Studio|Tools™

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Sketching

StudioTools 10

Sketching
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Not all features described are available in all products.

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Sketching

How to use the sketching tools to create 2D images on Windows.

Introduction

Introduces StudioTools sketching features.

Introduction to sketching

Introduces StudioTools sketching features.

StudioTools's sketching tools allow you to easily create 2D conceptual design sketches or annotate 3D models or cloud data.

You can use 2D sketches as a reference for building 3D models and iteratively revise concept sketches and 3D models.

You can use annotations to indicate problem areas on a model or ideas for future changes, or to indicate how you plan to build a surface from cloud data.

Sketching features on Windows and UNIX

Create or view sketches on Windows and UNIX computers.

Sketching features are only available on Windows.

If you open a wire file that contains a sketch on a UNIX computer, you will be able to view the sketch, but you cannot edit the sketch. You can, however, edit the *image plane* that contains the sketch. (For example, you can move, scale, or delete the image plane.)

If you open a wire file that contains a sketch on a UNIX computer, do not edit the image plane and save the file, the sketch information will remain unchanged. When you open the file again on a Windows computer, you can continue sketching on the individual layers of the sketch.

However, if you edit the image plane on a UNIX computer, StudioTools will convert the sketch image plane into an animation image plane and merge all image layers together. When you open the file again on a Windows computer, the individual layers of the sketch will be lost.

If you plan to transfer wire files that contain sketches from a Windows computer to a UNIX computer and vice versa, make sure you do not edit or delete the image plane on the UNIX computer.

Sketching features in DesignStudio, Studio, SurfaceStudio, and AutoStudio

Which sketching features are available in each StudioTools product.

Sketching features are available in DesignStudio, Studio, SurfaceStudio, and AutoStudio as follows:

Feature	DesignStudio, Studio, AutoStudio	SurfaceStudio
Pencils	Yes	Yes (colored)
Markers	Yes	No
Airbrushs	Yes	No
Solidbrushs	Yes	No
Erasers	Yes	Yes
Sharpenbrushes	Yes	No
Blurbrushes	Yes	No
Smearbrushes	Yes	No
Clonebrushes	Yes	No
Hide/Show brush modes	Yes	No
Floodfill tool	Yes	No
Select tools	Yes	No
Shape tools	Yes	No

How do I?

How to perform sketching tasks in StudioTools.

Set up for sketching

Set up a tablet/stylus and StudioTools for sketching.

Set up my tablet and stylus

Set up the stylus buttons for use in StudioTools.

You may want to customize the stylus buttons so you can easily access marking menus, camera hot keys, and vertical and horizontal constraints using the stylus.

To customize the stylus buttons on a Windows system

1   From the Windows **Start** button, choose **Start > Programs > Wacom Tablet > Wacom Tablet** to open the **Wacom Tablet Properties** window.

2   Click the **Tool Buttons** tab.

3   Set the **Switch Function(s)** to **Right-Click** and **Middle-Click**.
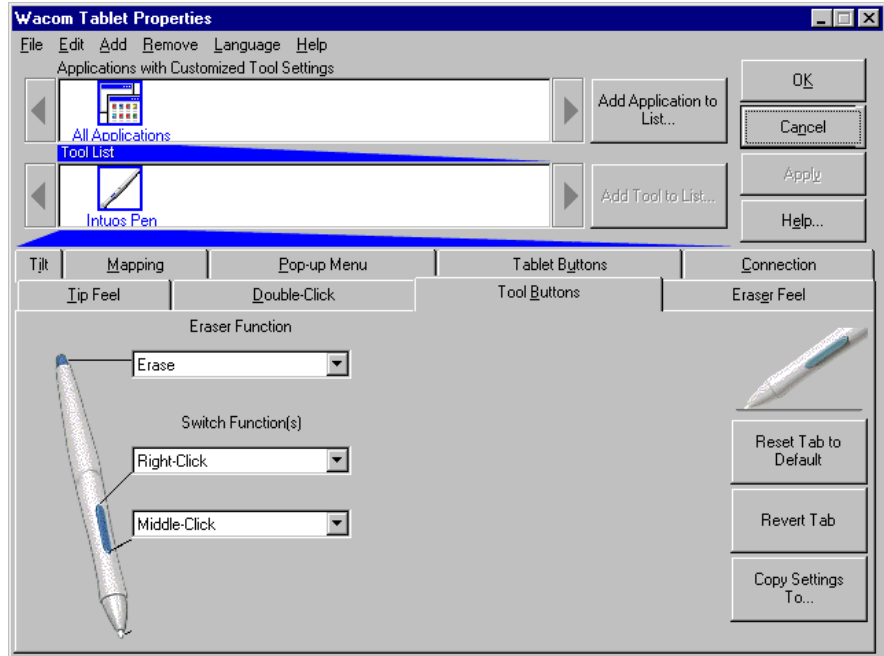
Note   You cannot use the Eraser button on a stylus to erase paint in StudioTools.

4   Click **OK** to close the **Wacom Tablet Properties** window.

Set up StudioTools for sketching

Choose **Image > Paint default UI**.

You can easily set up the StudioTools interface so non-sketching features are hidden and sketching features are more accessible. You can also lock the view windows so you don't accidentally move or resize them while sketching.

To set up StudioTools for sketching

Choose **Image > Paint default UI** to automatically:

- show only sketching-related menus and tools
- show the **Paint Panel**
- turn off all view grids
  - ❖ Hide or show view grids

Note The next time you start StudioTools, the grids will be displayed again. Choose **DisplayTgls > Window toggles > Grid** to turn them off.

- set the default view background color and sketch image plane background color to white
  - ❖ Set the background color

Note Before exiting StudioTools, choose **Preferences > Interface > User colors**, choose **File > Store**, and save the color file using the default filename, otherwise the background color will be gray the next time you start StudioTools.

- turn on sketching-specific marking menus.

Note To set up StudioTools for modeling, choose **Image > Modeling default UI**.

Note To customize the default interface colors, including the default view background color, use **Preferences > Interface > User colors** to customize the interface and save a color file, then choose **Image > Paint default UI** ❑, set **Color** to **Specied**, click **Browse** and choose the color file.

To lock the view windows

1   Choose **Preferences > Interface > Interface options** ❏ to open the **Interface Options** box.

2   Set **Modeling Windows** to one of the following:

- ◆   **MOVABLE**—You can move or resize the view windows freely.

- ◆   **<SHIFT> MOVABLE**—You can move or resize the view windows freely only if you hold down *Shift* while dragging.

- ◆   **LOCKED**—You cannot move or resize the view windows. To move or resize a view window, choose one of the above options.

3   Click **Go**.

To hide windows during brush strokes

1   Choose **Preferences > Interface > Interface options** ❏ to open the **Interface Options** box.

2   Set **Hide Windows During Brush Stroke** as follows:

- ◆   **0**—Windows are not hidden during brush strokes.

- ◆   **ANY OTHER VALUE**—Windows are hidden during brush strokes. The value of this option is the number of seconds windows remain hidden after you complete a brush stroke. For example, if this option is set to 2, windows are hidden during a brush stroke and re-appear 2 seconds after you complete the stroke.

3   Click **Go**.

To set the main linear unit

1   Choose **Preferences > Construction options** to open the **Construction Options** window.

2   Click **Units** and then **Linear** to show the current linear units.

3   Set **Main Units**.

To show only sketching-related menus and tools

Choose **Preferences > Menus > 2D menus**.

Note   To show all tools and menus again, choose **Preferences > Menus > Long menus**.

To show or hide the Paint Panel

Choose **Image > Tgl paint panel**.

To turn on sketching-specific marking menus

Choose **Preferences > Marking Menus > 2D Marking Menu**.

Note   To turn on standard marking menus, choose **Preferences > Marking Menus > Standard Marking Menu**.

Learn about sketching hot keys

Speed up your workflow by using sketching hokeys.

Hotkey	Function
F1	Paint mode
F2	Erase mode
F3	Hide mode
F4	Show mode
r	Interactive brush radius modification
o	Interactive brush opacity modification
t	Interactive brush rotation modification
p	Interactive brush aspect ratio modification
a	Add to Marquee mode and magic wand
s	Subtract from Marquee mode and magic wand
n	New marquee and magic wand
c	Grab color
l	Clonebrush re-select source
Ctrl+space	Hide floating windows (such as the color editor window)

Get started sketching

Start creating a conceptual design sketch or annotating a model or cloud data.

Create a conceptual design sketch

Get started creating a conceptual design sketch.

To create a conceptual design sketch

1   Choose **Layouts > Front** to create a **Front** view, or choose
    Layouts > All windows > All (Studio) to create four views.

2   Choose a **Pencil**, **Marker**, **Airbrush**, or **Solidbrush** from the
    Brushes palette (see *Paint and erase* (page 75)).

3   In the **Paint Panel** customize the brush's color, opacity,
    size, shape, and stroke properties (see *Customize brushes
    and paint* (page 78)).

4   Use your stylus to sketch in a view (see *Paint and
    erase* (page 75)).

    ◆   To create a new image layer to sketch on, choose
        Image > New > Image layer (see *Create an image
        layer* (page 54)).

    ◆   To select an image layer to sketch on, in the view
        window title bar click the *active image layer* button
        and select an image layer from the menu.

    ◆   To adjust your view of the sketch, press *alt shift* and
        drag in the view with either the *MMB* (middle mouse
        button) (track) or the *RMB* (right mouse button)
        (dolly) (see *Change your view of a sketch image
        plane* (page 27)).

5   Choose **File > Export > Make picture** to save the sketch as
    an image file (see *Export a sketch image plane* (page 46)).

6   Choose **File > Print** to print the sketch (see *Print a sketch
    image plane* (page 48)).

Annotate a model or cloud data

Get started annotating a model or cloud data.

To annotate a model or cloud data

1 Open the wire file that contains the model or cloud data that you want to annotate.

2 Click the view you want to annotate.

3 To adjust your view of the model or cloud data, press *alt shift* and drag in the view with either the *MMB* (middle mouse button) (track) or the *RMB* (right mouse button) (dolly) (see *Change your view of a sketch image plane* (page 27)).

4 To display the model in shaded mode, select a diagnostic shading mode from **ObjectDisplay > Diagnostic shading**.

5 Choose **Image > New > Image plane** to create a new sketch image plane on the view (see *Create a sketch image plane* (page 22)).

6 To sketch in front of 3D models or cloud data, choose **Windows > Edit > Image layers** to open the **Image Layers** window, click the *white triangle* beside **Sketch Properties**, and click the *gray diamond* beside **Foreground** (so it becomes a *black diamond*) (see *Move a sketch image plane* (page 42)).

7 Choose a **Pencil** tool from the **Brushes** palette (see *Paint and erase* (page 75)).

8 Use your stylus or mouse to sketch in the view (see *Paint and erase* (page 75)).

   ◆ To create a new image layer to sketch on, choose **Image > New > Image layer** (see *Create an image layer* (page 54)).

   ◆ To select an image layer to sketch on, in the view window title bar click the *active image layer* button and select an image layer from the menu.

- ◆ To adjust your view of the sketch, press *alt shift* and drag in the view with either the *MMB* (middle mouse button) (track) or the *RMB* (right mouse button) (dolly) (see *Change your view of a sketch image plane* (page 27)).

Note   Do not adjust a perspective view after you have started sketching or the sketch will no longer be aligned with the 3D model or cloud data.

9   When you are finished annotating, close any open windows or option boxes that are covering the view. Adjust your view so it appears as you want it to be saved.

10   Choose **File > Export > Current window** to save the model and annotations as an Alias pix image file (see *Export a sketch image plane* (page 46)).

11   Choose **File > Print** to print the model and annotations (see *Print a sketch image plane* (page 48)).

To annotate an image of a model or cloud data

1   Open the wire file that contains the model or cloud data that you want to annotate.

2   Click the view you want to annotate.

3   To adjust your view of the model or cloud data, press *alt shift* and drag in the view with either the *MMB* (middle mouse button) (track) or the *RMB* (right mouse button) (dolly) (see *Change your view of a sketch image plane* (page 27)).

4   Choose **DisplayTgls > Window toggles > Grid** to hide the grid.

5   To display the model in shaded mode, select a diagnostic shading mode from **ObjectDisplay > Diagnostic shading**.

6   Choose **File > Export > Current window** to save the current view of the model as an Alias pix image file (see *Export a sketch image plane* (page 46)).

7   Choose **DisplayTgls > Model** to hide the model (and, if diagnostic shading is on, turn it off), or choose **DisplayTgls > Object toggles > Clouds** to hide the cloud data.

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8   Choose **File > Import > Image plane** and import the image file as an image plane (see *Import an image as a new image plane* (page 24)).

9   Choose **Image > New > Image layer** to create a new layer to sketch on (see *Create an image layer* (page 54)).

10 Choose a **Pencil** tool from the **Brushes** palette (see *Paint and erase* (page 75)).

11 Use your stylus or mouse to sketch in the view (see *Paint and erase* (page 75)).

12 Choose **File > Export > Make picture** to save the sketch as an image file (see *Export a sketch image plane* (page 46)).

13 Choose **DisplayTgls > Model** to display the model again.

Choose **DisplayTgls > Object toggles > Clouds** to display the cloud data again.

14 Choose **File > Print** to print the sketch (see *Print a sketch image plane* (page 48)).

Use sketch image planes as canvases

Use sketch image planes as canvases for sketching on.

Introduction to sketch image planes

Introduces image planes, sketch image planes, and animation image planes.

There are two types of image planes in StudioTools: *animation* image planes and *sketch* image planes. Both types of image planes allow you to load an image file into a view. This image appears in the view and in images rendered from the view's camera (either in front of or behind 3D objects). However, there are important differences between animation image planes and sketch image planes.

Note   You can easily convert an animation image plane to a sketch image plane, or vice versa.

❖   Convert an animation image plane to a sketch image plane or vice versa

A *sketch* image plane allows you to sketch directly in a view. Each sketch image plane contains one or more image layers. You can only load one sketch image plane in each view (that is, for each camera), and you cannot animate sketch image planes in any way. You usually use a sketch image plane for creating conceptual design sketches to use as a reference for modeling or for annotating a model or cloud data.

❖   Introduction to image layers

An *animation* image plane allows you to load a series of image files (that is, an animation) into a view. You can also animate an animation image plane in other ways (for example, keyframing its **Image Plane Properties**). In addition, you can

load several animation image planes into a single view. You usually use an animation image plane as a static or animated background for rendering or as a reference for modeling or animating.

Related topics

❖ **Windows > Edit > Cameras**

❖ Introduction to image layers

Create a sketch image plane

Click the view you want to create a sketch image plane on and choose **Image > New > Image plane**.

You create a sketch image plane for a specific view (for example, the **Front** view). You can create more than one sketch image plane within a StudioTools wire file, but each view can contain only one sketch image plane. For example, the **Top**, **Side**, and **Front** views can each contain a sketch image plane.

If you select a brush and click in a view that does not contain a sketch image plane, StudioTools will automatically create a new sketch image plane. The image plane will be sized to fit the view so that one pixel on the image plane corresponds to one pixel in the view (that is, the size of the view window determines the number of pixels in the sketch image plane).

You can also create a new sketch image plane by importing an image file.

❖ Import an image as a new image plane

The default background color for a sketch image plane is either white or the same gray as its view (so you can't see the image plane until you begin sketching on it).

❖ Set up StudioTools for sketching

You can see the edges of a sketch image plane if you adjust the view.

❖ Change your view of a sketch image plane

You can change the background of the sketch image plane to any color.

❖ Set the background color

To create a new sketch image plane

1 Click the view you want to create a sketch image plane on.

2 Choose **Image > New > Image plane**.

A blank sketch image plane containing one image layer is created in the active view.

Note   To set the size and resolution of the sketch image plane, choose **Image > New > Image plane** ❐, set the **Image Width**, **Image Height**, and **Resolution** options, and click **Go**.

Related topics

* ❖   Import an image as a new image plane
* ❖   Change your view of a sketch image plane
* ❖   Set the background color

Import an image as a new image plane

Use an image as a new image plane by importing, cutting and pasting, or dragging and dropping from Windows Explorer or PortfolioWall.

You may want to import an image file to use as a reference or basis for a sketch. You can either import an image as a new image plane or import an image into an existing sketch image plane as an image layer.

❖ Import an image as an image layer

You can also copy an image from another application and paste it into StudioTools as a new image plane, or drag an image from Windows Explorer or PortfolioWall and drop it into StudioTools to import it as a sketch image plane.

If you import an image file that contains transparency or opacity information (that is, an *alpha* channel), the transparency information is also imported.

To import an image file as a new image plane

1 Click the view you want to load an image file into.

2 Choose **File > Import > Image plane** to open the **File Browser**.

3 Use the **File Browser** to select the image file you want to load and click **Select**.

The image is loaded in the active view as a new animation image plane.

❖ Convert an animation image plane to a sketch image plane or vice versa

To copy and paste an image as a new image plane

1 In another application, load or select the image you want to use and copy it to the Windows clipboard (for example, choose **Edit > Copy**).

2 In StudioTools, click the view you want to paste the image file into.

3 Choose **Image > Paste image**.

The image is pasted in the active view as a new animation image plane.

❖ Convert an animation image plane to a sketch image plane or vice versa

To import images from Windows Explorer or PortfolioWall as a new sketch image plane

Drag the images from Windows Explorer or PortfolioWall and drop them into StudioTools.

The images are imported as new image layers in the active view.

