

enter*

*discreet logic software

paint* getting started

version 2. options 1 and 2

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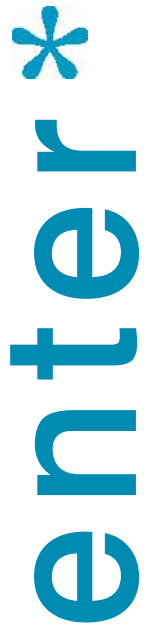
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Welcome to paint*

paint*™ is an interactive, vector-based, and object-oriented painting and animation system that offers unique tools for enhancing multi-frame clips and single-frame images on your Macintosh®, Windows® 95, and Windows NT® platforms. Combining flexibility and functionality, paint* allows digital artists, animators, videographers, website designers, and multimedia specialists of any experience level to create powerful desktop solutions.

An Introduction to paint*

These lessons provide an introduction to the capabilities of paint*. For a comprehensive guide to all of the software features, see the *paint* 2.0 User's Guide* or the Online Help. Each of the lessons includes screenshots (taken in Windows® 95 but also applicable to Macintosh® and Windows NT® platforms) and final clips for comparing results.

The lessons included on the paint* CD are:

Lesson 1: Using paint*

Lesson 2: Animating Text

Lesson 3: Tracking

Lesson 4: Using 3D Studio MAX with paint*

Where you learn to:

- Paint, edit and animate vector-based objects.
- Edit and animate vector-based text.
- Track and edit paint strokes in a clip.
- Create an animated material map.
- Apply 3D Post effects to RLA objects.

Before You Begin

The Lessons folder on the paint* CD contains a separate folder with the clips and projects needed for each lesson. For example, the files for Using paint* are in the Lessons\Lesson1 folder.

Before you begin, copy the lesson files from the CD to your computer's hard drive. You should keep the files in their respective folders so you do not have to locate any of the files when you open a project.

Note: The instructions given in the lessons assume you have copied the files to your system.

Comparing paint* Options 1 and 2

Both options 1 and 2 offer a full set of tools for painting, animating, and modifying images for film, video, web, animation, and multimedia. The features that are available only in paint* option 2 are:

- Advanced tracking tool, which allows position, scale, and rotation tracking, providing precise motion analysis and image stabilizing
- Full integration with 3D Studio MAX® modeling and animation software, with interactive live updating for texture creation and editing. Native paint* project files can be imported directly into 3D Studio MAX for use as texture maps. You can use 3D Post plugins to create effects on RLA files.
- Multiprocessing support
- Real-time playback from RAM

Steps that apply only to paint* option 2 are clearly marked in the lessons.

Getting More Help

For a comprehensive reference to all of the software features, see the *paint* 2.0 User's Guide*. If you are not able to find the answers to your questions in either this guide or the user's guide, contact the new Media Call Center from 8:00 a.m. to 8:00 p.m. EST Monday to Friday at one of the numbers below. You can also send queries by e-mail.

North America:	1-877-DISCREET
(toll-free)	
Overseas:	(514) 954-7550
Fax:	(514) 954-7254
E-mail:	techsupport@discreet.com

Readers' Comments

We would like to hear from you. Your comments can help us to improve the quality of the lessons and other documentation. Mail, fax, or email your comments to:

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*enter

paint* provides tools for painting, editing, and animating objects. Objects created in paint* possess vector-based properties offering easy editing and animating.

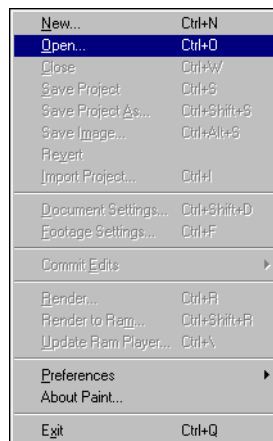
In this lesson:

- Go on a tour of the desktop
- Paint, edit, and animate vector-based objects
- Change the order of paint objects
- Paint effects using Draw Modes
- Apply effects to paint objects
- Change the order of effects applied to paint objects
- Remove a wire by keyframing with the Clone tool.

Open the Project

Opening a clip in paint* creates a project. Saving a project saves changes made to the clip.

1. Start paint*.
2. Choose **File | Open**.



3. In the Open dialog, select the *WireFix.avi* file and click Open.

Tour the paint* Desktop

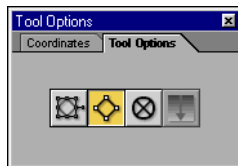
In this step, take a quick tour of the paint* desktop palettes used in this tutorial.

Note: The Tracker palette will be introduced in Lesson 3, "Tracking". The Coordinates palette displays the X and Y pixel positions and the pixel's color coordinates in both the RGB and HSV color models and is not used in this tutorial.

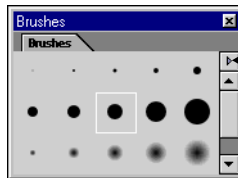
1. The Tools palette contains tools for creating objects and making selections.



2. The Tool Options palette displays options for the current tool selected. In this tutorial use the Tool Options palette in conjunction with the Object Edit tool:



3. Use the Brushes palette to display and pick brushes.

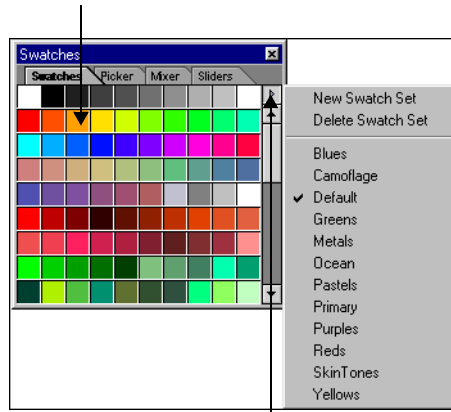


Click the right arrow to select different brush sets from the menu.

4. Use the Swatches, Picker, Mixer, and Sliders palettes to choose colors:

a) In the Swatches palette:

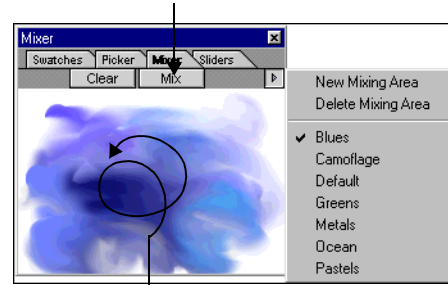
Click a color.



Click the right arrow to select a different switch set.

b) In the Mixer palette:

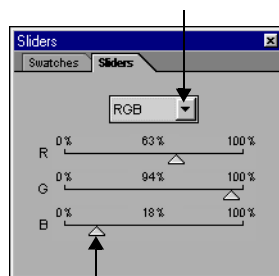
Select colors and place on palette.
Click Mix.



Move the cursor in a circular motion to mix the colors together.

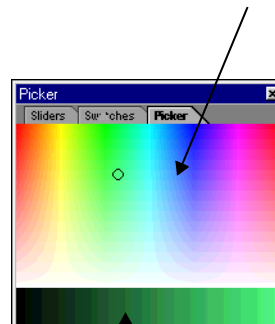
c) In the Sliders palette:

Select RGB or HSV color models.



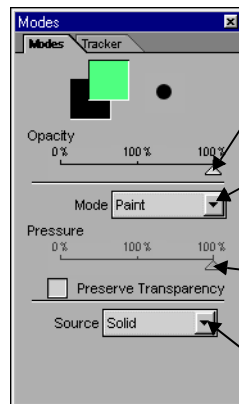
Select a color by dragging the sliders for the individual channels.

d) In the Picker palette, click to select a color.



Use the gradient to adjust the luminance and saturation.

5. The selected color appears in the Modes palette. Use the Modes palette to set the properties of your brush strokes:



- a) Drag the Opacity slider to select the opacity of your brush stroke. Varying the opacity determines how much of the draw mode effect is visible.
- b) Use the Mode list to select a draw mode. You use the Paint, Negative, and Tint modes in this lesson. For a description of the other available modes, see the *paint* 2.0 User's Guide*.
- c) Drag the Pressure slider to select the pressure of your brush stroke. Varying the pressure increases or decreases the strength of the created effect.
- d) Use the Source list to select the source of the brush stroke.

6. Use the Frame Controls palette to navigate through a project:

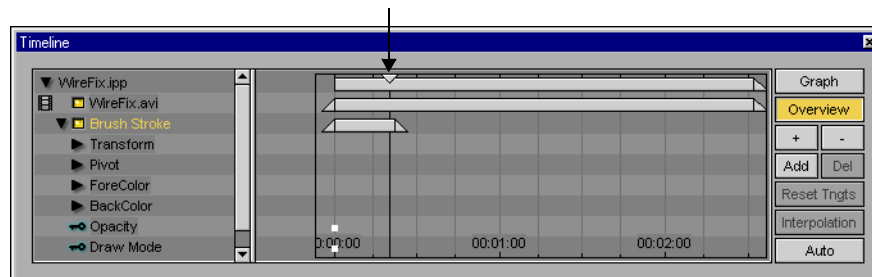
- a) Drag left and right over the Frame indicator to move back and forth through the tutorial clip.



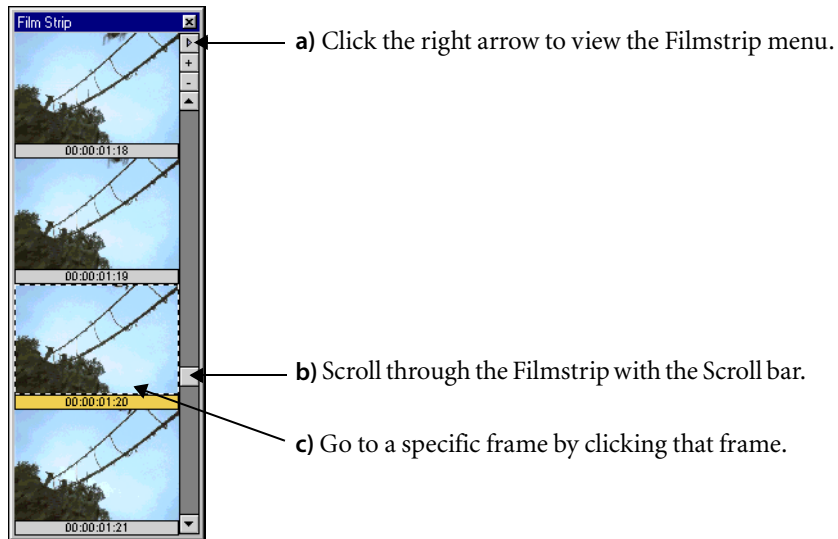
- b) Click the First Frame button to go to the beginning of the clip.

