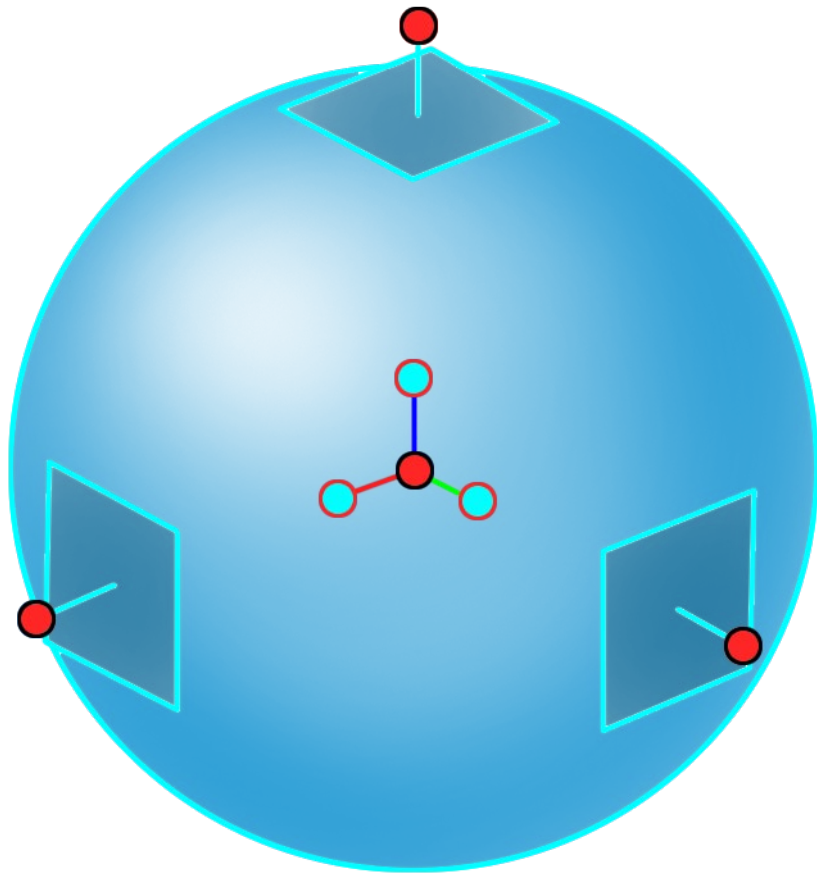


Master the TriBall



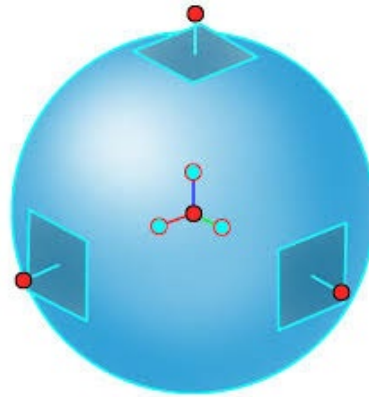


Master the TriBall

In IRONCAD there is a patented tool used for positioning objects in 3D called the TriBall.

By some, it has been called "The most useful tool in CAD history".

The TriBall is incredibly useful in many different situations but mainly used for positioning and copying objects in the 3D scene.



It is important to remember that the TriBall can be used to a lot more;

Control the Position of:

- **Parts**
- **Assemblies**
- **Intellishapes (features)**
- **Sketch/Cross-Section**
- **Textures**
- **Cameras**
- **Point Lights, Spot Lights and other sources of lights and lamps**
- **Anchor Point**
- **Attachment Point**

Edit:

- **Animations and animation paths**
- **Loft and Sweep Sketch planes**
- **Dynamic Modeling by pulling faces (also called *Direct Face Modeling*)**

Of course, it is also possible to position multiple objects at once with the TriBall. Combined with keyboard shortcut keys for selection you can mix parts, features and assemblies – and move them all in one step without any pre-set relation between them! This is truly a unique IRONCAD function.

