Survey, Coordinate Geometry and Drafting

Menus

If you are using Autocad® or IntelliCAD® type the following at the command prompt: **(load"c:/dpcogo/loadmenu")** Then press Enter.
This will append our pull down menu to your existing menu as well as load the toolbar menus.

For step by step instructions for our DPpoints menu items click here!

Before you begin go to Drafting -> Drawing Setup

Drawing Setup - Select English or Metric units -changes the ltscale and labeling precision, changes dimscale to the scale of the drawing, it changes textsize to one tenth the drawing scale (English) and to 3mm (Metric) and it changes other dimension variables. **You may use notepad to edit dpset.lsp in the Dpcogo directory if you want to change or customize these settings.**

Set points

Survey, Cogo and Drafting does not use AutoCAD® point objects, It uses blocks which contain the point node, a point number, point elevation and point description.
Set points by entering Northings & Eastings (coords) or pick a point (select).
(if you pick a point on a 3D object, the elevation will be used for the point).
You may also set points by Traverse, Sideshot, or by entering a station and offset along an alignment.

Note: Whenever you add points to the drawing a user definable block can also be placed there automatically, such as an iron pipe or a power pole etc. -
See Create key descriptions below.

Point blocks

There are two point nodes placed for each point. One node is placed at the elevation of the point on layer 3D_NODE to be used for surface modeling programs or for drawing 3D lines etc. The other node is placed at elevation 0 on layer 2D_NODE to be used for 2D drafting.
By default layer 3D_NODE is frozen.

The "Reassociate points" command will move all 2d nodes to their proper location in relation to the 3d nodes in case you move points manually and get them separated.

NOTE:
The point number is on layer DPNO, the point elevation is on layer DPEL, and the point description is on layer DPDES. By default these layers are locked to prevent interfering with the point snap in IntelliCAD®.
If you are using AutoCAD® you will want to unlock these layers. To permanently unlock these layers open the drawing c:\dpcogo\dpnode.dwg unlock the layers then save the drawing.

Create key descriptions

Selecting this option brings up a dialog box in which you may enter point descriptions that will cause a block to be placed along with the point, such as an iron pipe or a power pole. A block (drawing file) with the same name as the description must be placed in the c:\Dpcogo\dwglib\ directory - a sampling of some descriptions and blocks are included with the program. The list of descriptions are kept in the file c:\Dpcogo\dwglib\dpdestd.lbr Please note that the block will be scaled by the linetype scale of the drawing. If you are drawing at a 20 scale then the linetype scale (LTSCALE) variable should be set to 20. If you use the Set drawing scale option on the drafting menu, the linetype scale will be automatically set.

The key description must be the first part of the description before any spaces.

An example: Lets say the key is ip for iron pipe - when the program sees the key ip, it places the block ip.dwg at the point location.
The following are valid descriptions:
ip
ip bent
ip 1/2"

Create line descriptions

Selecting this option brings up a dialog box in which you may enter line descriptions that will cause a layer to be created and linework to be drawn on it from a point file (See Import line file).
If a line description was set up for ep, then any line name beginning with "ep" would be placed on layer ep.

Downloading a Data Collector

Use the software that came with your Data Collector to download to a file in one of the following formats:
Point Number, Northing, Easting, Elevation, Description (PNEZD) or
Point Number, Easting, Northing, Elevation, Description (PENZD).
This file may then be imported using the import points and/or the import linework commands.
Point symbols and lines are automatically drawn.

Example: Let's say you are downloading from a Sokkia SDR33.
If you use the ProLINK Comms program, which came with the Sokkia SDR33, you will need to send the data from the SDR33 in POS view. This option is under the Communication Menu. Once the data is in ProLINK Comms as coordinates then there is a format conversion that will convert to the format that you wish.

Point display

Points display on will set pdmode to 3 (displays an x) and pdsize to 0.03.
Points display off will set pdmode to 1 (no display).
Points display select will allow the user to select a point display mode.
Zoom to points by number will center the point in the current display.
Renumber points add a numeric value (+ or -) to existing point numbers.
Select points by number will make a selection set of points by entering a range of point numbers. Use the previous selection set "P" option to use these points in another command (such as nodelist or twist).
Select points by description will make a selection set of points by finding a matching description. Enter the description to find. Use the previous selection set "P" option to use these points in another command (such as nodelist or twist).
Change point layer by number will move points to a different layer by entering a range of point numbers. Enter the range of point numbers and the layer to move to (the layer must exist in the drawing).
Change point layer by description will move points with a certain descrption to a different layer. Enter the description to find and the layer to move to (the layer must exist in the drawing).
Add text to elevation by desc. Will add text to an elevation , such as adding TC= to an elevation (i.e. TC=600.00), by finding a matching description.
Add text to elevation by select Will add text to an elevation , such as adding TC= to an elevation (i.e. TC=600.00), by selecting a point or group of points.
Reset elevation by desc. Will reset the elevation text to the elevation of the point by finding a matching description.
Reset elevation by select Will reset the elevation text to the elevation of the point by selecting a point or group of points.