7. Use the Timeline to navigate through a clip and to control the keyframing of your animation:

- a) Drag the Current Time Marker to scroll through the tutorial clip.



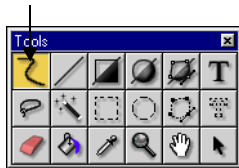
8. The Filmstrip presents a series of thumbnail views of different frames from your project. It can be used to preview your animation and navigate through your project:



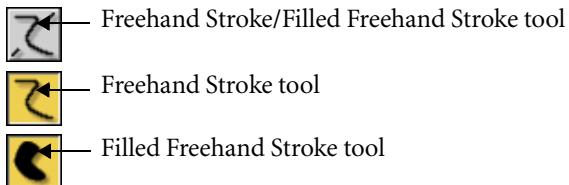
Paint and Edit a Simple Line

In this step, learn basic painting techniques by painting and editing a simple line.

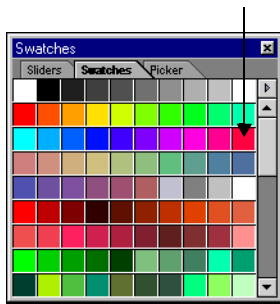
1. On the Tools palette, click the Freehand Stroke tool.



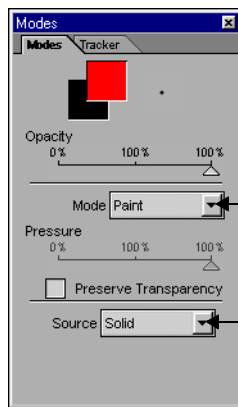
Note: The Freehand Stroke/Filled Freehand Stroke, the Rectangle, the Ellipse, and the Polygon tool have filled and outline options. Click the tool twice to toggle between the outline and filled options.



2. In the Swatches palette, click red.



3. In the Modes palette, select the options for painting a simple line:



a) Select Paint from the Mode list.

b) Select Solid from the Source list.

4. Draw a simple paint stroke.

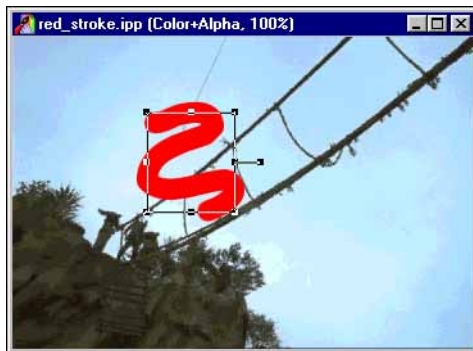


The line you just painted is a vector-based object, which means that it can be edited quickly and easily.

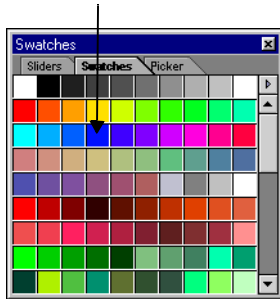
5. Click the Object Edit tool.



An object outline appears around the paint stroke.



6. Drag the paint stroke around in the same frame.
7. Change the color of the paint stroke by clicking blue in the Swatches palette.



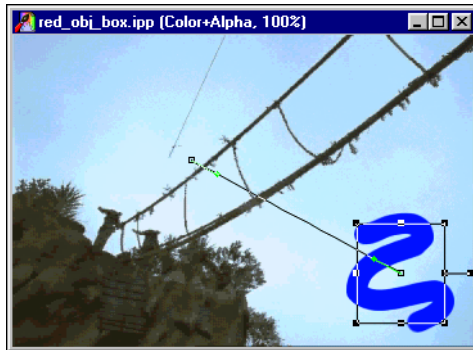
Animate the Paint Stroke

Because objects in paint* are vector-based, they can be animated. In this step, animate the position, rotation, color, and scale of the paint stroke.

1. In the Frame Controls palette, click the Last Frame button.

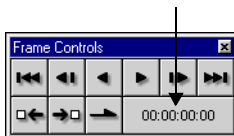


2. Move the paint stroke to a new position.



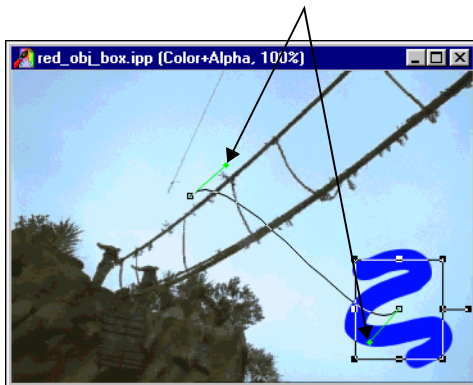
A motion path is created automatically between the positions of the paint stroke in the first and last frames. A keyframe is set in this frame. A keyframe is a point in time that records a change in an object's property. The changed property in this instance is the position.

3. In the Frame Controls palette, drag over the Frame indicator to scroll back and forth through the clip.



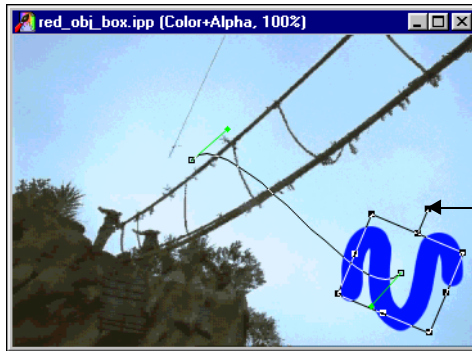
The paint stroke moves along the motion path.

4. Drag the bezier handles on the keyframes to adjust the shape of the motion path.

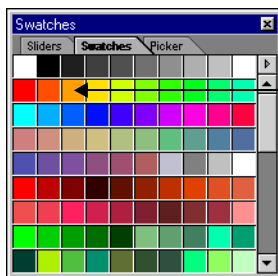


5. Scroll through the clip to see the change in the motion of the paint stroke.

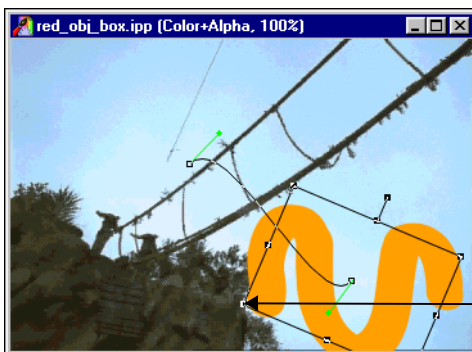
6. In addition to animating the position of the paint stroke, you can also animate its size, rotation, and color. Changing any of these attributes at a new frame creates a keyframe. At the last frame:



a) Rotate the paint stroke by dragging the rotation handle.



b) Change its color by clicking a new color in the Swatches palette.



c) Scale it up by dragging the points on the box.

Hint: Press **Shift** and drag one of the corners to proportionally scale the paint stroke.

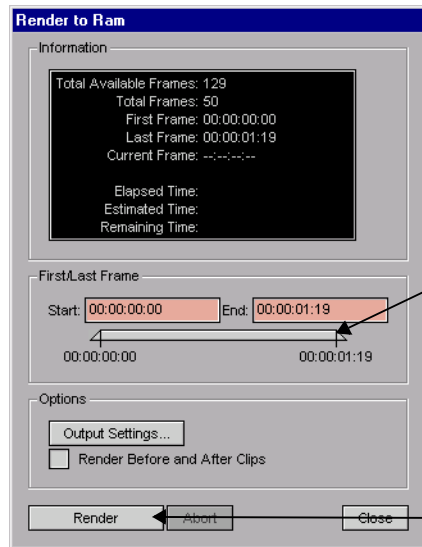
7. Scroll through the clip to view the wireframe animation. Stop in the middle of the animation and observe the color change. The color is interpolated automatically between keyframes.

Use the RAM Player

Rendering the clip to RAM is faster than rendering the clip to an AVI or M-JPEG file because data is cached to memory instead of being saved to disk.

Note: The RAM Player is available only in paint* option 2.

1. Use the RAM Player to render your clip to RAM:



- a) Choose **File | Render to RAM**.

The Render to RAM dialog appears.

- b) The timebar indicates the number of frames that can be rendered according to the amount of RAM available in your system. Verify how many frames can be played.

See the *paint* 2.0 User's Guide* for information on allocating RAM to paint* and setting RAM Player preferences.

- c) Click Render to render the clip.

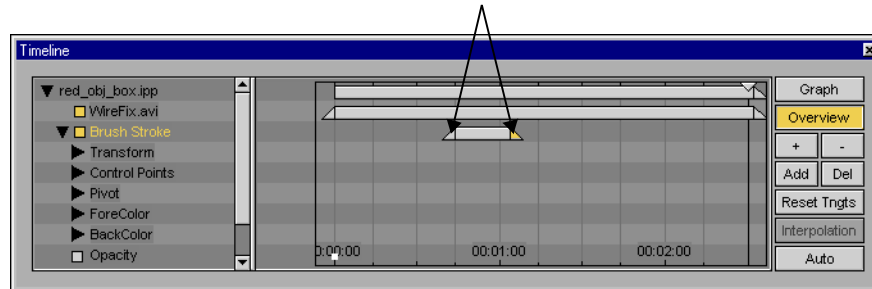
Note: Once you have rendered to RAM, the RAM player is updated dynamically when you rotoscope or make changes to individual frames. But if you perform an operation that changes several frames, for example keyframing, you must update the Ram Player to re-render the additional frames.