TriBall – Anatomy

CENTER HANDLE

This handle is mainly being used for a "point-to-point" positioning. Drag it directly to another point, or right click and choose from alternatives. Can also be combined with another "locked" (selected) handle.

ORIENTATION HANDLES

These handles are being used to orient objects around the TriBall center.

There are four ways to use them:

1. Left click to lock the linear/axis direction.
2. Left drag to re-orient to a green target face/edge/point.
3. Right click and choose an option in the menu to re-orient with.
4. Right drag and choose an option in the menu to create a copy/link.

OUTER HANDLES

These are mainly used for moving or copying along an axis or to specify a rotation axis.

Can also create a linear pattern.

2D PLANES

Left drag here to move in the plane represented by the square handle.

Left click on the handle to lock the plane and then move the TriBall with the *Center Handle* to snap to other objects.

Right click for options to snap "in height" of green target faces/edges/points.

Right drag and choose an option in the menu to move or create a copy/link or to create a rectangular pattern.

INTERIOR

When an axis is being locked, drag within this blank area to rotate around that axis.

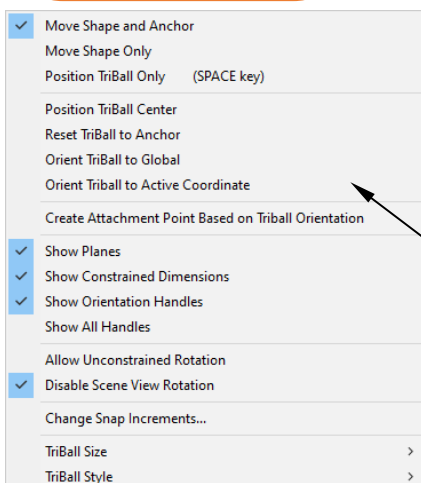
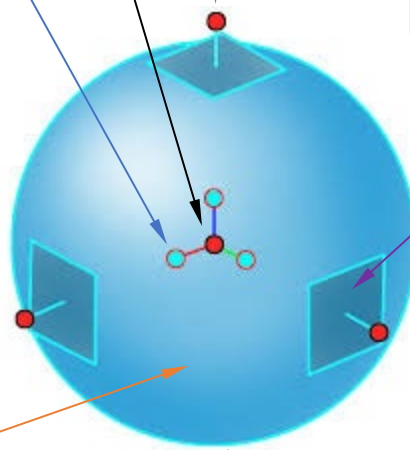
Use the right mouse button for options to create a copy/link or a circular pattern.

CIRCUMFERENCE

Drag this outer circle to rotate about the "virtual axis" extending from your "viewpoint" of the TriBall Center. Disabled by default.

TRIBALL SETTINGS MENU

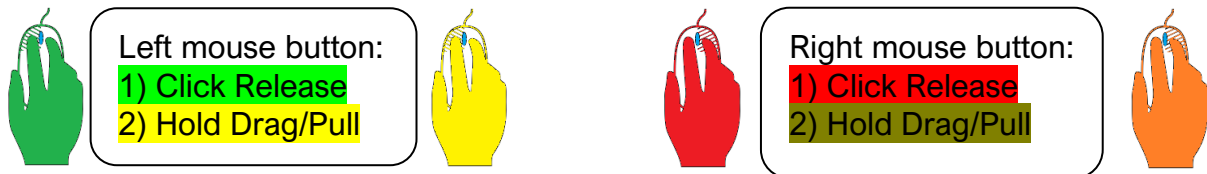
This menu will show up when you right click in the background when the TriBall is active.



TriBall – using Mouse and Keyboard

Mouse

The left and the right mouse buttons are both used in various ways and may have four (4) different functions on the TriBall handles.



The left mouse button is mainly used for a “direct action” which means that you will not be presented with any options and your action will be made directly.

