *(Alt S, E, T - page 548) functions in the* **Start** ➪ **Edit Menu** *to copy text onto the Windows Clipboard, from where it can be pasted into other Windows applications.*

When you **Export ASCII Text**, a standard Windows **Save** dialog box appears. Type a name for your ASCII file, then click OK. "Sight" Survey prompts:

Enclose text that should go to file

Draw a polygon around the text you want to export into the ASCII file. Once you have enclosed the text, "Sight" Survey will write the ASCII file.

1. *If you have enclosed several pieces of text in the polygon, the order in which these will appear in the ASCII file is dependent on their position in the drawing. The topmost text item will be transferred to the file first, followed by the second-topmost item, etc.*
2. *If text is not horizontal it will not transfer properly.*
3. *If the text is part of an object or group, such as text that has been imported, the entire group must be contained within the selection polygon or none of the text will be included.*

22.11 Print

FUNCTION: The **Print** function is used to print or plot a ***drawing***.

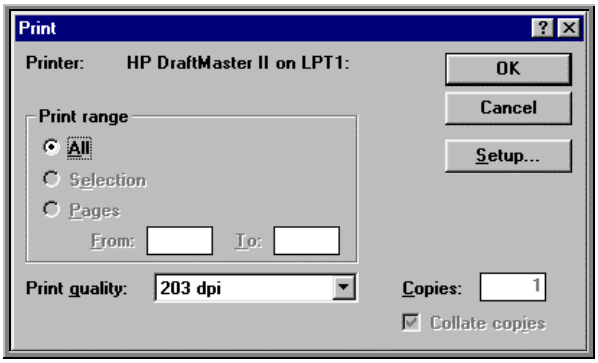
To access the **Print** function, press Alt S, F, P.

For information on how to install printers and on how to select the default printer, see the documentation that came with your copy of Windows.

*If you are outputting to a plotter, you should use one of the plotter fonts, **Modern**, **Roman** or **Script** for your text and dimensions. If you use any other font on your drawing it will be converted for the plotter but all your text will be plotted horizontally, regardless of its orientation on the drawing.*

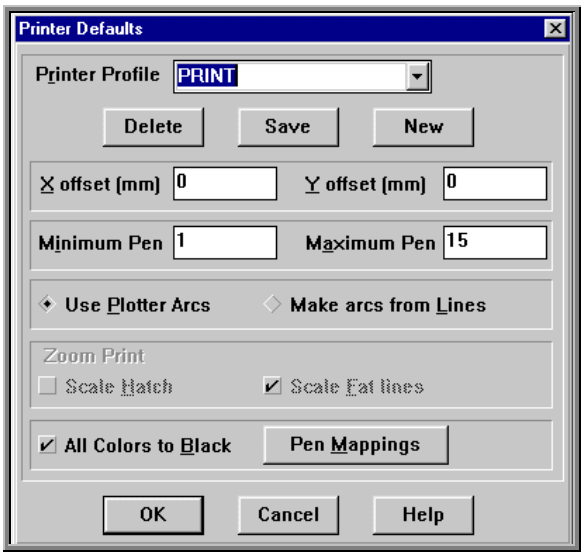
You can output bitmaps to printers and ink-jet plotters, but not to pen plotters.

When you select **Print**, the **Print** dialog box appears.



*The appearance of the **Print** dialog box may vary depending upon the version of Windows you are running.*

Edit the dialog box settings if necessary, then click OK. The **Printer Defaults** dialog box appears.



X and Y Offset

The **X and Y Offset** boxes allow you to offset the drawing on the paper. The offset is measured in mm. The X offset displaces the drawing to the right if a positive value is input, and to the left if a negative value is input. The Y offset displaces the drawing downwards if a positive value is input and upwards if a negative value is input.

Minimum and Maximum Pen

The **Minimum and Maximum Pen** boxes allow you to specify the range of colors that will be used when you are outputting to a plotter. The minimum pen is 1 and the maximum pen is 15.

If you are using a plotter with less than 15 pens, for example if your plotter has six pens, but you have used more than the first six colors in the **Pen Selection Area** (red, olive, yellow, lime, green and teal counting downwards from the top), you should specify minimum and maximum pens 1 and 15. If you do not, the parts of your drawing drawn with other colors will not be plotted.

These options are disabled if you are using a printer.

Use Plotter Arcs / Make Arcs from Lines

If the **Use Plotter Arcs** option is checked, "Sight" Survey will plot arcs created by your plotter driver. If the **Make Arcs from Lines** option is checked, "Sight" Survey will plot arcs made out of very small lines.

If no arcs appear when you try to plot, or if arcs are plotted incorrectly, use the **Make Arcs from Lines** option.

Zoom Print - Scale Hatch Scale Fat Lines

Selecting either the **Scale Hatch** or **Scale Fat Lines** options under the **Zoom Print** heading tells "Sight" Survey to scale line weight and/or hatch patterns accordingly when you change the scale on your drawing. ***These boxes may be grayed out if they are not applicable to your setup.***

All Colors to Black

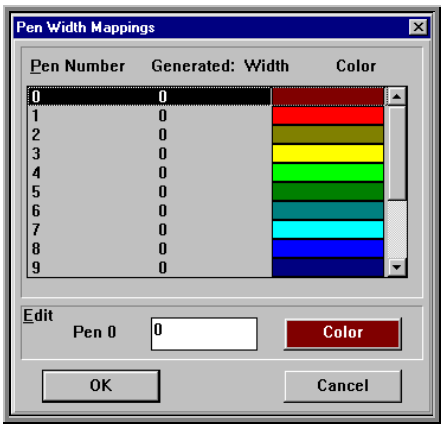
If your printer prints colors as different shades of grey, meaning that some colors are printed very faintly, check this option. All colors will then be printed as black.

Pen Mappings

This function allows you to use a printer such as an inkjet or laser printer as though it was a pen plotter. It does this by letting you map each color on the screen to a different line width on the printer. For example you could make red lines print at 0.3 mm, green lines print at 0.7 mm etc.

When you click on the 

button, the **Pen Width Mappings** dialog box appears.



The pens are listed on the left hand side of the box and are numbered from 0 to 15. Zero (0) is the top color in the **Pen Selection Area** at the right of the screen and 15 is the bottom color. Click on a pen to which you want to assign a width. The pen's number appears in the **Edit** part of the dialog box. Type a width (measured in mm) into the white part of the dialog box.

Now click on another pen to which you want to assign a width. The width associated with the first pen you edited appears next to that pen's number in the dialog box, and the second pen's number appears in the **Edit** area. Assign a width to the second pen and repeat until you have assigned a width to each pen. Click OK.

Pen mappings only affect those lines with a width of 0. For example, if you map the red pen to print at 0.3 mm, and there is a red line on the drawing that you have given a width of 0.7 mm using the Line Defaults dialog box, then that red line will print at 0.7 mm even though you have mapped the red pen to print at 0.3 mm.

This function is very useful for thickening dimension ***witness lines*** *(see page 826) which often print very faintly on modern high resolution inkjet printers. To thicken witness lines, set aside one color and draw all your witness lines in that color. Then map that color to the desired thickness.*

Busy printing

When you click OK, the message **Busy printing** appears while your drawing is printed or plotted.

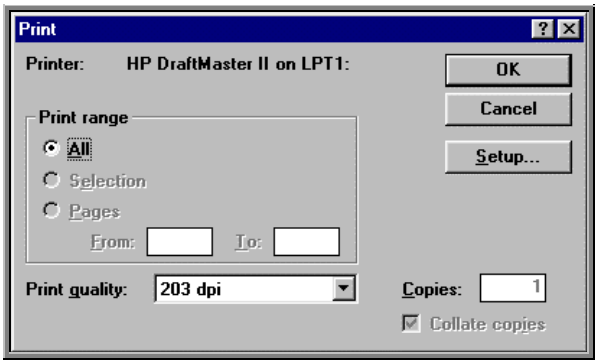
Change Pens in Plotter

If you specified a maximum pen greater than the number of pens your plotter driver provides for, you will get the message **Change Pens in Plotter**. Simply click on OK after changing them.

22.12 Zoom Print

FUNCTION: The **Zoom Print** function is used to print a selected part of your drawing at a selected scale.

To access the **Zoom Print** function, press Alt S, F, Z. The **Print** dialog box appears.



*The appearance of the **Print** dialog box may vary depending upon the version of Windows you are running.*

Edit the dialog box settings if necessary, then click OK. The **Printer Defaults** dialog box appears.

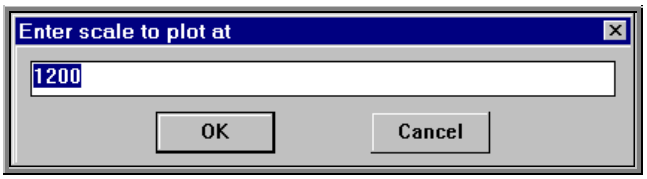
"Sight" Survey now checks the paper size and orientation of your output device. This may be different from the paper size and orientation of your drawing. For example, you may be doing a rough print of all or part of an A1 drawing on an A4 printer, prior

to producing a final plot. A pink dotted rectangle representing the paper size and orientation of your output device appears on the screen. "Sight" Survey prompts:

Plot to Fit? (else at exact scale)

If you click Yes, "Sight" Survey will read the paper size and orientation of your printer or plotter and will print your drawing so that it fits onto the paper exactly. You'll be given an opportunity to enter a border width, after which you should press Enter. Continue at the prompt "**Satisfied with zoom?**" on the next page.

If you click No, you can specify the exact scale at which your drawing will be printed.



The default scale that appears is the scale specified in the **Config** ➪**CAD Configuration Menu** as discussed on page 392. Accept the default scale by clicking OK, or by pressing Enter. To enter a new scale, type the value and click OK, or press Enter. "Sight" Survey prompts:

Enter center of zoom box

A gray box, the **zoom box,** appears. This box represents the area of your drawing that will be printed or plotted, given the paper size and orientation, and the scale you entered. As you move your mouse, so moves the box around your drawing.

Position the zoom box around the drawing or part of the drawing you want to print or plot and press Enter or click your mouse. "Sight" Survey prompts:

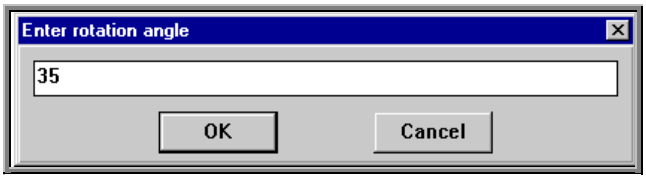
Would you like to rotate plot?

If you would like to rotate the plot, for example because your paper is oriented one way and your drawing the other, click Yes. "Sight" Survey prompts:

Enter angle from keyboard?

If you would like to enter an exact angle of rotation from the keyboard, click Yes. If you would like to rotate the drawing around using the cursor, click No.

If you elected to enter an exact angle of rotation from the keyboard, "Sight" Survey prompts:



Type the angle you want to rotate your drawing by, then click OK or press Enter. The message: **Standby while transforming plot** appears. Click OK. The drawing is rotated by the specified angle, which is measured in a counter-clockwise direction. Skip the next prompt.

If you elected to rotate the drawing using the cursor, "Sight" Survey prompts:

Drag till rotate satisfactory

Move your cursor. The zoom box rotates around the part of the drawing you want to plot or print. Once the zoom box fits nicely around the part of the drawing you want to plot or print, click OK or press Enter. The message **Standby while transforming plot** appears. Click OK. The drawing is rotated so that it fits onto the paper as specified. After the rotation prompts, "Sight" Survey continues with:

Satisfied with zoom?

The part of your drawing that will be printed or plotted appears on the screen enclosed by dashed lines indicating the edges of the paper. If you are satisfied with what is to be printed or plotted, click Yes. If you are not satisfied, click No button. "Sight" Survey prompts:

Enter new center of zoom box

Move the zoom box to a new position and press Enter or click your mouse. You will again be asked:

Satisfied with zoom?

Continue until you are satisfied with the plot, or abort **Plot Drawing** **Fit to Page** by pressing the Space Bar.

After you are satisfied with the orientation of the drawing, "Sight" Survey prompts:

Enter point for compass insertion (space bar for no compass)

Press the Space Bar if you do not want a North arrow on your drawing. If you want a North arrow, position your cursor at the chosen location and press Enter or click your mouse.

When you respond to the compass insertion prompt, "Sight" Survey will respond with the **Printer Defaults** dialog box. Continue with the instructions for the **Printer Defaults** dialog box found on page 533.

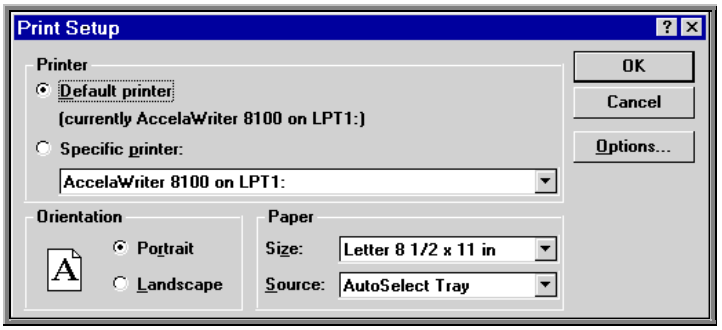
If you have rotated your print/plot, the message **Transforming plot back again** *will appear. Click* OK. *Your drawing will return to the orientation it was at prior to rotation.*

22.13 Print Setup

FUNCTION: The **Print Setup** function is used to change the output device, settings, or orientation.

To access the **Print Setup** function, press Alt S, F, R.

When you select **Print Setup**, a standard Windows **Print Setup** dialog box appears.



*The appearance of the **Print Setup** dialog box may vary depending upon the version of Windows you are running.*

*The **Paper Size** indicated here must be set to match the **Paper Size** in the **CAD Configuration Menu**. Otherwise, your drawing may not plot correctly.*

Windows 3.1 Users

In order to set up your output device fully in Windows 3.1 you may have to go to **Printers** in the **Control Panel**. Click on your printer or plotter in the list of installed printers that appears. Then click on the Setup... button.

Windows 95 or 98 Users

In order to set up your output device fully in Windows 95 or 98 you may have to go to **Start**, then **Settings**, then **Printers**. Click on the icon corresponding to the device. Select **Properties** from the **Printers File Menu**.

22.14 Repair Drawing File

FUNCTION: The **Repair Drawing File** function is used to rebuild and repair a drawing file which has somehow become corrupted, or which is an older file format than the one currently used by "Sight" Survey. It attempts to clean up the drawings by writing them out to disk as a temporary CAD macro (**.MAC**) file, and then reloading the macro into the **Drawing** window.

To access the **Repair Drawing File** function, press Alt S, F, F.

*This routine may also be accessed by using the two-letter command **FD**, for **F**ix **D**rawing.*

If for some reason you have a drawing that has become corrupted, the **Repair Drawing File** function may be able to recover your drawing.

Examples of corrupted drawings are those on which you get messages like **FP Error**, **Application Error**, **This Program has performed an Illegal Operation**, **Object too long**, **Object extends off the edge of the world**, **MainCAD caused a General Protection Fault** etc., or drawings that simply won't load at all. Sometimes "Sight" Survey will warn you that it has detected a corrupted drawing and will tell you to run the **Repair Drawing File** function.

Before you run **Repair Drawing File**, try save the drawing under a different name from the name it was previously saved under.

Repair Drawing File must be run from a clean drawing screen. Press Alt S, F, N to select **Start** ➪ **File** ➪ **New Drawing**. Then press Alt S, F, F to access the **Start** ➪ **File** ➪ **Repair Drawing File** function.

A dialog box headed **Select drawing to repair** appears. This is a standard Windows Load dialog box. If you do not know how to use a Windows Load dialog box, see the documentation that came with your copy of Windows.

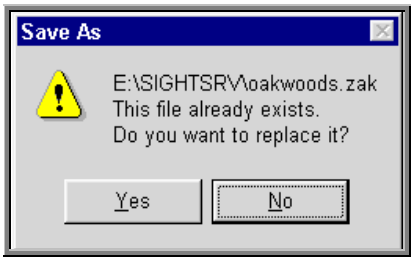
The **Open** dialog box will appear to allow you to enter the name of the drawing file that you wish to repair and click [OK] (or [Open]), or simply double-click on the filename. If the repair function was completed successfully, the prompt bar at the top of the **Drawing** window will display:

Repair Successful! Delete temp Macro file?

Click [Yes] to delete the temporary macro file which was created by the **Repair Drawing File** routine. If you wish to save the macro file, click [No].

If the drawing on your screen looks correct, which it should, you will want to save it. However, you will need to decide if you want to overwrite the original drawing file, or if you want to give the file a new name. Each method has its own unique caveat, as you will see within the next few paragraphs.

After repairing the drawing, "Sight" Survey will automatically prompt you to save the repaired drawing file. Type in a name for the file including the **.DRG** filename extension, and press e or click [OK] (or [Save]). If you enter the same name as the original drawing file, you will be prompted:



If you really wish to overwrite the existing drawing file, press [Y], otherwise press [N] and enter a different name for the drawing.

If you save the drawing over the top of the original drawing by giving it the same name, you lose the original drawing. Caveat: If you later find that something is missing from the repaired drawing, you will have to re-create that part of the drawing.

If you save the drawing as a new drawing file by giving it a different name than the original drawing, you will preserve the original drawing file intact. ***Caveat:*** The drawing that is associated with the COGO job file, is the original drawing file because it has the same main filename as the COGO file. You will need to work around this by renaming the original file to something else (but **DO NOT** give it a **.BAK** extension, as this extension is used internally), and then renaming the repaired drawing file to the original filename. This is really not as confusing as it may sound, and the **Windows 3.1 File Manager** or the **Windows 95/98 Explorer** will allow you to rename the files.

If you are not familiar with the **File Manager** or **Explorer** programs, please refer to your Windows documentation or online help for additional information.

There is another way to repair drawing files, but you should be very careful if you use it. The method is to simply load the COGO job file for the drawing you wish to repair, erase the drawing part of it (using the **DX** *command), then run the* **Repair Drawing File** *routine and type in the name of the current COGO job file followed by a* **.DRG** *extension. If the drawing repair is successful you can simply re-save the whole COGO job file under the same name, or preferably, a new name. This method eliminates having to rename drawing files after the drawing has been repaired.*

If **Repair Drawing File** *was unable to fix the drawing, copy it onto a floppy disk and send it to:*

Simplicity Systems, 1621 Second Avenue NE, East Grand Forks MN 56721-0556

Please include a brief explanation of what has happened.

22.15 Purge Redundant Elements

FUNCTION: The **Purge Redundant Elements** function is used to load eliminate unwanted redundancies in a "Sight" Survey or TrueCAD drawing.

To access the **Purge Redundant Elements** function, press Alt S, F, G.

The **Purge Redundant Elements** routine consists of three options:

Remove Duplicate Entries?

If you want to delete duplicate entities, click Yes, otherwise click No. "Sight" Survey will only remove entities that have been duplicated on the same layer.

Remove Unreferenced Blocks?

If you want to delete unreferenced blocks, click Yes, otherwise click No. This has the same effect as using the **Purge** command in AutoCAD.

Remove Unreferenced Layers?

If you want to delete unused or empty layers, click Yes, otherwise click No.

"Sight" Survey will examine the drawing and purge unwanted elements. A report of all elements purged will be issued. Be patient. Large drawings may a substantial amount of time to purge.

22.16 Execute Macro

FUNCTION: The **Execute Macro** function is used to run a CAD macro file.

To access the **Execute Macro** function, press Alt S, F, M.

Marcos are routines consisting of small number of actual CAD commands. "Sight" Survey uses macros for things such as **Arc Text** and **Title Block** loading. From time to time, additional macros may be made available, and this is the command you will use to run them.

When you select **Execute Macro**, a standard Windows **Load** dialog box entitled **Select macro name to run** appears.

To run a macro, select the macro file you want to run and click on OK. The macro is executed immediately. You can abort a running macro at any time by pressing Esc.

22.17 Load Title Block

FUNCTION: The **Load Title Block** function is used to add a pre-drawn title block to your existing "Sight" Survey drawing.

To access the **Open Drawing** function, press Alt S, F, O.

Load Title Block inserts a title block or border into your drawing at the correct scale, regardless of the scale of your drawing.

Before using **Load Title Block**, you must draw a title block to load. Draw it at a scale of 1:1, using Cartesian coordinates. You can include certificates, bitmaps of company logos, etc. When you have drawn the title block, select it by dragging a rectangle around it (see **Start** ➪ **Edit** ➪ **Select** (Alt S, E, S - page 552) in the **Menu**), and group it into an object (see **Group Into Object** (Alt S, O, G - page 767) in the **Start** ➪ **Objects Menu**). Then save your title block drawing.

Title Block construction is covered in greater detail in **Section 31 - Title Blocks**.

You should create a title block drawing for each paper size you are likely to use. For example, a 24" x 36" drawing could be named **TB24x36.drg**.

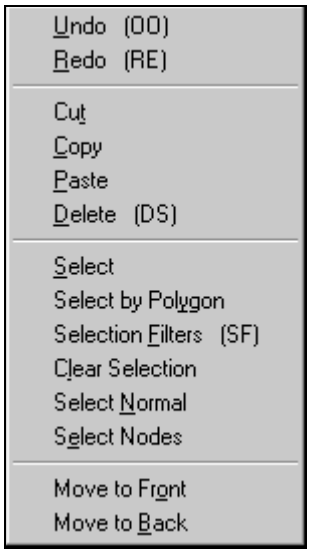
When started, **Load Title Block** activates a standard Windows **Load** dialog box. Select the title block drawing you want to use and click OK. The title block appears on your drawing at the correct scale, regardless of the scale of your drawing. Since the title block is a grouped object, you can select the title block and position it around your drawing as desired.

When you save a title block that contains a bitmap, ***the bitmap is not stored in the drawing****. Only a reference to the bitmap is stored.* ***It is therefore important that you do not delete the bitmap****. If you delete the bitmap or move it to another directory, an error message will appear next time you try to load the title block.*

"Sight" Survey 3.0

Section 23

Start Menu - EDIT



The **EDIT** menu accessed from the Start button in the **Drawing** window is where you'll find commands for editing your drawing. Commands include various cutting and pasting functions, Undo and Redo, and several selection functions useful for choosing objects and other drawing elements.

23.01 Undo

FUNCTION: The **Undo** function is used to erase the current drawing and start a new drawing.

To select the **Undo** function, press Alt S, E, U, or click the **Undo** icon ( ) on the **Drawing** window tool bar.

Undo undoes the last thing you did in the drawing, whether this was deleting something, moving something, drawing a line etc.

For example, suppose you:

- Draw a line.
- Draw a circle.
- Move the line and circle from point *a* to point *b*.
- Rub out the line and circle.

When you click **Undo**, the rubbed out line and circle re-appear. If you click **Undo** again, the line and circle move back from point *b* to point *a*. If you click **Undo** a third time, the circle disappears. And, if you click **Undo** again, the line disappears.

Undo will undo the last 1000 objects that have been changed. This is not the same as the last 1000 operations. For example, if you moved 100 objects at once and then click **Undo**, you would have used up 100 of the 1000 undos even though you had only undone one move.

If you click **Undo** something by accident, you can replace it using the **Redo** function.

Undo will **not** undo changes made by the **Start** ➪**Objects** ➪**Update Objects** function (Alt S, O, U - page 785). It will partially undo detailed views created by the **Start** ➪**Tools** ➪**Expand** function (Alt S, T, X - page 760).

23.02 Redo

FUNCTION: The **Redo** function replaces the things you have undone.

To select the **Redo** function, press Alt S, E, R, or right-click the **Redo** icon ( ) on the **Drawing** window tool bar.

Redo undoes the last action performed in the drawing, whether this was deleting something, moving something, drawing a line etc.

For example, suppose you:

- Draw a line.
- Draw a circle.

When you click **Undo**, the circle disappears. If you click **Redo**, the circle reappears.

23.03 Cut

FUNCTION: The **Cut** function is used to delete selected items and place them on the Windows Clipboard.

To select the **Cut** function, press Alt S, E, T.

You can also access **Cut** *by pressing Ctrl X or by pressing the Shift Delete keys on your keyboard at the same time.*

Cut deletes selected items and places them on the Windows Clipboard. The item last placed on the Clipboard can then be pasted back into "Sight" Survey or into another Windows application using that application's **Paste** command.

Before using **Cut**, choose the items you want to cut using **Select** or **Selection Filters**. If you have not selected anything, the **Cut** command prompts:

Select single entity (Shift for multiple selection)

Use your mouse to select objects to cut. If you have multiple items to select, press Shift while clicking the mouse on the objects. You can also enclose the target objects in a selection rectangle. To do that, click and hold the mouse on one corner, then drag the selection window open and release the mouse button. When you have all your target objects selected, press the Space Bar bar.

If you cut something by accident, use **Undo** *(Alt S, E, U - page 547) to replace it.*

?

The difference between **Cut** *and* **Delete** *is that* **Cut** *sends deleted items to the Clipboard, and* **Delete** *does not.*

Occasional problems have been experienced with cutting from "Sight" Survey and pasting into other applications, particularly when the drawing contains arcs. The target applications are almost always older programs, and the problems have been resolved in newer versions.

23.04 Copy

FUNCTION: The **Copy** function is used to copy selected items and place them on the Windows Clipboard.

To select the **Copy** function, press Alt S, E, C.

*You can also **Copy** items by pressing Ctrl C or by pressing the Ctrl Insert keys on your keyboard at the same time.*

The **Copy** command is exactly the same as the **Cut** command, except that selected items are not deleted. Instead, a copy of them is placed on the Clipboard, from where it can be pasted into "Sight" Survey or other applications.

23.05 Paste

FUNCTION: The **Paste** function is used to paste or insert items from the Windows Clipboard into a "Sight" Survey drawing.

To access the **Paste** function, press Alt S, E, P.

*You can also **Paste** items by pressing Ctrl V or by pressing the Shift Insert keys on your keyboard at the same time.*

Paste inserts text and graphics cut or copied from "Sight" Survey or other programs into a "Sight" Survey drawing, via the Clipboard.

Before you can paste, you must have cut or copied something to the Clipboard from "Sight" Survey or another program. If there is nothing in the Clipboard to be pasted, the **Paste** command will simply not function.

When you select **Paste**, "Sight" Survey prompts:

Enter paste position

Click the cursor where you want the contents of the Clipboard to appear on the screen.

If you are pasting graphics, or a mixture of text and graphics, the top left hand corner of the contents of the Clipboard will be placed at the cursor position you specify.

If you are pasting text only, where the text appears relative to the cursor position will depend on the **text label origin** that is set at the time of pasting. For example, if the text label origin is 1, the text will be placed above and to the right of the cursor position. See **Start** ➪ **Settings** ➪ **Set Text Defaults** (Alt S, S, E - page 820).

The font and text size of text pasted into "Sight" Survey is determined by the defaults set in **Set Text Defaults** at the time of pasting.

When pasting in drawings on several layers that have been cut or copied from another "Sight" Survey drawing, the layers will appear as follows:

- If the layers that the items were cut or copied from exist in the drawing the items are being pasted into, they are pasted to the correct layers.
- If the layers that the items were cut or copied from do not exist in the drawing the items are being pasted into, they are pasted to the current layer.

You cannot paste bitmaps into "Sight" Survey. To load a bitmap, use **Start** ➪ **File** ➪ **Import Bitmap** (Alt S, F, B - page 528).

23.06 Delete

FUNCTION: The **Delete** function is used to delete selected items. The deleted items are ***not*** placed on the Windows Clipboard.

To select the **Delete** function, press Alt S, E, D, or click the **Delete** icon ( ) on the **Drawing** window tool bar.

You can also access **Delete** *by pressing* Delete.

Delete erases selected items but does not place them on the Windows Clipboard . Before you use **Delete**, you should select the items you want to cut using the **Start** ➪**Edit** ➪**Select** command (Alt S, E, S - page 552) or **Start** ➪**Edit** ➪**Selection Filters** (Alt S, E, F - page 560). If you have not selected anything, the **Delete** command will prompt you:

Select single entity (Shift for multiple selection)

Use your mouse to select objects to delete. If you have multiple items to select, press Shift while clicking the mouse on the objects. You can also enclose the target objects in a selection rectangle. To do that, click and hold the mouse on one corner, then drag the selection window open and release the mouse button. When you have all your target objects selected, press the Space Bar bar.

If you delete something by accident, use **Undo** *(Alt S, E, U - page 547) to replace it.*

?

The difference between **Cut** *and* **Delete** *is that* **Cut** *sends deleted items to the Clipboard, and* **Delete** *does not.*

23.07 Select

FUNCTION: The **Select** function is used to select items; stretch, scale and rotate; drag, copy; edit text, lines, dimensions, arrows, polylines and bitmap parameters.

To access the **Select** function, press Alt S, E, S, or click the **Select** icon (▷) on the **Drawing** window tool bar.

The **Select** function is active whenever the cursor is arrow-shaped (▷). This cursor is called the **Select Cursor** and it can be used for the following.

Selection Set

Selected items are termed the **selection set**, and may be edited, moved, mirrored, scaled, copied, rotated, deleted etc., using functions in the **Start Modify Menu** and the **Start Edit Menu**. They can also be **nudged** by precise increments using the **arrow keys**.

Once selected using the **Select Cursor** (▷), eight **handles** (■) and a **rotate icon** (⬔) appear around the selection set.

For more information on handles, see the subheadings **Handles** on page 555.

Handles may be used to **scale** or **stretch** the selection set. See the subheading **Stretching and Scaling** on page 556.

The **rotate icon** (⬔) is used to **rotate** the selection set. See the subheading **Rotating** on page 556.

To **drag** and to **copy** the selection set, see the subheadings **Dragging** and **Copying** on page 557.

To **edit** line style, text, dimensions, arrows and bitmap parameters, see the subheading **Double Click Editing** on page 558.

☞ *The* **Start Edit Selection Filters** *function offers additional methods of selection. See* **Selection Filters** *on page 560*

Select Single Primitives

Select a single primitive (line, arc, piece of text, dimension, arrow etc.) by clicking on it with the **Select Cursor** (▷). The primitive will become highlighted and handles will appear around it.

To add a single primitive to a group of items that have already been selected, press Shift and click on the primitive at the same time.

Sometimes primitives have been grouped so that when you click on one primitive, the whole group is selected. To return the group to

primitives, use **Start** ➪**Objects** ➪**Explode Objects** (Alt S, O, X - page 770). Once the group is exploded, you will be able to select a single primitive within the group.

Select Single Objects

Whenever you create an object manually using **Begin New Object** (Alt S, O, B - page 765), **Group Into Object** (Alt S, O, G - page 767), or **Make Symbol** (Alt S, O, M - page 774) in the **Start** ➪**Objects Menu**, the primitives in the object are grouped. This means that when you click on the object with the **Select Cursor** (▷) all the primitives within it are selected at once, making selection quicker and easier.

Some CAD functions that automatically create objects also group the primitives within these objects. For example, when you draw a rectangle using **Rectangle** (Alt S, D, X - page 588) in the **Start** ➪**Draw Menu**, the four lines making up the rectangle are grouped. Similarly, symbols entered using **Start** ➪**Draw** ➪**Symbol** (Alt S, D, M - page 613) are grouped, and sketches produced using **Start** ➪**Draw** ➪**Sketch** (Alt S, D, K - page 615) are grouped.

Select a single object by clicking on it with the **Select Cursor** (▷). The object will be highlighted and handles will appear around it.

To add a single object to a group of items that have already been selected, press Shift and click on the object at the same time.

To select a primitive from an object, use **Explode Objects** *(Alt S, O, X - page 770) in the* **Start** ➪**Objects Menu**. *Once exploded, you may select a single primitive within the group.*

Select everything in a rectangle

To select everything within a rectangle, position the **Select Cursor** (▷) at one corner of the rectangle. Click and hold your mouse button, then drag your cursor to the diagonally opposite corner of the rectangle. The outline of the rectangle appears as the cursor is dragged. When the rectangular outline encompasses everything you want to select, release your mouse button.

If what is selected is not what you expected, check the ***filters*** *you have selected. See* **Selection Filters** *(Alt S, E, F - page 560).*

Deselecting Objects

If you have selected a single primitive or object by mistake and want to deselect it without deselecting anything else, press the Shift key and click on the offending primitive or object.

> *To deselect everything, use* **Clear Selection** *(Alt S, E, L - page 567), or click your mouse on an open section of the drawing.*

Handles

When you have selected something, eight **handles** (■) and a **rotate** icon ( ) appear around it, as illustrated below.

Handles may be used to **scale** or **stretch** the selection set. See the subheading **Stretching and Scaling** on page 556. The **rotate icon** ( ) is used to **rotate** the selection set. See the subheading **Rotating** on page 556.

If you click on the **Nodes Icon** ( ) on the **Drawing** window tool bar after you have selected something, the handles will be replaced by **nodes**. See **Start** ➪ **Edit** ➪ **Select Nodes** (Alt S, E, E - page 568). To return to the handles, click on the **Select** icon ( ) on the **Drawing** window tool bar.

Some users do not like working with the handles. If you do not want the handles to appear when you select things, you can turn them off as a default setting.

Turning off handles as a default

To turn the handles off as a default setting you must edit your **`LINETYPE.MAC`** file. This file resides in the **macro** directory inside your "Sight" Survey for Windows directory. You can edit it using any text editor, such as Windows Notepad.

If there is a line in your **`LINETYPE.MAC`** file that reads **`USEHANDLES 1`**, delete it. Insert a line into the file which reads: **`USEHANDLES 0`**. Next time you enter "Sight" Survey, the handles will be off by default. To turn the handles on again as

default, replace the line that reads **USEHANDLES 0** with **USEHANDLES 1**.

Stretching and Scaling

When you have selected items, eight **handles** (■) appear around them. When you pass the **Select Cursor** (▷)over one of the handles, the cursor changes shape: ↔ if it is a left or right handle, ↕ if it is a top or bottom handle, and ■ or ▪ if it is a corner handle. The arrows show the directions in which you will be able to scale the selection set if you click on that handle. If you click on the left or right handles, you can only stretch the selection set horizontally. If you click on the top or bottom handles, you can only stretch the selection set vertically, while corner handles let you stretch the selection set diagonally.

Text objects may only be stretched diagonally.

For alternative and more accurate methods of stretching and scaling, see **Stretch** *(Alt S, M, E - page 623) and* **Scale** *(Alt S, M, A - page 629) in the* **Start** **Modify Menu**.

Rotating

When you have selected items, eight **handles** (■) will appear around them, together with a **rotate icon** (▪) just to the left of the top right handle.

When you pass the **Select Cursor** (▷) over the rotate icon, the cursor changes to a circular arrow ( ). While the cursor is in the shape of a circular arrow, click your mouse and a **Freehand Cursor** ( ) will appear. The **Drawing** window prompt bar prompts:

Enter point to rotate to

Move your mouse to move the **Freehand Cursor** ( ) around. As you move it, a "ghost" image or outline of the selection set rotates about its center, as shown in the following illustration.

When you are satisfied with the rotation, click your mouse again to set the position.

For alternative and more accurate method of rotating, see **Start** ➪**Modify** ➪**Rotate** *(*Alt S, M, O *- page 636).*

Dragging

Use the **Select Cursor** to drag the selection set from one place to another. To do this, move the cursor onto some element of the selection set and press your left mouse button, holding it down. Move your mouse. The selection set moves with your mouse.

If you hold down the Shift key while you are dragging, you will only be able to drag the selection set **horizontally** or **vertically**.

For an alternative and more accurate method of moving, see **Move** *(*Alt S, M, M *- page 625) in the* **Start** ➪**Modify Menu**.

Copying

If you press the Ctrl key while you drag, the selection set will not be moved. Instead, a copy of the selection set will be made and the copy will be dragged. See the previous section, **Dragging**.

If the **Select Cursor** has a small box around the tip, you will be able to place the copy accurately, because the cursor will snap exactly onto any point within the box.

For alternative methods of copying, see **Drop** *(*Alt S, M, D *- page 634) and* **Repeat** *(*Alt S, M, R *- page 631) in the* **Start** ➪**Modify Menu**.

Double Click Editing

If you double click on a line or arc with the **Select Cursor** (▷), the **Line Style** dialog box appears. See **Start** ➪**Settings** ➪**Line Defaults** (Alt S, S, L - page 810).

If you double click on a piece of text, the **Text Entry** dialog box appears. See **Start** ➪**Settings** ➪**Set Text Defaults** (Alt S, S, E - page 820).

If you double click on a horizontal, vertical, ordinate or slope dimension, you enter the **Edit Dimension Properties** function. See **Start** ➪**Annotate** ➪**Edit Dimension Properties** (Alt S, A, P - page 705).

If you double click on an arrow, the **Arrow Defaults** dialog box appears. See **Start** ➪**Settings** ➪**Set Arrow Defaults** (Alt S, S, W - page 832).

If you double click on a polyline or bezier curve, the **Polyline Defaults** dialog box appears. See **Start** ➪**Settings** ➪**Polyline Defaults** (Alt S, S, F - page 812).

If you double click on the edge of a bitmap with the **Select Cursor** (▷), the **Set Bitmap Parameters** dialog box appears. See **Start** ➪**File** ➪**Import Bitmap** (Alt S, F, B - page 528).

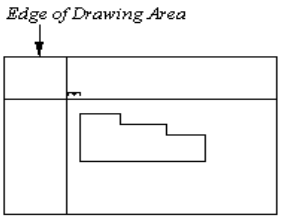
23.08 Select by Polygon

FUNCTION: The **Select by Polygon** function is used to select the drawing entities by creating a box or irregular polygon around those entities.

To access the **Select by Polygon** function, press Alt S, E, Y.

A large crosshair will appear with the **Freehand Cursor** (⁺) at the center, and "Sight" Survey prompts:

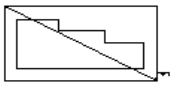
Enter polygon about elements to be selected



Draw a polygon around the elements to be selected. The polygon can be either a rectangular box, or it can be irregularly shaped. An irregularly shaped polygon is extremely useful to maneuver around entities in a cluttered drawing.

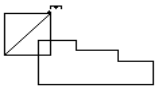
To select items within a rectangular box, position the **Freehand Cursor** ( ) at one corner of the rectangle. Click your mouse button and release it. The prompt bar at the top of the **Drawing Window** prompts:

Enter next point of polygon (hit space bar for a box)

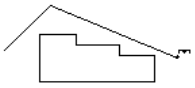


Move the cursor to the diagonally opposite corner of the rectangle. As you move the cursor, you will see the outline of a rectangular box with a diagonal line through it. When the rectangular outline encompasses everything you want to select, press Space Bar.

To select items within an irregularly shaped polygon, position the **Freehand Cursor** ( ) at one vertex of the polygon and click your mouse button or press Enter. The prompt bar at the top of the **Drawing Window** prompts:

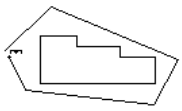


Enter next point of polygon (hit space bar for a box)



Move the cursor to the next vertex on the polygon boundary. As you move the cursor, you will see the outline of a rectangular box with a diagonal line through it. When positioned properly, click your mouse button, or press Enter. The prompt bar at the top of the **Drawing Window** will again prompt:

Next point of polygon (space bar to close)

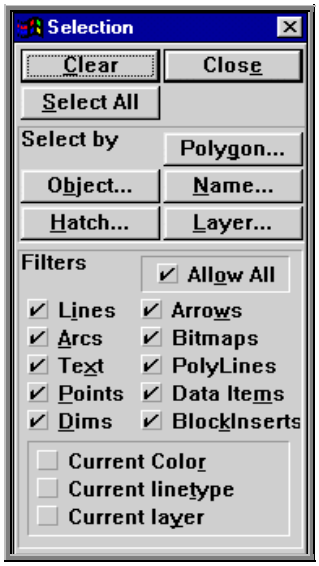


Move the cursor to the next vertex on the polygon boundary and click your mouse button or press Enter. You will continue to be prompted for the next point of the polygon until you close the polygon. Continue to enter the polygon vertices. When you have entered the last vertex, move the cursor close to the first point that you entered and press g to automatically close the polygon.

1. *If what is selected is not what you expected, check the **filters** you have selected. See* **Selection Filters** (Alt S, E, F - *below.*
2. *To deselect everything, use* **Clear Selection** (Alt S, E, L - *page 567), or click your mouse on an open section of the drawing.*

23.09 Selection Filters

FUNCTION: The **Selection Filter** dialog box allows you to control, or filter, the selection of entities within your drawing.



To access the **Selection Filter** dialog box type **SF**, or press Alt S, E, F.

Perhaps you want to change **all** the text and/or lines in your drawing to a different color, text size or line style. Using the **Selection Filter**, you can do this easily. (For other methods of selecting objects, see **Select** (Alt S, E, S - page 552).

Once objects are selected, the group of selected items (or primitives) is called the selection set, and can be edited, moved, scaled, copied, rotated, deleted, etc. It is highlighted and surrounded by eight **handles** (■).

If you run this routine **after** selecting any object(s), the selected object(s) will stay selected unless you select to Clear clear them. When you run this routine, the **Selection** dialog box (as shown to the left) appears:

Drawing Selection Filter Quick Reference

Clear	Clears the selection set (deselects everything).
Close	Closes the Selection window.
Select all	Selects everything matching the selected Filters.
Select by	
Polygon...	Selects everything within a polygon.
Object...	Selects grouped objects by clicking on any item.
Name...	Selects objects by name.
Hatch...	Selects hatches.
Layer...	Selects layers.
Filters	Controls what is selected. You can select one, two, or any combination of objects, including **all** objects.
Current Color	Selects objects matching the Current Color.
Current LineType	Selects objects matching the Current Line Type.
Current Layer	Selects objects on the Current Layer.

The dialog box remains open until you click Close. This allows you instant access to the Selection Filter while you are doing other things. While the dialog box is open, it will float on top of all other "Sight" Survey windows. If you find this to be obtrusive, you can move it to a more preferred location, or simply close the box between uses.

The filter settings are saved between uses within the current job file. When you load a new or different job the filter settings are reset to Allow All.

Filters

The Filters control what gets selected on your drawing when the Select all, Polygon..., Object..., Name... and Layer... buttons are used. For example, if you have set up the filters to select only Arcs and you click on Select all, only **arcs** and **circles** will be selected. If you click on Polygon... instead, only **arcs** and **circles within the polygon** (that you draw) will be selected. If Arcs and Current Color are the only filters checked, then only **arcs** and **circles** of the **current color** will be selected. The current color is the color that was last used in your drawing. It most likely will be the color that is shown in the Object Color setting of the Properties window, but may vary depending upon the last entity placed onto your drawing.

Allow All

To select absolutely everything on your drawing, enable the **Allow All** filter. This will enable all of the "entity" filters and disable all of the "current type" filters. The "entity" filters are: **Lines**, **Arcs**, **Text**, **Points**, **Dims**, **Arrows**, **Bitmaps**, **PolyLines**, **Data Items**, and **BlockInserts**. The "current type" filters are: **Current Color**, **Current LineType**, and **Current Layer**. The following table shows which entities each filter references:

This Selection Filter option…	Refers to these drawing entities:
Lines	Lines, Crosses, Symbols+, Rectangles, Leader Lines not attached to the Arrow, Line portions of Custom Lines
Arcs	Arcs, Circles, Symbols+
Text	Point Labels, Bearing & Distance Annotations, Curve & Line Tables, Coordinate Lists, Text/ Font portions of Custom Lines
Points	Dots
Dims	Dimensions*
Arrows	Arrows, and the attached leader line
Bitmaps	Inserted Bitmap Drawings
PolyLines	PolyLines*
DataItems	Data Items*
BlockInserts	Blocks* (And any Symbols which were inserted as Blocks)
Current Color	Any entities matching the Current Color
Current Linetype	Any entities matching the Current Line Type
Current Layer	Any entities contained on the Current Layer

* Imported from TrueCAD or other CAD's.

***Symbols** are made up of lines and arcs, therefore, when the **Lines** and/or **Arcs** options are enabled, the lines and/or arcs within the end point symbols will also be selected. This applies to End Point Symbols as well as Symbols which are drawn as part of a Custom Line. For instructions on changing the color of **ONLY** the End Point Symbols, see the **Hands-on Instruction** section on page 565.*

Select by Object...

To select portions of a grouped drawing entity by selecting a portion of the object, click on Object... . The prompt bar at the top of the **Drawing** window prompts:

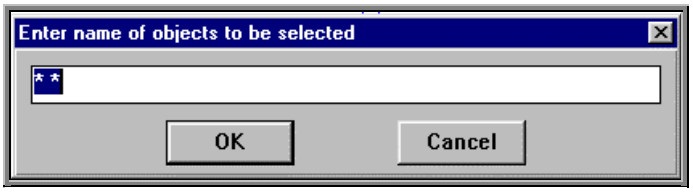
Select whole object (Shift for multiple selection)

Position the **Freehand Cursor** ( ) on any part of the grouped object (i.e. symbol or custom line) you want to select and click your mouse button. All entities grouped into that object (within the enabled filters) will be selected. For example, if you click on a symbol, but have only the Arc filter enabled, only the arcs and circles ***within that symbol*** will be selected. To select more than one object, hold down the s key while clicking on each object.

To cancel object selection, press Space Bar or click on Cancel .

Select by Name...

To select the drawing entities by typing in the name of the object, click on Name... . You will be prompted:



Type in the parent name, press g, then type the object name. If you do not know the parent or object names of an object, you can find out by using the **Query Entity** (**QE** or Alt S, T, Q- page 751) routine. Type in the names and press ↵Enter or click OK .

All drawing entities with the name you type (and within the enabled filters) will be selected. For example, if you type **`Symbol Pipe`**, all objects named **Pipe**, with the parent name **Symbol**, will be selected. Wildcards are allowed. For example, if you type **`Symbol *`**, all objects with the parent name **Symbol**, such as **Symbol Pipe**, **Symbol Pin**, **Symbol Water**, **Symbol ConcMon**, etc., will be selected. If you type **`* Water`**, all objects called **Water**, such as **Symbol Water**, **Line Water**, etc., will be selected.

To select additional items with a different name, click again on Name... and then enter another name.

Names are case-sensitive. You must type them using upper- and lower-case letters exactly as stored in the object.

Select by Hatch...

To select the drawing entities by selecting a hatch pattern off your drawing, click on [Hatch...]. The prompt bar at the top of the **Drawing** window prompts:

Select a hatch perimeter

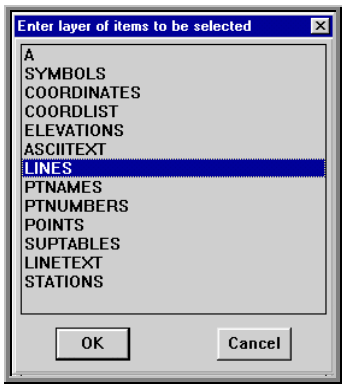
A cross (+ or x) appears at one location along the perimeter of each hatch. Position the **Freehand Cursor** ( ) on the perimeter cross, or on the hatch itself, and then click the mouse button. The perimeter of the hatch area becomes highlighted. The prompt bar at the top of the **Drawing** window will again prompt:

Select a hatch perimeter

Select another hatch perimeter or cancel the hatch selection by pressing g or by clicking on the [Cancel] button in the prompt bar at the top of the **Drawing** window.

Select by Layer...

To select the drawing entities on a specific layer or layers, click on [Layer...]. A layer selection window will appear.



Click on the desired layer and then click [OK], or just double-click on the desired layer. To select additional items on a different layer, click again on [Layer...] and then choose another layer.

All drawing entities on the layer(s) you choose (and within the enabled filters) will be selected.

An idiosyncrasy exists when using the **Select by** [Layer...] *button: The setting for the* **Current Layer** *filter is ignored, and the entities on the layer(s) you choose will be selected,* ***whether or not the chosen layer is the Current Layer.***

HANDS-ON INSTRUCTION:
Changing Colors of Objects

The following procedure changes all the green parts of a drawing to black. (Can be applied to any two colors.)

Step 1. *Set the* **Current Color** *to green. To do this, change the* **Object Color** *property value in the* **Properties** *window to* `05 -Green`

Step 2. *Select all the green parts of your drawing. To do this, type* `SF` *to display the* **Selection Filter**. *If it is not already enabled, enable the* **Allow All** *filter by clicking on the check box to the left of it. Next, enable the* **Current Color** *filter by clicking on its check box, and ensure that the* **Current LineType** *and* **Current Layer** *filters are disabled. Now, click on the* [Select all] *button and all the green entities on your drawing will become selected.*

Step 3. *Disable the* **Current Color** *filter, and close the window. To do this, click on its check box to remove the* ✓ *or* **X**, *then click on the* [Close] *button. If you do not do this step, you will only be able to select objects of the Current Color the next time you try to select anything.*

Step 4. *If you have any green* ***text****, change it to black. To do this, type* `XT`. *(If the* [Apply] *button in the* **Set Text Defaults** *dialog box is dimmed, you don't have any green text.) If you do have green text, click the* [Pen] *button, change the color to black, and click* [Apply]. *When the* **Attributes to Apply** *dialog box appears, disable the* **All** *option, enable the* **Pen** *option, and click* [OK]. *Click* [OK].

Step 5. *If you have any green **objects**, change them to black. To do this, type* **XL**. *Click the* [Pen] *button, change the color to black, and click* [Apply]. *Click* [OK].

Step 6. *If you have any green **arrows**, change them to black. To do this, type* **XA**. *Click the* [Pen] *button, change the color to black, and click* [Apply]. *Click* [OK].

Note: *You may not be able to see changes immediately because items will still be selected. After making all desired changes, deselect the items to see the changes.*

If your green lines and arcs have different line types and/or line widths, Step 5 of the previous procedure will change all the line types and widths to one line type and one line width. To retain the different line types/widths, in Step 1 you must change the **LineType** *property value in the* **Properties** *window to the desired line type. Then, in Step 2, you should enable the* **Current LineType** *filter in addition to the* **Current Color** *filter.*

HANDS-ON INSTRUCTION:
Changing the Color of End Point Symbols

The following procedure outlines steps to change the color of End Point and Custom Line Symbols within your drawing, without changing the color of other parts of your drawing.

Step 1. *Select all the symbols on your drawing. To do this, type* **SF** *to display the* **Selection Filter**. *If it is not already enabled, enable the* **Allow All** *filter by clicking on the check box to the left of it. Also ensure that the* **Current Color**, **Current LineType** *and* **Current Layer filters** *are disabled. Next, click on the* [Layer...] *button and select the layer which contains your end point symbols. (Most likely, this layer would be called* **SYMBOLS**.*)*

Step 2. *Change the symbols to the desired color. To do this, type* **XL**. *Then click the* [Pen] *button and select the desired color. Next, click* [Apply], *and then click* [OK].

Step 3. *Deselect the selected items. To do this, click on the* Clear *button in the* **Selection** *window.*

Step 4. *Close the* **Selection Filter**. *To do this, click on the* Close *button.*

23.10 Clear Selections

FUNCTION: The **Clear Selections** function is used to deselect, or clear, any current selections.

To access the **Clear Selections** function, press Alt S, E, L.

A faster way to deselect is to simply click your mouse in an unused portion of your drawing. Before doing so, you must turn off any active snap modes.

23.11 Select Normal

FUNCTION: The **Select Normal** function is used to reset the method of selection when "Sight" Survey has been using **Select Nodes.**

To access the **Select Normal** function, press Alt S, E, N.

If an object is currently selected by nodes when you activate the **Select Normal** function, the object will be *selected normally*, i.e. surrounded by eight **handles** (■) will appear around them, together with a **rotate icon** ( ) just to the left of the top right handle.

23.12 Select Nodes

FUNCTION: The **Select Nodes** function is used to select items; reshape items; drag, copy; edit text, lines, dimensions, arrows, polylines and bitmap parameters. .

To access the **Select Nodes** function, press Alt S, E, ↵Enter., or click the **Select Nodes** icon ( ) on the **Drawing** windows toolbar. The **Select Nodes** function is active whenever the cursor is cross-shaped (). This cursor is called the **Nodes Cursor**, which can be used to select items. Selecting with the **Nodes Cursor** is exactly the same as selecting with the **Select Cursor** ( ).

Once selected using the **Nodes Cursor**, all the nodes in the selection set (points, ends of lines and arcs, arc and circle centers, text and dimension origins etc.) are marked by a small square. These nodes can be used to reshape the selection set.

If you click on the **Select** icon ( ) on the **Drawing** window toolbar while the nodes are displayed, the nodes will be replaced by **handles**. To return to the nodes, click on the **Select Nodes** icon ( ) in the toolbar.

Like the **Select Cursor**, the **Nodes Cursor** can also be used to drag and copy the selection set (although it cannot be used for accurate dragging) and for double click editing.

Nodes

When you have selected items using the **Nodes Cursor**, all the nodes in the selection set (points, ends of lines and arcs, arc and circle centers, text and dimension origins etc.) are marked by a small square.

If you click on one of the small squares marking a node, it will become highlighted. To highlight more than one node, click on the nodes you want to highlight while pressing down the Shift key. When you pass the **Nodes Cursor** over one of the highlighted nodes, the cursor changes to four arrows: . While the cursor is in the shape of four arrows, press your left mouse button and hold it down. The cursor reverts to the cross shape ().

As you move the cursor around, all the highlighted nodes, together with any lines, arcs etc. attached to them, move. When you have finished moving the node or nodes, release your left mouse button.

Moving nodes accurately

You can move a single, highlighted node accurately by using **Start** ➪**Modify** ➪**Move Point** (Alt S, M, P - page 626).

To do this, press the ←, →, ↑, or ↓ keys to move the node left, right, up or down. "Sight" Survey will prompt you to enter the distance to be moved. When you have typed the distance, click OK or press Enter. The highlighted node will move.

23.13 Move to Front

FUNCTION: The **Move to Front** function is used to move elements to the front of other elements on your drawing.

To access the **Move to Front** function, press Alt S, E, O.

Move to Front moves elements to the front of other elements on your drawing. It is especially useful if there is a solid fill or bitmap on your drawing and you need lines or text to appear on top of the solid fill or bitmap. When you select **Move to Front**, "Sight" Survey prompts:

Select item to move to the front

Click on the element that you want to move to the front. The prompt is repeated until you press the Space Bar, or click on **Done**.

The elements you have moved to the front may not appear to have been moved to the front until you redraw the screen. If you can't see the element you want to move to the front because it's behind something else, select the area containing the element by dragging a rectangle over it or by using **Start** ➪**Edit** ➪**Select by Polygon** *(Alt S, E, O - page 558). When it is selected, the hidden element will be visible.*

23.14 Move to Back

FUNCTION: The **Move to Back** function is used to paste or insert items from the Windows Clipboard into a "Sight" Survey drawing.

To access the **Move to Back** function, press Alt S, E, B.

Move to Back moves elements behind other elements on your drawing. When you select **Move to Back**, "Sight" Survey prompts:

Select item to move to the back

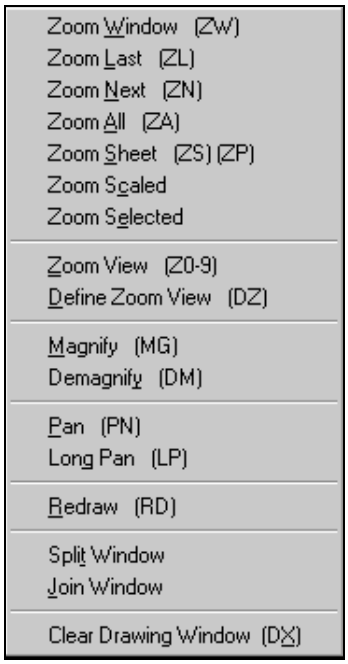
Click on the element that you want to move to the back. The prompt is repeated until you press the Space Bar, or click on Done.

The elements you have moved to the back may not appear to have been moved to the back until you redraw the screen.

"Sight" Survey 3.0

Section 24

Start Menu - VIEW



The **VIEW** menu accessed from the Start button in the **Drawing** window is where you'll find commands for zooming and panning your drawing. Commands include various drawing related functions, including multiple viewport management.

24.01 Zoom Window

FUNCTION: The **Zoom Window** function is used to define an area to zoom by drawing a box around it.

Access the **Zoom Window** function in any one of these ways:

- Type **ZW**.
- Press Alt S, V, W.
- Click the **Zoom Window** icon on the **Drawing** window toolbar.
- Through the **Zoom Icon** ( ) menu.

Enter a corner of zoom box

A large cross hair appears on the screen with the cursor at the cross center. Position the cursor at one corner of the area you want to zoom, click or press Enter.

Enter second corner of rectangle

As you move the cursor, you will notice it is attached to a box. Position the cursor so that the box surrounds the area you want to zoom, then click or press Enter.

The area within the box will now be enlarged to occupy the whole drawing area.

There are three ways to return your drawing to the previous view: type **ZP***; use* **Zoom Last** *in the* **Zoom Icon** *menu (*  *); or right-click the* **Zoom Window** *icon (*  *). To return your drawing to an unzoomed view, use* **Zoom Sheet**.

24.02 Zoom Last

FUNCTION: The **Zoom Last** function is used to move backward through sequence of zooms.

Access the **Zoom Last** function in any one of these ways:

- Type **ZL**.
- Press Alt S, V, L.
- Right-click the **Zoom Window**  icon on the **Drawing** window toolbar.
- Through the **Zoom Icon** () menu.

Zoom Last moves you backward through up to 10 previous zooms. For example, suppose you perform a sequence of three zooms: Zoom 1; Zoom2; and Zoom 3.

If you select **Zoom Last** while you are in Zoom 3, you will return to Zoom 2. If you then select **Zoom Last** while you are in Zoom 2, you will return to Zoom 1. If you then select **Zoom Last** while you are in Zoom 1, you will return to your original view.

The last ten zooms you have used are stored with your drawing when you save it. So next time you load the drawing, you can still use **Zoom Last** *to step backwards through your zooms.*

24.03 Zoom Next

FUNCTION: The **Zoom Next** function is used to move forward through sequence of zooms.

Access the **Zoom Next** function in any one of these ways:

- Type **ZN**.
- Press Alt S, V, N.
- Through the **Zoom Icon** ( ) menu.

Zoom Next moves you forward through up to 10 zooms. For example, suppose you perform a sequence of three zooms: Zoom 1; Zoom2; and Zoom 3. Using the **Zoom Last** command three times, you have returned to the unzoomed, original view.

If you select **Zoom Next** while you are in the unzoomed view, you will return to Zoom 1. If you then select **Zoom Next** while you are in Zoom 1, you will return to Zoom 2. If you then select **Zoom Next** while you are in Zoom 2, you will return to Zoom 3.

The last ten zooms you have used are stored with your drawing when you save it. So next time you load the drawing, you can still use **Zoom Next** *to step forwards through your zooms.*

24.04 Zoom All

FUNCTION: The **Zoom All** function is used to show the whole drawing at the maximum possible size.

Access the **Zoom All** function in any one of these ways:

- Type **ZA**.
- Press Alt S, V, A.
- Right-click the **Zoom Icon** ( ) menu.
- Through the **Zoom Icon** ( ) menu.

Zoom All displays your whole drawing. If the drawing is larger than the paper size, the paper is shown as a pink dotted rectangle.

There are three ways to return your drawing to the previous view: type **ZP***; use* **Zoom Last** *in the* **Zoom Icon** *menu (*  *); or right-click the* **Zoom Window** *icon (*  *). To return your drawing to an unzoomed view, use* **Zoom Sheet**.

24.05 Zoom Sheet

FUNCTION: The **Zoom Sheet** function is used to show the entire sheet of paper and its contents. (This routine is interchangeably referred to as **Zoom Page**, or **ZP**.)

Access the **Zoom Sheet** function in any one of these ways:

- Type **ZS** (or **ZP**).
- Press Alt S, V, S.
- Right-click the **Redraw Icon** () menu.
- Through the **Zoom Icon** () menu.

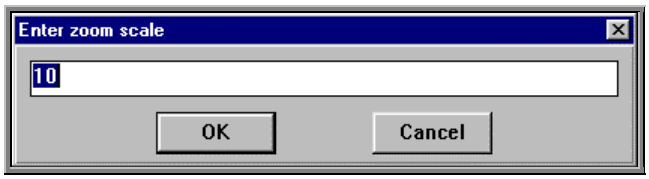
When selected, only that part of the drawing within the paper extents represented by the pink dotted rectangle is shown.

24.06 Zoom Scaled

FUNCTION: The **Zoom Scaled** function is used to show your drawing at a specified scale.

Access the **Zoom Scaled** function in any one of these ways:

- Type **ZC**.
- Press Alt S, V, C.
- Through the **Zoom Icon** () menu.