Note   If there is no sketch image plane in the active view, a new sketch image plane is automatically created.

Note   If there is no active view window, the images are not imported.

Name a sketch image plane

Name a sketch image plane.

Each sketch image plane has a name. When you create a sketch image plane, StudioTools automatically names it **Image**, **Image#2**, **Image#3**, and so on. You may, however, want to give a meaningful name to each sketch image plane.

To name a sketch image plane

1   Choose **Windows > Edit > Cameras** to open the **Camera Editor**.

2   Set **Camera** to the view that contains the sketch image plane you want to name.

3   In the **Image Planes** section of the **Camera Editor**, set **Name** to the name you want to use for the image plane.

Change your view of a sketch image plane

Track or dolly your view, set the zoom level percentage, or reset your view to its previous or original setting.

To sketch on different regions of a sketch image plane, you may want to move or *track* the view (left, right, up, or down) or zoom or *dolly* the view (forward or back).

Brushes are most responsive when you are viewing the sketch image plane at its actual size (1:1 or 100%).

Brush strokes may *appear* slow when you are zoomed out of a sketch image plane; however, this is because the stroke is actually very large relative to the sketch image plane.

You can only track and dolly the view of a sketch image plane that is in an *orthographic* view. You cannot track or dolly the view of a sketch image plane that is in a perspective view.

You can access the middle mouse button and right mouse button using the side button on your stylus.

❖ Set up my tablet and stylus

To track the view of a sketch image plane

Do one of the following:

- Hold down *alt shift* and drag in the view with the *MMB* (middle mouse button).
- In the bottom of the **Paint Panel** click the *pan tool* and then drag in the view.

To dolly the view of a sketch image plane

Do one of the following:

- Hold down *alt shift* and drag (left to zoom in, right to zoom out) in the view with the *RMB* (right mouse button).
- In the bottom of the **Paint Panel** click the *zoom tool* and then drag in the view. A red box appears as you drag. Drag so the red box covers the area you want to dolly into or out of. To dolly in, drag toward the right. To dolly out, drag toward the left.

To set the zoom level percentage

Click the *zoom level* button in the view window title bar, and select a zoom level from the menu.

Note   In an orthographic window, selecting a zoom level dollies the camera for that view. In a perspective window, selecting a zoom level scales the size of the sketch image plane.

     ❖   Scale a sketch image plane

To undo a change of view of a sketch image plane

1   Click the view that contains the sketch image plane you want to undo a change of view of.

2   Choose **Cameras > Previous**.

To reset the view of a sketch image plane to its default view

1   Choose **Cameras > Reset view** ❐ to open the **Reset View Options** box.

2   Set **Reset Type** to **Default** and click **Go**.

3   Click the view that contains the sketch image plane you want to reset the view of.

To view a sketch image plane at its actual size (1:1 or 100%)

Click the *zoom level* button in the view window title bar, and select **100%** from the menu.

To view a sketch image plane at its actual size (1:1 or 100%) using the Reset View tool

1   Choose **Cameras > Reset view** ❐ to open the **Reset View Options** box.

2   Set **Reset Type** to **Force 1 to 1** and click **Go**.

3   Click the view that contains the sketch image plane you want to view at actual size.

Hide or show a sketch image plane

Choose **DisplayTgls > Object toggles > Image planes**.

To hide or show all sketch image planes

1 Choose **DisplayTgls > Object toggles > Image planes** ▢ to open the **Toggle Image Plane Options** box.

2 Set **Display Toggle Type** to **Display On/Off** and **Toggle Type** to **All Windows**, then click **Go**.

To hide or show a sketch image plane

1 Click the view that contains the sketch image plane you want to hide or show.

2 Choose **DisplayTgls > Object toggles > Image planes** ▢ to open the **Toggle Image Plane Options** box.

3 Set **Display Toggle Type** to **Display On/Off** and **Toggle Type** to **Current Window**, then click **Go**.

To hide or show a sketch image plane (using the Camera Editor)

1 Choose **Windows > Edit > Cameras** to open the **Camera Editor**.

2 Set **Camera** to the view that contains the sketch image plane you want to hide/show.

3 In the **Image Planes** section of the **Camera Editor**, do one of the following:

- ◆ To *hide* the sketch image plane, set **Display Mode** to **Off**.
- ◆ To *show* the sketch image plane, set **Display Mode** to **Rgb**.

Related topics

- ❖ Hide or show an image layer

Set the background color

In the **Image Layers** window click the **Background** color swatch and choose a color in the **Color Editor**.

To set the background color for a sketch image plane

1 In the **Image Layers** window, click the **Background** *color chip* for the sketch image plane to open the **Color Editor**.
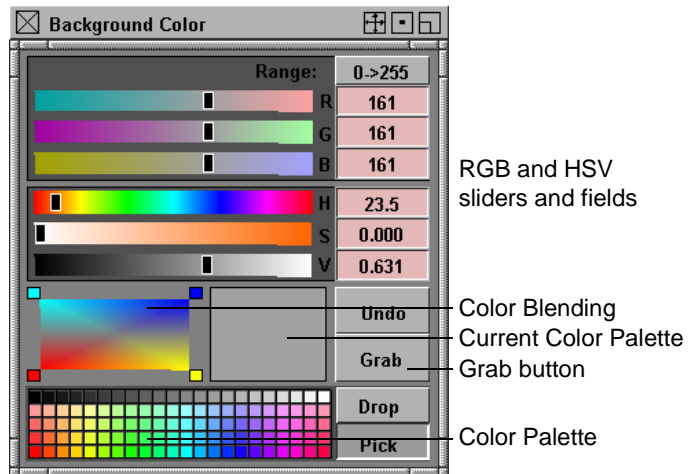
RGB and HSV sliders and fields

Color Blending
Current Color Palette
Grab button

Color Palette

2 In the **Color Editor**, do any of the following to select a color:

   ◆ Adjust the RGB or HSV sliders, or enter RGB or HSV values.

   ◆ Click in the **Color Blending Palette**.

   ◆ Click in the **Color Palette**.

   ◆ Click the **Grab** button and then click anywhere on your screen to pick that color.

Tip To use a color that you have saved to a shelf, click its icon on the shelf.

   ❖ Set brush paint color

The **Current Color Palette** updates with the new color.

Note If you imported a fully opaque image as an image plane, changing the background color will have no effect.

   ❖ Import an image as a new image plane

Note To change the colors in the **Color Blending Palette**, set the current color (for example, using the RGB or HSV sliders) and then click a corner square in the **Color Blending Palette**.

Note To store the current color in the **Color Palette**, click the **Drop** button and then click one of the squares in the **Color Palette**. Click the **Pick** button to allow you to pick colors from the **Color Palette**.

Display hard-edged or soft-edged pixels

In the **Image Layers** window click the check mark icon or dash icon for **Anti-aliased Image**.

Sketch image planes can either display paint and shape pixels with hard-edges or soft-edges (anti-aliased). Soft-edged pixels make colors appear to blend more smoothly into each other. Soft-edged pixels are displayed by default.

There are times when you may want to display hard-edged pixels. For example, if you are zoomed in very close and are editing individual pixels in a sketch, you will find it easier to see individual pixels when they are displayed with hard-edges.

To display hard-edged pixels for all sketch image planes

1   In the **Image Layers** window, click the *white triangle* beside **Sketch Properties**.

2   Beside **Anti-aliased Image** click the *check mark* icon so it becomes a *dash* icon.

To display soft-edged pixels for all sketch image planes

1   In the **Image Layers** window, click the *white triangle* beside **Sketch Properties**.

2   Beside **Anti-aliased Image** click the *dash* icon so it becomes a *check mark* icon.

Adjust sketch image plane brightness, contrast, and color

Dim, brighten, or color-correct a sketch image plane.

If you are using a sketch image plane as a reference for modeling, you may want to reduce the brightness or contrast of the sketch image plane to make it easier to see 3D objects. You can also adjust the overall colors of a sketch image plane.

To dim all sketch image planes

1   Choose **DisplayTgls > Object toggles > Image planes** ❏ to open the **Toggle Image Planes Options** box.

2   Set **Display Toggle Type** to **Dim/Undim**.

3   Set the **RGB Mult** and **RGB Offset** values that you want dimmed sketch image planes to be displayed with. The default values are 0.55.

4   Click **Go**.

Note   This is the same as setting the sketch image plane **RGB Mult** and **RGB Offset** values in the **Camera Editor** for all sketch image planes (see below).

Note   To undim all sketch image planes, choose **DisplayTgls > Object toggles > Image planes**.

To adjust sketch image plane brightness, contrast, or color

1   Choose **Windows > Edit > Cameras** to open the **Camera Editor**.

2   Set **Camera** to the view that contains the sketch image plane you want to adjust.

3   In the **Image Planes** section of the **Camera Editor**, do any of the following:

- ◆ To adjust the *brightness* of the sketch image plane, set the **RGB Mult** value.

- ◆ To adjust the *contrast* of the sketch image plane, set the **RGB Offset** value.

- ◆ To multiply all colors in the sketch image plane, click the **RGB Mult** *color chip* to open the **Color Editor** and select a color.

- To offset all colors in the sketch image plane, click the **RGB Offset** *color chip* to open the **Color Editor** and select a color.

Hide or show view grids

Toggle the display of view grids (choose **DisplayTgls > Window toggles > Grid**) or set the grid spacing (choose **Construction > Grids > Grid Spacing**).

To hide or show grids in all views

Choose **DisplayTgls > Window toggles > Grid**.

To hide or show the grid for a view

1 Click the view that you want to hide or show grids in.

2 Choose **DisplayTgls > Window toggles > Grid** ⊡ to open the **Toggle Grid Options** box.

3 Set **Toggle Type** to **Current Window**.

4 Click **Go**.

To change the spacing of grid lines in all views

1 Choose **Construction > Grids > Grid Spacing**.

Note To change the spacing of grid lines in one view, click the view to select it, choose **Construction > Grids > Grid Spacing** ⊡, set **Windows** to **Current**, and click **Go**.

2 Type the distance that you want between grid lines (measured in the main linear unit) and press *Enter*.

or

Drag the mouse left or right to resize the grid interactively.

❖ Set up StudioTools for sketching

To reset the spacing of grid lines in all views

Choose **Construction > Grids > Grid Preset**.

Note To reset the spacing of grid lines in one view, click the view to select it, choose **Construction > Grids > Grid Preset** ⊡, set **Windows** to **Current**, and click **Go**.

The view grids are reset to their default spacing.

Synchronize sketch image plane views

Choose **DisplayTgls > Window toggles > Window sync**.

If each view contains its own sketch image plane (for example, representing different views of a model), and you adjust your view of each image plane differently, the size and position of the image plane sketches will not correspond to each other.

You may want to synchronize all of your orthographic sketch image planes so that whenever you change the view of one image plane, the views of all other image planes automatically adjust.

To synchronize or unsynchronize all sketch image planes

Choose **DisplayTgls > Window toggles > Window sync**.

Scale a sketch image plane

Resize a sketch image plane by scaling it.

You can scale a sketch image plane to change its size relative to its view.

Resizing or scaling a sketch image plane changes the actual image plane, but it does not change the absolute size of the sketch image (measured in pixels). If you only want to change your view of a sketch image plane, *do not* resize or scale it.

❖ Change your view of a sketch image plane

To scale a sketch image plane interactively

1 Choose **Pick > Image plane**.

2 Click the *Pick Image Plane* button (directly below the **File** menu).

3 Click in the view to pick the sketch image plane.

4 Choose **Xform > Scale**.

A manipulator appears on the sketch image plane.
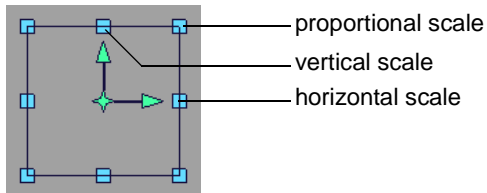
proportional scale
vertical scale
horizontal scale

Note The manipulator will not appear if objects other than image planes are selected (for example, surfaces).

5 Drag a manipulator handle to scale the sketch image plane, or click a manipulator handle to select it (the handle will become white) and either:

◆ drag anywhere in the view

◆ press the arrow keys

◆ type the horizontal and vertical values you want to scale the sketch image plane by and press *Enter*.

Note Choose **Edit > Undo** while the **Scale** tool is still active to undo the sketch image plane transformation.

Note If you transform a sketch image plane, the transformation will be applied as you drag the manipulator.

Note The manipulator is centered on the sketch image plane's pivot point. To adjust the position of the pivot point, use the **Xform > Local > Set pivot** tool. To position the pivot point in the center of the sketch image plane, use the **Xform > Local > Center pivot** tool.

To scale a sketch image plane (using the Camera Editor)

1 Choose **Windows > Edit > Cameras** to open the **Camera Editor**.

2 Set **Camera** to the view that contains the sketch image plane you want to scale.

3 In the **Image Planes** section of the **Camera Editor**, set the horizontal or vertical **Size** value (measured in the main linear unit) for the sketch image plane.

When you set one of the **Size** values, the sketch image plane is scaled proportionally; that is, when you set the X value, the Y value automatically updates (and vice versa).

❖ Set up StudioTools for sketching

Crop or extend a sketch image plane

Resize a sketch image plane by cropping or extending.

You can crop or extend the top, bottom, or side of a sketch image plane to remove part of a sketch or to change the size and shape of the sketch image plane. You can crop or extend a sketch image plane using either the **Marquee** tool, the **Image Layers** window, the **Camera Editor** or the **Resize** command.

When you crop a sketch image plane, the cropped regions still exist. If you later extend the sketch image plane, the cropped parts of the sketch will return.

To crop or extend a sketch image plane (using the Marquee tool)

1   Use the **Brushes > Select > Marquee (rectangle)** tool to select a rectangular region.

   ❖   Create a temporary mask by selecting a region

   This region will be the new size of the sketch image plane:

   ◆   To crop the sketch image plane, select a rectangular region within the sketch image plane. Areas outside the region will be shaded pink.

   ◆   To extend the sketch image plane, select a rectangular region that extends beyond the edges of the sketch image plane. There will be no visual indication of the region's boundary.

2   Choose **Image > Crop**.

   The sketch image plane is either cropped (if the border of the rectangular region is within the existing sketch image plane) or extended (if the rectangular region extends beyond the edges of the existing sketch image plane).

To crop or extend a sketch image plane (using the Image Layers window)

1   In the **Image Layers** window, click the *white triangle* beside **Sketch Properties**.

2   Double-click one of the **Pixels** values.

   The left value is the width of the sketch image plane; the right value is the height.

3 Type a new value and press *Enter*.

The sketch image plane is cropped or extended horizontally from the right or vertically from the top (or both).

Note This is the same as setting the sketch image plane **Pixels** values in the **Camera Editor** with **Extend/Crop Right** and **Extend/Crop Top** both on (see below).

To crop or extend a sketch image plane (using the Camera Editor)

1 Choose **Windows > Edit > Cameras** to open the **Camera Editor**.

2 Set **Camera** to the view that contains the sketch image plane you want to crop/extend.

3 In the **Image Planes** section of the **Camera Editor**, do the following:

◆ To extend the right side of the sketch image plane, turn on **Extend/Crop Right** and increase the X **Pixels** value.

◆ To extend the left side of the sketch image plane, turn off **Extend/Crop Right** and increase the X **Pixels** value.

◆ To extend the top of the sketch image plane, turn on **Extend/Crop Top** and increase the Y **Pixels** value.

◆ To extend the bottom of the sketch image plane, turn off **Extend/Crop Top** and increase the Y **Pixels** value.

◆ To crop the right side of the sketch image plane, turn on **Extend/Crop Right** and decrease the X **Pixels** value.

◆ To crop the left side of the sketch image plane, turn off **Extend/Crop Right** and decrease the X **Pixels** value.

◆ To crop the top of the sketch image plane, turn on **Extend/Crop Top** and decrease the Y **Pixels** value.

◆ To crop the bottom of the sketch image plane, turn off **Extend/Crop Top** and decrease the Y **Pixels** value.

Note The **Pixels** parameter represents the horizontal and vertical size of the sketch image plane in pixels. When you set the **Pixels** values, the sketch image plane is extended or cropped (and the **Size** values are automatically updated).

To crop or extend a sketch image plane (using the Resize command)

1   Click the view that contains the sketch image plane you want to crop/extend.

2   Choose **Image > Resize** ❐ to open the **Change Image Plane Options** box.

3   Set the **Change Image Plane Options**.

4   Click **Go**.

Move a sketch image plane

Move a sketch image plane horizontally, vertically, or in front of or behind 3D objects.

You can move a sketch image plane to change its position relative to its view. Moving a sketch image plane in this way changes the actual image plane. If you only want to change your view of a sketch image plane, *do not* move it.

❖ Change your view of a sketch image plane

You can also move a sketch image plane so that it appears behind (background) or in front of (foreground) the grid and 3D objects.

You can also move an individual image layer.

❖ Move, scale, or rotate an image layer

To move a sketch image plane horizontally or vertically (using the Move tool)

1 Choose **Pick > Image plane**.

2 Click the *Pick Image Plane* button (directly below the **File** menu).

3 Click in the view to pick the sketch image plane.

4 Choose **Xform > Move**.

A manipulator appears on the sketch image plane.
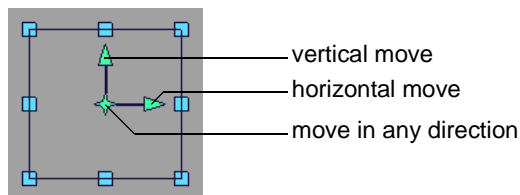
vertical move
horizontal move
move in any direction

Note The manipulator will not appear if objects other than image planes are selected (for example, surfaces).