Boundary Traverse and Sideshot

Set points using a boundary traverse or sideshot (use vertical angle or difference in elevation). Select a point to occupy by point number, or pick a random point graphically, then select a point to backsite - enter as many sideshots as you need. When done press enter - the program will move you to the last point that you set and backsite the point that you were on before - continue with traverse or sideshot. Note: In order to set on or backsite an existing point in the drawing you must enter the point number.

Draw Traverse - Draw by entering bearings and distances and curves. Good for inputing an existing boundary.

Radial Stakeout

Enter a point number to occupy. Then enter a point number to backsite. You will be prompted to create or select a file. If you select an existing file, the new data will be appended to it. You may graphically select all the points that you want to include in the stakeout report, or you can enter a range of point numbers. You may now open the file in notepad or any other text editor and print it out.

Inverse

Inverse points by entering point numbers. You will be prompted for the first point number and then the second point number.

A bearing and distance will be displayed at the command prompt.

Intersections

Find intersections by Bearing - Bearing, Bearing - Distance, Distance - Distance, Line - Arc, and Point offset to a line.

Bearing-Bearing:

You will be prompted for the first point number and bearing and then the second point number and bearing, the intersection will be displayed at the command prompt and you will be asked if you would like to set a new point there.

Bearing-Distance:

You will be prompted for the first point number and bearing and then the second point number and distance, the intersection will be displayed at the command prompt and you will be asked if you would like to set a new point there.

Distance-Distance:

You will be prompted for the first point number and distance and then the second point number and distance, the intersection will be displayed at the command prompt and you will be asked if you would like to set a new point there.

Note: If two answers are found, you will be asked to choose the answer you want to use.

Line-Arc:

You will be prompted for the first point number and the second point number to define a line, then you will be prompted for a point number at the center of the arc and a radius, the intersection will be displayed at the command prompt and you will be asked if you would like to set a new point there.

Point offset to a line:

You will be prompted for the first point number and the second point number to define a line, then you will be prompted for a point number, the bearing and distance from the point perpendicular to the line will be displayed at the command prompt.

Draw by point number

You may draw a line from point to point by entering the point number.

Import / Export

Import points from an ascii file or export points to an ascii file. A file is created in a variety of formats (including: Point Number, Northing, Easting, Elevation and Description). You may also create a Point List for viewing in the same format.

Import line file

Linework may be created in the drawing by reading a point file with linework coded into it. This may be the same file used to import the points (See create line descriptions). Line descriptors must start with a "." right after the key description (if any). The line name can be anything, such as "line1" or "line2" (An example would be .line1). If the line is on a curve place a "-" after the "." (An example would be .-line1).

In the following example there is an iron pipe found bent on the edge of pavement. To code the iron pipe we have set up the key description of "ip" and the line name is "ep1" also we want to note that the pipe was bent, thus the description would read in the following format: key description (if any) "." Line name, a space, and then the note.

Example: ip.ep1 bent.

The following are valid line descriptions:

.ep1
ip.ep1
ip.ep1 bent
ip.ep1 some note

Notice that there are no spaces till the beginning of the note.

If a line description was set up for ep (See create line descriptions), then line ep1 would be placed on layer ep. Any line name beginning with "ep" would be placed on layer ep.

Manipulate points

Move points - Select a group of points and move them. Select the 3d nodes (corresponding 2d nodes are selected automatically).
Rotate points - Select a group of points and rotate them. Select the 3d nodes (corresponding 2d nodes are selected automatically).

Note: You may use a window or crossing since the routine will only select the 3d nodes.