Type in the scale at which you want to see your drawing and click OK or press ↵Enter. For example, if you type 10, your drawing will appear on the screen at the size it would be at if its scale was 1:10.

Enter zoom box

A box representing the amount of the drawing that will fit on the screen after scaling appears as the cursor. Position this box around the part of your drawing you want to zoom into and click or press ↵Enter.

If you specified a scale greater than the scale at which you are currently viewing your drawing, you will not be able to see the box as the box will be larger that the screen. The cursor (which you will be able to see) represents the center of the box.

24.07 Zoom Selected

FUNCTION: The **Zoom Selected** function is used to zoom everything that has been selected to the maximum possible size to fit on the screen.

To access the **Zoom Selected** function, press Alt S, V, E, or use the **Zoom Icon** ( ) menu.

Before using this zoom you must select everything that you want zoomed using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) functions in the **Start** ➪ **Edit Menu**.

24.08 Zoom View

FUNCTION: The **Zoom View** function is used to zoom to one of 10 views as defined by the **Define Zoom View** function (Alt S, V, D - page 577).

Access the **Zoom View** function in any one of these ways:

- Type **z#**, where **#** is the number of the desired view.
- Press Alt S, V, Z.
- Through the **Zoom Icon** ( ) menu.

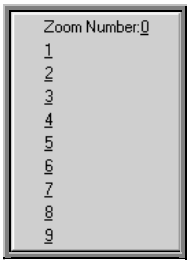
The operation of this function differs depending upon how it has been accessed. Use the appropriate instructions below:

z#

When you access the **Zoom View** function by typing **z#** (where **#** is the number of the desired view), "Sight" Survey automatically zooms to the requested view.

Start ➪View ➪Zoom View

When you access the **Zoom View** function through the **Start** menu, or by pressing Alt S, V, Z, a sub-menu appears:

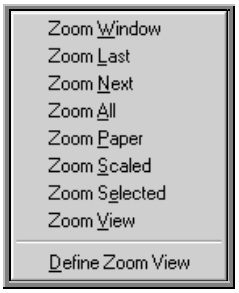


Click on the number corresponding to the view you want to zoom. "Sight" Survey will zoom to the requested view.

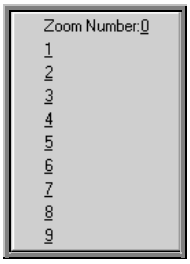
If you have not defined any views using the **Define Zoom View** function, the program will zoom to a default view.

Zoom Icon ( )

When you click on the **Zoom Icon** ( ) on the **Drawing** window toolbar, a sub-menu appears:



Press V or click on **Zoom View**. Another sub-menu appears:



Click on the number corresponding to the view you want to zoom. "Sight" Survey will zoom to the requested view. If you have not defined any views using the **Define Zoom View** function, the program will zoom to a default view.

Section 24

24.09 Define Zoom View

FUNCTION: The **Define Zoom View** function is used to define up to 10 different zoom or view areas.

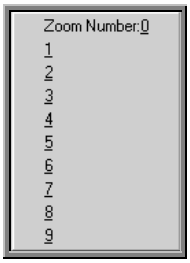
Access the **Define Zoom View** function in any one of these ways:

- Type **DZ**.
- Press Alt S, V, D.
- Through the **Zoom Icon** ( ) menu.

The operation of this function differs slightly depending upon how it has been accessed. Use the appropriate instructions below:

DZ or
Start ➪ **View** ➪ **Define Zoom View**

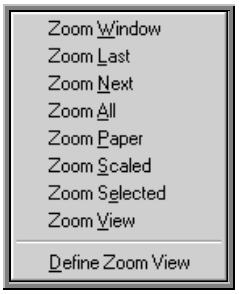
When you access the **Zoom View** function by typing **DZ**, or through the **Start** menu, or by pressing Alt S, V, D, a sub-menu appears:



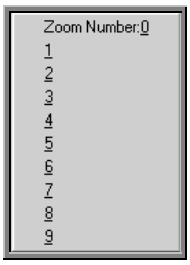
Click on the number corresponding to the zoom view you want to define.

Zoom Icon ( )

When you click on the **Zoom Icon** ( ) on the **Drawing** window toolbar, a sub-menu appears:



Press D or click on **Define Zoom View**. Another sub-menu appears:



Click on the number corresponding to the zoom view you want to define.

Common to all methods

"Sight" Survey prompts:

Enter a corner of zoom window

Position the cursor at one corner of the area you want to zoom into and click or press Enter. "Sight" Survey prompts:

Enter second corner of rectangle

As you move the cursor, a rubber-band box opens. Position the cursor so that the box surrounds the area you want to define and click or press Enter. The box you enter will be numbered and marked by green lines.

If you accessed **Define Zoom View** through the **Zoom Icon** ( ), the menu of numbers will reappear. You can click on another number to define another zoom, or exit the function by pressing Esc or by clicking on the screen somewhere outside the number menu.

The zooms you define are stored with your drawing.

When you have finished defining zoom areas, you can clean up the **Drawing** *window and remove the zoom region lines by using the* **Redraw** *(***RD** *- page 582) command.*

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24.10 Magnify

FUNCTION: The **Magnify** function is used to magnify your drawing at the cursor position.

To access the **Magnify** function, type **MG**, or press Alt S, V, M.

Magnification will occur centered on the current position the cursor. Your drawing is magnified by a factor of 3. To change this magnification factor, use **Start** ➪ **Settings** ➪ **Change Magnify Factor** (Alt S, S, C - page 810).

Since magnification occurs at the current cursor position, do not use your mouse to select this item from the menu. Instead, position your mouse first, then type **MG**, *or press* Alt S, V, M.

24.11 Demagnify

FUNCTION: The **Demagnify** function is used to demagnify your drawing at the cursor position.

To access the **Demagnify** function, type **DM**, or press Alt S, V, Y.

Demagnification will occur centered on the current position the cursor. Your drawing is demagnified by a factor of 3. To change this demagnification factor, use **Start** ➪ **Settings** ➪ **Change Magnify Factor** (Alt S, S, C - page 810).

Since demagnification occurs at the current cursor position, do not use your mouse to select this item from the menu. Instead, position your mouse first, then type **DM**, *or press* Alt S, V, Y.

24.12 Pan

FUNCTION: The **Pan** function is used to redraw the screen centered at the cursor position.

To access the **Pan** function, type **PN**, or press Alt S, V, P.
"Sight" Survey prompts:

Center display at point

Click the cursor at the desired center point. Panning will occur centered on the cursor position.

Since panning occurs at the current cursor position, do not use your mouse to select this item from the menu. Instead, position your mouse first, then type **PN**, *or press* Alt S, V, P.

24.13 Long Pan

FUNCTION: The **Long Pan** function is used to place a pan box around a part of the drawing to zoom into.

To access the **Long Pan** function, press Alt S, V, G.

When you select **Long Pan**, a small dotted square representing your sheet of paper appears, with your drawing inside it. "Sight" Survey prompts:

Enter pan box (Space bar for expanded view)

When you move your mouse, you will see that the cursor is attached to a box. Place this box around the part of your drawing you want to zoom into and click or press ↵Enter.

Alternatively, press the Space Bar. You will be returned to the view you were working in when you selected **Long Pan**. The cursor will still be attached to the box, although you may not be able to see the box. Move the cursor to the area of the drawing you want to pan to and click or press ↵Enter.

24.14 Redraw

FUNCTION: The **Redraw** function is used to refresh (clean up) the drawing.

Access the **Redraw** function in any one of these ways:

- Type **RD**.
- Press Alt S, V, R.
- Click the **Redraw Icon** ( ) on the **Drawing** window toolbar.

After several drawing operations have been performed, especially if they include changes and deletions, you may need to "clean up" the display. **Redraw** refreshes the screen to eliminate extraneous clutter.

24.15 Split Window

FUNCTION: The **Split Window** function is used to open multiple viewing ports. Each view can be of a different portion of the drawing, and at a different zoom factor.

For those times when you would benefit by being able to zoom two or more locations simultaneously, "Sight" Survey allows you to split the **Drawing** window into any number of sub-views.

To access the **Split Window** function, press Alt S, V, T. "Sight" Survey prompts:

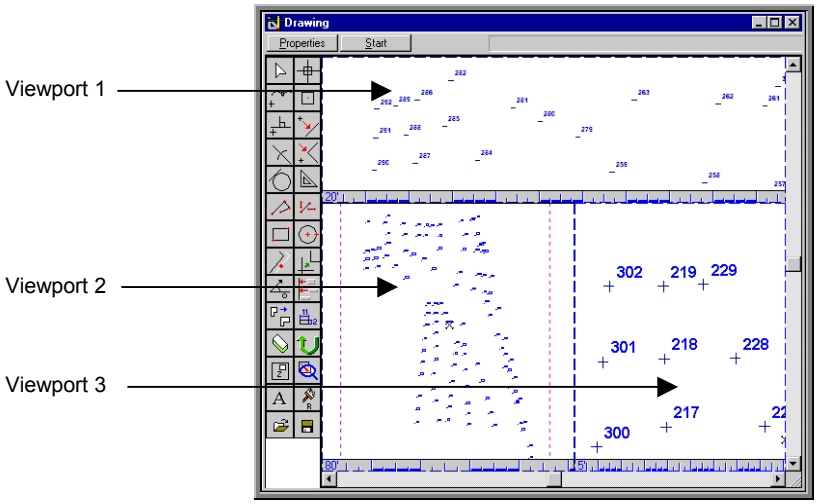
Split display at point

Click the cursor at a point in the **Drawing** window where you want to split the display. "Sight" Survey prompts:

Split vertically? (else horizontally)

Press [Y] or click [Yes] to split the window vertically, or press [N] or click [No] to split the window horizontally.

The screen will be split horizontally or vertically at the cursor position. Horizontal splits are marked by the presence of a scale bar. Vertical splits are indicated by a heavy dashed line. In the example below, the screen has been split in both directions.



Select the active viewport by placing the cursor somewhere inside it. Then use **Zoom** commands to define the view in the viewport.

?

Viewports are activated/deactivated by the cursor passing through them. If you want to use a toolbar function in a particular viewport, you cannot pass the cursor through another viewport on the way to the toolbar. Move the cursor out of the **Drawing** *window and around the* **Drawing** *window to the toolbar. For example, say you want to draw a line in viewport 3. Move the cursor out of viewport 3 to the right or down, then to the toolbar without entering any other viewports.*

24.16 Join Window

FUNCTION: The **Join Window** function is used to combine split windows.

Viewports must be removed in the same order in which they were created. For example, if you split a window horizontally, then split one of the horizontal windows vertically, you must remove the vertical split before removing the horizontal split. Using the screen illustration shown on the previous page, you must join viewport 2 and viewport 3 before you can join viewport 1 and viewport 2.

To access the **Join Window** function, press Alt S, V, J.

Click on border to join

Click the cursor on the border separating viewports to be joined.

24.17 Clear Drawing Window (DX)

FUNCTION: The **Clear Drawing Window** function is used to erase the entire contents of the **Drawing** window.

To access the **Clear Drawing Window** function, type **DX**, or press Alt S, V, X.

É *When you issue a* **Clear Drawing Window** *command, the on-screen drawing is lost and* ***cannot*** *be recovered using* **Undo**. ***This routine does not delete a saved drawing from your hard disk***. *After clearing the screen, you may reload a saved drawing using the* **Load Drawing** *routine.*

? *Use the* **DX** *keyboard command to clear drawings containing* ***Short Line (Curve) Tables*** *to allows proper clearing of the table data. See page 90 in the* **Quick Start** *manual.*

"Sight" Survey 3.0

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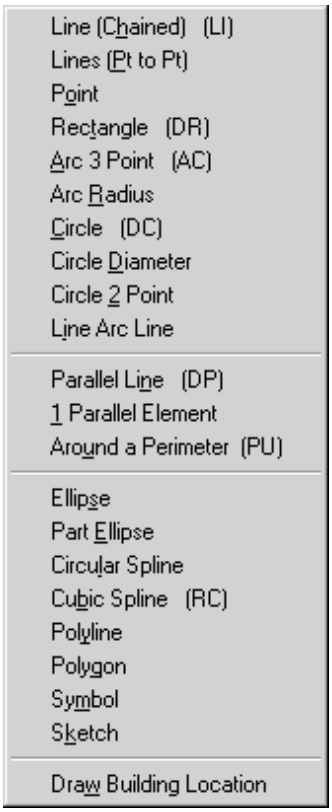
Start Menu - DRAW



The **DRAW** menu accessed from the Start button in the **Drawing** window is where you'll find commands for drawing construction. Commands include various functions for construction of lines, arcs, and circles. Drawing elements are placed on layers as indicated in the discussion for each element.

25.01 Line (Chained) (LI)

FUNCTION: The **Line (Chained)** function is used to construct a line consisting of segments where the end of one line automatically marks the beginning of the next.

Access the **Line (Chained)** function in any one of these ways:

- Type **LI**.
- Press Alt S, D, H.
- Click the **Line (Chained)** icon ( ) on the **Drawing** window.

Enter first point of line

Position the cursor where you want the start point of a line to be and click or press Enter.

Enter next point of line

As you move the cursor, a rubber-band line follows it. Position the cursor where you want the end point of the line to be and click or press Enter. This point also marks the start of the next line.

Enter next point of line

Lines are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

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Enter the end point of another line, or cancel line drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

1. *To draw a line of an exact length or at a given angle see* **Accurate Placement** *on page 497.*
2. *To change line* ***color*** *or* ***type*** *while you are drawing see* **Start** ➪ **Settings** ➪ **Line Defaults** *(Alt S, S, L - page 810).*

25.02 Lines (Pt to Pt)

FUNCTION: The **Lines (Pt to Pt)** function is used to draw separate lines.

 Lines are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

Access the **Lines (Pt to Pt)** function in any one of these ways:

- Type **LI**.
- Press Alt S, D, P.
- Click the **Lines (Pt to Pt)** icon ( ) on the **Drawing** window.

Enter first point of line

Position the cursor where you want the start point of a line to be and click or press Enter.

Enter next point of line

As you move the cursor, a rubber-band line follows it. Position the cursor where you want the end point of the line to be and click or press Enter.

Enter first point of line

Enter the first point of another line, or cancel line drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

1. To draw a line of an exact length or at a given angle see **Accurate Placement** *on page 497.*

2. To change line ***color*** *or* ***type*** *while you are drawing see* **Start** ➪ **Settings** ➪ **Line Defaults** *(Alt S, S, L - page 810).*

25.03 Point

FUNCTION: The **Point** function is used to draw points.

Points are drawn on the layer specified in Properties (PR) **Points Lyr**, unless **Layer Override** is active.

To access the **Point** function, press Alt S, D, O.

Enter position of point

Position the cursor where you want a point to be and click or press ↵Enter.

Enter position of point

Enter another point, or cancel point drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

When points are placed using the **Point** *function, as opposed to points placed from the COGO routines, the size of points and how they are displayed,* for example *as crosses, dots, with circles around them, etc., is controlled by the* Point Style... *button in* **Start** ➪ **Settings** ➪ **View Settings** *(Alt S, S, V - page 799).*

To position the cursor accurately see **Accurate Placement** *on page 497.*

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25.04 Rectangle (DR)

FUNCTION: The **Rectangle** function is used to draw rectangles by two diagonally opposite corners.


Rectangles are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

Access the **Rectangle** function in any one of these ways:

- Type **DR**.
- Press Alt S, D, T.
- Click the **Rectangle** icon ( ) on the **Drawing** window.

Enter first rectangle corner

Position the cursor where you want one corner of a rectangle to be and click or press Enter.

Enter second corner of rectangle

Move the cursor to a diagonally opposite corner. The cursor is rubber-banded, so you can see the rectangle as you draw it. When you have positioned the cursor, click or press Enter.

Enter first rectangle corner

Enter a corner of another rectangle, or cancel rectangle drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

1. To position the cursor accurately see **Accurate Placement** *on page 497.*

2. To change line ***color*** *or* ***type*** *while you are drawing see* **Start** ➪ **Settings** ➪ **Line Defaults** *(Alt S, S, L - page 810).*

When you draw a rectangle, the lines of the rectangle are automatically grouped so you can select the whole rectangle by clicking on it once with the **Select Cursor** *( ). To select a single line in the rectangle, you must first* ***explode*** *it using* **Start** ➪ **Objects** ➪ **Explode Object** *(Alt S, O, X - page 770).*

25.05 Arc 3 Point (AC)

FUNCTION: The **Arc 3 Point** function is used to draw an arc as defined by three points.

 Arcs are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Arc 3 Point** function , type **AC**, or press Alt S, D, A, or right-click the **Circle** icon ( ) on the **Drawing** window.

Enter first point of arc

Position the cursor where you want one end of the arc to be located and click or press Enter.

Enter point on arc

As you move the cursor, you can see the arc being drawn. Position the cursor at any point on the arc between its two ends and click or press Enter.

Enter last point of arc

Position the cursor where you want the other end of the arc to be and click or press Enter.

Enter first point of arc

Enter one end of another arc, or cancel arc drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

1. *To position the cursor accurately see* **Accurate Placement** *on page 497.*
2. *To change line* ***color*** *or* ***type*** *while you are drawing see* **Start** ➪ **Settings** ➪ **Line Defaults** *(Alt S, S, L - page 810).*

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25.06 Arc Radius

FUNCTION: The **Arc Radius** function is used to draw an arc as defined by two end points and a radius.


Arcs are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

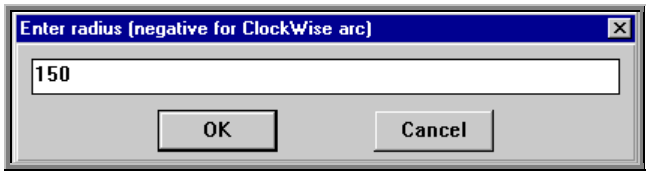
To access the **Arc 3 Point** function , type **AC**, or press Alt S, D, A.

Enter start point of arc

Position the cursor where you want one end of an arc to be and click or press Enter.

Enter end point of arc

Position the cursor where you want the other end of the arc to be and click or press Enter.



Type the radius of the arc and click OK or press Enter. If you do not know the radius and need to calculate it, you can type the necessary arithmetic expression, for example (518-212)/3 instead of the radius (see **Calculations** in **Accurate Placement** - page 508).


*To change line **color** or **type** while you are drawing see **Start** ➪**Settings** ➪**Line Defaults** (Alt S, S, L - page 810).*

Enter a **positive** radius value to construct an arc in an **counter-clockwise** direction between the start and end points you have defined. Enter a **negative** radius value to construct an arc in a **clockwise** direction between the start and end points you have defined.

The radius that you enter must be at least as long as half the distance between the start and end points of the arc. If the radius you enter is too short, the message…

will appear. "Sight" Survey will automatically set the radius to L/2 - half the distance between the two points - and draw the arc.

If you want to measure the distance between the two points, use the **Start** ➪ **Tools** ➪ **Measure** command. (Alt S, T, M - page 748).

Enter start point of arc

Enter one end of another arc, or cancel arc drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

25.07 Circle (DC)

FUNCTION: The **Circle** function is used to draw a circle by placing a center point and a point on the circle's circumference.

 Circles are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

Access the **Circle** function in any one of these ways:

- Type **DC**.
- Press Alt S, D, C.
- Click the **Circle** icon ( ) on the **Drawing** window.

Enter center point of circle

Position the cursor where you want the center point of a circle to be and click or press Enter.

Enter point on circle

As you move the cursor away from the circle center, the circle will appear. When it is the correct size, click or press Enter.

1. *To position the cursor accurately see* **Accurate Placement** *on page 497.*
2. *To change line* ***color*** *or* ***type*** *while you are drawing see* **Start** ➪**Settings** ➪**Line Defaults** *(Alt S, S, L - page 810).*

Enter center point of circle

Enter the center point of another circle, or cancel circle drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

Regardless of which point on the circle circumference was initially specified, only the center point and the point that lies on the circumference at the 3 o'clock position are stored.

25.08 Circle Diameter

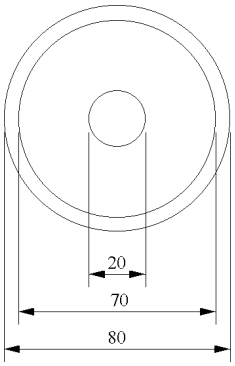
FUNCTION: The **Circle Diameter** function is used to draw up to five concentric circles.

Circles are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

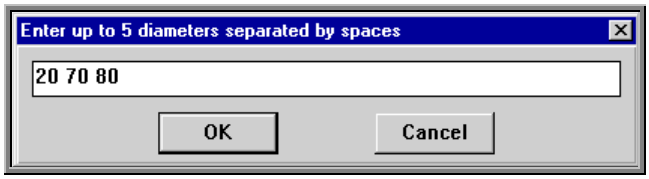
To access the **Circle Diameter** function , press Alt S, D, D.

Circle center point

Position the cursor where you want the center point of the circle or circles to be and click or press Enter.



1. *To position the cursor accurately see* **Accurate Placement** *on page 497.*
2. *To change line* ***color*** *or* ***type*** *while you are drawing see* **Start** ➪**Settings** ➪**Line Defaults** (Alt S, S, L - *page 810).*



Type in up to five diameters separated by spaces and click OK or press Enter.

For example, to produce these three circles shown to the left, you would type: `20 70 80`

Circle center point

Enter the center point of another circle or circles, or cancel concentric circle drawing by pressing Esc or the Space Bar, or by clicking on Cancel

25.09 Circle 2 Point

FUNCTION: The **Circle 2 Point** function is used to draw a circle defines by two points on the circle's circumference.

Circles are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Circle Diameter** function , press Alt S, D, 2.

Enter first point on circle

Position the cursor where you want one point on the circle's circumference to be and click or press Enter.

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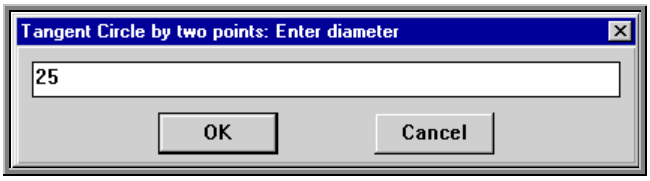
1. *To position the cursor accurately see* **Accurate Placement** *on page 497.*
2. *To change line* ***color*** *or* ***type*** *while you are drawing see* **Start** ➪**Settings** ➪**Line Defaults** *(Alt S, S, L - page 810).*
3. *To place the circle tangent to another entity (line, arc or circle) at the first point, change to* **Tan Snap** mode *(◯) before entering the point. See* **Tan Snap** mode *in* **Start** ➪**Settings** ➪**Snap Modes** *(Alt S, E, O - page 804).*

Enter point on circle

As you move the cursor, you will notice it moves as a rubber-banded circle attached to the first point. Position the cursor where you want the other point on the circle's circumference to be and click or press Enter.

If you were in **Tan Snap** mode (◯) when you entered one of the points, "Sight" Survey prompts:.



Enter a diameter for the circle, then click OK or press Enter.

The routine will repeat itself until you cancel the function by pressing Esc or the Space Bar, or by clicking on Cancel.

25.10 Line Arc Line

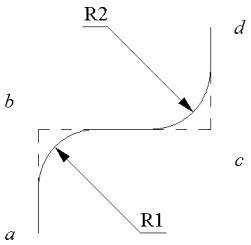
FUNCTION: The **Line Arc Line** function is used to draw a line-arc-line sequence.

Lines and arcs are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Line Arc Line** function, press Alt S, D, I.

Line Arc Line radiuses corners while you are drawing to produce a smooth sequence of lines and arcs. Nothing is drawn until you have entered the first three points.

To produce a sequence of parallel lines and arcs, see the **Parallel Line** *function (Alt S, D, N - page 597). For an alternative method of producing a line arc line sequence, see the* **Circular Spline** *(Alt S, D, L - page 607).*



It is sometimes helpful to use COGO functions to determine and set the corner points you will be using (b and c on the diagram) before you start.

When you access **Line Arc Line**, "Sight" Survey prompts:

Enter first point

Position the cursor where you want the first point of the first line in the line arc line sequence to be (*position a*). Click or press Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter corner point

Position the cursor at a corner that will be radiused (*position b*) and click or press Enter. Nothing is drawn yet.

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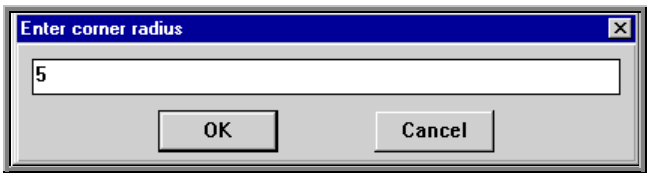
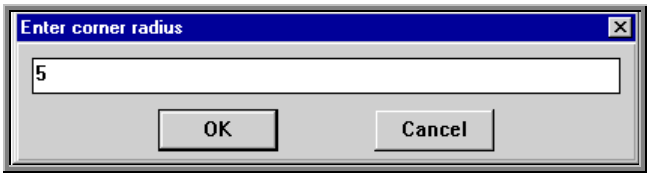


Type the radius for the corner (*R1*) and click OK or press Enter. If you do not know the radius and need to calculate it, you can type the necessary arithmetic expression, for example (518-212)/3 instead of the radius (see **Calculations** in **Accurate Placement** - page 508).

Enter next corner point (enter two points the same to end with a line)

When this question is asked, you can either enter another radiused corner (*as at c on the diagram*), or you can end the line-arc-line sequence, (*as at d on the diagram)*.



To enter another radiused corner, simply repeat the process you have used so far.

To end the line-arc-line sequence, press Esc to close the **Enter corner radius** prompt and then press Enter to accept *position d* again. You have now selected *position d* twice and the line-arc-line sequence will be terminated.

25.11 Parallel Line

FUNCTION: The **Parallel Line** function is used to draw parallel lines.

Lines are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Parallel Line** function, press Alt S, D, N, or click the **Parallel Line** icon ( ) on the **Drawing** window.

The way that the parallel lines are drawn is dependent on the parallel line defaults, which are set using **Start** ➪ **Settings** ➪ **Parallel Defaults** (Alt S, S, P - page 814).

Around Existing Perimeter

When you access the **Parallel Line** function with **Parallel Defaults** set for **Around Existing Perimeter** you get the **Perimeter Menu**. This is a multi-purpose menu, containing more items than you need for this function. Choose one of the top five items around or along which you want to place a parallel line: **Enter perimeter: Auto**; **Line**; **Rectangle**; **Arc**; or **Circle**. To select an item, press the underlined letter, or click the item.

Enter Perimeter: Auto If you select this option, you will be asked to click the cursor inside the desired perimeter. You will then be asked if you are satisfied with the perimeter. Click Yes and the parallel line(s) is (are) drawn.

Line If you select this option, the prompts that you get will be exactly the same as for **Start** ➪ **Draw** ➪ **Line (Chained)** (**LI** or Alt S, D, H - page 585). When you have completed drawing the line, press Esc or Space Bar and "Sight" Survey will return you to the **Perimeter Menu**. Select **Done Perim** and the parallel line(s) is (are) drawn.

Rectangle If you select this option, the prompts that you get will be exactly the same as for **Start** ➪ **Draw** ➪ **Rectangle** (**DR** or Alt S, D, T - page 588). When you have completed drawing the rectangle, press Esc or Space Bar and "Sight" Survey will return you to the **Perimeter Menu**. Select **Done Perim** and the parallel line(s) is (are) drawn.

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Arc If you select this option, the prompts that you get will be exactly the same as for **Start** ➪**Draw** ➪**Arc 3 Point** (**AC** or Alt S, D, A - page 589). When you have completed drawing the arc, press Esc or Space Bar and "Sight" Survey will return you to the **Perimeter Menu**. Select **Done Perim** and the parallel line(s) is (are) drawn.

Circle If you select this option, the prompts that you get will be exactly the same as for **Start** ➪**Draw** ➪**Circle** (**DC** or Alt S, D, C - page 591). When you have completed drawing the circle, press Esc or Space Bar and "Sight" Survey will return you to the **Perimeter Menu**. Select **Done Perim** and the parallel line(s) is (are) drawn.

Draw Fresh

If you checked the **Draw Fresh** box in **Parallel Defaults**, the prompts that you get when you select **Parallel Line** will be exactly the same as for **Line (Chained)** (**LI** or Alt S, D, H - page 585).

If you checked the **Line Arc Line** box in **Parallel Defaults**, the prompts that you get when you select **Parallel Line** will be exactly the same as for **Line Arc Line** (Alt S, D, I - page 595).

1. *When specifying radii in a line arc line sequence, make sure they are larger than the inside offset defined in* **Parallel Defaults**.
2. *If the corner points in a line-arc-line sequence are too close together and the radii are too large, your parallel lines will cross over and change sides.*

While only one line will appear as you are drawing, all the parallel lines you specified will appear once you finish line drawing, finish defining the perimeter, or finish drawing the line arc line sequence.

If your parallel lines are unexpectedly drawn on the wrong side of the line, perimeter, or line arc line sequence, use **Undo** *(***OO** *or Alt S, E, U - page 547) to delete them and check your offsets in* **Start** ➪**Settings** ➪**Parallel Defaults** *(Alt S, S, P - page 814).*

25.12 1 Parallel Element

FUNCTION: The **1 Parallel Element** function is used to draw a single line, arc, or circle parallel to an existing line, arc, or circle. It can also be used to draw multiple lines parallel to an existing line.


Lines are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

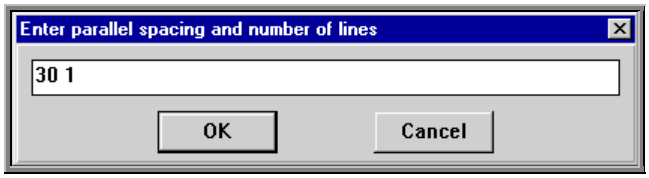
To access the **1 Parallel Element** function, press Alt S, D, 1, or right-click the **Parallel Line** icon ( ) on the **Drawing** window.

Parallel elements by spacing? (else through a given point)

Click Yes to set parallel elements by entering the spacing between elements. Click No to have the parallel element pass through a given point. Continue with the appropriate instructions.

Parallel Elements by Spacing

This option places a parallel element(s) by specifying a distance between the existing element and the parallel one, along with the number of parallel elements to create.



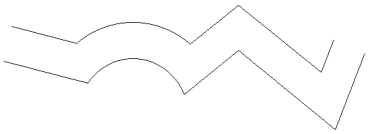
Type the spacing value and the number of elements you want to create, separating them with a space, and click OK or press Enter.


Elements containing arcs and circles are only copied once, regardless of the number of copies you specify in the prompt.

If you are going to use **1 Parallel Element** to draw more than one parallel line at once, the lines will be evenly spaced at the distance you type here.

Automatic trimming of consecutive parallel lines?

Click Yes to turn on line trimming, or No to leave the line trimming off. Trim will **not** work if the number of lines you have specified is greater than 1.



If you elect to use line trimming, each succeeding line will be trimmed to fit the previous one.

If you do not use line trimming, succeeding lines will not be trimmed.

The beginning of the first line and the end of the last line selected will not be trimmed. If you require a closed perimeter, use **Start** ➪ **Modify** ➪ **Trim** *(Alt S, M, T - page 638) to join the first and last lines together.*

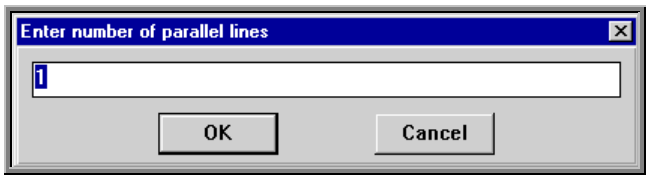
Select element to be parallel copied

Click on the element you want to copy and the copy will appear. This prompt will repeat until you cancel the function by pressing Esc or the Space Bar, or by clicking on Cancel.

Polylines cannot be duplicated with this routine. You must first explode the polyline, then duplicate the segments. See **Start** ➪ **Objects** ➪ **Explode Objects** *(Alt S, O, X - page 770).*

Parallel Elements through a Point

This option places a parallel element(s) through whatever point you specify.



Automatic trimming of consecutive parallel lines?

Click Yes to turn on line trimming, or No to leave the line trimming off. Trim will **not** work if the number of lines you have specified is greater than 1.

The beginning of the first line and the end of the last line selected will not be trimmed. If you require a closed perimeter, use **Start** ➪ **Modify** ➪ **Trim** *(Alt S, M, T - page 638) to join the first and last lines together.*

Select element to be parallel copied

Click on the element you want to copy and the copy will appear. This prompt will repeat until you cancel the function by pressing Esc or the Space Bar, or by clicking on Cancel.

Enter point parallel line (arc) should pass through

Click your mouse at the desired position and the parallel element will be constructed through that point. The position that you choose defines the distance between all the parallel lines.

To position the cursor accurately see **Accurate Placement** *on page 497.*

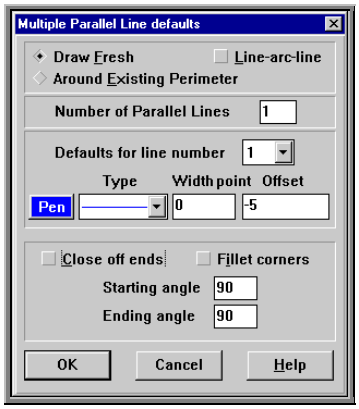
Select element to be parallel copied

This prompt will be repeat, allowing you to continue copying parallel elements. Cancel the function by pressing Esc or the Space Bar, or by clicking on Cancel.

25.13 Around a Perimeter (PU)

FUNCTION: The **Around a Perimeter** function is used to draw a parallel line around an existing perimeter.

Lines are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.



To access the **Around a Perimeter** function, type **PU**, or press Alt S, E, O.

The way that the parallel lines are drawn is dependent on the parallel line defaults, which are set using **Start** ➪ **Settings** ➪ **Parallel Defaults** (Alt S, S, P - page 814).

The distance that the parallel line will be placed away from the perimeter is controlled by the **Offset** setting. If you set the offset to a negative number, the parallel perimeter will be constructed inside the existing perimeter. If you use a positive offset value, the parallel perimeter will be constructed outside of the existing perimeter.

This function also works with polylines, except that no element will be constructed parallel to the last segment of the polyline.

Place Cursor inside perimeter and near a line

Click your mouse somewhere inside the perimeter, but close to one of the sides of the perimeter. The perimeter will be automatically selected.

Satisfied with perimeter?

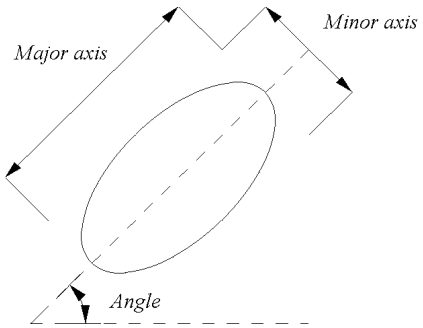
Click Yes if the perimeter has been correctly selected, or No to exit the routine. If you accept the perimeter, the parallel perimeter is automatically drawn, and the routine ends.

25.14 Ellipse

FUNCTION: The **Ellipse** function is used to draw ellipses.

Ellipses are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Ellipse** function, press Alt S, D, S.



Enter ellipse center point

Position the cursor where you want the center point of an ellipse to be and click or press Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Type in the length of the major axis (see diagram) and click OK or press Enter. If you do not know the length of the major axis and need to calculate it, you can type the necessary arithmetic expression, for example (518-212)/3 instead of the radius (see **Calculations** in **Accurate Placement** - page 508).

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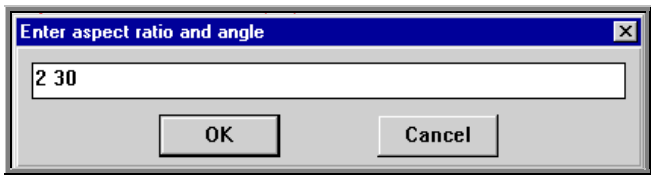


The aspect ratio is the length of the major axis divided by the length of the minor axis (see the diagram on the previous page). To get an ellipse that is twice as long as it is wide, use an aspect ratio of 2. To get an ellipse three times longer than it is wide, use an aspect ratio of 3, etc.

The angle is measured counter-clockwise from the 3 o'clock position.

Type the aspect ratio and the angle of the ellipse, separated by a space. Then click OK or press ↵Enter. An ellipse is drawn.

Enter ellipse center point

Enter the center point of another ellipse, or cancel ellipse drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

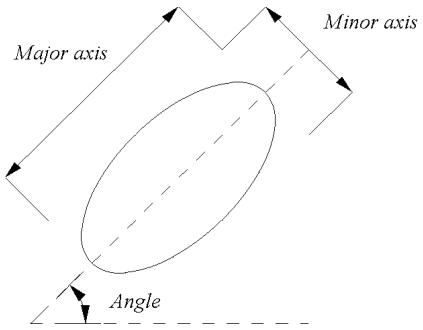
*In order to **snip**, **hatch** or **snap to** an ellipse, you must first change it to a sequence of 12 arcs using* **Start** ➪ **Modify** ➪ **Ellipse2Arcs** *(Alt S, M, 2 - page 658).*

25.15 Part Ellipse

FUNCTION: The **Part Ellipse** function is used to draw a portion of an ellipse.

To access the **Part Ellipse** function, press Alt S, D, E.

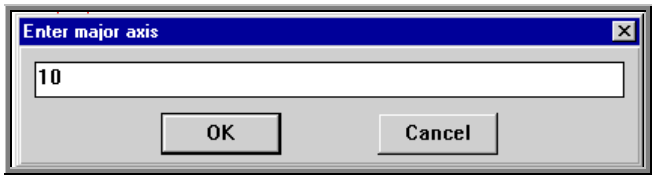
Ellipses are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.



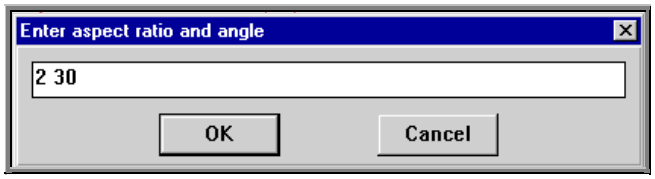
Enter ellipse center point

Position the cursor where you want the center point of an ellipse to be and click or press ↵Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*



Type in the length of the major axis (see diagram) and click OK or press ↵Enter. If you do not know the length of the major axis and need to calculate it, you can type the necessary arithmetic expression, for example (518-212)/3 instead of the radius (see **Calculations** in **Accurate Placement** - page 508).

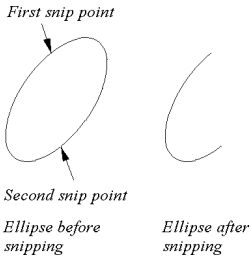


The aspect ratio is the length of the major axis divided by the length of the minor axis (see the diagram on the previous page). To get an ellipse that is twice as long as it is wide, use an aspect ratio of 2. To get an ellipse three times longer than it is wide, use an aspect ratio of 3, etc.

The angle is measured counter-clockwise from the 3 o'clock position.

Type the aspect ratio and the angle of the ellipse, separated by a space. Then click OK or press Enter. An ellipse is drawn.

Enter first snip point on ellipse (ellipse goes round ccw)



Position the cursor at a point on the ellipse boundary where you want one end of the ellipse part to be and click or press Enter.

The ellipse is drawn in an counter-clockwise direction. If you want to achieve the result illustrated here, you must choose the first snip point as indicated. To retain the other portion of the ellipse, reverse the first and second snip points.

Enter 2nd snip point

Position the cursor at a point on the ellipse boundary where you want the other end of the ellipse part to be and click or press Enter. The unwanted parts of the ellipse are cut away.

Enter ellipse center point

Enter the center point of another part ellipse, or cancel ellipse drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

Part ellipses created using this function cannot be hatched or snapped to. **Ellipse2Arcs** ***DOES NOT WORK*** *on part ellipses.*

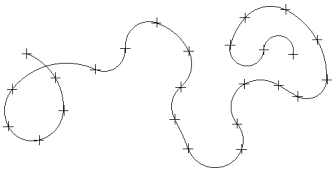
If you need a part ellipse that can be snapped to and hatched, create an ellipse using the **Ellipse** function and convert it to 12 arcs using **Start** ➪ **Modify** ➪ **Ellipse2Arcs** (Alt S, M, 2 - page 658).

After converting the ellipse to arcs, delete the unwanted parts using **Start** ➪ **Modify** ➪ **Cut and Rub** (Alt S, M, B - page 650) and **Start** ➪ **Edit** ➪ **Delete** (DS or Alt S, E, D - page 551).

25.16 Circular Spline

FUNCTION: The **Circular Spline** function is used to draw a randomly curving line, called a spline. A spline can be composed of arcs (Circular Spline) or line segments (Cubic Spline).

Circular splines are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.



To access the **Circular Spline** function, press Alt S, D, L.

This function draws a spline composed of arcs. Each new point enters another arc tangent to the previous one and through the point. This function also allows a line-arc-line sequence to be entered. The spline is rubber-banded to enable you to see exactly what will be drawn.

The first three points that you enter define an arc, as in the **Arc 3 Point** function.

Circular spline ... enter first point

Position the cursor where you want the first point in the circular spline to be and click or press Enter. This represents the first point of an arc.

Enter second point of spline

Position the cursor at another point on the spline and click or press Enter. This represents a point on an arc between its two ends.

Enter next point of spline

The arc that you are drawing appears, and is rubber-banded so that you can see exactly what you are drawing. Position the cursor at

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another point on the spline and click or press Enter. This represents the end point of an arc, and the arc is drawn.

Enter next point of spline - or [Ctrl End] to change arc to line

From here, each new point will enter an arc tangent to the previous arc and through the point. Lines may also be entered.

To draw another **arc**, position your cursor at another point along the spline, and click or press Enter.

To draw a **line**, press the Ctrl and End keys together. Then position your cursor and click or press Enter.

This prompt repeats until you terminate spline drawing by pressing Esc or the Space Bar, or by clicking on clicking Cancel.

To close a perimeter created using this function the first and second points of the spline must be entered again as the penultimate and last points of the spline.

25.17 Cubic Spline (RC)

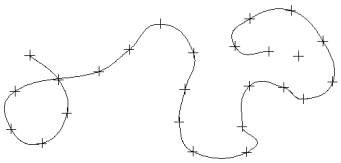
FUNCTION: The **Cubic Spline** function is used to draw a randomly curving line, called a spline. A spline can be composed of arcs (Circular Spline) or line segments (Cubic Spline).

Cubic splines are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Cubic Spline** function, type **RC** or press Alt S, D, B. This function fits a cubic spline, composed of small lines, through points.

Three points are required before a spline can be drawn between the first two points. No spline will be drawn to the last point entered.

Enter number of divisions per spline segment



The spline is reduced to straight line segments. This number dictates how many segments are produced between entered points. Numbers between 5 and 10 are useful. Larger numbers will result in smoother curves, they will consume more memory. Type a number then click OK or press Enter.

Cubic spline curve ... enter first point

Position the cursor where you want the first point in the cubic spline to be and click or press Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter second point

Position the cursor at another point on the spline and click or press Enter.

Next spline point

Position the cursor at another point on the spline and click or press Enter. A cubic spline is fitted between the first and second points.

Next spline point

Add another point to the spline or cancel spline drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

The spline is always drawn between the third last and second last points you entered.

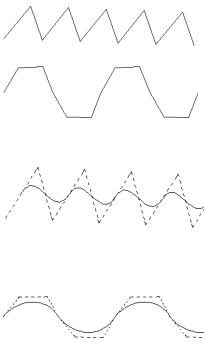
25.18 Polyline

FUNCTION: The **Polyline** function is used to draw a polyline or a 3 point or 4 point Bezier curve.


Polylines are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Open Drawing** function, press Alt S, D, Y, or click the **Polyline Icon** ( ) on the **Drawing** window toolbar.

Polylines look exactly the same as lines drawn using **Start** ➪**Draw** ➪**Line (Chained)** (**LI** or Alt S, D, H - page 585). The difference is that when you click on a polyline to select it with the **Select Cursor** ( ), the whole polyline is selected, not just one line segment.

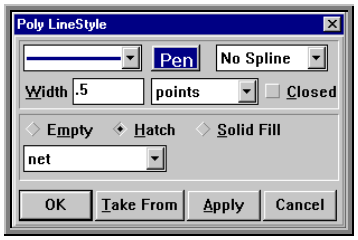


A polyline is defined by its vertices, i.e. the beginnings and ends of the line segments within it. To select just one line segment in a polyline, you must first explode the polyline. See **Start** ➪**Objects** ➪**Explode Object** (Alt S, O, X - page 770).

You can also use the **Polyline** function to draw 3 point and 4 point Bezier curves. **3 point Bezier curves** are drawn between every three polyline vertices.

4 point Bezier curves are drawn through every four polyline vertices.

To hatch or fill an object constructed by a polyline, you must first explode the object. See **Start** ➪**Objects** ➪**Explode Object** *(Alt S, O, X - page 770).*



Whether a polyline, 3 point Bezier or 4 point Bezier curve is drawn by the **Polyline** function, and whether or not it is closed and hatched depends on the options you have selected in **Start** ➪**Settings** ➪**Polyline Defaults** (right-click or press Alt S, S, F - page 812).

Once drawn, a polyline can be converted to a Bezier curve or a Bezier curve can be converted to a polyline simply by double-clicking on it with the **Select Cursor** ( ). You can also change the hatch status of a polyline by double clicking on it.

When you select the **Polyline** function, "Sight" Survey prompts:

Enter first point of polyline

Position the cursor where you want the first polyline vertex to be and click or press Enter.

To position the cursor accurately and to draw a line of an exact length or at a given angle see **Accurate Placement** *on page 497.*

Enter next point of polyline

As you move the cursor, a line follows it. Position the cursor for the second polyline vertex to be and click or press Enter.

If you are drawing a polyline, the first line segment will be drawn. If you are drawing a Bezier curve, nothing will be drawn until you have entered the fourth vertex.

Enter next point of polyline

Enter another polyline vertex, or cancel polyline drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

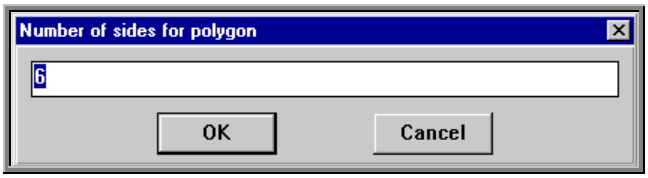
Once you have drawn a polyline or Bezier curve, you can use the function **Start** ➪ **Edit Menu** ➪ **Select Nodes** *(Alt S, E, E - page 568) to stretch the line or curve by its vertices.*

25.19 Polygon

FUNCTION: The **Polygon** function is used to draw polygons.

Polygons are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Polygon** function, press Alt S, D, G, or right-click the **Draw Rectangle Icon** ( ) in the **Drawing** window toolbar.



Type the number of sides you want the polygon to have, then click OK or press Enter.

Enter center point of polygon

Position the cursor where you want the center point of the polygon to be and click or press Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter polygon enclosing circle

Position the cursor on the circumference of a circle enclosing the polygon and click or press Enter.

Enter center point of polygon

Position the cursor at the center point of another polygon or cancel polygon drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

When you create a polygon, the lines making up the polygon are automatically grouped so that you can select the whole polygon by clicking on it once with the **Select Cursor** *( ). To select a single line in the polygon, you must first* ***explode*** *it using* **Start** ➪ **Objects** ➪ **Explode Object** *(Alt S, O, X - page 770).*

25.20 Symbol

FUNCTION: The **Symbol** function is used to enter into your drawing a symbol from the symbol file.

Symbols are drawn on the layer specified in Properties (PR) **Symbols Lyr**, unless **Layer Override** is active.

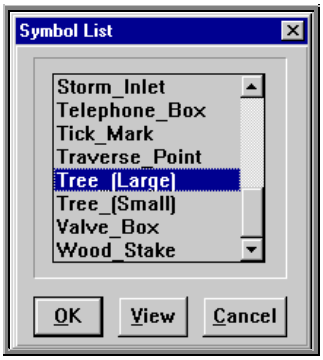
To access the **Symbol** function, press Alt S, D, M.

Before you can use the **Symbol** function, you must use **Start** ➪ **File** ➪ **Load Symbol File** (Alt S, F, Y - page 525) to load the drawing containing the symbols you want to use. Otherwise, "Sight" Survey wouldn't know where to find the symbols.

If you have not loaded a symbol file, "Sight" Survey will automatically enter the **Load Symbol File** function.

Selecting the symbol to use

When you enter the symbol function, you are presented with a menu from which to choose your symbol. Use the vertical scroll bar to scroll up and down the symbol list, and click on the desired symbol.



Alternatively, click View. Thumbnail sketches of the symbols appear on the screen. Click on the symbol you want.

After you have selected the desired symbol, "Sight" Survey prompts:

Enter position for symbol (will rotate onto nearest line if in graball mode)

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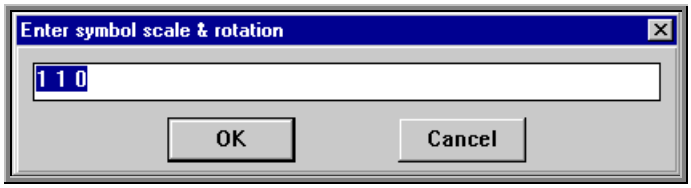
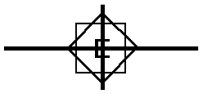
The symbol's ***hook point*** is positioned at the cursor position. Position the cursor where you want the symbol to appear and click or press ↵Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*



Enter the symbol scale in the X and Y directions, and the symbol rotation angle. Separate the values with spaces. Click OK.



Not Snipped

Snipped

Would you like to snip around symbol

If your symbol is being placed on top of another drawing element, you can elect to have the area under the symbol snipped, or cut away. This is useful to avoid confusion that might be caused by having lines running through and obscuring symbols. Click Yes to clip under the symbol, otherwise click No.

Attributes

If you are entering a symbol that has had attributes attached to it, you will be prompted for the value of attribute once you have specified the position of the symbol. For example, suppose the symbol you are entering has an attribute called **COLOR** attached to it. "Sight" Survey prompts:

The default value of the attribute **COLOR** will appear in the command line, where you can edit it.

If you answered Yes to the **Convert attributes to text during load?** prompt when you loaded the symbol library, the value that you type into the command line will be written as text next to the symbol. It will be written using the currently selected text defaults. If you need to edit this text once it is on the drawing, double click on it. If you need to move the text, you must first explode the object it is attached to using **Start** ⇨ **Objects** ⇨ **Explode Objects** (Alt S, O, X - page 770).

If you answered No to the **Convert attributes to text during load?** prompt when you loaded the symbol library, a diamond will appear at the attribute position. This diamond will disappear when you redraw the screen.

Once "Sight" Survey has prompted for the value of each attribute attached to the symbol, the symbol will be drawn on the screen.

Enter position for symbol (will rotate onto nearest line if in graball mode)

Enter another symbol, or cancel by pressing Esc or the Space Bar, or by clicking on Cancel.

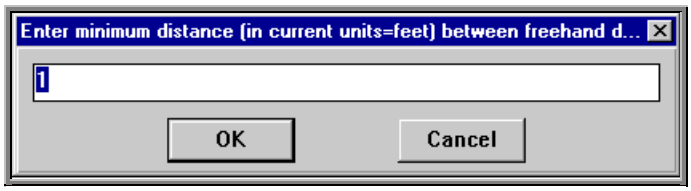
25.21 Sketch

FUNCTION: The **Sketch** function is used to draw in a freehand mode.

Sketches are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Sketch** function, press Alt S, D, K.

"Sight" Survey begins by prompting you for a minimum distance between points, i.e. the minimum length of any individual line segment.



Type an interval from 1 to 2 mm and click OK or press ↵Enter.

Freehand sketches are composed of many small line segments. While smaller intervals will result in smoother lines, more memory will be consumed and redraw time will be significantly slowed. You should keep the number of sketches on any drawing to a minimum.

Enter start of freehand drawing

Position the cursor where you want the sketch to begin and click or press ↵Enter. As you move the mouse, a continuous line will be drawn on the screen until you click or press ↵Enter.

Because it is difficult to move the mouse smoothly, the usual result of using **Sketch** is a wobbly squiggle. You may want to use **Start** ➪**Tools** ➪**Tidy Polygons** (Alt S, T, T - page 754) to clean up erratic lines. Sketching will yield the best results when done with a digitizer stylus.

Enter start of freehand drawing

Position the cursor to start another sketch or cancel sketching by pressing Esc or the Space Bar, or by clicking on Cancel.

The small lines making up the sketch are automatically grouped enabling you to select the whole sketch by clicking on it once with the **Select Cursor** *(▷). To select a single line in the sketch, you must first explode it using* **Start** ➪**Objects** ➪**Explode Object** *(Alt S, O, X - page 770).*

Large sketches may contain too many lines to be grouped into one object. Such sketches will be grouped into several objects.

25.22 Draw a Building Location

FUNCTION: The **Draw a Building Location** function is used to locate and draw a structure when you know the structure dimensions and tie-distances from two structure corners to two property corners.

Before beginning this routine, you might wish to set the dimension **Text Height** *to a value more compatible with the small point-tie dimensions you'll be placing on the drawing. Right-click the* **Dimension** *icon ( ) in the* **Drawing** *window toolbar to activate the* **Dimension Settings** *and change the dimension* **Text Height**.

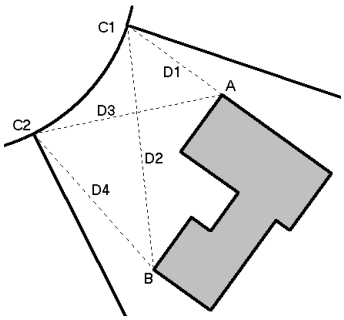
Buildings are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

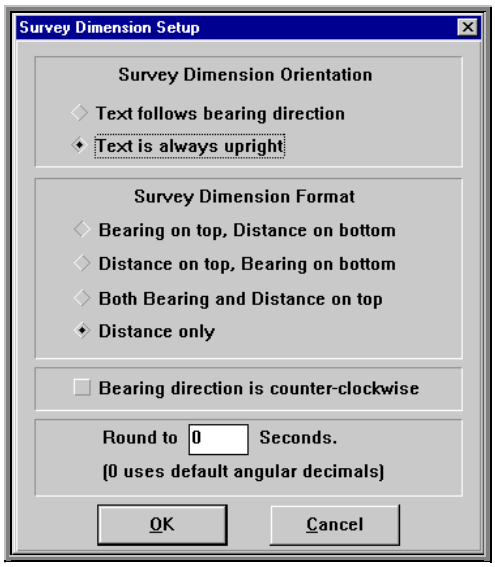
To access the **Draw a Building Location** function, press Alt S, D, W.

If the setting for **Surveying Dimensions** is not set to **`Distance Only`**, "Sight" Survey will suggest that you change the setting. In the **Drawing** window command line, you are prompted:

For best results, set Survey Dimension Format to Distance Only.

Since you have measured only distances to tie the lot corners to the building corners, the bearings of the tie lines to the corners are irrelevant and should not be printed. Therefore, you should instruct "Sight" Survey to print only the distances. To change the setting for **Surveying Dimensions,** click Yes. The **Survey Dimensions Setup** dialog box appears:





Under the **Survey Dimension Format** section, click the option **Distance only**. Click OK to close the dialog box. In the **Drawing** window command line, you are prompted:

Select 1st Lot Corner

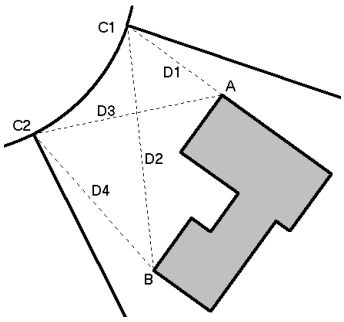
The cursor has changed to the **Grab All** cursor (⊡). Move the cursor so the first lot corner (**C1**) is in the box and click.

?

Choosing the correct starting corner is crucial because the **Draw a Building Location** *function requires distance-distance intersections to be performed in a clockwise direction. For example, assume your lot line runs Southwesterly with point* ***C1*** *on the North end, and point* ***C2*** *on the South. Starting at point* ***C1*** *and going to point* ***C2*** *will locate the structure on the East side of the line. Starting at point* ***C2*** *and going to point* ***C1*** *will locate the structure on the West side of the line.*

In the **Drawing** window command line, you are prompted:

Enter distances to Near & Far corner separated by a space



Type the known distance (**D1**) from the first lot corner (**C1**) to the ***near*** corner of the building (**A**) followed by a space, followed by the distance (**D2**) from the first lot corner (**C1**) to the ***far*** corner of the building (**B**) and press ↵Enter. In the **Drawing** window command line, you are prompted:

Select 2nd Lot Corner

Move the **Grab All** cursor (⊡) cursor so the second lot corner (**C2**) is in the box and click. In the **Drawing** window command line, you are prompted:

Enter distances to Far & Near corner separated by a space

Type the known distance (**D3**) from the second lot corner (**C2**) to the ***far*** corner of the building (**A**) followed by a space, followed by the distance (**D4**) from the second lot corner (**C2**) to the ***near*** corner of the building (**B**) and press ↵Enter.

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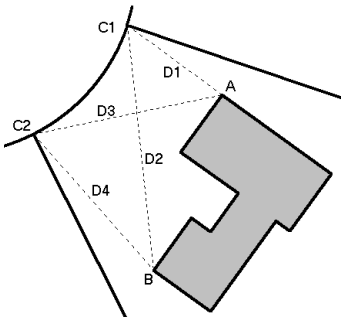
?

Notice that in this prompt you are asked for the **Far & Near** *distances while in the previous distance prompt you were asked for* **Near & Far** *distances. The order of distance entry is crucial to the success of this macro. Distances must be properly paired. The first distance in both entries must go to the first point, and the second distance in both entries must go to the second point.*

Upon successful data entry, an option menu appears in the **Drawing** window.

1. Continue
2. Lines and Dimensions
3. Dimensions Only
4. Quit

This menu governs how the ties and tie distances are to be shown on the drawing. The options are: **1. Continue** - continue without drawing lines or distances; **2. Lines and Dimensions** - draw dashed lines and label the distances; **3. Dimensions Only** - label the



distances without drawing dashed lines; and **4. Quit** - quit the macro. To select an option, press the corresponding number or click on the option.

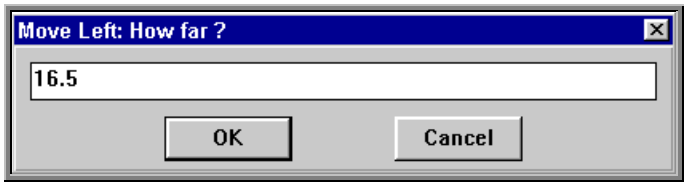
"Sight" Survey performs two distance-distance intersections and locates the building corners. If selected, dashed lines are drawn from the lot corners to the building corners, and the tie distances are labeled. In the **Drawing** window command line, you are prompted:

Set Building Starting Corner

Move the cursor somewhere into an open area of the **Drawing** window and click or press ↵Enter. At this time, the location is unimportant. (For this example, we'll refer to the starting point as **B**.) In the **Drawing** window command line, you are prompted:

Set Next Corner

You will now draw the building outline using the arrow keys to move the cursor measured distances. Press an arrow key (←, →, ↑, ↓) and a distance prompt box appears:



Type in the distance and press ↵Enter ↵Enter. (The first ↵Enter moves the cursor, the second ↵Enter sets the point.) A line is drawn. In the **Drawing** window command line, you are prompted:

Enter next point of polyline

Press another arrow key and a distance prompt box appears. Type in the distance and press ↵Enter ↵Enter. (The first ↵Enter moves the cursor, the second ↵Enter sets the point.) A line is drawn. This sequence continues until you have reached your starting point.

When your building has been drawn, press Esc to cancel the building drawing operation.

You can move diagonally using arrow keys in combination. For example to move up 4 feet and to the right 6 feet, press ↑ 4 ↵Enter → 4 ↵Enter ↵Enter. You may also enter polar dimensions such as a dimension and a particular bearing. To enter a polar dimension, press O instead of an arrow key. When you have moved the cursor, don't forget to press ↵Enter a second time to set the point.

