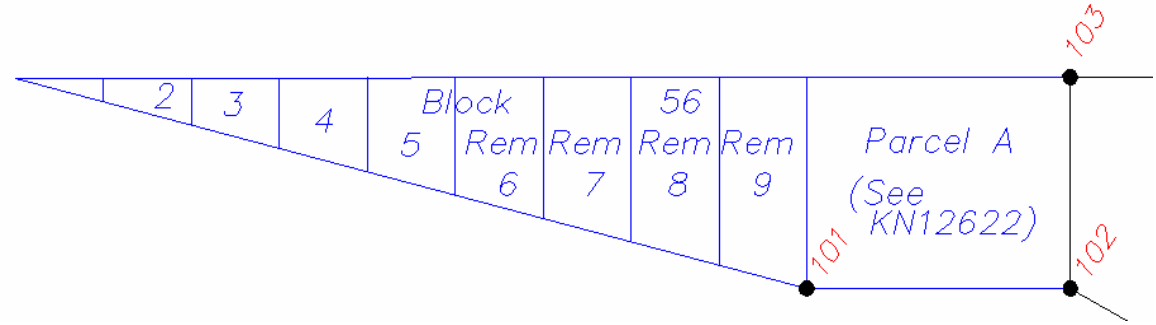
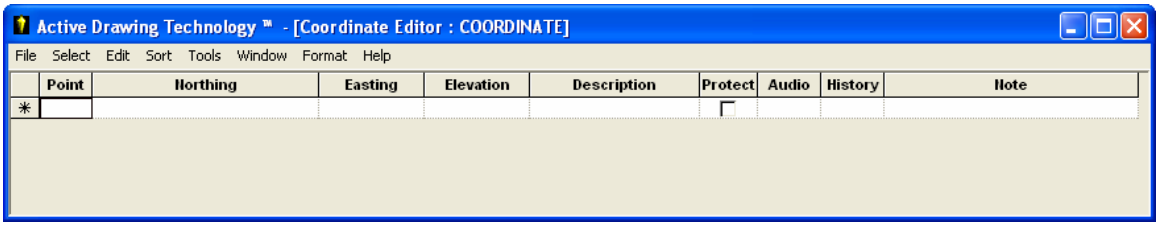
MSCAD 2005 / inCAD 2006

Adding Coordinates to an Existing Drawing

There are many occasions when you may want to coordinate an existing drawing file, or at least some of the entities in it. For example, if an engineer or architect sends you a DWG or DXF file it may already have all of the linework or points that you are interested in.



However, if you go into the Active Coordinate Editor you will not see any points listed. This is because the engineer or architect only sent you a drawing, perhaps created in AutoCAD or some other program, which does not include the MicroSurvey point database information.



There are four different commands that you can use to add existing points or linework into the database. You can use any method, but depending on the number of entities you want to coordinate, and the control you want over exact point numbers and descriptions that are assigned as you create the points, as well as the source of the coordinate data, you may find one method more appropriate than the others for your specific needs.

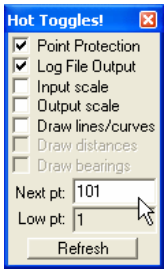
Method 1: Store and Edit Points

You can add points individually using the Store and Edit Points command, found under the MsPoints menu. This gives you full control over which point number to assign to each point you select, as well as the ability to assign a description to the point as it is created.

We will use this point to add points 101, 102, and 103 in the drawing shown above so that the point numbers in our database match the point numbers in the engineer/architect's files.

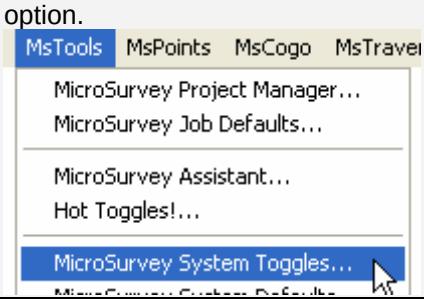
Quick Tip: Presetting the Next Point Number

