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3.1.1 Object



The Object tool is used to select an object. Once an object has been selected, the remaining object tools can be used. Choose the Object tool and left click on an object in the Workspace to select it.

If a subobject at any level of a scene object is currently selected, the top most scene level object will be selected.

3.1.6 Axis Tool



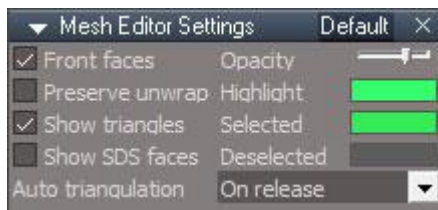
RMB toggles showing the axis in front and in back of the object.

3.2.0 Mesh Editor Settings

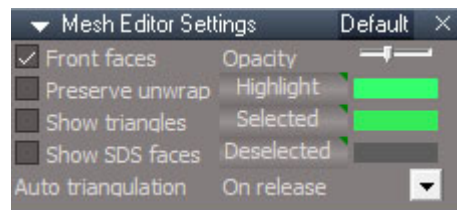
There are many options and settings that will control how Point Edit works, adjusting everything from the colors used in making a selection, to how certain tools work. This section details those options before we get into looking at the tools themselves. Where the options apply to a particular tool, you will find them repeated under that tool's description.

The Default aspect

This aspect is shown on activating Point Edit mode.



The Default aspect of the Mesh Editor Settings panel.



Unofficial Update Default aspect

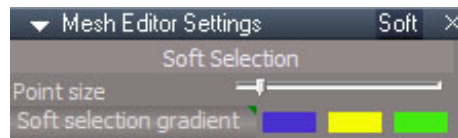
Highlighted, Selected, Deselected – RMB reset buttons.

The Soft aspect

This aspect must be selected manually. This section is repeated under the Soft Selection tool write up.



The Soft aspect of the Mesh Editor Settings panel.

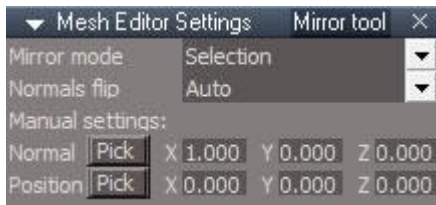


Unofficial Update Soft aspect.

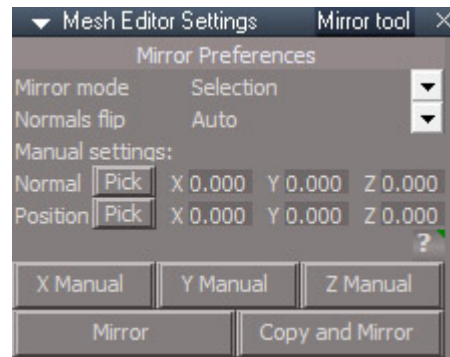
Soft Selection Gradient – RMB reset gradient colors

The Mirror Tool aspect

This aspect can be selected manually, or opened with a right click on the Mirror Tool. This section is repeated under the Mirror Tool write up. Note that these settings apply solely to the Mirror Tool, and not the Mirror Modeler.

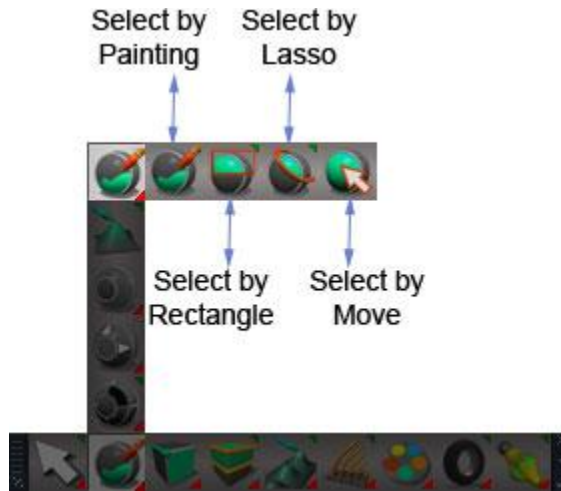


The Mirror Tool aspect of the Mesh Editor Settings panel.



Unofficial Update Mirror Tool aspect.

- X Manual – Sets mode to Manual, sets Normal to 1,0,0, sets Position to 0,0,0
- Y Manual – Sets mode to Manual, sets Normal to 0,1,0, sets Position to 0,0,0
- Z Manual – Sets mode to Manual, sets Normal to 0,0,1, sets Position to 0,0,0
- Mirror – run the mirror on the selection
- Copy and Mirror – copy the selection and then mirror



The basic selection tools for Point Editing.

3.2.1 Select By Painting



RMB sets to context mode and front faces.

3.2.2 Select By Rectangle

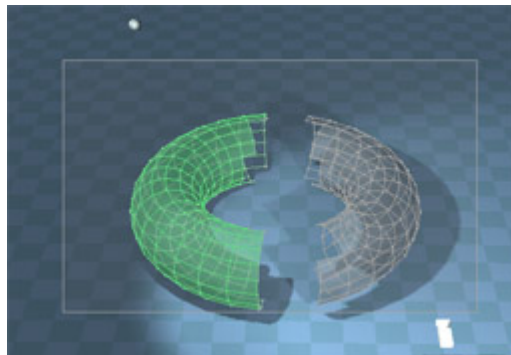


Connected – RMB panel, This checkbox determines if the selection is allowed to select other object's elements or not.

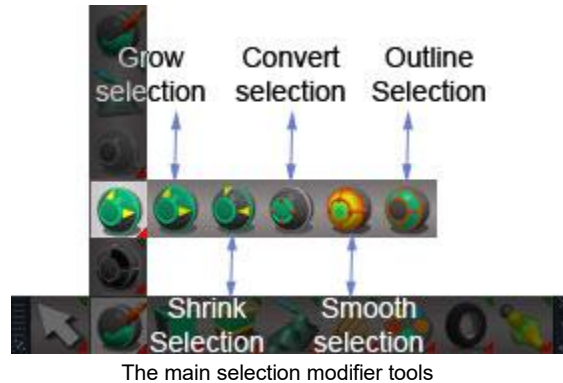
3.2.3 Select By Lasso



Connected – RMB panel, This checkbox determines if the selection is allowed to select other object's elements or not.



Connected active, only 1 part can be selected at a time.



3.2.11 Grow Selection



The Grow Selection tool first converts the current selection to vertices, and then expands it selection to include surrounding neighbor vertices and finally converts the selection to use the current point edit selection mode.