The right mouse button should be used when you want to be presented with an option, for example move or copy/link. The “Click Release” menu and the “Hold Drag/Pull” menu most often contain different options.

Keyboard shortcut keys for the TriBall

[Q] or **[F10]** - Activate the TriBall for the selected object(s).

[Spacebar] – Release/Lock the TriBall from/to the selected objects(s).

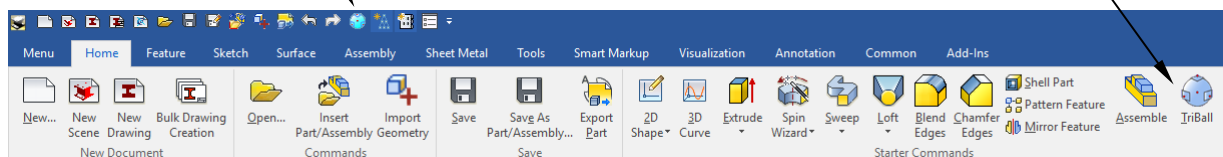
[CTRL] – Use incremental steps during moving or rotation of selected object(s) using the *Outer Handles*. Settings found in the background right click menu of the TriBall.

[SHIFT] – Find center points of circles or midpoints on edges when moving, using the *Center Handle* or when rotating, using the *Orientation Handles*.

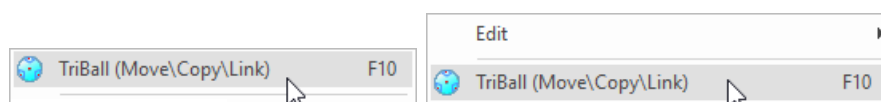


The TriBall icon - On/Off

The icon to turn On or Off the TriBall is found under the **Home tab** and in the **Quick Access Toolbar** and can be activated when an object is selected.

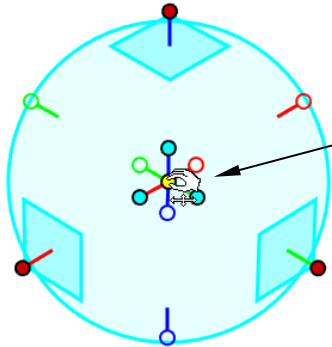


The right click menu of Intellishapes, Parts and Assemblies also includes the TriBall activation option, as well as on the objects themselves (close to the Anchor Point).



TriBall – Handle Options

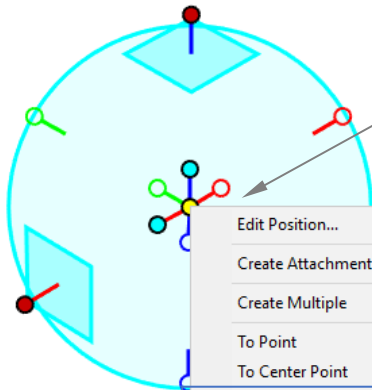
Center Handle



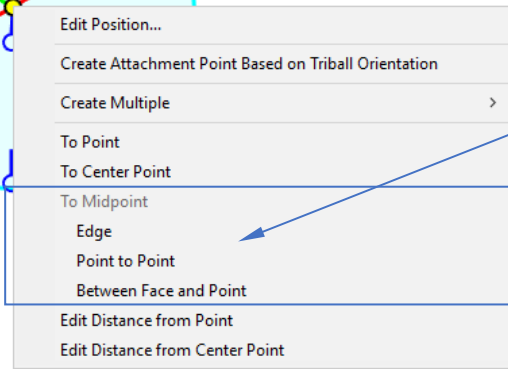
The red *Center Handle* is used primarily to perform point-to-point re-positioning. It is used by dragging it directly to a snap point with the left mouse button.