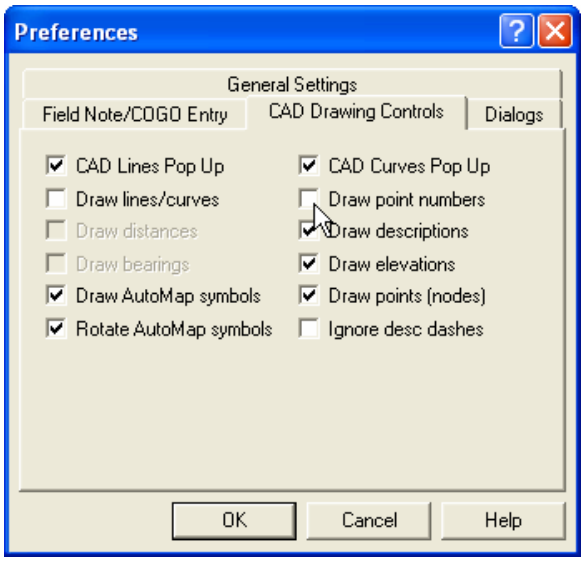
When you start the Store and Edit Points command, it will default to the Point Number defined by the "Next pt" field on the Hot Toggles dialog, so you could enter "101" in this field which will cause the Store and Edit Points command to start at the desired point number.



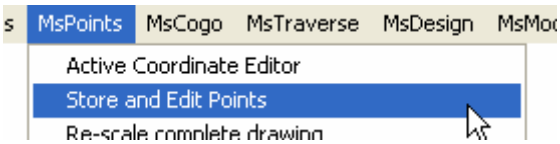
Quick Tip: Avoiding Unwanted Point Labels

When adding points to our database, MSCAD will by default also draw a new Point Node, Point Number, Description and Elevation into your drawing. In our example shown above, we already have a point number label drawn. So to prevent duplicate labels from being created, we should tell MSCAD to not draw Point Numbers. To do this, click on the **MsTools** menu then **MicroSurvey System Toggles…**, and then switch to the **Cad Drawing Controls** tab and turn off the "Draw point numbers" option.





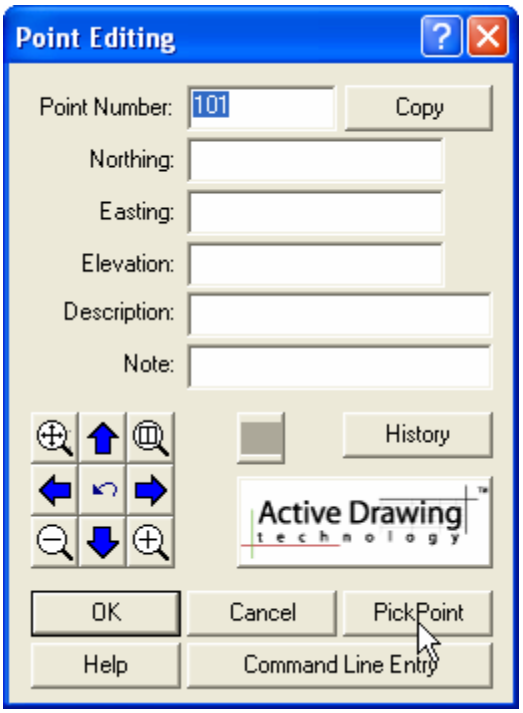
Click on the **MsPoints** menu then choose **Store and Edit Points**.



On the Point Editing window that comes up, specify the desired Point Number. It will default to whatever the "Next pt" value is on the Hot Toggles dialog.

Then click on the "Pick Point" button, which will take us back to the drawing to select a location.

Make sure to use the appropriate snap mode (see below) to exactly select the desired coordinate.



Quick Tip: Using Entity Snaps

Click on the desired snap button, or type the first three letters of its name (shown in bold below), to ensure that you are exactly selecting the desired coordinate. Don't just try to get your mouse "close enough" to the desired location, use the entity snaps to exactly lock on to the entity's location. Below are details on the most commonly used snaps:

ENDpoint – Snap onto the end of a line or arc.

MIDpoint – Snap onto the midpoint of a line or arc.

INSertion point – Snap onto the insertion point of a block/symbol.