3.2.12 Shrink Selection



The Shrink Selection tool first converts the current selection to vertices, and then shrinks that selection by removing the outer vertices and finally converts the selection to use the current point edit selection mode.

Select Plane Loop



Select a single edge or 2 neighboring vertices to build a loop type selection. [Todo make this a link to the UU additions section.](#)

3.2.17 Hide Unselected Geometry



This hides the unselected elements, so that the selected elements are the only ones that remain visible, and are the only ones that can be selected and edited. This is useful for focusing work on a particular area of an object, without the distraction of other elements being visible in the scene.

The original manual has the wrong button image

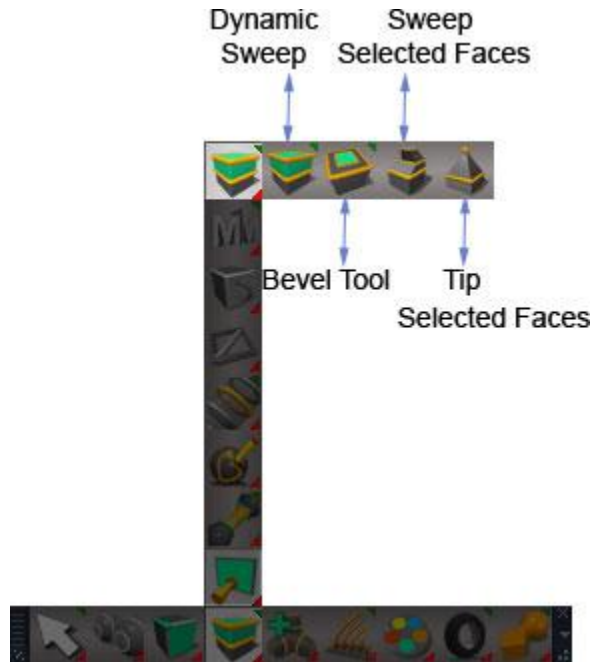
Fix Bad Geometry



Tool for making various selections plus a couple of fixing tools. [Todo make this a link to the UU additions section and change icon image.](#)

3.4 Sweep, Draw, Topology Tools

The Point Edit tools allow you to perform tasks on your mesh to change the geometry. These tools are used in conjunction with the Select and Context Point Edit tools to provide you with essential mesh-editing tools. The Point Edit Operations tools are as follows:



The sweep, bevel and tip tools, are explained below.



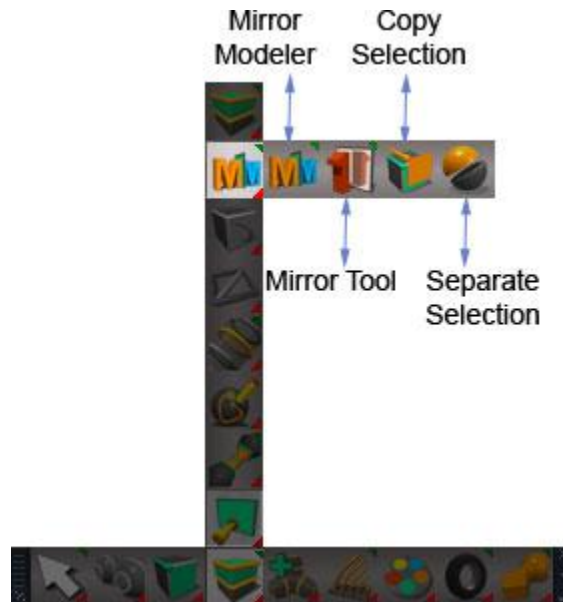
[TODO link to lathe](#)



[TODO link to static sweep](#)



[Link to true bevel](#)



3.4.5 Mirror Modeler

Link to object mirror tool?

3.4.6 Mirror Tool

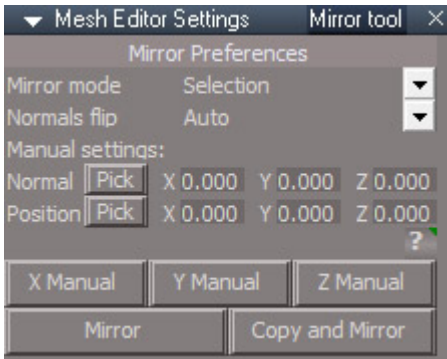


The Mirror Tool allows you to make a selection of elements on an object and Mirror that selection. If no selection of elements is made, the entire object is mirrored across the x-axis.

The Mirror Tool has some options associated with it. These can be selected manually in the Mirror Tool aspect of the Mesh Editor Settings option panel in the stack, or opened with a right click on the Mirror Tool.



The Mirror Tool aspect of the Mesh Editor Settings panel.



Unofficial Update Mirror Tool aspect.

TODO link to page.

3.4.21 Add Polygons



The Add Polygons tool allows you to create a polygon on existing geometry. You can begin on an existing edge or vertex, or start in the middle of an existing face.

Information missing from the original manual

To modify the position of a previous drawn vertex simply drag it to the desired location. To remove a vertex while drawing, move it to another vertex. This looks slightly cleaner when the other vertex does not share a line segment with the point being removed. The tool will snap to edges and vertices even when snapping is disabled.

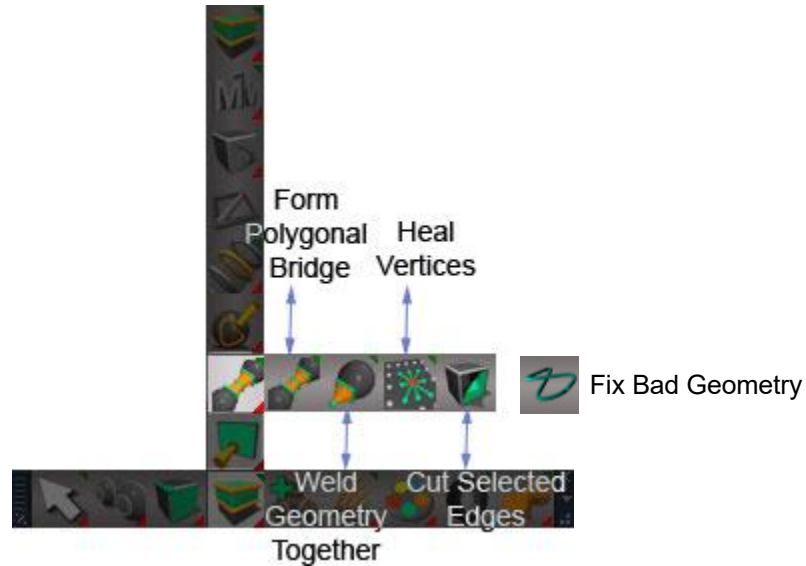
The regular snapping and constraint tools can be used with the add polygon/edge/point tools.