Edit Keyframes and Object Bars in the Timeline

As you saw in a previous step, you can create an animation in paint* by changing an attribute of the paint stroke at different frames of the clip. All keyframes and object bars are plotted in the Timeline. You can also use the Timeline to create, view, and edit keyframes.

1. By default all paint strokes have a life span of one frame.

- a) Use the object bars to change the length of the animation.



- b) Move to the first frame by scrolling the Frame indicator to 00:00:00:00.

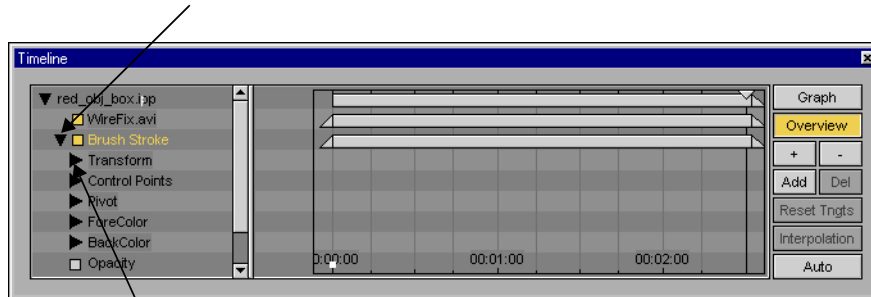


- c) Click the Next Frame button in the Frame Controls palette to move through the clip frame by frame to see when the paint stroke appears in the clip. Notice the correlation between the Brush Strokes bar and the appearance of the paint stroke.

- d) Undo this change by extending the Brush Strokes bar to its original length.

2. View the Brush Stroke attributes:

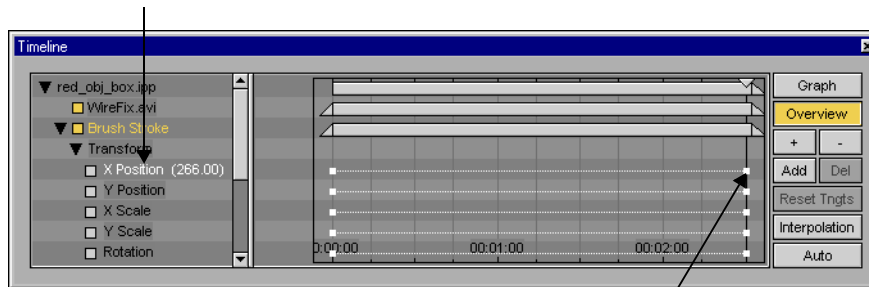
- a) Click the arrow next to the Brush Stroke object in the Timeline to view its attributes.



- b) Open the Transform folder to view the position, scale, and rotation channels.

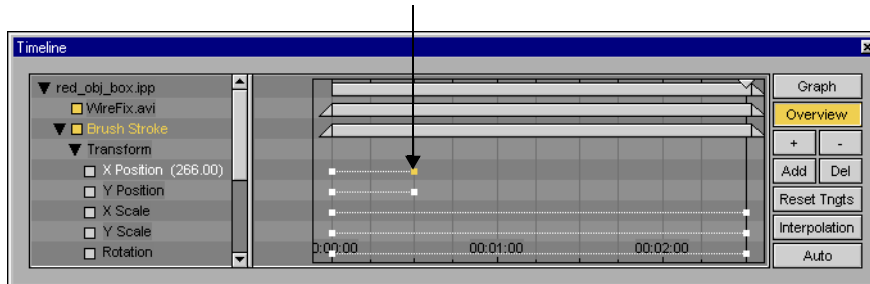
3. Drag keyframes to set the time span of individual parameters of the paint stroke:

- a) Click X Position in the Timeline to highlight the Brush Stroke keyframes.

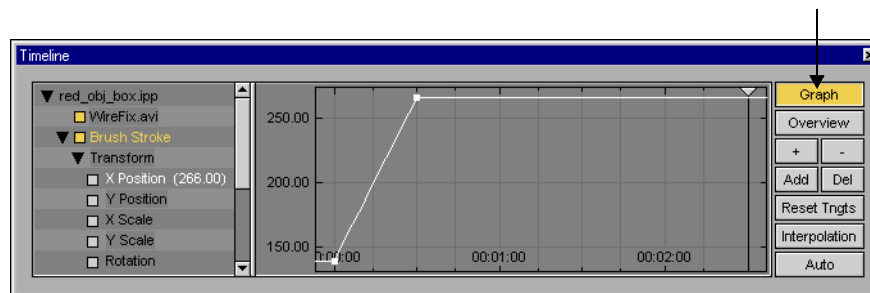


Notice that the X and Y Brush Stroke keyframes are extended to the length of the Brush Stroke bar, indicating that the X and Y positions of the paint stroke change throughout the entire clip.

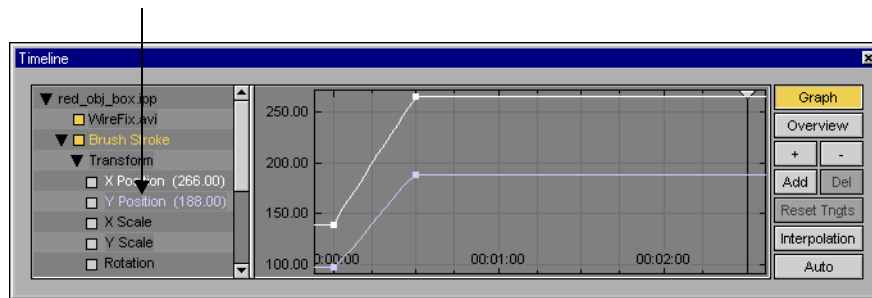
- b) Drag one of the Brush Stroke position keyframes to a length shorter than the Brush Stroke bar. The X and Y positions of the paint stroke change only during the set period. Undo this change by extending the Brush Stroke keyframes to their original length.



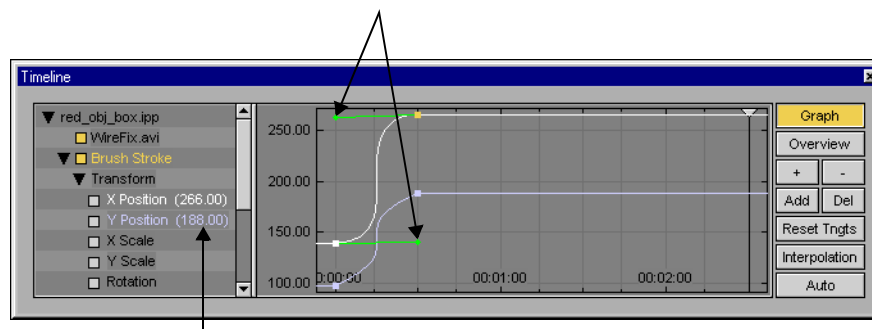
4. Click Graph to view the graph for the X position of the paint stroke.



5. Hold the Shift key and click Y Position to view the graph for the X and Y position at the same time.



6. Use the bezier handles on the X Position curve to adjust the rate of change between keyframes. Click one of the keyframes to activate the bezier handles, then drag the handles until the curve looks like the one shown here:

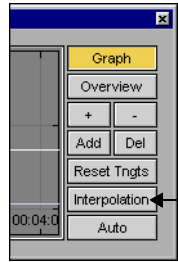


The values in the Timeline are virtual sliders which means they can be increased by dragging on the numbers to the right and decreased by dragging to the left.

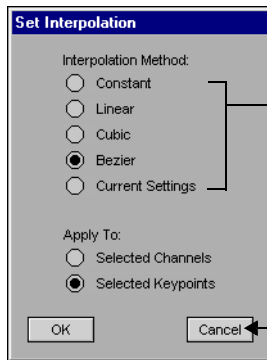
Note: Adjustments made with the bezier handles affect the rate of transformation between clips in an animation.

7. Interpolation is the process of calculating the values between two keyframes. The interpolation method determines how the change from one keyframe to the next is made. There are several different interpolation methods which can be applied to entire channels or just selected keyframes.

Select:	To:
Constant	Change values instantly, with no interpolation between keyframes.
Linear	Draw a straight line between keyframes, causing abrupt changes in the animation when moving from one keyframe to the next.
Cubic	Draw smooth curves between keyframes, so the animation is not interrupted when moving from one keyframe to the next.
Bezier	Draw smooth curves with tangent lines allowing you to adjust the exact slope of the curve at the entry and exit of each keyframe.



a) Click the Interpolation button in the Timeline.



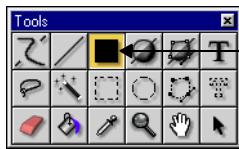
b) Change the interpolation method. Note the effect on the X and Y position curves.

c) Click Cancel to return to the default settings.

Change the Order of Paint Objects

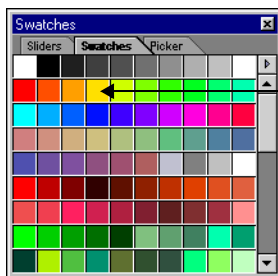
Because paint objects are vector-based, you can draw one on top of another and then change their order.

1. Draw a rectangle on top of the paint stroke:



a) Click the Rectangle tool in the Tools palette to select Filled Rectangle.

Hint: Click the Rectangle tool again if Outline Rectangle is selected.



b) Click a yellow square in the Swatches palette to change the active color to yellow.



c) Drag diagonally on the image to draw the rectangle.

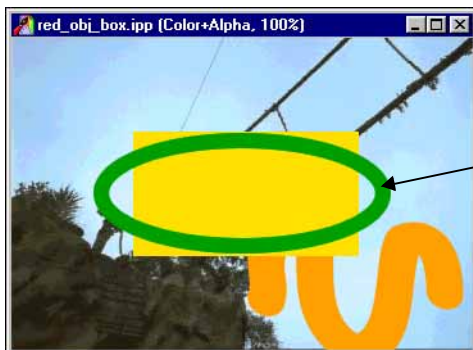
2. Draw an outline ellipse on top of the other objects:



a) Click the Ellipse tool in the Tools palette to select an Outline Ellipse.