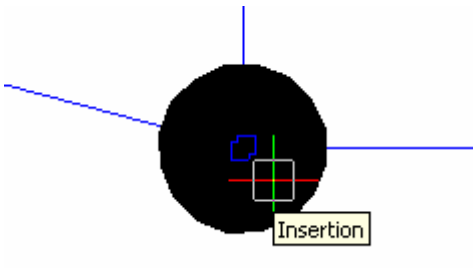
point **NOD**e – Snap onto a point node.

INTersection – Snap onto the intersection of two lines. (They must exactly meet, touching each other at the same elevation.)

APParent Intersection – Snap onto the apparent intersection of two lines. (They do not have to exactly meet at the same elevation, only appear to intersect when looking at them from above)

NONe – Turns off all entity snaps.

In this example, the engineer/architect has placed a block to represent his points, so we can use the Insertion point snap, and when we get close to the insertion point we see the snap marker show up on the insertion point (even if the cursor isn't exactly there), as well as a ToolTip indicating that this is an Insertion snap. *(Note, we could have instead used the Endpoint, Intersection or Apparent Intersection snaps to get the same location, since the three blue lines meet at the same coordinate.)*



After the coordinate is selected, we are taken back to the Point Editing window.

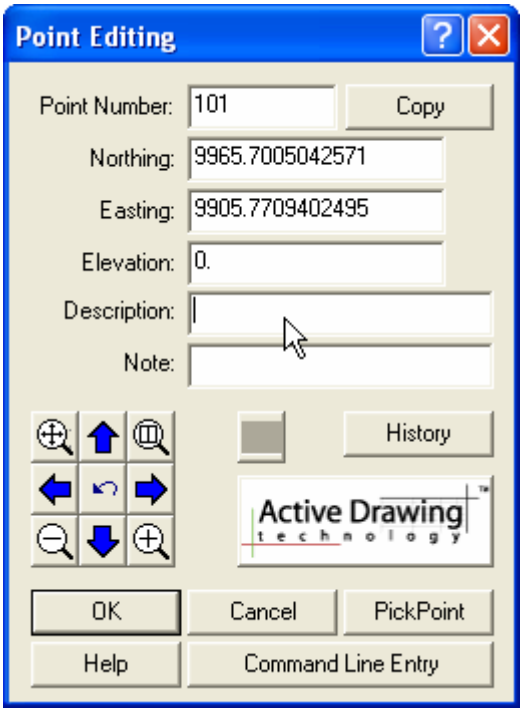
You can see that the elevation in this example is 0, because the drawing is 2-dimensional. If you are snapping onto a 3D entity, it will retrieve its elevation.

You can enter a Description and Note if desired.

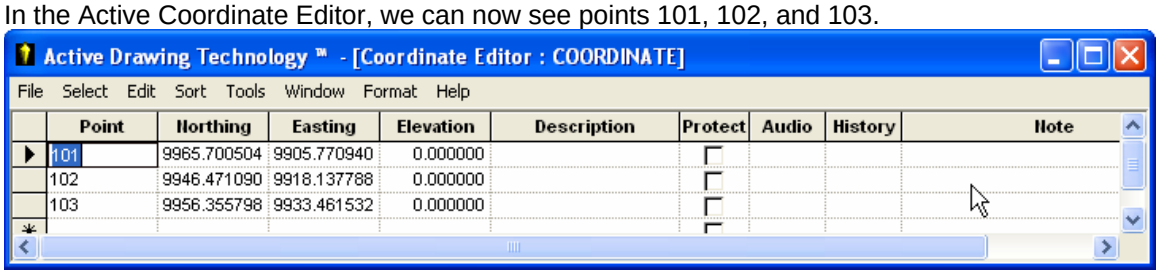
Then press OK to save the point into your database.

After clicking OK, the Point Number will advance and you can continue to use the "Pick Point" button to retrieve coordinates for additional points. In this example I will also pick points 102 and 103.

When done, click the red X button to close the Point Editing window and return to the drawing.



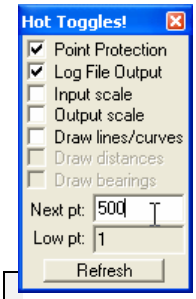
In the Active Coordinate Editor, we can now see points 101, 102, and 103.