The snapping can be locked to an edge by holding the shift key. To lock movement perpendicular to the current snap location on the edge hold the shift and ctrl keys.

Target Weld



TODO make link.



Fix Bad Geometry



fix bad geometry. Creates a selection based on mesh characteristics such as side count and planarity.and the SDS corruption that can occur inside trueSpace.

TODO write this up.

Select Triangles - select 3 sided polygons

Select 4 sided polygons

Select Ngons - select polygons with more than 4 sides

Non-Manifold Edges - select edges that joins more than 2 polygons

Lamina Polygons - select polygons that share all the same vertices

Concave - select concave polygons

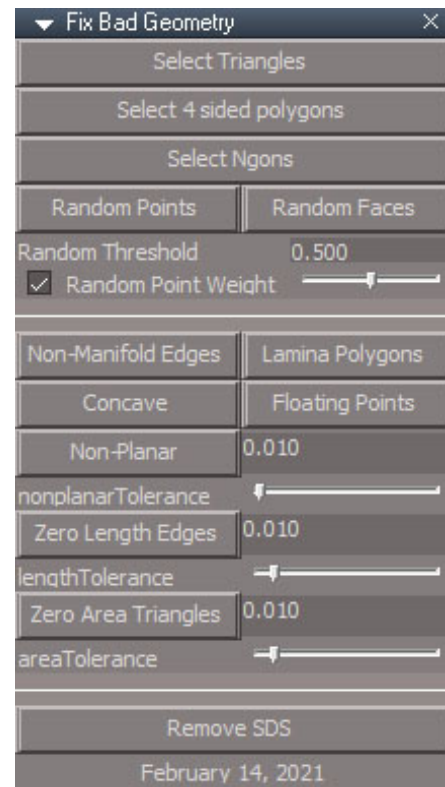
Floating Points - delete points that have no edge connections

Non-Planar - select polygons that are not flat

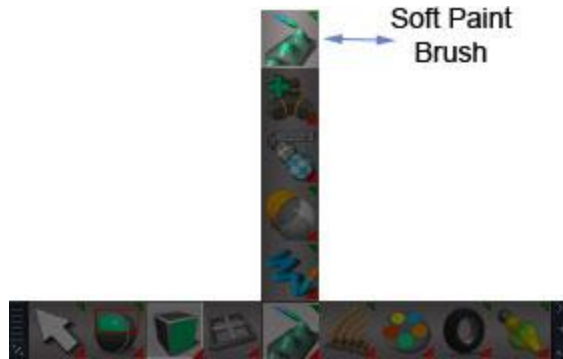
Zero Length Edges - select triangles that have a zero length side

Zero Area Triangles - select triangles that are very small

Remove SDS - removes a bad SDS from a mesh so it can be reapplied



3.5 Soft Paint



soft paint has a morph mode to paint one morph into another

3.6 Subdivision Surfaces



Add link

3.11 Flatten History



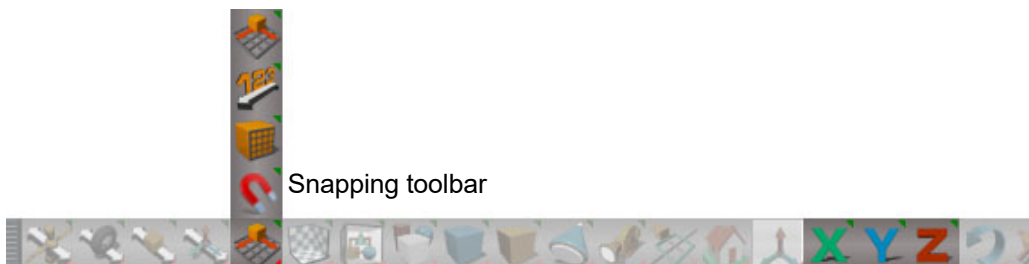
The location of the Flatten History tool



3.12 Snapping and Distance Tools



The location of the snapping tools

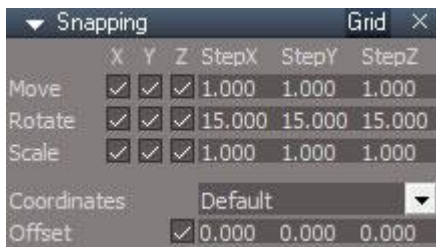


Unofficial Update location of the snapping tools

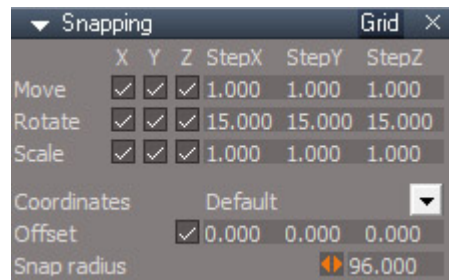
3.12.1 Grid Snapping



Grid Snapping lets you control whether edits to an object's position, rotation or size happen smoothly, or whether they snap to preset values and amounts.



The Grid Snapping options panel.



Unofficial Update Grid Snapping options panel.

Snap radius – This value controls how close to a snapping grid location you need to move before snapping will take place

3.12.2 Other Snapping Options

The Snapping panel has other aspects that let you control other options for snapping. These are listed below (except Dimensions, which is listed under the Distance Feedback Display section).

Axes Lock Aspect

This lets you lock out movement in certain directions, and control movement in the orthogonal views. Note that these settings affect movement even when Grid Snap is NOT enabled.



The Axes Lock aspect of the Snapping options panel.

- **Locked Axes** – This locks changes in the X, Y or Z directions, and is the same as activating or deactivating the X, Y and Z locks on the main toolbar. Activating or deactivating these checkboxes will highlight or un-highlight the icon on the main toolbar, and using the icons on the main toolbar will check or un-check these parameters.



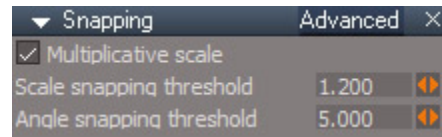
RMB open the Snapping Panel

Advanced Aspect

This aspect lets you control snapping with the Scale tool.



The Advanced aspect of the Snapping options panel.



Unofficial Update Advanced aspect of the Snapping options panel.

- **Scale snapping threshold** – This value controls how much you must move before snapping will take place for scaling.
- **Angle snapping threshold** – This value controls how close to a snapping angle you need to be before snapping will take place

3.12.4 Point Edit Snapping

Missing from the original manual

The snapping can be locked to an edge by holding the shift key. This also displays a guide line. When the guideline is active you can lock movement perpendicular to the current snap location on the edge by holding the shift and ctrl keys. This perpendicular locking only works when moving along an edge connected to the vertex that is moving. If you have enabled edge points and you snap to edge, snapping positions will also be evaluated outside that edges end points.

