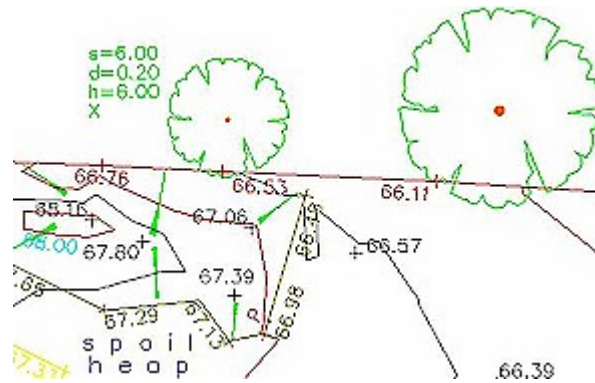


AutoCAD Functions

By Chris Skellern



- **Drawing**

AutoCAD drawings are drawn true sized (as real world co-ordinates) so there is no scale to set. For example, if you wished to draw a rectangle to represent a footprint of a building with a size of 20 by 15 meters you would actually set the size of the rectangle to be 20000 units by 15000 AutoCAD units (assuming 1mm = 1 AutoCAD unit). To do this graphically you would first need to Zoom the display out to a suitable level.

An advantage of drawing in true size is that you can also take true measurements straight from the AutoCAD screen without needing to use any scale conversion device (i.e. using a scale ruler with a paper drawing). Simply, select the **Inquiry function**, measure the distance required and read off the value in meters/millimeters.

Site plan drawings may be produced using a single AutoCAD unit to represent 1m or as 1 unit to represent 1mm. Its easy to find out which method is in use, simply measure an item on the drawing!

- **Zoom**

The Zoom functions change the magnification of your display view so that you use the whole display screen to view a large site plan of say 1km square and then zoom in to look closely at a fence post top of 100mm square. There are really no limits to how far you wish to zoom.

- **Co-ordinates**

All drawing co-ordinates relate to the drawing origin which is normally located at the bottom left of the drawing. The X and Y axis pass through the origin at 0,0.

During the plotting of an object such as a circle, its X and Y co-ordinates (for its centre) need to be defined either by clicking the mouse on the screen or by inputting the positions numerically with the keyboard. So, when prompted for the X and Y position of a circles centre, you can type 350,2056 at the command line and the circle will be drawn 350 units along the X axis and 2056 units along the Y axis. This is positioning using **Absolute Co-ordinates**. However, one useful command line option is to use **Relative Co-ordinates** where the inputted values are treated relative to the last point entered. Relative values must have the @ character entered before

the number text. So, as an example, if I have just drawn a line which ended at position 90,120. I could enter the relative co-ordinates for a circles position as @50,-10. This tells the program to draw the circle 50 units to the right and 10 units below the position of the last point plotted (the line end). Relative co-ordinates can only be entered from the keyboard or from within a script. Note: If plotting a detailed drawing from a script then the use of relative co-ordinates is essential as a script has no means of storing reference values.

- **Grip boxes**

When you click the mouse on a drawn object such as a line or circle it becomes active and its small blue grip boxes appear. These are places on the entity which you can pick and adjust with the mouse. In some cases you can use them to reposition the whole object or just part of the object (stretch).