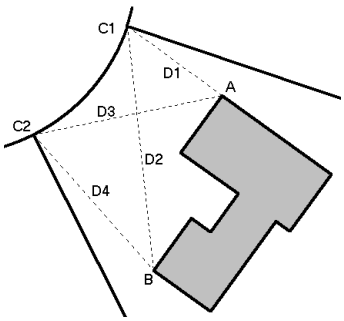
Enter point that must move

Move the **Grab All** cursor (⊡) so building corner **B** is in the box and click. In the **Drawing** window command line, you are prompted:

Enter point it should move to

Move the **Grab All** cursor (⊡) to the points computed by the tie distances **D2** and **D4** and click. The building moves to the new location. In the **Drawing** window command line, you are prompted:

Enter point about which to rotate



The point we are at is the point around which we want to rotate. Without moving the **Grab All** cursor (⊡), press ↵Enter or click. In the **Drawing** window command line, you are prompted:

Enter angle from keyboard (else from cursor)

Since we are going to be using the other computer building corner to set our building rotation, we will not be entering the angle from the keyboard. Press N or click **No**. In the **Drawing** window command line, you are prompted:

Enter point that must rotate

Move the **Grab All** cursor (⊡) so building corner **A** is in the box and click. In the **Drawing** window command line, you are prompted:

Enter point it must rotate to

Move the **Grab All** cursor (⊡) to the point computed by the tie distances **D1** and **D3**, and click. The building rotates to the new location. In the **Drawing** window command line, you are prompted:

Enter point that must move

Press Esc to end the macro.

25.23 Draw Perpendiculars +

FUNCTION: The **Draw Perpendiculars +** function is used to place multiple perpendicular lines to a baseline.

Perpendiculars are drawn on the layer specified in Properties (PR) **Line Lyr**, unless **Layer Override** is active.

To access the **Draw Perpendiculars +** function, press Alt S, D, +.

Select the baseline

Move the cursor onto (or near) the baseline and click. "Sight" Survey prompts:

Select a point

Move the **Grab All** cursor (⊡) cursor so the point from which you want to draw the perpendicular line is in the box and click. "Sight" Survey will place the perpendicular line on the drawing. This prompt repeats until you press Esc or Cancel to quit this routine.

"Sight" Survey 3.0

Section 26

Start Menu - MODIFY

The **MODIFY** menu accessed from the Start button in the **Drawing** window is where you'll find commands for modifying drawing elements. Commands include various functions for resizing and moving elements, functions for specialized copying and pasting, and functions for joining and trimming lines and arcs.

26.01 Stretch

FUNCTION: The **Stretch** function is used to move that part of a drawing enclosed within a polygon.

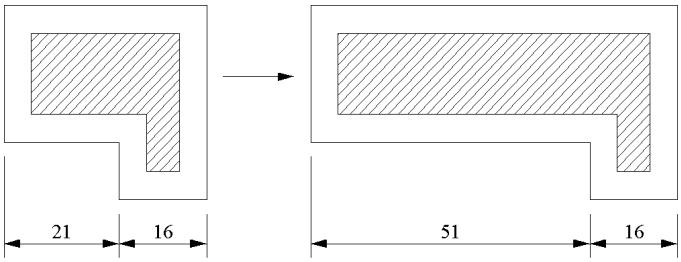
To access the **Stretch** function, press Alt S, M, E, or click the **Stretch** icon ( ) on the **Drawing** window toolbar.

In this function you move only that part of a drawing that you enclose within a polygon. The rest of the drawing remains stationary.

You can also stretch parts of your drawing using **Start** ➪ **Edit** ➪ **Select** *(Alt S, E, S - page 552) or* **Start** ➪ **Edit** ➪ **Select Nodes** *(Alt S, E, E - page 568), and also* **Start** ➪ **Modify** ➪ **Scale** *(Alt S, M, A - page 629).*

Any lines crossing the polygon boundary act like rubber-bands. They enlarge, shrink or rotate depending on the amount and direction of movement.

If previously dimensioned, linear dimensions will adjust automatically when **Stretch** is used, although tolerances will be lost. Hatching and filling will also be updated automatically.



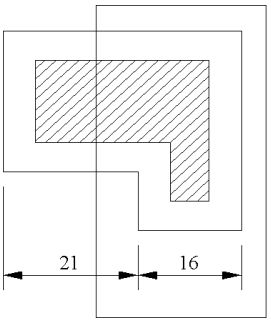
Before stretching. *After stretching.*

It is best to be in **Freehand** mode (⌒) *when you use* **Stretch**. *If you are in a snap mode, the cursor sometimes jumps from the point you select to move to, back to the point you selected as the point to move, resulting in no stretching. To enter* **Freehand** mode, *click on the* **Freehand** mode *(⌒) in the* **Drawing** *window toolbar.*

Stretch everything? (else just selected)

Click Yes to stretch everything within the user-defined polygon. If you click No only those elements within the polygon that have been selected using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) functions will be moved.

Enter polygon about points to be moved



Draw a polygon around the elements to be stretched. Do not put the polygon around the whole shape or it will be moved, not stretched.

Enter point that must move

Position the cursor on a point and click or press Enter. This point is a reference point used to define the movement of the part of the drawing that you enclosed in the polygon. The polygon that you drew will disappear.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter point it must move to

Move the cursor to indicate the position the point will be stretched to. A square representing the part of the drawing to be stretched appears. Press Enter or click to accept the position, and the drawing is stretched.

26.02 Move

FUNCTION: The **Move** function is used to move a selection set. You can also move the selection set using the **Start** ➪ **Edit** ➪ **Select** function (Alt S, E, S - page 552).

To access the **Move** function, press Alt S, M, M.

It is best to be in **Freehand** mode ( ) *when you use* **Move**. *If you are in a snap mode, the cursor sometimes jumps from the point you select to move to, back to the point you selected as the point to move, resulting in no movement. To enter* **Freehand** mode, *click on the* **Freehand** mode ( ) *in the* **Drawing** *window toolbar.*

The **Move** function moves everything that has been selected. Before you use the command, you must select the primitives you want to move using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Move**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the entities you want to move. When you have finished, press the Space Bar or click Cancel.

Enter point that must move

Position the cursor on a point on the selection set and click or press Enter. This point is a reference point used to define the movement.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter point it should move to

Move the cursor to indicate the position the selected point must move to. A ghosted selection set moves as you move the cursor. Press Enter or click when you are satisfied. The selection set is drawn at the new position.

26.03 Move Point

FUNCTION: The **Move Point** function is used to move a point and everything attached to it.

To access the **Move Point** function, press Alt S, M, P.

You can also move a point using the **Start** ➪ **Edit** ➪ **Select Nodes** *(Alt S, E, E - page 568) function.*

Select point to move

The cursor has switched to **Point** mode (). Position the cursor close to the point you want to move and click or press Enter. The cursor jumps exactly onto the point because it is in **Point** mode.

Enter point it should move to

The cursor has switched to **Grab All** mode (⊡). Move the cursor to where the point should move to and click or press Enter. The point is moved.

Select point to move

Select another point to move or cancel point moving by pressing Esc or the Space Bar, or by clicking on Cancel.

26.04 Mirror Image

FUNCTION: The **Mirror Image** function is used to create a mirror image of the selection set.

To access the **Mirror Image** function, press Alt S, M, G.

The **Mirror Image** function mirrors everything that has been selected. Before you use the command, you must select the entities you want to mirror using the **Start** ➪ **Edit** ➪ **Select** (Alt S, E, S - page 552) or **Start** ➪ **Edit** ➪ **Selection Filters** (Alt S, E, F - page 560) commands.

Mirror Image lets you choose to mirror vertically about a horizontal axis, horizontally about a vertical axis, or about an arbitrarily axis.

Select the axis orientation with your mouse, or by pressing **V**, **H**, or **A**.

If you haven't selected anything when you choose **Mirror Image**, you will automatically enter the **Select** function as soon as you choose this routine. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the entities you want to mirror. When you have finished, press the Space Bar or click Cancel.

Enter point about which to mirror

Position the cursor at a point about which to mirror. The mirror axis will pass through this point.

Keep old half

If you want to retain the original selection set after performing a **Mirror Image**, click Yes. To discard the original image , keeping only the new mirrored image, click No.

If you have chosen to mirror horizontally or vertically, the selection set is mirrored. If you have chose to mirror arbitrarily, "Sight" Survey prompts:

Enter other point on mirror axis

Position the cursor at the second point defining the axis and click or press Enter. The selection set is mirrored.

To position the cursor so the selection set is mirrored at a specific angle, press O to perform a **Polar Move**. *See* **Accurate Placement** *on page 497.*

When text is mirrored it remains readable because only the label origin is mirrored. The label origin of text that is not centered is changed. For example, if the * denotes the label origin of the text and the word **TEXT** denotes a piece of text, ***TEXT** mirrors to **TEXT*** during a vertical mirror.

When you mirror objects, the mirrored half is a new object with the same name and parent name as the original. This means that if you have drawn, for example, half of an object and have mirrored it to get the other half, you will have to unite the two halves into a single object. You can do this using **Start** ➪ **Objects** ➪ **Group Into Object** (Alt S, O, O - page 767).

26.05 Scale

FUNCTION: The **Scale** function is used to alter the scale of the selection set.

To access the **Scale** function, press Alt S, M, A.

You can also scale the selection set using **Start** ➪ **Edit** ➪ **Select** (Alt S, E, S - *page 552).*

The **Scale** function scales everything that has been selected. Before you use the command, you must select the entities you want to scale using the **Start** ➪ **Edit** ➪ **Select** (Alt S, E, S - page 552) or **Start** ➪ **Edit** ➪ **Selection Filters** (Alt S, E, F - page 560) commands. The selection set can be scaled differently in the horizontal and vertical directions.

If you haven't selected anything when you choose **Scale**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the entities you want to scale. When you have finished, press the Space Bar or click Cancel.

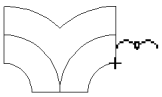
Enter point about which to scale

Position the cursor at the point around which the increase or decrease in scale is to take place. This point will remain stationary while the rest of the selection set is scaled. Click or press ↵Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

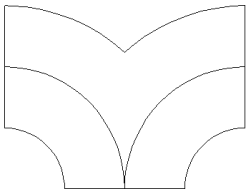
Enter scale from cursor (else from keyboard)

You can use the cursor to indicate where the selection set must be scaled to. For example, if you indicate that this point ...



must be scaled to here...

... the selection set will be scaled like this.

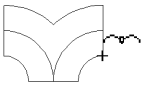


If you want to indicate the scaling by cursor, click Yes and go to **Scaling by Cursor**. Otherwise, click No and continue at **Scaling by the Keyboard**.

If you don't scale by using the cursor, you can type specific horizontal and vertical scaling factors from the keyboard. For example, typing **2 1** will scale the selection set by a factor of **2** in

the horizontal direction and by a factor of **1** in the vertical direction.

Scaling by Cursor



Enter point to be scaled

Position the cursor on a point to be moved during the scale. Press Enter or click to accept the point to be scaled.

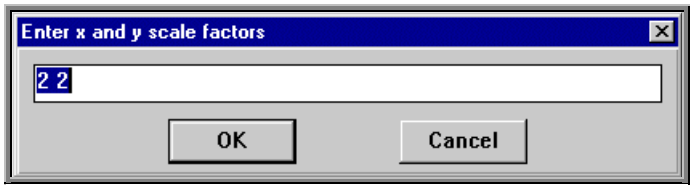
Enter point it must scale to

Move your cursor to the desired position. As you move your cursor, you can see the selection set being scaled. To retain the horizontal and vertical proportions of the selection set as you scale it, press the Shift key as you move the cursor.

To position the cursor exactly on the point it must scale to, see **Accurate Placement** *on page 497.*

Click or press Enter. The selection set is scaled.

Scaling by the Keyboard



Type in horizontal and vertical scaling factors separated by a space, then click OK or press Enter. The selection set is scaled.

26.06 Repeat

FUNCTION: The **Repeat** function is used to make rectangular (linear) or polar (radial) copies of the selection set.

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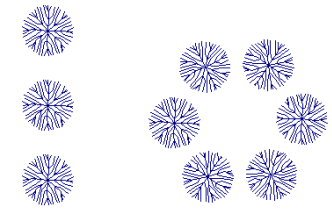


Rectangular Repeat | Polar Repeat

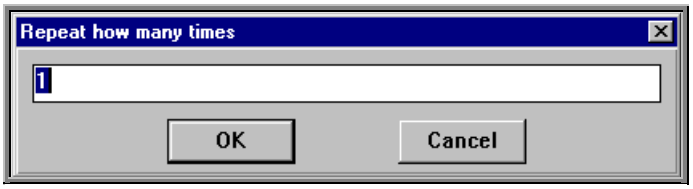
To access the **Repeat** function, press Alt S, M, R.

The **Repeat** function copies everything that has been selected. Before you use the command, you must select the entities you want to repeat using the **Start** ➪ **Edit** ➪ **Select** (Alt S, E, S - page 552) or **Start** ➪ **Edit** ➪ **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Repeat**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the entities you want to copy. When you have finished, press the Space Bar or click Cancel.



Type in the number of *additional* copies required and click OK or press ↵Enter. For example, if you type **2** you will end up with three copies of the selection set: the original and two copies.

Rectangular repeat? (else polar)

To repeat along a line, click Yes and go to **Rectangular Repeat**. To repeat in a circle, click No and go to **Polar Repeat**.

Rectangular Repeat

Enter point on original set

Position the cursor at a point on the selection set and click or press ↵Enter. This point acts as a reference point.

To position the cursor exactly on a specific point, see **Accurate Placement** *on page 497.*

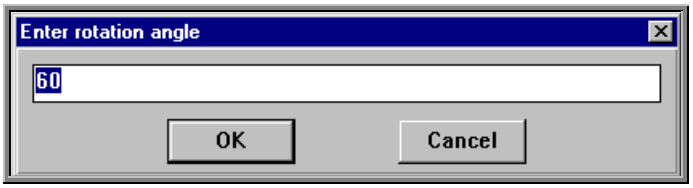
Enter point on repeated set

Position the cursor at the place where the first copy should be positioned. This position defines the distance between copies. All subsequent copies will be positioned at equal distances from each other. Click or press Enter. The selection set is repeated.

Polar Repeat

Enter point about which to rotate

Position the cursor at the center of the circle around which the copies will be placed and click or press Enter.



The default angle required to copy the selection set evenly around a circle will appear. Accept this default by clicking OK or pressing Enter. Alternatively, type an angle of your choice and click OK or press Enter. The selection set is repeated.

For example, to produce the polar repeat diagram at the beginning of this section you would have had to answer `5` to the question, Repeat how many times, and type `60` in answer to this question, for the number of degrees (6 copies multiplied by 60 degrees is 360 degrees - a complete circle).

The angle you type is measured counter-clockwise. If you do not know the angle and need to calculate it, you can type the necessary arithmetic expression, for example 360/4 instead of the angle. See **Calculations** in **Accurate Placement** on page 508.

Each copy produced by **Repeat** is a new object, with the same name and parent name as the original. For example, if you started off with one tree, which you repeated five times, you would end up with six trees. If you draw one part of an object and then use **Repeat** to complete the object, you have to group the repeated parts into a single object. You can do this using **Start** ➪ **Objects** ➪ **Group Into Object** (Alt S, O, O - page 767).

26.07 Drop

FUNCTION: The **Drop** function is used to copy the selection set.

To access the **Drop** function, press Alt S, M, D.

You can also copy the selection set using the **Start** ➪ **Edit** ➪ **Copy** *(Alt S, E, C - page 549) and* **Start** ➪ **Edit** ➪ **Paste** *(Alt S, E, P - page 550) functions.*

Unlike **Repeat**, **Drop** does not assume a regular interval between copies of the selection set. Copies are positioned individually.

The **Drop** function copies everything that has been selected. Before you use the command, you must select the entities you want to repeat using the **Start** ➪ **Edit** ➪ **Select** (Alt S, E, S - page 552) or **Start** ➪ **Edit** ➪ **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Drop**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the entities you want to copy. When you have finished, press the Space Bar or click Cancel.

Enter a point on selection set

Position the cursor on a point and click or press Enter. This point is a reference point that you will use to define where the copy will be placed.

To position the cursor exactly on a specific point, see **Accurate Placement** *on page 497.*

Enter point where you would like to copy selection set

As you move the cursor, you will see an image of the selection set moving with it. Position this image and click or press Enter. The copy will be drawn.

Enter point where you would like to copy selection set

As you move the cursor, you will see another image of the selection set moving with it. Position this copy and press Enter or click, or cancel copying by pressing Esc or the Space Bar, or by clicking on Cancel.

Each copy produced by **Drop** is a new object, with the same name and parent name as the original. For example, if you started off with one tree, which you repeated five times, you would end up with six trees. If you draw one part of an object and then use **Drop** to complete the object, you have to group the repeated parts into a single object. You can do this using **Start** ➪ **Objects** ➪ **Group Into Object** (Alt S, O, O - page 767).

26.08 Rotate

FUNCTION: The **Rotate** function is used to rotate the selection set.

To access the **Rotate** function, press Alt S, M, O.

You can also scale the selection set using **Start** ➪ **Edit** ➪ **Select** *(Alt S, E, S - page 552).*

The **Rotate** function rotates everything that has been selected. Before you use the command, you must select the entities you want to rotate using the **Start** ➪ **Edit** ➪ **Select** (Alt S, E, S - page 552) or **Start** ➪ **Edit** ➪ **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Rotate**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the entities you want to rotate. When you have finished, press the Space Bar or click Cancel.

Enter point about which to rotate

Position the cursor at the point about which the selection set will be rotated and click or press ↵Enter.

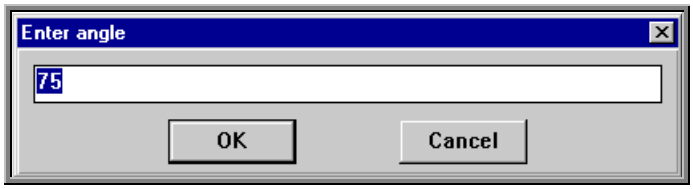
To position the cursor exactly on a specific point, see **Accurate Placement** *on page 497.*

Enter angle from keyboard (else from cursor)

If you know the angle of rotation, click Yes and go to **Rotating by Angle**.

If you want to rotate the selection set by dragging it with your cursor, click No and go to **Rotating by Cursor**.

Rotating by Angle



Type the rotation angle and click OK or press Enter. The selection set is rotated.

The rotation angle is measured counter-clockwise from the three o'clock position regardless of how you have set up the **Angular Format** in **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

If you do not know the angle and need to calculate it, you can type the necessary arithmetic expression, for example 360/4 instead of the angle. See **Calculations** in **Accurate Placement** on page 508.

Enter point that must move

You are now given the option to move the rotated selection set (see **Start** ➪ **Modify** ➪ **Move** (Alt S, M, M - page 625)). If you do not want to move the rotated selection set, cancel by pressing Esc or the Space Bar, or by clicking on Cancel.

Rotating by Cursor

Enter point that must rotate

Position the cursor at the point you want to use to drag the selection set around with and click or press Enter.

To position the cursor exactly on a specific point, see **Accurate Placement** *on page 497.*

Enter point it must rotate to

Position the cursor at a point to indicate the new inclination of the selection set, and click or press Enter. You will see the selection set rotating as you move the cursor.

Enter point that must move

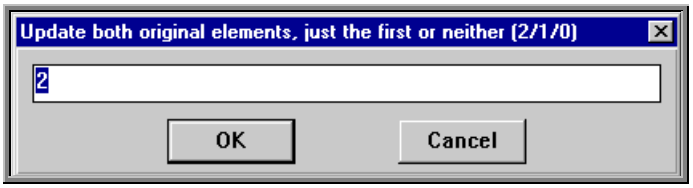
You are now given the option to move the rotated selection set (see **Start** ➪ **Modify** ➪ **Move** (Alt S, M, M - page 625)). If you do not want to move the rotated selection set, cancel by pressing Esc or the Space Bar, or by clicking on Cancel.

26.09 Trim

FUNCTION: The **Trim** function is used to automatically trim or extend a line or arc to join another one exactly.

To access the **Trim** function, press Alt S, M, T, or click the **Trim** icon ( ) on the **Drawing** window toolbar.

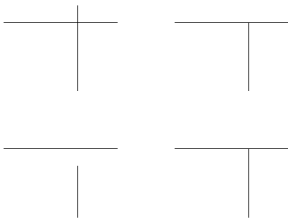
When you select the **Trim** function, the cursor switches to **Freehand** mode ( ) and you are prompted:



"Sight" Survey needs to know how many elements you want to update. Type **2**, or **1**, and click OK. The **0** option is irrelevant in this option.

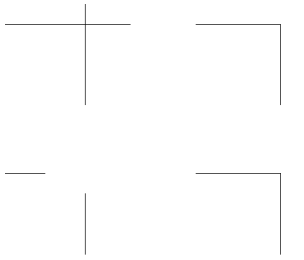
Update

If you choose **First Line**, one line or arc will be trimmed or extended to meet another line or arc.



Before Trim *After Trim*

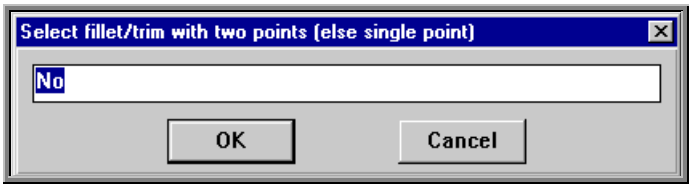
If you choose **Both Lines**, two lines or arcs will be trimmed or extended to meet each other.



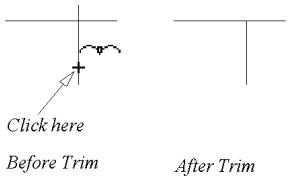
Before Trim *After Trim*

Use

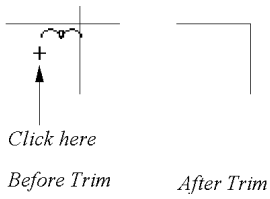
You need to tell "Sight" Survey how many points you want to use when selecting the elements to be trimmed.



Click OK to choose **Single Point**, and you will be able to select the lines or arcs to trim with one mouse click.



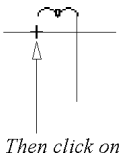
If you have chosen to update the **First Line**, you must click on the element you want to trim or extend. If you are trimming an element rather than extending it, ensure that you click on that part of the element to be retained after the trim.



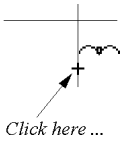
If you have chosen to update **Both Lines**, you must click inside the corner made by the two elements.

If you choose **Two Points**, you must select the lines or arcs to trim with two mouse clicks.

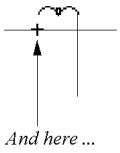
If you have chosen to update the **First Line**, you must click on the element you want to trim or extend ***first***. If you are trimming an element rather than extending it, ensure that you click on that part of the element to be retained after the trim.



Once you have clicked on the element to trim or extend, click on the element that it must be trimmed or extended to.



If you have chosen to update **Both Lines**, you must click on one of the elements you want to trim or extend, then on the other.



If you are trimming an element rather than extending it, ensure that you click on that part of the element to be retained after the trim.

When you have finished trimming, select another element to trim or extend or cancel by pressing Esc or the Space Bar, or by clicking on Cancel.

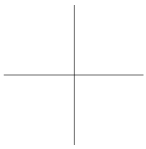
26.10 Fillet

FUNCTION: The **Fillet** function is used to insert radiused corners between elements or edits elements to join exactly.

To access the **Fillet** function, press Alt S, M, F, or right-click the **Trim** icon ( ) on the **Drawing** window toolbar.

The elements to be filleted may be arcs or lines. It doesn't matter whether they join, cross, or do not intersect at all. However, if you are going to fillet two elements that cross and you are going to update both elements (see **Update** in this section), you may need to divide the elements at the intersection to give four lines before filleting. For example:

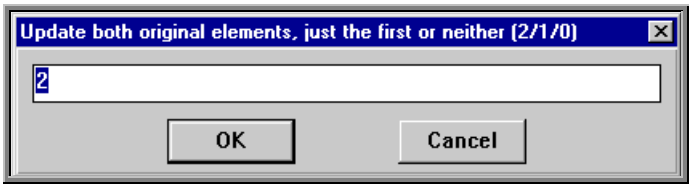
Two lines that cross like this ...



... will fillet like this if you update both elements...

unless you divide them at the intersection using the function **Start** ➪**Modify** ➪**Divide/Extend** (Alt S, M, V - page 647).

When you select the **Trim** function, the cursor switches to **Freehand** mode ( ) and you are prompted:



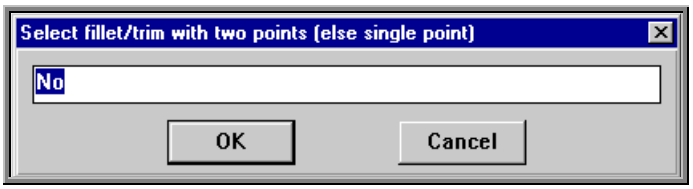
"Sight" Survey needs to know how many elements you want to update. Type **2**, **1**, or **0** and click OK.

Update If you choose to update **neither elements**, a fillet will be inserted between two elements, but the elements will not be updated.

If you choose to update just the **first element**, a fillet will be inserted between two elements and one of the elements will be updated.

If you choose to update **both elements**, a fillet will be inserted between two elements and both of the elements will be updated.

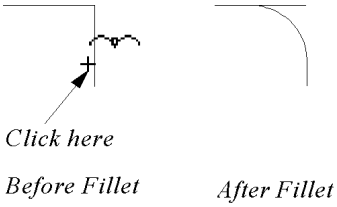
Use You need to tell "Sight" Survey how many points you want to use when selecting the elements to fillet.



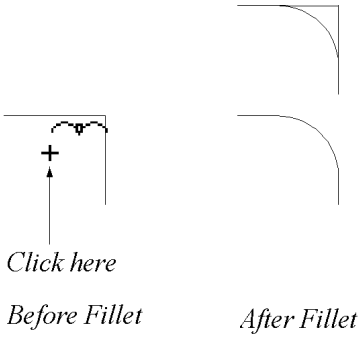
Click OK to choose **Single Point**, and you will be able to select the lines or arcs to trim with one mouse click.

Single Point

If you have chosen to update the **first element**, you must click near the element you want to update but ***inside*** the corner made by the two elements.



If you have chosen to update **neither** or **both elements**, you must click ***inside*** the corner made by the two elements.



Two Points

If you choose **Two Points**, you must select the elements to fillet with two mouse clicks.

If you have chosen to update the **first element**, you must click near the element you want to update ***first***. You must click ***inside*** the corner made by the two elements.

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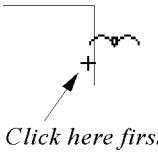
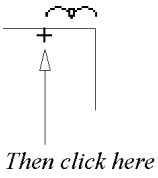
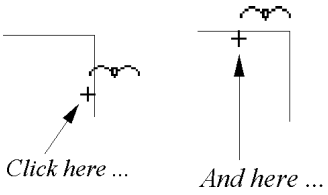


Once you have clicked near the element to update, click near the other element. Again, you must click on the inside of the corner made by the two elements.

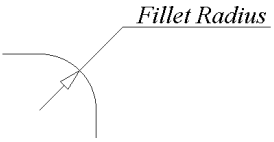


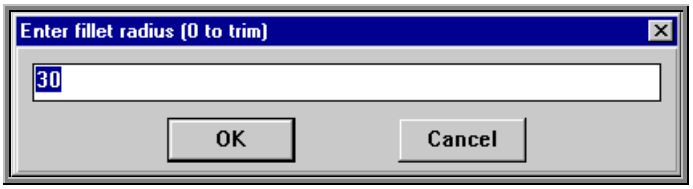
If you have chosen to update **neither** or **both elements**, you must click near to one of the elements to fillet between, then click near the other. You must click on the ***inside*** of the corner made by the two elements.



Radius

You now need to specify the radius to be used for filleting. "Sight" Survey prompts:





Type the fillet radius. If you type `0`, the **Fillet** function will operate in exactly the same way as the **Trim** function.

If your fillet is "inside out", you probably clicked outside the corner made by the elements being filleted, not inside. **Undo** *(click* or type OO - *page 547) the fillet and try again, clicking on the inside of the corner.*

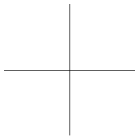
26.11 Chamfer

FUNCTION: The **Chamfer** function is used to draw a third, sloping line between two existing lines.

To access the **Chamfer** function, press Alt S, M, H.

However, if you are going to chamfer two elements that cross and you are going to update both elements (see **Update** in this section), you may need to divide the elements at the intersection to give four lines before filleting. For example:

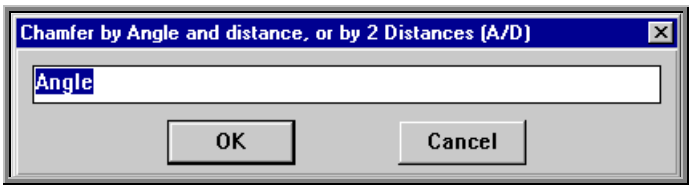
Two lines that cross like this ...



... will chamfer like this...

unless you divide them at the intersection using the function **Start** ➪**Modify** ➪**Divide/Extend** (Alt S, M, V - page 647).

When you select the **Chamfer** function, the cursor switches to **Freehand** mode ( ) and you are prompted:



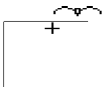
You can either specify a chamfer by angle and one distance or by two distances. Specify the chamfer method by typing **A** (by angle) or **D** (by distances, and clicking OK.

Distances are measured from the intersection point of the two lines even if they do not meet, and are applied to the lines in the order in which they are selected.

Select first line to be chamfered

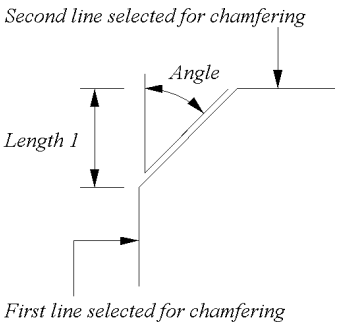
Position the cursor on or near the first line to be chamfered and click or press Enter.

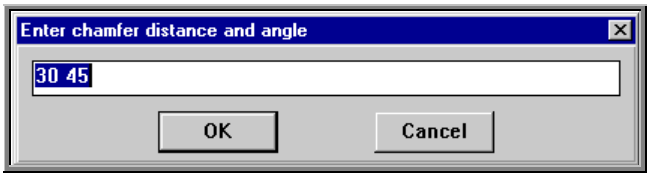
Second line



Position the cursor on or near the second line to be chamfered and click or press Enter.

Chamfer by Angle and Distance





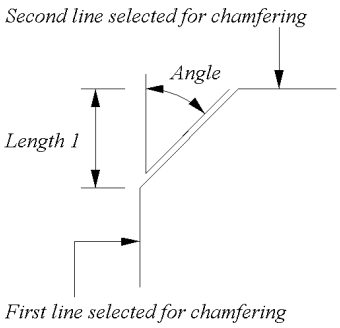
Type in a chamfer distance and a chamfer angle, separated by a space, and click OK or press Enter. In the example shown above, the distance is **30** drawing units, and the angle is **45** degrees.

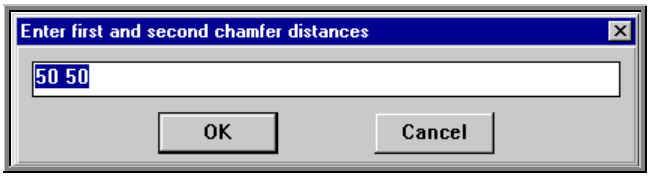
After specifying the units, the chamfer will be drawn. "Sight" Survey prompts:

Select first line to be chamfered

Click on another line to be chamfered, or cancel chamfering by pressing Esc or the Space Bar, or by clicking on Cancel.

Chamfer by Two Distances





Type in the two chamfer distance and a chamfer angle, separated by a space, and click OK or press ↵Enter. In the example shown above, both distances are **50** drawing.

After specifying the units, the chamfer will be drawn. "Sight" Survey prompts:

Select first line to be chamfered

Click on another line to be chamfered, or cancel chamfering by pressing Esc or the Space Bar, or by clicking on Cancel.

Section 26

26.12 Divide/Extend (BL)

FUNCTION: The **Divide/Extend** function is used to split or extend a line or arc.

To access the **Divide/Extend** function, type **BL** (for **B**reak **L**ine) or press Alt S, M, V.

This function has two purposes.

- Splitting a line or arc. When a line or arc is split, the two split ends form a point that can be snapped to exactly. Also, once a line or arc has been split, one part of it can be rubbed out or edited.

- Extending a line or arc. For example, extending a line to meet another line.

When you select **Divide/Extend**, "Sight" Survey prompts:

Select line or arc to be divided or extended

Position the cursor on the line or arc to be divided or extended and click or press Enter.

Enter point where you want to divide element (or point to extend it to)

If you want to divide the line or arc, position the cursor at the point where the split must take place and click or press Enter. If the point is not exactly on the line or arc, the split will take place at the nearest position on the line or arc.

If you want to extend the line or arc, position the cursor at the point you want to extend it to and click or press Enter. If the point does not lie exactly on the extended line or arc, the line or arc will be extended to the nearest position.

To position the cursor exactly on a specific point, see **Accurate Placement** *on page 497.*

26.13 Join Lines

FUNCTION: The **Join Lines** function is used to join the ends of two lines.

To access the **Join Lines** function, press Alt S, M, J.

?

Some lines are deleted when you use **Join Lines**. *This function is therefore described using two examples which show the action of* **Join Lines** *in two different instances.*

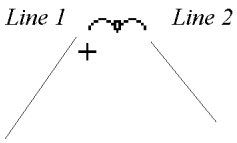
When using **Join Lines** *you should be in* **Freehand** mode ( ). *Click the* **Freehand** *icon ( ) in the* **Drawing** *window toolbar.*

Before using **Join Lines**, you must have two lines.

Select first line to be joined

Position your cursor at the end of one of the lines and click or press ↵Enter. ***The end of the line that you position your cursor close to will be deleted***.

Example 1

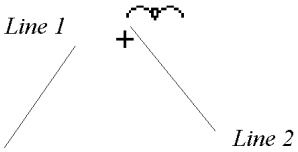


Example 2

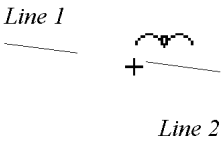
Select second line to be joined

Position your cursor at the end of the other line and click or press ↵Enter. ***The end of the line that you position your cursor close to will be deleted.***

Example 1



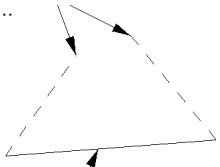
Example 2



The two lines are joined and the original lines are deleted.

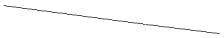
Example 1

These ends have been deleted ...



... to give this line

Example 2



Lines 1 and 2 have been joined

If the two original lines disappear and no new line is produced, click **Undo** ( ) and try again. Ensure that you are in **Freehand** mode ( ), and that you click at the ends of the lines that are to be deleted.

Select first line to be joined

Position the cursor near the end of another line and click or press Enter, or cancel the function by pressing Esc or the Space Bar, or by clicking on Cancel.

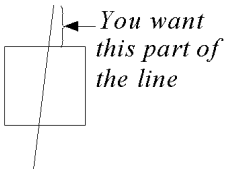
26.14 Cut and Rub

FUNCTION: The **Cut and Rub** function is used to rub out (erase) part of a line.

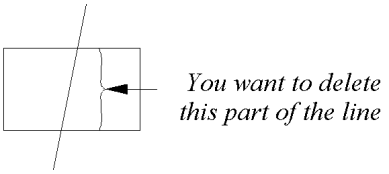
To access the **Cut and Rub** function, press Alt S, M, B.

Do you want to cut one place (else two places)

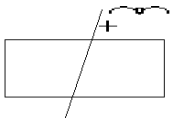
If you want to rub out the end of a line, and therefore only have to cut the line in one place, click Yes. Go to **Cutting in one place**.



If the part of the line that you want to rub out means that you must cut the line in two places, click **No**. Go to **Cutting in two places**.



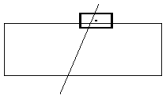
Cutting in one place

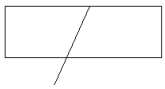


Select line to cut (between cut point and end)

Position your cursor between the cut point and the end of the line. Click or press Enter.

Select cut point





Notice that the cursor has switched from **Freehand** mode ( ) to **Grab All** mode ( ). By switching into **Grab All** mode, the **Cut and Rub** function assumes the piece of line you want to cut away is bounded by an intersection that must be snapped to exactly. If this is not the case, switch back to **Freehand** mode by clicking on the **Freehand** ( ) in the **Drawing** window toolbar.

Position the cursor so that the intersection is within the cursor box and click or press Enter.

The unwanted section of line disappears.

Cut another line (else exit)

If you want to cut another line, click **Yes**, otherwise click **No**.

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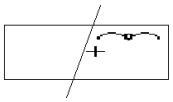
Cutting in two places

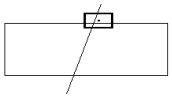
Select line to cut (between cut points)



Position your cursor between the two intersections. Click or press ↵Enter.

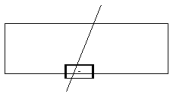
Enter first cut point

Notice that the cursor has switched from **Freehand** mode ( ) to **Grab All** mode ( ). By switching into **Grab All** mode, the **Cut and Rub** function assumes the piece of line you want to cut away is bounded by an intersection that must be snapped to exactly. If this is not the case, switch back to **Freehand** mode by clicking on the **Freehand** ( ) in the **Drawing** window toolbar.

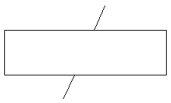


Position the cursor so that one of the intersections bounding the piece of line you want to rub out is within the cursor box and click or press ↵Enter.

Enter second cut point



Position the cursor so that the other intersection bounding the piece of line you want to rub out is within the cursor box and click or press ↵Enter.



The unwanted section of line disappears.

Cut another line (else exit)

If you want to cut another line, click Yes, otherwise click No.

26.15 Snip

FUNCTION: The **Snip** function is used to rub out (delete) everything inside or outside a box or circle.

To access the **Snip** function, press Alt S, M, S.

Snip cuts all lines, arcs and circles passing through the perimeter of a box or circle drawn around them. It can be used to create openings in walls before doors are placed, to create a space for text that would otherwise pass over previously drawn lines, to delete all but a small part of a drawing etc.

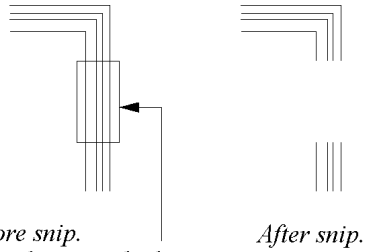
Annotations (text, arrows, dimensions) whose ***origins*** do not lie entirely within the snip box or circle will not be deleted.

Snip out box? (else circle)

To snip everything inside or outside a box, click Yes. To snip everything inside or outside a circle, click No.

Remove elements on inside? (else outside)

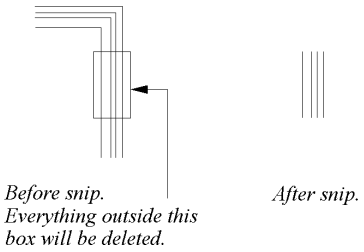
To delete everything inside a box or circle, click Yes.



Before snip. Everything inside this box will be snipped out.

After snip.

To delete that portion of the snipped entity outside a box or circle, click No.



Would you like to enter box/circle after snip

If you would like the snip box or circle to be drawn after the snip, click Yes. Otherwise click No.

Snipping inside or outside a box

Enter corner of snip box

Place the cursor at a corner of the snip box and click or press Enter.

To position the cursor exactly on a specific point, see **Accurate Placement** *on page 497.*

Enter second corner of rectangle

Move the cursor diagonally away from the first corner you entered and click or press Enter to delete elements inside or outside the box.

Enter new corner of snip box

When you move the cursor the snip box you have just defined moves with it. Place the snip box at another position and click or

press Enter. The elements inside or outside the box will be deleted. Cancel **Snip** by pressing Esc or the Space Bar, or by clicking Cancel.

Snipping inside or outside a circle

Enter center point of snip circle

Position the cursor at the center of the snip circle and click or press Enter.

To position the cursor exactly on a specific point, see **Accurate Placement** *on page 497.*

Enter point on radius

Position the cursor at a point on the snip circle's circumference and click or press Enter to delete elements inside or outside the circle.

Enter new center point of snip circle

When you move the cursor the snip circle just defined moves with it. Place the snip circle at another position and click or press Enter. The elements inside or outside the circle will be deleted. Cancel **Snip** by pressing Esc or the Space Bar, or by clicking on Cancel.

26.16 Move Selected to a New Layer (XY)

FUNCTION: The **Move Selected to a New Layer** function is used to move selection set to a particular layer.

To access the **Move Selected to a New Layer** function, type **XY** or press Alt S, M, Y.

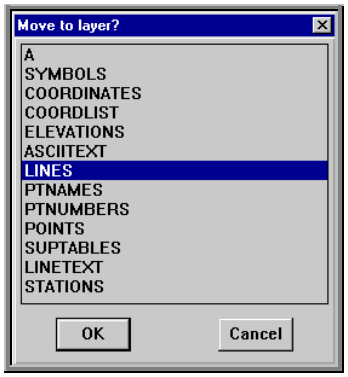
Before using this function, you must have created a layer to move the selection set to. See **Start** ➪ **Settings** ➪ **Layer Control** (, **EL** or Alt S, S, Y - page 839) .

1. *The layer containing items to be selected must be visible and unlocked.*
2. *The target layer does not need to be visible or unlocked.*
3. *Use* **Undo** *to restore items accidentally selected or moved to the wrong layer.*
4. *To move a copy of an object, use* **Copy** *and* **Paste** *before using this routine. This leaves the original item unchanged.*
5. *If an object that originally came from the* **Drawing** *window is pasted back into the* **Drawing** *window, it is placed onto its original layer.*
6. *If an object that did not originally come from the* **Drawing** *window is pasted into the* **Drawing** *window, it is placed onto the current layer.*

The **Move Selected to a New Layer** function moves everything that has been selected. Before you use the command, you must select the primitives you want to move using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Move Selected to a New Layer**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)



Select the entities you want to move to a new layer. When you have finished, press the Space Bar or click Cancel.

Once you have selected something to move into another layer, a layer name dialog box (as shown to the left) appears.

Click on the layer that the selection set must be moved to. The new layer that the selection set has been moved to is highlighted.

26.17 Copy Selected to a New Layer

FUNCTION: The **Copy Selected to a New Layer** function is used to copy selection set to a particular layer.

To access the **Copy Selected to a New Layer** function, press Alt S, M, C.

Before using this function, you must have created a layer to move the selection set to. See **Start** ➪ **Settings** ➪ **Layer Control** (, **EL** or Alt S, S, Y - page 839) .

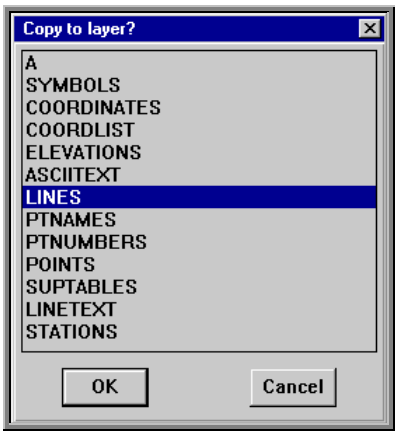
The **Copy Selected to a New Layer** function moves everything that has been selected. Before you use the command, you must select the primitives you want to move using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Copy Selected to a New Layer**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the entities you want to copy to a new layer. When you have finished, press the Space Bar or click Cancel.

Once you have selected something to move into another layer, a layer name dialog box appears.



Click on the layer that the selection set must be moved to. The new layer that the selection set has been moved to is highlighted.

26.18 Ellipse2Arcs

FUNCTION: The **Ellipse2Arcs** function is used to convert ellipses into 12 arcs so that they can be snipped.

To access the **Ellipse2Arcs** function, press Alt S, M, 2.

This function will not operate on part ellipses drawn using the **Start** ➪ **Draw** ➪ **Part Ellipse** *function (Alt S, D, E - page 604).*

Enter polygon about ellipses to be converted to arcs

Draw a polygon around the ellipses to be converted.

Enter polygon about ellipses to be converted to arcs

Either draw a polygon around more ellipses to be converted to arcs, or cancel ellipse conversion by pressing Esc or the Space Bar, or by clicking on Cancel.

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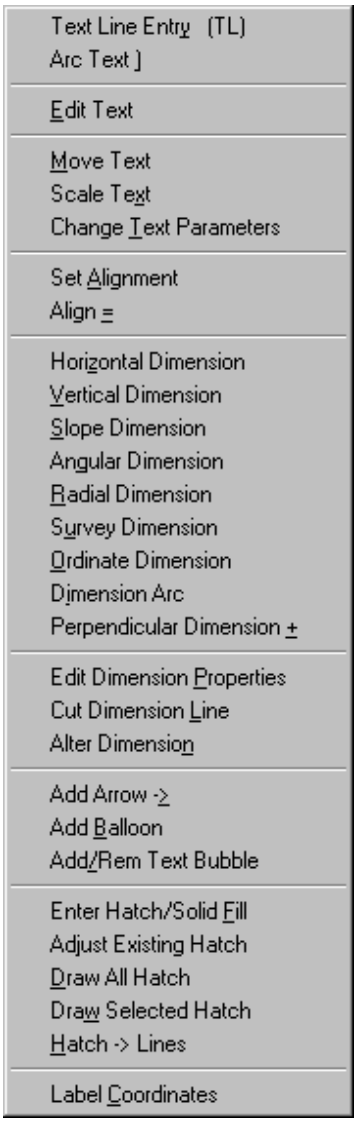
Start Menu - ANNOTATE



The **ANNOTATE** menu accessed from the Start button in the **Drawing** window is where you'll find commands for adding text to your drawing. Commands include various functions for adding text lines and around arcs. Commands for editing and scaling text are also found here, along with several options for dimension various aspects of your drawings. Finally, the Annotate menu also includes commands for hatching and filling, as well as for setting object alignment.

All annotation, hatches and fills placed by routines accessed through this menu are written to the current layer!

27.01 Text Line Entry (TL)

FUNCTION: The **Text Line Entry** function is used to write text to your drawing.

Access the **Text Line Entry** function in any one of these ways:

- Type **TL**.
- Press Alt S, A, Y.
- Click the **Text** icon (A) on the **Drawing** window.

Before entering text, use **Start** ➪ **Settings** ➪ **Set Text Defaults** (Alt S, S, E - page 820) to set the text parameters. You can also change the text parameters as you are entering the text into the **Text Entry** dialog box, or change the parameters of text that has already been entered using the **Set Text Defaults** function or the **Start** ➪ **Annotate** ➪ **Edit Text** (Alt S, A, E - page 664).

Text Line Entry allows you to type text directly into a "Sight" Survey drawing. You can also import text from a word processor

as an ASCII file using **Start** ➪**File** ➪**Import ASCII Text** (Alt S, F, T - page 527), or paste text into the drawing from a Windows word-processor or desk top publishing program using **Start** ➪**Edit** ➪**Paste** (Alt S, E, P - page 527).

This routine normally places text on a horizontal line. To place text along a line oriented at an angle, see **Placing Text at an Angle** on page 662.

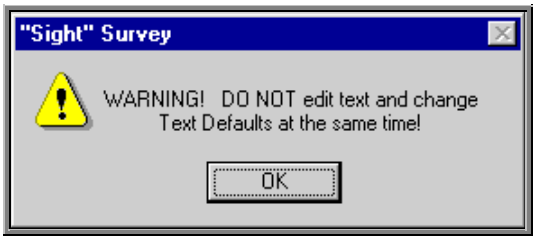
When you access the **Text Line Entry** function, "Sight" Survey prompts:

Enter text position

Position the cursor where you want the text to appear and click or press Enter. Where the text will appear relative to this position depends on the ***text label origin*** you have set using **Start** ➪**Settings** ➪**Set Text Defaults**.

To position the cursor accurately see **Accurate Placement** *on page 497.*

A warning message appears:

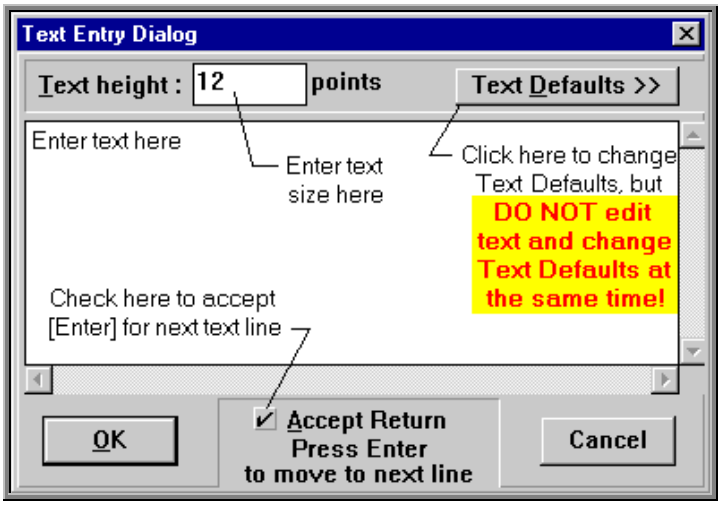


The **Text Entry** dialog box (shown on the next page) allows you to enter and/or edit text and set **Text Defaults** (i.e. change font, color, bold, etc.) at the same time. Some users experience sporadic problems when they have combined these operations. To date, we have been unable to consistently and remedy this problem.

É

To avoid a program crash, *if you have entered or edited text in the* **Text Entry** *dialog box,* ***DO NOT*** *click the* [Text Defaults >>] *button. Close the dialog box, then double-click the text to re-open the* **Text Entry** *dialog box, after which you can click the* [Text Defaults >>] *button and change your text settings.*

Click [OK] to erase the warning message and the **Text Entry** dialog box appears. Type the text, which will appear in the white area of the dialog box at the position of the black vertical cursor.



If you check the **Accept Return** box, you can enter a new line of text by pressing the [↵Enter] key on its own. Otherwise you must press the [Ctrl] and [↵Enter] keys at the same time to enter a new line of text.

If you want to change the text parameters from this dialog box, click on the [Text Defaults >>] button. You will enter **Start** ➪ **Settings** ➪ **Set Text Defaults** ([Alt][S], [S], [E] - page 820). ***DO NOT do this if you have entered or edited text – see the warning message above!***

If you want to change text height, you can type a new text height into the text height box. If you want to use different height units

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from those displayed, you must click Text Defaults >> to enter Start ➪Settings ➪Set Text Defaults.

When you have finished typing the text, click OK.

Enter text position

Position the cursor where you want another piece of text to appear and click or press ↵Enter. Cancel text entry by pressing Esc or the Space Bar, or by clicking on Cancel.

If you need to edit text content after you have entered it, for example because you have made a spelling mistake, double click on the text with the **Select Cursor** (▷). The text will appear in the **Text Entry** dialog box for editing. You can also use **Start ➪Annotate ➪Edit Text** (Alt S, A, E - page 664).

To place text along a line see **Accurate Placement** *on page 497.*

Placing Text at an Angle

When you access the **Text Line Entry** function, "Sight" Survey prompts:

Enter text position

Position the cursor on the line to which you want to align text. ***DO NOT click the cursor.*** Instead, press K to lock the cursor to the angle of the line. Now move the cursor to the desired text location and click. Then enter text just as before.

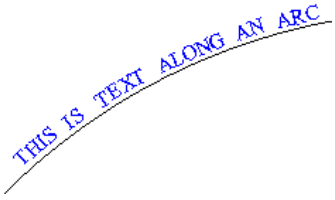
If you want text perpendicular to the line, press U after you have pressed K.

Text will stay locked at the angle until you exit the **Text Line Entry** function. The next time you enter the function, text will default to horizontal.

27.02 Arc Text

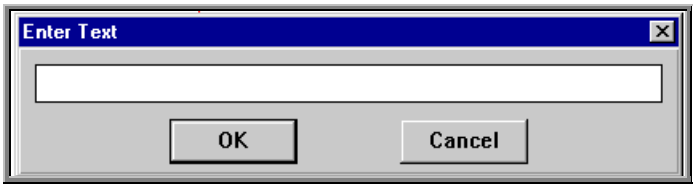
FUNCTION: The **Arc Text** function is used to place text around an arc.

To access the **Arc Text** function, press Alt S, A,).



Select arc to place text on

Position your cursor on the arc you want to place the text around and click or press ↵Enter.



Type the text you want to place around the arc and click OK or press ↵Enter.

The text is placed around the arc, centered between the ends of the arc.

If you are placing text around a circle, the text will be centered on the 3:00 o'clock position. You may rotate the text around the circle to the desired position using **Start ➪Modify ➪Rotate** (Alt S, M, O - page 636) .

Arc Text is actually drawn one character at a time, after which it is grouped into a single object. Therefore, if you double-click to edit the text properties, you will only be able to edit one letter at a time. If you want to delete or move the text, it will perform as a single object. However, if you want to delete only a portion of the text, you must first explode the text object using **Start ➪Objects ➪Explode Object** (Alt S, O, X - page 770) .

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27.03 Edit Text

FUNCTION: The **Edit Text** function is used to edit existing text.

To access the **Edit Text** function, press Alt S, A, E.

You can also edit text content by double clicking on the piece of text you want to edit with the **Select Cursor** *( ).*

É

Some users experience sporadic problems when they edit text and then try to change **Text Defaults** *at the same time. To date, we have been unable to consistently and remedy this problem.* ***To avoid a program crash,*** *if you have entered / edited text in the* **Text Entry** *dialog box,* ***DO NOT*** *click the* Text Defaults >> *button. Close the dialog box, then double-click the text to re-open the* **Text Entry** *dialog box, after which you can click the* Text Defaults >> *button and change your text settings.*

The **Edit Text** function edits all the text that has been selected. Before you use the command, you must select the text you want to edit using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Edit Text**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the text you want to edit. When you have finished, press the Space Bar or click Cancel.

The text you have selected will appear inside the **Text Entry** dialog box (see page 661), where it can be edited.

If you have selected several pieces of text to edit, only one will appear at one time. The next will appear when you have finished editing the first piece of text and have clicked OK.

If you want to change the text parameters from this dialog box, click on the Text Defaults >> button. You will enter **Start** ➪ **Settings** ➪ **Set Text Defaults** (Alt S, S, E - page 820). ***DO NOT do this if you have entered or edited text – see the warning message on the previous page!***

If you just want to change text height, you can type a new text height into the text height box. If you want to use different height units from those displayed, you must click Text Defaults >> to enter **Start** ➪ **Settings** ➪ **Set Text Defaults**.

When you have finished editing the text, click OK.

27.04 Move Text

FUNCTION: The **Move Text** function is used to move all text that has been selected.

To access the **Move Text** function, press Alt S, A, M.

You can also move text using the **Select Cursor** *(▷). Select the text you want to move, then drag it to a new location using your mouse.*

The **Move Text** function moves all the text that has been selected. Before you use the command, you must select the text you want to move using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Move Text**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the text you want to move. When you have finished, press the Space Bar or click Cancel.

Enter point on text that must move

Position the cursor at a point on the text and click or press ↵Enter. This point is a reference point that you will use to define the movement.

Enter new text position

Position the cursor to indicate the position the selected point must move to and click or press ↵Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

27.05 Scale Text

FUNCTION: The **Scale Text** function is used to change the scale of selected text.

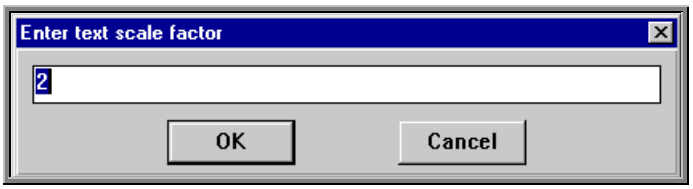
To access the **Scale Text** function, press Alt S, A, E.

The **Scale Text** function scales all the text that has been selected. Before you use the command, you must select the text you want to scale using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Scale Text**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the text you want to scale. When you have finished, press the Space Bar or click Cancel.



Type the text scale factor. For example, if you want the text to be twice as big, type **2**. Then click OK or press Enter.

Scaling takes place about the text label origin as set in **Start** ➪**Settings** ➪**Set Text Defaults** (Alt S, S, E - page 820).

27.06 Change Text Parameters

FUNCTION: The **Change Text Parameters** function is used to alter the characteristics of the text.

To access the **Change Text Parameters** routine, press Alt S, A, T.

You can edit the text parameters of a single piece of text by double clicking on it with the **Select Cursor** *(▷). The text you have selected will appear inside the* **Text Entry** *dialog box. Click on the* Text Defaults >> *button to enter* **Start** ➪**Settings** ➪**Set Text Defaults** *(Alt S, S, E - page 820).*

Change Text Parameters allows you to change the text parameters of all text that has been selected. Before you use the command, you must select the text whose parameters you want to change using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

If you haven't selected anything when you choose **Change Text Parameters**, you will automatically enter the **Select** function as soon as you choose the command. "Sight" Survey prompts:

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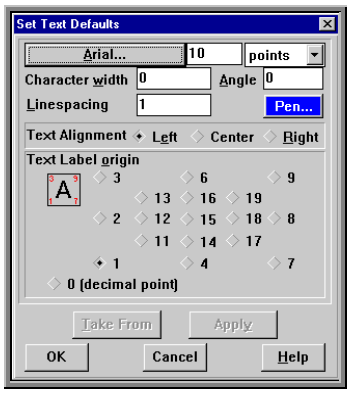


Select Single Entity (Shift for multiple selection)

Select the text whose parameters you want to change. When you have finished, press the Space Bar or click Cancel. The **Set Text Defaults** dialog box will appear. Complete instructions for the available settings are discussed beginning on page 820.

When you have edited the parameters, you can exit the dialog box by clicking OK or Apply. The parameters of all the selected text will be updated.

27.07 Set Alignment

FUNCTION: The **Set Alignment** function is used to define how the selection set should be aligned, or align the selection set horizontally or vertically.

To access the **Set Alignment** function, press Alt S, A, A., or click the **Align Objects** icon ( ) in the **Drawing** window toolbar.

"Grid lines" are referred to in this section. When you use **Start** ➪ **Tools** ➪ **Grid** *to create a grid in "Sight" Survey, only the dots representing the intersections between the horizontal and vertical grid lines are displayed.*

Use **Set Alignment** to determine how the selection set will be aligned next time you use **Start** ➪ **Annotate** ➪ **Align** (Alt S, A, = - page 671). The selection set is all the items that have been selected using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

To align or distribute the selection set, use **Select** or **Selection Filters** to select the items you want to align. Then select **Set Alignment**. Edit the dialog box to your satisfaction and click Apply.

When you select **Set Alignment**, the **Align** dialog box appears.

Align: To Each Other or To Grid

If you check **To Each Other** in the **Align** dialog box, the selection set will be aligned with itself. In the example below, the selection set has been left aligned. The items in the selection set have been aligned with the left hand edge of the square, because this was the left most thing in the selection set before alignment.

The align **To Each Other** *and* **To Grid** *options are only relevant to* **Align**, *not to* **Distribute**.

If you check **To Grid**, the selection set will be aligned to the nearest grid line There must be a grid on the screen before you align using **To Grid**, or nothing will happen. See **Start** ➪ **Tools** ➪ **Grid** (Alt S, T, D - page 747).

Alignment

The **Vertical** section of the **Align** dialog box allows the items in the selection set to be aligned to the **Top**, **Center** or **Bottom**. The **Horizontal** section of the **Align** dialog box allows the items in the selection set to be aligned to the **Left**, **Center** or **Right**.

Items in the selection set can be aligned both horizontally and vertically at the same time.

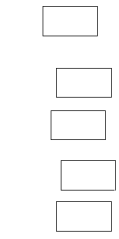
Distribution

Distribution refers to the practice of placing selected objects at equal spacing to one another Before you distribute items, they must be ***approximately*** positioned. Distribute will not work on randomly placed items.

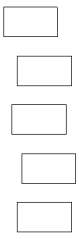
The align **To Each Other** *and* **To Grid** *options are only relevant to* **Align**, *not to* **Distribute**.

Vertical Distribution

Distribution may take place vertically or horizontally. When you select **Vertical Distribution** you must specify **Top**, **Center**, or **Bottom**. For example: If you specify **Top**, selected objects are repositioned so that their tops are equally spread between the top of the top object and the top of the bottom object.



Before Distribution



After Distribution

Horizontal Distribution

.When you select **Horizontal Distribution** you must specify **Left**, **Center**, or **Right**. For example: If you specify **Left**, selected objects are repositioned so that their left sides are equally spread between the left side of the left-most object and the left side of the right-most object.