If you snap to a face not connected to the selected element and hold the shift key the snapping will lock to the face. This can be most easily be seen when using the Select by Move tool instead using of the point edit widget. When using the point edit widget it will constrain to a line on the plane. Shift and control together do not move perpendicular to the face.

Inferences only work on perfectly flat faces.

Inferences are useful when used with the drawing tools for polygons and lines and also may be useful for moving some elements around on a flat surface like after a bevel insert.

Lock to Selection –This option lets you constrain editing in Point Editing to particular directions. For example, if you set a lock based on a polygon, then you will only be able to move points in the plane defined by that polygon (ie, in 2 directions), or if you set a lock based on an edge, you would only be able to move points in the direction defined by that edge.

Once you have checked this option, you will need to make a selection on your object, and then use the Set button to define the lock (or you can use the Set button first, and then check this box).

Lock to selection - extra information

To use the tool, in point edit mode select a face, two faces or an edge.

- o When selecting a face, movement will be constrained to a direction parallel to that face. This will be visualized by showing 2 arrows from the face center.
- o When selecting two faces, movement will be constrained to the edge defined by the intersection of the two planes. If the 2 planes are parallel then 1 plane will be ignored for the locking.

Error from the original manual

2D Snap – When checked, snapping will only occur to snapping points on the current face beneath the mouse pointer. When unchecked, snapping can occur to any snapping points beneath the mouse pointer, even those on a back face, so long as it is within the Snap Distance. This parameter is checked by default.

2D Snap means that the 3D arrangement of the elements are ignored for snapping and only their distance in screen space is used. Unchecked and items have to be near each other in 3D space to snap.

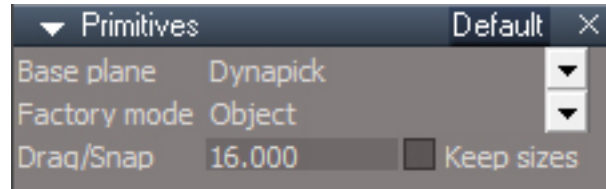
Primitives information missing from original manual



Primitives in the bottom toolbar



Unofficial Update Primitives in the bottom toolbar



RMB panels

Default Aspect - primitive tool preferences panel

Base plane

Dynapick - will create primitives aligned to and touching the face of a preexisting object, if no object is below the cursor it will behave the same as Ground

Ground - create primitive on the ground plane, isometric view create on the perpendicular plane of the view

Screen - will create primitives aligned with the view and located behind the view mirrored relative to the object location under the cursor. *Looks like a bug, should be centered on the object, not behind the view.* Move object in local space along it's z axis to reposition. If no object is under the cursor behaves the same as Ground.

To work around the screen space bug, use vertex snapping with 2D snap enabled.

Factory mode

Add - boolean add to the selected item

Cut - boolean cut the selected item, lines need to be visible to see the result

Intersect - boolean intersection

Merge - boolean merge

Object - create a new stand alone primitive object

Sibling - create a grouped relationship with the selected item as children of the same group object

Subtract - boolean subtraction

Union - boolean union

Cameras and lights only have Object and Sibling modes.

For the boolean modes, add, cut, intersect, merge, subtract and union set the primitive preferences before drawing or clicking to create the next instance.

Boolean modes are applied with a flatten mode of operation. Other modes are not supported.

Boolean modes may be unstable - got some crashes

Text primitive with cut can be slow and unstable.

Wireframe solid draw mode is needed to see the cut boolean properly.

Plane primitive will not boolean cut the face that it is drawn on.

TODO: Link to the boolean tools.

Drag/Snap - sets a radius where snapping cannot occur when creating primitives with snapping enabled. To override and force snapping press the ALT key.

Keep sizes - will remember and for single click creation will use the last size that a primitive is created while the tool is active. Dropping the tool will reset to the default size. When unchecked will use the size parameters from the individual primitive preferences panels.

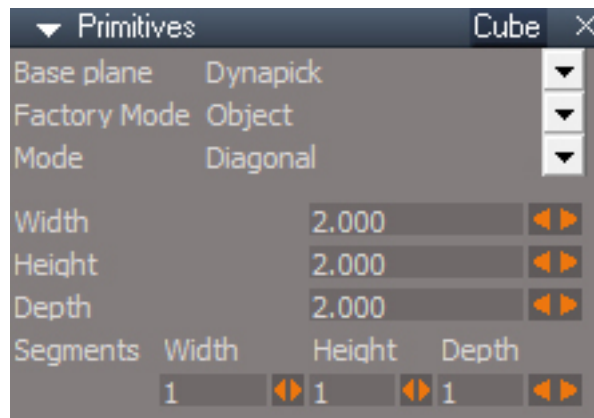
"Primitive employs extensive snapping."

Can set the height by snapping to other objects in the scene when RMB dragging during creation of the primitive. Snapping can also be done during the LMB phase of primitive creation.

RMB - primitive preferences panels



Cube Primitive



Mode

Diagonal - define base plane by LDrag, RDrag to define the height

Edges - define first edge by LDrag, release the button and move mouse to finish defining the base then RDrag to define the height or LClick to use the current height

Points - LClick define first point of the edge, LClick to define the last point of the edge, LClick to define the base, LClick to define the height

Width - size in the local X direction

Height - size in the local Z direction

Depth - size in the local Y direction

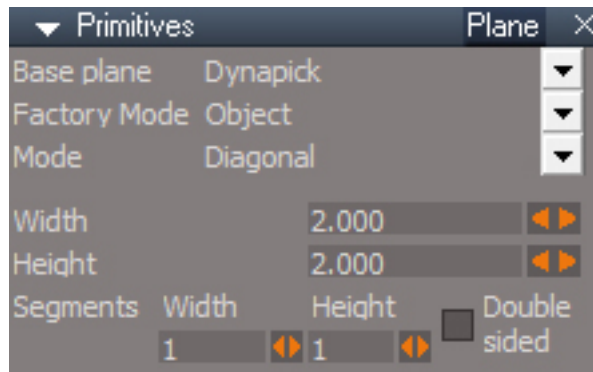
Width Segments - number of edges in the X direction

Height Segments - number of edges in the Z direction

Depth Segments - number of edges in the Y direction



Plane Primitive



Mode

Diagonal – LDrag to define first corner and the opposing corner of the plane.