Method 2: Auto Add Points to Objects

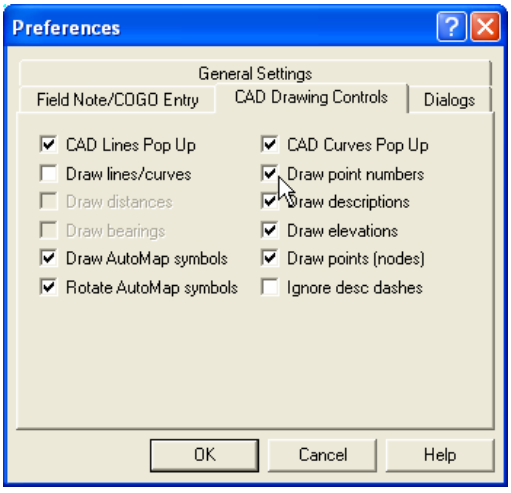
You can add multiple points at once using the Auto Add Points to Objects command, found under the MsPoints menu. This allows you to select multiple entities, and MSCAD will create a coordinate on the selected entities based upon: the two endpoints of selected lines and arcs, the radial point of selected arcs, center point of a circle and CAD points. Polylines would have to be exploded into lines and arcs to be coordinated.

We will use this to create new points at the endpoint of each of the other lines in the drawing.



Quick Tip: Setting the starting point number

Point numbers will always begin at whatever is set as the "Next pt" on your Hot Toggles! window, and will increment from there if multiple points are being created. To avoid potential conflicts with other points in the project, I want to create our new points in the 500 range. So, I enter 500 in the "Next pt" field, as shown in the Hot Toggles screen to the left.

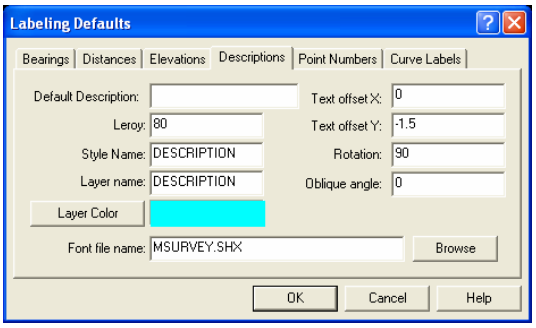


Quick Tip: Ensure labels will be drawn

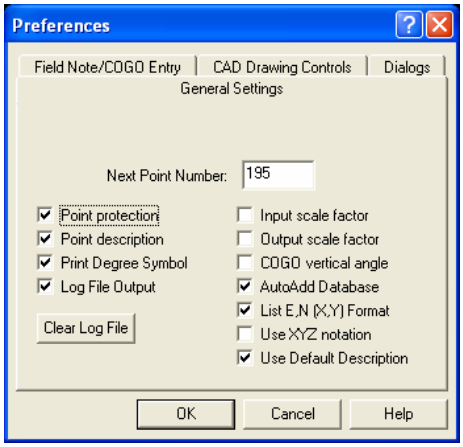
Unlike with the first method (using the Store and Edit Points command) we do not have any existing point labels, so we want to ensure that MSCAD will draw new labels in for us. Click on the **MsTools** menu then **MicroSurvey System Toggles…** and make sure that all of the desired CAD Drawing Control toggles are turned on, as shown to the right.

Quick Tip: Using a Default Description

You can have MSCAD assign a default description to the points as it creates them, by setting one in the Labeling Defaults, and enabling it in the System Toggles. Click on **MsAnnotate** > **Labeling Defaults** > **Descriptions** and then enter the desired description in the "Default Description" field.