Before Distribution

After Distribution

Combining Distribution and Alignment

You can combine alignment and distribution into one operation. The possible combinations are:

- Vertical Alignment & Horizontal Alignment
- Vertical Alignment & Horizontal Distribution
- Vertical Distribution & Horizontal Alignment
- Vertical Distribution & Horizontal Distribution

27.08 Align =

FUNCTION: The **Align** function is used to align and/or distribute the selection set.

To access the **Align** function, press Alt S, A, =., or click the **Align** icon ( ) on the **Drawing** window toolbar.

The **Align** function aligns everything that has been selected. Before you use the command, you must select the entities you want to align using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands, or nothing will happen.

One item cannot be aligned with itself. You must select at least two items to align or three to distribute, or nothing will happen.

The way that the selection set is aligned and/or distributed depends on the way you have set up the **Align** dialog box. See **Start** ➪ **Annotate** ➪ **Set Alignment** (Alt S, A, A - page 668).

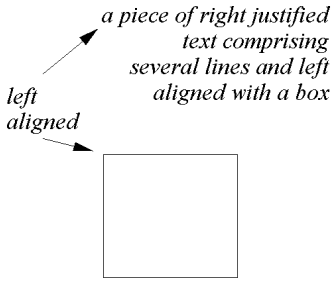
Aligning Text

Text may not look as though it has been aligned with the other items in the selection set. This is because the text characters are enclosed in a "cell" with a space above them and below them. For example, when aligning text to the **`top`**, it is not the top of the character that is aligned, but the top of the "cell".

The **text label origin** associated with a piece of text does not affect the way that text is aligned using **Align**. See **Start** ➪ **Settings** ➪ **Set Text Defaults** (Alt S, S, E - page 820)).

Each piece of text is associated with a text alignment, defined in **Start** ➪ **Settings** ➪ **Set Text Defaults**. If you have a piece of text comprised of several lines, this ***does*** affect the way that text is aligned using **Align**.

For example, the text alignment of the piece of text has been set to "**`right`**" in the **Set Text Defaults** dialog box.



When you use **Align** to left align it with another item, the left-hand edge of the piece of text is aligned, but the lines remain right justified.

To align all the text to the left, you must change the text alignment associated with the piece of text to "left". Do this by double clicking on the piece of text with the **Select Cursor** (▷). The selected text you have will appear inside the **Text Entry** dialog box. Click on the Text Defaults >> button to enter the **Set Text Defaults** dialog box. Change **Text Alignment** to `left`, then click OK.

27.09 Horizontal Dimension

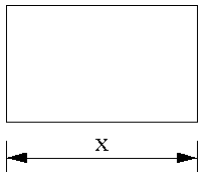
FUNCTION: The **Horizontal Dimension** function is used to place horizontal dimensions on the drawing.

To access the **Horizontal Dimension** function, press Alt S, A, Z, or click the **Dimension** icon ( ) on the **Drawing** window toolbar and press H.

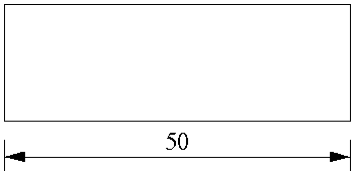
Dimension appearance (text height, arrow size, number of decimals, etc.) is set using **Start** ➪ **Settings** ➪ **Dimension Defaults** (Alt S, S, N - page 826). The settings in **Dimension Defaults** will affect ***all*** the dimensions on your drawing (except those placed while doing COGO), including previously drawn ones. This means that if you are not satisfied with the way your dimensions look, you can change them at any stage.

You can change the text content, arrow type and witness line color of individual dimensions using **Start** ➪ **Annotate** ➪ **Edit Dimension Properties** (Alt S, A, P - page 705).

Horizontal dimensions are fully ***associative***. This means that if you change the size of a dimensioned object using, for example, **Stretch**, **Scale** or **Move Point**, the dimensions will automatically update to reflect the new size. You can also change horizontal dimensions to cause a change in the size of dimensioned object. See **Start** ➪ **Annotate** ➪ **Alter Dimension** (Alt S, A, N - page 705).



For example, this object has been dimensioned *x*.



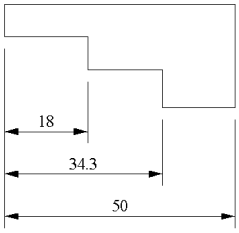
If you replace the *x* with *50*, for example, using the **Alter Dimension** function, the object will change size so that it is *50* units long.

Horizontal dimensions need not dimension horizontally aligned points, although horizontal distances will be measured. If you do not want to measure horizontal distances, use **Start** ➪**Annotate** ➪**Slope Dimension** (Alt S, A, S - page 679).

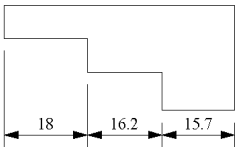
Mechanical Style

If you have checked the **Mechanical Style** button in **Start** ➪**Settings** ➪**Dimension Defaults**, "Sight" Survey prompts:

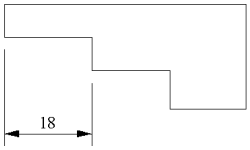
Type **R** for Running, **C** for Chained, or **F** for Free. Click OK or press Enter.



Dimensions may be **running**,

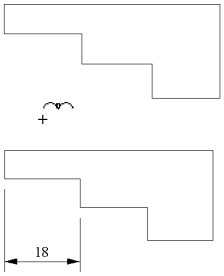


or they may be **chained**,



or they may be **free** (just one isolated dimension).

Enter text position



The cursor switches to **Freehand** mode ( ). Position it and click or press Enter.

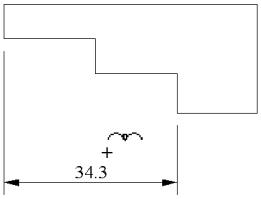
The text and dimension line will be positioned at the cursor position.

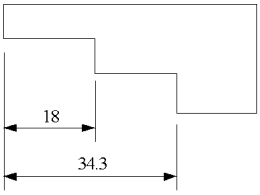
The text will automatically be centered between the witness lines. If you do not want the text centered, you can move it to the desired

position after you have drawn the dimension, using the **Start** ➪ **Modify** ➪ **Stretch** (Alt S, M, E - page 623).

To position the cursor accurately see **Accurate Placement** *on page 497.*

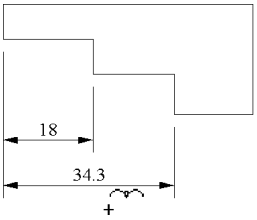
If you are drawing **running** or **chained** dimensions and you position the cursor close to an existing dimension, the new dimension text and line will be drawn relative to this existing dimension regardless of the cursor position. For example: If you position the cursor as shown below to the left,

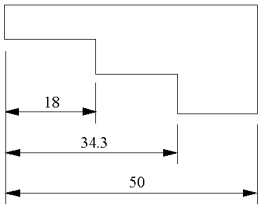




the new dimension text and line will be positioned as shown above to the right.

If you position the cursor as shown below to the left,

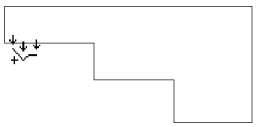




The new dimension text and line will be positioned as shown above to the right.

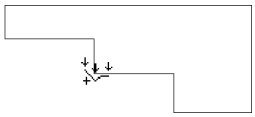
The spacing between subsequent dimensions is determined by the **Linefeed** option in **Start** ➪ **Settings** ➪ **Dimension Defaults**.

Enter first point

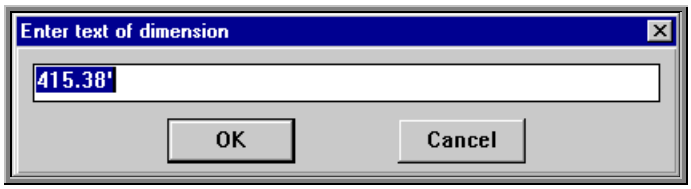


The cursor will switch to **Point** mode ( ). Position it close to the first point to be included in the dimension and click or press Enter. The cursor will automatically jump onto the point. If you do not want to jump onto the point you can change cursor modes, for example by clicking on the **Freehand Icon** ( ) in the **Drawing** window toolbar.

Enter next point



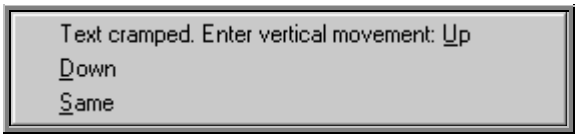
Position the cursor close to the next point to be included in the dimension and click or press Enter.



The distance between the two points is measured and is displayed on the screen as text in the prompt. At this point you can:

- Click OK or press ↵Enter to accept the dimension as it is.
- Edit the dimension. For example, if your convention is to show dimensions to the nearest 10 or 50 you might overtype a dimension of 2134 with 2150. This will not update the positions of the points it refers to and should thus be entered as **2150 NTS** (not to scale) so that someone else taking over the drawing will know that the exact measured dimension is not in fact 2150.
- Add notes to the dimension.
- Replace the dimension. For example, you might be dimensioning a generic object. In this case, you could overtype the dimension that is displayed with a variable letter such as X. You could later use the **Alter Dimension** function to assign an exact value to X. See **Start** ➪ **Annotate** ➪ **Alter Dimension** (Alt S, A, N - page 705). **Alter Dimension** only works on horizontal and vertical dimensions.

When you are satisfied with the text in the prompt, click OK or press ↵Enter.



This menu only appears if your text is too large to fit comfortably in the available space. Choose one of the options. If you select **Up** or **Down** the text will be moved in the relevant direction.

This menu only appears if your text is too large to fit comfortably in the available space. Choose one of the options. If you select **`Left`** or **`Right`** the text will be moved in the relevant direction.

If you have checked the **Architectural Style** *button in* **Start** ➪**Settings** ➪**Dimension Defaults**, *go to the* **Enter Next Point** *prompt on page 678.*

If you are drawing **Running** or **Chained** dimensions, "Sight" Survey prompts:

Enter next point

Position the cursor close to the next point to be included in the dimension and press Enter or click. Or you may cancel dimension drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

If you are drawing **Free** dimensions, "Sight" Survey prompts:

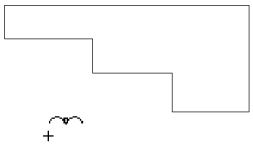
Enter text position

Enter the text position for another dimension, or cancel dimension drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

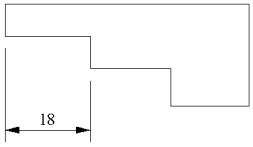
Mechanical Style

If you have checked the **Architectural Style** button in **Start** ➪**Settings** ➪**Dimension Defaults**, "Sight" Survey prompts:

Enter text position



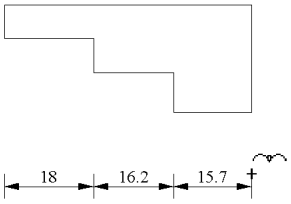
The cursor will switch to **Freehand** mode ( ). Position it and click or press Enter.



The text and dimension line will be positioned at the cursor position.

The text will automatically be centered between the witness lines. If you do not want the text centered, you can move it to the desired position after you have drawn the dimension, using the **Start** ➪ **Modify** ➪ **Stretch** (Alt S, M, E - page 623).

To position the cursor accurately see **Accurate Placement** *on page 497.*



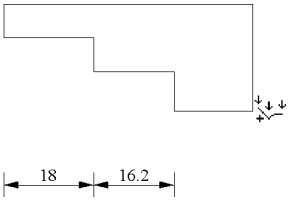
Enter position leader lines should extend to

Position the cursor where you want the leader lines to extend to and click or press Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

The next four prompts are the same as those beginning with the **Enter First Point** *prompt on page 675.*

Enter next point



Position the cursor close to the next point to be included in the dimension and click or press Enter. Or you may cancel dimension drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

27.10 Vertical Dimension

FUNCTION: The **Vertical Dimension** function is used to write vertical dimensions to your drawing.

To access the **Vertical Dimension** function, press Alt S, A, V, or click the **Dimension** icon ( )on the **Drawing** window toolbar.

This function works in exactly the same way as **Horizontal Dimension** (page 672) except that vertical dimensions are produced instead of horizontal ones.

27.11 Slope Dimension

FUNCTION: The **Slope Dimension** function is used to write slope dimensions to your drawing.

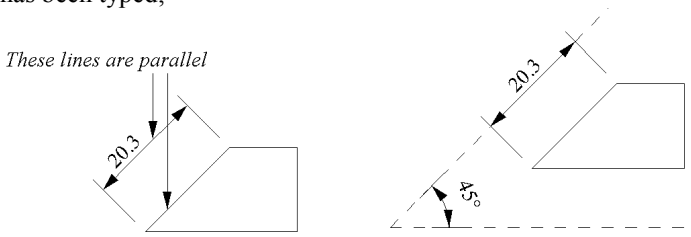
To access the **Slope Dimension** function, press Alt S, A, S, or click the **Dimension** icon ( ) on the **Drawing** window toolbar and press S.

Dimension appearance (text height, arrow size, number of decimals, etc.) is set using **Start** ➪ **Settings** ➪ **Dimension Defaults** (Alt S, S, N - page 826). The settings in **Dimension Defaults** will affect ***all*** the dimensions on your drawing (except those placed while doing COGO), including previously drawn ones. This means that if you are not satisfied with the way your dimensions look, you can change them at any stage.

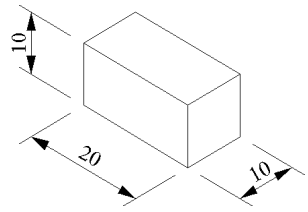
You can change the text content, arrow type and witness line color of individual dimensions using **Start** ➪ **Annotate** ➪ **Edit Dimension Properties** (Alt S, A, P - page 705).

Slope dimensions are fully ***associative***. This means that if you change the size of a dimensioned object using, for example, **Stretch**, **Scale** or **Move Point**, the dimensions will automatically update to reflect the new size.

There are three sloping dimension options: A dimension **parallel** to the line being dimensioned (below left); A dimension at a **fixed angle** that you type in (below right). In this example, 45 degrees has been typed;



And an **isometric dimension** where the witness lines are angled at 60 or 120° to the line being dimensioned. If you want to enter an isometric dimension, the **Isometric Grids** box in the **Start** ➪ **Settings** ➪ **Drawing Settings** dialog box must be checked.



Do you want dimension at fixed angle, (else take angle from points)

If you want to draw a dimension **parallel** to the line being dimensioned, click **No** and go to **Parallel sloping dimensions**.

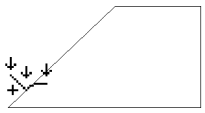
If you want to draw a dimension at a **fixed angle** that you type in, click **Yes** and go to **Dimensions at fixed angles**.

If the **Isometric Grids** box in the **Start** ➪ **Settings** ➪ **Drawing Settings** dialog box is checked and you want to draw an isometric dimension, click **Yes** and go to **Isometric dimensions**.

Parallel sloping dimensions

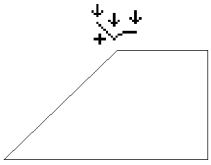
The cursor will switch to **Point** mode ( ).

Enter first point

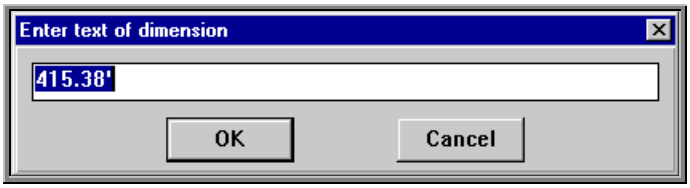


Position it close to the first point to be included in the dimension and click or press Enter. The cursor will automatically jump onto the point. If you do not want to jump onto the point, you can change cursor modes.

Enter next point



Position the cursor close to the next point to be included in the dimension and click or press Enter.

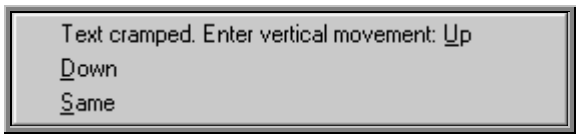


The distance between the two points is measured and is displayed on the screen as text in the prompt. At this point you can:

- Click OK or press Enter to accept the dimension as it is.
- Edit the dimension. For example, if your convention is to show dimensions to the nearest 10 or 50 you might overtype a dimension of 2134 with 2150. This will not update the positions of the points it refers to and should thus be entered as `2150 NTS` (not to scale) so that someone else taking over the drawing will know that the exact measured dimension is not in fact 2150.
- Add notes to the dimension.
- Replace the dimension.

When you are satisfied with the text in the prompt, click OK or press Enter.

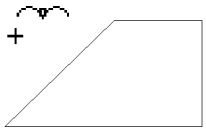
Section 27



This menu only appears if your text is too large to fit comfortably in the available space. Choose one of the options. If you select **Up** or **Down** the text will be moved in the relevant direction.

This menu only appears if your text is too large to fit comfortably in the available space. Choose one of the options. If you select **Left** or **Right** the text will be moved in the relevant direction.

Enter text position



Place the cursor where you want the text to appear and click or press Enter. Note that the cursor mode has changed back to **Freehand** mode ( ).

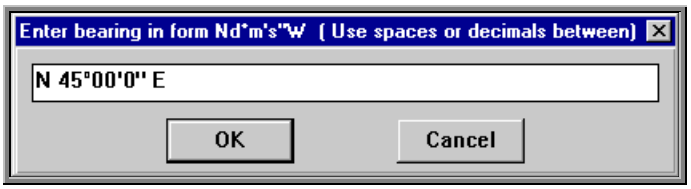
The text will automatically be centered between the witness lines. If you do not want the text centered, you can move it to the desired position after you have drawn the dimension, using the **Start** ➪ **Modify** ➪ **Stretch** (Alt S, M, E - page 623).

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter first point

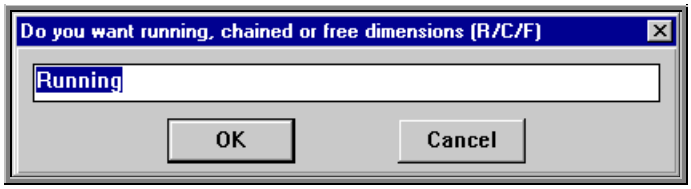
Enter the first point of another dimension or cancel dimensioning by pressing Esc or the Space Bar, or by clicking on Cancel.

Dimensions at fixed angles



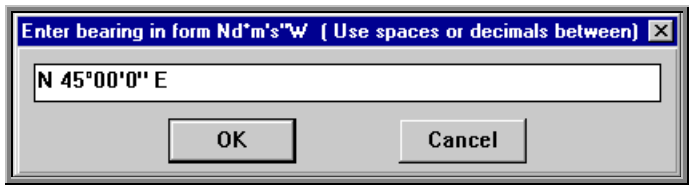
Type in the angle at which want the dimension to be drawn. If you are working in decimal angles, you will be asked to enter the bearing in the form dd.dddd (for example 45.5 degrees). If you are working in degrees, minutes and seconds, you will be asked to enter the bearing in degrees, minutes and seconds. When you have entered the angle click OK or press ↵Enter.

The way that angles are measured (for example counter-clockwise from 3 o'clock) depends on the way you have set up the **Angular Format** in **Start** ➪ **Settings** ➪ **Drawing Settings**.



This question, and the remaining questions are the same as for **Horizontal Dimensions**. *Please continue on page 673.*

Isometric dimensions



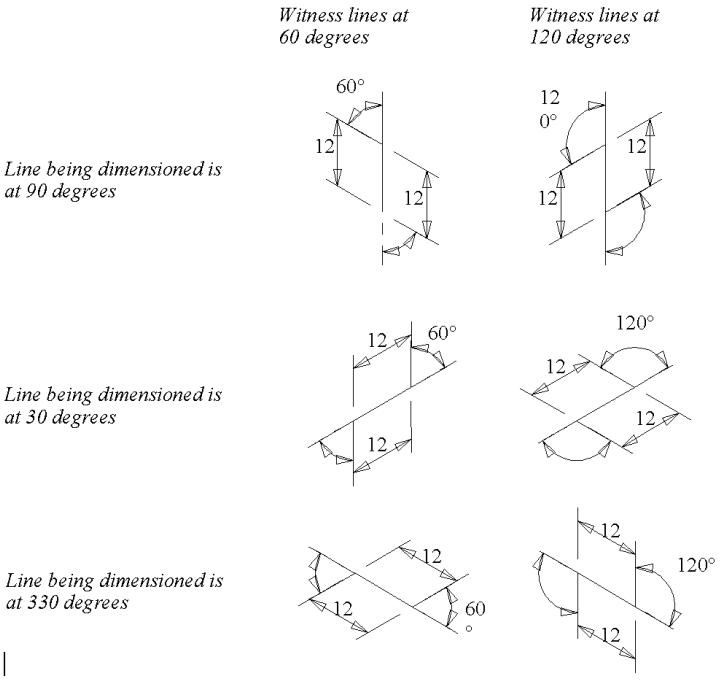
Type in the angle at which you want the dimension to be drawn and click OK or press ↵Enter. This will be the same angle as the line you are dimensioning: 30, -30 or 90 degrees if you are doing an isometric drawing and have set up the **Angular Format** to measure counter-clockwise from the 3 o'clock position.

The way that angles are measured depends on the way you have set up the **Angular Format** in **Start** ➪ **Settings** ➪ **Drawing Settings**.

Do you want witness lines to be at angle +60 (else at angle +120)

Click [Yes] if you want the witness lines to be angled at 60 degrees to the line being dimensioned, or [No] if you want the witness lines to be angled at 120 degrees (see diagram below).

This question, and the remaining questions are the same as for **Horizontal Dimensions**. *Please continue on page 673.*



27.12 Angular Dimension

FUNCTION: The **Angular Dimension** function is used to dimension angles or arc lengths.

To access the **Angular Dimension** function, press Alt S, A, G, or click the **Dimension** icon ( ) on the **Drawing** window toolbar and press A.

Dimension appearance (text height, arrow size, number of decimals, etc.) is set using **Start** ➪ **Settings** ➪ **Dimension Defaults** (Alt S, S, N - page 826). The settings in **Dimension Defaults** will affect ***all*** the dimensions on your drawing (except those placed while doing COGO), including previously drawn ones. This means that if you are not satisfied with the way your dimensions look, you can change them at any stage.

Angular dimensions are not affected by the **Witness Gap** and **Witness Overshoot** options in **Start** ➪ **Settings** ➪ **Dimension Defaults**.

You can change the text content of individual dimensions using **Start** ➪ **Annotate** ➪ **Edit Dimension Properties** (Alt S, A, P - page 705). However, you ***cannot*** change angular dimension witness line or dimension arrow colors once you have drawn the dimension.

Angular Dimension gives four options:

1. Dimensioning an angle between two existing lines;
2. Dimensioning an angle between three points;
3. Dimensioning an existing arc length; and
4. Dimensioning an arc length between three points.

When you access the **Angular Dimension** function, "Sight" Survey prompts:

```
Do you want angle (else arc length)
```

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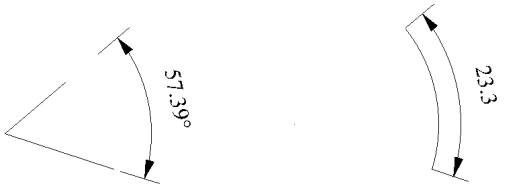
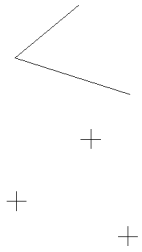
If you want to dimension an angle (below left), click Yes and go to **Dimensioning Angles** below.

If you want to dimension an arc length (below right), click No and go to **Dimensioning Arc Lengths** on page 690.



Dimensioning Angles

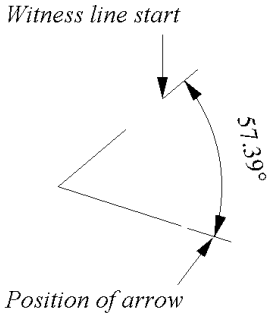


Is this dimension between two existing lines?

If there are two **intersecting** lines you want to dimension, click Yes and go to **Dimensioning Angles Between Two Existing Lines** on page 686. (The lines must actually intersect.)

If you want a dimension between three points, click No and go to **Dimensioning Angles Between Three Points** on page 688.

Dimensioning Angles Between Two Existing Lines



Select first line

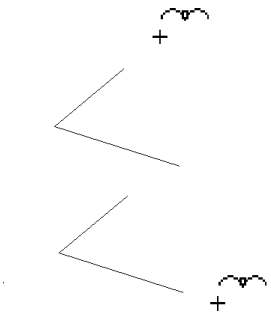
Position the cursor near one of the two lines to be dimensioned and click or press Enter.

Select second line

Position the cursor near the other line and click or press Enter.

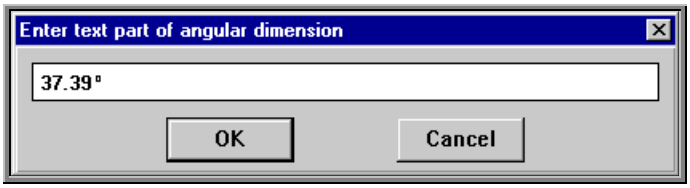
Enter witness line start

Position the cursor where you want the witness lines to start and click or press Enter.



Enter witness line end

Position the cursor at the place where you want the dimension arrow to be and click or press ↵Enter.



The angle between the two lines is measured and is displayed on the screen as text in the prompt. At this point you can:

- Click OK or press ↵Enter to accept the dimension as it is.
- Edit the dimension.
- Add notes to the dimension.
- Replace the dimension.

When you are satisfied with the text, click OK or press ↵Enter.

To obtain a degree symbol, type Alt 0176. Hold down the Alt key while you type in the four numbers on the numeric keypad.

Satisfied with arc radius?

If you are satisfied with the position of the arc indicating the measurement (the position of the dimension arrow), click Yes. Otherwise, click No.

Drag till satisfied with arc radius

This question is only asked if you answered No to the previous prompt.

As you move the cursor, you will see a circle expanding and shrinking. This circle represents the position of the dimension

arrow. Once the position of the arrow is satisfactory, click or press ↵Enter.

Satisfied with text position?

If you are satisfied with the position of the text, click Yes. Otherwise click No.

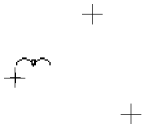
Enter new dimension text position

This question is only asked if you answered No to the previous prompt.

When you reposition text, it will always be horizontal and not at an angle around the arc.

Use the cursor to drag the dimension text (represented by a box) to a new position and click or press ↵Enter.

Dimensioning Angles Between Three Points

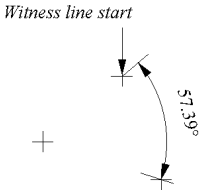


Enter center point

Position the cursor at the center point of the three and click or press ↵Enter.

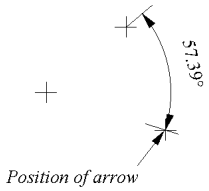
To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter first angular point (defines witness line start)

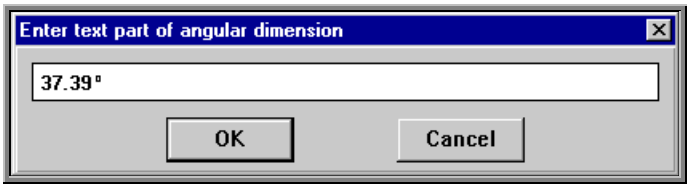


Position the cursor at one of the other points and click or press ↵Enter. This first angular point will also define the **witness line start**.

Enter second angular point (defines text radius)



Position the cursor on the last point and click or press Enter. This point also defines the **position of the dimension arrow**.



The angle between the two lines is measured and is displayed on the screen as text in the prompt. At this point you can:

- Click OK or press Enter to accept the dimension as it is.
- Edit the dimension.
- Add notes to the dimension.
- Replace the dimension.

When you are satisfied with the text, click OK or press Enter.

To obtain a degree symbol, type Alt 0176. Hold down the Alt key while you type in the four numbers on the numeric keypad.

Satisfied with arc radius?

If you are satisfied with the position of the arc indicating the measurement (the position of the dimension arrow), click Yes. Otherwise, click No.

Drag till satisfied with arc radius

This question is only asked if you answered No to the previous prompt.

As you move the cursor, you will see a circle expanding and shrinking. This circle represents the position of the dimension arrow. Once the position is satisfactory, click or press Enter.

Satisfied with text position?

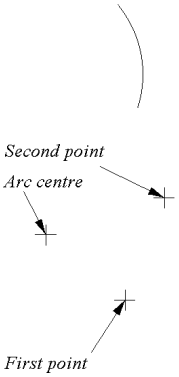
If you are satisfied with the position of the text, click Yes and go to **Dimensioning Arc Lengths**. Otherwise click No.

Enter new dimension text position

When you reposition text, it will always be horizontal and not at an angle around the arc.

Use the cursor to drag the dimension text (represented by a box) to a new position and click or press ↵Enter.

Dimensioning Arc Lengths



Is this dimension of an existing arc?

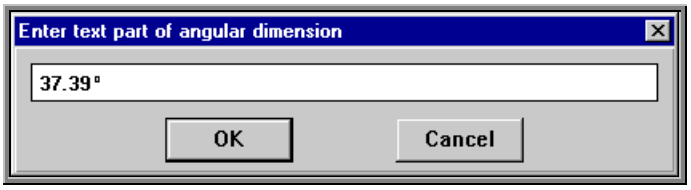
If the arc you want to dimension already exists, click Yes and go to **Dimension an Existing Arc**.

Otherwise, you must define an arc by three points - the arc center and two points that define the arc radius to be measured and the position of the dimension arrow. Click No and go to **Dimension an Arc Between Three Points** on page 692.

Dimension an Existing Arc

Select arc

Position the cursor on the arc you want to dimension and click or press ↵Enter.



The angle between the two lines is measured and is displayed on the screen as text in the prompt. At this point you can:

- Click OK or press Enter to accept the dimension as it is.
- Edit the dimension.
- Add notes to the dimension.
- Replace the dimension.

When you are satisfied with the text, click OK or press Enter.

To obtain a degree symbol, type Alt 0176. Hold down the Alt key while you type in the four numbers on the numeric keypad.

Satisfied with arc radius?

If you are satisfied with the position of the arc indicating the measurement (the position of the dimension arrow), click Yes. Otherwise, click No.

Drag till satisfied with arc radius

This question is only asked if you answered No to the previous prompt.

As you move the cursor, you will see a circle expanding and shrinking. This circle represents the position of the dimension arrow. Once the position is satisfactory, click or press Enter.

Satisfied with text position?

If you are satisfied with the position of the text, click Yes. Otherwise click No.

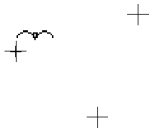
Enter new dimension text position

This question is only asked if you answered No to the previous prompt.

When you reposition text, it will always be horizontal and not at an angle around the arc.

Use the cursor to drag the dimension text (represented by a box) to a new position and click or press Enter.

Dimension an Arc Between Three Points



Enter center point

Position the cursor at the arc center and click or press Enter.

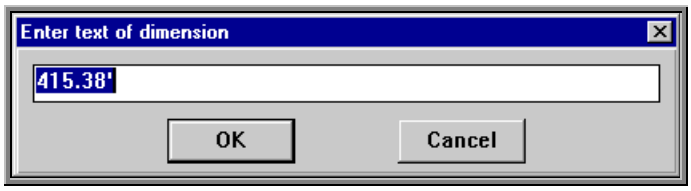
Enter first point (arc goes ccw)(defines arc radius)

Position the cursor at the first point and click or press Enter. Bear in mind that the arc will be measured in an counter-clockwise (ccw) direction between the two points you enter.

The point you enter here also defines the actual arc radius that will be measured.

Enter second angular point (defines text radius)

Position the cursor at the second point and click or press Enter.
The point you enter here also defines the position of the dimension arrow.



The arc length between the two lines is measured and is displayed on the screen as text in the prompt. At this point you can:

- Click OK or press Enter to accept the dimension as it is.
- Edit the dimension.
- Add notes to the dimension.
- Replace the dimension.

When you are satisfied with the text, click OK or press Enter.

To obtain a degree symbol, type Alt 0176. Hold down the Alt key while you type in the four numbers on the numeric keypad.

Satisfied with arc radius?

If you are satisfied with the position of the arc indicating the measurement (the position of the dimension arrow), click Yes. Otherwise, click No.

Drag till satisfied with arc radius

This question is only asked if you answered No to the previous prompt.

As you move the cursor, you will see a circle expanding and shrinking. This circle represents the position of the dimension arrow. Once the position of the arrow is satisfactory, click or press Enter.

Satisfied with text position?

If you are satisfied with the position of the text, click Yes. Otherwise click No.

Enter new dimension text position

This question is only asked if you answered No to the previous prompt.

When you reposition text, it will always be horizontal and not at an angle around the arc.

Use the cursor to drag the dimension text (represented by a box) to a new position and click or press Enter.

27.13 Radial Dimension

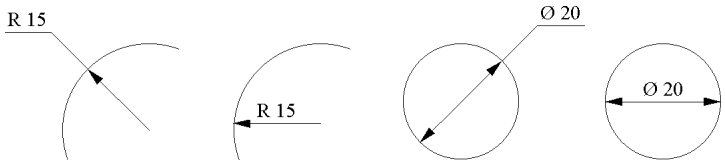
FUNCTION: The **Radial Dimension** function is used to dimension arcs or circles.

To access the **Radial Dimension** function, press Alt S, A, R, or click the **Dimension** icon ( ) on the **Drawing** window toolbar and press R.

This function enters a radial dimension onto an arc or circle. In the case of arcs, the radius is measured and is indicated by an **R**. In the case of circles, the diameter is measured and is indicated by a **Ø** (the diameter sign).

Dimension appearance (text height, arrow size, the number of decimals, etc.) is set using **Start** ➪**Settings** ➪**Dimension Defaults** (Alt S, S, N - page 826). The settings in **Dimension Defaults** will affect ***all*** the dimensions on your drawing (except those placed while doing COGO), including previously drawn ones. This means that if you are not satisfied with the way your dimensions look, you can change them at any stage.

You can change the text content of individual radial dimensions using **Start** ➪**Annotate** ➪**Edit Dimension Properties** (Alt S, A, P - page 705). However, you ***cannot*** change angular dimension witness line or dimension arrow colors once you have drawn the dimension.

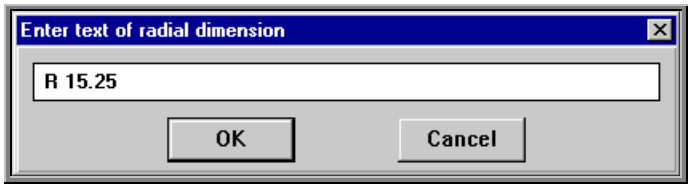


When you access the **Radial Dimension** function, "Sight" Survey prompts:

Radial dimension .. select arc or circle

Position the cursor close to the arc or circle you want to dimension and click or press Enter.

This cursor position affects the way that the dimension will be drawn. See the prompt **Do you want text on radius arrow?** *below.*



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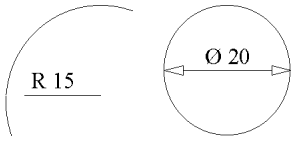
The radius of an arc or the diameter of a circle is measured and is displayed on the screen as text in the prompt. To accept the dimension as it is, click OK or press ↵Enter. Alternatively, you can add tolerances to the dimension, add notes to it or edit it. When the dimension text is to your satisfaction, click OK or press ↵Enter.

To obtain a diameter symbol (Ø), type Alt 0216. Hold down the Alt key while you type in the four numbers on the numeric keypad.

Do you want text on radius arrow?

If you want text along the radius arrow (arc) or along the diameter arrow (circle), click Yes.

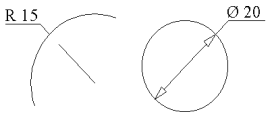


The radius or diameter arrow will be drawn. It will be drawn through the point where you positioned the cursor in the first prompt and through the arc or circle center. Thus, for a horizontal arrow you must position the cursor at the extreme left or right edge of the arc or circle indicated in the first prompt.

If you do not want text on the arrow, click No and skip the next prompt.

Enter text position

This question is only asked if you answered No to the previous prompt.



Position the cursor where the text should appear and click or press ↵Enter. The radius or diameter arrow will be drawn. It will be drawn through the **text position** you have specified and through the **arc or circle center**.

When you reposition text, it will always be horizontal and not aligned along the dimension line.

Radial dimension .. select arc or circle

Position the cursor close to the arc or circle you want to dimension and click or press ↵Enter, or cancel dimensioning by pressing Esc or the Space Bar, or by clicking on Cancel.

27.14 Survey Dimension

FUNCTION: The **Survey Dimension** function is used to place bearing and/or distance dimensions on your drawing.

To access the **Survey Dimension** function, press Alt S, A, U, or click the **Dimension** icon ( ) on the **Drawing** window toolbar and press U. You may also enter the routine by clicking the **Surveying Dimension** icon ( ) in the **Drawing** window toolbar. (**Not** the dimension icon on "Sight" Survey's **Main** tool bar.)

Dimensions placed into your drawing using this function are similar to those placed automatically by COGO functions. **Survey Dimension** offers you a very quick, convenient method for placing bearing and/or distance dimensions on your drawing, simply by snapping to points. You will find it most useful in replacing the COGO **Inverse** function when adding extraneous dimensions to your drawing.

Since **Survey Dimension** places only text, without drawing a line like **Inverse**, it is perfect for dimensioning parking spaces, road right-of-ways, offsets, etc.

Dimension appearance are controlled by various settings. Text style and number of decimals are set using **Start** ➪ **Settings** ➪ **Dimension Defaults** (Alt S, S, N - page 826). Dimension format and angular decimals are controlled by using **Start** ➪ **Settings** ➪ **Surveying Dimension** (Alt S, S, G - page 826).

The settings in **Dimension Defaults** *will affect* ***all*** *the dimensions on your drawing (except those placed while doing COGO), including previously drawn ones.*

Surveying Dimensions do not use arrows and witness lines.

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Surveying dimensions are not associative. This means that if you change the size of a dimensioned object using, for example, **Stretch**, **Scale** or **Move Point**, the dimensions will ***not*** automatically update to reflect the new size. You must delete the dimensions and then redimension the object.

For ease of use, you should be in **Point** *or* **Grab All** *snap mode prior to using this function. Click the appropriate icon on the* **Drawing** *window toolbar. See* **Start** ➪ **Settings** ➪ **Snap Mode** (Alt S, S, S - page 804).

When you access the **Surveying Dimension** function, "Sight" Survey prompts:

Enter first point

Position the cursor at the first point and click or press Enter.

Enter next point

If you want to jump to a new first point press the Space Bar. Otherwise, position the cursor at the next point and click or press Enter. The dimension will be written.

Enter next point

The most recent point becomes the new first point, and his prompt will repeat until you jump to a new first point or press Esc or Cancel to exit the routine.

27.15 Ordinate Dimension

FUNCTION: The **Ordinate Dimension** function is used to enter ordinate dimensions.

To access the **Ordinate Dimension** function, press Alt S, A, O, or click the **Dimension** icon ( ) on the **Drawing** window toolbar and press O.

Dimension appearance (text height, arrow size, number of decimals, etc.) is set using **Start** ➪ **Settings** ➪ **Dimension Defaults** (Alt S, S, N - page 826). The settings in **Dimension Defaults** will affect ***all*** the dimensions on your drawing (except those placed while doing COGO), including previously drawn ones. This means that if you are not satisfied with the way your dimensions look, you can change them at any stage.

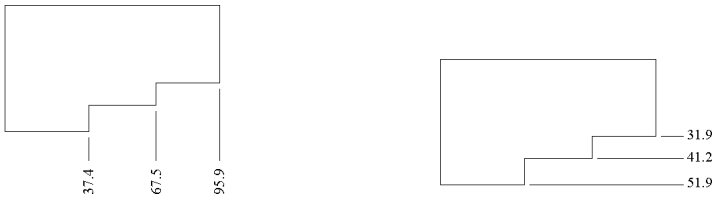
You can change the text content, arrow type and witness line color of individual dimensions using **Start** ➪ **Annotate** ➪ **Edit Dimension Properties** (Alt S, A, P - page 705).

Ordinate dimensions are fully ***associative***. This means that if you change the size of a dimensioned object using, for example, **Stretch**, **Scale** or **Move Point**, the dimensions will automatically update to reflect the new size. You can also change ordinate dimensions to cause a change in the size of dimensioned object. See **Start** ➪ **Annotate** ➪ **Alter Dimension** (Alt S, A, N - page 705).

When you access the **Ordinate Dimension** function, "Sight" Survey prompts:

X Ordinate (Else Y Ordinate)

Click Yes if you want ordinate dimensions along the x axis (as shown below to the left). Click No if you want ordinate dimensions along the y axis (as shown below to the right).



Enter first (base) point

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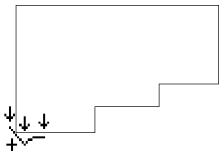
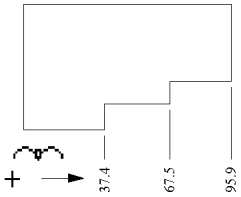


This is the point from which the ordinate dimensions will be measured.

The cursor switches to **Point** mode ( ). Position it close to the base point and click or press Enter. The cursor will automatically jump onto the point. If you do not want to jump onto the point you

can change cursor modes, for example by clicking on the **Freehand** icon ( ) in the **Drawing** window toolbar.

Enter text position

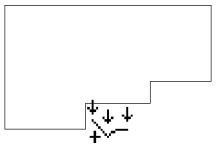


This defines where the dimension text will be positioned.

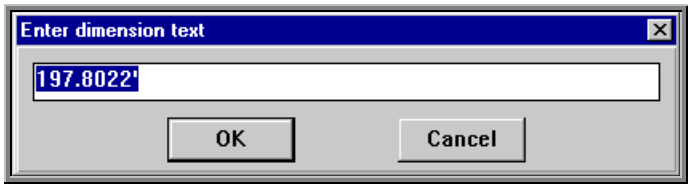
The cursor switches to **Freehand** mode ( ). Position it where you want the dimension text to be and click or press Enter. The dimension text will appear in line with the position you enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter next point



The cursor switches back to **Point** mode ( ). Position it close to a point to be dimensioned and click or press Enter. The cursor will automatically jump onto the point.

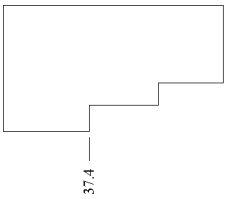


The distance between the base point and the point you have just entered is measured and is displayed on the screen as text in the prompt. At this point you can:

- Click OK or press Enter to accept the dimension as it is.
- Edit the dimension.

- Add notes to the dimension.
- Replace the dimension.

When you are satisfied with the text, click OK or press Enter. The dimension appears on the drawing.



Enter next point

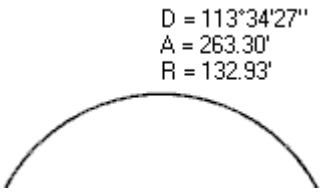
The cursor switches back to **Point** mode. Position it close to a point to be dimensioned and click or press Enter. This prompt will be repeated until you cancel the function by pressing Esc or the Space Bar, or by clicking on Cancel.

27.16 Dimension Arc

FUNCTION: The **Dimension Arc** function is used to dimension an arc.

To access the **Dimension Arc** function, press Alt S, A, I.

Dimension Arc is used to place the delta angle, arc length, and radius along an arc. You are given the option of using a witness arrow and placing the dimensions away from the arc.



Dimension appearance are controlled by various settings. Text style, arrow style, and number of distance decimals are set using **Start** ➪ **Settings** ➪ **Dimension Defaults** (Alt S, S, N - page 826). The number of angular decimals is controlled by using **Start** ➪ **Settings** ➪ **Surveying Dimension** (Alt S, S, G - page 826).

Dimensions placed using* Dimension Arc *are not associative. This means that if you change the size of a dimensioned object using, for example, **Stretch**, **Scale** or **Move Point**, the dimensions will ***not*** automatically update to reflect the new size. You must delete the dimensions and then re-dimension the object.

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When you access the **Dimension Arc** function, "Sight" Survey prompts:

Select arc to dimension

Position the cursor near the arc you want to dimension and click or press Enter. This position may affect the placement of the arc text. See the discussion for the next prompt.

Text along the arc? (else apart)

Click Yes to place the text at point you clicked in the first prompt. Click No to place the text at a different location and connect the text to the arc with a witness line and arrowhead.

Enter text position

This prompt, as well as the next three prompts, will only appear if you answered No to the previous prompt. Position the cursor where you want the to be and click or press Enter.

Enter arrow tail

Position the cursor where you want an arrow tail to be and click or press Enter.

Enter next point of arrow (exit = [Space Bar] to enter arrow head)

Position the cursor where you want the arrow head or a bend in the arrow tail to be. To place a bend in the line, click or press Enter. To place an arrowhead, press Space Bar.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter arrow head

Position the cursor where you want the arrow head to be and click or press Enter. The dimension line is drawn.

Select arc to dimension

Position the cursor near the arc you want to dimension and click or press Enter, or cancel this routine by pressing Esc or the Space Bar, or by clicking on Cancel.

27.17 Dimension Perpendicular +

FUNCTION: The **Dimension Perpendicular** function is used to compute and annotate (on the drawing) the perpendicular dimension from a baseline to a point.

Before beginning this routine, you might want to set the dimension **Text Height** *to a value more compatible with the small perpendicular dimensions you'll be placing on the drawing. Right-click the* **Dimension** *icon ( ) in the* **Drawing** *window toolbar to activate the* **Dimension Settings** *and change the dimension* **Text Height**.

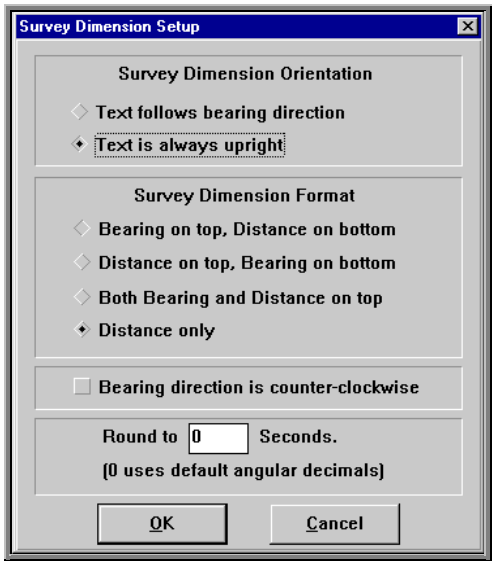
To access the **Dimension Perpendicular** function, press Alt S, A, +., or right-click the **Snap Perpendicular** button ( ) on the **Drawing** window toolbar.

If the setting for **Surveying Dimensions** is not set to **`Distance Only`**, "Sight" Survey will suggest that you change the setting. In the **Drawing** window command line, you are prompted:

For best results, set Survey Dimension Format to Distance Only.

Since you are measuring only distances from a baseline to a point, the bearing of the line to the point is irrelevant and should not be printed. Therefore, you should instruct "Sight" Survey to print only the distances. To change the setting for **Surveying**

Dimensions, click [Yes]. The **Survey Dimensions Setup** dialog box appears:



Under the **Survey Dimension Format** section, click the option **Distance only**. Click [OK] to close the dialog box. In the **Drawing** window command line, you are prompted:

Select the baseline

Move the cursor onto (or near) the baseline and click. "Sight" Survey prompts:

1. Dimension Only
2. Line and Dimension
3. Quit

To label with only a dimension, press 1 or click **Dimension Only**. To label with a dimension and draw a dashed line from the baseline to the point, press 2 or click **Line and Dimension**. To quit this routine, press 3 or click **Quit**.

If you select option 1 or 2, "Sight" Survey prompts:

Select a point

Move the **Grab All** cursor ( ) cursor so the point to which you want to dimension is in the box and click. "Sight" Survey will place the dimension on the drawing. This prompt will repeat until you press Esc or Cancel to quit this routine.

27.18 Edit Dimension Properties

FUNCTION: The **Edit Dimension Properties** function may be used to: edit the text of an individual dimension; change a dimension arrow head; and/or edit the color of the witness lines and dimension arrows.

To access the **Edit Dimension Properties** function, double click on the dimension you want to edit. This short cut only works on **horizontal**, **vertical** and **slope** dimensions.

You cannot use **Edit Dimension Properties** *to edit survey dimensions.*

This function does three things:

1. Edits the text of an individual dimension. For example, you can add tolerances, add notes, change the text etc.
2. Changes a dimension arrow head into a blob (horizontal, vertical and slope dimensions only).
3. Edits the color of the witness lines and dimension arrows (horizontal, vertical and slope dimensions only).

To change dimension parameters (for example text size, number of decimals etc.), use **Start** ➪ **Settings** ➪ **Dimension Defaults** (Alt S, S, N - page 826).

To move dimension text, use **Start** ➪ **Modify** ➪ **Stretch** (Alt S, M, E - page 623).

To cut out portions of witness lines, use **Start** ➪ **Annotate** ➪ **Cut Dimension Line** (Alt S, A, L - page 707).

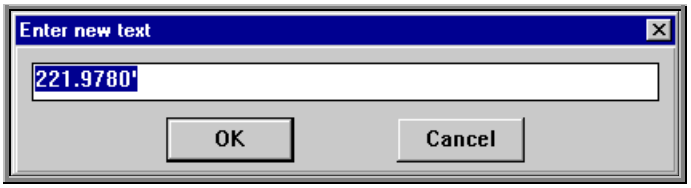
When you access the **Edit Dimension Properties** function, "Sight" Survey prompts:

Select dimension to be edited

Position the cursor anywhere on the dimension to be edited and click or press ↵Enter.

Select the editing option from the menu shown by clicking on the desired item.

Editing Text



The existing dimension text is displayed in the prompt. Edit it, then click OK or press ↵Enter.

Select dimension to be edited

Select another dimension to edit and click or press ↵Enter, or cancel dimension editing by pressing Esc or the Space Bar, or by clicking on Cancel.

Editing Arrow Heads

Place cursor near arrow head to change

Position the cursor near the arrow head you wish to change and click or press ↵Enter. The arrow head is changed into a blob.

Select dimension to be edited

Select another dimension to edit and click or press ↵Enter, or cancel dimension editing by pressing Esc or the Space Bar, or by clicking on Cancel.

Editing Pen

Enter new witness line pen

A palette appears. Click on the color you want to use and press ↵Enter.

Select dimension to be edited

Select another dimension to edit and click or press ↵Enter, or cancel dimension editing by pressing Esc or the Space Bar, or by clicking on Cancel.

27.19 Cut Dimension Line

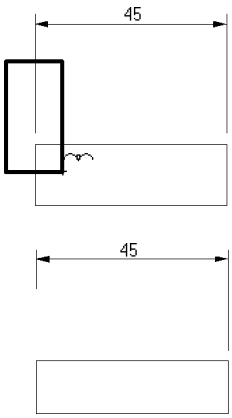
FUNCTION: The **Cut Dimension Line** function is used to cut the witness lines of **horizontal** and **vertical** dimensions.

To access the **Cut Dimension Line** function, press Alt S, A, L.

Select dimension whose line must be cut

Position the cursor on the dimension text of the dimension whose witness line you are going to cut and click or press ↵Enter.

Enter snip box for cutting line



Position the cursor at one corner of the snip box and click or press Enter.

Enter second corner of rectangle

Move the cursor diagonally away from the first corner you entered and click or press Enter.

The portion of the witness line inside the snip box is deleted.

Select dimension whose line must be cut

Position the cursor on another dimension and click or press Enter, or cancel witness line cutting by pressing Esc or the Space Bar, or by clicking on Cancel.

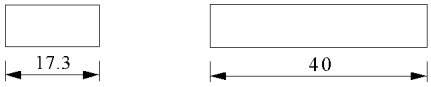
27.20 Alter Dimension

FUNCTION: The **Alter Dimension** function physically changes the size of part of a drawing when the dimension text associated with that part is changed.

To access the **Alter Dimension** function, press Alt S, A, N.

Alter Dimension *only works on* ***horizontal*** *and* ***vertical*** *dimensions.*

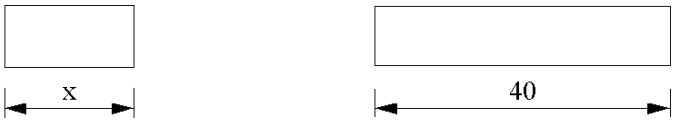
Access the **Alter Dimension** function when you want to change the size of a drawing element by changing its dimension. For example, if you change the dimension text shown here from 17.3 to 40, the dimensioned object will lengthen (or shorten) to fit the new dimension text.



This enables *"drawing by number"*, where you draw the generic outline of a part and dimension it with variables such as *A*, *B*, *C*, *X*, etc.

You can enter dimension variables as you dimension the object when "Sight" Survey prompts **Enter text of dimension**. You can also enter these variables using **Text** in **Start** ➪ **Annotate** ➪ **Edit Dimension Properties**.

You can then use **Alter Dimension** to change the dimension text. For example, if you change the dimension text shown here from *x* to *40*, the dimensioned object will lengthen (or shorten) to fit the new dimension text.



Each dimension should be assigned a different variable name. "Sight" Survey will not know which dimension you wish to change if there are more than one with the same name.

Prompt # 1

Select dimension to be altered with cursor (else search for text)

If you want to select the dimension text to be altered by clicking on it with your mouse, click Yes and go to **Prompt # 2**.

If you want to type the dimension text to be altered, click No and go to **Prompt # 3**.

Selecting the dimension text to change by clicking on it if you answered Yes to **Prompt # 1**.

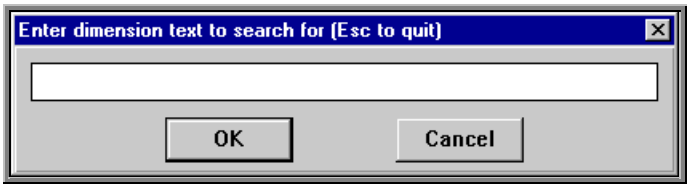
Prompt # 2

Select dimension to be altered with cursor

Click on the dimension you want to alter and go to **Prompt # 4**.

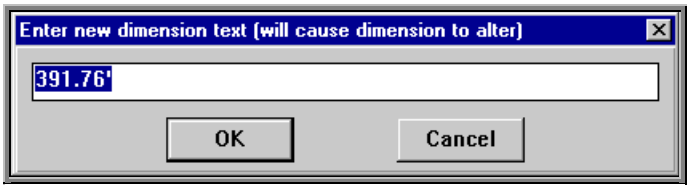
Type the dimension text to change if you answered No to **Prompt # 1**.

Prompt # 3



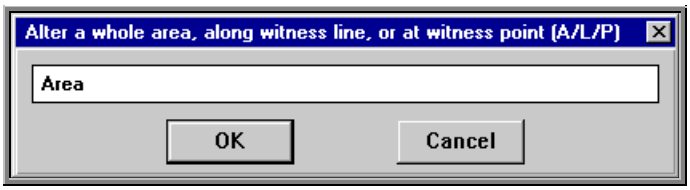
Type the text you want to alter. It is important that you type the dimension text **exactly** as it appears on the drawing, including decimal points or commas and any trailing spaces or zeros. Click OK or press ↵Enter.

Prompt # 4



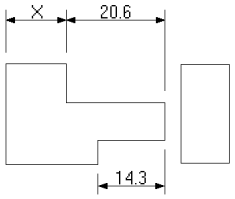
Type in the numeric value that the dimension text must change to and click OK or press ↵Enter. The dimension and dimensioned part will shrink or stretch to match the new value.

Prompt # 5

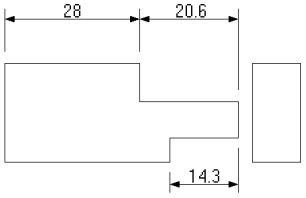


The answer you type here determines what will be affected by the new dimension. Type **A** for **Area**, **L** for along witness **Line**, or **P** for **Point**. Then click OK or press ↵Enter.

If you type **A** to alter the **Area**, the whole drawing will be updated.

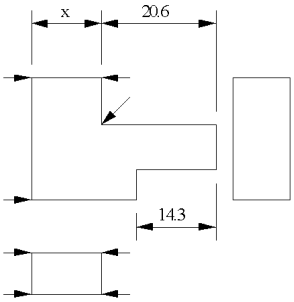


Before Alter Dimension.

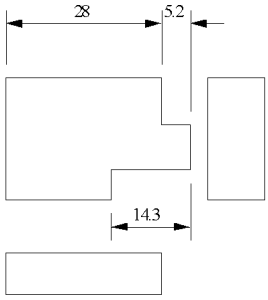


After Alter Dimension. X has been dimensioned 28. The whole area is altered.

If you type **L** to alter **along a witness Line**, all points that lie on a witness line will be altered, but the rest of the drawing will not change.

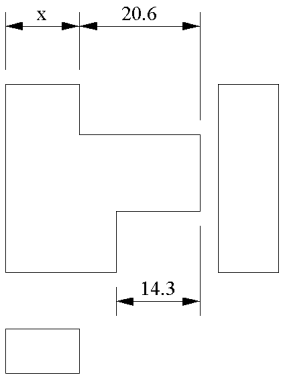


Before Alter Dimension. All points that lie along the relevant witness lines are arrowed.

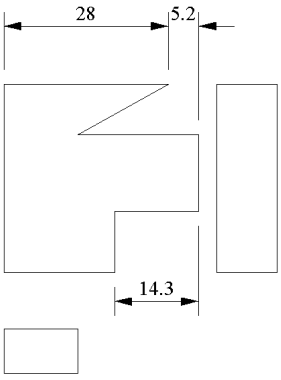


After Alter Dimension. X has been dimensioned 28. The points along the witness lines are altered.

If you type **P** to alter a **Point**, only the dimensioned line will be altered. The rest of the drawing will not change.



Before Alter Dimension.



After Alter Dimension. X has been dimensioned 28. Only the dimensioned line has been altered.

Prompt # 6

Keep left/lower point fixed? (else right/upper)

If you click Yes, the **left** most point of the dimension will remain fixed if you are altering a horizontal dimension and the **lowest** point of the dimension will remain fixed if you are altering a vertical dimension. Alterations will take place about this point.

If you click No, the **right** most point of the dimension will remain fixed if you are altering a horizontal dimension and the **highest** point of the dimension will remain fixed if you are altering a vertical dimension. Alterations will take place about this point.

Prompt # 7

Select dimension to be altered with cursor (else search for text)

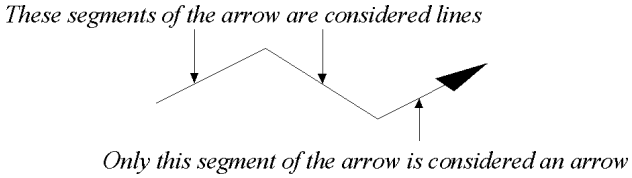
Alter another dimension or cancel dimension altering by pressing the Space Bar.

27.21 Add Arrow ->

FUNCTION: The **Add Arrow** function is used to draw chained lines terminated by an arrow head.

To access the **Add Arrow** function, press Alt S, A, >.

The arrow color, size of the head, and whether the arrow head is a blob or slash is determined in **Start** ➪ **Settings** ➪ **Set Arrow Defaults** (**XA** or Alt S, S, W - page 832).



Only the last line segment with the arrow head is considered an arrow. The preceding line segments are regarded as normal lines. This may lead to some confusion when using functions that discriminate between arrows and other elements. For example, if

you use **Set Arrow Defaults** to change the color of an arrow, only the color of the last segment with the arrow head will be changed. You must use **Line Defaults** to change the color of the other arrow segments.

Enter arrow tail

Position the cursor where you want an arrow tail to be and click or press Enter.

Enter next point of arrow (exit = [Space Bar] to enter arrow head)

Position the cursor where you want the arrow head or a bend in the arrow tail to be and click or press Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter next point of arrow (exit = [Space Bar] to enter arrow head)

If you want the arrow head to be at the end of the line you have just drawn, press the Space Bar or click Cancel.

If you want to add another line to the arrow before adding the head, position the cursor where you want the arrow head or a bend in the arrow tail to be and click or press Enter.

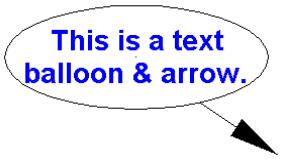
Enter arrow tail

Enter the position of another arrow tail or cancel arrow drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

27.22 Add Balloon

FUNCTION: The **Add Balloon** function is used to draw a maximum of two lines of text with a circle around it, with an arrow from the circle if desired.

To access the **Add Balloon** function, press Alt S, A, B.