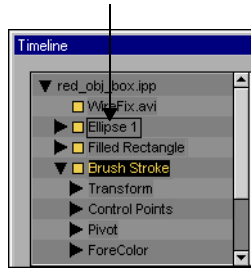
Hint: Click the Ellipse tool again if Filled Ellipse is selected.

b) Click a green square in the Swatches palette to change the active color to green.



c) Drag on the image to draw the ellipse.

3. You can change the order of appearance of the objects (that is, their order from front to back) by dragging the objects up and down in the Timeline. In the Timeline, drag the Brush Stroke object from the bottom to the top of the list.



Notice the change in order of the objects on screen; the Brush Stroke object moves to the front.

4. Delete all of the objects in your project by pressing **Shift + Delete**.



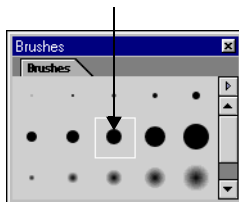
5. On the Frame Controls palette, click the First Frame button.

Use Draw Modes to Add Effects

In this step, use Draw Modes to apply and edit filter effects on-screen as you work. You can change the Draw Mode by selecting one of the modes in the Modes palette.

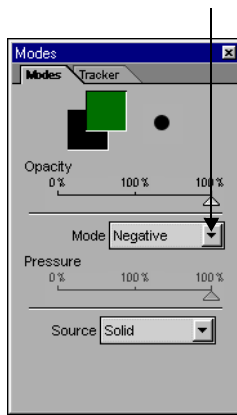


1. Click the Freehand Drawing tool.
2. Select a medium-sized brush from the default Brushes palette. The default palette is displayed when the program is first started. If your palette looks different from the one shown here, click the right arrow at the side of the Brushes palette and select Default.



Note: Double-clicking on a brush opens the Edit Brush palette where the brush can be edited. For more information, see the *paint* 2.0 User's Guide*.

- On the Modes palette, select Negative from the Mode list.



- Paint over the figure standing at the end of the bridge.



The figure is replaced with its negative image.



- Click the Object Edit tool.
- Click the object you just painted and resize it by dragging the handles on the object outline. Even though the object uses a filter effect, it can be scaled like any other vector-based object.

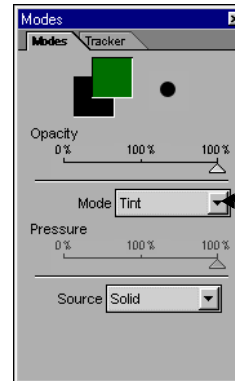


7. Drag the object to a new position. It is easy to move an object that uses an effect and apply the effect somewhere else. There is no need to undo and re-apply the effect.
8. Animate the Draw Mode:



a) Move to the end of the Scroll bar.

b) Click the last proxy in the Filmstrip to go to the last frame.



c) On the Modes palette, select Tint.

9. On the Frame Controls palette, click the Play button or update the RAM Player. See “Use the RAM Player” above for more information.



10. Press **Shift + Delete** to delete the object from the project.



11. On the Frame Controls palette, click the First Frame button.

Apply the Noise and Twirl Effects

You can apply effects to paint objects using the options in the Effects menu. In addition to the 50 or so effects included with paint*, you can use plug-ins from Photoshop as well as third-party After Effects plug-ins like FinalEffects from Meta Creations or Cinelook from DigiEffects.

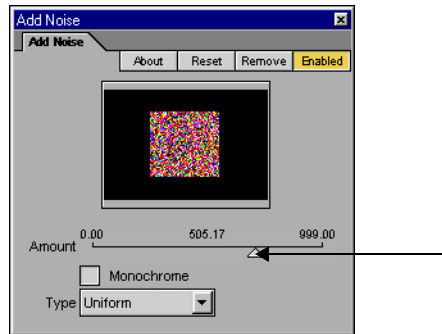
1. Draw a red square:
 - a) Click the Filled Rectangle tool.
 - b) Pick red from the Swatches palette.
 - c) Select Paint from the Mode list.
 - d) Drag on the image to draw the square.

2. Click the Object Edit tool to select the red square.

3. Choose **Effects | Noise | Add Noise**.

The Add Noise palette appears.

4. On the Add Noise palette, drag the Amount slider back and forth to increase or decrease the amount of noise. You can watch the effect preview as you move the slider.

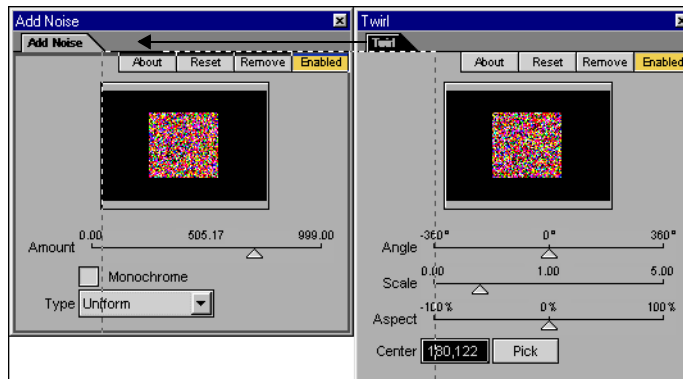


5. Set the Amount to about 500. Notice how the noise on the square is uniform and clear.

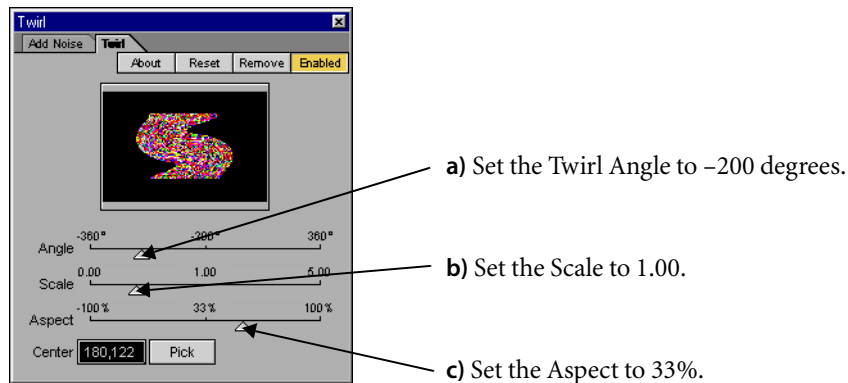


6. Choose **Effects | Distort | Twirl**.

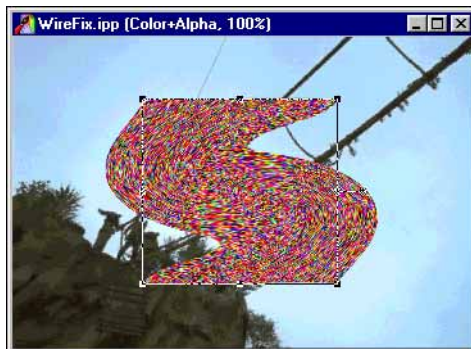
7. Group the Add Noise and Twirl palettes together by dragging the tab on the Twirl palette to the right of the tab on the Add Noise palette.



8. Set the Twirl parameters:



Notice that the object is extended outside its original rectangular boundaries and that the noise is also distorted by the Twirl effect.

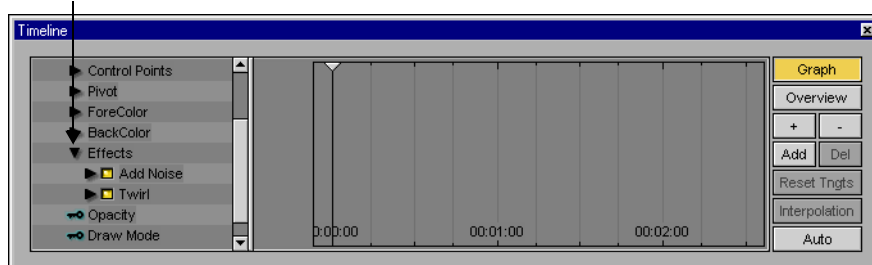


9. Even though you are applying an effect to this object, it maintains its vector-based characteristics and can still be edited. Drag the object around the screen, then return it to its original position.

Change the Order of Operations

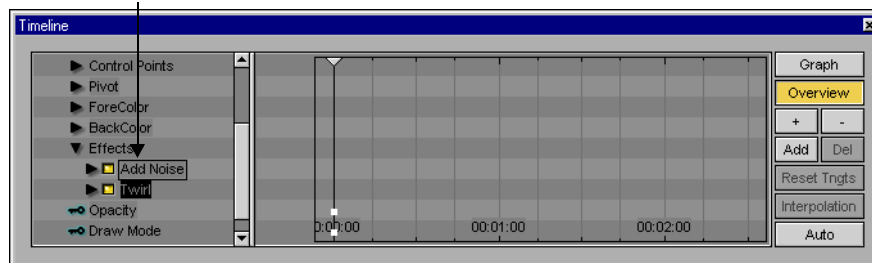
The order in which effects are applied is called the Order of Operations. You can view and animate the Order of Operations in the Timeline.

1. In the Timeline, click the arrow next to the Filled Rectangle object to open up the Filled Rectangle folder. Open the Effects folder by clicking the triangle next to the Effects object.

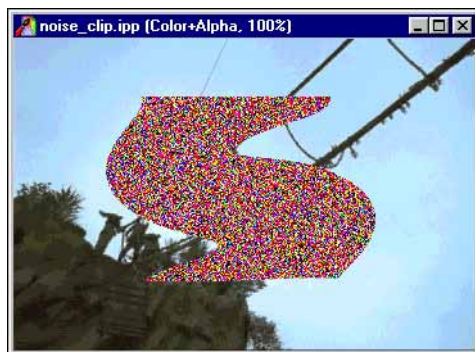


Since the Add Noise effect was applied first, it is listed first in the Timeline. The Twirl effect is listed below it.

2. Click the Twirl effect in the Timeline and drag it above the Add Noise effect.



Notice how the noise applied to the object is once again clean with no distortion from the twirl. Changing the Order of Operations changes the additive outcome of the effects, creating new results from the same effects.