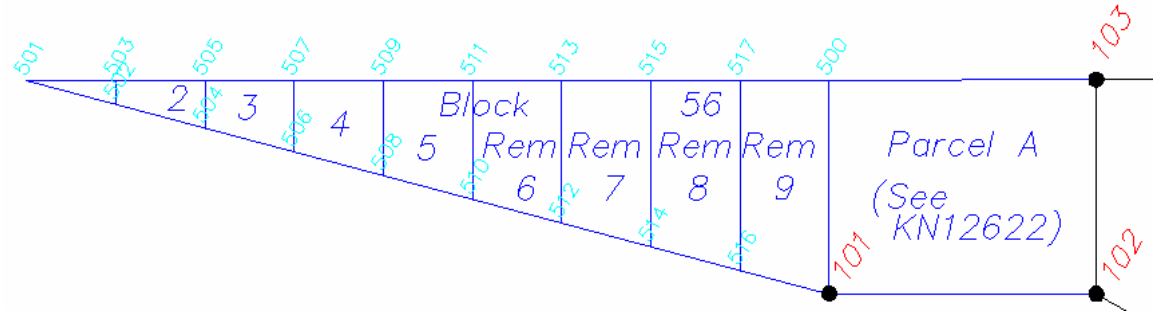


You also need to tell MSCAD to use this description, by going to **MsTools** > **MicroSurvey System Defaults…**, and on the General Settings tab, turn on the "Use Default Description" option.

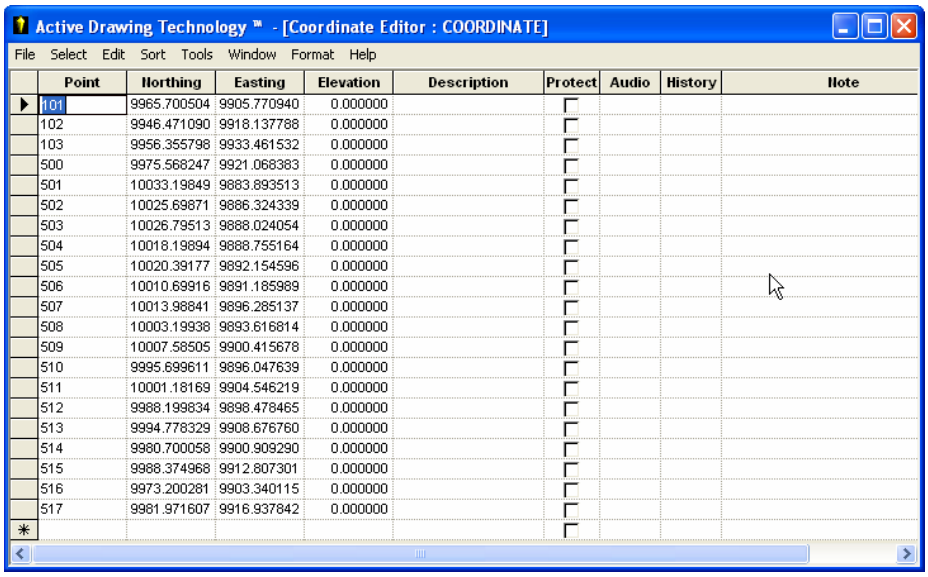


Click on the **MsPoints** menu then **Auto Add Points to Objects**. On your command line, you will now be prompted to select the entities that you want to add. Select the lines by clicking on them (or the other usual selection methods such as windowing around them), then press Enter.

As MSCAD creates each new point, it checks to see if there is already a point in the database at that coordinate, so in places where multiple lines end at the same coordinate, only one point is created in the database. For example, only one point is created at the tip where the two long lines meet. Similarly, extra points are not created at the other end of the long lines where points 101 and 103 have already been created, using the Store and Edit Points command above.



And looking in the Active Coordinate Editor, we see all of the points, 101-103 and 500-517.

