Move - Pivot - Straighten

Move / Copy objects with optional free pivoting and straightening by rotation about a line

▶Overview and common principles

*The transformation is done in **4 steps**:*

1) Object(s) Selection

2) Free Translation

3) Free Pivoting to align along a direction

4) Straighten by rotation about this direction

Applicable Objects

- Applicable objects are **Groups**, **Component Instances**, **Faces**, **Edges** and **Images**
- You can select **any combination of these objects**
- Note: Faces and Edges are *extracted* from the model when transformed. So, there is **NO autofolding** of their neighboring faces

Navigating through Steps (Skip, Exit, Undo, Abort)

- You can **skip a step** with a **Double-Click** on the origin point (instead of a simple click).
- You can **exit the tool after a step**
  - by hitting **Spacebar**
  - or by a **Double-Click** on the target point
  - or by a **Double-Click in empty space**
  - or via the **Contextual menu**.
- You can **undo a step** by hitting **Esc** or **Ctrl-Z**. Note that MAM will never undo beyond the initial state when you entered the tool
- You can **abort and exit** via the **Contextual menu**

Copy Mode

*Toggling the Copy mode is possible only **during selection and translation***

*Toggle **Ctrl** to activate or deactivate **Copy mode***

The cursor will display a small  *sign when in Copy mode*

NO-inference mode

- When you move the mouse, inferences are calculated based on remarkable points and remarkable directions in the model
- You can disable inference
  - **Alt Down** (temporarily)
  - **Toggle Alt** (permanently)

XRay Mode

- MoveAlignMe includes the toggling of XRay mode to facilitate the picking of origin and target points
- By default, the XRay mode will be automatically activated when you click to select the origin of translation
  - You can disable the Automatic XRay in the Default Parameters
- Press **TAB** to toggle the XRay mode at any time
- When exiting, MoveAlignMe will restore the XRay mode which was in effect when entering the tool

▶Step 1: Object Selection

*MoveAlignMe supports **Preselection** and **Interactive selection***

Summary of Modifiers during Selection

- **Ctrl**: Toggle Copy mode
- **Shift**: Add to or Remove from the permament selection
- **Alt**: Select single face within a surface or single edge within a curve

Preselection

Select objects and then launch MoveAlignMe

- The selection cannot be modified. Hit **Esc** to clear the selection and start an interactive selection
- With Preselection, you start directly with the Translation from any point in the model

Interactive Selection

Launch MoveAlignMe without any object selected.

Interactive selection is used to select objects and specify the origin of the translation

- **Mouse over the model**; Selectable objects are highlighted.
  - A mouse-click will confirm the selection and go to the next step: Translation
  - The clicked point will be the **origin of the translation**
- **Selecting several objects**
  - Press down **Shift** when hovering over the object (do not click)
  - This will add (or remove) the object in the **permanent** selection
  - While **Shift** is down, hovered objects are added in the permanent selection (or removed if already permanently selected)
  - When finished, **Click** on a point in the model to set the origin of the translation
- **Selecting a face at a vertex**
  - Mouse over the face first
  - Then gently move the mouse over the vertex to make it the origin of the translation
- **Selecting a surface versus a single face within a surface**
  - By default, MoveAlignMe will select the whole surface if the picked face belongs to it
  - When you are in the *Show Hidden Geometry* mode, you can however select a single face by pressing **Alt Down**
- **Selecting a curve versus a single edge within a curve**
  - By default, MoveAlignMe will select the whole curve if the picked edge belongs to it
  - You can however select a single edge by pressing **Alt Down**

▶Step 2: Free Translation

This is a standard translation as in the native Move tool

There are a few additional features

- More inferences
- Planar constraints

Summary of Modifiers during Free Translation

- **Ctrl**: Toggle Copy mode
- **Shift**: Lock a direction
- **Alt**: Set or toggle NO inference mode
- **Arrows**: Lock an axis or custom direction
- **Ctrl-Arrows**: Force a planar constraint from an axis
- **Backspace**: Remove visuals for bounding box inferences

Performing the Free Translation

- The Translation starts as soon as you **Click** (or **Click-Drag**) the **origin point** in the Selection step
- Move the mouse to translate the object(s) to the **target point**
  - **Click** to validate the target point and switch to the next step: **Pivoting**
  - **Double-Click** to validate the target point and **Exit the tool**
- You can skip the Translation by a **Double-Click** on the origin point in the selection step