Edges – define first edge by LDrag, LClick to finish the plane

Points – LClick 3 times to define 3 corners of the plane

Width - size in the local X direction

Height - size in the local Y direction

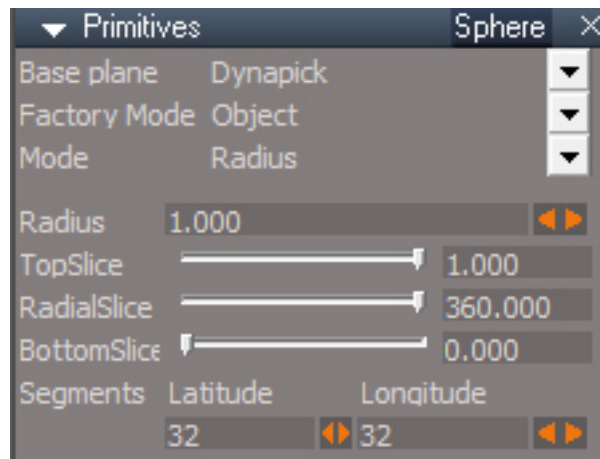
Width Segments - number of edges in the X direction

Height Segments - number of edges in the Y direction

Double sided - number of edges in the Y direction



Sphere Primitive



Mode

Diameter – define diameter for base by LDrag or RDrag defines height.

Radius - define center + radius for base by LDrag or RDrag defines height.

Radius - size of the sphere as measured from its center

TopSlice - percentage of the top portion to keep after slicing 1.0=100%=keep all of the top

RadialSlice - number of degrees in the radial direction

BottomSlice - percentage of the bottom portion be sliced 0=0%=no slice

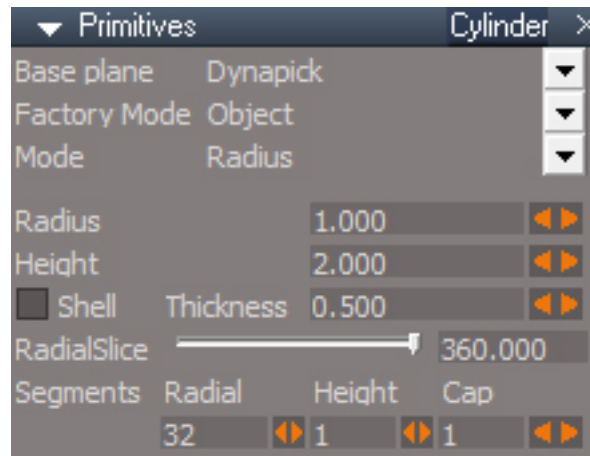
Latitude Segments - number of edges in the radial direction

Longitude Segments - number of edges in the axial direction



Cylinder Primitive

* For adding torus, sphere, cylinder, cone there are 2 modes.
 o Diameter – define diameter for base, by ldrag, rdgar defines height.
 o Radius - define center + radius for base, by ldrag, rdgar defines height.



Mode

Diameter – define diameter for base by LDrag, RDrag defines height.

Radius - define center + radius for base by LDrag, RDrag defines height.

When switching between LDrag and RDrag do not release the held button until after the switch.

Radius - size of the circle cross section as measured from its center

Height - height

Shell -

Thickness - shell thickness

RadialSlice - number of degrees in the radial direction

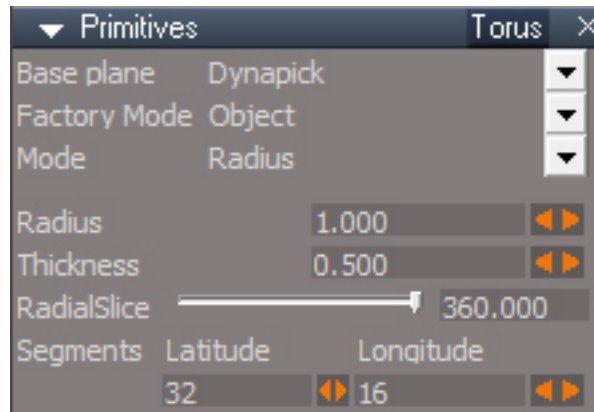
Radial Segments - number of edges in the radial direction

Height Segments - number of edges in the local Z direction

Cap Segments - number of edges at the top and bottom of the mesh, the first edge is invisible



Torus Primitive



Mode

Diameter – define diameter for base by LDrag

Radius - define center + radius for base by LDrag

RDrag does not work for the Torus primitive.

Radius - size of the torus as measured from its center, not measured to the center of the cross section

Thickness - diameter of the circular cross section of the torus

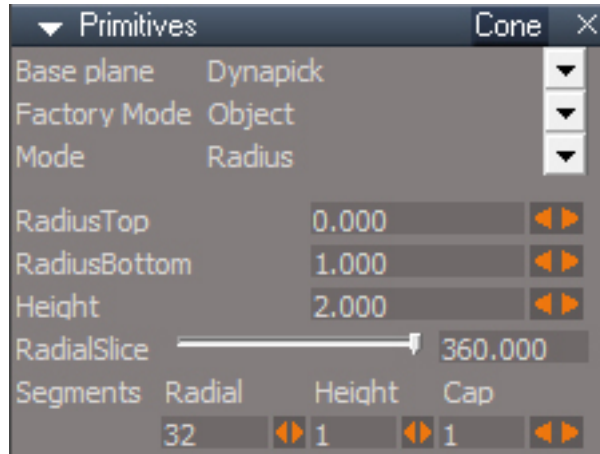
RadialSlice - number of degrees in the axial direction

Latitude Segments - number of edges around the major axis

Longitude Segments - number of edges around the minor axis or cross section



Cone Primitive



Mode

Diameter – define diameter for base by LDrag, RDrag defines height.

Radius - define center + radius for base by LDrag, RDrag defines height.

When switching between LDrag and RDrag do not release the held button until after the switch.