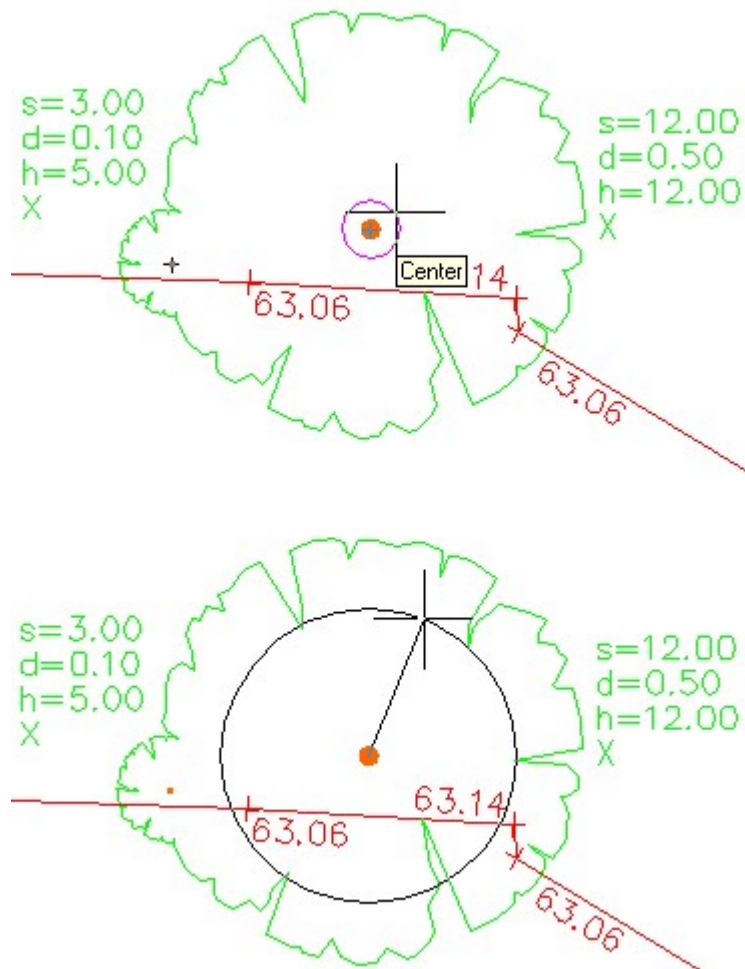
- **Object Snap Settings**

Most drawn objects need to be accurately connected together. Very rarely would you ever position an object by eye (one exception is descriptive text such as a tree tag number or name).

As an example, suppose you wish to plot a circle over a trees centre spot to represent a canopy extent or protective circle. You would locate your circle using an **'Object snap' function**. This is carried out when prompted for the circles X and Y co-ordinate; instead of typing in its position (which you wouldn't know anyway) and instead of just guessing the position by eye, you select a snap function to do the work for you. If the land survey have identified each tree with a small circle, you would select **'snap to circle centre'** function. If instead the trees are positioned using a point mark, then you would select the **'snap to node (point)'** function. Once the snap is selected you only need to move the mouse close to the target position and a marker will indicate the precise centre, click the mouse and its positioned precisely. Lots of snap settings are available which enable you to snap to all manner of objects (including line ends, line mid-points, intersections, etc.).

A dialogue box enables you to set running object snap settings which then stay active until changed. This saves you the trouble of continually picking the same snap setting during repetitive work. If for example, you are plotting a tree survey list from a batch processing program and all the trees need to be plotted to an existing tree position based upon a circle spot. Then its best to set the running snap to 'circle centre' (and delete all other snap settings) to speed up the process. Note: Do not confuse this with the movement snap setting which can be set to move the cursor around the drawing in multiples of a specified distance.

The following picture shows two of the stages of drawing a circle to the exact center of an existing tree location. First the circle function is selected and then the 'snap to centre' setting selected. As the mouse cursor is moved anywhere near an existing circle, AutoCAD will automatically highlight the circle centre (in the top drawing this is shown as a magenta coloured circle and 'centre' tip). The mouse is now clicked and a prompt to specify the radius of the circle appears. The radius can be specified by simply moving the mouse (as shown on the lower picture) or by entering data from the command line (keyboard input).



- **Purge**

The purge function strips a drawing of any unused references which would otherwise add unnecessary data to a drawing file. A purged file will be smaller, more stable and quicker to email. When you select Purge from the menu you are given a choice of items to remove; these include, removing unused layers, linetypes, blocks, textstyles etc. If you wish to purge a number of items then keep running Purge until it returns with an message saying no more references were found. Purge will not remove any parts of your drawing.

- **Filedia**

Filedia is an AutoCAD system variable which controls whether or not dialogue boxes should be displayed when you type a command such as Script. If the variable is set to 0 they will not be displayed as the choice is controlled through the command line. I have mentioned it here because if you are running a script which switches this

variable and then becomes interrupted by an error and stops running you may be stranded with no dialogue boxes! To rectify such a problem, type `filedia <enter>` followed by `1 <enter>` to switch their display back on.

- **Donut**

This is actually a modified polyline which draws a filled circle or ring. It is very handy for creating a BS5837 coloured category disk. Simply set the internal diameter to a value of 0 to create a filled circle.

- **Spline**

A spline is a curve which will attempt to pass through any number of points which you define. You can specify a 'tolerance of fit' for each defined point; this instructs the curve on how close it must be drawn to the point. A higher tolerance will produce a more natural looking curve as it has greater flexibility when negotiating the curve through tight corners. A spline is handy for producing a flowing tree canopy spread based upon the north, south, east and west distances. A tolerance of 0 is necessary to keep the curve tight to each point.

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