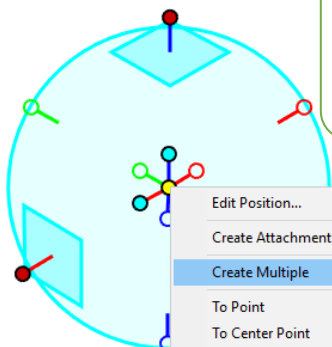
The *Center Handle* cannot be dragged or moved in space. It needs geometrical (green) target points to snap against and you do not need to hold down the [Shift] key in order to do so.



Right clicking on the *Center Handle* presents this menu, in which you can choose to position the TriBall in different ways.



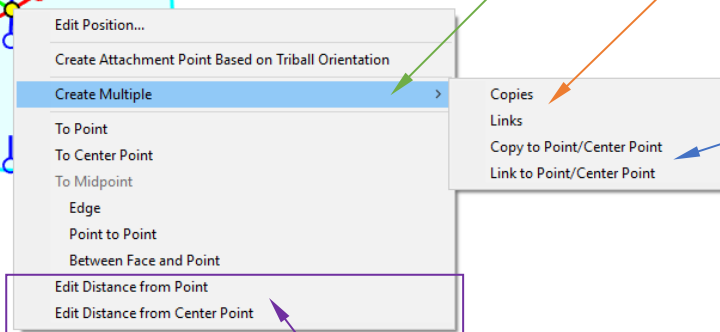
To find the midpoint of an edge, between two points or between a face and a point, the three *To Midpoint* options are found here.



Through the right click menu it is also possible to create multiple copies in one go, using the *Create Multiple* fly-out menu options...

Copies and *Links* - use the [P] keyboard button to create points where the TriBall center is located.

Apply and exit with the [Enter] keyboard button.

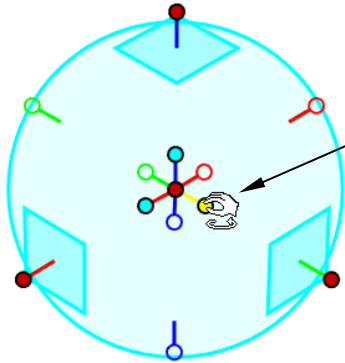


Copy to Point and *Link to Point* - use the mouse cursor and left click on green target points to place the copies!

The *Edit Distance from Point* and ...*Center Point* options can be used as a fast way to control the TriBall position and “measure” at the same time.

Remember that the distance from the *Center Handle* is the shortest distance in space!

TriBall – Handle Options Orientation Handles

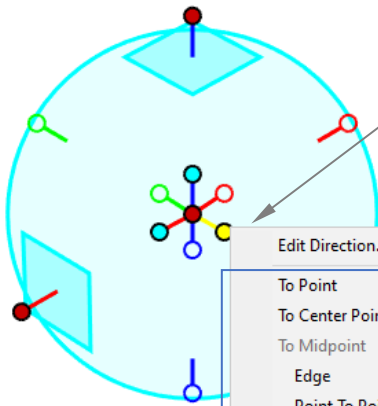


The three inner blue *Orientation Handles* are used to rotate and orient the direction of the TriBall around the center, by snapping to different green target points/edges/faces.

Drag with the left mouse button to directly orient selected objects against geometry.



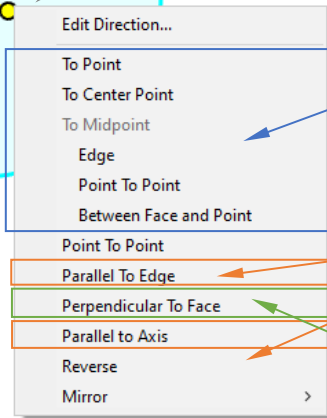
Drag with the right mouse button against a target point to be presented with options to *Move* or *Copy/Link*.



Right clicking on one of the three/six Orientation handles presents this menu.