RadiusTop - size of the circle cross section at the top

RadiusBottom - size of the circle cross section at the bottom

Height - height

RadialSlice - number of degrees in the radial direction

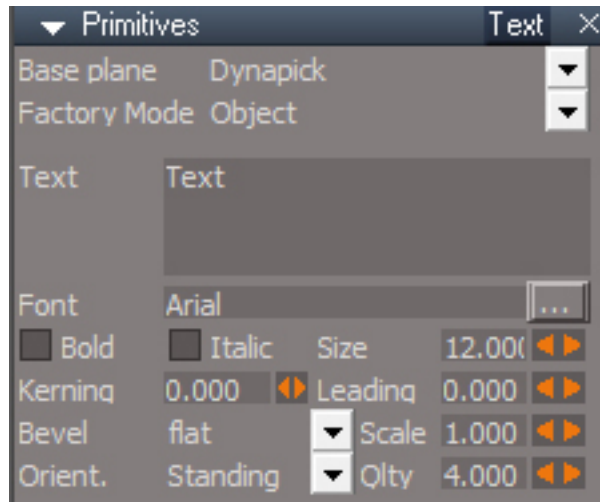
Radial Segments - number of edges in the radial direction

Height Segments - number of edges in the local Z direction

Cap Segments - number of edges at the bottom of the mesh, the first edge is invisible



Text Primitive



LDrag to control orientation about the local Z axis, RDrag to scale along the local Z axis.

Text -

Font -

Bold -

Italic -

Size - width/height of a character where a value of 4 translates to about 1 meter for TrueType fonts

Kerning - adjust spacing between letters

Leading - adjust spacing between lines of text

Bevel - type of bevel, base has no bevel and 2D has zero thickness

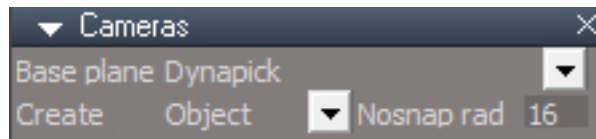
Scale - bevel scale, positive values effect the bevel and negative values effect the base(more or less)

Orient - **Lying** against the base plane or **Standing** up on it

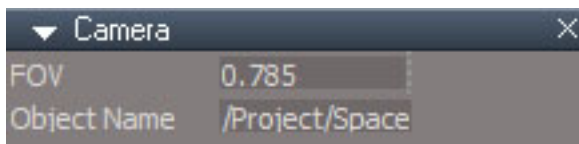
Qlty - controls the number of vertices used to create the text

The thickness of the text depends on the bevel type.

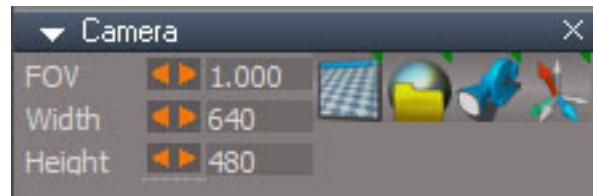
Large values for Qlty will reduce the characters smoothing. Values of the form "X.1" like 4.1, 5.1, 6.1 seem to work best in producing the shape defined by the chosen font.



Nosnap rad - sets a radius where snapping cannot occur when creating primitives with snapping enabled. To override and force snapping press the ALT key. **This setting does not seem to be working.**



Camera panel



Unofficial Update Camera panel



Create a camera in the scene facing in the negative Y direction. The camera has a FOV of 0.785 by default.

The Unofficial Update version of the camera has a default FOV of 1.000, extra buttons and the Object Name is not shown in the panel.

Switch the first floating 3D window or open a new 3D window to the camera view and move it to the upper right of the tS screen with the size of the window taken from the Width and Height parameters.

RClick selects the camera

Same icon as 3D Window

If the first floating 3D window is closed, any other floating 3D windows will not take its place, so a new window will be opened. If all 3D windows are closed then the first becomes eligible for conversion.

The second button LClick is the same as the first button except it also opens the Render to file dialog. Note that the size in the dialog may need to be manually updated to match the Width and Height set on the camera.

RClick opens windows explorer to the render folder set in the Render to file dialog.

The third button switches the main 3D window to the camera view.

RClick restores the previous perspective view of the window. Does not set previous view if the window was an orthogonal view or another camera view. Only switches to previous perspective view.

Same icon as Set camera

The fourth button orients the camera to point in the negative Y direction.

RClick orient and position the camera to values of the default perspective view.

Same icon as Normalize rotation for axes



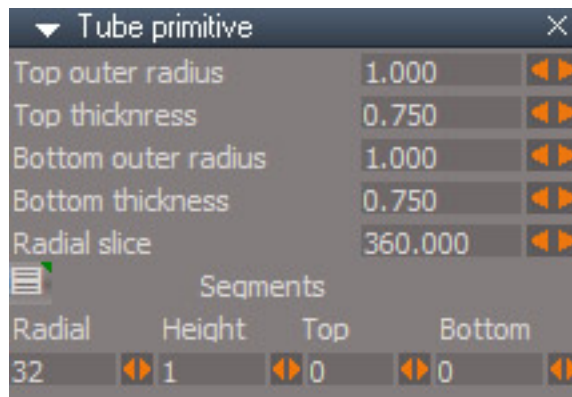
The entry point is the same as a camera except it has no Object name connector and the FOV is set to 0.5 by default.

The entry point camera has the special name "EntryPoint". Any object at the root level of the scene with the name "EntryPoint" will be used as the 3D view point and orientation when loading the scene. The view will also get its FOV from the camera. The view is not tied to the EntryPoint. So if the entry point camera moves the view does not move with it.

New for the Unofficial Updates



Tube Primitive



Top outer radius - size of the circle cross section at the top

Top thickness - top inner radius, not true thickness

Bottom outer radius - size of the circle cross section at the bottom

Bottom thickness - bottom inner radius, not true thickness

Radial slice - number of degrees in the radial direction

Blank Button - LClick open Keying panel and select the internal primitive node, RClick select the full mesh object

Radial Segments - number of edges in the radial direction

Height Segments - number of edges in the local Z direction

Top Segments - number of edges at the top of the mesh

Bottom Segments - number of edges at the bottom of the mesh

If the thickness value is greater than the radius value then the outer radius will be pushed out by the thickness.



Gear Primitive - makes a star shaped mesh



Height - size local Z direction

Inner Radius - size of the central hub

Longitude - number of gear teeth or star points

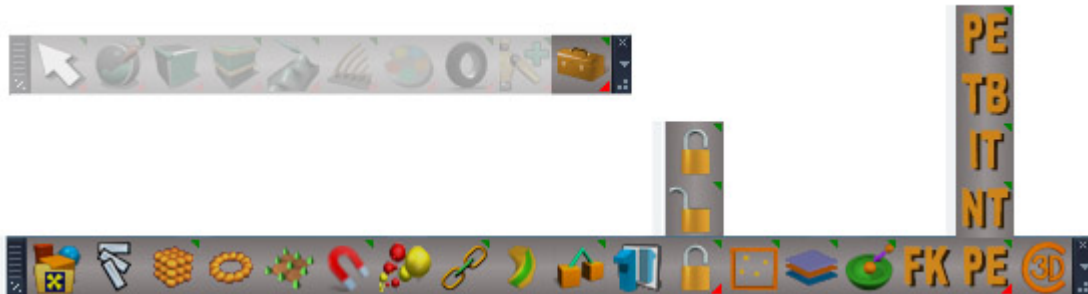
Outer Radius - length of the teeth

Blank Button - LClick open Keying panel and select the internal primitive node, RClick select the full mesh object