Reassociate points - This command will move all 2d nodes to their correct location with the 3d nodes. (In case a 2d node gets moved by accident or a 3d node is moved without using the "Move points" command.)
Resize points - Select a group of points and change the size of the point display. (point no. elevation and description)
Note: This command will not change the size of a block placed at the point (such as a power pole or iron pipe).
Twist points - Select a group of points and pivot the points about their placement point.
Change elevation - Select a group of points and change the elevation by adding or subtracting.
Convert elevation - Select a group of points and change the elevation by mutiplication.(such as converting between metric and English)
Resize blocks - Select a group of blocks and change their size. (such as power pole or iron pipe)
Note: This command will not affect the points.
Note: To resize both points and blocks - use resize points then use resize blocks.

Drafting

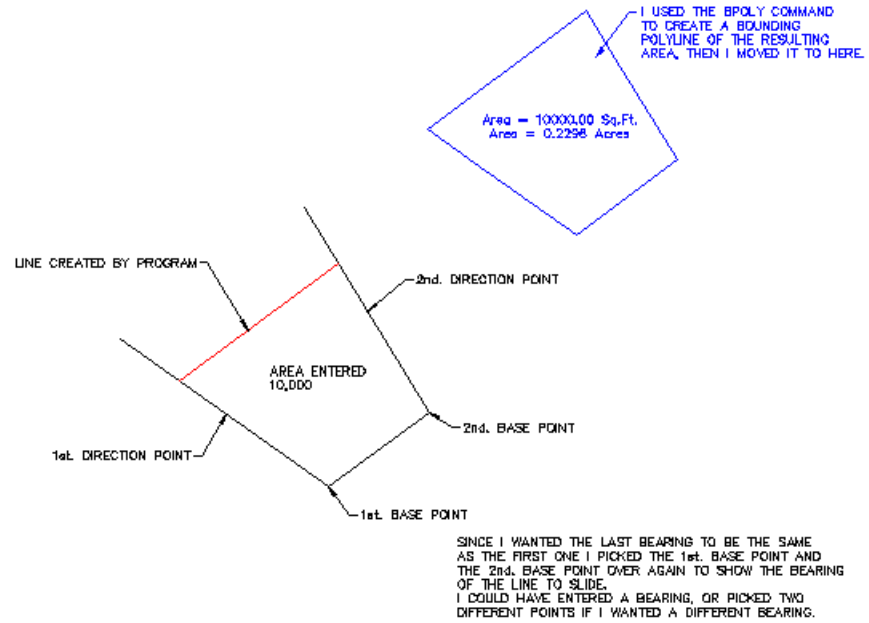
Drawing Setup - Select English or Metric units -changes the ltscale and labeling precision, changes dimscale to the scale of the drawing, it changes textsize to one tenth the drawing scale (English) and to 3mm (Metric) and it changes other dimension variables (you may edit dpset.lsp in the Dpcogo directory if you want to change these settings).

NOTE: many of our programs use the ltscale setting to scale objects they create.

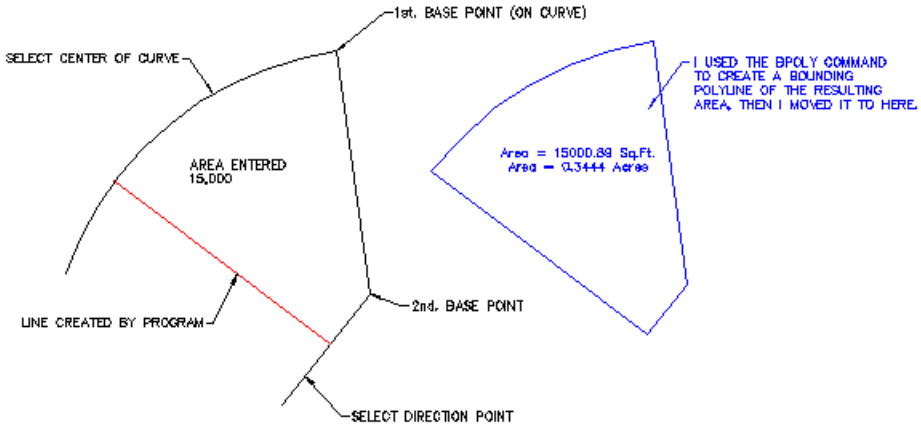
Compute Areas

You may let the program automatically compute lot areas by Slide Bearing or Radial methods.

To change the desired result pick the resulting bearing in reverse order.