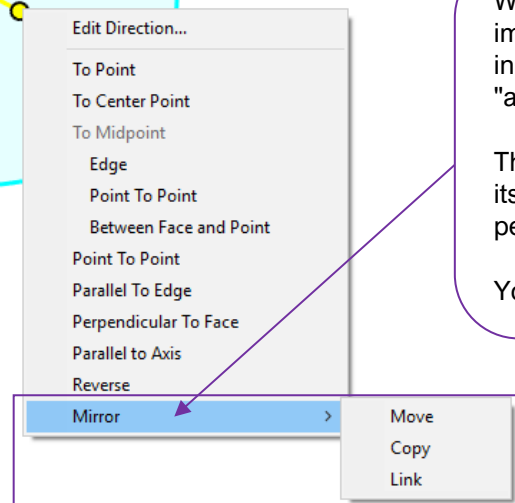
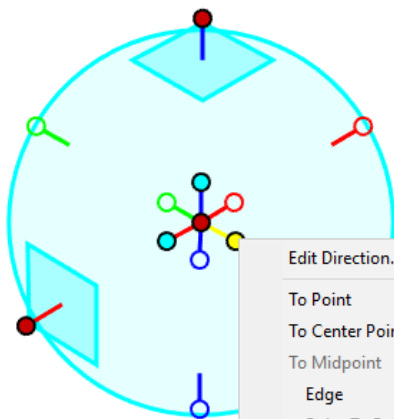
As a new user it is usually easiest to start using the right click menu options, to see which alternatives there are available.



The *To...* options in the menu are three different snap functions to find green target points, center points or mid points.

Parallel to Edge/Axis is a commonly used option and orients the handle parallel to an edge or an axis.

Perpendicular to Face is being used to point the handle perpendicular away from the face that you select.

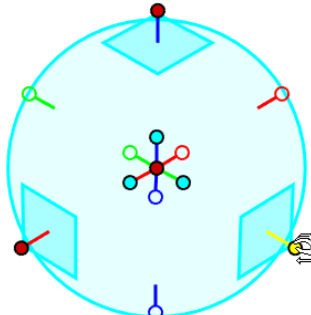


When mirroring selected objects it is important to think about the "direction" in which to mirror about and not "around which axis".

The TriBall represents the mirror plane itself and the inner handle points perpendicular away from that plane.

You can *Move*, *Copy* and *Link*.

TriBall – Handle Options Outer Handles

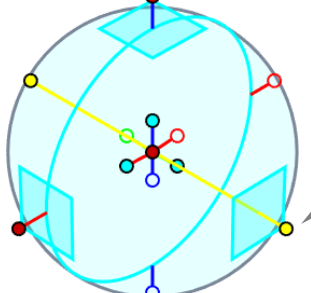


Drag or pull any of the red *Outer Handles* to move the TriBall in the linear direction of the handle.

Use the left mouse button to move and to directly be presented with a length value.



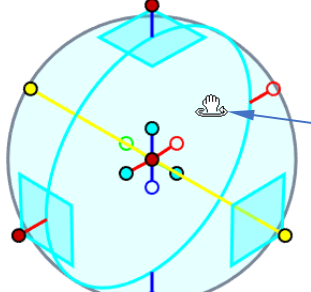
The right mouse button will present you options, which are different if you click compared with if you drag the handle.



Left click on the handle to temporary making it act as a linear or an axis constraint, to move along or rotate around.

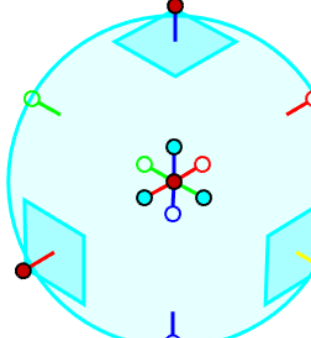


(This will also work when clicking on one of the inner *Orientation Handles*, which might be faster when using those options).

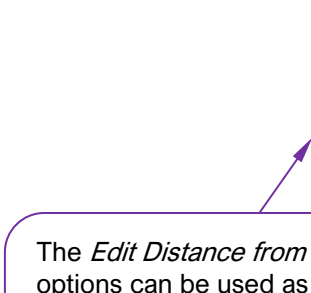


To rotate around a (yellow colored and temporary locked) axis, make sure that the mouse cursor is being placed within the Circumference area of the TriBall and is being shown as a “fist” mouse cursor symbol.