5 Drag a manipulator handle to move the sketch image plane, or click a manipulator handle to select it (the handle will become white) and either:

◆ drag anywhere in the view

◆ press the arrow keys

- ◆ type the horizontal and vertical values you want to move the sketch image plane by and press *Enter*.

Note Choose **Edit > Undo** while the **Move** tool is still active to undo the sketch image plane transformation.

Note If you transform a sketch image plane, the transformation will be applied as you drag the manipulator.

Note The manipulator is centered on the sketch image plane's pivot point. To adjust the position of the pivot point, use the **Xform > Local > Set pivot** tool. To position the pivot point in the center of the sketch image plane, use the **Xform > Local > Center pivot** tool.

To move a sketch image plane horizontally or vertically (using the Camera Editor)

1 Choose **Windows > Edit > Cameras** to open the **Camera Editor**.

2 Set **Camera** to the view that contains the sketch image plane you want to move.

3 In the **Image Planes** section of the **Camera Editor**, set the following parameters:

- ◆ **Bottom Left**—The location of the bottom left corner of the sketch image plane (in the main linear unit). If you set the **Bottom Left** X (or Y) value, the **Top Right** X (or Y) value automatically updates.

- ◆ **Top Right**—The location of the top right corner of the sketch image plane (in the main linear unit). If you set the **Top Right** X (or Y) value, the **Bottom Left** X (or Y) value automatically updates.

- ❖ Set up StudioTools for sketching

To move a sketch image plane behind or in front of the grid and 3D objects (using the Image Layers window)

1 In the **Image Layers** window, click the *white triangle* beside **Sketch Properties**.

2 In the **Image Layers** window, click the *gray diamond* beside either **Foreground** or **Background** (so it becomes a *black diamond*).

To move a sketch image plane behind or in front of the grid and 3D objects (using the Camera Editor)

1   Choose **Windows > Edit > Cameras** to open the **Camera Editor**.

2   Set **Camera** to the view that contains the sketch image plane you want to move.

3   In the **Image Planes** section of the **Camera Editor**, set the **Depth** parameter to either **Foreground** or **Background**.

Convert an animation image plane to a sketch image plane or vice versa

Convert an animation image plane to a sketch image plane or vice versa.

Although sketch image planes and animation image planes are slightly different, they are both image planes and you can easily convert an animation image plane to a sketch image plane. When you convert an animation image plane to a sketch image plane, the animation image plane's image file becomes an image layer in the sketch image plane. You can then sketch on it.

> ❖ Introduction to sketch image planes

You can also convert a sketch image plane to an animation image plane. When you convert a sketch image plane to an animation image plane, StudioTools first merges the background layer and all image layers (and shape layers) in the sketch image plane into a single image layer (see *Merge image layers* (page 67)), and then saves the image as a separate file (see *Name a sketch image plane* (page 26)). If you then convert the animation image plane back to a sketch image plane, the sketch image plane will only contain a single image layer.

If you try to sketch on an animation image plane, StudioTools will automatically convert the animation image plane to a sketch image plane.

To convert an animation image plane to a sketch image plane or vice versa

1 Choose **Windows > Edit > Cameras** to open the **Camera Editor**.

2 Set **Camera** to the view that contains the image plane you want to convert.

3 In the **Image Planes** section of the **Camera Editor**, do the following:

- To convert an *animation* image plane to a *sketch* image plane, turn on **Sketch Layers**.

- To convert a *sketch* image plane to an *animation* image plane, turn off **Sketch Layers**.

Export a sketch image plane

Click the view and choose **File > Export > Make picture**.

After you have created a sketch, you may want to export it as an image file. You can either export an entire sketch image plane as an image or export a single layer as an image. You can also export a sketch image plane together with 3D objects.

❖ Export an image layer

To export a sketch image plane

1 Click the view that contains the sketch image plane you want to export as an image.

2 Choose **File > Export > Make picture** to open the **File Browser**.

Tip To choose the image file format, choose **File > Export > Make picture** ❑ to open the **Save Image Options** box, choose the image file format (JPEG, ALS, TIFF, 24 bit BMP, or 32 bit BMP), and click **Go**.

3 Use the **File Browser** to enter a name for the image file and click **Save**.

The image is saved.

Note When you export a sketch image plane using **File > Export > Make picture**, any areas of the sketch that do not contain paint will be either transparent (if the sketch image plane is in the **Foreground**) or fully opaque with the background color (if the sketch image plane is in the **Background**). See *Move a sketch image plane* (page 42) and *Set the background color* (page 30).

Note You can export a sketch image plane in 32 bit BMP format, so that the image file contains four channels (RGBA), or in 24 bit BMP format, so that the image file contains three channels (RGB). Many graphics applications cannot read 32 bit BMP files. In these cases, export the sketch image plane in 24 bit BMP format or use the `imgcvt` utility to convert the 32 bit BMP file to a 24 bit BMP file.

To export a sketch image plane together with 3D objects

1 Click the view that contains the sketch image plane and 3D objects you want to export as an image.

2 Close any open windows or option boxes that are covering the view.

3 Choose **File > Export > Current window** to open the **File Browser**.

4 Use the **File Browser** to enter a name for the image file and click **Save**.

The image is saved as an Alias pix file.

Print a sketch image plane

Choose **File > Print**.

To print a sketch image plane

Choose **File > Print** to open the **Print Preview** window. (See **File > Print** and **File > Print Setup** for more information.)

Delete a sketch image plane

Permanently remove a sketch image plane.

If you no longer need a sketch image plane (for example, if you have finished sketching and exported the sketch image), you may want to delete it. (If you save a wire file that contains a sketch image plane, the sketch image will be saved within the wire file, and the wire file may become significantly larger.)

To delete a sketch image plane (method 1)

1 Choose **Pick > Image plane**.

2 Click the *Pick Image Plane* button (directly below the **File** menu).

3 Click the view of the sketch image plane you want to delete.

4 Choose **Delete > Del active** or press *delete*.

The sketch image plane is deleted.

To delete a sketch image plane (method 2)

1 Click the view that contains the sketch image plane you want to delete.

2 Choose **Delete > Del image planes** ☐ to open the **Delete Image Plane Options** box.

3 Set **Delete Type** to **Current Window**.

4 Click **Go**.

The sketch image plane is deleted.

To delete all sketch image planes

1 Choose **Delete > Del image planes** ☐ to open the **Delete Image Plane Options** box.

2 Set **Delete Type** to **All Windows**.

3 Click **Go**.

All sketch image planes are deleted.

Organize a sketch using image layers

Use image layers as transparent layers for sketching on.

Introduction to image layers

Introduces image layers

Each sketch image plane can contain one or more *image layers*. An image layer is like a piece of transparent acetate that you can sketch on.

By sketching different elements on different image layers you can easily make changes to individual elements or re-arrange image layers to change their order. You can also duplicate image layers, merge image layers together, temporarily hide image layers, or permanently delete image layers.

Note   If a **Brushes** palette tool is active, you can undo most layer operations (for example, deleting a layer, merging layers) by choosing **Edit > Undo**. If a **Brushes** palette tool is not active, you cannot undo layer operations.

Each sketch image plane also contains a *background layer*. The background layer defines the background color for the sketch image plane. You can only change the color of the background layer; you cannot rename, move, or delete it.

❖   Set the background color

The background layer is only displayed if the sketch image plane is behind 3D objects (that is, it is in the background).

❖   Move a sketch image plane

A sketch image plane can also contain shape layers (see *Introduction to shapes* (page 100)) and mask layers (see *Introduction to masks* (page 110)).

View the arrangment of image layers

Choose **Windows > Edit > Image layers**.

To view the arrangement of image layers

Choose **Windows > Edit > Image layers** to open the **Image Layers** window.

To view image layers for the active sketch image plane

In the **Image Layers** window choose **Show > Active sketch**.

To view image layers for all sketch image planes

In the **Image Layers** window choose **Show > All sketches**.

Create an image layer

Choose **Image > New > Image layer**.

By default, a sketch image plane contains one image layer. You can, however, create several additional image layers for each sketch image plane.

If your scene contains an animation image plane but no sketch image planes, when you create a new image layer, StudioTools automatically converts the image plane in the active view to a sketch image plane and creates a new image layer.

If your scene does not contain any image planes, when you create a new image layer, StudioTools automatically creates a new sketch image plane in the active view.

To create a new image layer

1 Select the image layer you want to create a new image layer above.

    ❖ Select an image layer

2 Do one of the following:

    ◆ choose **Image > New > Image layer**.

    ◆ in the **Image Layers** window, choose **Edit > New image layer**.

A blank image layer is added to the sketch image plane (above the active image layer) and becomes the active image layer.

Note   You can undo the creation of a new layer by choosing **Edit > Undo** only if a **Brushes** palette tool is active.

Name an image layer

Double-click the layer name in the **Image Layers** window, type a new name, and press Enter.

By default, image layers are named **Layer-1**, **Layer-2**, **Layer-3**, and so on. Whenever you create new image layers, you should give them meaningful names (for example, **Background**, **Outline**, **Handle**).

The name of each image layer is listed in the **Image Layers** window.

To name an image layer

1   In the **Image Layers** window, double-click the image layer's *layer name*.

2   Type a new name for the image layer and press *Enter*.

Import an image as an image layer

Choose **File > Import > Image/mask layer**.

You may want to import an image file to use as a reference or basis for a sketch. You can either import an image as a new sketch image plane or import an image as an image layer into an existing sketch image plane. You can also drag an image from Windows Explorer or PortfolioWall and drop it into StudioTools to import it as an image layer.

If you import an image file that contains transparency or opacity information (that is, an *alpha* channel), the transparency information is also imported.

To import an image file onto a sketch image plane

1   Click the view that you want to import an image file onto. (The view may or may not already contain a sketch image plane.)

2   Choose **File > Import > Image/mask layer** to open the **File Browser**.

3   Use the **File Browser** to select the image file you want to load and click **Open**.

    To import multiple image files at once, Shift-click each file in the **File Browser**. The order of the imported image layers is based on the order that the image files are listed in the **File Browser**.

    ◆   If the active view contains a sketch image plane, then the image is loaded onto it as an image layer.

    ◆   If the active view contains an animation image plane, then the image plane is converted to a sketch image plane and the image is loaded onto it as an image layer.

    ◆   If the active view does not contain an image plane, then a new sketch image plane is created and the image is loaded onto it as an image layer (filling the entire sketch image plane). The size and resolution of the sketch image plane is based on the **New Image Options**.

Note If there is an active selection mask, the image is imported to the center of the selection mask. If there is not an active selection mask, the image is imported to the center of the sketch image plane.

To import images from Windows Explorer or PortfolioWall as image layers

1 Click the StudioTools view you want to load image files onto.

2 Drag the images from Windows Explorer or PortfolioWall and drop them into StudioTools.

The images are imported as new image layers in the active view.

Note If there is no sketch image plane in the active view, a new sketch image plane is automatically created.

Note If there is no active view, the images are not imported.

Related topics

❖ Import an image as a new image plane
❖ Create a mask from an image file

Select an image layer

Click the image layer name in the **Image Layers** window.

You can only sketch on one image layer at a time. This image layer is referred to as the *active* image layer. In order to sketch on an image layer you must select it (making it the active image layer).

You may also need to select an image layer in order to:

- duplicate it
  - ❖ Duplicate an image layer
- merge it with another image layer, or
  - ❖ Merge image layers
- delete it.
  - ❖ Delete an image layer

The active image layer is indicated by *active image layer* in the active view window title bar and is highlighted in white in the **Image Layers** window.

To select an image layer

Do one of the following:

- In the view window title bar click the *active image layer* button and select an image layer from the menu.
- In the **Image Layers** window click the image layer you want to select.

  The image layer is highlighted in white, indicating that it is the active image layer.

Duplicate an image layer

Select the image layer and choose **Image > Duplicate layer**.

When you duplicate an image layer, StudioTools creates a new image layer that contains an image identical to the original image layer.

To duplicate an image layer

1   Select the image layer you want to duplicate.

   ❖   Select an image layer

2   Do one of the following:

   ◆   choose **Image > Duplicate layer**.

   ◆   in the **Image Layers** window, choose **Edit > Duplicate layer**.

   The image layer is duplicated.

   The duplicated image layer is placed above the original image layer and becomes the active image layer.

Note   You can undo the duplication of a layer by choosing **Edit > Undo** only if a **Brushes** palette tool is active.
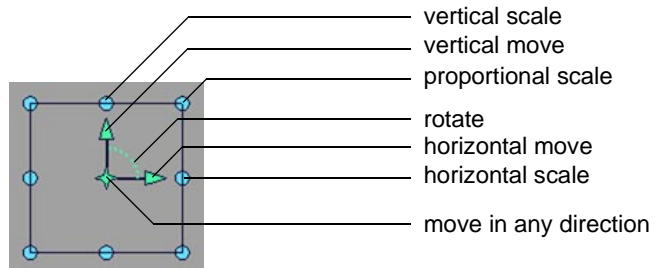
Move, scale, or rotate an image layer

Move, resize, or rotate an image layer.

You can move, scale, or rotate an image layer relative to its sketch image plane or relative to other image layers (if the sketch image plane contains more than one image layer).

To move, scale, or rotate an image layer

1   Select the image layer you want to move, scale, or rotate.

    ❖   Select an image layer

2   Choose **Pick > Image plane**.

3   Click the *Pick Image Layer* button (directly below the **File** menu).

4   Click in the view to pick the image layer.

5   Choose **Xform > Move**, **Xform > Rotate**, or **Xform > Scale**.

    A manipulator appears on the image layer.

vertical scale
vertical move
proportional scale

rotate
horizontal move
horizontal scale

move in any direction

Note   The manipulator will not appear if objects other than image layers are selected (for example, surfaces).

6   Drag a manipulator handle to transform the image layer, or click a manipulator handle to select it (the handle will become white) and either:

    ◆   drag anywhere in the view

    ◆   press the arrow keys to transform the image layer one pixel at a time

    ◆   type the horizontal and vertical values you want to move the sketch image plane by and press *Enter*.

7 Choose **Edit > Undo** to undo the last image layer transformation. To undo all image layer transformations, select another tool.

To accept the image layer transformation, click the **Accept** button in the view.

Note When you transform an image layer, the transformation will not be applied until you click the **Accept** button in the view.

Note The manipulator is centered on the image layer's pivot point. To adjust the position of the pivot point, use the **Xform > Local > Set pivot** tool. To position the pivot point in the center of the image layer, use the **Xform > Local > Center pivot** tool.

Related topics

- ❖ Scale a sketch image plane
- ❖ Move a sketch image plane

Flip an image layer horizontally or vertically

Choose **Image > Effect > Horizontal flip** or **Image > Effect > Vertical flip**.

To flip an image layer horizontally or vertically

1 Select the image layer you want to flip.

   ❖ Select an image layer

2 Choose one of the following:

   ◆ **Image > Effect > Horizontal flip**
   ◆ **Image > Effect > Vertical flip**

Arrange image layers

Use the middle mouse button to drag the image layer name in the **Image Layers** window.

When a sketch image plane contains more than one image layer, you can arrange the image layers in any order. For example, you can move an image layer so that it appears behind or in front of another image layer.

To move an image layer up or down

In the **Image Layers** window use the *MMB* (middle mouse button) to drag the image layer you want to move.

When you drag an image layer with the *MMB* (middle mouse button), it becomes highlighted with a red border.

Red Border
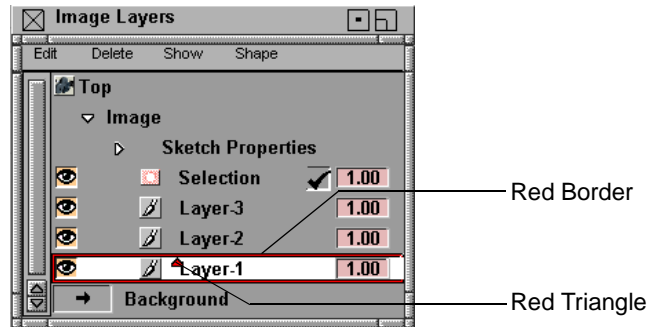
Red Triangle

A red triangle within the red border indicates where the image layer will be moved to (when you release the *MMB*) relative to the current location of the red border.

For example, if you move **Layer-1** and release the middle mouse button on **Layer-2** so that the red triangle points up, **Layer-1** will be moved above **Layer-2**.
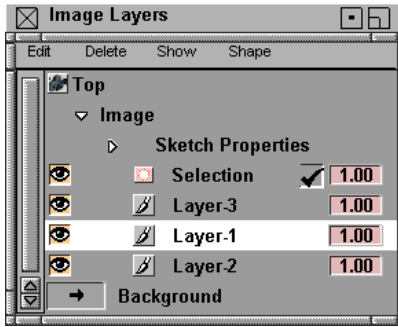
Note You can undo the re-arrangement of a layer by choosing **Edit > Undo** only if a **Brushes** palette tool is active.

Hide or show an image layer

In the **Image Layers** window click the open-eye or closed-eye icon for the image layer.

To make it easier to sketch on individual image layers, you may want to hide some image layers while you are sketching. You can then show these hidden image layers when you are finished.

