The Selection Tools

The Selection Tools, consisting of the Lasso and the Selector tools, are probably the most important and most often used selection tools in the whole program. They provide the starting point for almost all the other operations that can be done with the many tools and commands. Let us show you how to put them to work.

The Lasso Tool

The Lasso tool in ModelPro acts much like other lasso tools you may have encountered in other programs such as paint and draw programs. It allows you to draw a freehand selection boundary such that all things inside that boundary get selected.

The special thing about the ModelPro Lasso tool is that it is used for selecting vertices of 2-D and 3-D objects that you want to manipulate.

In order to select vertices with the Lasso tool, the vertices of the object must first be made visible. The Lasso tool has no effect on completely de-selected objects.

Selecting Vertices with the Lasso Tool

1) Using the standard Selector (with no keys pressed), click on the desired object to select it. All of its vertices will become visible.
2) Pick the Lasso tool from the Tool Palette.
3) Draw a freehand selection fence that encloses just the vertices that you want selected.

When you release the mouse, the Lasso tool will automatically close the lasso from end point to beginning point. The enclosed vertices and their control handles will become selected. If a new "lasso" is immediately drawn, the originally selected vertices will become deselected, and the new set will become selected instead.

The Selector must now be picked again in order to manipulate the vertices. All of the selected vertices will act as a group. If one of them is moved, they all will be moved. Control handles can be edited individually.
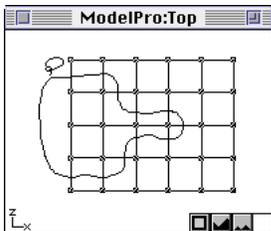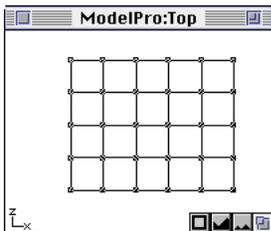
The Selector Tools

There are two Selector tools. The Standard Selector, and the Direct Selector. These two selection tools behave exactly the same except that only the Standard Selector may be used to select grouped objects on screen.

The Standard Selector Tool

This tool will only select individual objects on the screen that are in open folders in the Group window.

If you click on an object in one of the view windows with this tool, one of two things will happen.

1) If the object resides in a folder in the Group window that is open, then the object itself will be selected.
2) If the object is inside a closed folder, then the folder itself and the entire group of objects contained in that folder will all be selected.

The Direct Selector Tool

This tool will select individual objects on the screen regardless of open or closed folders in the Group window.

If you click on an object in one of the view windows with this tool, it will get selected. This tool has the ability to "reach inside" nested folders and select individual objects contained therein.

You will find that you won't care which Selector tool you are using at any point in time unless there are groups involved; then, it will make a significant difference to you.

Because the two Selector tools are so similar, during the rest of this discussion the two tools will be referred to equally as the Selector tool. If no distinction is made in the description, then it doesn't matter which one you use. Only when one or the other Selector tool is specifically required will it be referred to by its full name.

Note: Only the Standard Selector can select grouped objects on the screen. It can be selected directly by typing the "s" key.

Note: The Direct Selector Tool is on the Standard Selector Tool pop-up. It can be selected directly by typing the "d" key.

Closed Folder

Open Folder
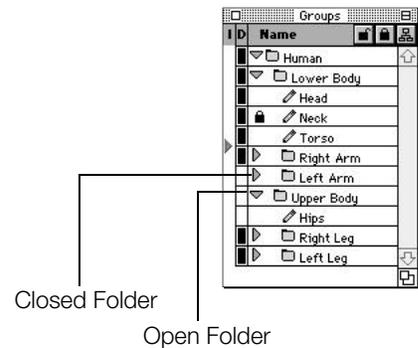
In order to do operations on the objects in the model space, those objects must first be selected.

Note: A Visible vertex is marked by a hollow square.

A Selected vertex is marked by a filled-in square.