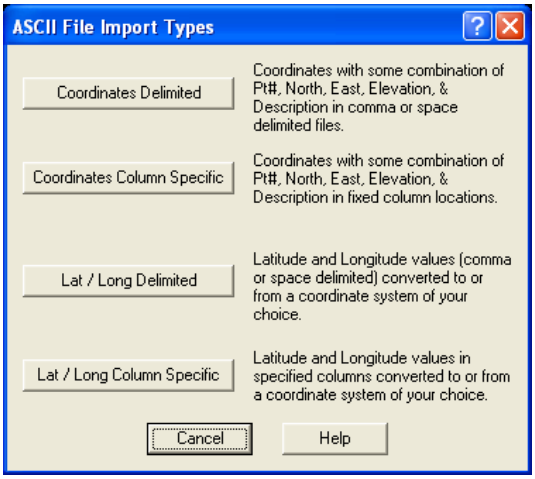


Point	Northing	Easting	Elevation	Description	Protect	Audio	History	Note
101	9965.700504	9905.770940	0.000000					
102	9946.471090	9918.137788	0.000000					
103	9956.355798	9933.461532	0.000000					
500	9975.568247	9921.068383	0.000000					
501	10033.19849	9883.893513	0.000000					
502	10025.69871	9886.324339	0.000000					
503	10026.79513	9888.024054	0.000000					
504	10018.19894	9888.755164	0.000000					
505	10020.39177	9892.154596	0.000000					
506	10010.69916	9891.185989	0.000000					
507	10013.98841	9896.285137	0.000000					
508	10003.19938	9893.616814	0.000000					
509	10007.58505	9900.415678	0.000000					
510	9995.699611	9896.047639	0.000000					
511	10001.18169	9904.546219	0.000000					
512	9988.199834	9898.478465	0.000000					
513	9994.778329	9908.676760	0.000000					
514	9980.700058	9900.909290	0.000000					
515	9988.374968	9912.807301	0.000000					
516	9973.200281	9903.340115	0.000000					
517	9981.971607	9916.937842	0.000000					

Method 3: Import ASCII File

If the Engineer or Architect also supplies you with an ASCII coordinate file, then you may be able to read that file directly into the drawing to add the points accordingly.

Go to the **MsPoints** menu -> **Import ASCII points or Lat Long file**



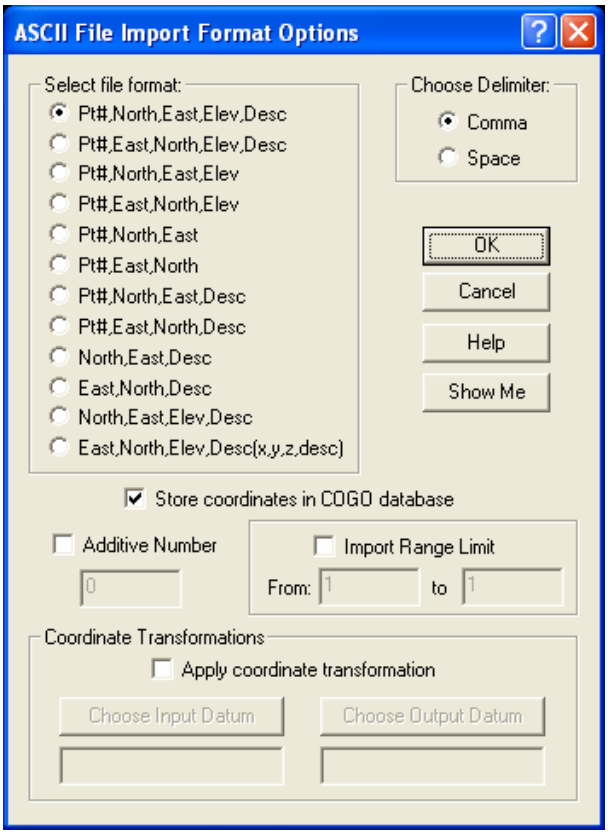
Pick on the Coordinates Delimited button (assuming this will contain a format that matches the file format)

Select the format that matches your ASCII file.

Ensure you have the correct delimiter chosen.

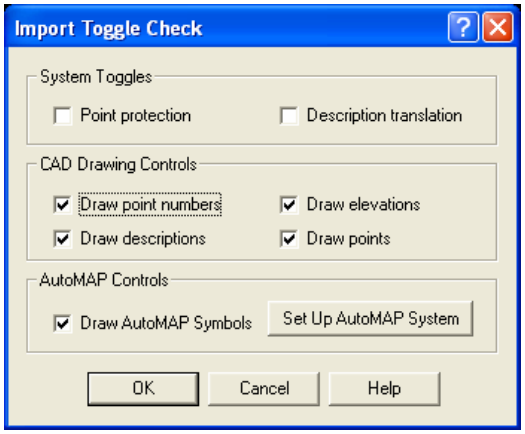
Store Coordinates in COGO Database, this toggle needs to be on.

The remainder of the options would not be applicable in all cases, but can be helpful in some.