Visible image layers are listed in the **Image Layers** window with an *open eye* icon. Hidden image layers are listed with a *closed eye* icon.

To hide an image layer

In the **Image Layers** window, click the *open eye* icon of the image layer you want to hide.

The icon becomes a *closed eye* to indicate that the image layer is hidden.

To hide all image layers except the active image layer

In the **Image Layers** window, choose **Show > Hide all layers (except active)**.

To show a hidden image layer

In the **Image Layers** window, click the *closed eye* icon of the image layer you want to show.

The icon becomes an *open eye* to indicate that the image layer is visible.

To show all image layers

In the **Image Layers** window, choose **Show > Show all layers**.

Related topics

❖ Customize the mask display

Change the opacity of an image layer

In the **Image Layers** window select the opacity value for the image layer, type a new value, and press Enter.

To make it easier to sketch on individual image layers while referencing other image layers, you may want to reduce the opacity of some image layers while you are sketching. You can then increase their opacity when you are finished. (You may also want to reduce image layer opacity to "ghost back" an image.)

Note   You can also control the opacity of paint as you are sketching.

❖   Set brush and paint opacity

The opacity of an image layer controls how see-through *all* paint on it is. (Opacity is the opposite of transparency.) An opacity of 1 means you cannot see anything underneath the paint. The lower the opacity, the more you can see through the image layer's paint. An opacity of 0 means the image layer's paint is perfectly clear and invisible.

Each image layer's opacity is indicated by a *layer opacity* value along the right side of the **Image Layers** window.

To change the opacity of an image layer

1   In the **Image Layers** window, select the image layer's *layer opacity* value.

2   Type a new opacity value for the image layer and press *Enter*.

Tip   To interactively adjust the opacity value, hold down *alt* and drag the *MMB* (middle mouse button) in the *layer opacity* field.

Merge image layers

Choose **Image > Modify layer > Merge below**, **Image > Modify layer > Merge visible image layers**, or **Image > Modify layer > Merge all image layers**.

After you have finished sketching on two or more image layers, you may want to merge them into a single image layer. Once you merge two or more image layers together, you cannot split them into separate image layers.

To merge an image layer with the image layer beneath it

1 Select the image layer you want to merge.

   ❖ Select an image layer

2 Do one of the following:

   ◆ Choose **Image > Modify layer > Merge below**.

   ◆ In the **Image Layers** window choose **Edit > Merge below**.

   The image layer is merged with the image layer beneath it.

Note You can undo the merging of layers by choosing **Edit > Undo** only if a **Brushes** palette tool is active.

To merge all visible image layers into a single image layer

   ❖ Hide or show an image layer

1 Do one of the following:

   ◆ Click the view of the sketch image plane you want to merge all visible image layers.

   ◆ Select any image layer in the sketch image plane you want to merge all visible image layers.

   ❖ Select an image layer

2 Do one of the following:

   ◆ Choose **Image > Modify layer > Merge visible layers**.

   ◆ In the **Image Layers** window choose **Edit > Merge visible image layers**.

   All visible image layers in the sketch image plane are merged into the lowest visible layer.

Note You can undo the merging of layers by choosing **Edit > Undo** only if a **Brushes** palette tool is active.

To merge all image layers into a single image layer

1 Do one of the following:

- Click the view of the sketch image plane you want to merge all image layers.

- Select any image layer in the sketch image plane you want to merge all image layers.

- Select an image layer

2 Do one of the following:

- Choose **Image > Modify layer > Merge all image layers**.

- In the **Image Layers** window choose **Edit > Merge all image layers**.

All image layers in the sketch image plane are merged into a single image layer.

Note You can undo the merging of layers by choosing **Edit > Undo** only if a **Brushes** palette tool is active.

Export an image layer

Select the image layer and choose **File > Export > Image/mask layer**.

After you have created a sketch, you may want to export it as an image file. You can either export an entire sketch image plane or export a single image layer.

❖ Export a sketch image plane

Note You can export an image layer in 32 bit BMP format, so that the image file contains four channels (RGBA), or in 24 bit BMP format, so that the image file contains three channels (RGB). Many graphics applications cannot read 32 bit BMP files. In these cases, export the image layer in 24 bit BMP format or use the `imgcvt` utility to convert the 32 bit BMP file to a 24 bit BMP file.

To export an image layer

1 Click the view that contains the image layer you want to export as an image.

2 Select the image layer you want to export.

❖ Select an image layer

3 To export part of an image layer, select the region you want to export.

❖ Create a temporary mask by selecting a region

4 Choose **File > Export > Image/mask layer** to open the **File Browser**.

Tip To choose the image file format choose **File > Export > Image/mask layer** ❐, choose the image file format (JPEG, ALS, TIFF, 24 bit BMP, or 32 bit BMP), and click **Go**.

5 Use the **File Browser** to enter a name for the image file and click **Save**.

The image is saved.

Clear an image layer

Select the image layer and choose **Image > Modify layer > Clear image**.

When you clear an image layer, all paint is removed from the unmasked regions of the image layer, but the image layer is not deleted. You can then continue sketching on the image layer.

To clear an image layer

1 Select the image layer you want to clear.

   ❖ Select an image layer

2 Do one of the following:

   ◆ Choose **Image > Modify layer > Clear image**.

   ◆ In the **Image Layers** window choose **Edit > Clear image layer**.

   All paint is cleared from the image layer.

Note You can undo the clearing of a layer by choosing **Edit > Undo** only if a **Brushes** palette tool is active.

Related topics

   ❖ Introduction to masks

Delete an image layer

Select the image layer and choose **Delete > Del active image layer**.

You can delete an image layer to permanently remove it from a sketch image plane.

When you delete an image layer:

- The image layer below the deleted image layer becomes the active image layer.

- If there is no image layer below the deleted image layer, the image layer above the deleted image layer becomes the active image layer.

- If there is no other image layer in the sketch image plane, a new blank image layer is automatically created and becomes the active image layer.

To delete an image layer

1 Select the image layer you want to delete.

   ❖ Select an image layer

2 Do one of the following:

   ◆ Choose **Delete > Del active image layer**.

   ◆ In the **Image Layers** window choose **Delete > Active layer**.

   The active image layer is deleted.

Note   You can undo the deletion of a layer by choosing **Edit > Undo** only if a **Brushes** palette tool is active.

Apply and remove paint using brushes

Use brushes to apply paint, erase, hide, and show paint, clone regions; customize brush properties and brush display.

Introduction to brushes

Introduces brushes.

Markers, Airbrushes, Solidbrushes, Sharpenbrushes, Blurbrushes, Smear-brushes, Clonebrushes, and Hide/Show mode are not available in Surface-Studio. The default pencils in SurfaceStudio are colored.

The sketching tools in StudioTools are collectively referred to as brushes. When you create a sketch, you use a brush to apply paint to an image layer in a sketch image plane.

Paint and erase

Choose a brush tool **Brushes > Brush type > Brush name** and drag in a view.

Markers, Airbrushes, Solidbrushes, Sharpenbrushes, Blurbrushes, Smearbrushes, Clonebrushes, and Hide/Show mode are not available in SurfaceStudio. The default pencils in SurfaceStudio are colored.

To select a brush and sketch with it

1 Choose a brush tool (**Brushes > Brush type > Brush name**).

The **Pencil**, **Marker**, **Airbrush**, and **Solidbrush** tools let you drag the stylus to apply strokes of paint to a sketch image plane.

Pencil

Marker

Airbrush

Solidbrush

The **Eraser** tools lets you drag the stylus to remove paint from a sketch image plane in strokes.

Eraser
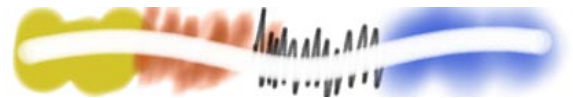
When a brush tool is active, the cursor becomes a crosshair with the letter **P** (paint), **E** (erase), **H** (hide), or **S** (show).

When you hold the cursor over a sketch image plane, the cursor also displays a preview image of how the brush will apply paint to the sketch.
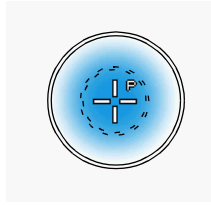
Note You can turn off the brush preview and radius indicator.

❖ Customize brushes and paint

2 Drag the stylus on the sketch image plane to begin sketching.

Tip To quickly switch between painting and erasing using the same brush, with a brush tool active press and release F1 to paint or F2 to erase.

Note You can undo up to ten brush strokes by choosing **Edit > Undo** only if a brush tool is active.

Tip To make any brush erase paint, set the **Brush Color** to black and set the **Color Opacity** to 0. (To keep these settings for the brush, turn on **Preserve Color**.) See *Customize brushes and paint* on page 78.

Tip To create a horizontal brush stroke in an orthographic window, drag the *MMB* (middle mouse button or the equivalent stylus button).

To create a vertical brush stroke in an orthographic window, drag the *RMB* (right mouse button or the equivalent stylus button). See *Set up my tablet and stylus* on page 9.

Tip To snap a brush to a curve, click the *curve snap* button to the right of the prompt line (or hold down *ctrl alt*). See *Snap a brush to a curve* on page 93.

Note Brushes are most responsive when you are viewing the sketch image plane at its actual size (1:1 or 100%). See *Change your view of a sketch image plane* on page 27.

Brush strokes may *appear* slow when you are zoomed out of a sketch image plane; however, this is because the stroke is actually very large relative to the sketch image plane.

Note Brushes may be more responsive if you do not have any other windows open (for example, the **Image Layers** window or the **Color Editor**).

Note   Brushes may be more responsive if you do not have any other applications running.

Note   If you cannot paint, the active image layer may be hidden (the cursor becomes a *shape cursor*) or may contain hidden paint (you cannot paint over hidden paint) or the active layer may be a shape layer (you cannot paint on a shape layer; the cursor becomes a *shape cursor*).

Customize brushes and paint

Choose **Brushes > Brush type > Brush name** ☐ and set the **Brush Options**.

To customize a brush

1 Do one of the following:

- ◆ Choose a brush, then choose **Image > Tgl paint panel** to display the **Paint Panel**.
- ◆ Choose **Brushes > Brush type > Brush name** ☐ to open the **Brush Options** box.

Note If the **Brush Properties** section is not open, click **Brush Properties** to open it.

2 To customize the brush, do the following:

To set the brush's...	See...
Mode	*Set brush mode to paint, erase, hide, or show* (page 81)
Color	*Set brush paint color* (page 82)
Opacity	*Set brush and paint opacity* (page 85)
Marker wetness	*Set marker wetness* (page 87)
Size, shape, or profile	*Set brush size, shape, and profile* (page 88)
Stroke properties	*Set brush stroke properties* (page 91)

Note To reset a brush to its default settings, click **Reset** in the **Brush Options** box or hold down *shift* and click the brush tool icon.

3 Drag the stylus on the sketch image plane to begin sketching.

Tip To save the brush to a shelf, use the *MMB* (middle mouse button or the equivalent stylus button) to drag the brush icon from the **Brush Options** box (or from the **Brushes** palette) to the shelf.

To save a brush to a shelf

Use the *MMB* (middle mouse button or the equivalent stylus button) to drag the brush icon from the **Brush Options** box (or from the **Brushes** palette) to the shelf.

Customize brush display

Choose **Preferences > Interface > Interface options** ❏ and set **Brush Stamp Preview** and **Brush Cursor Outline**.

To display or hide the brush preview

1   Choose **Preferences > Interface > Interface options** ❏ to open the **Interface Options** box.

2   Do the following:

   ◆   To display or hide the brush preview turn **Brush Stamp Preview** on or off.

   crosshair
   preview
   minimum radius outline
   maximum radius outline
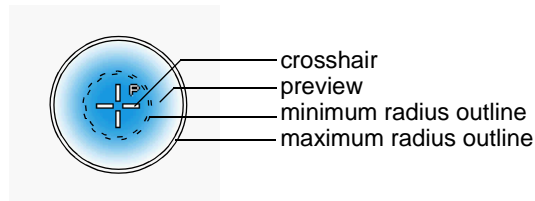
   ◆   To display or hide the brush radius set **Brush Cursor Outline** to one of the following:

On	always display brush outline
Off During Stroke	display brush outline except when creating a stroke of paint
Off	do not display brush outline

Note   Brush outlines will only appear on systems with graphics cards that support hardware overlay planes.

Brush outlines are not displayed for very small brushes.

3   Click **Go**.

Set brush mode to paint, erase, hide, or show

In the **Paint Panel** or **Brush Options** box set **Brush Mode**.

Hide/Show mode is not available in SurfaceStudio.

To set the brush mode

In the **Paint Panel** or **Brush Options** box do any of the following:

- to apply paint as a brush set **Brush Mode** to **Paint** or press and release F1

- to erase paint set **Brush Mode** to **Erase** or press and release F2

- to hide paint set **Brush Mode** to **Hide** or press and release F3

- to show hidden paint set **Brush Mode** to **Show** or press and release F4.

Note   **Markers** always apply paint and do not have a **Brush Mode**.

Note   You can also set **Brush Mode** to smear paint (**Smear**), blur paint (**Blur**), sharpen paint (**Sharpen**), or clone an area (**Clone**). See *Blur paint* (page 127), *Sharpen paint* (page 128), and *Smear paint* (page 129).

Set brush paint color

In the **Paint Panel** or **Brush Options** box set **Brush Color**.

To set brush color using RGB/HSV sliders or color blending palette

1   With a brush tool active do one of the following:

   ◆   click the *color chip* directly below the **File** menu, or

   ◆   click the **Color** *color chip* in the **Paint Panel**, or

   ◆   click the **Brush Color** *color chip* in the **Brush Options** box.

   to open the **Color Editor**.
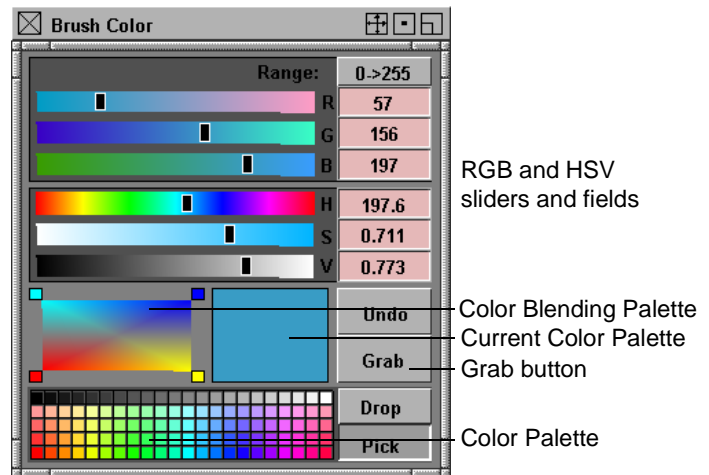
RGB and HSV sliders and fields

Color Blending Palette
Current Color Palette
Grab button

Color Palette

2   In the **Color Editor**, do any of the following to select a color:

   ◆   Adjust the RGB or HSV sliders, or enter RGB or HSV values.

   ◆   Click in the **Color Blending Palette**.

   ◆   Click in the **Color Palette**.

   ◆   Click the **Grab** button and then click anywhere on your screen to grab that color.

Tip   To adjust the color *value* only, adjust the **Brush Color** slider in the **Paint Panel** or **Brush Options** box.

Tip   To change the colors in the **Color Blending Palette**, set the current color (for example, using the RGB or HSV sliders) and then click a corner square in the **Color Blending Palette**.

Tip   To store the current color in the **Color Palette**, click the **Drop** button and then click one of the squares in the **Color Palette**. Click the **Pick** button to allow you to pick colors from the **Color Palette**.

The **Current Color Palette** updates with the new color. The *color chip* in the status area also updates.

3   In the **Brush Options** box, set **Preserve Color** as follows:

  ◆ **ON**—the next time you select the brush, the **Brush Color** will be the same as it is now.

  ◆ **OFF**—the next time you select the brush, the **Brush Color** will be the same as the previous brush's **Brush Color**. This is the default setting.

For example, to save a *colored* brush to a shelf, turn on **Preserve Color** before you save the brush to the shelf. To save an *uncolored* brush to a shelf, turn off **Preserve Color** before you save the brush to the shelf.

To set brush color by grabbing a color from anywhere on your screen

1   With a brush tool active do one of the following:

  ◆ click the *eye dropper* button below the **Delete** menu

  ◆ press and hold down the **C** key.

2   Click or drag anywhere on your screen to grab a color and do one of the following:

  ◆ release the mouse button

  ◆ release the **C** key.

To set brush color by choosing a color you have saved to a shelf

With a brush tool active choose the color swatch icon on the shelf.

To save a color to a shelf

1 In any **Color Editor**, or in the **Color Swatch Option Box** (**Windows > Edit > Color Swatch** ❏), do any of the following to select a color:

- Adjust the RGB or HSV sliders, or enter RGB or HSV values.

- Click in the **Color Blending Palette**.

- Click in the **Color Palette**.

- Click the **Grab** button and then click anywhere on your screen to grab that color.

The **Current Color Palette** updates with the new color.

2 Use the *MMB* (middle mouse button or the equivalent stylus button) to drag the **Current Color Palette** from the **Color Editor** to the shelf.

Set brush and paint opacity

In the **Paint Panel** or **Brush Options** box set **Min Opacity** and **Max Opacity**, and in the **Brush Options** box set **Color Opacity**.