In fact, there are two basic categories of things in ModelPro that can be selected using the Selector tool: 1) Objects, and 2) Vertices. They both share a common trait in that they both can be either visible or selected. There is an important difference.

The difference is that only selected objects and selected vertices can be operated on with other tools and commands. Visible items cannot. Visible items can only be selected.


A Visible object   Bounding box handles shown

ModelPro will display a selected object in one of two ways. One way is to show that object with the handles of its bounding rectangle displayed around it. A second way is to show that object with all of its vertices made visible. Both ways are equally valid. The object is selected. (It's just that the "object" form of selection behaves differently with certain tools and commands than the "vertex" form of selection.)
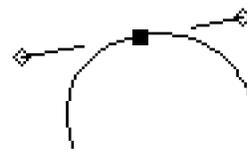
A selected vertex has its control handles displayed (if the object is a spline). These handles are diamond-shaped.
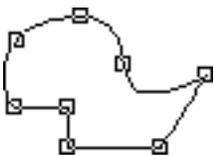
A selected object with all of the vertices made visible.
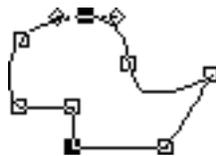
A selected object with two of its vertices selected.

A selected vertex with its two control handles clearly shown.

Object Types in ModelPro

There are three different object types in ModelPro:

1) **Multi-Line**—Most of the 2-D objects in ModelPro are made up of Multi-Lines. This includes Lines, Arcs, Circles, Polygons and Splines.

2) **Spline Mesh**—Most of the 3-D objects in ModelPro are made up of Spline Mesh objects. A Spline Mesh results when an object is acted on by one of the Operation tools, like Extrude, Sweep, Loft, etc. And, of course, there are objects that result from the Spline Mesh tool.

3) **Primitives**—These are the basic 3-D shapes that are created from the Tool Palette such as the Cube, Prism, Cylinder, Sphere, etc. These objects are simple surfaced shapes that can be combined to build more complex models.

Clicking on Different Object Types

When clicking on a Multi-Line object or a Spline Mesh object with the Selector tool, its vertices will become visible. These vertices can be edited.

When clicking on a Primitive object, its bounding box corners will be displayed. The vertices of a Primitive object cannot be edited. The nature of a Primitive object is to be the simplest possible form of that shape. As a result, Primitives take up an absolute minimum amount of memory. A Primitive object can be converted to a Spline object by double-clicking on the object and using the "Convert to Spline Mesh" button in the Object Info dialog box. Then its vertices can be edited.

When clicking on a group (using the Standard Selector, and the group folder closed in the Group Window), the bounding box corners for the extents of that group are displayed.

Note: You can find out what type an object is by double-clicking on it and looking in the Type field in the Info dialog box that results.
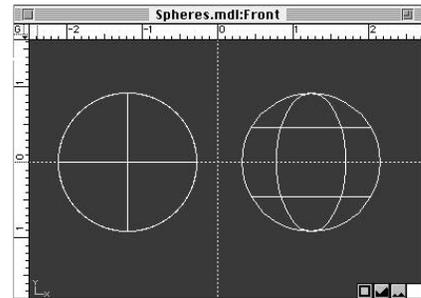

Sphere on left converted to splines.
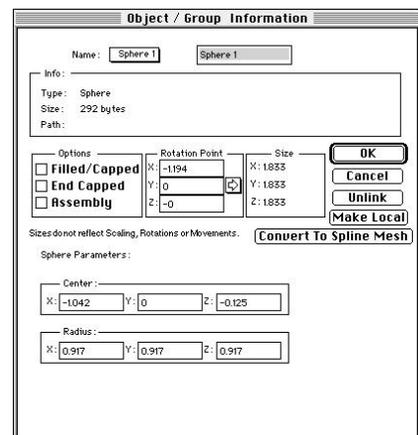
Object Info dialog box for primitives

Using Modifier Keys (Selector Tool)