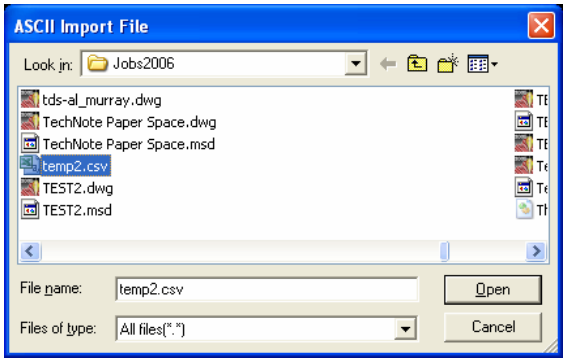
Pick OK to continue:

The Import Toggle Check dialog comes up to confirm if the Point protection is on, what will be drawn, and if the AutoMAP symbols would be drawn.



Pick OK to continue:

Locate the ASCII file from your hard drive, pick it and pick on OPEN to read the file into the drawing.



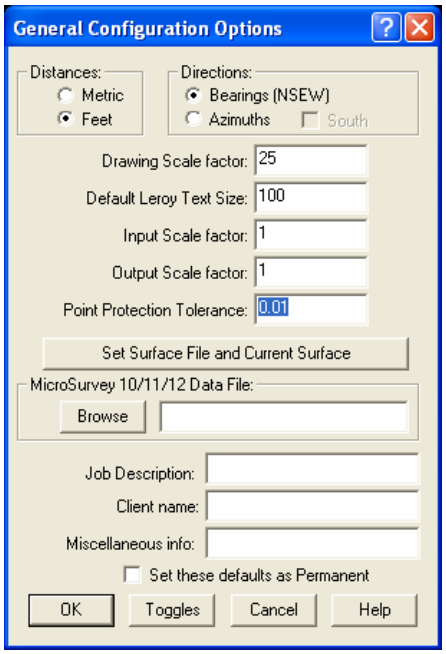
Once you have read the ASCII file into the drawing, the points will appear on the drawing.

We now have coordinates, but the lines and the points are two separate entities and are not linked together at this stage. To link the lines and the points together, we need to ensure that the Point Protection Tolerance is set course enough so they will match.

MsTools menu -> **MicroSurvey Job Defaults**

Because the drawing accuracy is carried to many more decimal places than the ASCII file being read in, we need to tell the program how close is close enough, to consider the ends of lines equal to the points being read in.

Once set, we can run the **Auto Add Points to Objects** command, found under the **MsPoints** menu. You would select all of the lines, arcs, etc. as well as all of the points you just read in. MSCAD 2005 will now compare the points to the lines, etc. and link them together, as long as they are close enough to be considered equal.



So now the Linework and Points are both in our database and your points match what the Engineer or Architect used for numbering and descriptions.

Method 4: Other Program Ties

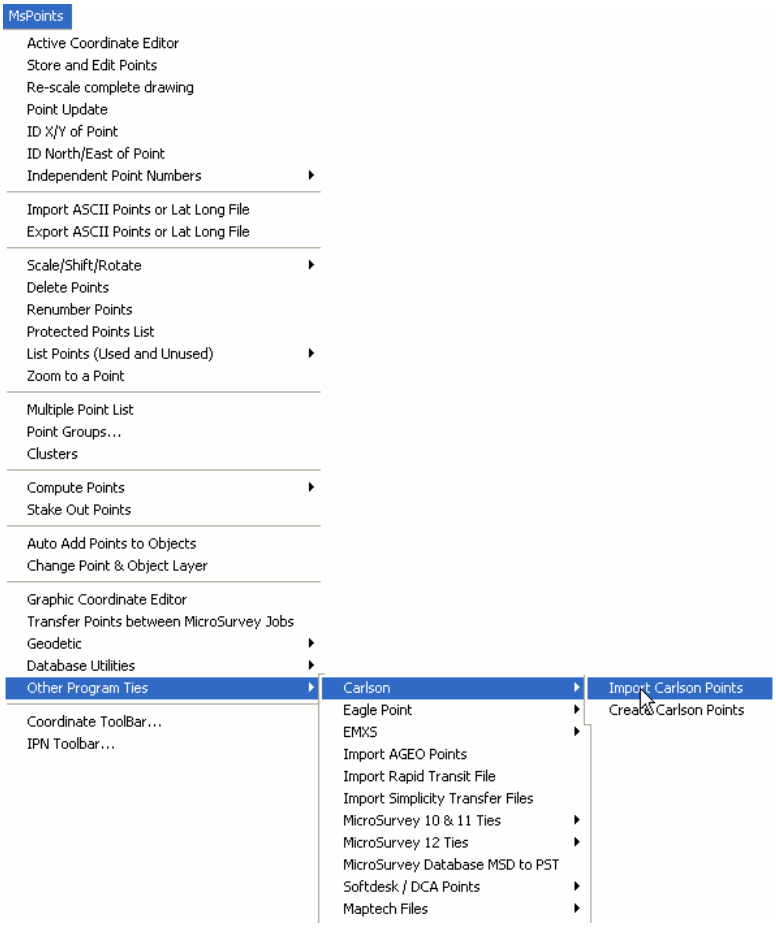
Sometimes a drawing file will contain point data from another program. This point data is not contained in our database, but it is in the drawing in a format we can scan and import. We can convert this data into the MicroSurvey database, by running the appropriate command found in **Other Program Ties**, under the **MsPoints** menu