Opacity is a way of representing how "see-through" a brush's paint is. (Opacity is the opposite of transparency.) You cannot see anything underneath paint that has an opacity of 1. The lower the opacity, the more you can see through the paint. Paint that has an opacity of 0 is perfectly clear and invisible.

Note   You can also control the opacity of layers.

❖ Change the opacity of an image layer

High Opacity   Low Opacity
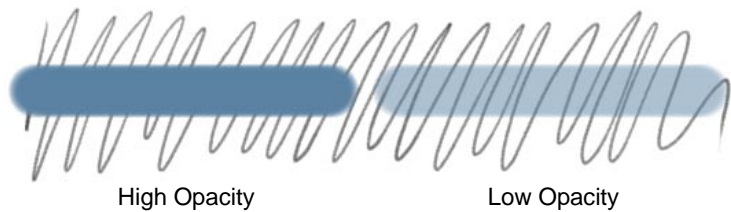
Most brushes in StudioTools have two types of opacity: *brush* opacity (controlled by the **Min Opacity** and **Max Opacity** options) and *paint* opacity (controlled by the **Color Opacity** option). (**Markers** do not have **Color Opacity**.)

The difference between brush opacity and paint opacity becomes noticeable when you paint more than once over the same spot. If the *brush* opacity is less than 1, the paint will build up and become more opaque. If the *paint* opacity is less than 1 (and the brush opacity is 1), the paint will not build up.

Min/Max Opacity = 1   Min/Max Opacity = 0.1
Color Opacity = 0.5   Color Opacity = 1
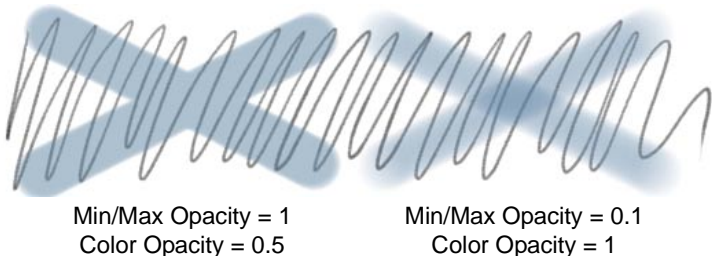
In addition, you can make the brush opacity change based on how hard you press the stylus on your tablet. The **Min Opacity** is the minimum opacity for the brush (when you press lightly with the stylus) and the **Max Opacity** is the maximum opacity

for the brush (when you press hard with the stylus). If you do not want the opacity to vary with stylus pressure on the tablet, set the **Min Opacity** and the **Max Opacity** to the same value.
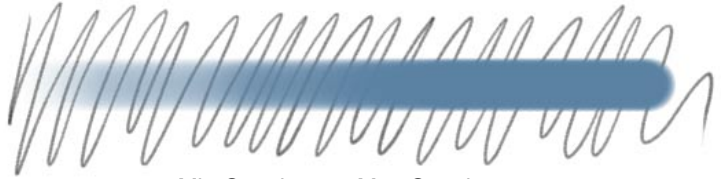
Min Opacity = 0, Max Opacity = 1

To set brush opacity

Do any of the following:

- In the **Paint Panel** or **Brush Options** box set **Min Opacity** and **Max Opacity**.

- With the brush tool active hold down the **O** key and drag:
  - up to increase the minimum opacity
  - down to decrease the minimum opacity
  - right to increase the maximum opacity
  - left to decrease the maximum opacity.

To set paint opacity

In the **Brush Options** box set **Color Opacity**.

Note   **Markers** do not have **Color Opacity**.

Tip   To make any brush erase paint, set the **Brush Color** to black and set the **Color Opacity** to 0. (To keep these settings for the brush, turn on **Preserve Color**.)

Set marker wetness

In the **Paint Panel** or **Brush Options** box set **Wetness**.

By default, most **Marker** brushes have a **Wetness** value of 0.5, which simulates ink from a somewhat used marker. You may want to increase the **Wetness** to simulate a brand new marker, or reduce the **Wetness** to simulate a dry or semi-dry marker.

Wetness = 0.2   Wetness = 1
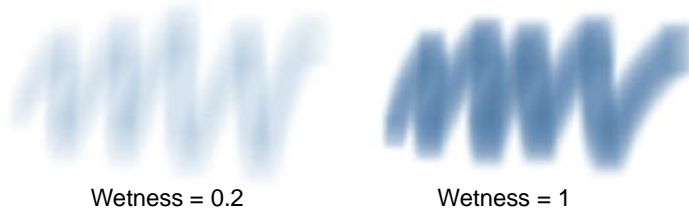
When using a marker, pressing the stylus against the tablet without moving it will continue to apply paint to the sketch image plane just like a real marker on paper.

If the **Wetness** is high (for example, 0.9), paint will be applied to the sketch image plane more rapidly than if the **Wetness** is low (for example, 0.1). You can therefore create different types of strokes with a marker simply by moving the stylus faster or slower.

To set marker wetness

In the **Paint Panel** or **Brush Options** box adjust the **Wetness** slider or enter a value in the **Wetness** field.

Set brush size, shape, and profile

In the **Paint Panel** or **Brush Options** box set **Min Radius**, **Max Radius**, **Aspect**, **Rotation**, and **Brush Profile**.

Brushes apply paint to a sketch image plane in *strokes.* A stroke consists of a series of closely spaced *stamps.* (If you click a brush onto a sketch image plane, instead of dragging the stylus, you will apply a single stamp of paint.) The default brushes (**Pencil**, **Marker**, **Airbrush**, and **Solid**) have circular stamps. You can, however, control the size and shape of brush stamps to produce different types of strokes.
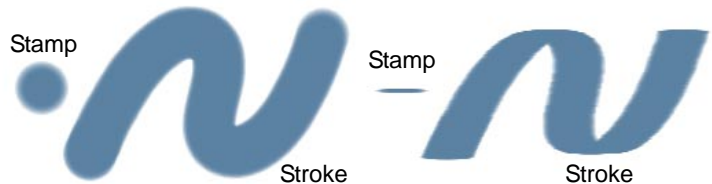
Size

The size of a brush is based on its **Min Radius** (when you press lightly with the stylus) and its **Max Radius** (when you press hard with the stylus). If you do not want the size to vary with stylus pressure on the tablet, set the **Min Radius** and the **Max Radius** to the same value.

Tip   Small brushes are more responsive than large brushes.

| Min Radius = 5 | Min Radius = 20 | Min Radius = 5 |
| Max Radius = 5 | Max Radius = 20 | Max Radius = 20 |
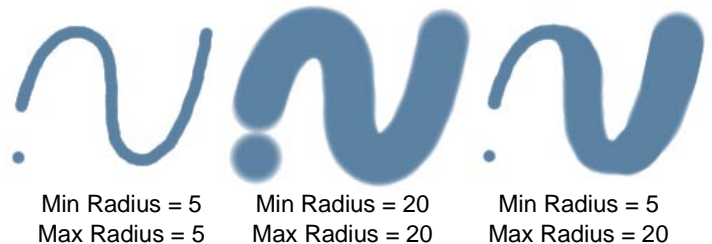
Shape

The shape of a brush is based on its aspect ratio. An aspect ratio of 1 means the brush stamp is circular. The lower the aspect ratio, the flatter the brush stamp. The angle of a flat stamp is based on the brush **Rotation**.

Aspect = 1   Aspect = 0.2   Aspect = 0.2
Rotation = 0   Rotation = 0   Rotation = 90
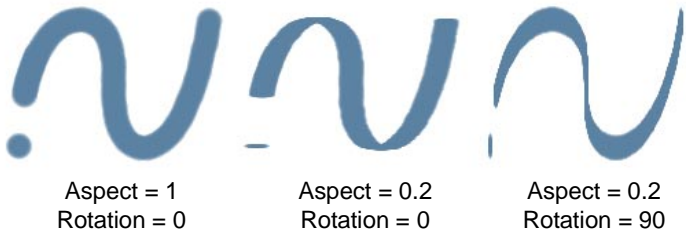
Profile

The profile of a brush controls the softness of the brush stamp edges.

Hard Solid   Solid   Regular
Brush Profile   Brush Profile   Brush Profile

To set the size of a brush

Do any of the following:

● In the **Paint Panel** or **Brush Options** box, adjust the **Min Radius** and **Max Radius** sliders or enter values in the **Min Radius** and **Max Radius** fields. These values are measured in pixels (of the sketch image plane). The maximum brush size is 255.

● With the brush tool active, hold down the **R** key and drag:

  ◆ up to increase the minimum radius

  ◆ down to decrease the minimum radius

  ◆ right to increase the maximum radius

  ◆ left to decrease the maximum radius.

To set the shape of a brush

Do any of the following:

● In the **Paint Panel** or **Brush Options** box, do the following:

- ◆ Adjust the **Aspect** slider, or enter a value in the **Aspect** field, to make the brush more flat and thin (0) or more circular (1).

- ◆ If the **Aspect** value is less than 1, adjust the **Rotation** slider, or enter a value in the **Rotation** field, to make the brush more horizontal (0) or more vertical (90). (If the **Aspect** value is 1, the **Rotation** value has no effect.)

- With the brush tool active, hold down the **P** key and drag the mouse:
  - ◆ up or right to increase the **Aspect** value
  - ◆ down or left to decrease the **Aspect** value.

- With the brush tool active, hold down the **T** key and drag the mouse:
  - ◆ up or right to increase the **Rotation** value
  - ◆ down or left to decrease the **Rotation** value.

To set the profile of a brush

In the **Paint Panel** or **Brush Options** box, set **Brush Profile** to **Hard Solid**, **Solid**, or **Regular**.

Set brush stroke properties

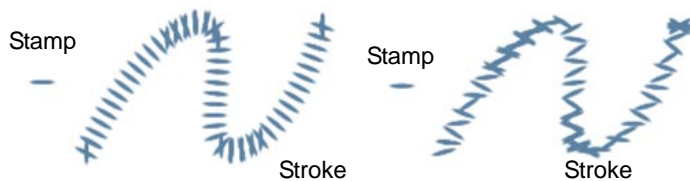In the **Brush Options** box set **Spacing Bias**, **Spacing Noise**, **Rotate to Stroke**, and **Rotation Jitter**.

Brushes apply paint to a sketch image plane in *strokes.* A stroke consists of a series of closely spaced *stamps.* (If you click a brush onto a sketch image plane, instead of dragging the stylus, you will apply a single stamp of paint.) You can control how strokes are generated from stamps.
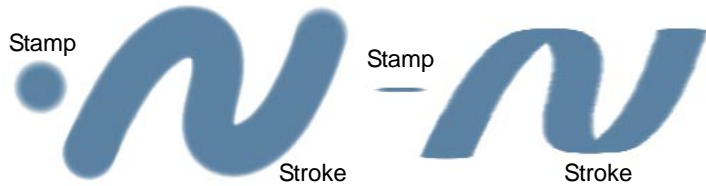
For example, you can control the spacing between stamps in a stroke so they are close or far apart, or so their spacing has an element of randomness.
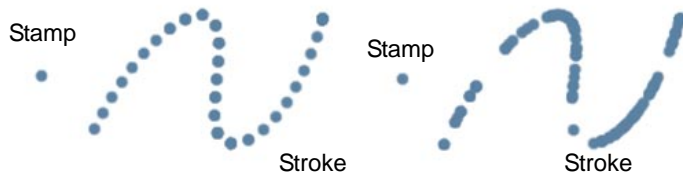
You can make stamps rotate in the direction of a stroke or always remain in the same direction, or rotate with an element of randomness.

To set brush stamp spacing

In the **Brush Options** box, do the following:

- Set **Spacing Bias** to control the space between stamps in a stroke. Low values produce smooth strokes with no spaces between stamps. Higher values produce strokes that appear as a series of dots. The valid range is 0 to 255.

- Set **Spacing Noise** to control the amount of random variation in the space between stamps in a stroke. The valid range is 0 (no random variation) to 25 (high random variation).

To set brush stamp rotation

In the **Brush Options** box, do the following:

- To rotate the brush stamp in the direction of the brush stroke, turn on **Rotate to Stroke**.

  To always keep the brush stamp in the same direction and not rotate it in the direction of the brush stroke, turn off **Rotate to Stroke**.

- Set **Rotation Jitter** to control the amount of random variation in the brush stamp direction. The valid range is 0 (no random variation) to 255 (high random variation).

Snap a brush to a curve

Hold down *ctrl alt*, click the curve and drag along the curve.

When you are sketching, you can snap a brush to a curve (or surface isoparametric curve or curve-on-surface). This allows you to use curves as sketching guidelines.
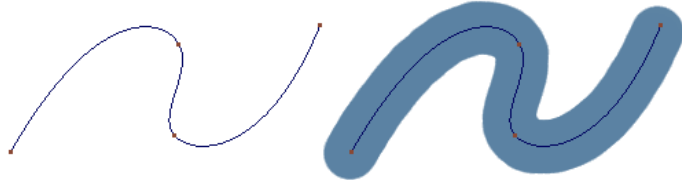
To snap a brush to a curve

1   With a brush active click the *curve snap* button to the right of the prompt line, or hold down *ctrl alt*, to activate curve snapping.

2   Move the stylus so the brush profile is near the curve.

The brush profile will jump onto the curve.

Note   To set the brush curve snap tolerance, choose **Preferences > Interface > Interface options** ❐ and set **Brush Curve Snap Tolerance** to the number of pixels the brush cursor must be from a curve in order for the brush profile to jump onto the curve.

3   Drag the stylus along the curve.

4   Click the *curve snap* button again, or release *ctrl alt*, to deactivate curve snapping.

Tip   You can snap to invisible curves (see **ObjectDisplay > Invisible**) or curves on invisible layers (**Layers > Visibility > Invisible**).

Clone an area

Choose a brush from **Brushes > Clonebrush**, click to select a source texture, then click or drag to apply the source texture.

This feature is not available in SurfaceStudio.

To clone an area

1 Choose a brush from **Brushes > Clonebrush** (for example, **Brushes > Clonebrush > Medium Clonebrush**).

2 Click the region of the image you want to use as a source texture.

3 Click or drag anywhere on the image to apply the source texture.

   As you drag, more of the source texture is applied.

   To select a new source texture, hold down the **L** key and click the source texture.

   To resize the **Clonebrush**, hold down the **R** key and drag:

   ◆ up to increase the minimum radius
   ◆ down to decrease the minimum radius
   ◆ right to increase the maximum radius
   ◆ left to decrease the maximum radius.

   To adjust the **Clonebrush** opacity, hold down the **O** key and drag:

   ◆ up to increase the minimum opacity
   ◆ down to decrease the minimum opacity
   ◆ right to increase the maximum opacity
   ◆ left to decrease the maximum opacity.

Flood an area with paint

Choose **Brushes > FloodFill** and click the area or color you want to fill.

This feature is not available in SurfaceStudio.

To flood or fill a consistently colored area of an image layer with paint

1 Choose **Brushes > FloodFill**.

 The cursor becomes a paint bucket.

2 Click the area or color on the image layer you want to fill with paint.

3 In the **Flood Fill Options** section of the **Paint Panel** do the following:

 ◆ To set the fill paint color, see *Set brush paint color* (page 82).

 ◆ To set the fill paint opacity, set **Color Opacity**. (For more information on opacity, see *Set brush and paint opacity* (page 85).)

 ◆ To set the range of colors to be filled, set **Tolerance**. A low value fills pixels having a color very similar to the color you clicked. A high value fills pixels having a broader range of colors.

Note Alternately, you can set the **Flood Fill Options** before clicking the area or color on the image layer you want to fill.

Hide and show paint

In the **Paint Panel** or **Brush Options** box set **Brush Mode** to **Hide** or **Show**.

This feature is not available in SurfaceStudio.

You can use any brush to hide paint in an image layer. Hidden paint is not visible, but it still exists. You can later show hidden paint using any brush.

You can also easily show all hidden paint in an image layer or erase all hidden paint in an image layer.

You cannot sketch on an area of an image layer that contains hidden paint. You must first show or erase the hidden paint before you can sketch on it.

To hide or show paint

1   In any **Paint Panel** or **Brush Options** box, set **Brush Mode** to **Hide** or **Show**.

2   Drag the stylus on the image layer to hide or show paint.

Tip   To quickly switch between hiding and showing paint using the same brush, with a brush tool active press and release F3 to hide or F4 to show.

To view hidden paint

1   In any **Paint Panel** or **Brush Options** box, set **Brush Mode** to **Show**.

2   Move the cursor over the hidden paint, but do not press the stylus against the tablet or press the mouse button.

    The brush preview will momentarily reveal the hidden paint beneath it.

To show all hidden paint in an image layer

1   Select the image layer you want to show hidden paint on.

    ❖   Select an image layer

2   Do one of the following:

    ◆   choose **Image > Modify layer > Show hidden paint**

- in the **Image Layers** window choose **Show > Hidden Paint**.

To erase all hidden paint in an image layer

1 Select the image layer you want to delete hidden paint from.

  ❖ Select an image layer

2 Do one of the following:

  - choose **Image > Modify layer > Clear hidden paint**
  - in the **Image Layers** window choose **Delete > Hidden paint**.

Apply paint using shapes

Use StudioTools curves to create shapes with fill and outline properties.

Introduction to shapes

Introduces shapes.

This feature is not available in SurfaceStudio.

A shape is a way of creating a precise image that you can easily modify.