The Selector tool has a great deal of power and flexibility, largely due to the fact that it can be used by itself, or in combination with three different modifier keys: The Option key, Control key, and the Command key. Each of these has a specific purpose when used with the Selector tool.
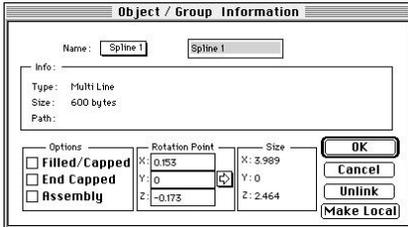
The one common function to the Selector tool regardless of the modifier key, is that if you double-click on an object, an Object/Group Info dialog box will appear. This dialog box shows all sorts of relevant information about that object, which you can also edit. In many cases, if you double-click on a vertex, a Vertex Move To... dialog box will appear. (All currently selected vertices will move according to what is typed into this dialog box.)

Object Info dialog box

Selecting and Moving Objects (Selector Tool)
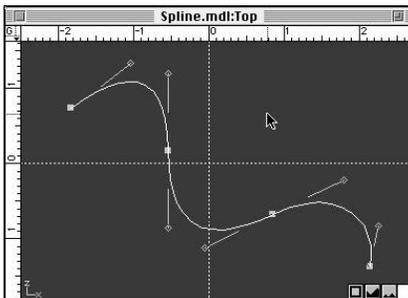
The Selector tool by itself is used to select objects in order to operate on them.
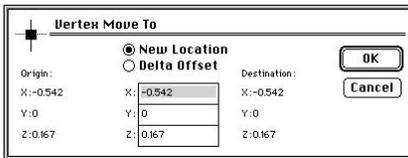
In order to move an object with the Selector tool, grab the object while it is completely deselected, drag it and it will move.

Vertex Move To dialog box

The first click on an object will display its vertices. (If you click on a Primitive or a Group, its bounding box corners will be displayed.) That object can now be operated on by the many tools and commands available.

The second click on that object will select the segment that is clicked on by selecting the two vertices at either end of that segment. If the second click is directly on a vertex, then just that vertex will be selected. (You can shift-click on additional vertices to select them as well.)

Control points along a spline

Once a vertex has been selected, its control handles appear. (A straight segment has no control handles.) The vertex can be edited by dragging the selected vertex, or the curvature of the adjoining segments can be altered by dragging the control handles.

Selector Tool with Option Key

The OPTION key alters the operation of the Selector tool in two basic ways.

1) It allows the selection of an object by displaying its bounding box corners rather than its vertices. Another way to say this is that the Option key allows the selection of an object at an object level, rather than at a vertex level. This allows the user to edit the object as a whole instead of editing the individual vertices.

2) The Option key creates copies of objects during dragging operations. Holding the Option key while dragging a selected object, segment, vertex, bounding box corner, or control handle, makes a copy of the item and moves the copy with the cursor.

The first option-click on an object will display its bounding box corners.

Subsequent option-clicks on that object will move up the group hierarchy and select the folders that contain that object. (Of course, if the Standard Selector is used, then the folders must all be open in the Group Window.)

Duplicating an object.

Selector Tool with Control Key

Use the Control key with the Selector to convert a sharp-cornered vertex to a smooth-curved vertex, and vice-versa.