Drag with the right mouse button to show a menu for *Move, Copy, Link*, mirror or to create a *Radial Pattern*.



Right click on one of the *Outer Handles* to re-position the TriBall in a linear distance with snap options or to create a *Linear Pattern*.



- To Point
- To Center Point
- To Midpoint
- Edge
- Point to Point
- Between Face and Point
- Edit Distance
- Edit Distance from Point
- Edit Distance from Center Point
- Create Linear Pattern

The *Edit Distance from Point* and ... *Center Point* options can be used as a fast way to control the TriBall position and “measure” at the same time.

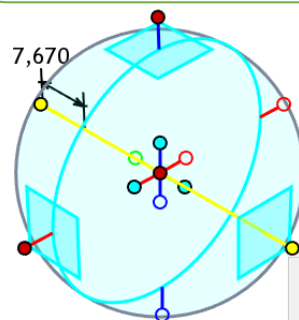
Remember that the distance is always calculated from the *Center Handle*.

Drag with the right mouse button in one of the *Outer Handles* to show this menu.



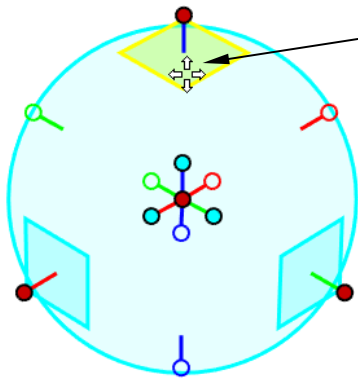
Options to *Move* or *Copy/Link* in that direction are then presented.

You can also create a *Linear Pattern*.

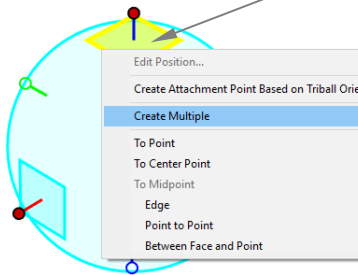


- Move Here
- Copy Here
- Link Here
- Copy Along Curve
- Link Along Curve
- Create Linear Pattern
- Cancel

TriBall – Handle Options 2D Plane Handles



The 2D Plane Handles will move the TriBall in the plane represented by the square (“length and height” at the same time).



The 2D Plane right click menu presents options to position the TriBall in the plane, relative the target points in the 3D scene.

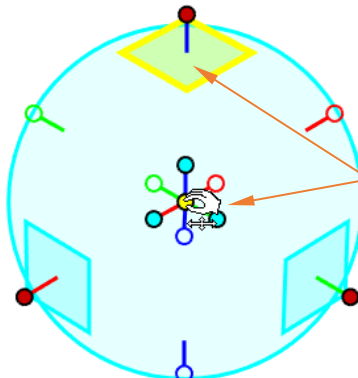
You can also create multiple copies and links to target points. Remember to use the [P] key to create points with the TriBall.



Distance 2: 28 Distance 1: 26,812

Drag with the right mouse button in one of the *Plane Handles* to show this menu.

Options to *Move* or *Copy/Link* in that direction are then presented or to create a *Rectangular Pattern*.

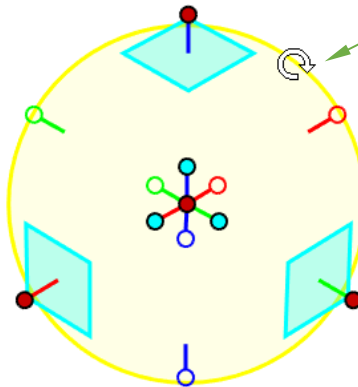


By a single left mouse click on a 2D Plane Handle, the plane will act as a temporary constraint having a yellow color and you can instead drag the Center Handle to still stay in the plane and find target points in other “levels of space”.