A shape's shape is defined by a curve or set of curves. You can create a shape from any StudioTools curve, including curves-on-surface and surface edges. A shape also has fill and outline properties.
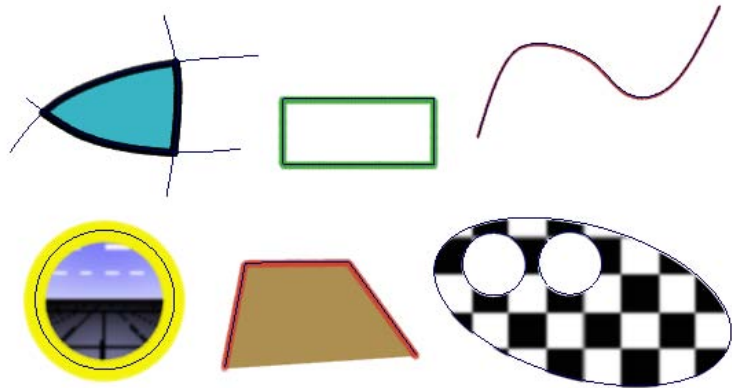
After you create a shape from a curve or set of curves, any changes you make to the curves (for example, scaling a curve or moving an edit point) will update the shape.

You can then use the original curves to build surfaces, and any changes you make to the curves will automatically update both the sketch and the model.

Shape layers and shapes

Shapes appear in the **Image Layers** window in *shape layers.* A shape layer (indicated by *shape layer* in the **Image Layers** window) is similar to an image layer (indicated by *image layer* in the **Image Layers** window). An image layer contains paint and a shape layer contains shapes. You cannot use a brush to apply paint to a shape layer. If you try to paint on a shape layer, the cursor will change to a *shape cursor*.

The first time you create a shape on a sketch image plane, StudioTools automatically creates a shape layer and places the shape on that layer. Similarly, if the active layer is an image layer, when you create a shape StudioTools automatically creates a shape layer and places the shape on that layer. However, if the active layer is a shape layer, then StudioTools places the new shape in that layer.

A shape layer contains an expandable list of all shapes in that layer. Each shape also contains an expandable list of all curves that make up the shape. To expand a list click the *white triangle*.

You can perform the following operations on shapes:

- Create curves
- Edit a shape
- Delete a shape
- Convert shapes to paint.

You can also perform most image layer operations on shape layers and on individual shapes, including:

- Name an image layer

  You can also name a shape in the **Paint Panel** when the shape is selected.

  ❖ Select an image layer

- Select an image layer

  When you select a shape layer, it is highlighted in white.

  When you select an individual shape, it is highlighted in yellow (without affecting the active layer selection).

- Duplicate an image layer

  If you duplicate a shape layer, the layer is duplicated and converted into an image layer.

  You cannot duplicate an individual shape.

- Arrange image layers
- Hide or show an image layer
- Change the opacity of an image layer
- Merge image layers
- Export an image layer

You can export a shape layer as an image file. The size of the image file will be just large enough to contain the shapes in that layer; it may not be the size of the sketch image plane.

You cannot export an individual shape.

- Delete an image layer.

Create curves

Create curves.

Before you can create a shape, you must create a curve or set of curves (or you must already have a curve or set of curves in your wire file)

For information on creating and editing curves, see *Using StudioTools > How do I? > Create curves.*

Create a shape

Choose **Brushes > Shape > Make shape**, click the curves that define the shape, and click **Accept**.

To create a shape

1   Do one of the following:

- select the image layer you want to create a new shape layer above
- select the shape layer that you want to add a new shape to.
- Select an image layer

2   Choose **Brushes > Shape > Make shape**.

3   Click each curve to include in the shape. (Make sure you click the part of the curve that you want to include in the shape boundary.)

Note   Do not drag a pick box around the curves, or the shape may not appear as you expect.

These curves will define the inner and outer boundaries of the shape.

To remove a curve from the selection, click it.

4   In the **Paint Panel** set the **Shape Outline Options** and **Shape Fill Options**.

5   Click **Accept**.

6   If necessary, continue adjusting the **Shape Outline Options** and **Shape Fill Options**.

Note   You cannot create a shape in a perspective view.

Note   If you create a shape using curves on a symmetric layer, the shape will also be mirrored across the plane of symmetry.

Note   If a shape's curves do not form a closed region, then the end points of the curve ends will be connected by a straight line segment that does not have any outline properties.

Note If a shape's curves a 3D curves, the shape may not appear as you expect.

Tip To create a new shape layer, first create a new image layer and make it the active layer, then create a new shape.

Edit a shape

In the **Image Layers** window select the shape, then in the **Paint Panel** set the outline and fill options.

To edit a shape's fill and outline

1   Make sure you do not have any **Brushes** tool selected (for example, choose **Pick > Object**).

2   Do one of the following:
    ◆   In the **Image Layers** window, select the shape that you want to edit. It should become highlighted in yellow.

Note   To unselect a shape, *Shift* click it.

    ◆   Pick any curve belonging to the shape using a **Pick** tool (for example, **Pick > Object**).

    The shape's name appears in the **Paint Panel** above the **Display** options.

Note   If you pick more than one shape in the **Image Layers** window, or pick curves that belong to more than one shape using a **Pick** tool, the number of picked shapes is displayed in the **Paint Panel** above the **Display** options (for example, **3 picked shapes**). Click this display and select a shape from the menu.

3   In the **Paint Panel** set the **Shape Outline Options** and **Shape Fill Options**.

To edit a shape's shape

Transform the shape or the shape's curves using the **Xform** tools (for example, **Xform > Scale**).

Note   If you deform a curve excessively, the shape may not appear as you expect.

Delete a shape

In the **Image Layers** window select the shape and choose **Shape > Delete Shape**.

To delete a shape

1   In the **Image Layers** window select the shape that you want to delete. It should become highlighted in yellow.

2   In the **Image Layers** window choose **Shape > Delete Shape**.

Convert shapes to paint

In the **Image Layers** window select the shape layer and choose **Shape > Convert Shape Layer to Image Layer**.

After you have finalized a shape, you may want to convert it into paint. You do this by converting the shape layer into an image layer. You cannot convert an individual shape within a shape layer into paint.

Tip   To convert an individual shape within a shape layer into paint, first re-create the shape on its own shape layer. Then convert the shape layer to an image layer.

To convert a shape layer into an image layer (and delete the original shape layer)

1   Select the shape layer that you want to convert.

   ❖   Select an image layer

2   In the **Image Layers** window do one of the following:

   ◆   if the active shape layer is an image shape layer, choose **Shape > Convert Shape Layer to Image Layer**

   ◆   if the active shape layer is a mask shape layer, choose **Shape > Convert ShapeMask Layer to Mask Layer**.

A new image layer is created containing a painted representation of the shape.

The original shape layer is deleted.

Protect areas using masks

Use paint, shapes, and selections to protect areas of an image layer.

Introduction to masks

Introduces masks.

This feature is not available in SurfaceStudio.

A mask is way of protecting areas of an image layer from brushes, erasers, and from certain image layer operations (for example, clearing an image layer, blurring an image layer, and so on).

There are two types of masks: the selection mask and mask layers.

Selection mask

The selection mask (indicated by *mask layer* in the **Image Layers** window) is a special type of layer that sits above all other layers and acts as a mask for all image layers.

You usually use the selection mask to create a temporary mask that you do not wish to keep. Each time you make a selection (using a **Brushes > Select** tool), the previous selection mask is lost. You also use the selection mask to cut or copy parts of an image.

❖   Cut, copy, and paste regions of a sketch

When you create a mask by selecting a region, masked regions are indicated by a pink color.

Unmasked (Selected) Region

Masked Region
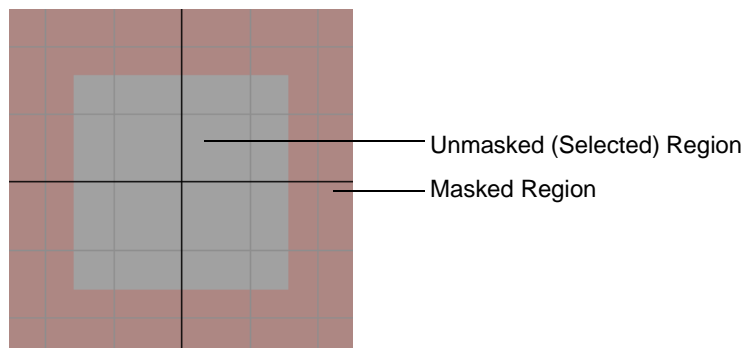
Whenever you have an active selection, the selection mask is the only active mask. That is, any mask layers (see below) are temporarily disabled. To enable mask layers, you must clear the selection mask.

❖ **Create a temporary mask by selecting a region**

Note   StudioTools will automatically clear the selection
mask when you paste a cut or copied image using
Image > Paste image.

The selection mask layer is similar to an image layer.

Regions of the selection mask layer that contain paint are
masked, and regions of the selection mask layer that do not
contain paint are selected.

Most of the time you do not need to worry about the selection
mask layer. You just select a region using the **MagicWand** or
Marquee tool.

However, in some situations you may want to modify the
selection by modifying the selection mask layer (for example,
blurring, rotating, painting, and so on).

Mask layers

A mask layer is a way of creating a mask for a specific image
layer. Once you create a mask layer, it will remain until you
delete it.

When you create a mask layer, masked regions are indicated
by a red color.

Unmasked Region

Masked Region
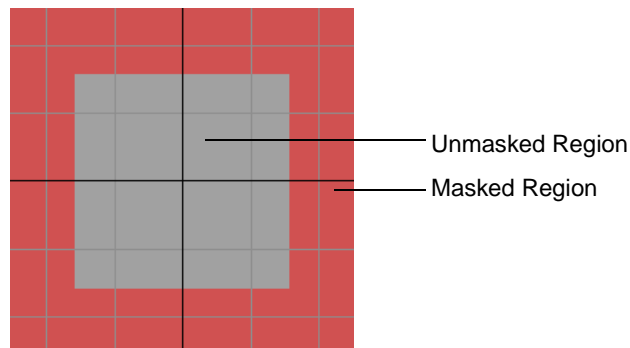
A mask layer can either contain paint or shapes.

A mask layer that contains paint is indicated by *mask layer* in
the **Image Layers** window and is similar to an image layer.

❖ **Introduction to image layers**

A mask layer that contains shapes is indicated by *shape mask* in the **Image Layers** window and is similar to a shape layer.

❖ Introduction to shapes

Regions of a mask layer that contain paint or shapes are masked, and regions of a mask layer that do not contain paint or shapes are not masked.

Creating and using masks

There are several ways you can create a mask, including:

- Create a temporary mask by selecting a region
- Create a mask from an image file
- Create a mask by painting
- Create a mask from curves

You can perform the following operations on masks:

- Invert a mask
- Customize the mask display
- Disable or enable a mask
- Delete masks.

You can also perform most image layer operations on mask layers or on the selection layer, including:

- Name an image layer
- Import an image as an image layer
- Select an image layer
- Duplicate an image layer
- Move, scale, or rotate an image layer

  You cannot move, scale, or rotate a mask layer that contains shapes.

- Flip an image layer horizontally or vertically

  You cannot flip a mask layer that contains shapes.

- Arrange image layers
- Hide or show an image layer
- Change the opacity of an image layer

- Merge image layers
- Export an image layer
- Clear an image layer

  You cannot clear a mask layer that contains shapes.

- Delete an image layer.

Create a temporary mask by selecting a region

Choose **Brushes > Select > Marquee** and drag over a region or choose **Brushes > Select > MagicWand** and click a colored region.

You can create a temporary mask by selecting a rectangular, circular, or elliptical region or by selecting a consistently colored area of an image layer. You can also add to or subtract from the selection.

Note   You can also create a selection by importing an image file directly into the selection mask (see Create a mask from an image file), by copying a mask layer into the selection mask (see Cut, copy, and paste regions of a sketch), or by painting directly in the selection mask (see Create a mask by painting).

When you select a region, the selected region is unmasked and all other regions are masked. This mask information is temporarily stored in the **Selection** layer. If you select another region (and do not add it to the selection), the previous selection will not be saved.

Whenever you have a region selected, the selection mask is the only active mask. That is, any mask layers are temporarily disabled. To enable mask layers, you must clear the selection mask.

To select a rectangular, circular, or elliptical region

1   Select the image layer you want to select a region of.

   ❖   Select an image layer

2   Choose one of the following:

   ◆   **Brushes > Select > Marquee (rectangle)**
   ◆   **Brushes > Select > Marquee (circle)**
   ◆   **Brushes > Select > Marquee (ellipse)**

   The cursor becomes a knife.

3   In the **Marquee Options** section of the **Paint Panel** set **Mode** to one of the following:

   ◆   **New**—to create a new selection area
   ◆   **Add**—to add to the selection area
   ◆   **Subtract**—to subtract from the selection area

4 Drag the stylus to create a rectangular, circular, or elliptical region.

Tip While the **Marquee** tool is active, you can clear the current selection by clicking anywhere in the view, create a new selection area by holding down the n key, add to the selection area by holding down the a key, or subtract from the selection area by holding down the s key.

To select a consistently colored area of an image layer

1 Select the image layer you want to select a colored area of.

  ❖ Select an image layer

2 Choose **Brushes > Select > MagicWand**.

The cursor becomes a wand.

3 Click the area or color of the image layer you want to select.

To select a different colored area, click it.

4 In the **Magic Wand Options** section of the **Paint Panel** adjust the **Tolerance** from 0 to 255. A low value selects pixels having a color very similar to the color you clicked. A high value selects pixels having a broader range of colors.

Note Alternately, you can set the **Magic Wand Options** before clicking the area or color of the image layer you want to fill.

Note If you want to set the **Tolerance** before selecting another area, without affecting the area you've already selected (for example, to add to the selection), click **Accept** or choose **Brushes > Select > MagicWand** again.

To clear the selection mask

Do one of the following:

● Choose **Image > Modify layer > Clear selection mask**.

● Choose **Pick > Nothing**.

● Clear the **Selection** mask layer.

  ❖ Clear an image layer

To copy a mask layer to the selection mask

1   Select the mask layer you want to copy to the selection mask.

   ❖   Select an image layer

2   Choose **Image > Copy image**.

3   Select the selection mask.

   ❖   Select an image layer

4   Choose **Image > Paste image**.

To import an image into the selection mask

1   Select the selection mask.

   ❖   Select an image layer

2   Import the image file you want to use as the selection mask.

   ❖   Create a mask from an image file

Create a mask from an image file

Choose **File > Import > Image/mask layer** ⊡, set **Image Layer Type** to **Mask**, click **Go**, and choose an image file.

To create a mask from an image file

1 Select the image layer you want to mask.

    ❖   Select an image layer

2 Choose **File > Import > Image/mask layer** ⊡ to open the **Import Image Layer** options box.

3 Set **Image Layer Type** to **Mask**, and **Color to Mask Conversion Method** to one of the following:

    ◆   **Luminance**—uses the image's luminance values as the mask; areas that are 100% black are fully masked.

    ◆   **Transparency**—uses the image's opacity values as the mask; areas that are fully opaque are fully masked.

4 Click **Go** and select the image file from the **File Browser**.

The image is imported as a mask layer and is automatically selected.

Note   Make sure you select the image layer again before using a brush or choosing an image layer operation (for example, clearing the image layer).

    ❖   Select an image layer

Create a mask by painting

Choose **Image > New > Mask layer** and paint the regions of the mask layer you want to act as a mask.

You can create a mask by painting directly onto a mask layer. Areas of the layer that contain paint will masked, and areas of the layer that do not contain paint will be unmasked. Areas of the layer that contain partially transparent paint will be partially masked.

To create a mask by painting

1   Select the image layer you want to mask.

  ❖   Select an image layer

2   Do one of the following:

  ◆   choose **Image > New > Mask layer**

  ◆   in the **Image Layers** window choose **Edit > New mask layer**.

  A new mask layer is created and automatically selected.

3   Select a brush and paint the regions that you want to mask.

  ❖   Paint and erase

Note   Make sure you select the image layer again before using a brush or choosing an image layer operation (for example, clearing the image layer).

  ❖   Select an image layer

Create a mask from curves

Choose **Brushes > Shape > Make masked shape**, click the curves that define the mask shape, and click **Accept**.

You can create a mask from a curve or set of curves in a similar way that you create shapes from curves.

❖ Create a shape

To create a mask from curves

1 Select the image layer you want to mask.

❖ Select an image layer

2 Choose **Brushes > Shape > Make masked shape**.

3 Click each curve to include in the mask shape. (Make sure you click the part of the curve that you want to include in the mask boundary.)

These curves will define the inner and outer boundaries of the shape.

To remove a curve from the selection, click it.

4 Click **Accept**.

Invert a mask

Choose **Image > Modify layer > Invert layer mask**.

You can easily invert a mask so that masked regions become unmasked and unmasked regions become masked.

To invert a mask

1   Do one of the following:

- Select the mask layer or selection layer you want to invert.
- Select the image layer that you want to invert all masks for.
- Select an image layer

2   Do one of the following:

- choose **Image > Modify layer > Invert layer mask**
- in the **Image Layers** window choose **Edit > Invert layer mask**.

Customize the mask display

Hide or show the mask color or selection marquee; change the mask color

By default masked regions for mask layers are displayed in red and masked regions for the selection mask are displayed in pink. You can customize the mask display color and opacity for mask layers and the selection mask.

You may prefer not to see mask display colors while sketching. In this case, you can turn off the display of these colors and the mask will remain active.