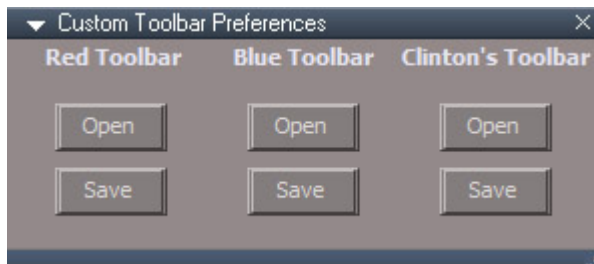
Flatten - flattens the mesh and fixes the normals - do not use if animating the gear attributes



Plane loop selection from Clintons toolbar, Point Edit toolbar.

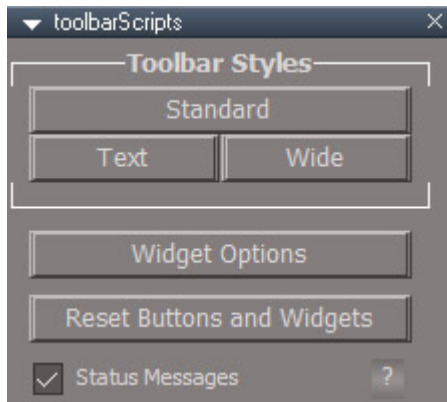


Open Clinton's Toolbar. RMB open custom toolbar preferences.
 TODO writeup Open?, Save?

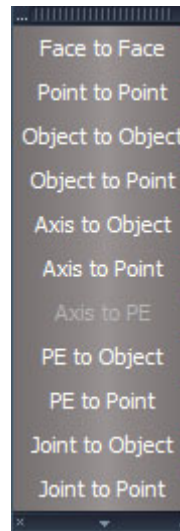




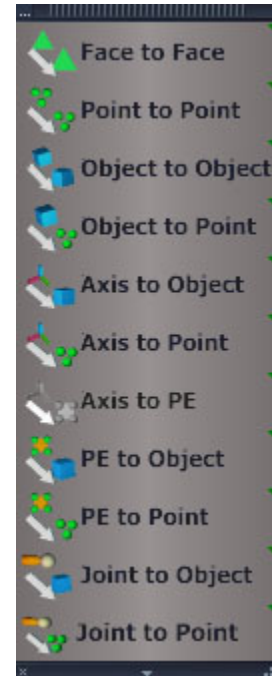
Snapping Toolbar – standard style



Snapping Toolbar Options



Snapping Toolbar – text and wide styles



Open Snapping Toolbar.

Standard - square icon buttons

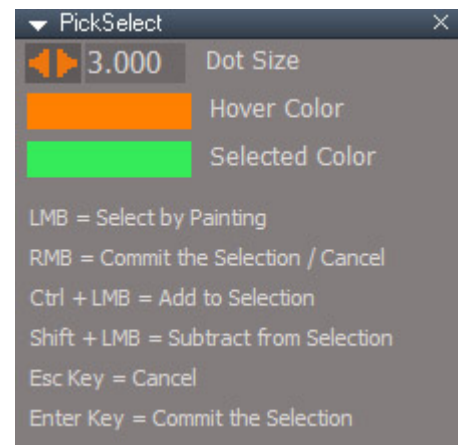
Text - text based buttons

Wide - icon plus text

Widget Options - set hover and selected colors and dot size

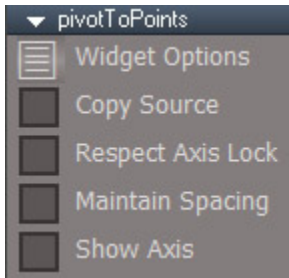
Reset Buttons and Widgets - clean out of sync widgets

Status Messages - **writeup**



Widget Options

The Reset Buttons and Widgets is used as a safety net to clean the user interface. It will deactivate any picking widget, clear the button highlighting, clear mesh highlighting effects and clear the status line.



Snapping Tools Options



Snapping Toolbar – standard style

Widget Options is the same thing as the Pick Widget Options of the toolbar button.

Copy Source makes a copy and snaps it to the target selection and the widget stays active to continue copying to new target selections.

Respect Axis Lock uses the state of axis locking to restrict the movement of the snapped selection.

Maintain Spacing will snap the selected items as a fixed group instead of individually snapping each to the target selection

Show Axis **witeup**

General Usage:

Select the objects/elements to be snapped

Press one of the snapping buttons

Select the destination objects/elements

RMB to commit the selection and move the original selection to the center of the target selection

The Face to Face and Point to Point snap tools do not use the current selection and start by deselecting everything.

If the Copy Source option is active RMB will snap move then reselect the source and wait for another target selection.



Face to Face Move and rotates one object to another based on triangle face selections.



Point to Point Move one object to another based on point selections.



Object to Object Move an object selection to the center of a target object selection.



Object to Points Move an object selection to a target vertex selection center.



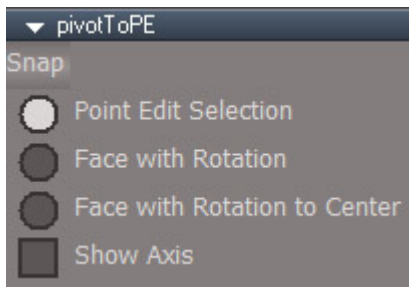
Axis to Object Move the axes of an object selection to the center of a target object selection.



Axis to Points Move the axes of an object selection to a target vertex selection center.



Axis to PE selection Moves the axis of the current point edit object to the center of the point edit selection.



Snap – **writeup**

Point Edit Selection - move the pivot to selection

Face with Rotation - orient the pivot to the face selection then move the pivot to the selection center

Face with Rotation to Center - orient the pivot to the face selection then move the pivot to the geometry center

Show Axis - **writeup**



PE to Object Moves the current point edit selection to the center of a target object selection.



PE to Points Moves the current point edit selection to a target vertex selection center



Joint to Object Move a joint selection to the center of a target object selection



Joint to Points Move a joint selection to a target vertex selection center.



Point Edit toolbar.