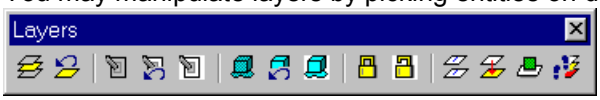
SAMPLE OF SLIDE BEARING



SAMPLE OF RADIAL SWING

Layers

You may manipulate layers by picking entities on desired layers. The options are:



Isolate Layer - Sets first selected layer current and turns off all unselected layers.
Undo Isolate Layer - Restores layer settings.

Layer Off - Turns off selected layers.
Undo Layer Off - Restores layer settings.
Turn all layers on - Turns all layers on.

Layer Match - Moves selected entities to new layer.
Change to current layer - Moves selected entities to current layer.
Make Layer Current - Sets selected layer current.

Layer Walk - Displays layers one at a time.

Layer Lock - Locks selected layers.
Undo Layer Lock - Restores layer settings.
Layer Unlock - Unlocks selected layers.
Layer Freeze - Freezes selected layers.
Undo Layer Freeze - Restores layer settings.
Thaw all layers - Thaws all layers.

Text

Text Leader - Draws a leader and begins dtext.
Text leader box - Draws a leader and places a box around a single line of text.
Box around text - Select text to place a box around (ltscale will control the space between text and box).
Trim behind text - Trims all entities behind selected text.

Text Manipulation

Import Text - Import a plain text (ascii) file.
Edit Mtext - Uses a list box to edit mtext (usefull in IntelliCAD® 98).
Find and Replace - Find and replace or append text in the drawing.
Convert Mtext to text - Converts mtext to single line text. (IntelliCAD® does not explode mtext to text)
Convert text to Mtext - Converts single line text to mtext.
Write text to file - Writes selected text to a file.
Write Mtext to file - Writes selected Mtext to a file.
Mtext to spreadsheet cdf - Writes selected Mtext and Text to a comma delimited file.
Add to text - Add to the beginning or end of existing text.
Remove from text - Remove characters from the beginning or end of existing text.

Graphic Scale - Places a graphic scale at the desired location (ltscale variable will determine the size and units).

Lot Numbers - Will place incremented numbers at the desired location.

Label Stations - Will place station labels along a line, arc or polyline.

Profiles

Section Tools - If you purchased Design Section Tools this command will start it. Create profile UCS, Draw and label tangents, spot elevations, manholes and more. See advertisement on this web site.
Sewer Profiles - If you purchased Sewer Profiles this command will start it. Automatically draws fully annotated sewer profiles from plan drawings. See advertisement on this web site.
Draw profile grid - Draws and annotates a profile grid, based on current UCS. Pick lower left and upper right limits.
Label profile elevations - Labels elevations along a datum line as you pick the point in a profile, based on current UCS.
Extract Profile - Extracts a profile from a tin of 3dfaces or 3dlines along a defined line.

Lines

Convert to text line - Converts a line to a line with text placed at user defined intervals.
Draw text line - Draw a line with text placed at user defined intervals.
Exist san - Draws a line with hollow flow arrows.
Exist storm - Draws a line with double hollow flow arrows.
Prop san - Draws a line with solid flow arrows.
Prop storm - Draws a line with double solid flow arrows.

Lines D.O.T.

Exist san - Draws an existing sanitary line using DOT symbology (hoop).
Exist storm - Draws an existing storm line using DOT symbology (elongated hollow arrow).
Prop san - Draws an proposed sanitary line using DOT symbology (hoop).
Prop storm - Draws an proposed storm line using DOT symbology (elongated solid arrow).

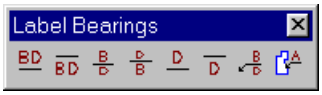
Design Parking - If you purchased Design Parking this command will start it. Draw parking stalls at any angle, draw radial stalls, draw a combination of regular and accessibility stalls. Tabulates number of stalls in drawing. See advertisement on this web site.

Labels

You may label the bearing and distance of a line by selecting it or by picking points.
You may label a curve (radius, length) or (delta, radius, tangent, length and chord bearing & length) by selecting it or by picking points.

NOTE: LABELING WILL USE THE UNITS (ENGLISH OR METRIC) THAT IS SELECTED IN DRAFTING-> DRAWING SETUP. LABELING WILL ALSO USE THE CURRENT PRECISION SETTINGS.