3. Close the Twirl and Add Noise palettes by clicking the top-right corner of the palette.
4. Delete the object from the project.
5. On the Frame Controls palette, click the First Frame button.

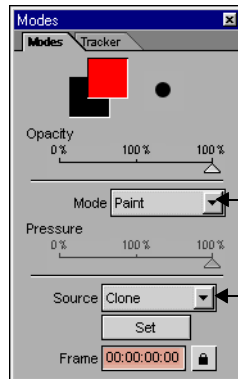


Use Clone to Remove the Wire

In this step, use Clone to remove a wire from each frame of the clip. Using vector objects makes removing the wire faster and more efficient than traditional rotoscoping.



1. Click the Straight Line tool.
2. On the Brushes palette, select a medium-sized brush.
3. On the Modes palette:



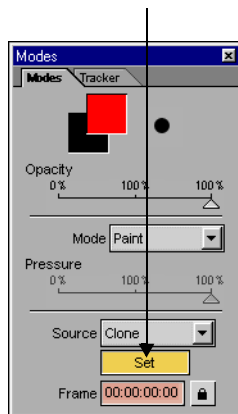
a) Make sure the draw mode is set to Paint.

b) Select Clone from the Source list.

Note: You can use the Frame box, to type the frame number of the frame that contains the image you want to clone. You do not use the Frame box in this exercise.

4. Set the Clone point:

a) Click the Set button below the Source list.



b) Click just to the left of the wire to select the point from which to clone.

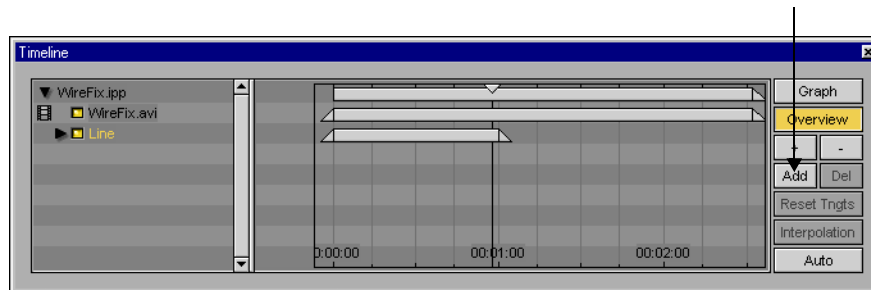


5. Position the brush over the top end of the wire. Click and drag to paint the line down to the end of the wire.



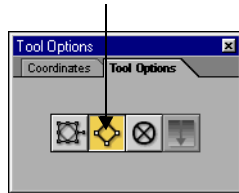
You could repeat instructions 4 and 5 in each frame to paint out the wire. However, there is an easier way to clean up this clip which takes advantage of the vector-based capabilities of paint*.

6. Click the Object Edit tool. An object outline appears around the line.
7. Advance to frame 00:00:00:29 where the wire is shortest.
8. Click Add in the Timeline to set a keyframe at this frame.



9. Remove the wire:

a) Click Control Points in the Tool Options palette.



b) Click the upper control point and move it slightly to the right to cover the wire.



c) Click the lower control point and move it up to cover the end of the wire.

10. In the Frame Controls palette, drag back and forth on the Frame indicator to view the wireframe animation.

Notice that the wire is removed in all frames. Simply by setting keyframes at two frames, you have removed the wire over all frames in the clip without time-consuming rotoscoping.

11. Choose **File | Save Project**.

12. Render the finished clip:

a) Choose **File | Render**.

b) In the Render Movie dialog, click the Render button.

c) In the Save As dialog, click the Save button.

d) In the Select Compressor dialog, click OK.

You can play the rendered clip in Media Player or a similar playback program. Compare your results to the *wire_removed.avi* clip.

Note: If you have paint* option 2, you can render to RAM instead of rendering to disk. If you render to RAM, play the clip in the RAM Player.

This concludes the Using paint* lesson.



The Text tutorial covers text editing and animation capabilities unique to paint*.

In this lesson:

- Type text on-screen
- Edit font, size, and color, in context
- Apply Draw Modes with text
- Edit text as a vector-based object
- Animate text as a vector-based object
- Animate text objects as members of groups
- Animate individual characters
- Animate text kerning automatically
- Duplicate a text object
- Create a duplicate text outline.

Open the Project

1. Start paint*.
2. Choose **File | Open**.
3. In the Open dialog, select the *BWlogic.avi* file and click Open.

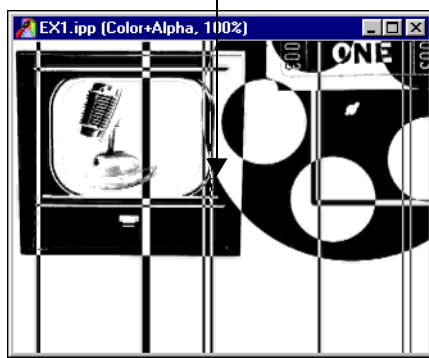
Type and Edit Text

In this step, type and edit text.

1. On the Tools palette, click the Text tool.

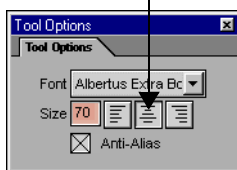


2. Click on the center of the project window to select the insertion point for the text.

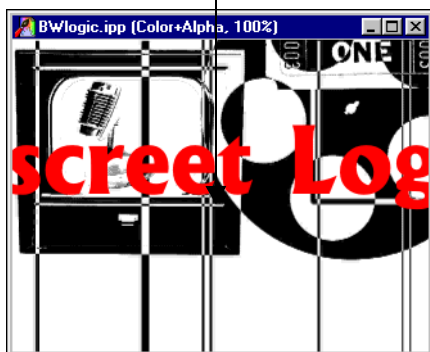


A flashing cursor appears.

3. On the Tool Options palette, click the Center button.

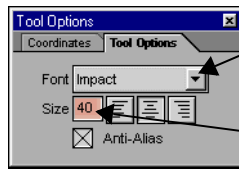


4. Type Discreet Logic.



Hint: Edit text on-screen using the Backspace key to delete text and Ctrl (Windows) or Command (Macintosh) in combination with the arrow keys to manually kern text.

5. Change the font:



a) In the Tool Options palette, select Impact from the Font list. Any Adobe TrueType or PostScript fonts installed in the system can be used.

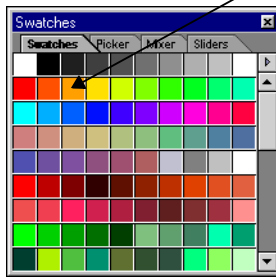
b) Click the Size field and type 40 to change the font size to 40 point.



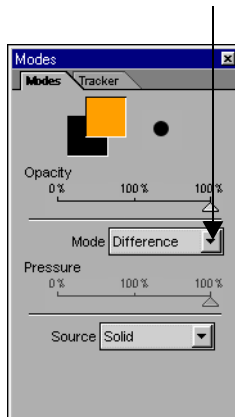
6. On the Tools palette, click the Object Edit tool to make the text a vector-based object.

An object outline appears around the text. Although you can no longer edit its font and characters, you can now animate the text.

7. On the Swatches palette, click an orange square to change the color of the text to orange.



8. On the Modes palette, select Difference from the Mode list. The parts of the text on the white background become blue.

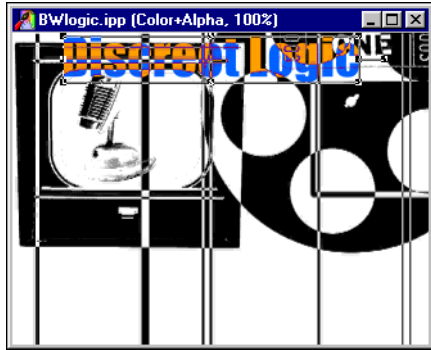


Difference mode subtracts the RGB color values of the current color from those of the image you are painting on. If the result is a negative number, the inverse value is used. This can produce a psychedelic effect. In this mode, black has no effect (since all values are zero) and white creates a complete inversion of the color information.

Animate the Text

In this step, set a keyframe to animate the text.

1. Drag the text to the top of the Project window.



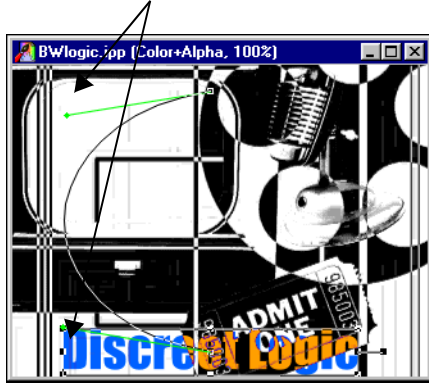
2. On the Frame Controls palette, click the Last Frame button.



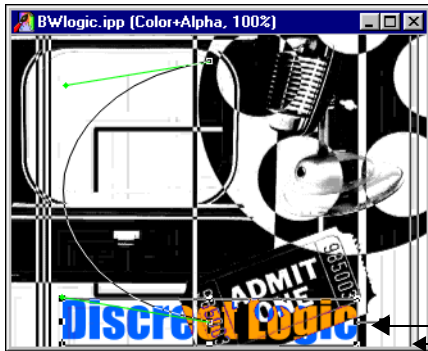
3. Drag the text to the bottom of the Project window.



4. The bezier handles are green. Drag the bezier handles to the left to adjust the motion path of the text.

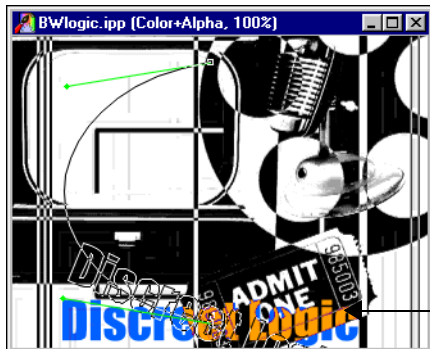


5. Rotate the text:



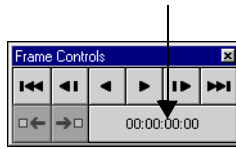
- a) Place the cursor over the end of the bar on the right side of the object outline. Click when the cursor changes to a curved arrow.