Remember that you can also still right click on the Center Handle to show the various snap options.



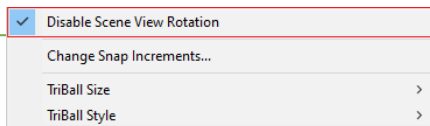
Circumference



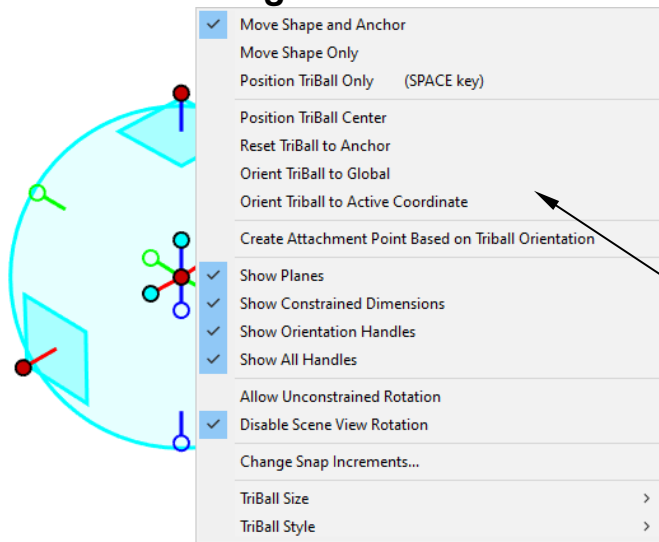
Drag this outer circumference circle with the left mouse button to rotate the TriBall around the virtual axis extending from your “viewpoint” of the TriBall Center Handle.

Mostly useful when orientating decals on surfaces or if the camera looks perpendicular to a face, which will then lock the rotation axis of the TriBall.

Right click in the background if you want to allow the Scene View Rotation function (not recommended).



TriBall – Settings Menu



Right click in the background when the TriBall is active to present this menu. Make sure not to click anywhere on the TriBall itself.

The options here controls the visual appearance of the TriBall, which are global settings.

The first three options controls what is being moved when using the TriBall handles.

Move Shape and Anchor – will move the TriBall together with the object(s) that are selected and the anchor points will follow. This is the default behavior. Uses a blue color on the TriBall.

Move Shape Only – will only move the selected object(s) while the TriBall and the anchor point(s) stays put in space. Is usually only used with Attachment Points. Uses a green color on the TriBall.

Position TriBall Only ([SPACE] key) – will only move the TriBall, to position it relative the selected object(s) before re-positioning or re-orienting them. Uses a white color on the TriBall.

Position TriBall Center – a fast way to re-position the TriBall on a geometrical point when it is "out of reach". You do not have to zoom out to "find it" first.

Reset TriBall to Anchor – resets the TriBall back to the position of the anchor point of the (first) selected object.

Orient TriBall to Global – resets the TriBall orientation according to the global coordinate system.

Orient TriBall to Active Coordinate – resets the TriBall orientation according to the active coordinate system (it is possible to have multiple coordinate systems in the 3D scene).

Create Attachment Point Based on Triball Orientation – creates an unlocked Attachment Point on the position of the TriBall Center Handle. The same option is available on the Center Handle.

The four **Show** options controls which handles and planes that should be visible within the TriBall. In this document all handles are shown, but the **Show All Handles** option is usually disabled by default.

Allow Unconstrained Rotation – drag inside the blank area of the TriBall to rotate in all directions at once around the Center Handle.

Disable Screen View Rotation – disables the rotation with the outer circumference circle of the TriBall. This can be tricky to use and has a narrow area of use, why it is disabled by default.

Change Snap Increments – set the incremental steps to use when [Ctrl] dragging the Outer Handle (linear) or within the blank area of the TriBall (angle) when an axis is being locked.