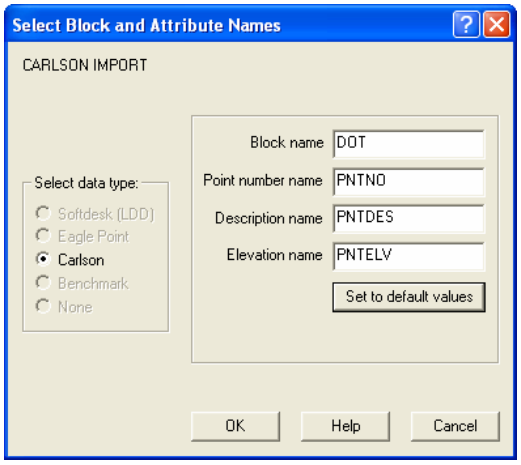
An example would be a drawing coming from an Engineer or Architect that used a program such as Softdesk, or Carlson to do their work.

From this menu, you can see the different program options we have for reading data from other programs.

In this example, if the drawing was created in Carlson, we can import the point data by scanning the drawing to find the point data already in the drawing.

If your drawing file is from another program which is not listed, you will have to use one of the other methods discussed above.

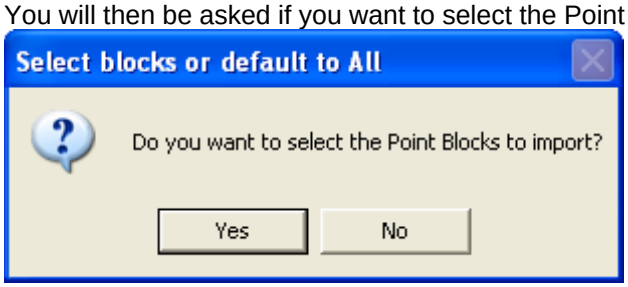




The points already in this drawing would have to use the attributes defined in the dialog, or you would have to change the dialog to match what the attributes are in the drawing.

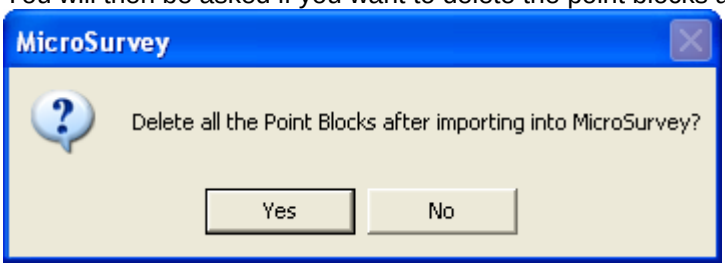
Pick OK to continue:

You will then be asked if you want to select the Point Blocks to import:



Yes, allows you to select only certain point blocks from the drawing by using any valid selection process.
No, allows all point blocks in the entire drawing to be selected.

You will then be asked if you want to delete the point blocks after they are imported:



Yes, will see the original point blocks be erased from your drawing, leaving you with our coordinate points both in our database as well as in our drawing.
No, will keep the original point blocks as well as our coordinate points. They will be on different layers so they can be turned on and off as desired.