Hint: If necessary, increase the width of the Project window by dragging on the side of the Project window when the double-headed arrow appears.



- b) Rotate the text clockwise 360 degrees.

6. Drag back and forth on the Frame indicator in the Frame Controls palette to view the wireframe animation.



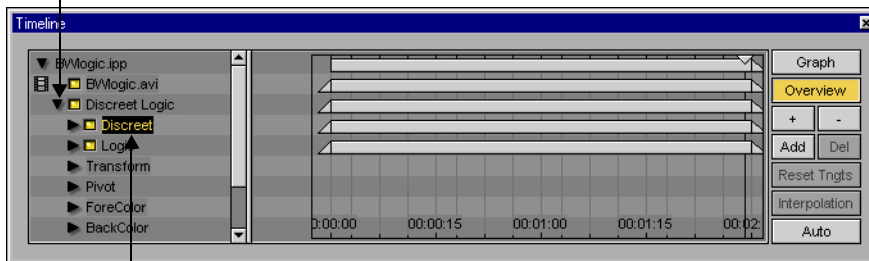
7. On the Frame Controls palette, click the Last Frame button.

Group and Ungroup Objects

When you type text, individual objects are created for each word and letter allowing you to animate them separately. In this step, animate the words separately, then set a global keyframe by using the grouping feature.

1. Edit the Discreet object in the Timeline:

- a) Open the Discreet Logic folder by clicking the triangle beside it in the Timeline. The Discreet Logic folder contains objects for the two words typed—Discreet and Logic—each with its own motion path.

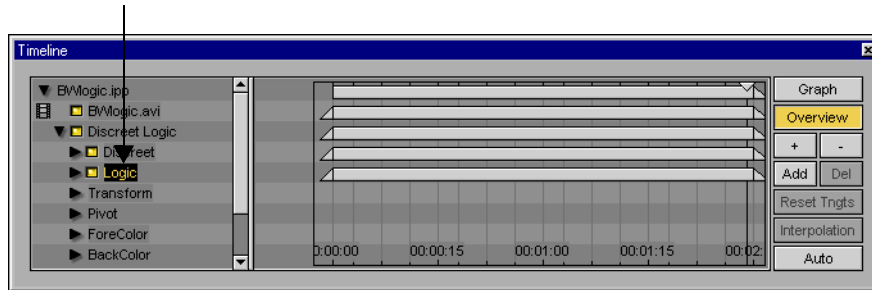


- b) Click the Discreet object to select it.
- c) In the Project window, rotate the Discreet object 360 degrees counterclockwise.

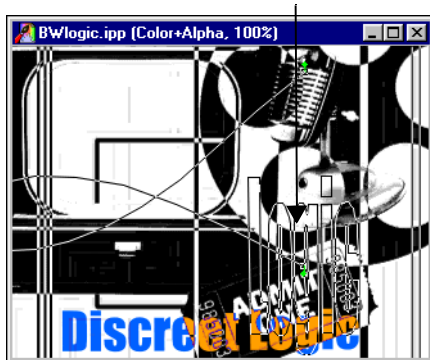


2. Edit the Logic object:

- a) In the Discreet Logic folder, select the Logic object.



- b) In the Project window, scale the Logic object by dragging the handles.



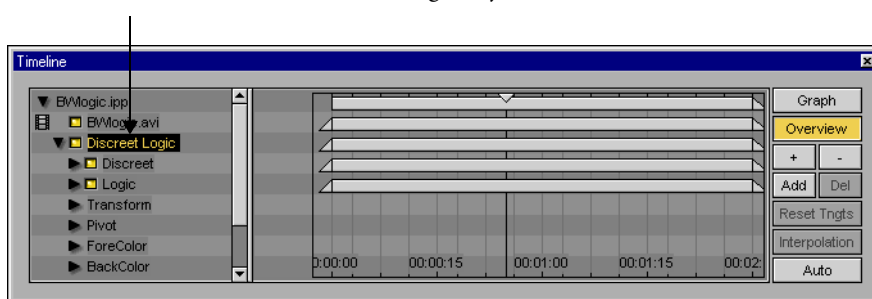
3. Repeatedly click the Previous Frame button in the Frame Controls palette to view the animation frame by frame. Notice that the objects have different rotations and scales.



4. Go to frame 00:00:00:25.

5. Set a new keyframe:

- a) In the Timeline, select the Discreet Logic object.



- b) In the Project window, drag the Discreet Logic object to the right.



Even though you edited the objects separately, the Discreet Logic group remains intact and can still be edited as a whole. This grouping feature allows you to make global changes, which are automatically applied to all objects in the group. You do not need to animate a series of objects separately.

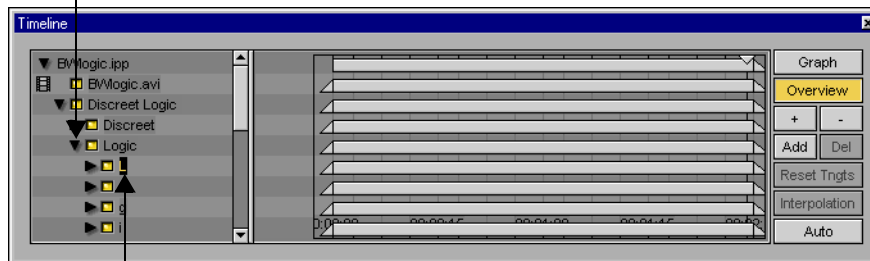


6. Click the Last Frame button in the Frame Controls palette.

Create a Text Kerning Animation

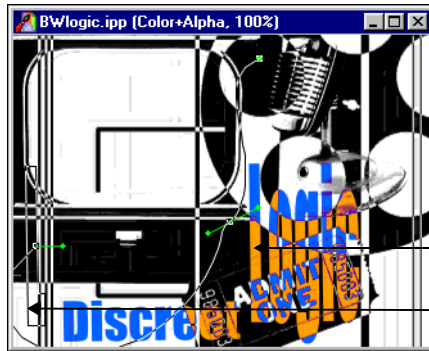
In this step, animate the letters separately to create a text kerning animation.

1. Select the L object in the Timeline:
 - a) Click the arrow next to the Logic object. The Logic object consists of individual characters that may be edited separately.



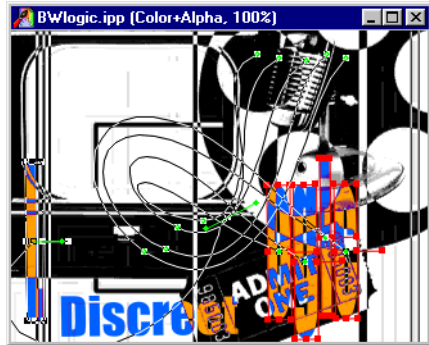
- b) Select the L object in the Timeline or hold down the Ctrl button and click on the L in the Project window.

2. Move the L object to the left side of the Project window, then



- a) Click and hold the L object in the project window.
- b) Hold the Shift key and drag the L object to the left side of the Project window.

3. In the Project window, select the remaining letters in Logic by Ctrl-Shift-clicking them. Alternately, Shift-click the remaining letters in the Timeline.

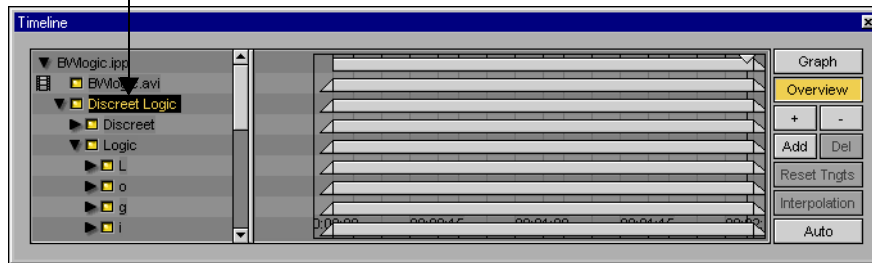


4. Choose **Object | Horizontal Alignment | Distribute Centers**. Since keyframes are set automatically when performing this procedure, the text automatically kerns out over time. You can also see the motion paths for the individual characters.
5. Drag on the Frame indicator on the Frame Controls palette to view the animation.
6. Return to the first frame.
7. Regroup the objects by clicking outside the object in the Project window.

Create a Text Outline

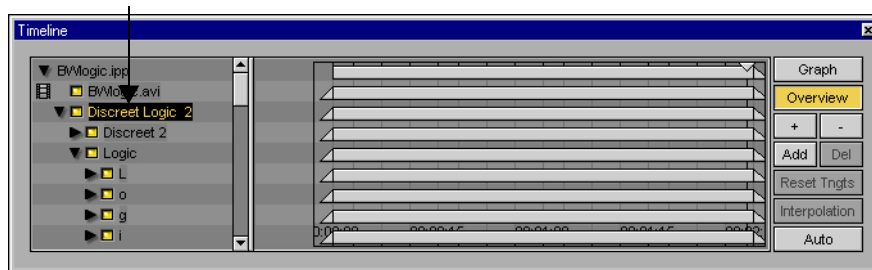
In this step, duplicate the existing text to create and animate a text outline.

1. Select the Discreet Logic object in the Timeline.

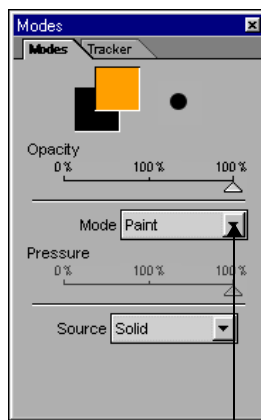


2. Choose **Edit | Duplicate**.

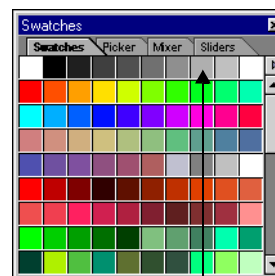
3. In the Timeline, select the Discreet Logic 2 object.