To Smooth a Sharp Corner
1) Using the Selector tool (with no keys pressed), click on an object to display its vertices.
2) Click to select a vertex that joins two segments as a sharp corner.
3) Hold the CONTROL key and drag off the vertex. As you drag you will see that the two segments are joined now as a continuous smooth curve.
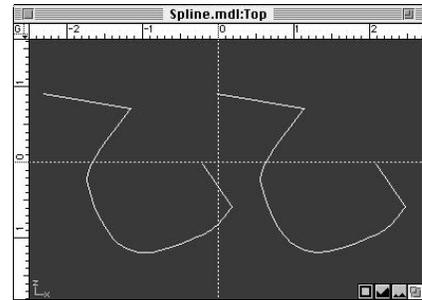
To Move Vertex Control Handles Independent of One Another
1) Using the Selector (with no keys pressed), click on an object to display its vertices.
2) Click to select a vertex through which a smooth curve runs. Its control handles will become visible
3) Hold the CONTROL key and drag one of the control handles. As you drag, you will see that the control handle now moves independent of the other, allowing you to edit the two sides of the vertex separately.
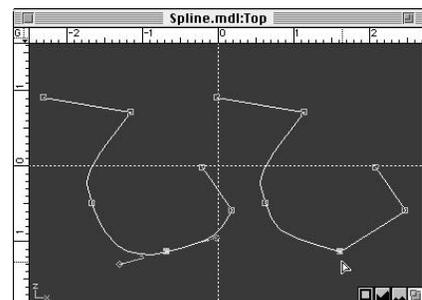
Converting vertices to smooth or sharp.

To Make a Sharp Corner from a "Smooth" Vertex
1) Using the Selector (with no keys pressed), click on an object to display its vertices.
2) Press the Control key, and click on a "smooth" vertex. It automatically transforms into a sharp cornered vertex.

Selector Tool with Command Key

Rib Selector

The Command key used with the Selector allows you to select a "rib" of a 3-D spline mesh in order to do operations on it.

Selecting a "rib"

1) Using the Selector tool (with no keys pressed), click on an object to display its vertices.

2) Hold the Command key and click on a segment of a 3-D spline mesh object.

ModelPro will select the entire continuous spline object that contains the segment that was clicked on. (You can shift-command-click on additional ribs to select them as well.)

Once the rib has been selected, you can operate on it with any of the tools or commands available such as Extrude, Sweep, Loft, etc.

If you want to move the selected rib, you must Command-drag on it with the Selector tool. (Note that the segments that connect that rib to the rest of the object remain connected, and they get stretched as a result of the movement.)
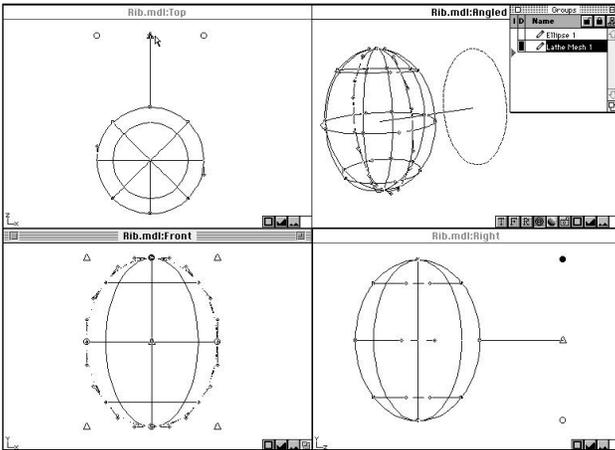
Command-select edge of object in the Front View for extrusion.
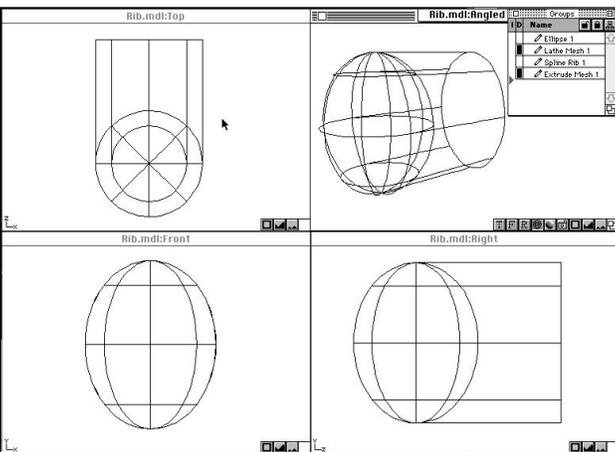
Completed extrusion of selected ribs.