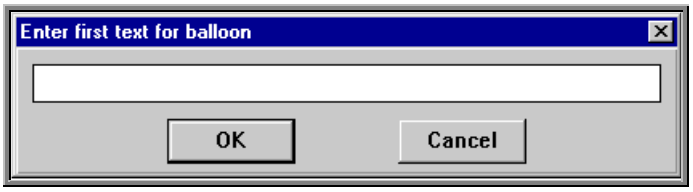


Before using **Add Balloon**, you should define the number of text lines that appear in each balloon, and whether or not the balloon has an arrow. Use **Start Settings Set Balloon Defaults** (Alt S, S, O - page 834).

If you choose to attach an arrow to the balloon, the properties of the arrow are defined using **Start Settings Set Arrow Defaults** (**XA** or Alt S, S, W - page 832). The text parameters used are those set in **Start Settings Set Text Defaults** (Alt S, S, E - page 820). The label origin, however, is always centered. The color of the balloon circle is defined in **Start Settings Line Defaults** (**XL** or Alt S, S, L - page 810).

Enter text position for balloon

Position the cursor where you want the balloon text to appear. This will be the center of the text (as though the label origin was set to **15**). Click OK or press Enter.



Type the text for the balloon and click OK or press Enter. If you specified two lines of text in the **Start Settings Set Balloon Defaults** (Alt S, S, O - page 834) function, the prompt will be repeated so you may enter the second text line.

Enter next point for arrow (press [Space Bar] to produce arrow head)

This question is only asked if you have specified arrows in the **Start** ➪ **Settings** ➪ **Set Balloon Defaults**.

Position the cursor where you want the arrow head or a bend in the arrow tail to be and click or press Enter.

This prompt will be repeated until you press the Space Bar, or click on Cancel to add an arrow head to the line you have just drawn.

Enter text position for balloon

Position the cursor where you want balloon text to appear and click or press Enter. Alternatively cancel balloon drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

27.23 Add/Rem Text Bubble

FUNCTION: The **Add/Rem Text Bubble** function is used to add or remove a text bubble to or from existing text.

To access the **Add/Rem Text Bubble** function, press Alt S, A, /.

Select text that you want to add/remove balloon to

Position the cursor close to text that you want to add a balloon to or remove a balloon from. Click or press Enter.

The balloon becomes part of the text parameters. This means that if you use the **Take From** option in the **Start** ➪ **Settings** ➪ **Set Text Defaults** (Alt S, S, E - page 820) function to set text parameters and pick on the text with the balloon, subsequent text will also have a balloon.

Select text that you want to add/remove balloon to

Position the cursor close to other text that you want to add a balloon to or remove a balloon from and click or press Enter. Cancel bubble drawing by pressing Esc or the Space Bar, or by clicking on Cancel.

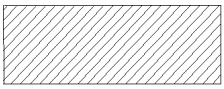
27.24 Enter Hatch/Solid Fill

FUNCTION: The **Enter Hatch/Solid Fill** function is used to hatch or solid fill an area.

To access the **Enter Hatch/Solid Fill** function, press Alt S, A, F, or click the **Hatch/Fill** icon ( ) in the **Drawing** window toolbar.

To hatch a polyline, see **Start** ➪ **Settings** ➪ **Polyline Defaults** (Alt S, S, F - *page 812*).

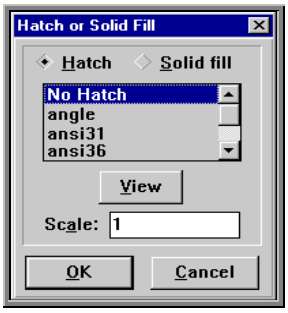
In "Sight" Survey, you can either cross hatch an area (below left), or solid fill an area (below right).



When you select **Enter Hatch/Solid Fill**, the **Hatch or Solid Fill** dialog box appears on the screen in one of two versions: **Hatch**; or **Solid Fill**.

Hatch dialog box

This dialog box appears if the **Hatch** option is checked. If you want a solid fill, check the **Solid Fill** option.



The **Hatch** dialog box contains a list of hatch pattern names and a scale option. The scale option allows you to scale hatch patterns.

Hatches are stored in a file named **HATCH.PAT**, which is located in the program directory. You can edit hatches in this file, and even add your own hatches to the file. See **Section 32 - Hatch Patterns** for more information.

If you give a scale of 1, hatches are drawn at the size defined in the **HATCH.PAT** file. If you give a scale of 2, hatches are drawn at twice the size defined in the **HATCH.PAT** file, etc.

Click on the name of the hatch pattern you want to use, then click OK. If you are not sure what the hatch patterns look like, click on the View button. A sample of each hatch pattern will appear on the screen. Click on the one you want to use.

Perimeter Menu

The **Perimeter Menu** appears. Choose one of the top five items for use in defining the hatch area. To select an item, press the underlined letter, or click the item.

Enter Perimeter: Auto If you select this option, you will be asked to click the cursor inside the desired perimeter. You will then be asked if you are satisfied with the perimeter. Click Yes and the hatch/fill is drawn.

Line If you select this option, the prompts that you get will be exactly the same as for **Start Draw Line (Chained)** (**LI** or Alt S, D, H - page 585). When you have completed drawing the line, press Esc or Space Bar and "Sight" Survey will return you to the **Perimeter Menu**. Select **Done Perim** and the hatch/fill is drawn.

Rectangle If you select this option, the prompts that you get will be exactly the same as for **Start Draw Rectangle** (**DR** or Alt S, D, T - page 588). When you have completed drawing the rectangle, press Esc or Space Bar and "Sight" Survey will return you to the **Perimeter Menu**. Select **Done Perim** and the hatch/fill is drawn.

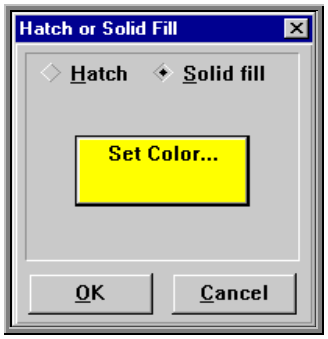
Arc If you select this option, the prompts that you get will be exactly the same as for **Start Draw Arc 3 Point** (**AC** or Alt S, D, A - page 589). When you have completed drawing the arc,

press Esc or Space Bar and "Sight" Survey will return you to the **Perimeter Menu**. Select **Done Perim** and the hatch/fill is drawn.

Circle If you select this option, the prompts that you get will be exactly the same as for **Start** ➪ **Draw** ➪ **Circle** (DC or Alt S, D, C - page 591). When you have completed drawing the circle, press Esc or Space Bar and "Sight" Survey will return you to the **Perimeter Menu**. Select **Done Perim** and the hatch/fill is drawn.

Hatches and solid fills can significantly slow down redraws. It is a good idea to go to **Start** ➪ **Settings** ➪ **View Settings** *(Alt S, S, V - page 799) and to set the* **Hatch to Draw** *section of the dialog box to* **None**. *This means that hatches will not be drawn on redraws. If you then want to see your hatches, you can display them when you want to using* **Start** ➪ **Annotate** ➪ **Draw All Hatch** *(Alt S, A, D - page 721).*

Solid Fill dialog box



This dialog box appears if the **Solid Fill** option is checked. If you want a solid fill, check the **Hatch** option.

The **Solid Fill** dialog box contains a color palette that allows you to select a solid fill color.

The current solid fill color setting is displayed on the **Set Color** button. To change the color, click on the button and a palette will appear. Click on the color you want for solid fills. When you are satisfied with the color of the solid fill, click OK.

The **Perimeter Menu** appears (see page 717.) Use it to define the area to be filled. Once you have defined the perimeter, it is filled.

Solid Filling Areas with Islands

It is easy to cross hatch an area with an island in "Sight" Survey. However, if you try to solid fill an area with an island you can end up with fills that look quite ugly.

To prevent this happening, you can divide the area to be filled into sub-areas without islands. For example, this is the original area to be filled.

By extending the left hand vertical line of the D so it touches the top and the bottom of the box, the area can be divided into three sub-areas without islands: the area to the left of the D, the area to the right of the D, and the area in the middle.

These three areas can then be filled to achieve the desired effect.

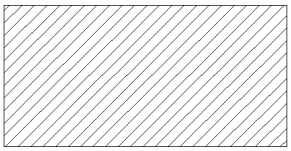
You can also create solid fills with islands as follows: Solid fill an area, then solid fill another area on top of it in white, to make the island.

27.25 Adjust Existing Hatch

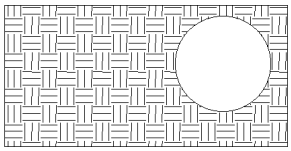
FUNCTION: The **Adjust Existing Hatch** function is used to adjust or alter an existing hatch.

To access the **Adjust Existing Hatch** function, press Alt S, A, J.

This function allows you to alter the hatch pattern of a hatch, the hatch scale and/or the hatch perimeter. For example, **Adjust Existing Hatch** will allow you to alter a hatch such as this one ...



... in order to create a hatch such as this one.



When you select **Adjust Existing Hatch**, a cross corresponding to each hatch appears.

Select hatch to change

Position the cursor on the cross corresponding to the hatch you want to alter and click or press Enter. The **Hatch** dialog box or the **Solid Fill** dialog box appears. See **Start** ➪ **Annotate** ➪ **Enter Hatch/Solid Fill** (Alt S, A, F - page 716).

If you do not want to change the hatch pattern or scale of the hatch but want to change the perimeter, for example by adding an island as in the diagram above, click OK.

Otherwise, select a new hatch pattern or scale from the **Hatch** or the **Solid Fill** dialog box, then click OK. The **Perimeter Menu** appears. (See page 717.) If you don't want to alter the hatch perimeter, click Accept.

If you do want to alter the perimeter, as in the example illustrated where a circle has been added to the perimeter, draw the additional perimeter. Then click on the **Done Perim** option of the **Perimeter Menu** and the updated hatch will be drawn.

27.26 Draw All Hatch

FUNCTION: The **Draw All Hatch** function is used to display hatches on screen.

To access the **Draw All Hatch** function, press Alt S, A, D.

Since hatches can significantly slow down redraws, it is a good idea to "switch them off" and to display them only when you want to see them.

To "switch off" hatches, you must set to **None** the **Hatches to Draw** section of the **Start** ➪ **Settings** ➪ **View Settings** dialog box (Alt S, S, V - page 799).

When you want to see the hatches, select **Draw All Hatch**. The hatches will be displayed on the screen. They will disappear next time you redraw the screen.

27.27 Draw Selected Hatch

FUNCTION: The **Draw Selected Hatch** function is used to display selected hatches on screen.

To access the **Draw Selected Hatch** function, press Alt S, E, O.

Since hatches can significantly slow down redraws, it is a good idea to "switch them off" and to display them only when you want to see them.

To "switch off" hatches, you must set to **None** the **Hatches to Draw** section of the **Start** ➪ **Settings** ➪ **View Settings** dialog box (Alt S, S, V - page 799).

You can display selected hatches on the screen when desired using **Draw Selected Hatch**. The hatches will disappear next time you redraw the screen.

Selected hatches are hatches that have been selected using the **Hatch** option in **Start** ➪ **Edit** ➪ **Selection Filters** (Alt S, E, F - page 560).

27.28 Hatch -> Lines

FUNCTION: The **Hatch -> Lines** function is used to convert a hatch to lines.

To access the **Hatch -> Lines** function, press Alt S, A, H.

To keep memory requirements for hatching minimal, "Sight" Survey stores only the hatch perimeter, not the lines that make up the hatch. These are recalculated each time the hatch is displayed. **Hatch -> Lines** converts a hatch to the lines which comprise it. After conversion the hatch will no longer respond to hatch functions. The lines will be like any other lines.

The disadvantage of converting hatches to lines is that the lines take up more memory than a hatch perimeter and, because each line must be drawn on each redraw, redraws take longer.

When you select **Hatch -> Lines**, a large crosshair appears on the screen. Each hatch is marked with a cross.

Enter box about hatch perimeters to be converted to lines

Draw a polygon around the white crosses marking the hatches to be converted to lines. The hatches are converted to lines.

27.29 Label Coordinates

FUNCTION: The **Label Coordinates** function is used to write coordinate values into your drawing.

To access the **Label Coordinates** function, press Alt S, A, C.

This function writes the coordinates of a point either at the point or in a coordinate table. The appearance of the text is defined using **Start Settings Set Text Defaults** (Alt S, S, E - page 820).

When you access the **Label Coordinates** function, "Sight" Survey prompts:

Do you want a coordinate table, (else place each coordinate at point)

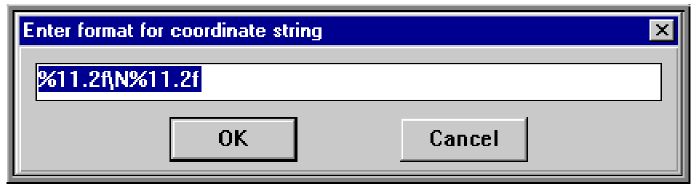
If you want the coordinates to appear in a coordinate table, click Yes. If you want each point to be labeled with its coordinate position, click No.

Enter point where coordinate table should start

This question is only asked if you answered Yes to the previous prompt.

Position the cursor at the position where you want the coordinate table to be and click or press Enter.

Where the table appears relative to this position is dependent on the **Text Label Origin** you have defined in **Start Settings Set Text Defaults** (Alt S, S, E - page 820). For example, if the origin is 2, the table will appear on the right of this position. If the origin is 15, it will be centered around the position, etc.



If the format for the coordinate string is **%11.1f%11.1f**, each coordinate is allotted eleven characters, of which one is set aside for a decimal place. Thus, the coordinate 25.6 -30 will appear as:

							2	**5**	**.**	**6**							**-**	**3**	**0**	**.**	**0**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*

Similarly, a format of %9.3f%9.3f would allot nine characters to each coordinate and set aside three of these for decimal places:

		2	**3**	**4**	**.**	**6**	**7**	**8**				**6**	**.4**	**.**	**3**	**2**	**7**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*

Coordinates can be left justified by typing a "-" sign into the format. Thus %-9.3f%-9.3f will give the following result:

2	**3**	**4**	**.**	**6**	**7**	**8**			**6**	**4**	**.**	**3**	**2**	**7**			
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*

Additional text can also be added into the format. For example the format N = %5.2f, E = %5.2f will yield the following:

N		**=**				**4**	**.**	**7**	**8**	**,**					**E**		**=**		**3**	**4**	**.**	**2**	**7**
_	_	_	_	_	*1*	*2*	*3*	*4*	*5*	_	_	_	_	_	_	_	_	_	*1*	*2*	*3*	*4*	*5*

When you have entered the format, click OK or press Enter.

In the four examples shown above, the coordinates will be placed side-by-side. For example: `N 345.25'   E 512.33'`

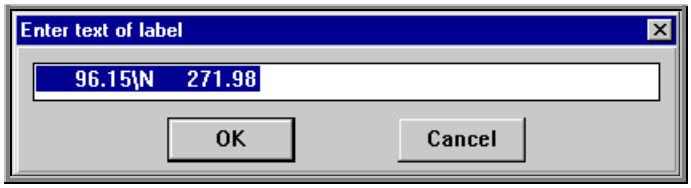
If you are placing coordinates at each point, instead of in a table, you can add a **\N** between the numbers to place the coordinates one atop the other. For example, entering a format string of **N %5.2f\NE %5.2f** would yield a printout of:

```
N 345.25'
E 512.33'
```

Enter point

Position the cursor onto the point that you want labeled and click or press ↵Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*



The coordinates are displayed in the prompt before they are placed on the drawing. At this stage they can be edited, for example to reflect a station name. To accept the coordinates, click OK or press ↵Enter.

The coordinates will either be written into a table or onto the points, as specified.

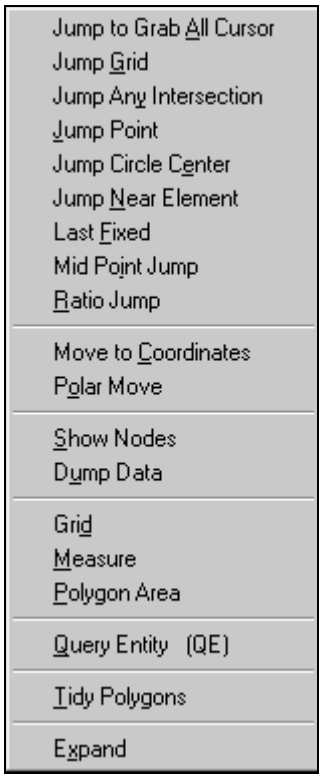
The order in which coordinates are displayed depends on the way you have set up Northings and Eastings in the **Surveyor Setup** *section of* **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

Enter point

Position the cursor onto another point that you want labeled or cancel coordinate labeling by pressing Esc or the Space Bar, or by clicking on Cancel.

"Sight" Survey 3.0

Section 28
Start Menu - TOOLS



The **TOOLS** menu accessed from the Start button in the **Drawing** window is where you'll find commands for various cursor operations, including jumps and moves.

28.01 Jump to Grab All Cursor

FUNCTION: The **Jump to Grab All Cursor** function is used to jumps to the closest point, intersection or grid point enclosed within the cursor box.

To access the **Jump to Grab All Cursor** function, press Alt S, T, A.

Jump to Grab All Cursor will only work if you are in the **Grab All** mode, i.e. if your cursor looks like this: ⊡.

Jump to Grab All Cursor searches for a point within the cursor box in the following order:

1. If a point (a point, the end of a line, the end of an arc, an arc or circle center) is found in the box, jump to the nearest one.
2. If a geometry intersection is found in the box, jump to the nearest one.
3. If any other intersection is found in the box, jump to the nearest one.
4. If a grid point is found in the box, jump to the nearest one.

Enter point to jump to

Move your cursor so that the cursor box surrounds the point, intersection or grid point you want to jump to, and click or press

↵Enter. The cursor jumps exactly onto the point, intersection or grid point.

? ***If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse!*** *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press ↵Enter to set the point as your starting point.*

28.02 Jump Grid

FUNCTION: The **Jump Grid** function causes the cursor to snap to the nearest grid point of a grid created using **Start** ➪ **Tools** ➪ **Grid** (Alt S, T, G - page 747).

To access the **Jump Grid** function, press Alt S, T, U.

Enter point to jump to

Move your cursor close to the grid point you want to jump to and click or press ↵Enter. The cursor jumps exactly onto the grid point.

If **Jump Grid** *does not appear to be working, it is probable that it is snapping to invisible grid points. In order to see these invisible points, zoom into your drawing or increase the maximum number of grid dots across screen. See* **Start** ➪ **Tools** ➪ **Grid** (Alt S, T, G - page 747).

? ***If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse!*** *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press ↵Enter to set the point as your starting point.*

You can snap to a grid point anytime the **Drawing** *window is prompting you to enter a point. Move the cursor close to the desired location and press* G. *Then press* ↵Enter *to set the point.*

28.03 Jump Any Intersection

FUNCTION: The **Jump Any Intersection** function causes the cursor to jump onto the nearest intersection. This intersection can be any combination of lines, arcs and geometry lines and circles.

To access the **Jump Any Intersection** function, press Alt S, T, Y.

Enter point to jump to

Move your cursor close to the intersection you want to jump to and click or press ↵Enter. The cursor jumps exactly onto the intersection.

If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse! *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press* ↵Enter *to set the point as your starting point.*

You can snap to any intersection point anytime the **Drawing** *window is prompting you to enter a point. Move the cursor close to the desired location and press* Y. *Then press* ↵Enter *to set the point.*

28.04 Jump Point

FUNCTION: The **Jump Point** function causes the cursor to snap onto the nearest point. This may be a point, the end of a line or arc, an arc or circle center point, the label origin of an item of text, the label origin of an item of dimension text or an arrow end point.

To access the **Jump Point** function, press Alt S, T, J.

Enter point to jump to

Move your cursor close to the point you want to jump to and click or press Enter. The cursor jumps exactly onto the point.

The search time increases as the number of elements increases.

If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse! *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press Enter to set the point as your starting point.*

You can snap to point anytime the **Drawing** *window is prompting you to enter a point. Move the cursor close to the desired location and press J. Then press Enter to set the point.*

28.05 Jump Circle Center

FUNCTION: The **Jump Circle Center** function causes the cursor to jump onto the nearest arc or circle center.

To access the **Jump Circle Center** function, press Alt S, T, E.

Enter point to jump to

Move the cursor close to the circle center you want to jump to and click or press Enter. The cursor jumps exactly to the circle center.

? ***If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse!*** *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press Enter to set the point as your starting point.*

You can snap to a circle center point anytime the **Drawing** *window is prompting you to enter a point. Move the cursor close to the desired location and press E. Then press Enter to set the point.*

28.06 Jump Near Element

FUNCTION: The **Jump Near Element** function causes the cursor to jump onto the nearest element. This element can be a solid, line or arc.

To access the **Jump Near Element** function, press Alt S, T, N.

Enter point to jump to

Move your cursor close to the line or arc you want to jump to and click or press Enter. The cursor jumps exactly onto the line or arc.

? ***If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse!*** *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press Enter to set the point as your starting point.*

You can snap to the nearest element anytime the **Drawing** *window is prompting you to enter a point. Move the cursor close to the desired location and press* N. *Then press* ↵Enter *to set the point.*

28.07 Last Fixed

FUNCTION: The **Last Fixed** function is used to jump to the location of the last selected point.

To access the **Last Fixed** function, press Alt S, T, F.

The word "fixed" denotes the position of the last point you selected by pressing ↵Enter or by clicking. This may be, for example, the end point of the last line you drew, and is always marked by a small cross: **x**. If the cursor is accidentally moved off this point, it can be returned to it using the **Last Fixed** jump.

If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse! *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press* ↵Enter *to set the point as your starting point.*

You can snap to the last fixed point anytime the **Drawing** *window is prompting you to enter a point. Move the cursor close to the desired location and press* X. *Then press* ↵Enter *to set the point.*

28.08 Mid Point Jump

FUNCTION: The **Mid Point Jump** function causes the cursor to jump onto the mid-point of the nearest line.

To access the **Mid Point Jump** function, press Alt S, T, I.

Enter point to jump to

Move your cursor close to the line you want to jump to the mid point of and click or press ↵Enter. The cursor jumps exactly onto the mid point of the line.

? ***If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse!*** *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press ↵Enter to set the point as your starting point.*

You can snap to the mid-point of a line anytime the **Drawing** *window is prompting you to enter a point. Move the cursor close to the desired location and press T. Then press ↵Enter to set the point.*

Section 28

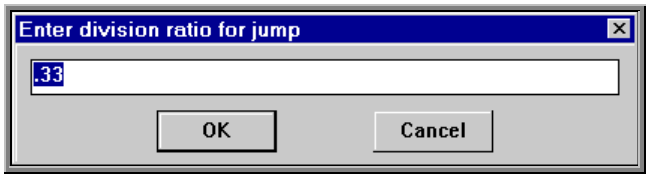
28.09 Ratio Jump

FUNCTION: The **Ratio Jump** function causes the cursor to jump to a specified distance along a line or between two points.

To access the **Ratio Jump** function, press Alt S, T, R.

Enter point to jump to

Move your cursor close to the line or one of the points and click or press Enter. It is important that you position your cursor carefully.



Type a number here, for example if you type 0.5 or 1/2, the cursor will jump to half way along the line or between the two points. If you type 1/3, the cursor will jump to a third of the way along the line or between the two points, etc. Click OK or press Enter.

Would you like to jump to ratio point on line (else between two points)

Jump to point on line

If you click Yes, the cursor will jump to the point along the nearest line specified by the ratio you entered in the previous prompt. The ratio distance will be measured from the point nearest to the cursor when the jump is made.

? ***If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse!*** *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press Enter to set the point as your starting point.*

Jump to point between points

If you click No, Sight Survey will prompt you for the first and second points.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter first point

Move your cursor to the location of the first point and click or press Enter.

Enter next point

Move your cursor to the location of the second point and click or press Enter. The cursor will jump to the point along the nearest line specified by the ratio you entered in the previous prompt. The ratio distance will be measured from the point nearest to the cursor when the jump is made.

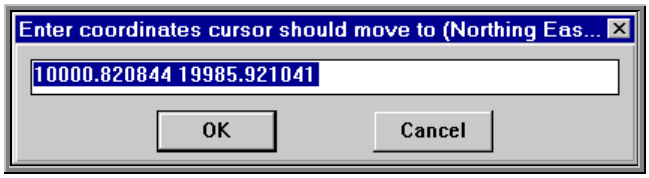
? ***If you intend to use the point you just jumped to as a starting point for a line, point, arc, etc., you must not move the mouse!*** *After jumping to the point, use your keyboard to issue the drawing command. When "Sight" Survey prompts you for a point entry, press Enter to set the point as your starting point.*

28.10 Move to Coordinates

FUNCTION: The **Move to Coordinates** function causes the cursor to jump to a specific coordinate location.

To access the **Move to Coordinates** function, press Alt S, T, C, or right-click the **Polar Move** icon ( ) on the **Drawing** window toolbar.

You can **Move to Coordinates** *anytime the* **Drawing** *window is prompting you to enter a point by pressing C.*



Type the Northing and Easting coordinates that the cursor should move to, separated by a space, and click OK or press Enter.

Whether these coordinates are in the order Northing, Easting or Easting, Northing depends on how you have set this up in **Start** ➪ **Settings** ➪ **Drawing Settings** *(Alt S, S, D - page 789). The order or data entry is given in the prompt.*

The origin point, (0, 0) is the center of the sheet of paper unless you have changed this using the **Surveyor Setup** in **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

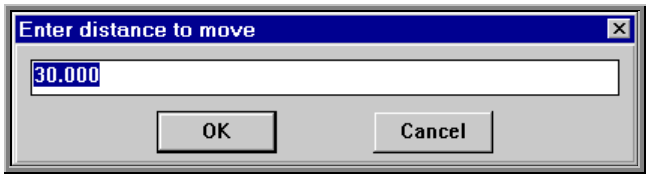
Unlike the other jumps in this section, you do not have to press Enter to accept the new cursor position after using **Move to Coordinates**.

28.11 Polar Move

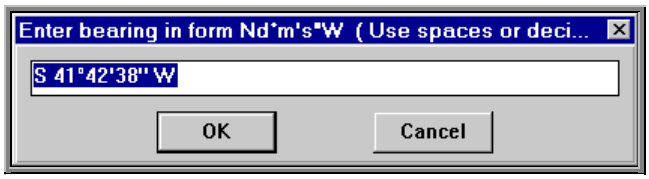
FUNCTION: The **Polar Move** function causes the cursor to move a particular distance in a particular direction.

To access the **Polar Move** function, press Alt S, T, C, or click the **Polar Move** icon ( ) on the **Drawing** window toolbar.

You can **Polar Move** *anytime the* **Drawing** *window is prompting you to enter a point by pressing O.*



Type the distance you want the cursor to move then click OK or press Enter.



Type the angle you want the cursor to move at then click OK or press Enter. The cursor moves the specified distance and angle.

The way in which the angle is measured depends upon how you have set up the **Angular Format** *in* **Start** ➪ **Settings** ➪ **Drawing Settings** *(Alt S, S, D - page 789). The order or data entry is given in the prompt.*

Unlike the other jumps in this section, you do not have to press Enter to accept the new cursor position after using **Polar Move**.

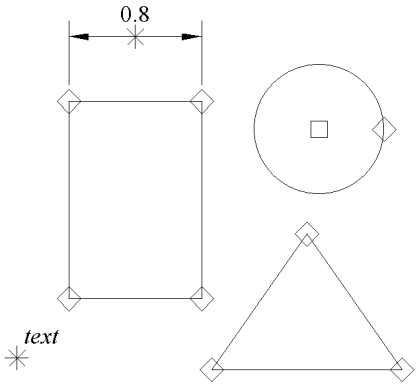
28.12 Show Nodes

FUNCTION: The **Show Nodes** function is used to show all the nodes (object control points) on the drawing.

To access the **Show Nodes** function, press Alt S, T, S.

When you select this function, all nodes on the drawing are marked:

- Points, the ends of lines and the ends of arcs are shown as **diamonds**.
- Arc and circle centers are shown as **squares**.
- Text and dimension text origins are shown as **stars**.



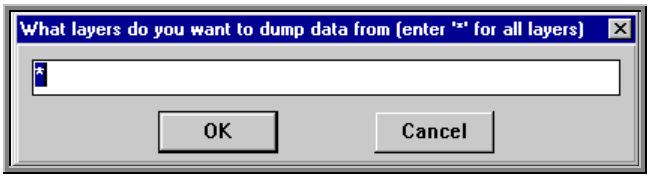
28.13 Dump Data

FUNCTION: The **Dump Data** function is used to create a file of detailed data about the objects in your drawing.

To access the **Dump Data** function, press Alt S, T, U.

Dump Data creates a file which gives the following information about each or specific objects in your drawing:

- Parent and object names.
- The coordinates of the object's snip box.
- The layer the object is on.
- The coordinates of the object's hook point.
- Whether the object is selected.
- Whether the object is a hatch perimeter.
- The coordinates, line type, pen and width of each primitive in the object, and whether this primitive is selected.



Type the name of the layer that you want to dump information from. To dump information from all layers, type * and click OK or press ↵Enter.

Type the name of the object or objects you want information about and click OK or press ↵Enter. For example, if you type: **YELLOW CIRC1**, information about objects with the name **CIRC1** and with the parent name **YELLOW** will be dumped.

Wildcards may be used. For example, if you type: *** CIRC1**, information about all objects with the name **CIRC1** will be dumped, regardless of parent names. If you type: **YELLOW ***, information about all objects with the parent name **YELLOW** will be dumped, regardless of object names. If you type : *** ***, information about all the objects on the layer or layers you specified in the first prompt will be dumped.

Do you want data from all elements (else just object headers)

If you click Yes, the information that is dumped to the file will include both **Object Header** information and **Object Details**.

If you click No, only **Object Header** information will be dumped (see **Object Header** and **Object Details** later in this section).

A dialog box headed **Save Dump Data As** will then appear. This is a standard Windows **Save** dialog box. Type a name for the file. By default it has the name **UNTITLED.DMP**, but you can change this to any name by typing a new name in the **File Name** part of the dialog box.

After entering a filename, click OK. The information is saved to file. You can look at it using any text editor such as the Windows Notebook. Sample data produced by **Dump Data** is shown below.

```
**********************************************
parent YELLOW            object CIRC1
objectbox 39.962 -15.016 88.891 33.914 objectscale 1.000 1.000 objectrot 0.000
objectlength 208 visibility 1 layer BEE object hook 88.891 9.449
selected 0 clip 0 hatch 0 type 0 patnumber 79 lib 0 key 0
arc      88.891    9.449    64.426    9.449    88.891    9.449
radius    24.465   cw  0  line, pen, width 1 3 0 0 0 1 aspect 1 angle 0
**********************************************
parent RED               object RECT2
objectbox -90.770 -43.810 -36.365 7.158 objectscale 1.000 1.000 objectrot 0.000
objectlength 364 visibility 1 layer A object hook -90.770 -43.810
selected 0 clip 0 hatch 0 type 0 patnumber 75 lib 0 key 0
line     -90.770   -43.810         -36.365    -43.810    1 1 0 0 0 0
line     -36.365   -43.810         -36.365               7.158       1 1 0 0 0 0
line     -36.365    7.158          -90.770               7.158       1 1 0 0 0 0
line     -90.770    7.158          -90.770    -43.810    1 1 0 0 0 0
**********************************************
parent A                 object P82
objectbox -90.770 -43.810 -36.365 7.158 objectscale 1.000 1.000 objectrot 0.000
objectlength 364 visibility 1 layer BEE object hook -90.770 -43.810
selected 0 clip 0 hatch 251658241 type 0 patnumber 93 lib 0 key 0
line     -90.770   -43.810         -36.365    -43.810    1 3 0 0 0 0
line     -36.365   -43.810         -36.365     7.158     1 3 0 0 0 0
line     -36.365    7.158          -90.770     7.158     1 3 0 0 0 0
line     -90.770    7.158          -90.770    -43.810    1 3 0 0 0 0
```

ObjectHeader

Information about each object comprises an **Object Header** followed by **Object Details**. The **Object Header** looks like this:

```
parent YELLOW            object CIRC1
objectbox 39.962 -15.016 88.891 33.914 objectscale 1.000 1.000 objectrot 0.000
objectlength 208 visibility 1 layer BEE object hook 88.891 9.449
selected 0 clip 0 hatch 0 type 0 patnumber 79 lib 0 key 0
```

It contains the following information.

parent	parent name.
object	object name.
objectbox	coordinates of rectangle that encloses object.
objectscale	information used by TrueCAD.
objectrot	information used by TrueCAD.
objectlength	length of object data structure in bytes.
visibility	information used by TrueCAD.

layer	the layer the object is on.
object hook	coordinates of the object's hook point.
selected	this figure is 1 if the object is selected.
clip	information used by TrueCAD.
hatch	this is 0 if the object is not a hatch perimeter.
type	information used by TrueCAD.
patnumber	information used by TrueCAD.
lib	information used by TrueCAD.
key	information used by TrueCAD.

Blocks

Drawings that have been imported as DXF or DWG files are likely to contain AutoCAD blocks. These will be represented in **Dump Data** files in the same way as TrueCAD objects, except that they will have a STARTBLOCK line above the object description and an ENDBLOCK line beneath it:

```
==============================================
STARTBLOCK SOP  [0.000000,0.000000] storescale=1.000000 flags=64
purgedflag=0
************************************************
 parent A                object P121
 objectbox -10.000 -10.000 10.000 10.000 objectscale 1.000 1.000 objectrot 0.000
 objectlength 328 visibility 0 layer 0 object hook 10.000 0.000
selected 0 clip 0 hatch 0 type 0 patnumber 121 lib 0 key 0
arc      10.000     0.000     0.000     0.000     10.000     0.000
 radius     10.000   cw  0  line, pen, width 255 11 0 0 0 0 aspect 1 angle 0
line      -7.071     7.071     7.071    -7.071   255 11 0 0 0 0
line       7.071     7.071    -7.071    -7.071   255 11 0 0 0 0
ENDBLOCK
```

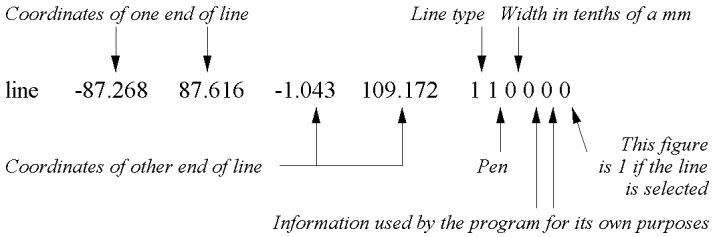
The first item after the word STARTBLOCK is the block's name. The other parameters are not relevant in TrueCAD but are necessary if the drawing is later exported back to AutoCAD.

Object Details

After the **Object Header**, details about each primitive in the object are given. These details vary depending on the nature of the primitive.

*Pens (colors) are numbered downwards from 0 to 15 in the **Pen Selection Area** so that maroon is 0, red is 1, etc. A pen of 255 indicates that the pen is being set By Layer. **Line types** are numbered from 1 downwards in the **Line Type Menu** so that continuous is 1, dashed is 2, etc. A line type of 255 indicates that the line type is being set **By Layer**.*

Points and Lines



Points are represented in Dump Data files as lines whose start and end coordinates are the same.

Polylines

```
polyline  linet=    1 pen=1 used=0 selection=0 nvertex=4 spline=0
swid=    0, ewid=    0, closed=0, key=0, SNode=0, ENode=0
vertex    -148.75    -3.4421 type=0 swidth=    0 ewidth=    0
vertex    -119.73     35.404 type=0 swidth=    0 ewidth=    0
vertex    -76.954    -16.719 type=0 swidth=    0 ewidth=    0
vertex    -42.042     49.172 type=0 swidth=    0 ewidth=    0
```

Coordinates of polyline's vertices

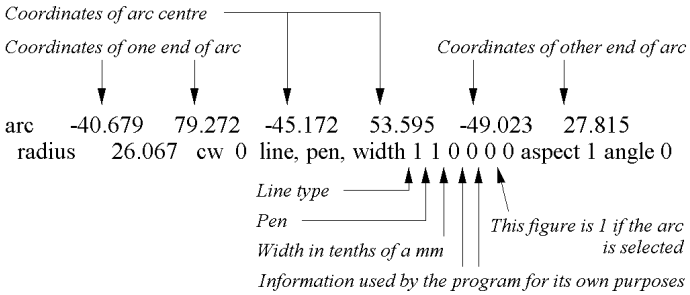
Vertex type (straight line or arc)

Start width and end width of vertex

linet	line type.
pen	color.
used	information used by TrueCAD.
selection	1 if polyline is selected, else 0.
nvertex	number of vertices in the polyline.
spline	spline type: 0 = no spline, 1 = 3 pt Bezier, 4 = 4 pt Bezier.
swid	start width of polyline.
ewid	end width of polyline.
closed	1 if polyline is closed, else 0.

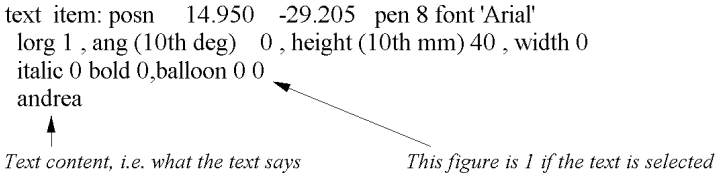
key	ID field for GIS type applications.
SNode	ID field for start point of polyline.
ENode	ID field of end node.

Arcs, Circles and Ellipses



radius	radius, measured in the units selected in **Start ➪ Settings ➪ Drawing Settings**.
Cw	if the arc has been drawn in a clockwise direction, else 0.
aspect	ellipse aspect ratio if the arc is an ellipse (see **Start ➪ Draw ➪ Ellipse**).
angle	ellipse angle if the arc is an ellipse (see **Start ➪ Draw ➪ Ellipse**).

Text

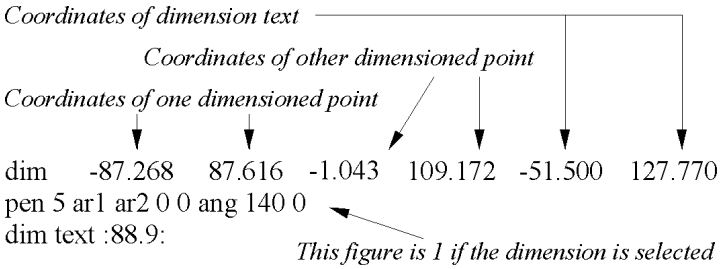


posn	coordinate position of text.
pen	color.
font	font.
lorg	text label origin.
ang	angle, in tenths of a degree.
height	height in tenths of a mm.
width	width, in tenths of a mm.
italic	this figure is 1 if text is italic.
bold	this figure is 1 if text is bold.

balloon — this figure is 1 if a balloon has been placed around the text using **Start ➪ Annotate ➪ Add/Rem Text Bubble**.

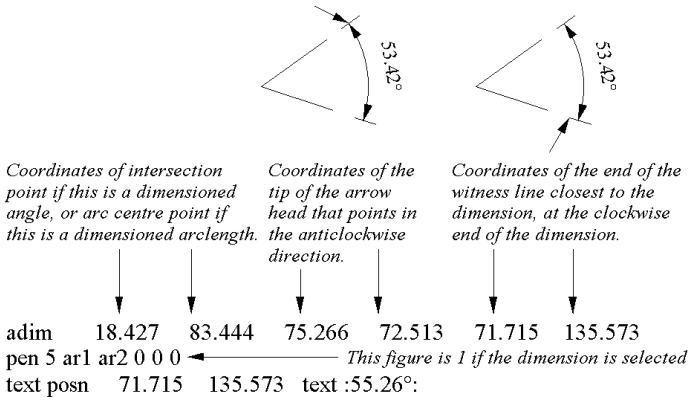
For further information on the above text properties, see **Start ➪ Settings ➪ Set Text Defaults**.

Horizontal, Vertical, Slope and Ordinate Dimensions



pen — color.
ar1 ar2 — arrow heads. The two figures following ar1 ar2 are normally both 0. If an arrow head has been updated using **Start ➪ Annotate ➪ Edit Dimension Properties** it will be represented by the number 10.
ang — angle of dimension in tenths of a degree.
dim text — the contents of the dimension text, i.e. the measurement.

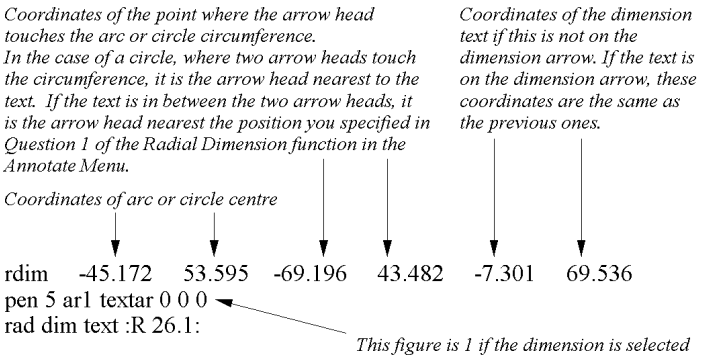
Angular Dimensions



pen — color.

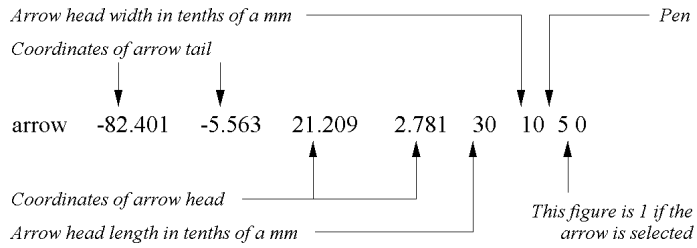
ar1 ar2	the two figures following this are not relevant to angular dimensions
text posn	coordinates of dimension text position.
text	the contents of the dimension text, i.e. the measurement.

Radial Dimensions

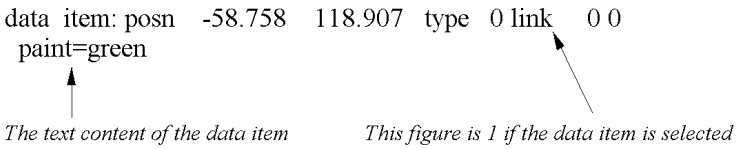


pen	color.
ar1 textar	the two figures following this are not relevant to radial dimensions.
raddim text	the contents of the dimension text, i.e. the measurement.

Arrows



Data Items



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posn	coordinate position of data item.
type	normally 0. Other types of data item are used internally by the program.
link	information used by TrueCAD.

Bitmaps

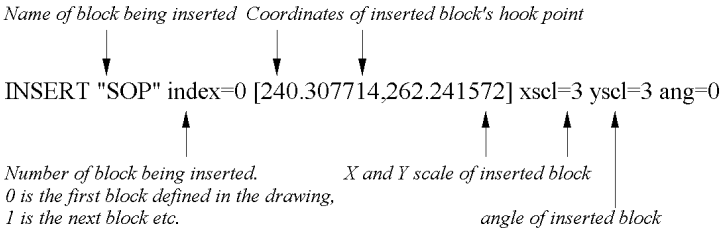
bitmap: filename = "C:\MANDRAW\CCAD.BMP" pixel visible = "Y" position = 138.725166

filename	the full path and filename of the bitmap.
pixel size	real world pixel size.
visible	this is “Y” if the bitmap is visible and “N” if it is displayed as a placeholder.
position	the coordinates of the top left hand corner of the bitmap.

For further information on the above bitmap properties, see **Start ➪File ➪Import Bitmap**.

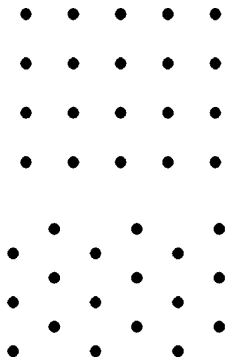
Block Inserts

Drawings that have been imported as DXF or DWG files are likely to contain AutoCAD block inserts. These are represented as follows:



28.14 Grid

FUNCTION: The **Grid** function is used to draw a grid to aid drawing.

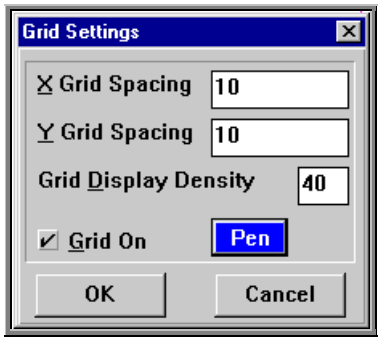


To access the **Grid** function, press Alt S, T, D.

Grid allows you to draw a user-defined grid onto the screen. The grid points can be snapped to using the **Grid Snap** mode or **Jump Grid**. The grid may also be turned on and off.

If you have ticked the **Isometric Grids** box in the **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789). dialog box, you will get an isometric grid.

When you select the **Grid** function **Grid Settings** dialog box appears:



X Grid Spacing
Y Grid Spacing

This setting controls the distance between grid points in the X (East-West) and Y (North-South) directions

Grid Display Density

A high X and Y grid spacing may place too many dots on the screen causing confusion and slow redraws. This is especially true if you zoom out, causing even more dots to appear on the screen.

The figure entered here is the maximum number of dots that will be displayed on the screen at any time, regardless of X and Y spacing and magnification. For example, if you have chosen X and Y

spacing that should generate 80 rows and 80 columns of dots on the screen at a particular time, only 40 rows and 40 columns (i.e. every second dot) will be displayed if 40 has been typed as the maximum. The dots that are not displayed still exist and can be snapped to. You just can't see them.

If the **Grid Snap** mode *or the* **Jump Grid Jump** *do not appear to be snapping to grid points, it is likely they are snapping to invisible grid points. To see these invisible points, zoom into your drawing or increase the* **Grid Display Density**.

Grid On ***checkbox***

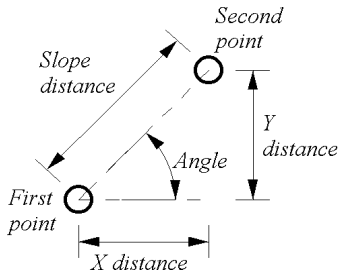
When this box is checked, the grid is displayed. To hide the grid, uncheck this box.

Pen

The **Pen** button controls the color of the grid when it is displayed. To change the color, click the pen button and click on a new color.

28.15 Measure

FUNCTION: The **Measure** function is used to measure and display the distance and angle between two points. To place the dimension into your drawing, use dimensioning functions from the **Start** ➪**Annotate** menu.



To access the **Measure** function, press Alt S, T, M.

This function measures the slope distance, the x and the y distances and the angle between any two points.

Distances, arc lengths, angles, diameters and radii may also be measured using the various dimensioning functions in the **Start** ➪**Annotate** menu. If you use a dimensioning function to measure but do not want to add the dimension to the drawing, cancel the dimensioning function immediately after the measurement has been displayed.

The way that angles are measured depends on the way you have set up the **Angular Format** *in* **Start** ➪ **Settings** ➪ **Drawing Settings** *(Alt S, S, D - page 789).*

Distance ... enter first point ([Space Bar] to exit)

Position the cursor at the first point and click or press Enter.

Second point

Position the cursor at the second point and click or press Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

The measurements are displayed. Click OK.

Distance ... enter first point ([Space Bar] to exit)

This routine repeats until you cancel measuring by pressing Esc or the Space Bar, or by clicking on Cancel.

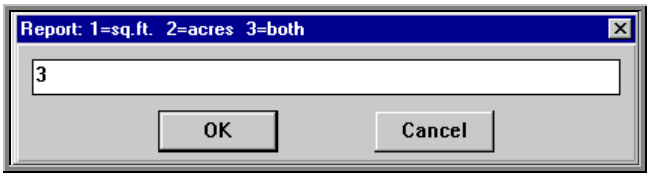
28.16 Polygon Area

FUNCTION: The **Polygon Area** function is used to measure the area of a polygon, then print the area inside the polygon.

To access the **Polygon Area** function, press Alt S, T, P.

Enter point inside perimeter

Click your mouse somewhere inside the polygon you want to measure. "Sight" Survey will attempt to automatically identify a border, then highlight it so you can verify a correct perimeter border.



Select in what units the area should be reported by typing **1**, **2**, or **3** and clicking OK. The prompt will reflect English or Metric choices depending upon the units you have set up in **Start** ➪**Settings** ➪**Unit Settings** (Alt S, S, U - page 797).

Enter placement for Area Text

Position the cursor where you want the middle of the text to be and click or press ↵Enter. If you selected option 1 or option 2 in the previous prompt, only a single line of text will be printed. If you selected option 3, two lines will be printed, one above the other.

Enter point inside perimeter

This routine repeats until you cancel it by pressing Esc or the Space Bar, or by clicking on Cancel.

"Sight" Survey may not be able to determine the correct perimeter, especially if you have a series of polygons, such as a group of lots. You may need to **Select** *the lot, then use* **Start** ➪**Modify** ➪**Move** *(Alt S, M, M - page 625) to move the lot away from the others before using* **Polygon Area**. *Once the area has been established, you can move the lot back into place.*

An alternate method of measurement also exists. At any point prompt, type **XX**. *In the* **TrueCAD Command** *window that opens, type* **QRYAREA** *and click* OK. *Use the* ***Perimeter Menu*** *(see page 597) that appears to select the method for marking the perimeter. When the perimeter is identified, press the space bar to reactivate the* ***Perimeter Menu****, then select* **Done Perim**. *The area and perimeter will be displayed but there is no way to place this information on your drawing.*

28.17 Query Entity

FUNCTION: The **Query Entity** function is used to examine details of a drawing entity.

To access the **Query Entity** function, press Alt S, T, Q.

Select element to query

Position the cursor on the entity you want to query and click or press Enter. An entity information box will appear.

Pens (colors) are numbered downwards from 0 to 15 in the **Pen Selection Area**. A pen of 255 indicates that the pen is being set **By Layer**. **Line types** are numbered from 1 downwards in the **Line Type Menu**. A line type of 255 indicates that the line type is being set **By Layer**. **Width** is measured in tenths of a mm. **Angles** are measured counter-clockwise from the 3 o'clock position. The letter or name in single quotes after the word **Layer** is the layer name.

Depending upon the entity queried, the following information is displayed.

Points and Lines

Line:	Parent and Object names.
Layer:	Layer containing the object.
Length:	Length in units set in **Start** ⇨ **Settings** ⇨ **Units**.
Angle:	Direction measured counter-clockwise from zero at 3 o'clock position.
Linetype:	The style of the line.
Pen:	The pen (or color) used to draw the line.
Width:	The width of the line.
Line Coords:	The first pair of numbers are the X (Easting) and Y (Northing) coordinates of the beginning of the line. The second pair of numbers are the X and Y coordinates for the end of the line. If the first and second pair are identical, the entity is a point.

Polylines

NVertex	The number of vertices in the polyline.
Spline	0=polyline, 1=3 point Bezier curve, 2=4 point Bezier curve.
Key	ID field for GIS type applications.
Snode	ID field for start point of polyline.
Enode	ID field of end node.
Vertex # Coordinates:	Coordinates (X, Y) of the position of the first two vertices.

Arcs, Circles and Ellipses

Arc Length	In the units set in **Start ➪ Settings ➪ Units**.
Radius	In the units set in **Start ➪ Settings ➪ Units**.
CW	1 if the arc was drawn clockwise, else 0.
Aspect	Ellipse aspect ratio if ellipse.
Angle	Ellipse angle if ellipse.
Arc Coordinates	The first pair (X, Y) mark the start of the arc. The second pair (X, Y) mark the center point. The third pair (X, Y) mark the other end of the arc.

Text

Height	Text height is measured in tenths of a mm.
Width	Width is measured in tenths of a mm. 0 is the default width.
String	Text content, i.e. what it says.
Position	Coordinate position (X, Y) of text.
Lorg	text label origin.

Horizontal, Vertical, Slope and Ordinate Dimensions

Arrow1, Arrow2	Arrow heads. The two figures following arrow1 and arrow2 are normally both 0. If an arrow head has been updated using **Start ➪ Annotate ➪ Edit Dimension Properties** it will be represented by the number 10.
Dimension Text	The contents of the dimension text, i.e. the measurement.
Dimension Coordinates:	The first pair (X, Y) mark one dimension point. The next pair (X, Y) mark the other dimension point. The third pair (X, Y) mark the position of the dimension text.

Angular Dimensions

Arrow1, Arrow2	These figures are not relevant to angular dimensions.
Dimension Text	The contents of the dimension text, i.e. the measurement.
Angular Dimensions	The first coordinate pair (X, Y) mark the intersection point if this is a dimensioned angle. If this is a dimensioned arc length, they mark the arc center point. The second pair (X, Y) mark the tip of the arrowhead that points in the counter-clockwise direction. The third pair (X, Y) mark the tip of the arrowhead that points in the clockwise direction.

Radial Dimensions

Arrow	This figure is not relevant to radial dimensions.
Text on Arrow	1 if the dimension text is on the arrow, otherwise 0.
Dimension Text	The contents of the dimension text, i.e. the measurement.
Radial Dimension	The first coordinate pair (X, Y) are the coordinates of arc or circle center. The second pair (X, Y) are the coordinates of the point where the arrow head touches the arc or circle circumference. In the case of a circle, where two arrow heads touch the circumference, it is the arrow head nearest to the text. If the text is in between the two arrow heads, it is the arrow head nearest the position you specified in prompt 1 of **Start ➪ Annotate ➪ Radial Dimension**. The third coordinate pair (X, Y) are the coordinates of the dimension text if this is not on the dimension arrow. If the text is on the dimension arrow, these coordinates are the same as the previous ones.

Arrows

Head Length	Length of arrow head, in tenths of a mm.
Head Width	Width of arrow head in tenths of a mm.
Arrow Coords	The first coordinate pair (X, Y) mark the arrow tail. The second pair (X, Y) mark the arrow tip.

Data Items

String	Text content of the data item.
Position	Coordinate position of data item.
Type	Normally 0. Other types of data item are used internally by the program.
Link	Information used by TrueCAD.

Bitmaps

Pixel size	Real world pixel size, measured in the units selected in **Start** ➪ **Settings** ➪ **Drawing Settings**.
Filename	The full path and filename of the bitmap.
Upper left position	The coordinate position of the upper left corner of the bitmap
CX	Number of pixels in the X direction.
CY	Number of pixels in the Y direction.

Block Inserts

Drawings that have been imported as DXF or DWG files are likely to contain AutoCAD block inserts. When you query a block insert the following information appears:

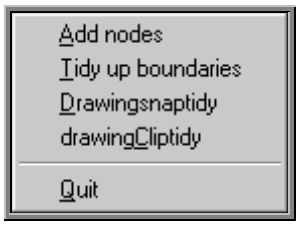
Position	Coordinates (X,Y) of the block's hook point.
X Scale	Horizontal scale of the block.
Y Scale	Vertical scale of the block.
Angle	Rotation angle of the block.

28.18 Tidy Polygons

FUNCTION: The **Tidy Polygons** function is used to clean up polygon segments entered from an "untidy" source such as a digitizer or raster to vector conversion program.

To access the **Tidy Polygons** function, press Alt S, T, T.

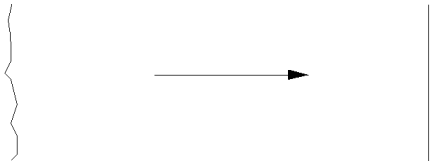
Tidy Polygons has three functions to clean up polygons. When you enter the routine you must select one of these functions.



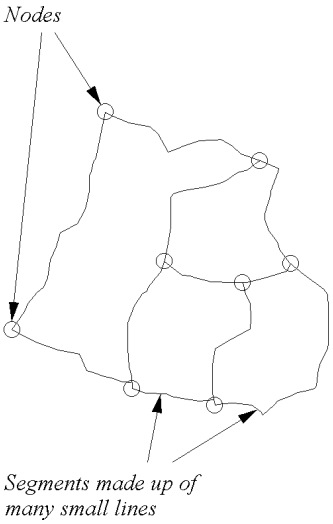
Select an option with your mouse or by pressing **A**, **T**, **D**, **C**, or **Q**.

1. Tidy Boundary

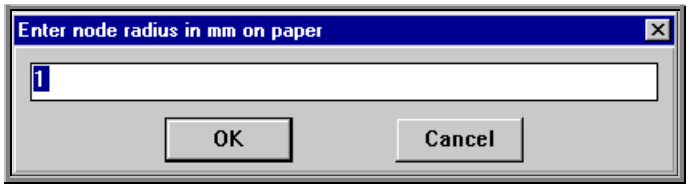
Tidy Boundary removes redundant line segments. For example, when you sketch or digitize, you commonly enter many more line segments than are necessary. **Tidy Boundary** replaces these redundant segments with a single line.



Before After



Before you can use **Tidy Boundary**, you must add some nodes to the existing boundary. This **add nodes** function adds nodes at segment intersection points.

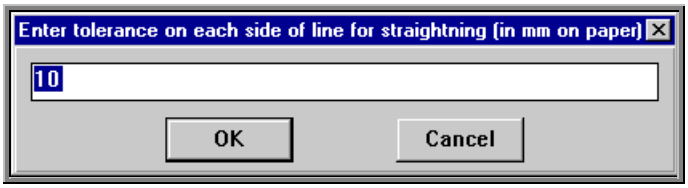


Enter the radius of the nodes to be added. A value of between one and two millimeters is reasonable. Press ↵Enter or click OK.

The cursor changes to **Point** mode ()cursor. Position it close to the segment intersection you want to add a node to and click or press Enter. A circle appears around the intersection, and this node is automatically added to the **__NODES__** layer so you can easily switch off or delete the nodes when you no longer need them.

Enter next node position

Add another node or cancel node addition by pressing the Space Bar or clicking Cancel.



Type a number and press Enter or click OK. A number between .3 and .7 is usually appropriate. This number defines a "corridor" of a certain width, and line segments falling within this corridor will be replaced with a single line segment. The larger the number chosen, the more generalized (or smoother) the resulting boundary.

Select node for start of next boundary segment

Position the cursor on the node marking one end of the boundary segment to be tidied and click or press Enter.

Show first line of segment (Pick first line at its mid point)

Position the cursor half way along the first line making up the boundary segment to be tidied, and click or press Enter.

You may have to magnify into the drawing in order to identify this segment. At any time, you may click the **Zoom Window** *icon () to magnify a portion of your drawing.*

The program tracks along the segment until it reaches another node. You will see its progress as it tracks. If tracking is lost

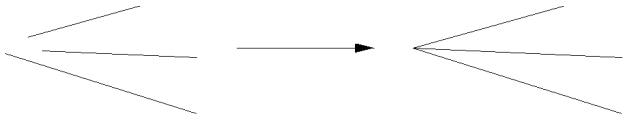
before another node is reached, or if there is ambiguity at a point, "Sight" Survey will be prompt:

Position the cursor on the next line in the boundary segment to be tracked and click or press Enter. Alternatively abandon tracking the boundary by pressing the Space Bar or clicking Cancel.

Click on the first node of another boundary segment to tidy or cancel boundary tidying by pressing the Space Bar or clicking Cancel.

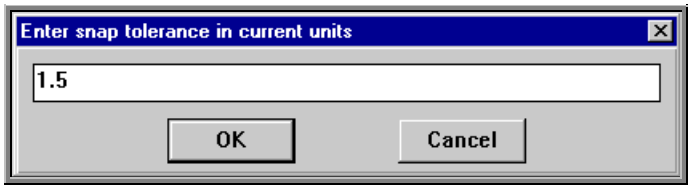
2. Tidy Snaps

Tidy Snaps joins line end points to give a neat junction, deletes very short lines and removes duplicate lines.



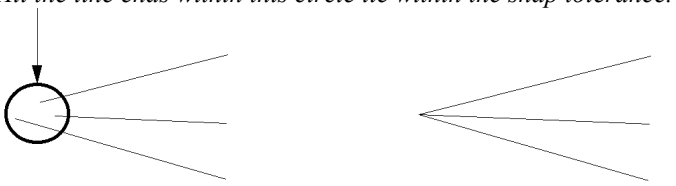
Before After

If you are using this function in conjunction with **Tidy Clips** *then you must* **Tidy Snaps** *first.* **Tidy Snaps** *might move line end points causing overshoots and undershoots already tidied by* **Tidy Clips** *to become untidy again.*



If two or more line end points lie within the snap tolerance, then **Tidy Snaps** will try to move these end points onto the intersection points of the lines.

All the line ends within this circle lie within the snap tolerance.



Before After

Type in the tolerance and press Enter or click OK. The tolerance should normally be about 50% higher than the maximum gap to be closed. You can use the **Start** ➪ **Tools** ➪ **Measure** (Alt S, T, M - page 748) to find the gap size.

If you simply want to use **Tidy Snaps** for removing duplicate lines, set the tolerance to **0** (zero).