Label lines BRG

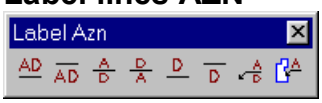


Label by selecting a line
Brg dist / - Label bearing and distance on top of line.
/ Brg Dist - Label bearing and distance on bottom of line.
Brg / Dist - Label bearing on top and distance on bottom of line.
Dist / Brg - Label distance on top and bearing on bottom of line.
Dist / - Label distance on top of line.
/ Dist - Label distance on bottom of line.
Note - Label bearing and distance with a leader to a line.

point to point

Label by selecting 2 points for a line
Brg dist / - Label bearing and distance on top of line by selecting points.
/ Brg Dist - Label bearing and distance on bottom of line by selecting points.
Brg / Dist - Label bearing on top and distance on bottom of line by selecting points.
Dist / Brg - Label distance on top and bearing on bottom of line by selecting points.
Dist / - Label distance on top of line by selecting points.
/ Dist - Label distance on bottom of line by selecting points.

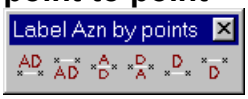
Label lines AZN



Label by selecting a line
Azn dist / - Label North azimuth and distance on top of line.
/ Azn Dist - Label North azimuth and distance on bottom of line.

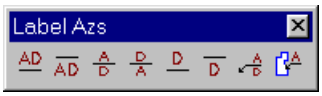
Azn / Dist - Label North azimuth on top and distance on bottom of line.
Dist / Azn - Label distance on top and North azimuth on bottom of line.
Dist / - Label distance on top of line.
/ Dist - Label distance on bottom of line.
Note - Label North azimuth and distance with a leader to a line.

point to point



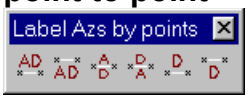
Label by selecting 2 points for a line
Azn dist / - Label North azimuth and distance on top of line by selecting points.
/ Azn Dist - Label North azimuth and distance on bottom of line by selecting points.
Azn / Dist - Label North azimuth on top and distance on bottom of line by selecting points.
Dist / Azn - Label distance on top and North azimuth on bottom of line by selecting points.
Dist / - Label distance on top of line by selecting points.
/ Dist - Label distance on bottom of line by selecting points.

Label lines AZS



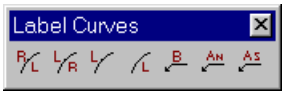
Label by selecting a line
Azs dist / - Label South azimuth and distance on top of line.
/ Azs Dist - Label South azimuth and distance on bottom of line.
Azs / Dist - Label South azimuth on top and distance on bottom of line.
Dist / Azs - Label distance on top and South azimuth on bottom of line.
Dist / - Label distance on top of line.
/ Dist - Label distance on bottom of line.
Note - Label South azimuth and distance with a leader to a line.

point to point



Label by selecting 2 points for a line
Azs dist / - Label South azimuth and distance on top of line by selecting points.
/ Azs Dist - Label South azimuth and distance on bottom of line by selecting points.
Azs / Dist - Label South azimuth on top and distance on bottom of line by selecting points.
Dist / Azs - Label distance on top and South azimuth on bottom of line by selecting points.
Dist / - Label distance on top of line by selecting points.
/ Dist - Label distance on bottom of line by selecting points.

Label curves



Label by selecting a curve
Rad (Len - Label radius on outside and arc length on inside of curve.
Len (Rad - Label arc length on outside and radius on inside of curve.
Len (- Label arc length on outside of curve.
(Len - Label arc length on inside of curve.
Note Brg - Label Delta, Tangent, Arc length, Radius, Chord bearing and Chord distance in a note off the curve.
Note Azn - Label Delta, Tangent, Arc length, Radius, Chord Azimuth North and Chord distance in a note off the curve.
Note Azs - Label Delta, Tangent, Arc length, Radius, Chord Azimuth South and Chord distance in a note off the curve.

Label curves (point)

Label by selecting 3 points to define a curve (center start end - counterclockwise)
Rad (Len - Label radius on outside and arc length on inside of curve.
Len (Rad - Label arc length on outside and radius on inside of curve.
Len (- Label arc length on outside of curve.
(Len - Label arc length on inside of curve.

Label coords - Label coordinates by picking a point.

Label areas - Label areas in square feet and acres (or Hectares) by selecting a closed polyline.

Listing

List lines - You may list the bearing and distance of a line by selecting it.
List curves - You may list a curve (delta, radius, tangent, length and chord bearing & length) by selecting it.

Write Legal

This routine will write an ascii text file of selected bearings and distances and curve data by selecting a series of lines and curves.
You may also add notes to the file. This file may then be edited and used for a legal description.

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