To change the mask display color and opacity for mask layers or the selection mask

1   In the **Image Layers** window, click the *white triangle* beside **Sketch Properties**.

2   Do one of the following:
    ◆   to change the mask color for mask layers, click the **Mask Color** *color chip* to open the **Color Editor**.
    ◆   to change the mask color for the selection mask, click the **Selection Mask Color** *color chip* to open the **Color Editor**.

3   In the **Color Editor**, do any of the following to select a color:
    ◆   Adjust the RGB or HSV sliders, or enter RGB or HSV values.
    ◆   Click in the **Color Blending Palette**.
    ◆   Click in the **Color Palette**.
    ◆   Click the **Grab** button and then click anywhere on your screen to grab that color.

Tip   To change the colors in the **Color Blending Palette**, set the current color (for example, using the RGB or HSV sliders) and then click a corner square in the **Color Blending Palette**.

Tip   To store the current color in the **Color Palette**, click the **Drop** button and then click one of the squares in the **Color Palette**. Click the **Pick** button to allow you to pick colors from the **Color Palette**.

The **Current Color Palette** updates with the new color. The *color chip* in the **Image Layers** window also updates.

4 Do one of the following:

- ◆ to change the mask display opacity for mask layers, select the **Mask Display Opacity** *layer opacity* value, type a new opacity value and press *Enter*.

- ◆ to change the mask display opacity for the selection mask, select the **Selection Display Opacity** *layer opacity* value, type a new opacity value and press *Enter*.

Tip To interactively adjust the opacity value, hold down *alt* and drag the *MMB* (middle mouse button) in the *layer opacity* field.

To hide the mask display color

In the **Image Layers** window, click the *open eye* icon for the mask layer or selection layer.

To show the mask display color

In the **Image Layers** window, click the *closed eye* icon for the mask layer or selection layer.

Disable or enable a mask

Click the check mark icon or dash icon for the mask layer or selection layer.

To disable a mask

In the **Image Layers** window, click the *check mark* icon for the mask layer or selection layer so it becomes a *dash* icon.

To enable a mask

In the **Image Layers** window, click the *dash* icon for the mask layer or selection layer so it becomes a *check mark* icon.

To disable or enable the selection mask

Choose **Image > Modify layer > Tgl selection/mask**.

Delete masks

Delete a mask or all masks in a sketch image plane.

To delete a mask

❖ Delete an image layer

To delete all masks in a sketch image plane

Do one of the following:

◆ Choose **Delete > Del all mask layers**.

◆ In the **Image Layers** window, choose **Delete > All masks**.

Edit images

Cut, copy, and paste regions of an image layer; blur, sharpen, and smear paint on an image layer.

Cut, copy, and paste regions of a sketch

Select a region, choose **Image > Cut image** or **Image > Copy image**, then **Image > Paste image**.

This feature is not available in SurfaceStudio.

To select a region

❖ Create a temporary mask by selecting a region

Note   You can also select a region of an image layer by creating a mask for that image layer (see Create a mask from an image file, Create a mask by painting, and Create a mask from curves).

To cut the selected region

Choose **Image > Cut image**.

To copy the selected region

Choose **Image > Copy image**.

To paste the cut/copied region (in StudioTools)

1   Select the image layer you want to paste the cut/copied region above.

❖ Select an image layer

2   Choose **Image > Paste image**.

The cut/copied region is pasted into a new image layer above the active image layer.

Note   The region is pasted either into the center of the selection mask (if there is one) or into the center of the sketch image plane (if there is no selection mask).

To paste the cut/copied region (into another application)

In the application, choose **Edit > Paste**.

Blur paint

Choose **Image > Effect > Blur layer** or choose a brush from **Brushes > Blurbrush** and use the brush to blur paint.

This feature is not available in SurfaceStudio.

To blur all unmasked paint on an image layer

1　Select the image layer you want to blur.

　　❖　Select an image layer

2　Choose **Image > Effect > Blur layer**.

Note　To set the amount of blurring, choose **Image > Effect > Blur layer** ❑ to open the **Blur Layer Options** box, adjust the **Blur Radius** from 0 (no blur) to 32 (maximum blur), and click **Go**.

To blur paint by brushing

1　Select the image layer you want to blur paint on.

　　❖　Select an image layer

2　Choose a brush from **Brushes > Blurbrush** (for example, **Brushes > Blurbrush > Medium Blurbrush**).

3　Drag the stylus on the area of the image layer you want to blur.

Note　To set the amount of blurring, open the **Brush Options** box (for example, choose **Brushes > Blurbrush > Medium Blurbrush** ❑) and adjust the **Blur Radius** from 0 (no blur) to 32 (maximum blur).

Tip　You can use any brush as a blur brush by setting **Brush Mode** to **Blur** in the **Brush Options** box.

Sharpen paint

Choose **Image > Effect > Sharpen layer** or choose a brush from **Brushes > Sharpenbrush** and use the brush to sharpen paint.

This feature is not available in SurfaceStudio.

To sharpen all unmasked paint on an image layer

1 Select the image layer you want to sharpen.

❖ Select an image layer

2 Choose **Image > Effect > Sharpen layer**.

Note To set the amount of sharpening, choose **Image > Effect > Sharpen layer** ❐ to open the **Sharpen Layer Options** box and adjust the **Sharpness** from 0 (no sharpening) to 10 (maximum sharpening). To set the extent that each pixel is sharpened, set the **Radius** from 0 to 4.

To sharpen paint by brushing

1 Select the image layer you want to sharpen paint on.

❖ Select an image layer

2 Choose a brush from **Brushes > Sharpenbrush** (for example, **Brushes > Sharpenbrush > Medium Sharpenbrush**).

3 Drag the stylus on the area of the image layer you want to sharpen.

Note To set the amount of sharpening, open the **Brush Options** box (for example, choose **Brushes > Sharpenbrush > Medium Sharpenbrush** ❐) and adjust the **Sharpness** from 0 (no sharpening) to 10 (maximum sharpening). To set the extent that each pixel is sharpened, set the **Sharpen Radius** from 0 to 4.

Tip You can use any brush as a sharpen brush by setting **Brush Mode** to **Sharpen** in the **Brush Options** box.

Smear paint

Choose a brush from **Brushes > Smearbrush** and use the brush to smear paint.

This feature is not available in SurfaceStudio.

To smear paint

1   Select the image layer you want to smear paint on.

   ❖   Select an image layer

2   Choose a brush from **Brushes > Smearbrush** (for example, **Brushes > Smearbrush > Medium Smearbrush**).

3   Drag the stylus on the area of the image layer you want to smear.

Tip   You can use any brush as a smear brush by setting **Brush Mode** to **Smear** in the **Brush Options** box.

Tools and menus

Pick > Image plane

Allows you to pick an image plane or the active image layer.

Pick Image Plane Options

Pick Active Image Layer

    On—Allows you to click in a view to pick the active image layer.

    Off—Allows you to click in a view to pick an image plane.

Note   You can also set this option by clicking either the *Pick Image Layer* button or *Pick Image Plane* button directly under the **File** menu.

Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil

Applies pencil strokes to the active image layer.

Not all options are available in SurfaceStudio.

Brush Options

Note   Some of these options are also available in the **Paint Panel** when this tool is active.

Reset

Resets all **Brush Options** to their default settings.

Brush Properties

Brush Mode

Controls whether the brush will:

- apply paint as a brush (**Paint**) (see *Paint and erase* (page 75))
- erase paint (**Erase**) (see *Paint and erase* (page 75))
- hide paint (**Hide**) (see *Hide and show paint* (page 96))
- show hidden paint (**Show**) (see *Hide and show paint* (page 96))
- smear paint (**Smear**) (see *Smear paint* (page 129))
- blur paint (**Blur**) (see *Blur paint* (page 127))
- sharpen paint (**Sharpen**) (see *Sharpen paint* (page 128))
- clone a region (**Clone**) (see *Clone an area* (page 94)).

See also *Set brush mode to paint, erase, hide, or show* (page 81).

This option is not available for **Markers**.

Brush Color

The color of the brush's paint. See *Set brush paint color* (page 82).

Preserve Color

> **ON**—When you save the brush to a shelf, its current color is saved with it. When you later select the brush from the shelf, its color will be the same as when you saved it to the shelf.

> **OFF**—When you save the brush to a shelf, its current color is not saved with it. When you later select the brush from the shelf, its color will be the current color.

> See *Set brush paint color* (page 82).

Color Opacity

> Controls how see-through the paint applied by the brush is. If **Color Opacity** is less than 1, and you sketch several times in the same spot, the paint will not build up and become more opaque. The valid range is 0 (entirely clear and invisible) to 1 (entirely opaque). See *Set brush and paint opacity* (page 85).

Min Radius

> The radius of the brush (measured in pixels) when you press the stylus lightly against the tablet. The valid range is 0 to 255. See *Set brush size, shape, and profile* (page 88).

Max Radius

> The radius of the brush (measured in pixels) when you press the stylus strongly against the tablet. The valid range is 0 to 255. See *Set brush size, shape, and profile* (page 88).

Min Opacity

> Controls how see-through the paint applied by the brush is when you press the stylus very lightly against the tablet. If **Min Opacity** is less than 1, and you sketch several times in the same spot, the paint will build up and become more opaque. The valid range is 0 (fully transparent) to 1 (fully opaque). See *Set brush and paint opacity* (page 85).

Max Opacity

> Controls how see-through the paint applied by the brush is when you press the stylus very strongly against the tablet. If **Max Opacity** is less than 1, and you sketch several times in the same spot, the paint will build up and become more opaque. The valid range is 0 (fully transparent) to 1 (fully opaque). See *Set brush and paint opacity* (page 85).

Aspect

Controls how flat or circular the brush stamp is. The valid range is 0.01 (very flat and thin) to 1 (circular). See *Set brush size, shape, and profile* (page 88).

Rotation

The angle (measured in degrees) of the brush stamp. If **Aspect** is less than 1, changing **Rotation** makes the brush stamp more horizontal (0) or more vertical (90). The valid range is 0 to 360. See *Set brush size, shape, and profile* (page 88).

Brush Profile

Controls the softness or hardness of the brush stamp edges. See *Set brush size, shape, and profile* (page 88).

Hard Solid   Solid   Regular

Spacing Bias

Controls the space between stamps in a stroke. Low values produce smooth strokes with no spaces between stamps. Higher values produce strokes that appear as a series of dots. The valid range is 0 to 255. See *Set brush stroke properties* (page 91).

Spacing Noise

The amount of random variation in the space between stamps in a stroke. The valid range is 0 (no random variation) to 25 (high random variation). See *Set brush stroke properties* (page 91).

Rotate to Stroke

ON—The brush stamp rotates in the direction of the brush stroke as you sketch.

OFF—The brush stamp always remains in the same direction and does not rotate in the direction of the brush stroke.

See *Set brush stroke properties* (page 91).

Rotation Jitter

The amount of random variation in the brush stamp direction. The valid range is 0 (no random variation) to 255 (high random variation). See *Set brush stroke properties* (page 91).

Marker Properties

Wetness

The wetness or dryness of the marker. The valid range is 0 (very dry like a very old marker) to 1 (very wet like a brand new marker). See *Set marker wetness* (page 87).

Blur Properties

Blur Radius

Controls how much the brush will blur paint on the active image layer. The valid range is 0 (no blurring) to 32 (strong blurring). See *Blur paint* (page 127).

Sharpen Properties

Sharpness

Controls how much the brush will sharpen paint on the active image layer. The valid range is 0 (no sharpening) to 10 (strong sharpening). See *Sharpen paint* (page 128).

Sharpen Radius

Controls the extent that the brush will sharpen paint on the active image layer. Each pixel in the image layer is sharpened by comparing it with a certain number of its surrounding pixels based on the **Sharpen Radius** value. For example, if **Sharpen Radius** is set to 4, then each pixel is sharpened by comparing it with all surrounding pixels within a 4 pixel radius. The valid range is 0 to 4. See *Sharpen paint* (page 128).

Brushes > Marker > Small Marker, Medium Marker, Large Marker

Applies marker strokes to the active image layer.

This feature is not available in SurfaceStudio.

❖ *Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil* (page 133)

Brushes > Airbrush > Small Airbrush, Medium Airbrush, Large Airbrush

Applies airbrushed paint to the active image layer.

This feature is not available in SurfaceStudio.

❖ *Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil* (page 133)

Brushes > Solidbrush > Fine Solidbrush, Small Solidbrush, Medium Solidbrush, Large Solidbrush

Applies solid strokes of paint to the active image layer.

This feature is not available in SurfaceStudio.

❖ *Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil* (page 133)

Brushes > Eraser > Fine Solid Eraser, Small Solid Eraser, Medium Solid Eraser, Large Solid Eraser, Small Airbrush Eraser, Medium Airbrush Eraser, Large Airbrush Eraser

Erases paint from the active image layer.

❖ *Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil* (page 133)

Brushes > Sharpenbrush > Small Sharpenbrush, Medium Sharpenbrush, Large Sharpenbrush

Sharpens paint on the active image layer.

This feature is not available in SurfaceStudio.

❖ *Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil* (page 133)

Brushes > Blurbrush > Small Blurbrush, Medium Blurbrush, Large Blurbrush

Blurs paint on the active image layer.

This feature is not available in SurfaceStudio.

❖ *Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil* (page 133)

Brushes > Smearbrush > Small Smearbrush, Medium Smearbrush, Large Smearbrush

Smears paint on the active image layer.

This feature is not available in SurfaceStudio.

> ❖ *Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil* (page 133)

Brushes > Clonebrush > Small Clonebrush, Medium Clonebrush, Large Clonebrush

Clones an area of paint on the active image layer.

This feature is not available in SurfaceStudio.

❖ *Brushes > Pencil > HB Pencil, 2B Pencil, 4B Pencil, 6B Pencil, 2H Pencil, 6H Pencil, Black Pencil, White Pencil, Red Pencil, Blue Pencil, Green Pencil, Yellow Pencil* (page 133)

Brushes > FloodFill

Flood or fill a consistently colored area of an image layer with paint.

This feature is not available in SurfaceStudio.

Flood Fill Options

Note   These options are also available in the **Paint Panel** when this tool is active.

Fill Color

The color of paint that fills the area of the image layer you click.

Color Opacity

Controls how see-through the paint that fills the area of the image layer you click is. Paint with a low **Color Opacity** is more transparent than paint with a high **Color Opacity**. The valid range is 0 to 1.

Tolerance

Controls the range of colors that are filled. A low value fills pixels having a color very similar to the color you click. A high value fills pixels having a broader range of colors. The valid range is 0 to 255.

Brushes > Select > Marquee (rectangle), Marquee (circle), Marquee (ellipse)

Select a rectangular, circular, or elliptical region of an image layer.

This feature is not available in SurfaceStudio.

Marquee Options

Note These options are also available in the **Paint Panel** when this tool is active.

Marquee Selection Mode

Allows you to create a new selection area (**New**), add to the selection area (**Add**), or subtract from the selection area (**Subtract**).

Brushes > Select > MagicWand

Select a consistently colored area of an image layer.

This feature is not available in SurfaceStudio.

Magic Wand Options

Note   These options are also available in the **Paint Panel** when this tool is active.

Magic Wand Selection Mode

Allows you to create a new selection area (**New**), add to the selection area (**Add**), or subtract from the selection area (**Subtract**).

Tolerance

Controls the range of colors that are selected. A low value selects pixels having a color very similar to the color you click. A high value selects pixels having a broader range of colors. The valid range is 0 to 255.

Brushes > Shape > Make shape

Create a shape from a curve or set of curves.

This feature is not available in SurfaceStudio.

Brushes > Shape > Make masked shape

Create a mask from curves.

This feature is not available in SurfaceStudio.

File > Import > Image/mask layer

Imports an image file as a new image layer.

This feature is not available in SurfaceStudio.

Import Image Layer Options

Image Layer Type

> **Best Guess**—Imports the image either as an image layer (if the image contains three channels of color) or as a mask layer (if the image contains a single channel).

> **Color**—Imports the image as an image layer.

> **Mask**—Imports the image as a mask layer.

Color to Mask Conversion Method

> This option is only available if **Image Layer Type** is set to **Mask**.

> **Luminance**—Uses the image's luminance values as a mask.

> **Transparency**—Uses the image's transparency (that is, its alpha channel) as a mask.

File > Export > Image/mask layer

Exports the active image layer as an image file.

This feature is not available in SurfaceStudio.

Save Image Options

File Type

The file format to save the exported image as: JPEG, TIFF, 24 bit BMP, or 32 bit BMP.

File > Export > Make picture

Exports the sketch image plane in the active view as an image file.

Save Image Options

File Type

The file format to save the exported image as: JPEG, TIFF, 24 bit BMP, or 32 bit BMP.

Delete > Del active image layer

Deletes the active image layer.

Delete > Del all mask layers

Deletes all mask layers in the active sketch image plane.

This feature is not available in SurfaceStudio.

Image > Cut image

Cut selected regions of the active image layer and place them in the Windows clipboard.

This feature is not available in SurfaceStudio.

Image > Copy image

Copy selected regions of the active image layer and place them in the Windows clipboard.

This feature is not available in SurfaceStudio.

Image > Paste image

Paste the contents of the Windows clipboard into StudioTools either as a new animation image plane (if the active view doesn't contain a sketch image plane) or as a new image layer (if the active view contains a sketch image plane).

This feature is not available in SurfaceStudio.

Note   The contents of the clipboard is pasted into an existing sketch image plane either into the center of the selection mask (if there is one) or into the center of the sketch image plane (if there is no selection mask).