Tidy Snaps will delete all lines shorter than a given length. Type a minimum line length and press Enter or click OK. If you do not want to delete any very short lines, enter a length of **0** (zero).

If you simply want to use **Tidy Snaps** for removing duplicate lines, set the length to **0** (zero).

Click Yes to remove overlapping lines, otherwise click No. Overlapping lines will be removed as follows:

- Exactly overlapping - one line will be deleted.
- Partially overlapping - one line will be trimmed to meet the other.
- Long line completely overlapping short line - short line will be deleted.

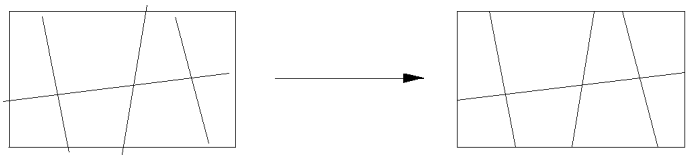
Enter polygon within which to Snaptidy

Draw a polygon around the area within which **Tidy Snaps** is to operate. This prompt repeats until you cancel by pressing Esc or the Space Bar, or by clicking on Cancel.

In some cases, for example where there are three or more lines that do not intersect at the same point, **Tidy Snaps** *may not be able to join the lines. In such cases you may have to use the* **Trim**, **Divide/Extend** *or* **Move Point** *functions in the* **Start** ➪**Modify Menu** *to join them.*

3. Tidy Clips

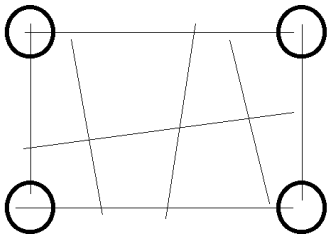
Tidy Clips cleans up line over and undershoots.



Before After

If you are using this function in conjunction with **Tidy Clips** *then you must* **Tidy Snaps** *first.* **Tidy Snaps** *might move line end points causing overshoots and undershoots already tidied by* **Tidy Clips** *to become untidy again.*

Tidy Clips will not tidy overshoots and undershoots where two line ends meet (circled in the diagram below). This is the function of **Tidy Snaps**.



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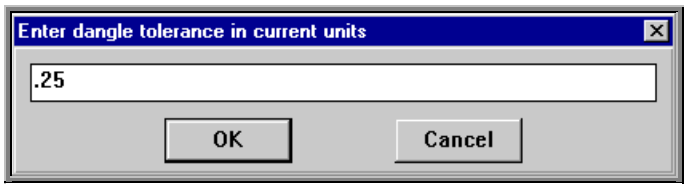


Type in a tolerance for the maximum length of an over or undershoot to be tidied and press ↵Enter or click OK.

Enter polygon within which to Cliptidy

Draw a polygon around the area within which **Tidy Clips** is to operate. This prompt repeats until you cancel by pressing Esc or the Space Bar, or by clicking on Cancel.

In some cases **Tidy Clips** *may not be able to resolve the over and undershoots. In such cases you may have to use the* **Trim**, **Divide/Extend** *or* **Move Point** *functions in the* **Start** ➪ **Modify Menu** *to join them.*

28.19 Expand

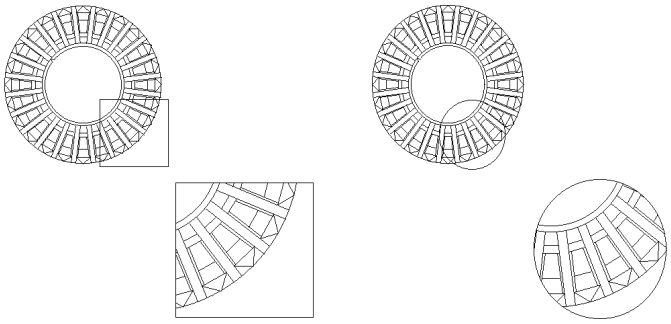
FUNCTION: The **Expand** function is used to automatically produce a detailed view.

To access the **Expand** function, press Alt S, T, X.

Expand automatically produces a detailed view within a box or circle. It can also be used as a *"cut and paste"* function if magnification is set to **1**.

Expand *lets you save a detailed view to a separate layer.* ***This is a good practice*** *to avoid accidentally changing the magnification of your drawing. You must create a layer to save the detailed view to before using* **Expand**. *Use* **Start** ➪ **Settings** ➪ **Layer Control** *(***EL** *or* Alt S, S, Y *- page 839).*

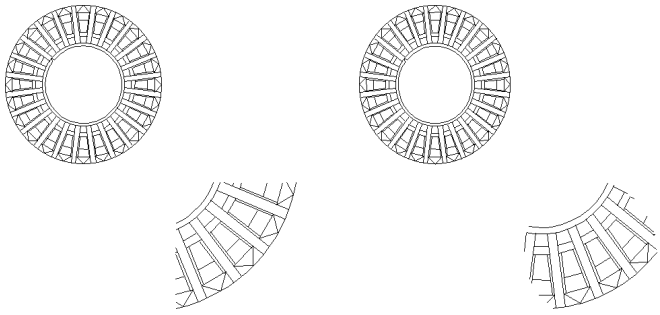
Expand inside a box? (else circle)



Inside a Box *Inside a Circle*

Click Yes to have the detailed view to appear inside a box. To have the detailed view to appear inside a circle, click No.

Would you like to enter box/circle after expand



No Box *No Circle*

If you would like the box or circle to be drawn around the detailed view as in the previous examples, click Yes. Otherwise, click No.

Detailed View in a Box

Enter corner of expand box

Position the cursor at one corner of the expand box and click or press ↵Enter.

Enter another corner of box

Position the cursor at a diagonally opposite corner of the expand box and click or press ↵Enter. Go to the **Enter magnification factor** prompt on the next page.

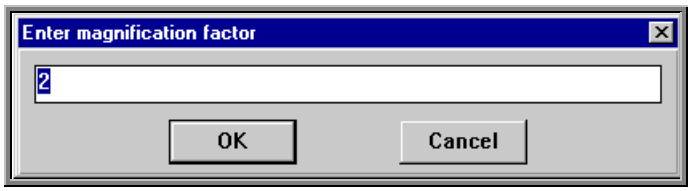
Detailed View in a Circle

Enter center point of expand circle

Position the cursor where the center of the expand circle is to be and click or press ↵Enter.

Enter point on radius

Position the cursor at a point on the expand circle's circumference and click or press ↵Enter.



Type the magnification of the detailed view and click OK or press ↵Enter.

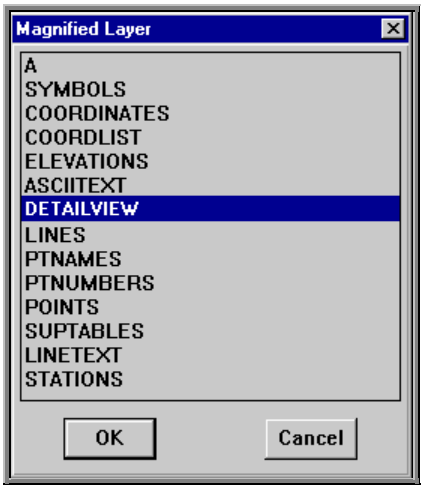
Enter position of expanded detail

A box appears, representing the size of the detailed view. Move the box to a suitable screen location and click or press ↵Enter. The detailed view is drawn.

Do you want an arrow joining the two circles

This question is only asked if you have chosen to draw an expand circle rather than a box, and if you have drawn a circle around the detailed view.

If you want to join the two circles with an arrow, click Yes. Otherwise, click No.



A **Magnified Layer** dialog box appears. Choose a layer for the detailed view to be copied onto by clicking on the layer name.

Anything that you subsequently draw onto the layer that the detailed view is on will have the magnification that you give here. For example, if the drawing scale is 1:1, and you enter a factor for magnification of **2**, anything else that you draw on this layer will be drawn at a scale of 1:0.5.

? *If you have placed the detailed view onto the same layer as the rest of your drawing, it is important that you type a magnification of* `1` *so that anything else you draw on the layer is not drawn at the wrong scale.*

To add dimensions to the detailed view, accept the default magnification, which is the magnification of the detailed view. This will ensure that the dimensions are correctly sized. Accept the magnification you type by clicking OK or pressing Enter.

If you had already dimensioned the drawing before creating the detailed view and the dimensions in the detailed view are now incorrect, you must do the following after you have completed the **Expand** *function.*

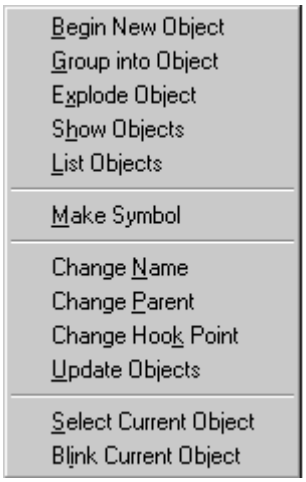
1. *Select the detailed view using the* **Select** *or* **Selection Filters** *commands in the* **Start** ➪ **Edit Menu**.
2. *Then use the* **Start** ➪ **Modify** ➪ **Scale** *function to scale the detailed view by* `0.5 0.5` *then by* `2 2`. *The dimensions will then read correctly.*

Once you have changed the magnification of the layer, you will see that this magnification is reflected in the **Start** ➪ **Settings** ➪ **Layer Control** *dialog box.*

"Sight" Survey 3.0

Section 29

Start Menu - OBJECTS



The **OBJECTS** menu contains commands relating to the creation and changing of objects. Objects are groups of drawing primitives that have been given a name, and function as a single entity.

29.01 Begin New Object

FUNCTION: The **Begin New Object** function is used to create an object by naming it, and then drawing it.

To access the **Begin New Object** function, press Alt S, O, B.

There are three functions that may be used to create an object manually: **Begin New Object**; **Group Into Object**; and **Make Symbol**. Using the **Begin New Object** involves naming the object first, then drawing it.

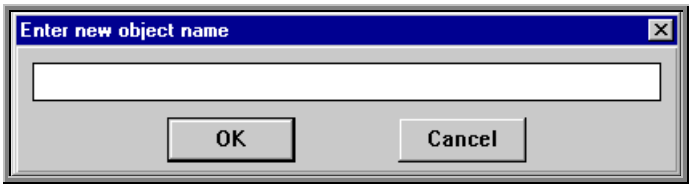
Giving the object a parent name

Follow one of these procedures to give an object a specific parent name:

- Before creating the object, use **Start** ➪ **Objects** ➪ **Change Parent** (Alt S, O, P - page 783). This function defines the default parent name, which will be given to all the objects you subsequently create until you use **Change Parent** again.
- After you have created the object, use **Start** ➪ **Objects** ➪ **Change Name** (Alt S, O, N - page 780).
- If you do not choose a parent name before creating the object, the object will be given the default parent name. This will be **A** unless you have already used the **Change Parent** option to change it.

Objects with the parent name **__LABEL__** *(there are two underscores on either side of* **LABEL***) are not displayed in the list of symbols that appears when you use the* **Start Draw Symbol** *function. If you are creating objects for use as symbols, use* **__LABEL__** *as the parent name for anything which you do not want displayed, such as text descriptions.*

When you enter the **Begin New Object** function, "Sight" Survey prompts:



Type a name for the object and click OK or press ↵Enter. You only need to type the object's name. ***Do not type a parent name***. From this point on, all the primitives that you draw will be grouped into an object with this name until:

- You create another object using **Begin New Object**, **Group Into Object**, or **Make Symbol**.
- You use a function that automatically starts a new object, or you make the object too big (8000 bytes - roughly 250 lines or 130 arcs). In either of these cases, "Sight" Survey will automatically start a new object.
- You change the current object (the object you are currently drawing) using the **Select Current Object** function.

If you are going to use the object as a symbol, you should draw it horizontally. For example, if you are drawing a fuse:

Draw it this way…

… not this way.

This is because of the way "Sight" Survey can automatically rotate and snip around symbols when they are inserted into drawings.

"Sight" Survey will have positioned the object's hook point automatically. When you have finished creating the object, you may want to position its hook point manually. To do this, use **Start** ➪**Objects** ➪**Change Hook Point** (Alt S, O, K - *page 784). If you are going to use the object as a symbol, you should position the hook point at the* ***left*** *hand end of the symbol because of the way that "Sight" Survey can automatically rotate and snip around symbols when they are inserted into drawings.*

When you use **Begin New Object** to create an object, the object's snip box will fit exactly around the extreme edges of the object. No attributes will have been assigned to the object.

When you have created the object, you will be able to select the entire object at once by clicking on it with the **Select Cursor** (▷). If you want to select a single primitive within the object, you must explode it first by using. **Start** ➪**Objects** ➪**Explode Object** (Alt S, O, X - page 770).

29.02 Group Into Object

FUNCTION: The **Group Into Object** function is used to create an object by selecting primitives you have already drawn, then grouping them.

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To access the **Group Into Object** function, press Alt S, E, O.

There are three functions that may be used to create an object manually: **Begin New Object**; **Group Into Object**; and **Make Symbol**. The **Group Into Object** function involves drawing primitives, then grouping the primitives into objects later.

Before you use **Group Into Object**, first draw the primitives you want to group. You must then select them using the **Select** (Alt S,

E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) commands.

If you are going to use the object as a symbol, you should draw it horizontally. For example, if you are drawing a fuse:

Draw it this way…

… not this way.

This is because of the way that "Sight" Survey can automatically rotate and snip around symbols when they are inserted into drawings.

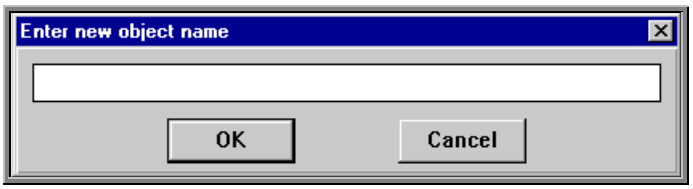
Giving the object a parent name

Follow one of these procedures to give an object a specific parent name:

- Before creating the object, use **Start** ➪ **Objects** ➪ **Change Parent** (Alt S, O, P - page 783). This function defines the default parent name, which will be given to all the objects you subsequently create until you use **Change Parent** again.
- After you have created the object, use **Start** ➪ **Objects** ➪ **Change Name** (Alt S, O, N - page 780).
- If you do not choose a parent name before creating the object, the object will be given the default parent name. This will be **A** unless you have already used the **Change Parent** option to change it.

Objects with the parent name **__LABEL__** *(there are two underscores on either side of* **LABEL***) are not displayed in the list of symbols that appears when you use the* **Start** ➪ **Draw** ➪ **Symbol** *function. If you are creating objects for use as symbols, use* **__LABEL__** *as the parent name for anything which you do not want displayed, such as text descriptions.*

When you enter the **Begin New Object** function, "Sight" Survey prompts:



Type a name for the object and click OK or press ↵Enter. You only need to type the object's name. ***Do not type a parent name***. The selected primitives will be highlighted, and will be grouped under the name you have typed.

If you hadn't selected anything when you chose **Group Into Object**, you will now enter the **Select** function. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the primitives you want to group. When you have finished selecting primitives, press the Space Bar or click Cancel. The selected primitives will be grouped and highlighted.

"Sight" Survey will have positioned the object's hook point automatically. When you have finished creating the object, you may want to position its hook point manually. To do this, use **Start** ➪ **Objects** ➪ **Change Hook Point** (Alt S, O, K - *page 784). If you are going to use the object as a symbol, you should position the hook point at the* ***left*** *hand end of the symbol because of the way that "Sight" Survey can automatically rotate and snip around symbols when they are inserted into drawings.*

When you use **Group Into Object** to create an object, the object's snip box will fit exactly around the extreme edges of the object. No attributes will have been assigned to the object.

When you have created the object, you will be able to select the entire object at once by clicking on it with the **Select Cursor** (▷). If you want to select a single primitive within the object, you must explode it first by using. **Start** ➪ **Objects** ➪ **Explode Object** (Alt S, O, X - page 770).

29.03 Explode Object

FUNCTION: The **Explode Object** function is used to break apart objects and blocks so that individual primitives within them can be selected.

To access the **Explode Object** function, press Alt S, O, X.

Whenever you create an object manually using **Begin New Object**, **Group Into Object**, or **Make Symbol** in the **Start** ➪**Objects** menu, the primitives in the object are grouped. This means that when you click on the object with the **Select Cursor** (▷) all the primitives within it are selected at once, making selection quicker and easier.

Some "Sight" Survey functions that automatically create objects also group the primitives within these objects. For example, when you draw a rectangle using **Start** ➪**Draw** ➪**Rectangle**, the four lines making up the rectangle are grouped. When you create a polyline using **Start** ➪**Draw** ➪**Polyline**, all the lines making up the polyline are grouped. Similarly, symbols entered using **Start** ➪**Draw** ➪**Symbol** are grouped, and sketches produced using **Start** ➪**Draw** ➪**Sketch** are grouped.

All the lines, arcs etc. in a block that has been brought in from DXF or DWG are also grouped together. If you do not want to select the entire grouped object or block when you click on it, but want to select one primitive within it, you must first explode the object or block. To do this, select the object or block using **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560).

If you haven't selected anything when you choose **Explode Object**, you will automatically enter the **Select** function as soon as you enter this routine. "Sight" Survey prompts:

Select Single Entity (Shift for multiple selection)

Select the object or block you want to ungroup. When you have finished selecting, press the Space Bar, or click Cancel.

You will not see anything happening when you use **Explode Object**. Once you have used it, clear all selections using **Start** ➪ **Edit** ➪ **Clear Selection** (Alt S, E, L - page 567). You will now be able to select single primitives using **Select**.

Exploded polylines can be restored one at a time using **Start** ➪**Edit** ➪**Undo** (OO or or Alt S, E, U - page 547) .

To regroup an object that you have exploded, use **Object** in **Start** ➪**Edit** ➪**Selection Filters** to select all the component primitives of the object, and then use **Start** ➪**Objects** ➪**Group Into Object** (Alt S, O, G - page 767) to group them again.

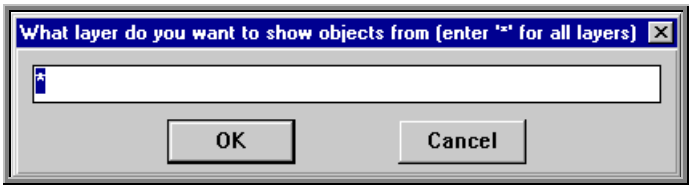
29.04 Show Objects

FUNCTION: The **Show Objects** function is used to draw objects on the screen one by one.

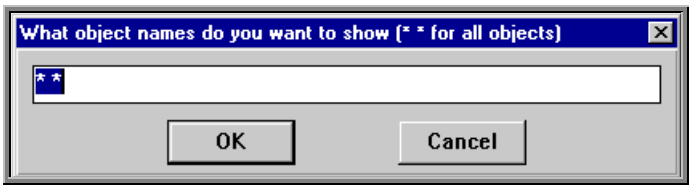
To access the **Show Objects** function, press Alt S, O, H.

Suppose you have three objects in a drawing. When you select **Show Objects**, each object will be shown on the screen in turn. The object's ***hook point*** will be displayed as a ***star***, and it will be surrounded by a box representing its ***snip box***. Its ***parent name***, ***object name*** and ***layer*** will be displayed in a prompt window. If the object is a hatch perimeter, the perimeter's reference point will be shown as a cross, and the hatch index used to hatch the perimeter will also be displayed in the prompt area.

When you select **Show Objects**, "Sight" Survey prompts:

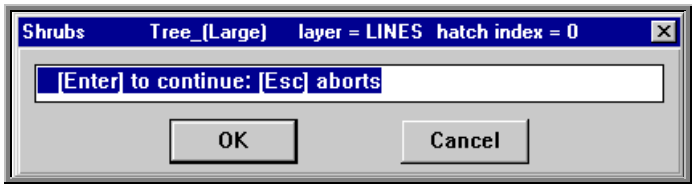


Type the name of the layer you want to display the objects from and click OK or press Enter. To show objects from all layers type * and click OK or press Enter.



You must type ***both the parent name and the object name*** of the objects you want to show. Names are ***case-sensitive***. Wildcards may be used. For example, typing **SHAPES *** will select all objects with the parent name SHAPES, such as SHAPES CIRCLE, SHAPES TRIANGLE, SHAPES RECTANGLE etc. Typing: *** CIRCLE** will select all objects called CIRCLE, whatever their parent names are. Typing: *** *** will select all the objects in the drawing regardless of name.

Click OK or press Enter. The objects are displayed, one by one, either until all the specified objects have been shown or until you press the Esc key.



1. *When the current object is displayed, the words* **current object** *are shown.*
2. *When all your objects have been displayed, an extra object, comprising just a hook point at the screen center will appear. This is normal.*

29.05 List Objects

FUNCTION: The **List Objects** function is used to list, count and measure objects.

To access the **List Objects** function, press Alt S, O, L.

List Objects creates an ASCII file which lists the objects in your drawing.

Below is a typical file created by **List Objects**, extracted from a drawing of a floor plan:

Parent name	object name	Quantity	Area	Perimeter
BUILDING	EXTWALLS	1	8.706215e+07	109939.5
BUILDING	INTWALLS	1	5647791	71410.93
fittings	door	8	8790306	27965.14
fittings	extdoor	1	3026734	3629.442
fittings	window	2	1.92039e+07	14844
furniture	chair	7	955833.1	8881.744
furniture	desk	7	4619122	23064.69

There are 27 objects selected

For each type of object on the drawing, **List Objects** shows:

- the parent name;
- the object name;
- the number of objects with that name;
- the total area taken up by objects with that name; and
- the total perimeter of objects with that name.

For example, in the listing shown above, there are seven desks in the drawing, grouped under the parent name furniture. The total area taken up by the seven desks is 4619122 sq. mm. The total perimeter of the desks is 23064.69mm.

The perimeters and areas are measured in the units you have selected in **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

When you select **List Objects**, "Sight" Survey prompts:

Do you want data from all layers (else just displayed layers)

If you want to list all the objects in your drawing, click [Yes]. If you only want to list the objects in the visible layers, click [No].

Do you want areas and perimeters calculated automatically

If you click [Yes], "Sight" Survey will calculate areas and perimeters. Click [No], and the perimeters and areas will not be calculated.

É *Areas calculated by* **List Objects** *may be incorrect. For* **List Objects** *to produce correct results, the elements in each object must have been drawn sequentially.*

You can select the units you want areas measured in, for example square feet, acres etc. These units can be different from the units you are drawing in. For example, you can draw in feet and measure areas in acres. See **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

A dialog box headed **Save Object Listing As** appears. This is a standard Windows **Save** dialog box. If you do not know how to use it, see the documentation that came with your copy of Windows.

Type a name for the file the object listing will be saved as, and click [OK]. The information is saved to file. You can look at it using any text editor such as the Windows Notepad.

29.06 Make Symbol

FUNCTION: The **Make Symbol** function is used to create an object from primitives you have already drawn by following a series of prompts.

To access the **Make Symbol** function, press Alt S, O, M.

There are three functions that may be used to create an object manually: **Begin New Object**; **Group Into Object**; and **Make Symbol**. The **Make Symbol** function involves drawing primitives, then grouping the primitives into objects later.

If you are going to use objects as symbols - that is, you are going to import them into other drawings - **Make Symbol** has three advantages over the other methods of object creation:

1. It asks you a series of questions allowing you, for example, to place the object's hook point at a position of your choice. The position of the hook point is very important if you are going to import an object from one drawing into another as a symbol, because the object will appear in the second drawing with its hook point at the cursor position. If you were to use **Begin New Object** or **Group Into Object** to create the object, you would have to position the hook point separately using **Start** ➪ **Objects** ➪ **Change Hook Point** (Alt S, O, K - page 784).

2. It allows you to attach information (attributes) to objects. For example, if you draw a fuse, you might want to attach an attribute to it stating that its current rating is 2 amps.

3. It allows you to define your own snip box around the object. This will automatically delete any part of the drawing over which the symbol is placed.

Before using Make Symbol

Before you use **Make Symbol**, you must draw the primitives you want to group.

If you are going to use the object as a symbol, you should draw it horizontally. For example, if you are drawing a fuse:

Draw it this way…

… not this way.

This is because of the way that "Sight" Survey can automatically rotate and snip around symbols when they are inserted into drawings.

Giving the object a parent name

Follow one of these procedures to give an object a specific parent name:

- Before creating the object, use **Start** ➪**Objects** ➪**Change Parent** (Alt S, O, P - page 783). This function defines the default parent name, which will be given to all the objects you subsequently create until you use **Change Parent** again.
- After you have created the object, use **Start** ➪**Objects** ➪**Change Name** (Alt S, O, N - page 780).
- If you do not choose a parent name before creating the object, the object will be given the default parent name. This will be **A** unless you have already used the **Change Parent** option to change it.

Objects with the parent name **__LABEL__** *(there are two underscores on either side of* **LABEL***) are not displayed in the list of symbols that appears when you use the* **Start** ➪**Draw** ➪**Symbol** *function. If you are creating objects for use as symbols, use* **__LABEL__** *as the parent name for anything which you do not want displayed, such as text descriptions.*

Using Make Symbol

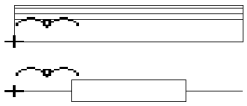
When you select **Make Symbol**, "Sight" Survey prompts:

Type the name of the object you are about to create and click OK or press Enter. ***Do not type a parent name.***

Enter symbol hook point

The hook point is the insertion (reference) point of the object which is used to position the object on the drawing. Choose the hook point carefully and position it accurately so that when you come to place the object into the drawing it will appear where you expect it to.

Because of the way that "Sight" Survey automatically rotates and snips around symbols when they are inserted into drawings, you should position the hook point on the left of the symbol.

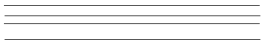


This diagram shows two examples of objects - a window and a fuse. Position the cursor at the position to be used as the hook point and click or press ↵Enter.

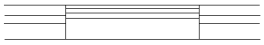
To position the hook point accurately see **Accurate Placement** *on page 497.*

Enter lower left corner of snip box (for snipping out lines)

You can only define a linear, square or rectangular snip box.



Wall before symbol



Wall after symbol

When you insert the symbol into a drawing, the program will automatically snip out everything inside the box you define here, if you want it to. In the example to the left, a window symbol has been inserted into a wall and the wall has been snipped away to accommodate the window.

Position the cursor at the lower left corner of the snip box and click or press ↵Enter.

To position the cursor accurately see **Accurate Placement** *on page 497.*

Enter upper right corner of snip box (for snipping out lines)

Position the cursor at the upper right corner of the snip box and click or press Enter.

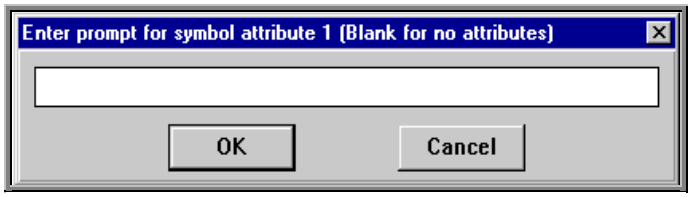
Enclose everything that you want included in symbol

Draw a box or polygon around the primitives that you want to include in the object. Two diamonds marking the extents of the snip box will appear.

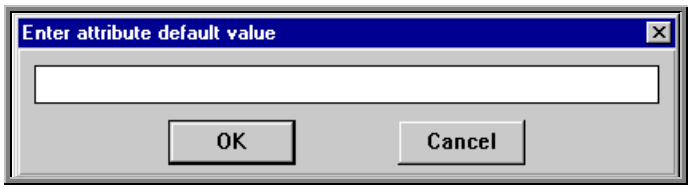
If you enclose any hatches within the polygon, these will be converted to lines. See **Start Annotate Hatch->Lines** *(Alt S, A, H - page 722).*

Attributes

If you want to attach information, called attributes, to an object, follow this section.



The attribute prompt is the name or description for information, for example RESISTANCE for a resistor, WEIGHT for a piece of steel, MATERIAL for what a window is to be manufactured from or CURRENT for the current rating of a fuse. Type in the name and click OK or press Enter.



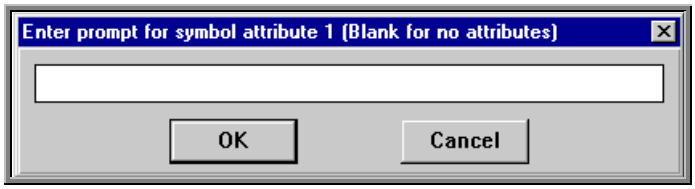
This will be the default value of the attribute named in the previous prompt. For example, you might type WOOD as the material a window is made out of, or 3 AMP for the current rating of a fuse. Type in the value and click OK or press Enter.

When you come to enter the object into another drawing using **Start** ➪ **Draw** ➪ **Symbol**, *you can either display attributes as text or extract them in a bill of materials. See* **Start** ➪ **File** ➪ **Load Symbol File** *(Alt S, F, Y - page 525).*

Enter attribute position

Position the cursor where you want the attribute to be positioned and click or press Enter. A diamond appears.

If you display the attribute as text when you load the object into another drawing, this is the position where the attribute will be displayed.



Type a prompt for another attribute and click OK or press Enter. Attribute prompts will be repeated with reference to the new attribute.

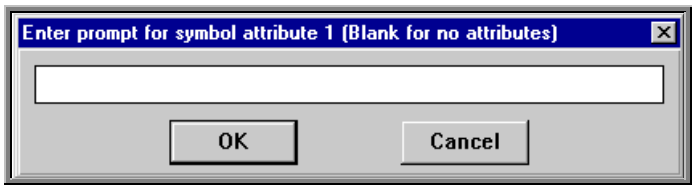
Alternatively stop adding attributes by leaving the text entry area blank and clicking OK or pressing Enter.

Type the name for a new object and click OK or press Enter. To stop making objects, leave the text entry area blank and click OK or press Enter.

No Attributes

If you don't want to attach information, called attributes, to an object, follow this section.

Section 29



Leave the text entry area blank and click OK or press ↵Enter.

Type the name for a new object and click OK or press ↵Enter. To stop making objects, leave the text entry area blank and click OK or press ↵Enter.

When you have created the object, you will be able to select the entire object at once by clicking on it with the **Select Cursor** (▷). If you want to select a single primitive within the object, you must explode it first by using. **Start** ➪ **Objects** ➪ **Explode Object** (Alt S, O, X - page 770).

29.07 Change Name

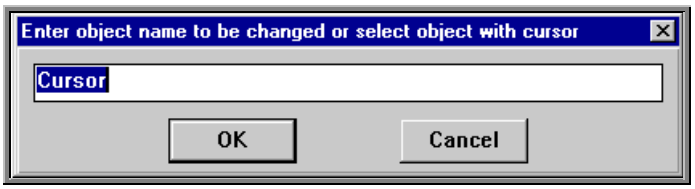
FUNCTION: The **Change Name** function allows you to rename an object or objects. Both the object and parent names may be changed.

To access the **Change Name** function, press Alt S, O, N.

You can select the object whose name must be changed by one of two methods:

1. Clicking on it with your cursor (see **Using the Cursor**);
2. Specifying the name of those objects (see **Specifying the Name**).

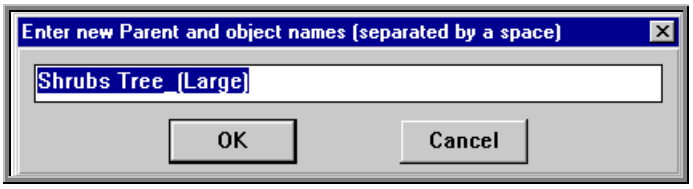
Using the Cursor



To select the object whose name must be changed by clicking on it with your cursor, click OK or press Enter to accept the default answer to this question, **Cursor**.

Select object for name change

Position the cursor on the object whose name is to be changed and click or press Enter.



Type the new parent and/or object name for the object you have selected and click OK or press Enter.

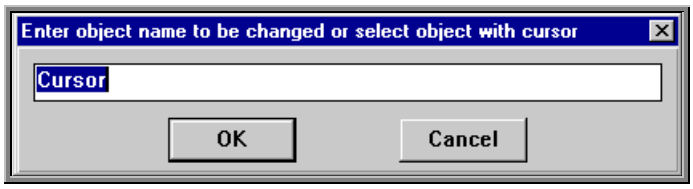
Objects with the parent name **__LABEL__** *(there are two underscores on either side of* **LABEL***) are not displayed in the list of symbols that appears when you use the* **Start Draw Symbol** *function. If you are creating objects for use as symbols, use* **__LABEL__** *as the parent name for anything which you do not want displayed, such as text descriptions.*

Select object for name change

Position the cursor on the object whose name is to be changed and click or press Enter, or cancel the function by pressing Esc or the Space Bar, or by clicking on Cancel.

Section 29

Specifying the Name



Type over the word **Cursor** with the name of the objects whose names you want to change. For example, suppose you have ten objects with the parent name **SHRUBS** and the object name **TREE_LG**. If you type **SHRUBS TREE_LG**, the names of all ten objects will be updated at once to the new name that you specify.

Wildcards may be used. For example, if you type **SHRUBS ***, all objects with the parent name **SHRUBS** will be updated to the new name that you specify, regardless of their object names. If you type ***TREE_LG**, all objects with the name **TREE_LG** will be updated to the new name that you specify, regardless of their parent names. If you type *** ***, all objects, regardless of their parent or object names, will be updated to the new name specified.

If "Sight" Survey can't find an object with the name you typed, the function will be terminated.

Type the new parent and object names and click OK or press ↵Enter. Wildcards may not be used.

Objects with the parent name **__LABEL__** *(there are two underscores on either side of* **LABEL***) are not displayed in the list of symbols that appears when you use the* **Start** ➪ **Draw** ➪ **Symbol** *function. If you are creating objects for use as symbols, use* **__LABEL__** *as the parent name for anything which you do not want displayed, such as text descriptions.*

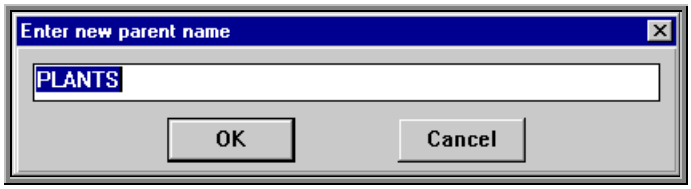
29.08 Change Parent

FUNCTION: The **Change Parent** function is used to change the parent name of an object.

To access the **Change Parent** function, press Alt S, O, P.

When you create a new object using **Begin New Object**, **Group Into Object** or **Make Symbol**, this object is given the default parent name. The **Change Parent** function changes the default parent name to whatever you specify. All subsequent objects that are created will be given this new name as their parent name until you change it again.

To change a parent name that has already been assigned to an object, use the **Change Name** function previously described.



Type the new default parent name and click OK or press Enter.

If you are going to use the object as a symbol, note that objects with the parent name **__LABEL__** *(there are two underscores on either side of* **LABEL***) are ignored by the* **Start ⇨ Draw ⇨ Symbol** *function. You can use* **__LABEL__** *as the parent name for anything which you do not want displayed in the symbols list, such as text descriptions and annotations.*

29.09 Change Hook Point

FUNCTION: The **Change Hook Point** function is used to change the origin, or placement point of an object.

To access the **Change Hook Point** function, press Alt S, O, K.

When an object is created it is automatically given a ***hook point***, or placement point. However, this hook point may not be in a suitable position, especially if the object is to be used as a symbol. The **Change Hook Point** function allows you to change the hook point of an object.

When you select **Change Hook Point**, stars appear on the drawing. These stars represent the current positions of the hook points.

You may find that some objects do not appear to have a hook point. This occurs when hook points are positioned on top of each other. This is especially likely to be the case if one object was drawn originally and was later split into several objects.

Select object for hook change

Position the cursor near the object that needs a new hook point and click or press Enter. The cursor jumps onto the object's current hook point.

Enter new hook point

Position the cursor where you want the object's new hook point to be and click or press Enter.

*If you are going to use the object as a symbol, you should position the hook point at the **left** hand end of the symbol because of the way "Sight" Survey automatically rotates and snips around symbols when they are inserted into drawings.*

To position the cursor accurately see **Accurate Placement** *on page 497.*

A star appears at the new hook point position.

Select object for hook change

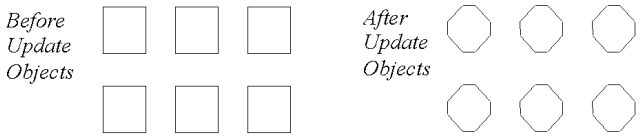
Position the cursor near another object that needs a new hook point and click or press Enter, or cancel the function by pressing Esc or the Space Bar, or by clicking on Cancel.

29.10 Update Objects

FUNCTION: The **Update Objects** function is used to replace all the examples of a particular object.

To access the **Update Objects** function, press Alt S, O, U.

Update Objects allows all the examples of a particular object to be updated at once. A typical example would be the need to replace all the square columns shown on an existing floor plan with differently shaped columns. Without this function, each column would have to be updated individually.



Before using **Update Objects**, you must select ***one*** of the original objects (one of the square columns in this example) as the ***current object*** using the **Start** ⇨ **Objects** ⇨ **Select Current Object** (Alt S, O, S - page 787). You must then ***edit*** this one object to the desired shape and select the **Update Objects** command.

É *It is a good idea to store your drawing before performing this operation, just in case things go wrong!*

Update Objects assumes that **Start** ➪**Modify** ➪**Repeat** (Alt S, M, R - page 631) or **Start** ➪**Modify** ➪**Drop** (Alt S, M, D - page 634) were used to create the multiple copies of an object that now need replacing, as these two commands generate copies with the same parent and object names as the original. If **Repeat** or **Drop** were not used, use **Start** ➪**Tools** ➪**Query Entity** (Alt S, T, Q - page 751) to ensure that all objects to be replaced have exactly the same parent and object names as the current object (the one that has been edited). If they do not, change them using **Start** ➪**Objects** ➪**Change Name** (Alt S, O, N - page 780).

It is a good idea to establish the positions of the hook points of the objects you are going to replace before you select the **Update Objects** command. To do this, select **Start** ➪**Objects** ➪**Change Hook Point** (Alt S, O, K - page 784). A star will appear on each object. Cancel the **Change Hook Point** function without changing any hook points by pressing Esc or the Space Bar, or by clicking on Cancel. The hook points will remain marked by green stars.

Update Objects will work on objects that have been scaled or rotated after being created using the **Start** ➪**Modify** ➪**Repeat** or **Start** ➪**Modify** ➪**Drop** commands. However it will not work if the current object (the one that has been edited) has been scaled or rotated.

Sure you want to update all objects with same name as current object

Click Yes if you are sure you want to update the objects, or No if you want to cancel the function.

Enter point on current object where reference points on old objects must be

If you want the objects to retain their current positions, it is important that the point you choose here is ***the hook point of the current object***. Otherwise, all the objects except the current object

will be moved and the positions of their hook points will be altered. Once you have selected the point, click or press ↵Enter. The objects are replaced.

To position the cursor exactly at the hook point, see **Accurate Placement** *on page 497.*

29.11 Select Current Object

FUNCTION: The **Select Current Object** function is used to select an object to be the current object.

To access the **Select Current Object** function, press Alt S, E, O.

All newly drawn primitives are added to the current object. If you want to add to an object which already exists, you should first choose that object as the current object.

Another use for **Select Current Object** is in the function **Update Objects** (discussed in the previous section) where the current object is used as the template for the other objects with the same name.

Select object to become current object

Position your cursor onto the object that must become the current object and click or press ↵Enter.

29.12 Blink Current Object

FUNCTION: The **Blink Current Object** function is used to highlight current object.

To access the **Blink Current Object** function, press Alt S, O, I.

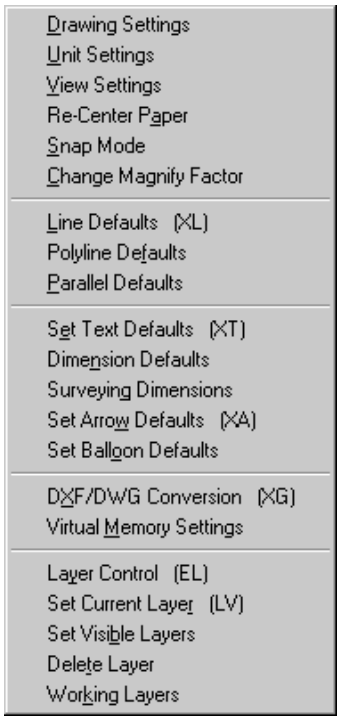
When you select this function, the current object is highlighted. If the current object is already highlighted, selecting **Blink Current Object** un-highlights it. In this way the current pattern can be made to "*blink.*"

Blinking the current object is a useful method of determining where the current object is located.

"Sight" Survey 3.0

Section 30

Start Menu - SETTINGS

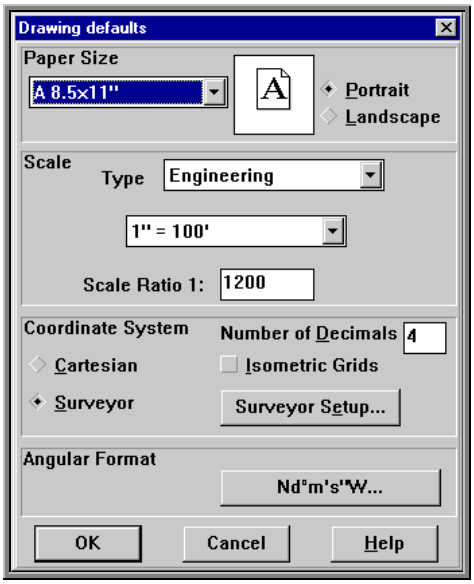


The **SETTINGS** menu is where you will find all of the various routines needed to control drawing settings. From this menu you can change settings for: Drawings; Units; View; Dimensions; Text; Arrows; Layers; Memory; Lines; and Drawing Conversion.

30.01 Drawing Settings

FUNCTION: The **Drawing Settings** function is used to set or change paper size, scale, units, coordinate system, angular format and isometric grid, circles and dimensions.

When you select this option, a dialog box appears. The options in the box can be set before you start drawing or changed at any time during drawing.



The default paper size, scale, units etc. that are loaded each time you enter "Sight" Survey or select **Start** ➪**File** ➪**New Drawing** (Alt S, F, N - page 509) are stored in a drawing called **STARTUP.DRG**.

Paper Size

The currently selected paper size is displayed in a drop-down menu. To change paper size, click the down arrow ( ). Scroll the list of paper sizes until you see the size you want, then click it.

On the drawing screen, the paper size is represented by a magenta box. The center of this box will always correspond to the coordinate **0**, **0** if you are using Cartesian coordinates, or to the coordinate you have specified for the screen center if you are using Surveyor coordinates (see **Coordinate System**).

If you change to a larger paper size in mid-drawing (for example from A4 to A3), the objects you have drawn will take up a smaller proportion of the paper. You can see this if you do a **Start** ➪**View** ➪**Zoom Sheet** (**ZS** or Alt S, V, S - page 574), which displays your entire sheet of paper on the screen.

Similarly, if you change to a smaller paper size in mid-drawing (for example from A3 to A4), the objects you have drawn will take up a larger proportion of the paper, and may even overlap the edges. If this is the case, do a **Start** ➪**View** ➪**Zoom All** (**ZA** or Alt S, V, A - page 573) to see the whole drawing in relation to the paper size (represented by a purple box

In either case, you may want to use **Scale** to rescale your drawing so that it fits the new paper size appropriately.

Orientation

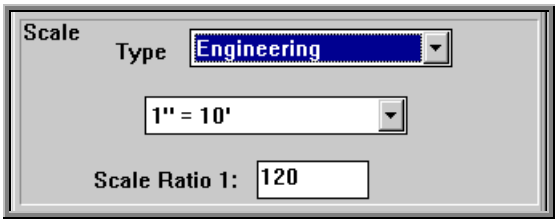
Click on **Portrait** if you want your drawing to be oriented in portrait (i.e. tall), or on **Landscape** if you want it in landscape (i.e. wide). You can also toggle the orientation by clicking on the **Paper Orientation** icon ( ) on "Sight" Survey's main toolbar.

Scale

The currently selected scale type is displayed in a drop-down menu. To change scale type , click the down arrow ( ) and choose from three scale options: **Architectural**, **Engineering** and **Metric/Custom**. Click on the option you want.

Engineering

If you select the **Engineering** option, the scale part of the **Drawing Settings** dialog box looks like this:



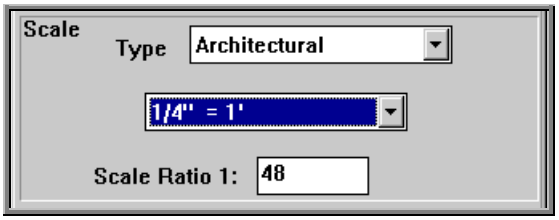
You can select a standard scale from the list of scales that appears, for example 1" = 10'. The first number (1") is a length on paper. The second number (10') is the equivalent real length. When you select a standard scale from the list box, the **Scale Ratio** box automatically updates. For example, if you have chosen a standard scale of **1"=10'**, the scale ratio will automatically update to **1:120**.

Alternatively you can type a scale ratio directly into the **Scale Ratio** box. For example, if you type **1**, the scale will be **1:1**. If you type **120**, the scale will be **1:10**, etc.

In the **Engineering** option, drawing units are automatically set to **feet**. However, you can change the units by selecting the **Metric/Custom** option, clicking on the **Drawing Units** button, and selecting the unit. Then reselect the **Engineering** option.

Architectural

The **Architectural** option, the scale part of the **Drawing Settings** dialog box looks like this:



You can select a standard scale from the list of scales that appears, for example 1" = 1'. The first number (1") is a length on paper. The second number (1') is the equivalent real length. When you

select a standard scale from the list box, the **Scale Ratio** box updates automatically. For example, if you have chosen a standard scale of **1"=1'**, the scale ratio will automatically update to **1:12**.

Alternatively you can type a scale ratio directly into the **Scale Ratio** box. For example, if you type **1**, the scale will be **1:1**. If you type **12**, the scale will be **1:12**, etc.

In the **Architectural** option, drawing units are automatically set to **feet and inches**. However, you can determine the preferred denominator, or set the inches to decimal by selecting the **Metric/Custom** option, clicking on the **Drawing Units** button, selecting **feet inches** as the unit, selecting the denominator (see **Drawing Units**, below), then reselecting the **Architectural** option.

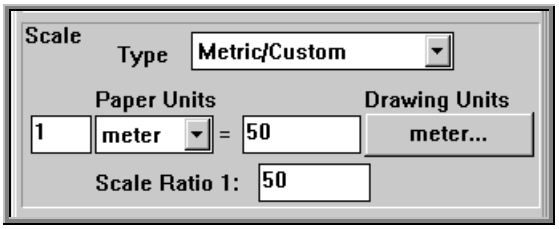
Metric/Custom

Setting your drawing scale and units using the **Metric/Custom** option is best described using an examples

For details on the **Drawing Units** *you can specify, see* **Drawing Units** *later in this chapter.*

When specifying **Drawing Units**, *ensure you also specify sensible* **Area Units**. *For example, if your drawing units are millimeters, you probably don't want to measure areas in square feet!*

Suppose you want to produce a drawing at a scale of 1:50 in meters. To draw at this scale, set up the scale part of the **Drawing Settings** dialog box so that it looks like this:



You can do this in one of two ways:

1. Set the **Paper Units** to **1 meter** and the **Drawing Units** to **50 meters**. The **Scale Ratio** box automatically updates to **1:50**.

2. Type **50** into the **Scale Ratio** box, which will then specify a scale of **1:50**. Set the **Drawing Units** to **meters**.

Changing Scale

If you change scale in mid-drawing, your drawing will be re-scaled about the coordinate **0**, **0** if you are using **Cartesian** coordinates or about the coordinate you have specified for the screen center if you are using **Surveyor** coordinates (see **Coordinate System** later in this section).

Changing scale does not change dimensions. For example, if a line has a dimension of 100 feet, and the scale is changed, then that line will still have a dimension of 100 feet. It will merely look smaller or larger in relation to the paper size.

If you change to a smaller scale (for example from 1:1 to 1:10), the objects you have drawn will take up a smaller proportion of the paper.

Similarly, if you change to a larger scale (for example from 1:10 to 1:1), the objects you have drawn will take up a larger proportion of the paper, and may even overlap the edges. If this is the case, use **Start** ➪ **View** ➪ **Zoom All** (**ZA** or Alt S, V, A - page 573) to see the whole drawing in relation to the paper size.

In either case, you may want to change the **Paper Size** (previously discussed) so that your drawing fits the paper appropriately.

Different Scales on One Drawing

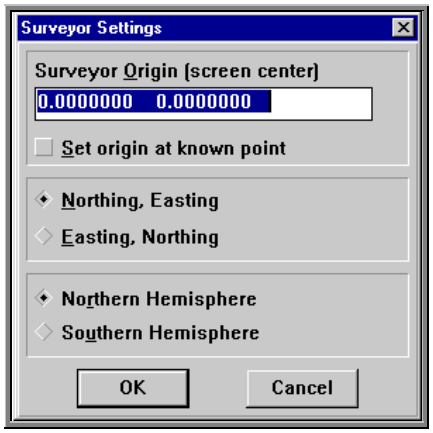
You can have different scales on one drawing by creating layers with different magnifications. See **Start** ➪ **Settings** ➪ **Layer Control** (**EL** or Alt S, S, Y - page 839) for more details.

Coordinate system

If you check **Cartesian**, the program will use the Cartesian coordinate system. Most professional designers, such as Mechanical Engineers and Architects, will use the Cartesian system.

Surveyor coordinates are for use by surveyors. If you choose this option, the text on the button labeled **Surveyor Setup...** will become

black. If you click on this button, the following dialog box appears.



If you are working in the **Surveyor** coordinate system, drawings that have been drawn using the same coordinate system will automatically be aligned with respect to each other if you use **Start** ➪ **View** ➪ **Open Drawing** to load more than one drawing at once.

Surveyor Origin

The **Surveyor Origin** section of the dialog box allows you to set up "Sight" Survey's coordinates to match the coordinates of your survey. Type the survey coordinates that should correspond to the screen center into the **Surveyor Origin** box.

If you want to type the coordinates of another point on the screen instead of the screen center, type these coordinates into the **Surveyor Origin** box and check **Set origin at known point**. When you exit **Drawing Settings**, this message will appear:

Click OK to exit the message box. "Sight" Survey prompts:

Click on point with coordinates x y

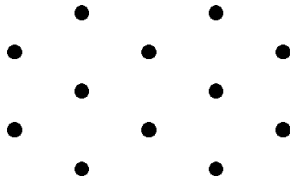
Place the cursor at the position on the screen corresponding to the coordinates you typed into the **Surveyor Origin** box and click or press ↵Enter.

Number of Decimals

The number that you type here defines the number of decimal places that "Sight" Survey's drawing is accurate to. The maximum number is 15. ***This setting has nothing to do with "Sight" Survey's double precision COGO accuracy.***

Isometric Grids

If the **Isometric Grids** box is checked, certain functions will behave in a particular way.



Start ➪ **Tools** ➪ **Grid** will produce an **isometric grid**, where the grid points are angled at 30, -30 and 90 degrees to each other.

Start ➪ **Draw** ➪ **Ellipse** will draw ellipses that are the right shape for use as **circles on an isometric drawing**, and that are angled at 90 degrees to the angle at which the cursor is locked.

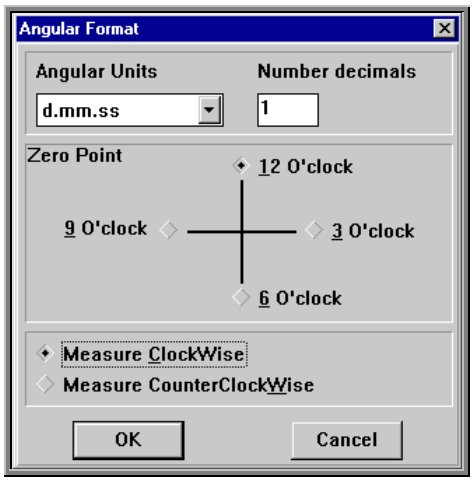
Start ➪ **Annotate** ➪ **Slope Dimensions** will allow you to angle witness lines to produce dimensions appropriate for isometrics.

Angular Format

When you click on the **Angular Format** button (labeled **dd.dddd** by default), a dialog box (shown on the next page) appears.

The selected **Angular Unit** is shown here (`dd.dddd` stands for decimal angles). To change units, click on the arrow, then click on the unit you want to use. You have a choice of grads (100 grads = 90 degrees), radians, decimal angles, and degrees, minutes and seconds.

Degrees, minutes and seconds can be displayed in one of three ways: degrees.minutes.seconds; degrees° minutes' seconds" or N degrees° minutes' seconds" W.



Number of Decimals

Type here the number of decimals that you want displayed.

Zero Point and Clockwise/ Counter-clockwise Settings

The zero point option allows you to decide whether zero degrees will be in the 3, 6, 9, or 12 o'clock position. If the 3 o'clock position is checked, zero degrees will be at the 3 o'clock position and 180 degrees will be at the 9 o'clock position. If the 12 o'clock position is checked, zero degrees will be at the 12 o'clock position and 180 degrees will be at the 6 o'clock position, etc.

The zero point and clockwise/counter-clockwise settings you define in **Angular Format** apply only to **Polar Move** and to surveyor functions.

Other functions, such as **Start** ➪**Modify** ➪**Rotate**, are not affected by **Angular Format**. Angles are measured counter-clockwise from the 3 o'clock position.

The description of each individual function states whether that function is affected by **Angular Format** or whether angles are measured counter-clockwise from 3 o'clock.

If you check the **Measure Clockwise** diamond, angles will be measured in a clockwise direction. For example, if zero degrees is positioned at the 3 o'clock position, 90 degrees will be at the 6 o'clock position. if you check the **Measure Counter Clockwise** diamond, angles will be measured in a counter clockwise direction.

For example, if zero degrees is positioned at the 3 o'clock position, 90 degrees will be at the 12 o'clock position.

Typing in degrees, minutes, seconds and quadrants

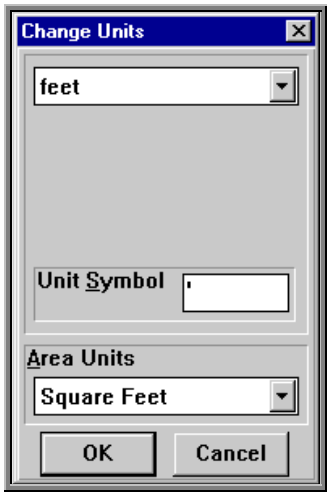
You can type in 12° 34' 56.78" as **`12 34 56.78`**, as **`12.34.56.78`**, or as **`12.345678`**. Using the last method, the first two characters after the decimal point are taken as minutes, the next two as seconds, and anything after that as decimal seconds.

You can type in quadrants as **`N45 23 12E`**. Alternatively, you can use a quadrant number instead. Use the **`/`** or **`*`** characters to separate the angle from the quadrant number, which must come after the angle. For example, **`N12°34'56"E`** can be entered as **`12.3456*1`** or as **`12.3456/1`**. As is the case in COGO, the four quadrants are: NE = 1; SE = 2; SW = 3; and NW = 4.

30.02 Unit Settings

FUNCTION: The **Unit Settings** function is used to change the drawing's linear and area units.

To access the **Unit Settings** function, press Alt S, S, U.



To change units, set the **Drawing Settings** scale type to **Metric/ Custom**. The currently selected linear unit is displayed on the **Drawing Units** button. To change linear or area units, click on this button, and the **Change Units** dialog box appears. The Linear Units are shown along with the Unit Symbol and the Area Units.

You can change the linear units using the list box at the top of the **Change Units** dialog box. The choices are as follows:

- mm
- Meter
- Inches. These are decimal inches, i.e. one and a half inches would be represented as 1.5.
- User-defined. If you check this option, the prompt mm per user unit will appear. Type the length of the user defined unit in mm.

- Feet inches. If you check this box, dimensions will be displayed in the format 5+7/12 (five inches and seven twelfths of an inch), 1'3+5/16 (one foot, three inches and five sixteenths of an inch), etc. When you check this option, another small dialog box appears. You must enter the largest denominator into this small dialog box. For example, if you type 12, the denominators used will be 2, 3, 4, 6 and 12. If you type 16, the denominators used will be 2, 4, 8 and 16, etc.
- Feet. These are decimal feet, i.e. one and a half feet would be represented as 1.5'.
- Yard
- Km
- Mile

Unit Symbol

Some units have a default symbol which appears in the **Unit Symbol** box. You can type any symbol to represent any unit here.

Area Units

These are the units that areas are measured in using **Start** ➪**Tools** ➪**Polygon Area**, and **Start** ➪**Objects** ➪**List Objects**. You can change the area units using the **Area Units** list box at the bottom of the **Change Units** dialog box. The choices are:

```
User defined        Square mm
Square inches       Square cm
Square feet         Square m
Square yards        Hectares
Acres               Square km
Square miles
```

Changing Units

If you change linear units in the middle of a drawing, existing dimensions will not be updated to the new units automatically (see next paragraph). All subsequent dimensions, however, will be displayed in the new units. This is an advantage to some people who want or need **to display both English and metric units on the same drawing**.

If you change units in the middle of a drawing and you want to update the dimensions you have already drawn to the new units, you must do the following once you have changed units. First ***select your entire drawing*** using **Select All** in **Start** ➪**Edit** ➪**Selection Filters** (Alt S, E, F - page 560). Then use the **Start** ➪**Modify** ➪**Scale** (Alt S, M, A - page 629) to scale the drawing

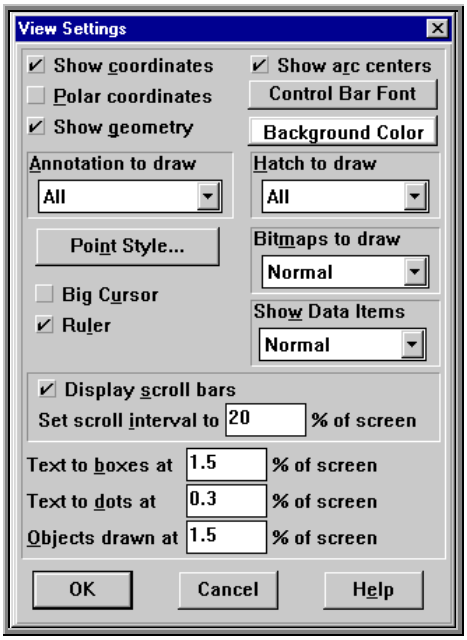
by **0.5 0.5**. Finally, use the **Scale** function again to scale the drawing by **2 2**. The dimensions will have been updated.

30.03 View Settings

FUNCTION: The **View Settings** function is used to to control what is displayed in the **Drawing** window.

To access the **View Settings** function, press Alt S, S, V.

When you select **View Settings**, a dialog box appears. The default view settings loaded each time you enter "Sight" Survey or select **Start** ➪ **File** ➪ **New Drawing** are stored in a drawing called **STARTUP.DRG**.



Show Coordinates and Polar Coordinates

The **Show Coordinates** and **Polar Coordinates** boxes are not used by "Sight" Survey. The Northing (Y) and Easting (X) coordinates at the cursor are always displayed at the bottom right of the screen.

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Whether these coordinates are shown in the order Easting, Northing or Northing, Easting depends on the **Coordinate System** you have chosen in **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

Show Geometry

The **Show Geometry** box is not used by "Sight" Survey.

Show Arc Centers

If the **Show Arc Centers** box is checked, dots marking arc or circle center points are displayed. *(Dot size shown is exaggerated.)*

You can jump to these dots using **Start** ➪ **Tools** ➪ **Jump Point** (Alt S, T, J - page 730) and **Start** ➪ **Tools** ➪ **Jump Circle Center** (Alt S, T, E - page 730).

If you uncheck the **Show Arc Centers** box, the dots will be "switched off". Even though you can't see them, you will still be able to jump to them.

Control Bar Font

The **Control Bar Font** button is not used by "Sight" Survey.

Background Color

This option allows you to change the background color of the **Drawing** window. When you click on the button, a color palette appears.

Click on the color you want the **Drawing** window to be.

Annotation to Draw

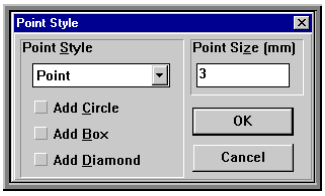
This setting allows you to determine which annotations will be displayed on the screen, and how. Your options are:

- **`None`**, all the annotations you have drawn will be "switched off". No annotations will be shown on the screen, although all will be printed or plotted out. This results in faster screen redraws.
- **`Text Only`**, dimensions will be "switched off".
- **`Dimensions Only`**, text, including text in balloons as well as entire text bubbles, will be "switched off".