4. Change the color of the duplicated text:



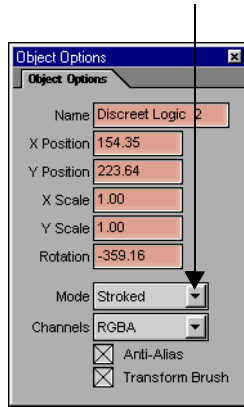
- a) On the Modes palette, click the Mode list and select Paint.



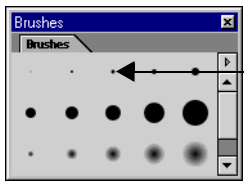
- b) On the Swatches palette, click a medium grey to change the text color to grey.

5. Create the outline:

- a) Double-click the Discreet Logic 2 object in the Timeline.
- b) On the Object Options palette that appears, select Stroked from the Mode list.

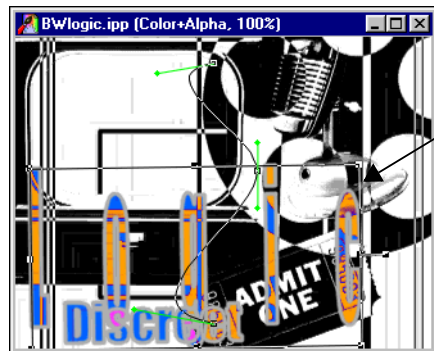


- c) Close the Object Options box.
- d) Select a small brush from the Brushes palette.



6. Click the Last Frame button in the Frame Controls palette.

You have created an outline that follows the original text. Because duplicating an object also duplicates all the keyframes, there is no need to animate the duplicate separately to match the animation of the original.



Hint: By adding new keyframes to those already duplicated from the original object, you could easily add a new effect to the outline.

Save and Render the Project

1. Choose **File | Save Project**.
2. Render the finished clip:
 - a) Choose **File | Render**.
 - b) In the Render Movie dialog, click the Render button.
 - c) In the Save As dialog, click the Save button.
 - d) In the Select Compressor dialog, click OK.

You can play the rendered clip in Media Player or a similar playback program. Compare your results to the *DLtext_result.avi* clip.

Note: If you have paint* option 2, you can render to RAM instead of rendering to disk. You can also save the RAM player clip to a file by selecting the RAM player clip and choosing **File | Save As**. If you render to RAM, play the clip in the RAM Player.

This concludes the Animating Text lesson.

enter*

You can use the Tracker to track any object in paint*, such as circles, strokes and text. You can also track the vertices of polygons and the position of applied filter effects, for example, the center of a lens flare. paint* also has two filters that you use to perform stabilization.

In this lesson:

- Use the Clone tool to hide unwanted details in an image
- Use the Tracker to make paint strokes follow movement in a clip
- Correct the tracker's path if it moves off course.

Note: The Tracker is only available in paint* option 2.

Open the Clip Project

Open the clip that you work on in this project.

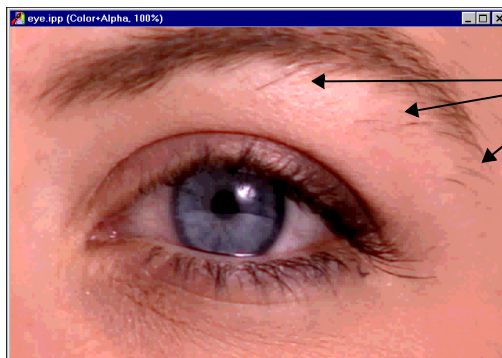
1. Start paint*.
2. Choose **File | Open**.
3. In the Open dialog, go to the Lessons\Lesson3 folder.
4. Select the file *eye.avi* and click Open.

Play the Clip



1. Click the Play button on the Frame Controls palette to play the clip.

As you can see, the clip is of an eye blinking. There is some camera movement as well.



Notice that there are some stray eyebrow hairs in the area between the eye and the eyebrow.

In this lesson, you remove these hairs from all the frames in the clip. You can do this easily in paint*, using the Clone Aligned tool to paint over the hairs with a nearby skin area, then using the tracking tool to make the paint strokes follow the movement of the eyebrow.



2. Click the First Frame button to go back to frame 1.

Select a Cloning Method and Brush

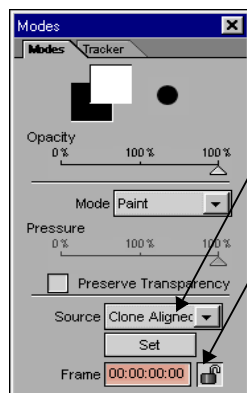
The Clone tool lets you paint on an image using color values sampled from another part of the same image, or from another image. You take a sample from the image, then paint to clone the sampled area.

You can use either the Clone method or the Clone Aligned method. The Clone method maintains the original sample point when you lift the brush and paint another stroke. With the Clone Aligned method, when you paint additional strokes, the sample point is updated to maintain its position relative to the brush position.

To achieve the most realistic results painting over the hairs, you should take samples from the skin area close to each individual hair. The Clone Aligned method makes this easier to do.

1. Select the Clone Aligned option:

a) Display the Modes palette by choosing **Window | Palettes | Show Modes**. If the palette is already on the desktop, click its tab to display it.



b) Select Clone Aligned from the Source list.

c) Click the Lock button so that it appears unlocked.

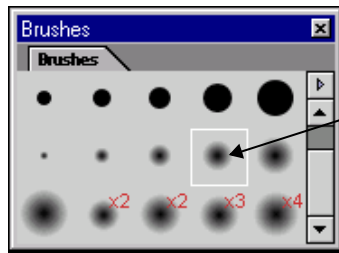
This button affects how strokes are cloned over a sequence of frames. When the button is unlocked, the contents of the stroke (color values) in the current frame are cloned. When the button is locked, the contents of the stroke in the frame in which the stroke was originally drawn are cloned.



2. Select the Freehand Stroke tool on the Tools palette.

3. Select a brush for painting over the eyebrow hairs:

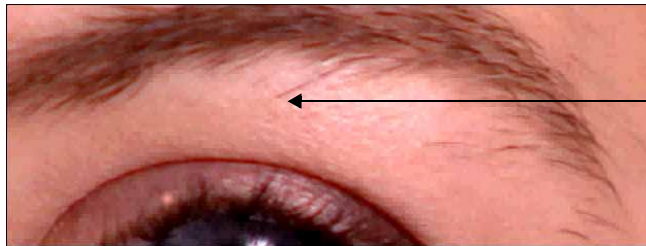
a) Display the Brushes palette by choosing **Window | Palettes | Show Brushes**.



b) Select a medium-sized round airbrush.

4. Select a sample point for the cloning.

a) Click the Set button on the Modes palette.



b) Pick a spot below one of the stray eyebrow hairs by clicking on the image.

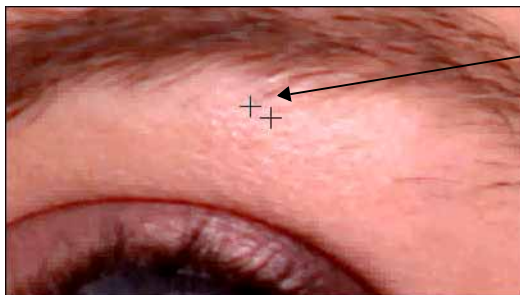
Paint Over the Eyebrow Hairs

Paint over the hairs between the eyebrow and the eye.

1. Paint over the first eyebrow hair.

a) Click and hold the cursor at the beginning of the eyebrow hair closest to the cloning source that you set in the previous step.

Two crosses appear. One shows you where you are painting, and the other shows you where the color values are being cloned from.



b) Drag the cross cursor along the length of the hair. The hair disappears as the color values are replaced with those next to the hair.

c) Release the mouse button.

2. Click and hold the cursor at the beginning of another hair. Since you chose Clone Aligned, the clone source remains below the brush position. Paint over the hair.

3. Paint over the rest of the stray eyebrow hairs in the same way. If you want to change the position of the clone source relative to the brush, click the Set button, pick a new source, then continue painting.

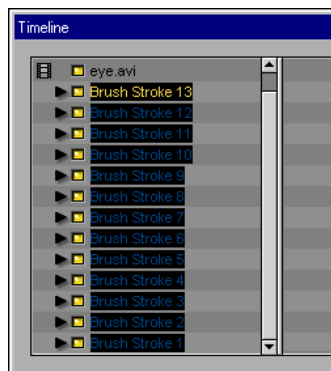
When the area is cleaned up, the image should look like this:



Group the Paint Strokes

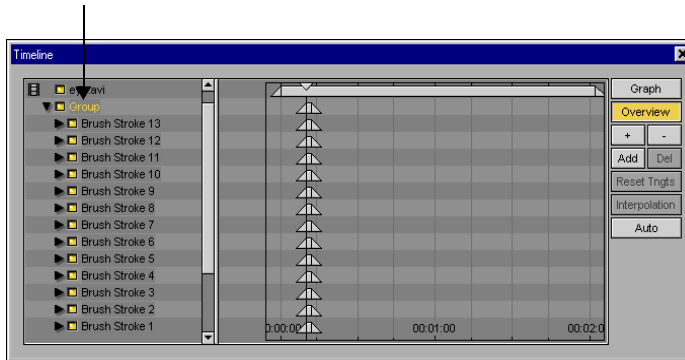
To track all the paint strokes at the same time, group them into a single object.

1. Select all the paint strokes in the Timeline:
 - a) Locate the brush strokes in the Timeline.
 - b) To select all the strokes, shift-click on each one. The first one should be highlighted in yellow, and the rest in blue.



2. Choose **Object | Group**.

The paint strokes are now grouped under a new element named Group.

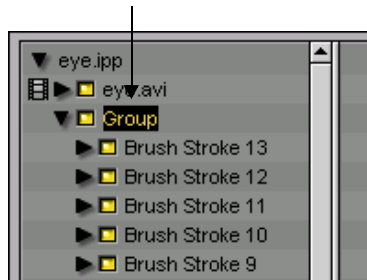


Expand the Group folder to view the grouped brush strokes.