Note   StudioTools will automatically clear the selection mask when you choose **Image > Paste image**.

Import Image Plane Options

See **File > Import > Image plane**.

Image > Duplicate layer

Duplicate the active image layer.

This feature is not available in SurfaceStudio.

Image > New > Image plane

Creates a new sketch image plane in the active view.

This feature is not available in SurfaceStudio.

New Image Options

Image Width, Image Height

> **Fit Window**—The width/height of the new sketch image plane fills the view. (Some of the sketch image plane will be under the view window title bar.)

> **Specified**—The width/height of the new sketch image plane is scaled based on the **Pixels** or **Units** value. This is the default setting.

Fill Type

> Lets you specify the width/height of the new sketch image plane in pixels (**Pixels**) or the main linear unit (**Units**). This option is only available if **Image Width** or **Image Height** is set to **Specified**. The default setting is **Pixels**.

Pixels, Units

> The width and height of the sketch image plane measured in pixels (**Pixels**) or the main linear unit (**Units**). This option is only available if **Image Width** or **Image Height** is set to **Specified**. The default width value is 1280 pixels; the default height value is 1024 pixels. The valid range is 1 to 4096.

> **Tip**   To set the main linear unit, choose **Preferences > Construction options**, and set **Units > Linear > Main Units**.

Fit Window

> Fits the image plane horizontally (**Width**) or vertically (**Height**) within the view. This option is only available if both **Image Width** and **Image Height** are set to **Specified**. The default setting is **Height**.

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Resolution

The resolution of the new sketch image plane (measured in pixels per linear unit). This option is only available if **Image Width** or **Image Height** is set to **Fit Window**. The slider range is 1 to 100. The valid range is 1 to 4096. The default value is 100.

Tip   To set the main linear unit, choose **Preferences > Construction options**, and set **Units > Linear > Main Units**.

Image > New > Image layer

Creates a new image layer above the active image layer.

This feature is not available in SurfaceStudio.

Image > New > Mask layer

Create a new mask layer for the active image layer.

This feature is not available in SurfaceStudio.

Image > Modify layer > Merge below

Merges the active image layer with the image layer beneath it.

This feature is not available in SurfaceStudio.

Image > Modify layer > Merge visible layers

Merges all visible image layers in the active sketch image plane into a single image layer.

This feature is not available in SurfaceStudio.

Image > Modify layer > Merge all image layers

Merges all image layers in the active sketch image plane into a single image layer.

This feature is not available in SurfaceStudio.

Image > Modify layer > Show hidden paint

Show all hidden paint on the active image layer.

This feature is not available in SurfaceStudio.

Image > Modify layer > Clear hidden paint

Delete all hidden paint on the active image layer.

This feature is not available in SurfaceStudio.

Image > Modify layer > Clear selection mask

Clears the **Selection** mask layer so that nothing is selected or masked.

This feature is not available in SurfaceStudio.

Image > Modify layer > Clear image

Removes all paint from the unmasked regions of the active image layer.

Image > Modify layer > Invert layer mask

Inverts a mask so that masked regions become unmasked and unmasked regions become masked

This feature is not available in SurfaceStudio.

Image > Modify layer > Tgl selection/mask

Disables or enables the selection mask.

This feature is not available in SurfaceStudio.

Image > Resize

Crops or extends a sketch image plane.

Change Image Plane Options

Image Plane Width, Image Plane Height

Fit to Window—Crops/extends the width/height of the sketch image plane to fit within the view.

Specified—Crops/extends the width/height of the sketch image plane by the **Pixels** or **Units** value.

Neither—Does not crop/extend the width/height of the sketch image plane.

Side

Left—Crops/extends the left side of the sketch image plane; the right side remains fixed.

Right—Crops/extends the right side of the sketch image plane; the left side remains fixed.

Top—Crops/extends the top of the sketch image plane; the bottom remains fixed.

Bottom—Crops/extends the bottom of the sketch image plane; the top remains fixed.

Both—Crops/extends both the top and bottom or the left side and right side (or all sides) of the sketch image plane.

Fill Type

Pixels—Crops/extends the sketch image plane width/height by the **Pixels** value (measured in pixels).

Units—Crops/extends the sketch image plane width/height by the **Units** value (measured in the main linear unit).

Tip   To set the main linear unit, choose **Preferences > Construction options**, and set **Units > Linear > Main Units**.

Pixels, Units

The amount to crop/extend the sketch image plane width/height by, measured in pixels (if **Fill Type** is **Pixels**) or the main linear unit (if **Fill Type** is **Units**).

Tip	To set the main linear unit, choose **Preferences > Construction options**, and set **Units > Linear > Main Units**.

Image > Crop

Crops or extends the active sketch image plane based on the current selection region.

This feature is not available in SurfaceStudio.

Image > Effect > Sharpen layer

Sharpens paint in all unmasked regions of the active image layer.

This feature is not available in SurfaceStudio.

Sharpen Layer Options

Sharpness

Controls the amount of sharpening. The valid range is 0 (no sharpening) to 10 (maximum sharpening).

Radius

Each pixel in the image layer is sharpened by comparing it with a certain number of its surrounding pixels based on the **Radius** value. For example, if **Radius** is set to 4, then each pixel is sharpened by comparing it with all surrounding pixels within a 4 pixel radius. The valid range is 0 to 4.

Image > Effect > Blur layer

Blurs paint in all unmasked regions of the active image layer.

This feature is not available in SurfaceStudio.

Blur Layer Options

Blur Radius

Each pixel in the image layer is blurred with a certain number of its surrounding pixels based on the **Blur Radius** value. For example, if **Blur Radius** is set to 4, then each pixel is blurred with all surrounding pixels within a 4 pixel radius. The valid range is 0 (no blur) to 32 (maximum blur).

Image > Effect > Horizontal flip, Vertical flip

Flips the active image layer horizontally or vertically.

This feature is not available in SurfaceStudio.

Image > Tgl paint panel

Display or hide the **Paint Panel**.

This feature is not available in SurfaceStudio.

Note   If the modeling control panel is displayed, choosing **Image > Tgl paint panel** displays the **Paint Panel** instead. If neither the modeling control panel or the **Paint Panel** is displayed, choosing **Image > Tgl paint panel** displays the **Paint Panel**. If the **Paint Panel** is displayed, choosing **Image > Tgl paint panel** hides the **Paint Panel**.

Paint Panel

The **Paint Panel** is a column of controls that you can display along the right side of the StudioTools window. It allows you to easily control shape properties, brush properties, and other tool options without having to open separate windows or option boxes. It also allows you to easily pan or zoom your view.

The options displayed in the **Paint Panel** correspond to those of the active sketching tool. (If no sketching tool is active, the shape options are displayed.)
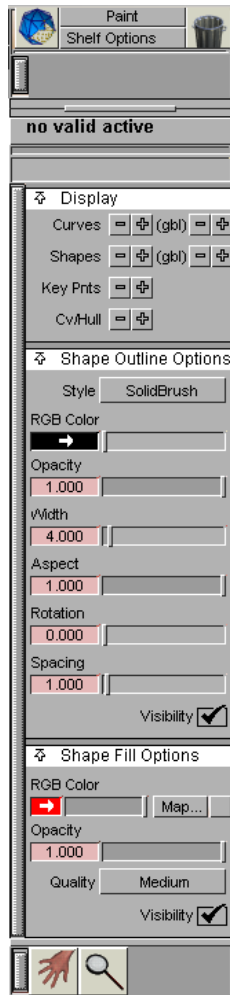
See also **Preferences > Interface > Tgl control panel**.

Display

Curves, Shapes, Key Pnts, Cv/Hull

Allows you to show (**+**) or hide (**-**) curves, shapes, key points, or CVs/hulls, either for selected objects or globally (**gbl**).

Brush Options

❖ Brush Options

Sharp Options

❖ Sharpen Properties

Blur Options

❖ Blur Properties

Flood Fill Options

❖ Flood Fill Options

Magic Wand Options

❖ Magic Wand Options

Marquee Options

❖ Marquee Options

Shape Outline Options

Style

The brush style of the shape outline, either **SolidBrush** or **AirBrush**.

RGB Color

The color of the shape outline.

To use a color that you have previously saved to a shelf, click the *color chip* to open the **Color Editor**, then click the color icon on the shelf.

Opacity

Controls how see-through the shape outline is. The valid range is 0 (entirely clear and invisible) to 1 (entirely opaque).

Width

The width (measured in pixels) of the shape outline.

Aspect

Controls how flat or circular the brush stamp used to create the shape outline is. The valid range is 0.01 (very flat and thin) to 1 (circular).

Rotation

> The angle (measured in degrees) of the brush stamp used to create the shape outline. If **Aspect** is less than 1, changing **Rotation** makes the brush stamp more horizontal (0) or more vertical (90). The valid range is 0 to 360.

Spacing

> Controls the space between the brush stamps used to create the shape outline. Low values produce a smooth outline with no spaces between stamps. Higher values produce outlines that appear as a series of dots. The valid range is 0 to 255.

Visibility

> Controls whether the shape has an outline (**Visibility** is turned on) or not (**Visibility** is turned off).

Shape Fill Options

RGB Color

> The color or texture of the shape interior.
>
> To use a color that you have previously saved to a shelf, click the to open the **Color Editor**, then click the color icon on the shelf.
>
> To map a texture to a shape's fill, click the *Map* button and choose a texture from the **Shape Texture** window. Then edit the texture's parameters.
>
> To change the texture of a shape's fill, click the *Map* button and choose the new texture from the **Shape Texture** window. Then edit the texture's parameters.
>
> To edit a shape's texture, click the *red arrow* beside the *Map* button and edit the texture's parameters.
>
> To remove a texture from a shape's fill, click the *Map* button and choose **Solid** from the **Shape Texture** window.
>
> For more information on textures and texture parameters, see the *Rendering* online documentation.

Note For shape masks, the **RGB Color** controls the opacity of the shape mask. The default **RGB Color** is white (fully opaque).

Opacity

Controls how see-through the shape outline is. The valid range is 0 (entirely clear and invisible) to 1 (entirely opaque).

Quality

Controls whether the shape's interior texture (if it has one) is displayed at low, medium, or high quality. This option only has an affect if a texture is mapped to **RGB Color**.

Visibility

Controls whether the shape has a fill (**Visibility** is turned on) or not (**Visibility** is turned off).

Tools

❖ **Control Panel > View > Track**

❖ **Control Panel > View > Dolly**

Image > Paint Default UI

Customize the StudioTools interface for sketching.

This feature is not available in SurfaceStudio.

Paint Default UI Options

Menu

Shows only sketching-related menus and tools (the same as choosing **Preferences > Menus > 2D menus**).

Control Panel

Shows the **Paint Panel** (the same as choosing **Image > Tgl paint panel**).

Turn off Grid

Hides the grid in all views (the same as choosing **DisplayTgls > Window toggles > Grid**).

Color

Sets the interface colors (including the default view background color) to the default modeling colors (**None**), the default sketching colors (**Default**), or to an interface color file (**Specified**) created from **Preferences > Interface > User colors**.

Marking Menu

Turns on the sketching-specific marking menus (the same as choosing **Preferences > Marking Menus > 2D Marking Menu**).

Image > Modeling Default UI

Customize the StudioTools interface for 3D modeling and rendering.

This feature is not available in SurfaceStudio.

Modeling Default UI Options

Menu, Menu Choice

Shows only **Short Menus**, **Long Menus**, **SurfaceDesign Menus**, or **Rendering Menus** (the same as choosing **Preferences > Menus > Short menus**, **Preferences > Menus > Long menus**, **Preferences > Menus > SurfaceDesign menus**, or **Preferences > Menus > Rendering menus**).

Color

Sets the default view background color to gray.

Marking Menu

Turns on the standard marking menus (the same as choosing **Preferences > Marking Menus > Standard Marking Menu**).

Control Panel

Shows the Modeling control panel (the same as choosing **Preferences > Interface > Tgl control panel**).

Turn on Grid

Shows the grid in all views (the same as choosing **DisplayTgls > Window toggles > Grid**).

Windows > Edit > Image layers

Opens the **Image Layers** window and allows you to control the arrangement of image layers.

This feature is not available in SurfaceStudio.

Image Layers
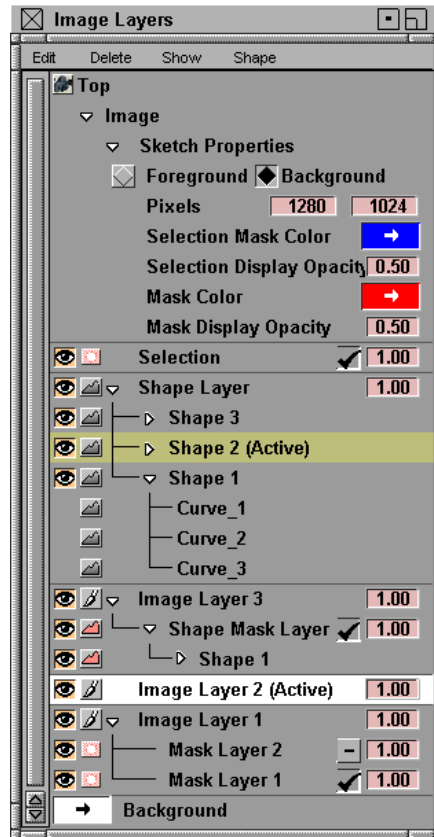
Edit menu

New image layer

> Creates a new image layer above the active image layer.

New mask layer

> Creates a new mask layer for the active image layer.

Clear image layer

Removes all paint from the active image layer.

Invert layer mask

Makes masked regions become unmasked and unmasked regions become masked on the active mask layer or on all mask layers associated with the active image layer.

Duplicate layer

Duplicates the active layer.

Merge below

Merges the active image layer with the image layer beneath it.

Merge visible image layers

Merges all visible image layers in the active sketch image plane into a single image layer.

Merge all image layers

Merges all image layers in the active sketch image plane into a single image layer.

Delete menu

Active layer

Deletes the active layer.

All masks

Deletes all mask layers in the active sketch image plane.

Hidden paint

Deletes all hidden paint on the active image layer.

Show menu

All sketches

Shows layers in the **Image Layers** window for all sketch image planes.

Active sketch

Shows layers in the **Image Layers** window only for the active sketch image plane.

Hidden Paint

Shows all hidden paint in the active image layer.

Show all layers

Shows all layers.

Hide all layers (except active)

Hides all layers except the active layer.

Shape menu

Convert Shape Layer to Image Layer

Converts the active shape layer into an image layer.

Convert ShapeMask Layer to Mask Layer

Converts the active shape mask layer into an image mask layer.

Delete Shape

Deletes the active shape.

Sketch Properties

Foreground/Background

Moves the sketch image plane so it appears behind (**Background**) or in front of (**Foreground**) the grid and 3D objects.

Pixels

The width and height of the sketch image plane measured in pixels.

Anti-aliased Image

Displays hard-edged *check mark* or soft-edged (anti-aliased) *dash* pixels in all sketch image planes.

Selection Mask Color

The color that selection mask regions are shown in.

Selection Display Opacity

The opacity of the **Selection Mask Color** that selection mask regions are shown in.

Mask Color

The color that masked regions on mask layers are shown in.

Mask Display Opacity

The opacity of the **Mask Color** that masked regions on mask layers are shown in.

Layers

Selection

The selection mask layer.

An *open eye* icon indicates the selection mask color is visible. A *closed eye* icon indicates the selection mask color is invisible.

A *check mark* icon indicates the selection mask is enabled. A *dash* icon indicates the selection mask is disabled.

Image layer

A layer (indicated by *image layer*) that can contain paint and that you can sketch on.

An *open eye* icon indicates the layer is visible. A *closed eye* icon indicates the layer is invisible.

Shape layer

A layer (indicated by *shape layer*) that can contain shapes and that you can create shapes on.

An *open eye* icon indicates the layer is visible. A *closed eye* icon indicates the layer is invisible.

Paint mask layer

A layer (indicated by *mask layer*) that can contain paint, that you can sketch on, and that protects regions of an image layer (that is, prevents you from sketching on regions of an image layer).

An *open eye* icon indicates the mask color is visible. A *closed eye* icon indicates the mask color is invisible.

A *check mark* icon indicates the mask is enabled. A *dash* icon indicates the mask is disabled.

Shape mask layer

A layer (indicated by *shape mask*) that can contain shapes, that you can create shapes on, and that protects regions of an image layer (that is, prevents you from sketching on regions of an image layer).

An *open eye* icon indicates the mask color is visible. A *closed eye* icon indicates the mask color is invisible.

A *check mark* icon indicates the mask is enabled. A *dash* icon indicates the mask is disabled.

Background

The background color of the sketch image plane.

Preferences > Menus > 2D menus

Show only sketching-related menus and tools.

Preferences > Marking Menus > 2D Marking Menu

Turn on the sketching-specific marking menu and allow you to customize the 2D marking menu.

For more information on marking menus, see **Preferences > Marking Menus > Standard Marking Menu**.

Control Panel > View > Pan

Allows you to pan the view of a sketch image plane by dragging in the view.

This feature is not available in SurfaceStudio.

Control Panel > View > Zoom

Allows you to zoom the view of a sketch image plane by dragging in the view.

This feature is not available in SurfaceStudio.

A red box appears as you drag. Drag so the red box covers the area you want to zoom into or out of. To zoom in, drag toward the right. To zoom out, drag toward the left.

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