- **All Text as Boxes**, all text, including balloon and dimension text, will be displayed as boxes.
- **All**, all annotations will be displayed.

Point Style

This option controls point size and how points drawn using **Start** ➪**Draw** ➪**Point** will be displayed.



Points can be "turned off," or displayed as follows:

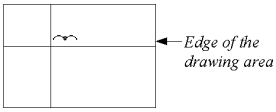
- Point
- \+ Cross
- X X Cross
- ' Blip

By checking one or more of the boxes: **Add Circle**; **Add box**; **Add biamond**; you can choose to display points with circles, boxes and/or diamonds around them.

You may also set the size of the point to be drawn. Enter a value (mm). If you type a negative point size, it is interpreted as a percentage of the screen size. For example, a point size of **-2** means that points will always be drawn at 2% of screen size regardless of magnification.

Big Cursor

If you check this option, the cursor will be attached to a cross hair extending all the way across the drawing area in the horizontal and vertical directions.



Ruler

If the **Ruler** box is checked, a **ruler bar** will be displayed across the bottom of the **Drawing** window. If the **Ruler** box is not checked, the **ruler bar** will not be displayed.

Hatch to Draw

Displaying hatches slows down redraws. This setting gives you the option to display hatches on request only, to display all hatches or to display selected hatches. Your options are:

- **None**, no hatches will be displayed when you redraw the screen. To display your hatches when None has been selected, use **Start** ➪**Annotate** ➪**Draw All Hatch** (Alt S, A, D - page 721). This will draw all your hatches onto the screen. The next time you do a redraw, the hatches be "switched off" again.
- **All**, all your hatches will be displayed each time you redraw the screen.
- **Selected,** only those hatch perimeters that have been selected using the **Hatch** option in **Start** ➪**Edit** ➪**Selection Filters** (Alt S, E, F - page 560) will be hatched each time you redraw the screen.

Bitmaps to Draw

When you load a bitmap, you can either load it as a placeholder or in full detail. If you load a bitmap as a placeholder, it will be displayed as a cross-hatched rectangle. This speeds up redraws.

The **Bitmaps to Draw** setting gives you the option to display all the bitmaps in your drawing as placeholders or in full detail, regardless of how you loaded them.

- **All**, all bitmaps will be displayed in full detail.
- **None**, all bitmaps will be displayed as placeholders.
- **Normal**, the bitmaps will be displayed as you loaded them. Bitmaps that were loaded as placeholders will be displayed as placeholders. Bitmaps that were loaded in full detail will be displayed in full detail.

Show Data Items

This setting is not used by "Sight" Survey.

Display Scroll Bars

If the **Display Scroll Bars** box is checked, scroll bars will be displayed on the screen. The **scroll interval** determines how sensitive the scroll bar is. The smaller the interval, the smaller the distance you will be able to pan using the scroll bars.

Text to Boxes at _ % of Screen

There is no point in drawing text onto the screen in full detail if it is too small to read. The **Text to Boxes** option specifies a percentage of the screen size below which text is not drawn in full detail. For example, if the value is 1.5%, any text smaller than 1.5% of the screen size is drawn as a box, speeding up screen redraws.

Text to Dots at _ % of Screen

This is exactly the same as **Text to Boxes**, except that text is drawn as a dot instead of as a box.

Objects Drawn at _ % of Screen

In concept, this option is the same as the **Text to Boxes** option. There is no point in drawing objects onto the screen in full detail if they are too small to see properly. This option specifies a percentage of the screen size below which objects are not drawn in full detail. For example, if the value is 1.5%, any object smaller than 1.5% of the screen size is drawn as a box, speeding up screen redraws.

30.04 Re-Center Paper

FUNCTION: The **Re-Center Paper** function is used to move the paper so it fits your drawing better.

To access the **Re-Center Paper** function, press Alt S, S, A.

This function is especially useful for centering drawings that have been imported via DXF or DWG.

The edges of your sheet of paper are marked by magenta dotted lines. Sometimes you may need to center your drawing on the paper.

When you select **Re-Center Paper**, "Sight" Survey prompts:

Enter new paper center

Position the cursor where you want the center of the paper to be and click or press Enter.

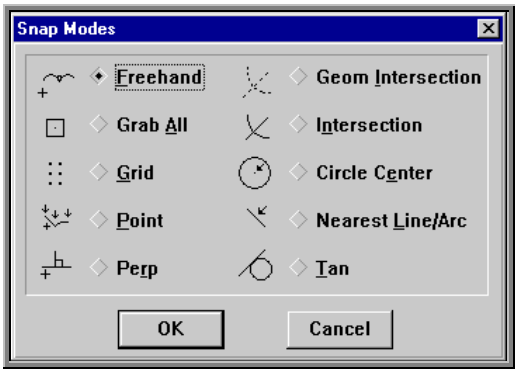
If you are using **Cartesian** coordinates, this position will be at coordinate position `0`, `0` after re-centering. If you are using **Surveyor** coordinates, it will retain its current coordinates, although it will be moved to the center of the paper.

30.05 Snap Mode

FUNCTION: The **Snap Mode** function is used to enter a snap mode.

To access the **Snap Mode** function, press Alt S, S, S.

When you access **Snap Mode**, "Sight" Survey prompts:



To select a **Snap Mode**, click on the mode you want to use and then click OK.

Snap modes cause the cursor to behave in a particular way each time you click or press Enter. All of the snap modes except **Freehand** cause the cursor to do two things:

1. To snap onto a specific point. For example, if you are in **Grid** mode, the cursor will snap onto the nearest grid point when you click or press Enter.

2. To accept the point that is snapped onto. For example, suppose you are in **Grid** mode and "Sight" Survey is prompting you to enter the first point of line. When you click or press Enter, the cursor will snap onto the nearest grid point and this point will also be accepted as the first point of the line, causing "Sight" Survey to prompt for the next point of the line.

Freehand mode is different from the other modes. Unlike the others, it does not cause the cursor to snap onto a particular point when you click or press Enter. It just accepts the point on which the cursor is currently located. To accept a specific point accurately when using **Freehand** mode, move to that point first using the **Arrow Keys** or one of the **Jumps**, and then accept the point by pressing Enter or clicking (see the various **Jumps** in the **Tools** menu beginning on page 727).

Freehand mode is the best mode to use for some functions. For example, if you use another mode for the **Fillet** function, the fillet may turn "inside-out". Similarly, if you are using a function like **Stretch**, this function may appear not to be working unless you are in **Freehand** mode. This is because the cursor may keep jumping back to the nearest point, usually the point you are trying to stretch. *If an inexplicable happening occurs, check your snap mode.*

There are two differences between **Snap modes** and **Jumps**:

1. Snap modes affect the cursor each time you click or press Enter. Jumps cause a "one-off" movement of the cursor, i.e. each time you want to perform a jump you have to select the jump.
2. Snap modes both move the cursor onto a point and accept that point. Jumps merely move the cursor. To accept a point after you have jumped to it, you must click or press Enter.

You can see from the cursor which mode you are in. For example, when you are in **Freehand** mode, the cursor looks like this: .

Unless you are using the **Grab All** mode ( ), the snap mode will not be operational when the **Select** or **Nodes** cursors are displayed (or).

Freehand

You can also enter the **Freehand** mode by clicking on the **Freehand** icon ( )he **Drawing** window toolbar.

When you are in **Freehand** mode, the cursor looks like this: .

When you press Enter or click in **Freehand** mode, the point that the cursor is located on is accepted, for example as the first point of a line. To accept an accurate point in **Freehand**mode, position the cursor accurately before pressing Enter or clicking using the arrow keys, a jump, etc. See **Accurate Placement** on page 497.

Grab All

You can also enter the **Grab All** mode by clicking on the **Grab All** icon ( ) in the **Drawing** window toolbar.

When you are in **Grab All** mode, the cursor looks like this: .

When Enter is pressed or when you click when you are in **Grab All** mode, the cursor will automatically snap onto the closest point, intersection or grid point enclosed within the cursor box. **Grab All** searches within the box in the following order:

1. If a point (for example a point, the end of a line, the end of an arc, an arc or circle center) is found, take the nearest one.
2. If a geometry intersection is found, take the nearest one.
3. If any other intersection is found, take the nearest one.
4. If any grid point is found, take the nearest one.
5. If none of the above are found, the **Grab All** mode will behave in the same way as the **Freehand** mode.

*Unless you need to snap onto points, intersections and grid points, the **Freehand** mode is a more efficient mode than the **Grab All** mode on a large drawing because of the searches that the **Grab All** mode must carry out.*

Grid

You can also enter the **Grid** mode by pressing Shift G on your keyboard.

When you are in **Grid** mode, the cursor looks like this: .

When you draw in this mode, the cursor will snap onto the nearest grid point when you click or press Enter. If no grid has been drawn, **Grid** mode acts like the **Freehand** mode. See **Start** ➪ **Tools** ➪ **Grid** (Alt S, T, D - page 747).

If the **Grid** *mode does not appear to be working, it is probable that it is snapping to invisible grid points. In order to see these invisible points, zoom into your drawing or increase the maximum number of grid dots across screen. See* **Start** ➪ **Tools** ➪ **Grid** *(Alt S, T, D - page 747).*

Point

When you are in **Point** mode, the cursor looks like this:  .

When you draw in this mode, the cursor will snap onto the nearest point when you click or press Enter. This may be a point drawn with the **Start** ➪ **Draw** ➪ **Point** function, the end of a line or arc, an arc or circle center point, the label origin of an item of text, the label origin of an item of dimension text or an arrow end point.

Geom Intersection

When you are in **Geometric Intersection** mode, the cursor looks like this: .

When you press Enter or click when you are in **Geometric Intersection** mode, the cursor will automatically snap onto the closest intersection or tangency point between geometry lines and circles. If no geometry has been drawn, the **Geometric Intersection** mode acts like the **Freehand** mode.

Intersection

You can also enter the **Intersection** mode by clicking the **Intersection** () icon in the **Drawing** window toolbar.

When you are in **Intersection** mode, the cursor looks like this: .

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When you press Enter or click in **Intersection** mode, the cursor will snap to the nearest intersection. This intersection can be any combination of lines, arcs and geometry lines and circles.

Circle Center

When you are in **Circle Center** mode, the cursor looks like this:  .

When you draw in this mode, the cursor will snap onto the nearest arc or circle center when you click or press Enter.

This mode will not snap to the centers of geometry circles. Use the **Geom Intersection** mode for this.

Nearest Line/Arc

You can also enter the **Nearest Line/Arc** mode by clicking on the **Nearest Line/Arc** icon () in the **Drawing** window toolbar.

When you are in **Nearest Line/Arc** mode, the cursor looks like this:  .

When you draw in this mode, the cursor will snap onto the nearest line or arc when you click or press Enter. This line or arc can be solid or geometry.

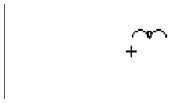
Perp

You can also enter the **Perpendicular** mode by clicking on the **Perpendicular** icon () in the **Drawing** window toolbar.

When you are in **Perpendicular** mode, the cursor looks like:  .

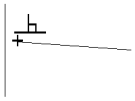
The **Perpendicular** mode snaps the end of a line to another line or arc so that they are perpendicular to one another. The **Perpendicular** snap only works when you are drawing lines, including polylines. For example, if you have selected the **Start Draw Line (Pt to Pt)** command, "Sight" Survey prompts:

Enter first point of line



Position the cursor where you want the start point of the line to be and click or press Enter.

Enter next point of line



Enter **Perpendicular** mode by clicking on the **Perpendicular** icon ( ) in the **Drawing** window toolbar. The cursor changes to: . Position it close to the line or arc that the line you are drawing must be perpendicular to. Click or press Enter.

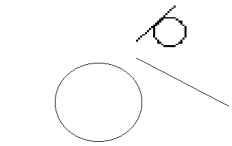
The end of the line you are drawing snaps to the other line or arc so that they are perpendicular to each other.

Tan

You can also enter the **Tangent** mode by clicking on the **Tangent** icon ( ) in the **Drawing** window toolbar.

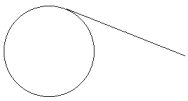
The **Tangent** mode snaps a line or arc to another line or arc so that they are tangential to one another. It only works when you are drawing lines or arcs, including polylines. For example, if you have selected the **Start** ➪ **Draw** ➪ **Line (Pt to Pt)** command, "Sight" Survey prompts:

Enter first point of line



Position the cursor where you want the start point of the line to be and click or press Enter.

Enter next point of line



Enter **Tan** mode by clicking on the **Tangent** icon ( ) in the **Drawing** window toolbar. The cursor changes shape. Position it close to the arc that the line you are drawing must be tangential to. Click or press Enter.

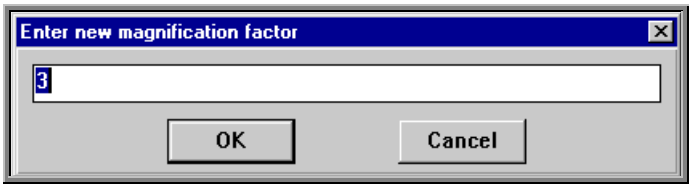
The end of the line you are drawing snaps to the arc so that they are tangential to each other.

30.06 Change Magnify Factor

FUNCTION: The **Change Magnify Factor** function is used to change the magnification factor.

To access the **Change Magnify Factor** function, press Alt S, S, C.

When you use **Start** ➪ **View** ➪ **Magnify** or **Demagnify**, the screen is magnified or demagnified by the factor you enter here.



Type the magnification factor you want to use, then click OK or press ↵Enter.

30.07 Line Defaults

FUNCTION: The **Line Defaults** function is used to determine or change the properties of lines and arcs drawn by "Sight" Survey.

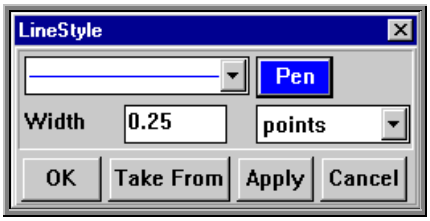
To access the **Line Defaults** function, press Alt S, E, O, or by right-clicking on the **Line** icon ( ) in the **Drawing** window toolbar.

The default line style that is loaded each time you enter "Sight" Survey or select **Start** ➪ **File** ➪ **New Drawing** is stored in a drawing called **STARTUP.DRG**.

When you edit the **Line Defaults**, the **Polyline Defaults** will automatically change to the same line type, pen and width you have selected.

You can also use **Line Defaults** to change the line style of lines and arcs as you are drawing them, or to change the line style of existing lines and arcs.

When you access the **Line Defaults** function, the **Line Style** dialog box appears.



Line Style

Press the ▼ button next to the line style shown. A drop-down scrollable selection list of several line styles will appear from which you can select the desired style.

Line Color

Press the Pen button next to the line style window. A color palette will appear from which you can select the desired color.

Line Width

Enter a new value into the **Width** entry box. If you need to change the line width measurement units, press the ▼ button next to the units box shown. You may select from the following units: **mm**, **inches**, and **points** (a point is $^{1}/_{72}$ of an inch).

Take From

If you want to match the line style of an existing line or arc, select it using the **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560) functions. Then go to the **Line Defaults** option and click Take From. The dialog box will automatically be updated so that the line style of subsequently drawn lines will match the line style of the existing line. Click OK.

Change Existing Lines

Use **Select** or **Selection Filters** to select the lines whose styles you want to change. Access the **Line Defaults** option. Edit the dialog box to your satisfaction, then click Apply and OK. The styles of the selected lines will be updated.

30.08 Polyline Defaults

FUNCTION: The **Polyline Defaults** function is used to determine or change the style of polylines and Bezier curves drawn by "Sight" Survey.

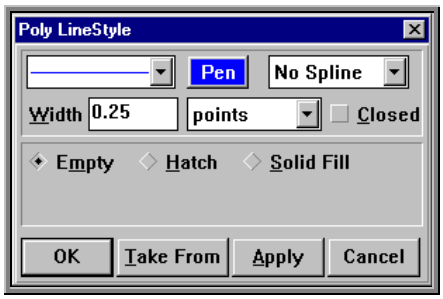
To access the **Polyline Defaults** function, press Alt S, S, F, or right-click the **Polyline** icon ( ) in the **Drawing** window toolbar.

The default polyline style that is loaded each time you enter "Sight" Survey or select **Start** ▷ **File** ▷ **New Drawing** is stored in a drawing called **STARTUP.DRG**.

When you edit the **Polyline Defaults**, the **Line Defaults** will automatically change to the same line type, pen and width you have selected.

The way polylines (and Bezier curves) look when you draw them depends on the way you have set up the **Polyline Defaults**. You can also use **Polyline Defaults** to change the style of existing polylines and Bezier curves.

When you access the **Polyline Defaults** function, the **Polyline Style** dialog box appears.

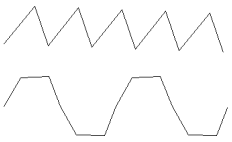


In the same manner as **Line Defaults**, this box allows you to select **Line Style** of the polyline or Bezier curve (for example solid or dotted); its **Line Color**; and its **Line Width** in mm, inches or points. You can select an actual line color and line type, or can choose to set line color and line type **By Layer** (see **Start** ▷ **Settings**

Layer Control on page 839). If you set line width to **0**, you can assign each color a width when you print using **Start** **File** **Print**.

The dialog box also allows you to determine whether a polyline will be a straightforward polyline with **No Spline**, a **3 pt Bezier** curve, or a **4 pt Bezier** curve, and whether it will be closed and contain a hatch or solid fill.

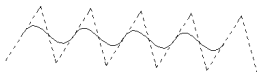
Polylines



Polyline Defaults allows you to determine whether a polyline will be a straightforward polyline without a spline, a 3 point Bezier curve or a 4 point Bezier curve.

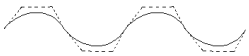
Polylines look exactly the same as lines drawn using **Start** **Draw** **Line (Chained)** (Alt S, D, H - page 585).

3 Pt Bezier curves



3 Point Bezier curves are drawn between every three polyline vertices.

4 Pt Bezier curves



4 Point Bezier curves are drawn through every four polyline vertices.

Closed

If you check the **Closed** option, the start point of the polyline will be joined with the end point.

Empty, Hatch and Solid Fill

Empty, **Hatch** and **Solid Fill** options allow you to hatch the polyline.

If you select **Empty**, the polyline will not be hatched.

Hatch lets you cross-hatch a polyline. If you select **Hatch**, a list box appears. Select the hatch pattern you want from the list box. Hatch patterns are the same as those used by **Enter Hatch/Solid Fill**, and are defined by the **HATCH.PAT** file. See **Start** **Annotate** **Enter Hatch/ Solid Fill** (Alt S, A, F - page 716) .

Solid Fill lets you solid fill a polyline. If you select **Solid Fill**, a colored button appears. Click on this button and a color palette appears. Select the color you want the polyline to be filled with.

Take From

If you want to match the style of an existing polyline or Bezier curve, select it using **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560). Access the **Polyline Defaults** option and click Take From. The dialog box will automatically be updated so that the style of subsequently drawn polylines will match the style of the existing polyline. Click OK.

Change Existing Polylines

Use **Select** or **Selection Filters** to select the polylines or Bezier curves whose styles you want to change. Access the **Polyline Defaults** option. Edit the dialog box to your satisfaction, then click Apply and OK. The styles of the selected polylines and Bezier curves will be updated.

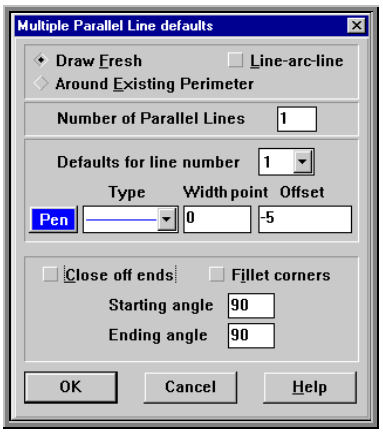
30.09 Parallel Defaults

FUNCTION: The **Parallel Defaults** function determines how parallel lines will be drawn, and what they will look like.

To access the **Parallel Defaults** function, press Alt S, S, P.

When you select **Parallel Defaults**, a dialog box appears. The defaults selected here determine how parallel lines drawn using **Start** ➪ **Draw** ➪ **Parallel Line** are drawn, and what they look like.

The default parallel line settings that are loaded each time you enter "Sight" Survey or select **Start** ➪ **File** ➪ **New Drawing** are stored in a drawing called **STARTUP.DRG**.



How Parallel Lines will be Drawn

Parallel lines may be drawn in one of three ways:

1. Around an existing perimeter;
2. As "fresh" parallel chained lines. "Fresh" means that there is no existing perimeter to draw around;
3. As a "fresh" sequence of parallel lines and arcs.

Around an Existing Perimeter

If you want to draw parallel lines around an existing perimeter, check the **Around Existing Perimeter** box.

If the **Around Existing Perimeter** box is checked, you will enter the **Perimeter Menu** (see page 597) when you select the **Parallel Line** ( ) function to draw the parallel lines. Using the **Perimeter Menu**, you will have to define the perimeter you want to draw parallel to. When you have defined the perimeter, the parallel lines and arcs will be drawn.

Fresh Parallel Chained Lines

Fresh parallel lines are parallel lines that are not drawn around an existing perimeter. When you draw fresh lines, only one line appears on the screen as you draw using the **Parallel Line** ( ) function. This line is called the setting out line. The other parallel lines are drawn relative to it once it is complete.

If you want to draw fresh parallel chained lines, for example the cavity walls of a house, check the **Draw Fresh** box.

If the **Draw Fresh** box is checked, you will enter the **Line (Chained)** function when you select the **Parallel Line** ( ) function. You will have to draw the line that other lines will be parallel to (the setting out line). When you have drawn the setting out line, the parallel lines will be drawn.

Parallel Line Arc LineSequence

If you want to draw a parallel line arc line sequence, check the **Line Arc Line** and **Draw Fresh** boxes.

If the **Line Arc Line** box is checked, you will enter the **Line Arc Line** function when you select the **Parallel Line** ( ) function. You will have to draw the line arc line sequence that other lines and arcs will be parallel to (the setting out line). When you have drawn the setting out line, the parallel lines and arcs will be drawn.

Defining the Parallel Lines

The number of parallel lines is the number of parallel lines excluding the setting out line or the perimeter. You can have a maximum of *ten* parallel lines.

The line style of the setting out line is controlled by **Start** ➪**Settings** ➪**Line Defaults**. For each parallel line you must set up a default line style.

Defaults for Line Number

You may have a maximum of ten parallel lines. Suppose you have chosen **3** as the number of parallel lines. Ensure that the number **1** is displayed in the **Defaults for Line Number** box. Choose the **Pen** (color), **Type** (for example dotted, solid), **Width** and **Offset** for parallel line **1**.

Then click on the arrow to the right of the number **1**. Because you have chosen 3 as the number of parallel lines, the numbers **1**, **2** and **3** are shown. Click on the number **2**, which will be displayed in the **Defaults for Line Number** box. Now choose the **Pen**, **Type**, **Width** and **Offset** for parallel line 2.

Repeat for line **3**, or for however many lines you have chosen as the number of parallel lines.

You can change the defaults of a particular parallel line at any time, so long as that line's number is the one shown in the **Defaults for Line Number** box.

Pen, Type & Width

The methods for setting the **Pen**, **Type** and **Width** are identical to the **Start** ➪**Settings** ➪**Line Defaults**. See page 810 for any needed instructions.

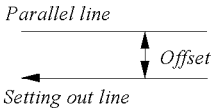
Offset

When you draw fresh parallel lines, only one line will appear on the screen as you draw them. This line is called the **setting out** line, and the other parallel lines will be drawn relative to it. When you draw parallel lines around existing lines or a perimeter, the parallel lines are drawn relative to this perimeter.

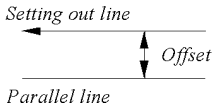
The **Offset** is the distance between a parallel line and the setting out line, or a parallel line and the perimeter. It is measured in the units you specified in the **Start** ➪**Settings** ➪**Drawing Settings** (Alt S, S, D - page) dialog box.

Offsets for fresh parallel lines

If you type a **positive** offset (for example: `5`), the parallel line will appear on the **right** of the setting out line in the direction of drawing.

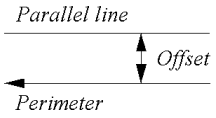


If you type a **negative** offset (for example: `-5`), the parallel line will appear on the **left** of the setting out line in the direction of drawing.

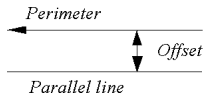


Offsets for parallel lines drawn around existing perimeters

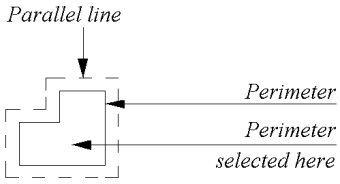
If you type a **positive** offset (for example: `5`), the parallel line will appear on the **right** of the perimeter in the direction in which you will define it using the **Perimeter Menu** options. (See page 597.)



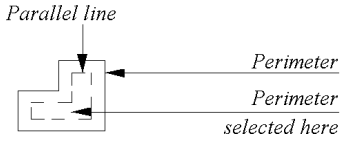
If you type a **negative** offset (for example: `-5`), the parallel line will appear on the **left** of the perimeter in the direction in which you define it using the **Perimeter Menu** options.



If you track the existing perimeter using the **Auto** option, parallel lines with a **positive** offset will appear on the **opposite side of the perimeter to the one you select** it on.

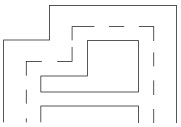


If you track the existing perimeter using the Auto option, parallel lines with a **negative** offset will appear on the **same side.**

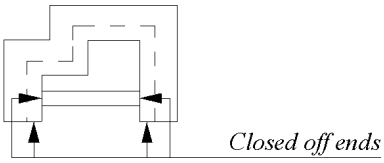


Closing Off Ends

If you do not want to close off the ends of your parallel lines, do not check this box.



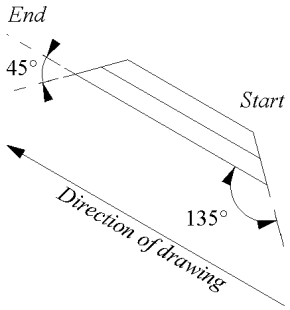
If you want to close off the ends of your parallel lines, check the **Close off Ends** box.



Starting and Ending Angles

Start and end angles are measured counter-clockwise from the setting out line, in the direction of drawing or perimeter definition.

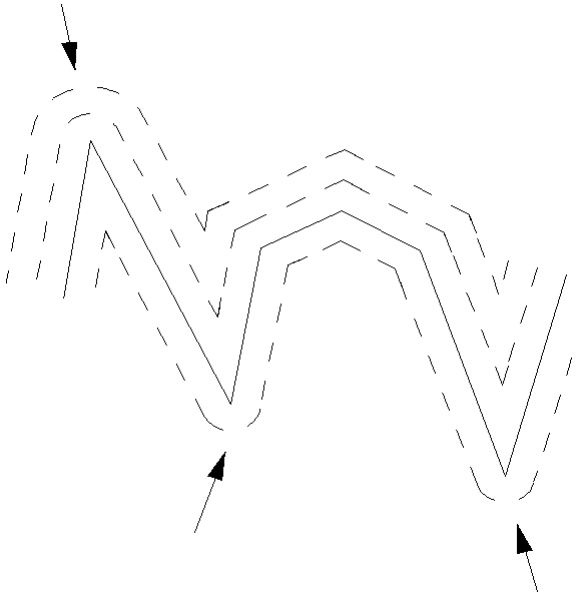
In this example, the starting and ending angles for the parallel lines were 135 degrees for the start angle and 45 degrees for the end angle.



Filleting Corners

If you check this box, "Sight" Survey will automatically fillet parallel lines on the **outside** of corners **less than 90 degrees**.

In this diagram, the solid line represents the setting out line or perimeter. The dashed lines represent the parallel lines.



New Geometry Color

"Sight" Survey does not use this setting.

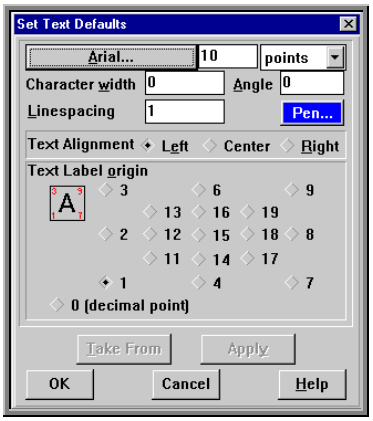
30.10 Set Text Defaults

FUNCTION: The **Set Text Defaults** function is used to determine or change the style in which text is drawn.

To access the **Set Text Defaults** function, press Alt S, S, E., or right-click the **Text** icon (A) in the **Drawing** window toolbar.

The text defaults that are loaded each time you enter "Sight" Survey or select **Start** ➪ **File** ➪ **New Drawing** are stored in a drawing called **STARTUP.DRG**.

You can use **Set Text Defaults** to determine the style of text as you are writing it; of subsequently entered text; of text that you are importing; or to change the style of existing text. When you select **Set Text Defaults**, the following dialog box appears.



Take From and **Apply**

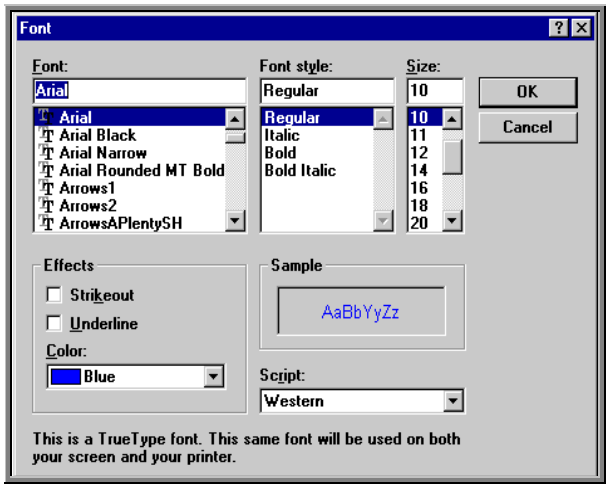
The **Take From** and **Apply** buttons lets you apply a captured text style or format to existing text. To capture text attributes, select the text, type **XT**, then click **Take From** **OK**.

To apply the captured attributes to other text, select the text, type **XT**, then click **Apply** to open the **Attributes to Apply** box, shown on the next page. From the **Attributes to Apply** box, select the attributes you want to apply to the selected text and click **OK**.

1. *If you select more than one item, the* Take From *button is not available.*
2. *If you double-click an item instead of typing* **XT**, *neither the* Take From *or* Apply *buttons are available.*
3. *To change more than one item at a time, use the* **Selection Filter** *to select them, then type* **XT**.

Font Style

The name of the currently selected font is written on the button at the top left-hand corner of the **Set Text Defaults** dialog box. If you click on this button, the **Font Dialog Box** appears. This allows you to select the font you wish to use, embolden or italicize it, change its size, its color and to strike out or underline it.



Section 30

Text height can either be determined in the **Font Dialog Box** *(the* **Size** *option), where it is measured in points, or in the* **Set Text Defaults** *dialog box. Text height is described later in this section.*

Windows contains with three types of fonts: **TrueType** fonts, **Screen** fonts and **Plotter** (or Stroke) fonts. If you are going to obtain output using a printer, you should use **TrueType** fonts, or **Printer** fonts that are native to your particular printer. If you are going to obtain output using a plotter, you should use **Plotter** fonts, such as the **Stroke Font** collection available from Simplicity Systems. *Call 1-800-777-7978 for details.*

É

If you are outputting to a vector (pen) plotter, you should use one of the plotter fonts, Modern, Roman, Script, or some type of stroke font for your text and dimensions. (HPGL Users - if you use any other font on your drawing it will be converted for the plotter but all your text will be plotted horizontally, regardless of its orientation on the drawing.)!

TrueType fonts are preceded by a **TT** or icon in the list of fonts in the **Font Dialog Box**. They look the same on your screen as they do when they are output to your printer. TrueType fonts scale smoothly to any size on almost any Windows-supported screen and printer (but not daisy-wheel printers or plotters). Extra TrueType fonts can be purchased, and those supplied with other packages can be used.

Screen fonts (if they appear at all) are preceded by an icon representing a screen and usually have the suffix (WN) on the list of fonts in the **Font Dialog Box**. These are the fonts that Windows uses for the text that appears in dialog boxes on the screen, among other things. The font that you see on the screen will be approximated by your printer, so text written using screen fonts may look slightly different on the screen than when printed.

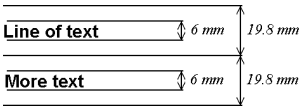
Plotter fonts are not preceded by an icon. They are vector fonts (i.e. they are made up of lines) and are the fonts you should choose if you are going to output to a plotter.

Printer fonts are usually preceded by a printer icon ( ). These fonts are installed to Windows when you install a new printer.

1. If you have set up your default printer in **Print Setup** *in the* **Windows Control Panel** *as a plotter, only the plotter fonts will be listed in the* **Font Dialog Box**. *Conversely, if the plotter fonts* ***do not appear*** *on your list of fonts, try setting up your default printer as a plotter.*

2. *Windows is supplied with* ***three*** *Plotter fonts:* ***Modern,*** ***Roman*** *and* ***Script****. The font called* ***Plotter*** *is a screen font,* ***not*** *a plotter font.*

Text Height



You can either select the text height in the **Font Dialog Box** (the **Size** option) or you can type it into the box next to the font button in the **Set Text Defaults** dialog box.

If you select text height in the **Font Dialog Box,** the height is measured in **points**. (A point is $^{1}/_{72}$ of an inch.)

If you type the text height into the box next to the font button in the **Set Text Defaults** dialog box, text height can be measured in **mm**, **points** or **inches**. The currently selected unit is shown at the top right of the **Set Text Defaults** dialog box. To change units, click on the arrow to the right of the selected unit, then click on the unit you want to use from the list that appears.

The actual character occupies approximately two thirds of the text height. For example, if text height is set to 6mm, the characters will be 4mm high.

Character Width

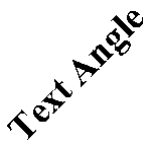
The figure you type here alters character width. If it is set to **zero**, the default width of the Windows fonts will be used.

Line Spacing

The figure you give for the **Line Spacing** is multiplied by the **Text Height** and then by 1.1 to give the distance between two lines of text. For example, suppose you enter a line spacing of 3 (triple space), and the a text height is 6mm. The distance between two

lines of text will be 19.8mm (3*6*1.1). The 1.1 factor is used because it creates an aesthetic line spacing for almost all fonts, whereas a factor of 1 causes some fonts to look squashed.

Angle



This determines the angle at which the text will be placed on the drawing. For example, an entry of 45 will result in the text being, placed on the drawing at an angle of 45 degrees.

Angles are measured in a counter-clockwise direction from the 3 o'clock position.

Pen

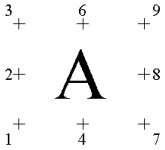
The Pen button is the color of the currently selected pen. To change pen colors, click on the Pen button and click on the color you want from the palette that appears.

Text Alignment

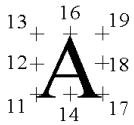
The **Text Alignment** option is relevant if you have several lines of text. If the **Left** option is checked, the text will be left justified. If the **Center** option is checked, it will be centered. If the **Right** option is checked, it will be right justified.

Text Label Origin

This determines where text will be placed relative to the cursor position.

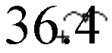


Label origins 1, 2, 3, 4, 6, 7, 8 and 9 are positioned around a character cell that is slightly larger than the character.



Label origins 11, 12, 13, 14, 16, 17, 18 and 19 are positioned around the character.

Label origin 15 is positioned at the center of the character.



Label origin 0 puts the text origin on the decimal point of the text. This is typically used for displaying elevations.

If you choose origins 1, 2, 3, 11, 12 or 13, the text will appear on the right of the cursor position. For example, if you choose label origin 2, text will be placed relative to the cursor position as shown.

If you choose origins 4, 6, 14, 15 or 16, text will appear centered about the cursor position. For example, if you choose label origin 15, text will be placed relative to the cursor position as shown.

If you choose origins 7, 8, 9, 17, 18 or 19, the text will appear on the left of the cursor position. For example, if you choose label origin 17, text will be placed relative to the cursor position as shown.

Take From

If you want to match the text style of an existing piece of text, select the existing text using **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560). Go to **Set Text Defaults** and click Take From. The dialog box will automatically be updated so that the style of subsequently entered text will match the style of the existing text. Click OK.

Set or Change Text Style while Entering Text

Text is entered in the **Text Edit** dialog box (see **Start** ➪ **Annotate** ➪ **Text Line Entry** - page 659). Click Text Defaults >> and the **Set Text Defaults** dialog box will appear. Edit the defaults until they are to your satisfaction. Then click OK. When you have finished typing the text and have exited the **Text Edit** dialog box, the text will appear on the screen in the style you have just defined.

Importing Text

Text can be imported either via the **Start** ➪ **File** ➪ **Import ASCII Text** option, or via the **Start** ➪ **Edit** ➪ **Paste** option. As text will be imported in the style currently selected in the **Set Text Defaults** dialog box, you should edit the dialog box to your satisfaction prior to importing the text.

Changing Existing Text

To change the style of existing text, double click the text. The **Text Entry** dialog box will appear. Click Text Defaults >> and the **Set Text Defaults** dialog box will appear. Edit the defaults until they are to your satisfaction. Then click OK. Click OK to exit.

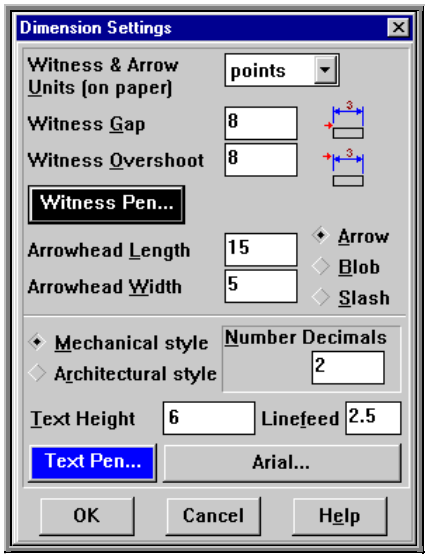
30.11 Dimension Defaults

FUNCTION: The **Dimension Defaults** function is used to set default dimension parameters.

To access the **Dimension Defaults** function, press Alt S, S, N., or right-click the **Dimension** icon ( ) on the **Drawing** window toolbar.

Dimension Defaults determines how dimensions look. Dimension parameters are unlike text parameters in that if you change them, **all** the dimensions that you have drawn will be updated to the new parameters (the **Witness Pen** of existing dimensions is not updated).

The dimension defaults that are loaded each time you enter "Sight" Survey or select **Start** ⇨ **File** ⇨ **New Drawing** are stored in a drawing called **STARTUP.DRG**.



Witness Line and Arrow Style

Witness lines are the lines accompanying and indicating dimensions. Witness lines often print very faintly on modern high

resolution inkjet printers. They can be thickened as follows. Set aside one color and draw all your witness lines in that color. Then map that color to the desired thickness when you print.

Witness and Arrow Units

The **Witness Gap**, **Witness Overshoot**, **Arrow Head Length**, **Arrow Head Width** and **Text Height** (see below) will be measured in the units you choose here.

The currently selected units are displayed. To change units, click on the down arrow ( ) on the right of the unit display, then click on the unit you want to use. You can choose between **mm**, **inches** and **points**.

The sizes you type for the **Witness Gap**, **Witness Overshoot**, **Arrow Head Length**, and **Arrow Head Width** are the ***sizes that will appear on the paper*** when you come to plot or print the drawing, regardless of the drawing's scale.

Witness Gap

Witness Gap is the gap between the item being dimensioned and the start of the witness lines, as shown by the illustration in the dialog box. The **Witness Gap** does not affect angular or radial dimensions.

Witness Overshoot

Witness Overshoot is the extension of the witness lines beyond the dimension arrow head, as shown by the illustration in the dialog box. **Witness Overshoot** does not affect angular or radial dimensions.

Witness Pen

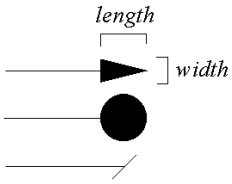
Witness Pen is the currently selected witness line and arrow color. If you click it, a color palette will appear. Click on the color you want the witness lines and arrows to be. To set pen **By Layer**, select the **By Layer** option. See **Start** ➪ **Settings** ➪ **Layer Control** on page 839.

The color of existing witness lines and arrows will not be updated, but subsequently drawn witness lines and arrows will be in the new color.

To change the pen of existing horizontal, vertical and slope dimensions, use **Start** ➪**Annotate** ➪**Edit Dimension Properties** (Alt S, A, P - page 705). It is not possible to change the pen of an existing angular or radial dimension.

Set Arrow Defaults *controls the arrows produced by the* **Start** ➪**Annotate** ➪**Add Arrow** *and* **Start** ➪**Annotate** ➪**Add Balloon**. *Dimension arrow defaults are set in* **Start** ➪**Settings** ➪**Dimension Defaults** *(Alt S, S, N - page 826).*

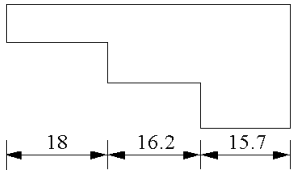
Arrowheads



You may choose one of three arrow styles: an **Arrow**; a **Blob**; or a **Slash**. Simply click on the desired arrow style.

Set the **Arrowhead Length** and **Arrowhead Width** measurements in the units shown.

Dimension Style



All dimensions are **Mechanical Style** unless the **Architectural Style** box is checked.

If the **Architectural Style** box is checked, dimensions have constant witness line lengths and are always drawn in chained mode. See **Start** ➪**Annotate** ➪**Horizontal Dimension** on page 672.

Number Decimals

The number that you type here determines the number of decimals that will be displayed on a dimension. The maximum number of decimals that can be displayed is 16.

If you set the number of decimals to **2**, then 12.3456 will be displayed as 12.35 (rounding to the nearest number). However, an exact number will be displayed without trailing decimals, for example, 12.000 will be displayed as 12.

You can also set the number of decimals to a negative number to get rounding to tens or hundreds. For example, if you set the number of decimals to **-2**, then 1234.45 will be displayed as 1200

(rounding to the nearest 100). If you set the number of decimals to `-1` then the number will be displayed as 1230.

Dimension Text Height

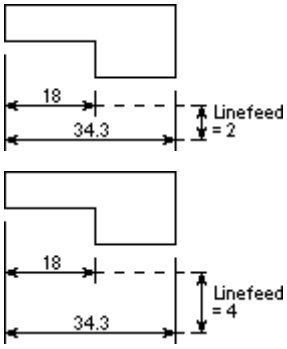
You can either type the dimension text height into this box, or type it into the **Size** box in the **Font Dialog Box** that appears when you click on the button to the right of the Text Pen... button.

If you type the height into the **Text Height** box, it is measured in the witness and arrow units specified at the top of the **Dimension Settings** dialog box. If you use the **Size** box in the **Font Dialog Box**, it is measured in points.

As with text height in **Set Text Defaults**, **Text Height** does not represent the height of the actual characters. The actual height of the characters is two thirds of the text height. For example, if you set a text height of 6 points, the actual height of the characters will be 4 points. See **Start** ➪ **Settings** ➪ **Set Text Defaults** on page 820.

Linefeed

Linefeed controls the distance between subsequent dimension lines in running dimensions.



The figure you give for the **Linefeed** is multiplied by the **Text Height** to give the distance between subsequent dimension lines.

Example: If you have set a text height of 6 points, and a linefeed of 2, the distance between subsequent dimension lines will be 12 points (2x6).

Example: If you have set a text height of 6 points, and a linefeed of 4, the distance between subsequent dimension lines will be 24 points (4x6).

Text Pen

The Text Pen... button allows you to define the color of the dimension text. The button displays the currently selected color. To change the color, click on the button and a palette appears. Click on the color you want the dimension text to be. To set text color **`By Layer`**, select the **`By Layer`** option. See **Start** ➪ **Settings** ➪ **Layer Control** on page 839.

Text Style

The button to the right of the Text Pen... allows you to determine the style of the dimension text. If you click on it, the **Font dialog box** appears (see **Start** ➪ **Settings** ➪ **Set Text Defaults** on page 820). From the **Font dialog box** you can select the dimension text font and font parameters.

30.12 Surveying Dimension Setup

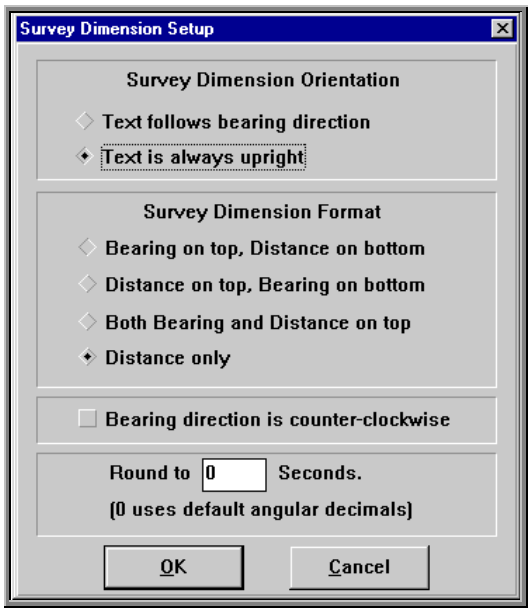
FUNCTION: The **Surveying Dimension Setup** function is used to determine or change the way Surveying dimensions are drawn.

To access the **Surveying Dimension Setup** function, press Alt S, S, G., or right-click the **Survey Dimension** icon ( ) in the **Drawing** window toolbar.

The **Annotate Line** *icon in "Sight" Survey's main toolbar looks the same as the* **Survey Dimension** *icon in the* **Drawing** *window toolbar. However, the two icons function differently.*

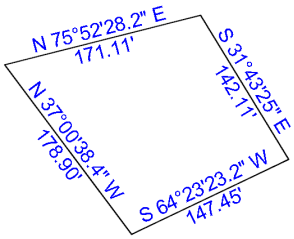
The surveying dimension defaults that are loaded each time you enter "Sight" Survey or select **Start** ➪ **File** ➪ **New Drawing** are stored in a drawing called **STARTUP.DRG**.

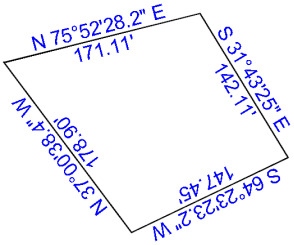
When you access the **Surveying Dimension Setup** function, "Sight" Survey displays the **Survey Dimension Setup** dialog box.



Survey Dimension Orientation

Click the desired dimension orientation option. Most engineering drawings are read with the text always oriented right-reading or upright. To select this orientation (below left) , click **Text is always upright**. If you select **Text follows bearing direction** (below right), your text can face any direction.





Survey Dimension Format

Click the desired dimension orientation format. Your choices are:

- Bearing on top, Distance on bottom
- Distance on top, Bearing on bottom
- Both Bearing and Distance on top
- Distance Only

Bearing Direction is Counter-Clockwise

This option is not used by "Sight" Survey. It should be left unchecked.

Round to ... Seconds

The survey dimension bearing is rounded to the number of seconds you use here. For example: enter **10** to round to the nearest 10 seconds; enter **1** to round to the nearest 1 second, etc.

If you enter **0**, "Sight" Survey will use the number of decimal places set in the **Angular Format** section of **Start** ➪ **Settings** ➪ **Drawing Settings** (Alt S, S, D - page 789).

Distances will always use the number of decimal places set in **Start** ➪ **Settings** ➪ **Dimension Defaults** *(Alt S, S, N - page 826).*

30.13 Set Arrow Defaults (XA)

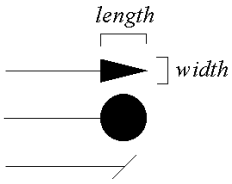
FUNCTION: The **Set Arrow Defaults** function is used to determine or change the way in which arrows are drawn.

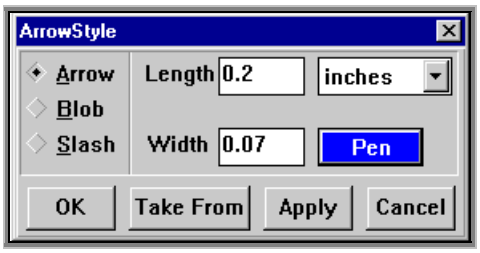
To access the **Set Arrow Defaults** function, type **XA** or press Alt S, S, W.

The arrow defaults that are loaded each time you enter "Sight" Survey or select **Start** ➪ **File** ➪ **New Drawing** are stored in a drawing called **STARTUP.DRG**.

Set Arrow Defaults *controls the arrows produced by the* **Start** ➪ **Annotate** ➪ **Add Arrow** *and* **Start** ➪ **Annotate** ➪ **Add Balloon**. *Dimension arrow defaults are set in* **Start** ➪ **Settings** ➪ **Dimension Defaults** *(Alt S, S, N - page 826).*

When you select this function, the **Arrow Style** dialog box appears. You can use it for determining the style of subsequently drawn arrows, or for changing the style of existing arrows.





Arrow Style

You may choose one of three arrow styles: an **Arrow**; a **Blob**; or a **Slash**. Simply click on the desired arrow style.

Length, Width & Units

Set the length and width measurements in the units shown. To change units, click on the down arrow and select from: **mm**; **inches**; or **points** (a point is $^{1}/_{72}$ of an inch).

Pen

The Pen button is the color of the currently selected pen. To change pen colors, click on the Pen button and click on the color you want from the palette that appears. You may also choose to place arrow colors **By Layer**.

Take From

If you want to match the style of an existing arrow, select the existing arrow using **Select** (Alt S, E, S - page 552) or **Selection Filters** (Alt S, E, F - page 560). Go to **Set Text Defaults** and click Take From. The dialog box will automatically be updated so that the style of subsequently entered text will match the style of the existing text. Click OK.

To Change Existing Arrows

Place your cursor on the arrow you want to change, then double click on it, or use **Select** or **Selection Filters** to select the arrows whose styles you want to change and select **Set Arrow Defaults** option. Edit the dialog box to your satisfaction, then click Apply. Click OK. The styles of the selected arrows will be updated.

All subsequently drawn arrows will also be drawn using the newly selected defaults.

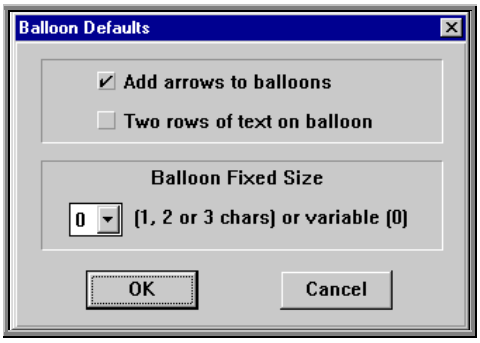
30.14 Set Balloon Defaults

FUNCTION: The **Set Balloon Defaults** function is used to set default balloon parameters.

To access the **Set Balloon Defaults** function, press Alt S, S, O.

When you select **Set Balloon Defaults**, a dialog box appears. This box allows you to specify the default balloon size, the number of text lines, and whether an arrow is to be added or not. All balloons drawn subsequently using **Start ➪ Annotate ➪ Add Balloon** will adhere to these defaults.

The balloon defaults that are loaded each time you enter "Sight" Survey or select **Start ➪ File ➪ New Drawing** are stored in a drawing called **STARTUP.DRG**.



The style (color etc.) of the circle enclosing the balloon text is defined by **Start ➪ Settings ➪ Line Defaults**.

The style (font etc.) of the text inside the balloon is determined by **Start ➪ Settings ➪ Text Defaults**.

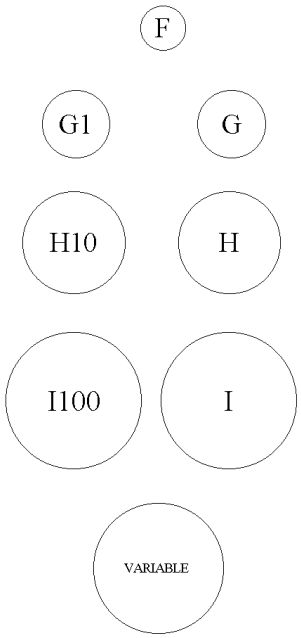
Add Arrows to Balloons If this box is checked, arrows will be added to balloons. If the box is not checked, arrows will not be added to balloons. The way that the arrows look is determined by **Start ➪ Settings ➪ Set Arrow Defaults** (Alt S, S, W - page 832).

Two Rows of Text on Balloon

If you want two rows of text in the balloon, check this box. If you select two rows, you will still be able to create balloons with one row of text by entering a blank instead of text for the second row. If you want one row of text in the balloon, don't check the box.

Balloon Fixed Size

The number of characters that the balloon will accommodate is displayed here. If you want to change this, click on the arrow next to the display.



If you select **1**, the balloon will accommodate 1 character in width.

If you select **2**, the balloon will accommodate 2 characters in width, even if you only type one character.

If you select **3**, the balloon will accommodate 3 characters in width, even if you only type 1 or 2 characters.

If you select **4**, the balloon will accommodate 4 characters in width, even if you only type 1, 2 or 3 characters.

If you type **0** the balloon will accommodate whatever you type in, to a maximum of **69** characters.

30.15 DXF/DWG Conversion Settings (XG)

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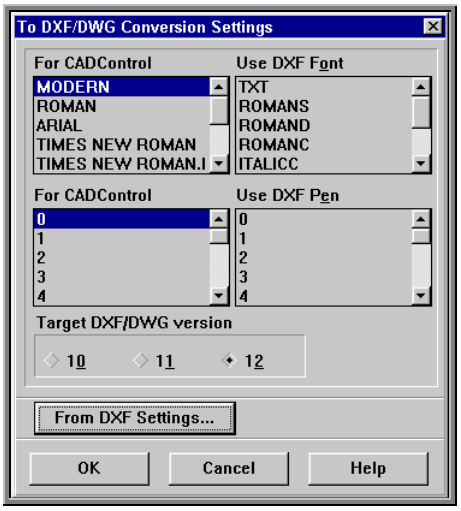
FUNCTION: The **DXF/DWG Conversion Settings** function is used to define how AutoCAD DWG and DXF files will be converted to "Sight" Survey drawings, and vice versa.

To access the **DXF/DWG Conversion Settings** function, type **XG** or press Alt S, S, X.

When you select this item, the **To DXF/DWG Conversion Settings** dialog box or the **From DXF/DWG Conversion Settings** dialog box appears, depending upon which dialog box was last used.



To DXF Files

The **To DXF/DWG Conversion Settings** dialog box defines how CADControl fonts and pens will be converted to AutoCAD fonts and pens when you create a DWG or DXF file using **Start** ➪ **File** ➪ **Save Drawing As**. It also determines the version of AutoCAD the DWG or DXF file will be compatible with.

Font Conversion

Click on a CADControl font in the left side font selection box. Then click on the AutoCAD font it must be converted to in the right side box.

Pen Conversion

Click on a CADControl pen in the left side pen selection box. Then click on the AutoCAD pen it must be converted to in the right side box. (For best results, **Import** and **Export** pen settings should be reciprocal values.)

AutoCAD Version

Click the AutoCAD version you want the DXF or DWG file you create to be compatible with: version 10; version 11; or version 12.

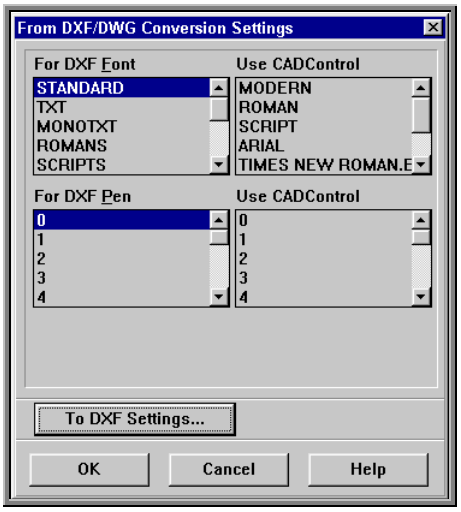
To / From Button

Click on this button to bring up the **From DXF/DWG Conversion Settings** dialog box.

CADControl pens are numbered from 0 to 15 in the **Pen Selection Area**. *So maroon is 0, red is 1, etc. View the file named* **`Linetype.mac`** *(located in the "**Macro**" sub-directory of your "**Program**" directory) to determine how CAD line types will be converted to AutoCAD line types.*

From DXF Files

The **From DXF/DWG Conversion Settings** dialog box defines how AutoCAD fonts and pens will be converted to CADControl fonts and pens when you load a DWG or DXF file using **File** ➪ **Import** ➪ **Drawing**.



Font Conversion

Click on an AutoCAD font in the left side font selection box. Then click on the CADControl font it must be converted to in the right side box.

Pen Conversion

Click on an AutoCAD pen in the left side pen selection box. Then click on the CADControl pen it must be converted to in the right side box. (For best results, **Import** and **Export** pen settings should be reciprocal values.)

To / From Button Click on this button to bring up the **To DXF/DWG Conversion Settings** dialog box.

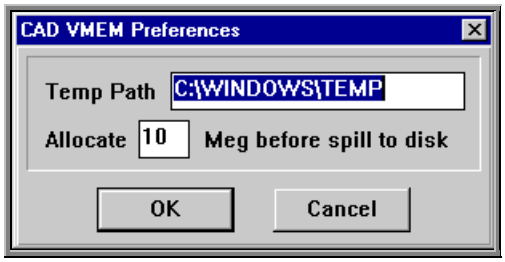
CADControl pens are numbered from 0 to 15 in the **Pen Selection Area**. *So maroon is 0, red is 1, etc. To set up line type conversion between AutoCAD and "Sight" Survey, use the* **`Linetype.mac`** *file (located in the "Macro" sub-directory of your "Program" directory).*

30.16 Virtual Memory Settings

FUNCTION: The **Virtual Memory Settings** function is used to specify at what point "Sight" Survey starts to use virtual memory.

To access the **Virtual Memory Settings** function, press Alt S, S, M.

When you select **Virtual Memory Settings**, a dialog box appears.



Sight" Survey will ask the operating system for as much memory as you type into the **Allocate** box. It will then start to spill temporary files to disk, at the location specified in the **Temp Path** box. This may be more efficient than the Windows swap file for large drawings.

If you experience a lot of disk thrashing, i.e. Sight" Survey seems to be accessing the hard disk continuously, lower the limit where the drawing will start to spill to the disk.

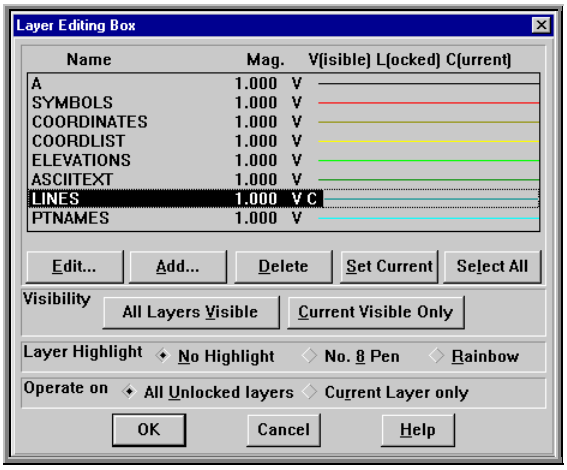
30.17 Layer Control (EL)

FUNCTION: The **Layer Control** function is used to add layers, edit layer names and magnifications, lock layers, and highlight layers.

To access the **Layer Control** function, type **EL** or press Alt S, S, Y, or click the **Layer Control** icon ( ) on the main "Sight" Survey toolbar

The layer names that are loaded each time you enter "Sight" Survey or select **Start** ➪ **File** ➪ **New Drawing** are stored in a drawing called **STARTUP.DRG**.

When you select **Layer Control**, the following dialog box appears.



The **Layer Editing Box** shows the layer name, line style, line color (pen), and magnification factor for each defined layer. If the layer is visible, a **V** is displayed in the layer row. If the layer is locked, an L is displayed in the layer row. In addition, the layer designated as the **Current Layer**, contains a **C** in the layer row.