Locking a direction or a plane

- You can lock a **direction** or a **plane** in the Selection mode and during the translation
- **With Arrows** (for axis direction) and **Ctrl-Arrows** (for axis plane)
  - **ArrowTop** for **blue** axis
  - **Arrow-Right** for **red** axis
  - **Arrow-Left** for **green** axis
- **Arrow-Down and Ctrl-Arrow-Down can be used to:**
  - Set a **custom direction or plane** (from the face, edge, Guide line or axis under the mouse) if there is NO locked direction
  - Remove direction or plane lock if there is one active
- You can also lock / unlock the current translation direction with **Toggle Shift**

Translation by a specified distance

- When moving in a direction you can **type the distance in the VCB** (in model units)
  - The object(s) will be moved and you **Exit the tool**

▶Step 3: Free Pivoting to orientate along a direction

*For Pivoting you **pick an origin and bring it to a target**. This determines a direction to align the selection*

*The **Pivot Point** is the target point of the translation (highlighted in **orange**)*

*You can set a **Pivoting Plane** with the Arrows (axis or custom)*

*You can force a direction from a **Lead Face** or **Lead Edge** (see this section)*

Summary of Modifiers during Pivoting

- **Ctrl**: Specify a Lead Face or a Lead Edge
- **Shift**: Toggle direction (direct or reverse) while pivoting
- **Alt**: Set or toggle NO inference mode
- **VCB**: Enter rotation angle in degree (only when pivot plane is active)

Performing the Free Pivoting

This is a pivoting in any direction. You can however set a pivoting plane.

*There are **2 substeps** since you need to pick an origin and then a target*

- **Pick the origin**
  - **Click** to pick the origin (highlighted in **green**)
- **Move the mouse to pivot the object(s)**
  - Inferences can be used to force a direction
- **Click to validate the pivoting**
  - This will validate the pivoting rotation and **go to the next step: Straightening**

Lead Face and Lead Edge for pivoting

Instead of pivoting interactively, you can take the direction from Faces or Edges in the model

The principle is that you pick a face or edge in the object(s) and then pick another one in the model

Both faces or edges will then be aligned

- **Pick a Lead Face or Lead Edge**
  - Instead of clicking an origin point, **hover the object(s)**
  - The face or edge under the cursor is highlighted in **light orange**
  - Keep **CtrlDown** and **Click** on the face or edge or just **Toggle Ctrl** when mouse is over the face or edge (without clicking)
  - The face or edge will be permanently highlighted in **dark orange**
- **Mouse over the Target Face or Target Edge in the model**
  - **Click** on it to perform the alignment
  - You can also **Toggle Ctrl** to validate the alignment (without clicking)

Forcing a Pivoting Plane

- Use **Arrows** to specify a plane of rotation
  - **ArrowTop** for **blue** axis
  - **Arrow-Right** for **red** axis
  - **Arrow-Left** for **green** axis
  - **Arrow-Down** for setting a **custom plane** (from the face, edge, Guide line or axis under the mouse) or **removing the current pivoting plane**
- Remark: for the Move and Glue tools, Arrows are forcing a plane only if there is NO face or edge alignment.

Rotation by a specified angle (when a pivot plane is active)

- When rotating you can **type the angle in the VCB (in degree [-180, +180])**
  - The object(s) will be rotated by the specified angle and you **Exit the tool**
  - Note: pay attention to the sign of the angle (check the VCB for positive and negative value)

▶Step 4: Straightening

*The translation target and the pivoting target define a **hinge line** (highlighted in dashed-yellow*

The Straightening is a rotation about this hinge line

Summary of Modifiers during Straightening

Performing the Straightening

*There are **2 substeps** since you need to pick an origin and then a target*

- **Pick the origin**
  - **Click** to pick the origin (highlighted in **green**)
- **Move the mouse to rotate the object(s)**
  - The object is rotating about the hinge line
  - Inferences can be used to force a direction
  - Axis planes are displayed when the origin and target are coplanar on an axis plane
- **Toggle Shift** to get the reverse or direct rotation
- **Click to validate the Straightening**
  - This will validate the transformation and **Exit the tool**

Rotation by a specified angle (when a pivot plane is active)

- When rotating you can **type the angle in the VCB (in degree [-180, +180])**
  - The object(s) will be rotated by the specified angle and you **Exit the tool**
  - Note: pay attention to the sign of the angle (check the VCB for positive and negative value)