Point Edit Toolbar open toolbar



Lathe



Static Sweep



True Bevel



Plane Loop Select



Target Weld



Normal Move



Toggle Object Coordinate Mode



Axis to Selection



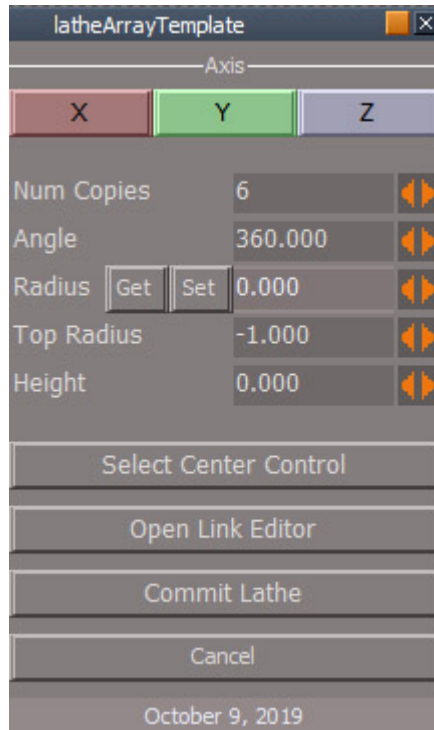
Freeze Transform .



Quad Toolbar .



Quad Menu .



TODO image of working and result



Lathe open toolbar, RMB display Clintons toolbar as 2 rows.

Usage:

Make a polygon selection and push the button to get a preview of the lathe.

Axis buttons(X, Y, Z) set the orientation of the sweep array.

Num Copies determines the number of sweeps

Angle determines the arc angle for the sweeps.

Set radius is a 3 step process

Get - read the current radius value as a starting point
update the Radius value

Set - apply the radius change to the Center Control

Top Radius is used to spiral in or out from the center.

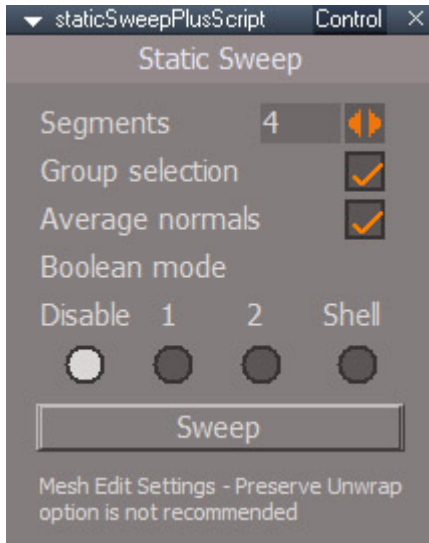
Height controls the offset from the plane of the array for spiral effects

Select Center Control button will select the handle that controls the center location for the array

Open in Link Editor - open a link editor window for unsticking controls if needed.

Commit Lathe convert the array into a series of sweeps. The result is lathed geometry.

Cancel Stop lathe and remove working geometry.



TODO image of working with soft selection



Static Sweep Plus is based on the Dynamic sweep tool except that it is not interactive and will have a soft selection when the number of segments is greater than one.

Sweep - perform sweep

Segments - number of sweep segments

Group selection - sweep selection as a single unit

Boolean mode - disable or shell, 1 and 2 behavior is the same as disable

Average normals - sweep in the average normal direction

Usage:

select faces or edges

push the button and the selection is swept by a tiny amount, too small to be seen. It will use the values previously set in the panel.

use the point edit widget to move the new swept geometry.



True Bevel is an edge bevel tool



make an edge or face selection
 press the button to open the panel
 continually drag the Offset control to see a preview of the bevel.
 the selection can be changed at any time before pressing the Bevel button
 Press the Bevel button to commit
 cleanup bad geometry created



Plane Loop Select is like a point loop selection tool that works with objects based on Plane primitives. Select 2 adjacent points and press the button to get a loop style selection. This tool was made because the built in loop select tool does not work with plane based meshes.



Target Weld weld one vertex to another by clicking on them one by one. RMB to exit the tool.

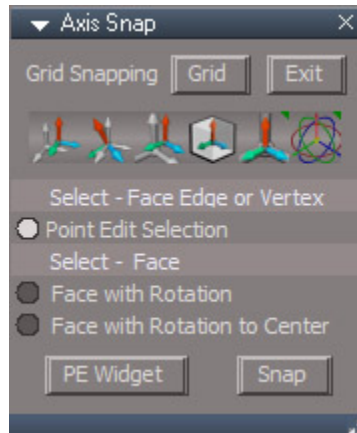


Normal Move will move a vertex selection in the direction of their normals. Left button drag the mouse in the 3D view to increase or decrease the offset value. RMB to exit the tool



Toggle Object Coordinate Mode between normal point edit selection orientation and object local space orientation. The point edit widget center will turn light blue to indicate object local space orientation mode.

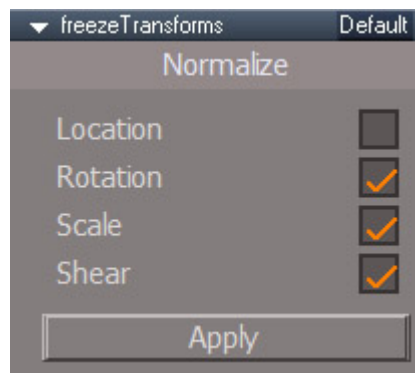
Note that this should be toggled off before using tangent coordinate mode.



Axis to Selection Panel



Axis to Selection **writeup**.



Freeze Transform Panel



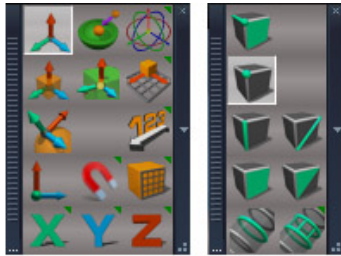
Freeze Transform .Set rotation to (0,0,0), set translation to (0,0,0) and set scale to (1,1,1) and set shear to (0,0,0) without changing the appearance of the object. RMB to open the panel to choose what transform attributes get frozen.

Freezing a group only freezes the group object.

To freeze the elements of a group select them and then run the script.

The Shear option only operates on single mesh objects. Groups,lights and cameras are ignored.

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Quad Menu



Quad Toolbar



Quad Toolbar .



Quad Menu .

The Quads are used to quickly select modeling tools via a shortcut. After a tool is selected the Quad closes automatically. It can also be closed by clicking on one of the blank buttons.

The Unofficial Update version of the Quad Toolbar and Quad menu are very similar in content. The Quad Toolbar opens centered on the mouse position and the Quad Menu opens to the right of the mouse position. The Quad toolbar has a lathe button. The Quad menu has 2 buttons for ? Help and zoom ?
 TODO check this