The following table lists each "Sight" Survey drawing entity and the corresponding layer onto which it is now placed:

When this entity is placed into the Drawing Window…	*"Sight" Survey places it onto this Layer:*
Dots & Crosses at Points	Points Layer
Symbols at End Points	Symbols Layer
Symbols within Custom Lines	Line Layer
Lines, Arcs, & Random Curves	Line Layer
Custom Lines	Line Layer
Circles & Rectangles	Line Layer
Parallel Lines	Line Layer
Leader Lines & Arrows	Current Layer
North Arrow & Scale Bar	Symbols Layer
Point Numbers	Pt. Number Layer
Northings & Eastings	Coords. Layer
Elevations	Elevations Layer
Point Descriptions/other Labels	Pt. Name Layer
Stations	Station Layer
Bearings & Distances	Line Annot Layer
Curve Length & Curve Labels	Line Annot Layer
Short Line Labels (L1, L2, etc.)	Line Annot Layer
Symbols Table	Symbols Layer
Text Placed w/Text Line (TL)	Current Layer
Text Placed on Custom Lines	Line Layer
Arc/Angle Labels (LA)	Current Layer
Surveying Dimensions	Current Layer
Dimensions	Current Layer
ASCII Text Files	ASCII File Layer
Coordinate Lists	Coord. List Layer
Curve & Line Tables	Sup. Table Layer
Imported BitMaps	Current Layer

Layer Name

The layer name will automatically appear in upper case. It can be up to 30 characters long. To change a layer's name, see **Adding Layers** later in this section.

Layer Magnification

Normally, layer magnification is 1. However, each layer can be assigned a different magnification with respect to the scale of the drawing.

To change a layer's magnification, see **Adding Layers** later in this section.

Visible Layers

Visible layers are the layers that are actually displayed on the screen. They are marked by the letter **V**. To change a layer's visibility, see **Adding Layers** and **Setting Visible Layers** later in this section.

Locked Layers

"Sight" Survey's functions will not work on locked layers. For example, you cannot select or accidentally move entities on a locked layer. Locked layers are marked by the letter **L**. To lock or unlock a layer, see **Adding Layers** later in this section.

Current Layer

Everything you draw is drawn onto the current layer. The current layer is marked by the letter **C**. To change the current layer, see **Setting the Current Layer**, later in this section.

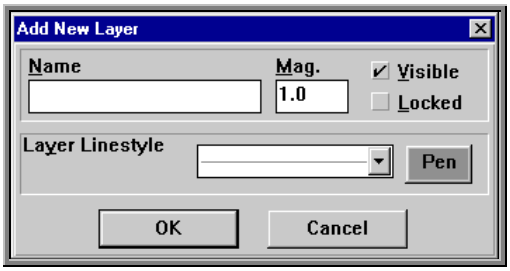
Pen and Line Type

A horizontal line in the pen and line type assigned to the layer is drawn after the other details listed above. This is the pen and line type that will be used if you draw **By Layer**.

See **Pen By Layer** and **Line Type By Layer**, later in this section.

Adding Layers

By default, "Sight" Survey has just one layer, **0**. You can add your own layers, up to a total of 65,000. To add a layer, click on the Add... button. The **Add New Layer** dialog box appears. Fill in the dialog box as shown below, then click OK. The new layer will be added to the end of the **Layer Editing Box**, and will automatically become the new **Current Layer**.



Name

The **Name** text entry box allows you to type in a new, or change an existing, layer name. Layer names can be up to 30 characters in

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length. If you type a name that is longer than 30 characters, it will be truncated after the 30th character. "Sight" Survey will replace any spaces and other invalid characters with an underscore to allow compatibility with other CAD programs. In addition, it will automatically convert any lowercase letters to UPPERCASE.

The name that you enter in this box will appear in the **Properties** window when assigning layers to specific drawing elements.

Layer Linestyle

The **Layer Linestyle** list box allows you to select the line type that you would like assigned to this layer. This line type is only used when the **Line Type** property (in the **Properties** window) is set to **By Layer**.

Pen

The Pen button allows you to select the pen color that you would like assigned to this layer. This color is only used when the **Object Color** and/or **Text Color** properties (in the **Properties** window) are set to **By Layer**.

Visible

The **Visible** check box is used to toggle the visibility of the layer. When the box is checked, the layer is visible (i.e. you **can** see that layer's drawing entities). When the box is not checked, the layer is hidden (you **cannot** see that layer's drawing entities). To change the status of this item, click the check box with your mouse, or press Alt V, Space Bar.

You cannot make editing changes to layers that are hidden. This prevents you from moving, changing, or deleting an entity which you didn't mean to edit. The only exception is the **Clear Drawing Area** (**DX**) routine which will always delete the entire drawing, regardless of layer settings.

*The **Current Layer** is ALWAYS visible regardless of the setting.*

Locked

The **Locked** check box is used to toggle the lock status of the layer. When the box is checked, the layer is locked. When the box is not checked, the layer is unlocked. To change the status of this item, click the check box with your mouse, or press Alt L, Space Bar.

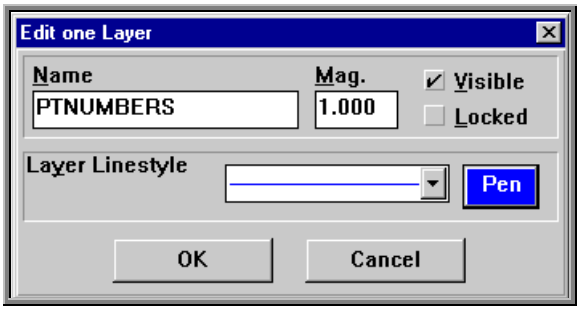
Layer locking is very helpful when you are trying to edit a cluttered area of your drawing. When a layer is locked, you cannot select, move, change or delete any entities on that layer, thus preventing you from editing something you didn't mean to edit. For example, by locking the Line Layer, you can easily select a bearing or distance without selecting a line by mistake. (The only exception is the **Clear Drawing Area** (**DX**) routine which will always delete the entire drawing, regardless of layer settings.)

Mag.

The **Mag.** text entry box allows you to type in a number for the layer magnification. Normal layer magnification is 1. However, each layer can be assigned a different magnification with respect to the scale of the drawing. (The exception is layer **A**, whose magnification always remains at 1.0) For example, suppose the drawing is at a scale of 1:10. If you assign a magnification of 2 to a layer, anything drawn on that layer subsequently will be twice the size, i.e. at a scale of 1:5. If you assign a magnification of 0.5 to a layer, anything drawn on that layer subsequently will be half the size, i.e. at a scale of 1:20.

Editing One Layer

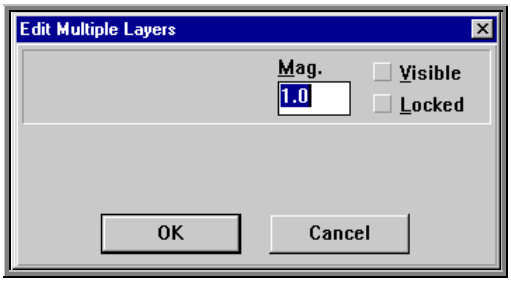
To edit or change an existing layer, double-click on the layer, or highlight the layer and click the Edit... button or press Alt E. This will display the **Edit one Layer** dialog box.



Whether you are editing or adding a layer, the items in the displayed dialog box are the same. Inside this box you can change the name, line type, color, magnification, visibility, and lock status of the layer.

Editing Multiple Layers

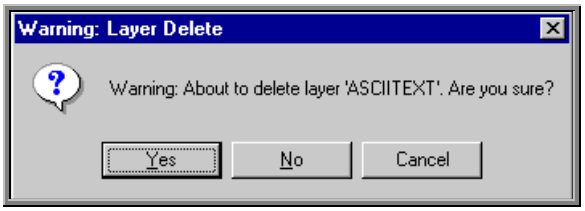
You can edit the magnification, visibility and lock status for several layers at a time. To do this, highlight the desired layers and click the Edit... button or press Alt E. This will display the **Edit Multiple Layers** dialog box. Make any desired changes and click the OK button. All highlighted layers will be assigned the new settings.



*To edit **ALL** the defined layers, first click* Select All *(or press* Alt L*), and then click* Edit... *(or press* Alt E*).*

Deleting Layers

To delete an existing layer, highlight the layer and click the Delete button or press Alt D. You will be prompted:



É *"Sight" Survey allows you to delete layers that **DO** contain drawing information. **Before you delete a layer, make sure there is no drawing information that you need on that layer!** Once you save the drawing, you will not be able to recover the deleted layers. If you have not saved the drawing, simply reload the file, without saving the current changes.*

If you are absolutely sure that you want to delete this layer, select Yes, otherwise select either No or Cancel.

To determine whether or not a layer has anything on it, *click once on the desired layer in the* **Edit Layers** *dialog box and then click on* Set Current *. Next, click on the* Current Visible Only *button (or press* Alt C*) to hide all the layers except the current one. Then click the* OK *button to close the dialog box. Now, click on the* **(Zoom All)** *tool bar icon (or type* **ZA***) to view the entire current layer within the* **Drawing** *window. If the* **Drawing** *window is empty, it is safe to delete the layer.*

If you delete a layer which is set as the current value for any of the **Layer...** *properties in the* **Properties** *window, that layer will be recreated when, or if, "Sight" Survey needs to place any drawing data on that layer. For example, if you delete the* **LINETEXT** *layer, but still have* **LINETEXT** *as the value for the* **Line Annotation Layer**, *the* **LINETEXT** *layer will be created as soon as any bearings or distances get placed on your drawing. If you want to delete a layer and not have it be recreated, you must change the value for the appropriate* **Layer...** *properties.*

Setting the Current Layer

To set a layer as the **Current Layer** , highlight the layer and click the Set Current button or press Alt S.

"Sight" Survey sends drawing entities to multiple layers based upon the layer setup specified in the **Properties** window. For example, before "Sight" Survey places a line, it sets the **Current Layer** to the specified **Line Layer**. However, when placing a **Leader Line & Arrow**, you must manually set the **Current Layer**.

1. *These drawing entities are drawn on the* ***Current Layer*** *at the time of placement:* **Leader Lines & Arrows** *(*`AW`*),* **Text Lines** *(*`TL`*), and* **Angle Labels** *(*`LA`*).*
2. *When you add a new layer it automatically becomes the new* ***Current Layer****.*

3. *The **Current Layer** is ALWAYS visible regardless of the setting.*
4. *The name of the **Current Layer** is always shown in the of the **Drawing** window title bar.*

Setting Visible Layers

Visible layers are the layers that are actually displayed on the screen. They are marked with the letter **V** to the right of the layer name in the **Layer Editing Box**. If you want ALL layers to be displayed on the screen, click on the All Layers Visible button (or press Alt V). If you want only the **Current Layer** displayed, click on the Current Visible Only button (or press Alt C).

To make one or more layers visible or hidden, highlight the desired layer(s) and click the Edit... button or press Alt E. Set the **Visible** check box to the desired setting. When the box is checked, the layer is visible. When the box is not checked, the layer is hidden. Since you cannot make editing changes to layers that are not visible, you are prevented from moving, changing, or deleting an entity which you didn't mean to edit. The only exception is the **Clear Drawing Area** (**DX**) routine which will always delete the entire drawing, regardless of layer settings.

1. *The **Current Layer** is ALWAYS visible regardless of the setting.*
2. *To highlight a sequence of layers, highlight the first layer in the sequence, then press* s *while you click on the last layer in the sequence.*
3. *To highlight more than one individual layer, press* Ctrl *while you click on each layer.*
4. *To remove the highlight from a layer, press* c *while you click on the layer.*

Layer Highlighting

You can choose to enable special layer highlighting for the **Drawing** window. If the selected option is the default, **No Highlight**, then no layer(s) will be highlighted. The drawing will appear as normal.

If the selected option is No. **8** Pen, all the layers except the **Current Layer** are drawn in a dotted line type with pen **08 - Blue**. This option is useful when you want to keep all the layers visible yet distinguish which entities are on the **Current Layer**.

If the selected option is **Rainbow**, all layers except the current layer will be displayed using the default **Pen** color and **Line Type** for that layer. The default **Pen** color and **Line Type** for each layer is set up in the **Edit Layers** (**EL**) routine. **Rainbow** is useful for isolating items that have been drawn on an incorrect layer. For example, if all your lines are supposed to be on the same layer, then they should all be the same color. If any line appears in a different color, then it is located on the wrong layer.

Operate On (Which Layers?)

You may work with all unlocked layers or work with only the **Current Layer**. If the selected option is **All Unlocked Layers**, you will be able to select items on all drawing layers which have not been locked. If the selected option is **Current Layer Only**, you will only be able to select items which are on the **Current Layer**.

The **Current Layer Only** option is ideal for editing portions of your drawing that are cluttered. Since you cannot select items which are not on the **Current Layer**, it prevents you from moving, changing, or deleting an entity which you didn't mean to edit. The only exception is the **Clear Drawing Area** (**DX**) routine which will always delete the entire drawing, regardless of layer settings.

*1. These settings control only the **selection** of entities. To control the **placement** of entities, use the **Layer...** properties within the **Properties** window, and the **Layer Override** (**LV**) routine.*

*2. To determine which layer a drawing entity is on, use the **Query Entity** (**QE**) command. See page 751 for more info.*

When a drawing is imported which contains specific layers, those layers will automatically be created in the "Sight" Survey drawing. If the imported layers already exist in the current drawing, they will be merged onto the existing layer.

"BY LAYER" Layering

The **Edit Layers** routine allows you to assign a specific **Linestyle** and **Pen** color to each layer. To instruct "Sight" Survey to use the assigned settings, select the **By Layer** value for the desired property.

Pen By Layer

You can optionally set pens and line types **By Layer**. This means that you assign a particular color and line type to each layer. Entities are automatically drawn using the pen and line type associated with the layer you are drawing on.

To set pens **By Layer**, click the Pen button in the following functions. A palette will appear. At the bottom of the palette is a ByLayer button. Click this button to make "Sight" Survey draw the relevant element **By Layer**:

Line Defaults	set line color by layer
Parallel Defaults	set parallel line color by layer
Polyline Defaults	set polyline color by layer
Set Arrow Defaults	set arrow color by layer
Set Text Defaults	set text color by layer
Set Dim Defaults	set dimension witness line and text color by layer

Line Type By Layer

When the **Line Type** property is set to **By Layer**, "Sight" Survey will draw all lines in the **Linestyle** associated with the layer that is currently assigned to the **Line Layer**.

Object Color By Layer

When the **Object Color** property is set to **By Layer**, "Sight" Survey draws all lines in the **Pen** color associated with the layer that is currently assigned to the **Line Layer**. End point symbols are an exception to this rule – they are placed in the color that they were created in, which is navy (or dark blue). You can change the symbol color after symbols are placed on the drawing by following the steps in the **Hands-On Instruction** section on page 566 of this manual. If you prefer, you can permanently change the symbol color by following the steps in the **How to Permanently Change Symbol Colors** section on page 474.

Text Color By Layer

When the **Text Color** property is set to **By Layer**, "Sight" Survey will place all text in the **Pen** color associated with the layer that is

currently assigned to the layer for the type of text being placed. To explain this more clearly, the specific text entities and the layer that determines the pen color to use for the text (when **Text Color** is set to **By Layer**) are shown in the table on the following page.

When this Text is Placed into Drawing Window "ByLayer"…	"Sight" Survey uses the Pen Color from Layer:
Point Numbers	**Pt. Number Layer**
Northings & Eastings	**Coords. Layer**
Elevations	**Elevations Layer**
Point Descriptions/other Labels	**Pt. Name Layer**
Stations	**Station Layer**
Bearings & Distances	**Line Annot Layer**
Curve Length & Curve Labels	**Line Annot Layer**
Short Line Labels (L1, L2, etc.)	**Line Annot Layer**
Symbols Table	**Symbols Layer**
Text Placed w/Text Line (TL)	**Current Layer**
Text Placed on a Custom Line	**Line Layer**
Arc/Angle Labels (LA)	**Current Layer**
ASCII Text Files	**ASCII File Layer**
Coordinate Lists	**Coord. List Layer**
Curve & Line Tables	**Sup. Table Layer**

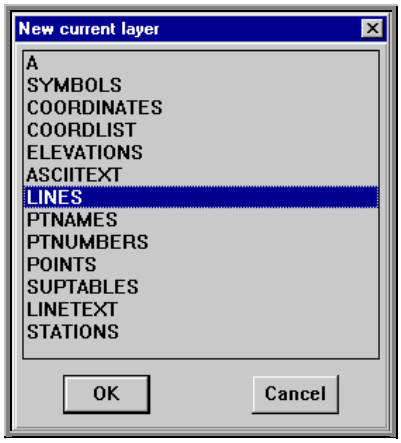
30.18 Set Current Layer

FUNCTION: The **Set Current Layer** function is used to change the current layer.

To access the **Set Current Layer** function, press Alt S, S, R, or type **YC**.

*When you first start off with "Sight" Survey, only one layer, **0**, will appear in this dialog box. To add further layers or to rename layer **0**, see **Layer Control**. You can save default layers in **STARTUP.DRG**.*

Whatever you draw is placed on the **current layer**. When you select **Set Current Layer**, the following dialog box appears.



Click on the layer that must become the current layer. The new current layer will be highlighted. Click OK to exit.

*The name of the **Current Layer** is always shown in the of the **Drawing** window title bar.*

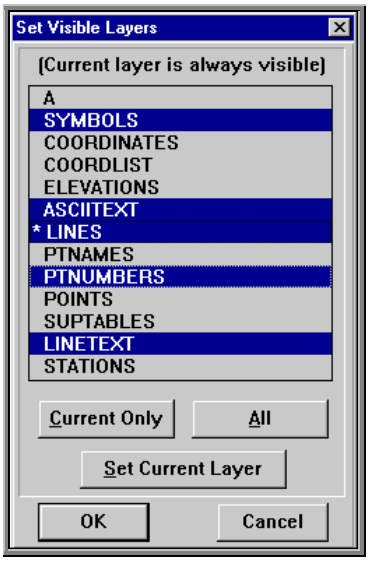
30.19 Set Visible Layers

FUNCTION: The **Set Visible Layers** function is used to select which layers should be displayed on the screen.

To access the **Set Visible Layers** function, press Alt S, S, B.

*When you first start off with "Sight" Survey, only one layer, **0**, will appear in this dialog box. To add further layers or to rename layer **0**, see **Layer Control**. You can save default layers in **STARTUP.DRG**.*

When you select **Set Visible Layers**, the following dialog box appears.



If you want **all** layers to be displayed on the screen, click All.

The **current layer** (the layer you are working on) is marked by an asterisk. If you only want to display the current layer, click Current Only.

You can change the current layer while in the **Set Visible Layers** dialog box by clicking Set Current Layer. If you click on this button, a second dialog box appears. Click on the layer that must become the current layer, then click OK.

If you only want to display a few layers, ensure that the layers you want to display are highlighted. To highlight a layer, click on it. To highlight more than one layer, press Ctrl while you click on the layers you want to display. If a layer that you do not want to see on the screen is highlighted, press Ctrl and click on it. The highlight will disappear.

*The **current layer** is always displayed, whether you highlight it or not.*

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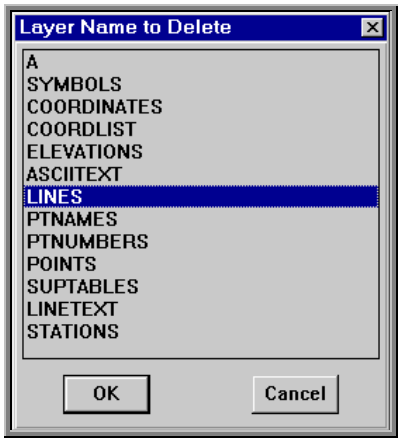
30.20 Delete Layer

FUNCTION: The **Delete Layer** function is used to delete a layer and its contents.

To access the **Delete Layer** function, press Alt S, S, T, or type **YX**.

When you access the **Delete Layer** function, "Sight" Survey displays a layer name dialog box:



To delete a layer, select the layer by clicking on it in the list of layers. The layer will be highlighted. Click OK. A warning will appear. If you are sure you want to delete the layer, click OK and the layer and all its contents will be deleted.

É ***You cannot undo a layer delete!***

Use caution when deleting layers, since the layer may contain drawing information. Once you save the drawing, you cannot recover deleted layers. If you have not saved the drawing, simply reload the file without saving the current changes.

To determine the contents of a drawing layer, type **YC** to make the layer the current layer. Next, use **Start** ➪ **Settings** ➪ **Set Visible Layers** and click Current Only | OK. Now type **ZA** to view the entire current layer. If the layer is empty, it is safe to delete the layer.

30.21 Working Layers

FUNCTION: The **Working Layers** function is used to select which layers are operational at any given time.

To access the **Working Layers** function, press Alt S, S, K.

When you access the **Working Layers** function, "Sight" Survey prompts:

Would you like to operate on current layer only (else all displayed layers)

If you click Yes, "Sight" Survey's functions will only operate on the current layer. If you click No, "Sight" Survey's functions will operate on all layers that have not been locked. To lock and unlock layers, see **Start** ➪ **Settings** ➪ **Layer Control** on page 839.

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Section 31

Title Blocks

You can use "Sight" Survey to create and store commonly used title blocks and symbols (objects, notes, certificates, etc.) that can be saved for reuse at a later time.

In the following example, you will create a title block and border for a 24"x36" sheet in landscape orientation, with 1½" border on the left and ½" on the other 3 sides.

Landscape orientation means the paper is wider than it is tall. Portrait orientation means the paper is taller than it is wide.

31.01 Drawing the Lines

Type **NJ**, or press Alt F, N, or click the **New Job** icon ( ) on the **Top** toolbar to select **File** ➪ **New Job**.

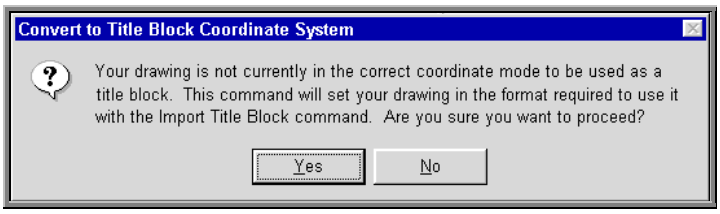
Paper Orientation

Press Alt G to activate the **Config** menu, then click the command, **CAD Paper in Landscape Orientation**. Make sure there is a check mark in front of the menu item. You may also change the paper orientation by clicking the **Paper Orientation** icon ( ) on the **Main** toolbar.

If you are constructing a portrait style title block and want to layout the border in portrait orientation, remove the checkmark by clicking on the **CAD Paper in Landscape Orientation** *command again.*

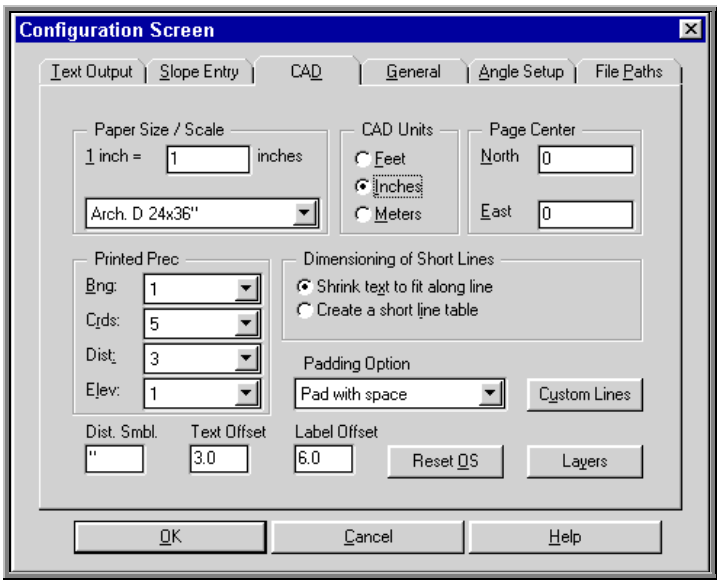
Set up page information

Title block drawings have to be created in a special coordinate system. Type the two-letter command **TB** to set the drawing to the title block coordinate mode.



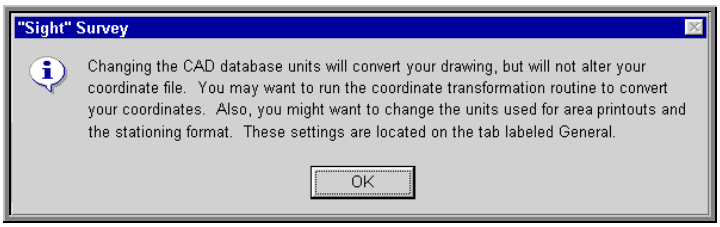
Click **Yes**.

Press Alt G, R to select **Config** ➪ **Drawing Configuration Menu**.



Under **Paper Size / Scale** , adjust the scale so that **1 foot = 1 foot**, and set the paper size to **Arch. D 24x36"**. Now set the **Page Center** to **0 North** and **0 East**, and set the **CAD Units** to **Inches**.

Changing the **CAD Units** will trigger an informational message about CAD database units. This message is shown at the top of the next page. Click **OK** to ignore the message and continue.

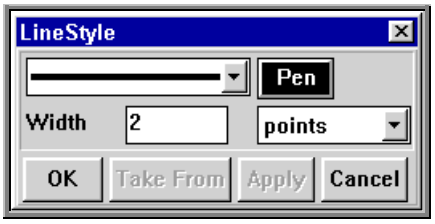


When everything on the **Configuration Screen** is correctly set, click OK.

Type the two-letter **Zoom Sheet** command **ZS** to center the sheet of paper in the CAD window.

Select line properties

Before drawing any lines, set the color and line weight you want to use for your border. Click your mouse anywhere in the **Drawing** window, then press Alt S, S, L to select **Start** ➪ **Settings** ➪ **Line Defaults**.



Set the **Pen** color to **Black** and the **Width** to **2** points, a nice bold line. Click OK.

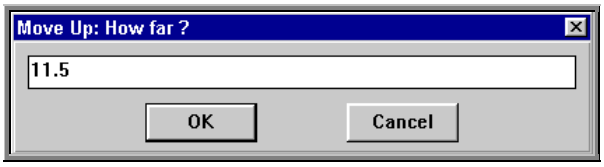
Set the Border Starting Point

We will begin in the upper left corner of the border. Press Alt S, D, H (or click) to select **Start** ➪ **Draw** ➪ **Lines (Chained)**. The **Drawing** window will prompt you for the first point of the line.

Press H to bring the **Freehand Cursor** ( ) cursor to the center of the of the paper, then press the left arrow key ←. The following window appears:

It is 18" from the center of the page to the left edge. Since we want a 1½" margin, we want to move 18" - 1.5" = 16.5". Type **16.5** in the dialog box and press Enter.

Press the up arrow key ↑.



It is 12" from the center of the page to the top edge. Since we want a ½" margin, we want to move 12" - 0.5" = 11.5". Type **11.5** in the dialog box and press Enter. Press Enter once again to accept this point as the start of the line.

Draw the top border

Press the right arrow key →. As in the previous step, "Sight" Survey will prompt you for a distance to move, this time to the right.

The top border should be 36" - 1½"- ½" = 34". Type **34** in the dialog box and press Enter. Press Enter once again to accept this point as the end of the line segment.

Create the rest of the border

In similar fashion, press the down arrow key ↓. Type **23** in the dialog box and press Enter. Press Enter once again to accept this point as the end of the line segment.

Press the left arrow key ←. Type **34** in the dialog box and press Enter. Press Enter once again to accept this point as the end of the line segment.

Press the up arrow key ↑. Type **23** in the dialog box and press ↵Enter. Press ↵Enter once again to accept this point as the end of the line segment.

Press Esc to cancel the line drawing routine. The border should now be completed.

Draw the title block lines

Now you will create a title block area on the right hand side of the page. You'll begin by placing a vertical line 5.5 inches from the right border.

Press Alt S, D, P (or click) to select **Start** ➪ **Draw** ➪ **Lines (Pt to Pt)**. The **Drawing** window will prompt you for the first point of the line.

Enter first point of line

Move the **Freehand Cursor** ( ) cursor so that the lower right corner of the border is very close the cursor. Press J to jump to the exact coordinates of the corner.

Press the left arrow key ← to activate the prompt **Move Left: How far ?** Type **5.5** and press ↵Enter. Press ↵Enter again to accept this point as the start of the line.

Enter next point of line

Press the up arrow key ↑. Type **23** in the dialog box and press ↵Enter. Press ↵Enter once again to accept this point as the end of the line segment.

Dividing lines

Now create some dividing lines within the title block. The first line will be located 1" up from the bottom border. The **Drawing** window will prompt you for the first point of the line.

Enter first point of line

Move the **Freehand Cursor** ( ) cursor so that the lower right corner of the border is very close the cursor. Press J to jump to the exact coordinates of the corner.

Press the up arrow key ↑. Type **1** in the dialog box and press ↵Enter. Press ↵Enter once again to accept this point as the beginning of the line segment.

Enter next point of line

Press the left arrow key ← to activate the prompt **Move Left: How far ?** Type **5.5** and press ↵Enter. Press ↵Enter again to accept this point as the end of the line segment.

Repeat this procedure to create horizontal lines at 2.5", 6", 8.5", 14.5", 18.5", and 19" from the bottom.

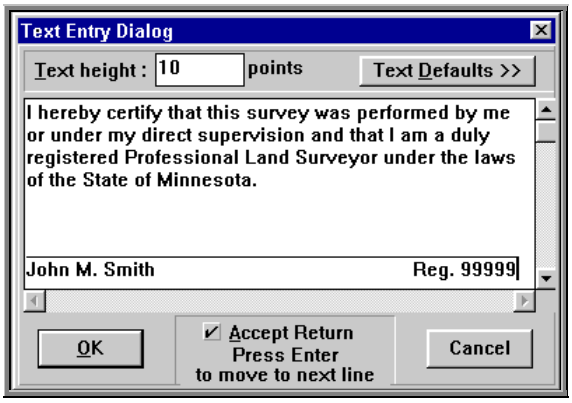
Press Esc to exit the line drawing mode. This completes the line work needed for the border and title block.

31.02 Adding Text

Now we'll add some text to the title block. Select **Start** ➪ **Annotate** ➪ **Text Line Entry** by typing **TL**, or pressing Alt S, A, Y, or clicking the **Text** icon (A) in the **Drawing** window toolbar.

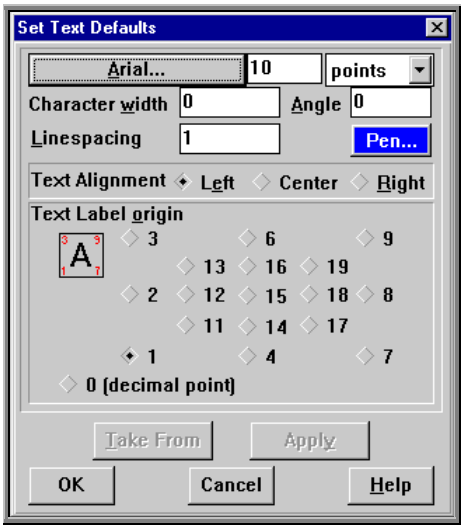
Enter text position

Click the cursor in the general area that you want to place text. Don't worry about the exact position. You'll probably want to reposition the text after you have completed text entry. The **Text Entry Dialog** box appears:



Enter the text in the **Text Entry Dialog**.

Now click Text Defaults >> to set the text properties. The **Set Text Defaults** dialog box appears:



Select the font name and color, and enter the height of the text, as well as the units of the measurement. Click OK and return to the **Text Entry Dialog** box. Click OK again to exit the **Text Entry Dialog** box and place the text on your drawing.

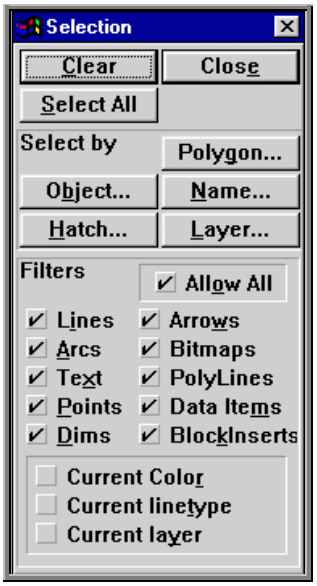
Repositioning text

If the text is not positioned correctly you can adjust it now. Click on the text that is out of position. While holding the left mouse button down move the mouse until the text is in the proper position. Release the left mouse button. To place and additional text, repeat the steps in this section.

31.03 Grouping the Title Block

When you have completed drawing your title block, you'll want to group the elements into a single object. This will make it easier to move or delete the title block once it has been placed into your drawing.

Select **Start** ➪ **Edit** ➪ **Selection Filters** by typing **SF**, or pressing Alt S, E, F. The **Selection** dialog box will appear:

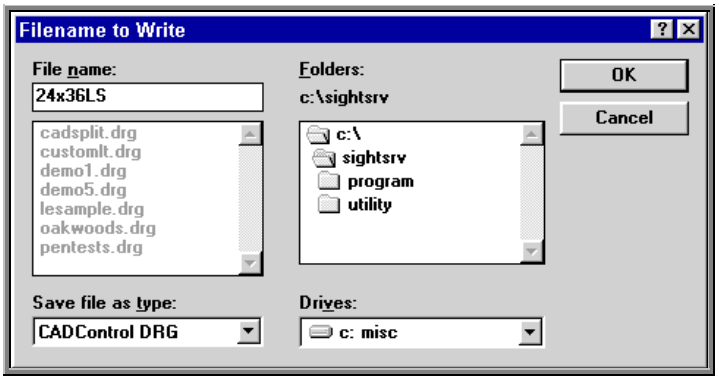


Click Select all, then click Close. All the elements drawn in your title block should now be selected.

Select **Start** ➪**Objects** ➪**Group into Object** by pressing Alt S, O, G. The **TextInp** dialog box will appear but is not needed. Press ↵Enter.

31.04 Saving the Title Block

Select **Start** ➪**File** ➪**Save Drawing As** by pressing Alt S, F, A, or clicking the **Save Drawing** icon ( ) in the **Drawing** window toolbar. The **File Save As** dialog box will appear:



In the **File name** entry box, enter a descriptive name for your title block drawing. For example, since this is for a 24"x36" sheet in landscape orientation a good name might be **24X36LS**. Verify that the drive and folder is set to your liking, then click OK to save your drawing.

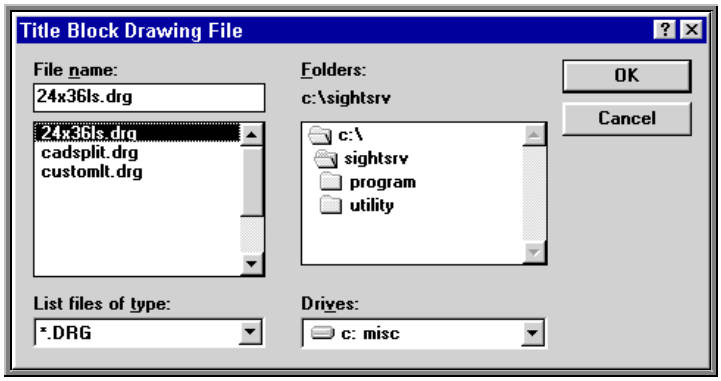
?

The file type should always be **CADControl DRG**.

31.05 Using Your New Title Block

After you have completed a “Sight” Survey job and drawing, you may add a title block as follows:

Press Alt S, F, K to access the **Start** ➪ **File** ➪ **Load Title Block** routine. The **Title Block Drawing File** dialog box appears:



Select the title block you want to load and click OK. The drawing will be zoomed to show the whole page and the title block will be drawn on the screen.

"Sight" Survey 3.0

Section 32
Hatches

This section shows you how hatch patterns are defined so that you can edit existing hatch patterns or create your own.

Hatch patterns are defined in a file called **HATCH.PAT** which resides in your Sight Survey program directory (usually **c:\Sightsrv\program**.

You can look at, print out or edit the **HATCH.PAT** file in any text editor such as Windows Notepad. We suggest that before you edit the **HATCH.PAT** file, you make a **backup** of it.

Hatch Pattern Definitions

Below are shown the definitions of four sample hatches in the **HATCH.PAT** file: **line** (parallel horizontal lines), **dash** (dashed lines), **newbrick** (brick hatching), and **triang** (equilateral triangles).

```
*line,Parallel horizontal lines
10, 0
1, 0, 0, 0,0, 0,.125
*dash,Dashed lines
10, 0
1, 0, 0, 0,0, .125,.125, .125,-.125
*newbrick, Brick or masonry-type surface
10, 0
1, 0, 0, 0,0, 0,.25
1, 0, 0, 0,.025, 0,.25
5, 1, 90, 0,.025, .25,.25, .225,-.275
*triang,Equilateral triangles
10, 0
1, 0, 60, 0,0, .1875,.324759526, .1875,-.1875
1, 0, 120, 0,0, .1875,.324759526, .1875,-.1875
1, 0, 0, -.09375,.162379763, .1875,.324759526, .1875,-.1875
```

These definitions comprise the following information.

- *hatch name,hatch description
- scale, rotation
- pen, line width, angle, x origin, y origin, odd line offset, spacing, on distance, off distance ... for one line of hatch
- pen, line width, angle, x origin, y origin, odd line offset, spacing, on distance, off distance ... for another line of hatch, etc.

The information in each description is summarized below, but is best understood by studying the **line**, **dash**, **brick** and **triangle** examples that follow on the next few pages (see **Examples 1**, **2**, **3** and **4**).

Scale

Scale is a scale factor which multiplies the x and y origins, off line offset, and on and off distance measurements to give the final size of the hatch.

Rotation

Rotation is applied to the entire hatch pattern and rotates it by the given angle. The angle is measured anti-clockwise from the 3 o'clock position.

Pen

Pen is the color of an individual line in the hatch pattern. The colors in the **Pen Selection Area** at the right of the screen are numbered downwards from 0 to 15, so maroon is 0, red is 1, olive is 2 etc.

Line width

Line width is the width of an individual line in the hatch pattern. It is measured in tenths of a millimeter and will be the width of the line on paper, regardless of drawing scale.

Angle

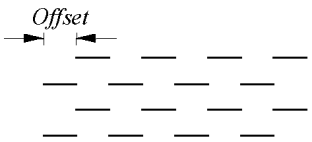
Angle is the angle of an individual line in the hatch pattern. The angle is measured anti-clockwise from the 3 o'clock position.

X origin and Y origin

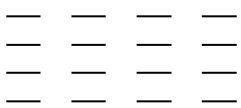
X origin and Y origin allow individual lines in the hatch pattern to start in different places and therefore to be offset with respect to one another. X and Y origin are measured in millimeters on the final paper plot, regardless of drawing scale.

Odd line offset

Odd line offset allows alternate lines of a hatch to be offset, i.e. like this ...



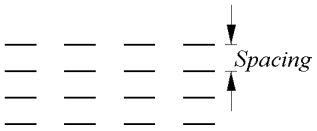
... rather than like this.



It is measured in millimeters on the final paper plot, regardless of drawing scale.

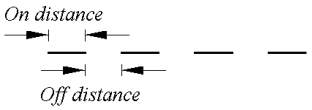
Spacing

Spacing is the distance between subsequent lines of the hatch. It is measured in millimeters on the final paper plot, regardless of drawing scale.



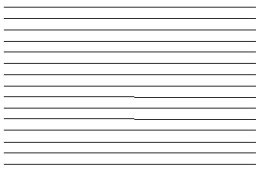
On distance & Off distance

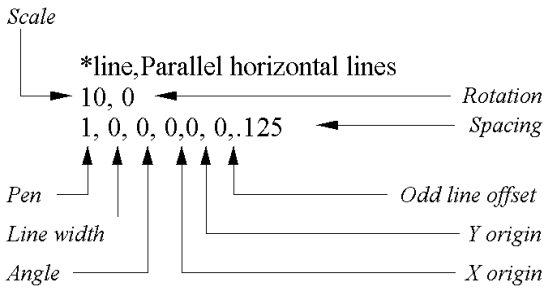
On distance & Off distance are the lengths of each dash and gap in a dashed line. The off distance is always a negative number. On and off distances are measured in millimeters on the final paper plot, regardless of drawing scale.

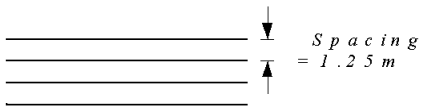


Example 1 - Line

The **line** hatch pattern comprises just **one** line at an **angle** of **0** degrees.



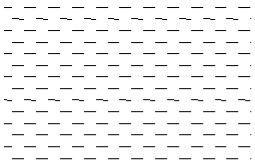




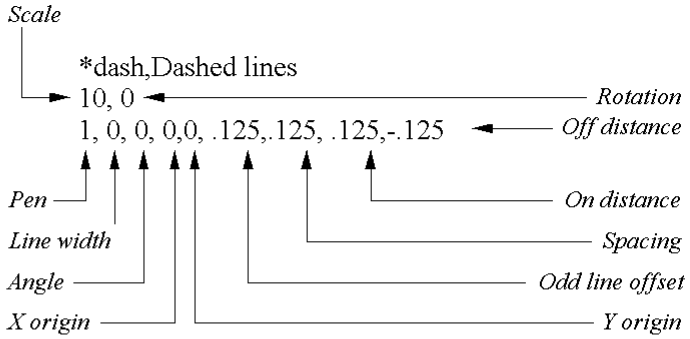
The line is repeated at a **spacing** of **0.125mm**. This spacing is multiplied by a **scale** of **10**, so the spacing between subsequent lines is actually **1.25mm.**

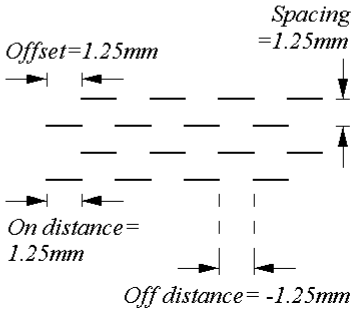
No on distance or off distance have been included in the hatch pattern because the line in the hatch is solid, not dashed.

Example 2 - Dash



The **dash** hatch pattern comprises just **one** dashed line at an **angle** of **0** degrees.



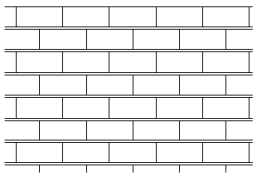


The line is repeated at a **spacing** of **0.125mm**. This spacing is multiplied by a **scale** of **10**, so the spacing between subsequent lines is actually **1.25mm.**

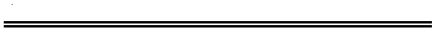
Each alternate line is **offset** by **0.125**mm. This offset is multiplied by a **scale** of **10**, so the offset is actually **1.25mm**.

Each dash is **0.125mm** long (**on distance**), and the gap between each dash is also **0.125mm** long (**off distance**). Note that the off distance is a negative number (**-0.125**). The on and off distances are multiplied by a **scale** of **10**, so the dashes and gaps are actually **1.25mm** long.

Example 3 - Newbrick



The **newbrick** hatch pattern comprises three lines: two solid lines at 0 degrees…



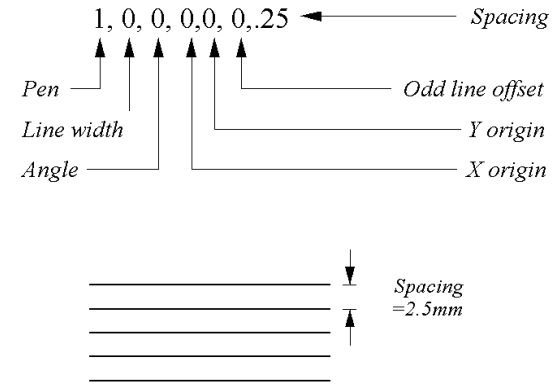
and one dashed line at 90 degrees.

Scale

```
*newbrick, Paulus Brick or masonry-type surface
10, 0                                          Rotation
1, 0, 0, 0,0, 0,.25
1, 0, 0, 0,.025, 0,.25
5, 1, 90, 0,.025, .25,.25, .225,-.275
```

Line 1

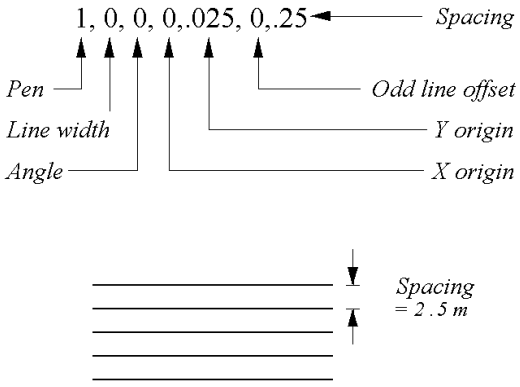
Line 1 is at an **angle** of **0** degrees.



The line is repeated at a **spacing** of **0.25mm**. This spacing is multiplied by a **scale** of **10**, so the spacing between subsequent lines is actually **2.5mm.**

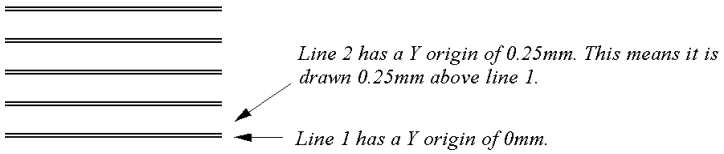
No on distance or off distance have been included in line 1 because it is solid, not dashed.

Line 2 Line 2 is at an **angle** of **0** degrees.



The line is repeated at a **spacing** of **0.25mm**. This spacing is multiplied by a **scale** of **10**, so the spacing between subsequent lines is actually **2.5mm.**

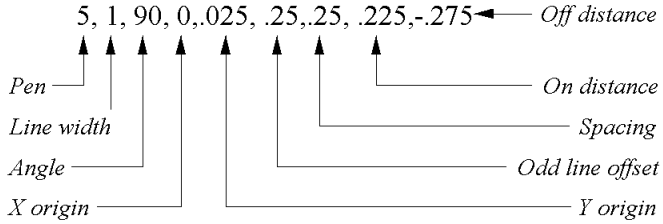
Line 2 also has a **Y origin** of **0.025mm**. Multiplied by the **scale** of **10**, this gives an actual Y origin of **0.25mm**. The effect of this origin can be seen if you superimpose lines 1 and 2:

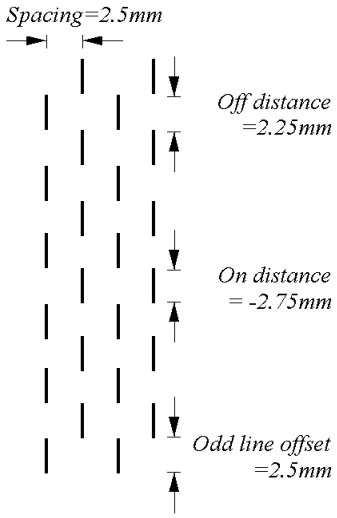


No on distance or off distance have been included in line 2 because it is solid, not dashed.

Line 3

Line 3 is at an **angle** of **90** degrees. It is a different color from lines 1 and 2 (it's **pen** is **5**), and slightly thicker (it's **line width** is **1** tenth of a millimeter).



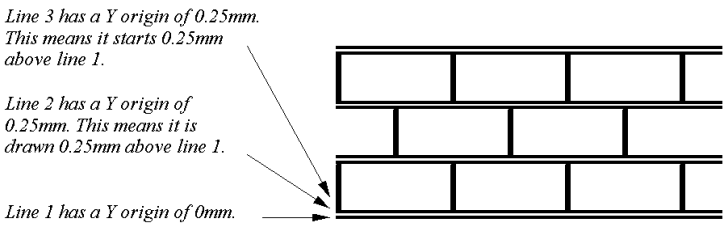


The line is repeated at a **spacing** of **0.25mm**. This spacing is multiplied by a **scale** of **10**, so the spacing between subsequent lines is actually **2.5mm.**

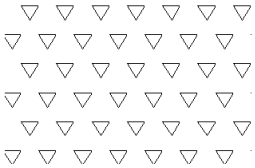
Each alternate line is **offset** by **0.25**mm. This offset is multiplied by a **scale** of **10**, so is actually **2.5mm**.

Each dash is **0.225mm** long (**on distance**), and the gap between each dash is also **0.275mm** long (**off distance**). Note that the off distance is a negative number (**-0.275**). The on and off distances are multiplied by a **scale** of **10**, so the dashes and gaps are actually **2.25** and **2.75mm** long respectively.

Line 3 also has a **Y origin** of **0.025mm**. Multiplied by the **scale** of **10**, this gives an actual Y origin of **0.25mm**. The effect of this origin can be seen if you superimpose lines 1, 2 and 3:



Example 4 - Triangle



The **triang** hatch pattern comprises three lines: a dashed line at 60 degrees,

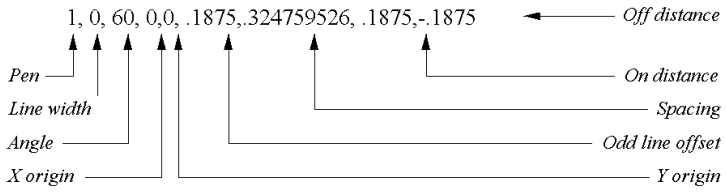
a dashed line at 120 degrees,

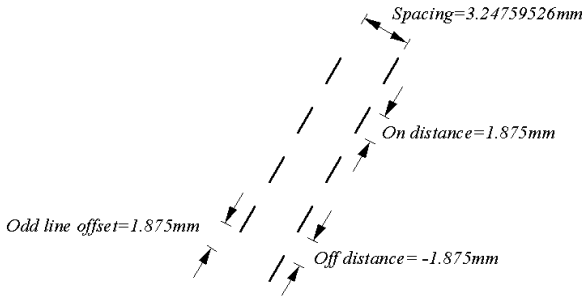
and a dashed line at 0 degrees.

Scale

```
*triangle,Equilateral triangles
10, 0                                          Rotation
1, 0, 60, 0,0, .1875,.324759526, .1875,-
1, 0, 120, 0,0, .1875,.324759526, .1875,-
1, 0, 0, -.09375,.162379763, .1875,.324759526, .1875,-
```

Line 1 Line 1 is at an **angle** of **60** degrees.





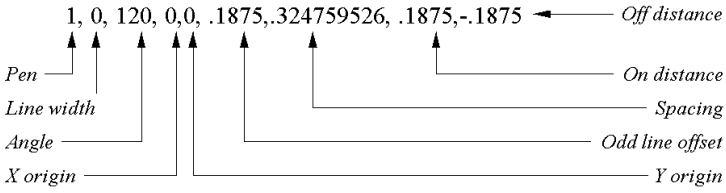
The line is repeated at a **spacing** of **0.324759526mm**. This spacing is multiplied by a **scale** of **10**, so the spacing between subsequent lines is actually **3.24759526mm.**

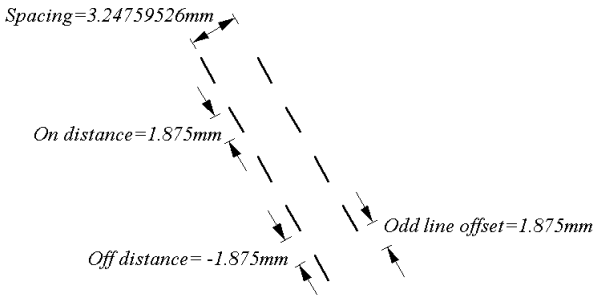
Each alternate line is **offset** by **0.1875mm**. This offset is multiplied by a **scale** of **10**, so the offset is actually **1.875mm**.

Each dash is **0.1875mm** long (**on distance**), and the gap between each dash is also **0.1875mm** long (**off distance**). Note that the off distance is a negative number (**-0.1875**).

The on and off distances are multiplied by a **scale** of **10**, so the dashes and gaps are actually **1.875mm** and **1.875mm** long respectively.

Line 2 Line 2 is at an **angle** of **120** degrees.





The line is repeated at a **spacing** of **0.324759526mm**. This spacing is multiplied by a **scale** of **10**, so the spacing between subsequent lines is actually **3.24759526mm.**

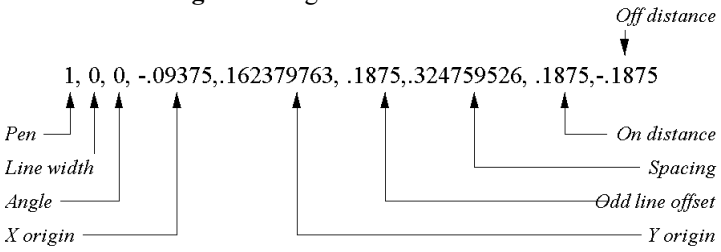
Each alternate line is **offset** by **0.1875mm**. This offset is multiplied by a **scale** of **10**, so the offset is actually **1.875mm**.

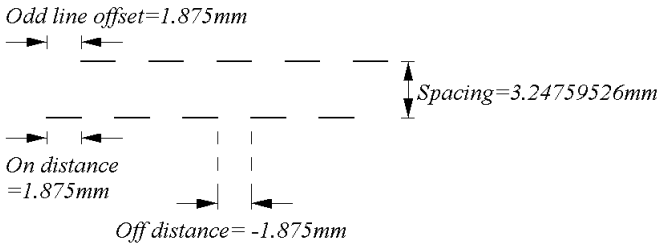
Each dash is **0.1875mm** long (**on distance**), and the gap between each dash is also **0.1875mm** long (**off distance**). Note that the off distance is a negative number (**-0.1875**).

The on and off distances are multiplied by a **scale** of **10**, so the dashes and gaps are actually **1.875mm** and **1.875mm** long respectively.

Line 3

Line 3 is at an **angle** of **0** degrees.



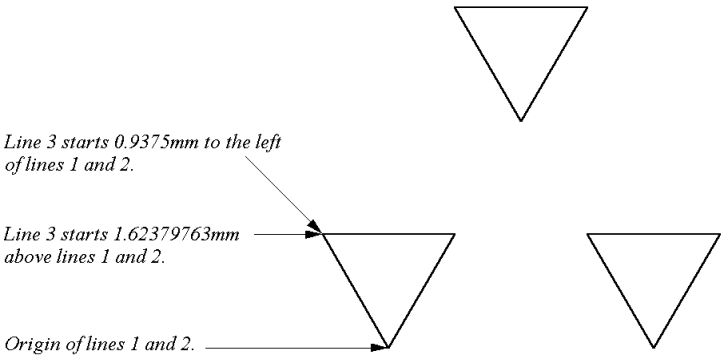


The line is repeated at a **spacing** of **0.324759526mm**. This spacing is multiplied by a **scale** of **10**, so the spacing between subsequent lines is actually **3.24759526mm.**

Each alternate line is **offset** by **0.1875mm**. This offset is multiplied by a **scale** of **10**, so the offset is actually **1.875mm**.

Each dash is **0.1875mm** long (**on distance**), and the gap between each dash is also **0.1875mm** long (**off distance**). Note that the off distance is a negative number (**-0.1875**). The on and off distances are multiplied by a **scale** of **10**, so the dashes and gaps are actually **1.875mm** and **1.875mm** long respectively.

Line 3 also has an **X origin** of **-0.09375mm** and a **Y origin** of **0.162379763mm**. Multiplied by the **scale** of **10**, this gives an actual **X origin** of **-0.9375mm** and an actual **Y origin** of **1.62379763mm**. The effect of this origin can be seen if you superimpose lines 1, 2 and 3:



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"Sight" Survey 3.0

Section 33

Line Types

Every time you enter "Sight" Survey, a **LINETYPE.MAC** macro is automatically run. This macro controls the way that different line types appear on the screen and on paper. This chapter shows you how line types are defined so that you can edit existing line types or create your own.

You can define up to 30 line types.

LINETYPE.MAC is stored in the **macro** sub-directory of your \Sightsrv\Program\ directory. You can look at, print it out or edit it in any text editor such as Windows Notepad. We suggest that before you edit the **LINETYPE.MAC** file, you make a backup.

*The **LINETYPE.MAC** file also determines whether **handles** are displayed when you select something.*

Lines in the **LINETYPE.MAC** that start with the word **REM** are comments and will be ignored by "Sight" Survey.

Line Type Definitions

Each line in the **LINETYPE.MAC** file that defines a line type starts with the word **SETLINEDASH**. Below are shown the definitions of five sample line types in the **LINETYPE.MAC** file: 1 (Continuous), 2 (Dashed), 3 (Hidden), 4 (Center2) and 5 (Phantom2).

```
SETLINEDASH 1 Continuous  8  32  0  100 0   0   0   0   0   0   0   0   0
SETLINEDASH 2 Dashed  8  16  0  70  100   0   0   0   0   0   0   0   0
SETLINEDASH 3 Hidden  4  8  0  50  100   0   0   0   0   0   0   0   0
SETLINEDASH 4 Center2  8  32  0  50  70  80  100   0   0   0   0   0   0
SETLINEDASH 5 Phantom2  8  32  0  50 60 70 80 90 100   0   0   0   0
```

These definitions comprise the following information.

```
SETLINEDASH Line_number Description Plotrepeat Pixrepeat  Percstart
Perc_on  Perc_off  Perc_on  Perc_off etc.
```

This information is summarized below, but is best understood by studying the diagrams at the end of this chapter.

Line number Each line is numbered from 1 to 30.

Description The description is matched to DXF or DWG line types when you load or save a DXF or DWG file. For example, when you load a DXF file, the DXF line type "Hidden" is displayed as line type 3.

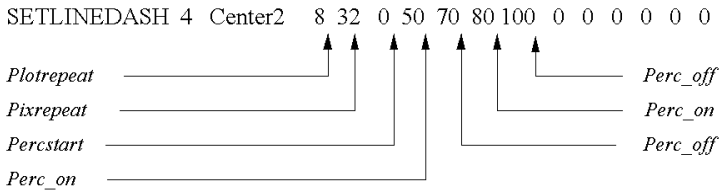
Plotrepeat This is the distance over which the line type pattern is repeated on your printer or plotter - 8mm for line types 1, 2, 4 and 5 and 4mm for line 3.

Pixrepeat This is the distance over which the line type pattern is repeated on the screen - 32 pixels for line types 1, 4 and 5; 16 pixels for line type 2 and 8 pixels for line type 3. Pixrepeat must be a factor of 32, e.g. 4, 8, 16 or 32.

Pixels are the little squares that make up the display on your screen. Typically there are 640 pixels across the screen and 480 down it, or 800 pixels across the screen and 600 down it, or 1024 pixels across the screen and 768 down it, depending on screen resolution.

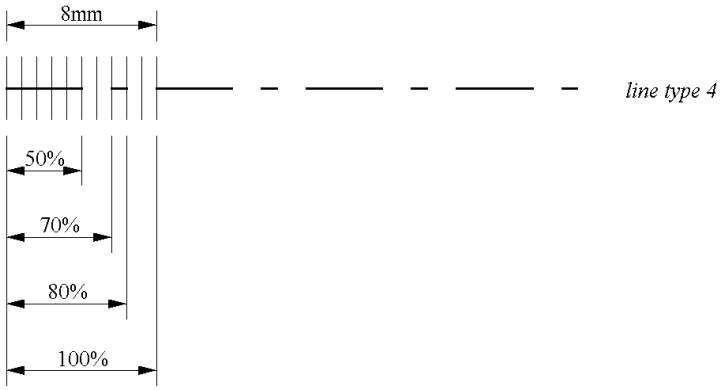
Some dashed/dotted line types appear continuous on the screen, although they plot or print correctly on paper. This problem can be overcome by increasing the Pixrepeat.

Percstart, Perc_on and Perc_off Percstart, perc_on and perc_off show the percentage of **Plotrepeat** or **Pixrepeat** where a line is drawn and where a gap is left. Percstart is always 0. For example, in line type 4:

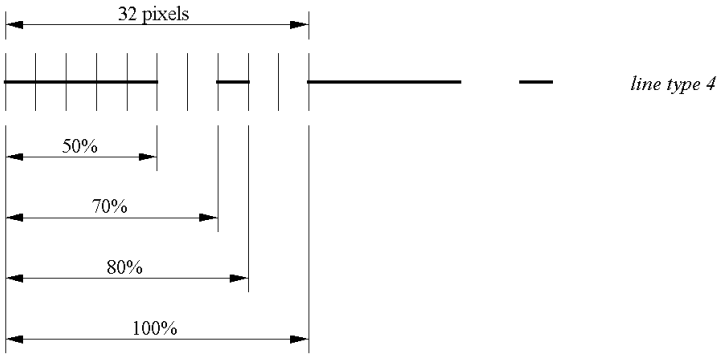


On paper, a line is drawn between 0 and 50% of the 8mm

Plotrepeat. No line is drawn between 50 and 70%. A line is drawn between 70 and 80%. No line is drawn between 80 and 100%.



On the screen, a line is drawn between 0 and 50% of the 32 pixel **Pixrepeat**. No line is drawn between 50 and 70%. A line is drawn between 70 and 80%. No line is drawn between 80 and 100%.



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