Get Set to Track the Eyebrow Hairs

To track in paint*, you first select the object that will follow movement in a clip, and then select an area in the clip for the Tracker to track (called the *reference point*). In this clip, you want all the paint strokes to follow the movement of the upper eye area. To make all the hairs follow the movement at once, select the Group element in the Timeline. To make sure that they follow the movement correctly, select a reference point in the area above the eye.

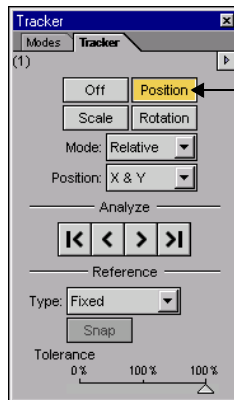
1. Select the Group element in the Timeline.



2. Display the Tracker palette by choosing **Window | Palettes | Show Tracker**.

3. Make sure you are at the first frame of the clip.

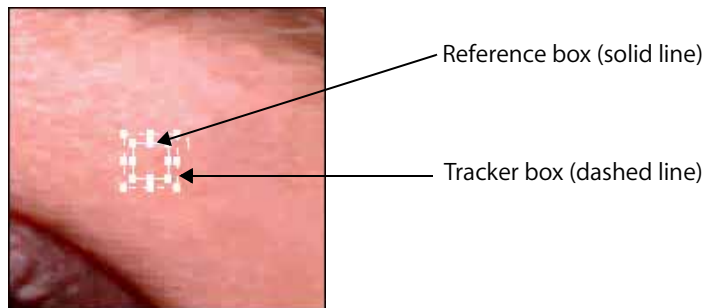
4. In paint* you can track the position, scale or rotation of the selected reference point in a clip. In the *eye.avi* clip, you need to track the position of the eyebrow.



Click Position to track the position of the reference point.

Note: If the paint strokes disappear when you select Position, the Tracker's Hide Objects option is turned on. To re-display the paint strokes, deselect Hide Objects in the Tracker palette menu, accessed by clicking the arrow on the top right corner of the Tracker palette.

A tracker, consisting of a tracker box and reference box, appears in the project window.



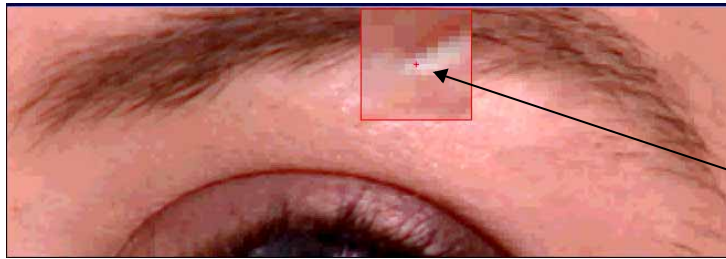
Reference box (solid line)

Tracker box (dashed line)

With the reference box, you specify the starting position of the reference point. Before you start the tracking process, the reference and tracker boxes are in the same position.

When you start tracking, the tracker box follows the frame-to-frame movement of the reference point, which includes the entire area inside the reference box at frame 1. The tracker box compares the image it encounters within its borders at each frame with the reference point and tries to find a match. The reference box stays in the original position (unless you change it).

5. To track effectively, you need to select a high-contrast pattern that has good definition, both vertically and horizontally. Place the tracker over a clearly distinguishable part of an eyebrow hair.

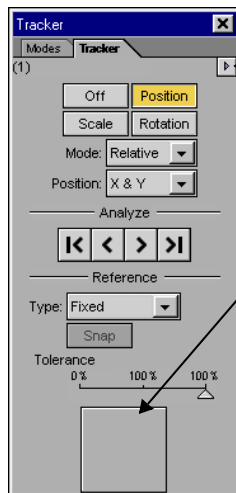


a) Press the cursor on the tracker. The image inside the box is magnified to help you choose a good reference point.

b) Drag the tracker over the end of an eyebrow hair.

Hint: You can change the degree of magnification inside the box by choosing Magnification from the Tracker palette menu. You can also change the magnifier mode to emphasize edges or contrast in the image. Choose Magnifier Mode from the Tracker palette menu and select Edge or Contrast.

6. Display the tracker preview window.



From the Tracker palette menu, choose Show Result.

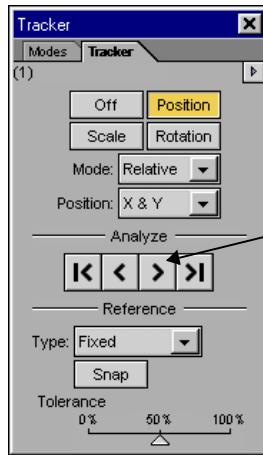
The tracker preview window appears.

This window shows the contents of the tracker box as you track. You can use it to make sure the selected reference point remains in the centre of the tracker box.

Analyze the Clip

Now that you have set the tracking parameters, start the tracking process.

1. Make sure you are at the first frame.
2. Analyze the clip.



The Group follows the movement of the tracker box, and paint strokes are applied to each frame in the new location, painting out the stray hairs.

Tracker Options

In addition to selecting the type of movement to track, you can select the following tracker options:

Relative or Absolute Mode

Relative mode retains the original position of the tracking object and applies the tracker movements to it at that position. Absolute mode moves the tracking object to the position of the tracker and directly applies the tracker movements to it.

Fixed or Roaming Reference Type

You can use either a fixed or roaming reference point. With Fixed, the Tracker searches for the reference point specified at the first frame, while with Roaming, the reference point is updated at each frame as the analysis takes place. Roaming is useful when the feature being tracked rotates, or changes in size or shape.

Snap

Snap is useful if the Tracker loses the reference point because its appearance has changed. Use the Snap button to update the reference point based on the contents of the tracker box in the current frame.

Tolerance

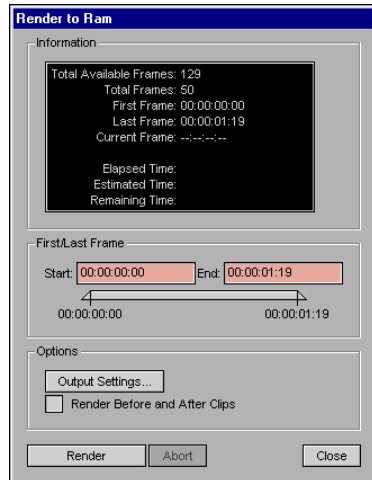
The tolerance value determines how exact a match the Tracker requires when identifying the reference point. With a tolerance of 0%, the feature being tracked must be exactly the same as the reference point. With a tolerance of 100%, the Tracker accepts anything as a match.

For more information on these options, see the *paint* 2.0 User's Guide*.

Render and View the Clip

Use the RAM Player to render and view your clip. The RAM Player gives you full-resolution, real-time playback without having to export the clip. Instead of rendering to disk, you render to RAM, which is faster because the data is cached. If you need to make adjustments to the tracking sequence, the RAM player automatically updates with the new information.

1. Choose **File | Render to RAM**. The Render to RAM dialog appears.



2. Look at the timebar in the First/Last Frame section—it shows whether your system has enough RAM to play back the entire clip. If the timebar extends all the way to the end point, your system has enough RAM for the entire clip. If it does not, close the Render to RAM dialog and render the clip to disk. See “Save and Render the Project” in the Animating Text lesson.
3. Accept the default parameters and click the Render button.
4. When the render is complete, the RAM player appears.



5. Click the Play button in the Frame Controls palette to play the rendered clip. The brush strokes should follow the movement of the hairs, covering them up in every frame.

If eyebrow hairs show up in some frames, it means that the tracker lost the reference point. If this happened, try the procedure in “Correcting Mistakes When Tracking” on page 3-10. If you still have problems, reset the Tracker (see note on page 3-10), select a more distinct reference point, and re-analyze the clip.

6. Save your project by choosing **File | Save Project As**, and naming it *Eye Project*.

7. To save your rendered project:

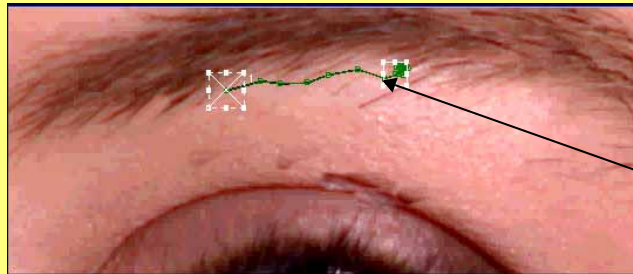
- a) Select the RAM Player.
- b) Choose **File | Save As**.
- c) In the Output Settings dialog, click OK.
- d) In the Save As dialog, give the file a name and click Save.

You can play the rendered clip in Media Player or a similar playback program. If you wish, compare it to the rendered clip provided with the lesson, *eye_clean.avi*.

This concludes the Tracking lesson.

Correcting Mistakes When Tracking

If stray eyebrow hairs showed up in some frames, it means that the Tracker lost the reference point and stopped following the movement of the eyebrow, as shown in the example below:



The tracker lost the reference point here.

One way to correct the tracker's movement is to delete the incorrect keyframes, update the reference point, then re-analyze the remaining portion of the clip. Here is how to do it:

1. Make sure that the tracker is still active — the X inside the tracker box and the keyframes should both be visible. If they are not, click inside the tracker box to re-activate it.
2. Press the Backspace key on the keyboard. The last keyframe is deleted, and the current time marker moves back one frame. The tracker box is now on the previous keyframe.
3. If you want to remove this keyframe, press Backspace again.
4. Repeat instruction 3 for all the incorrect keyframes.
5. Click the Snap button on the Tracker palette. This updates the reference point from the one originally specified at the first frame to the image currently inside the tracker box.
6. Click the Analyze button to continue the tracking process.

Note: To remove all the tracker keyframes, make sure the tracker is active, then choose **Reset | Shift Only** from the Tracker palette menu. To remove all tracker keyframes and reset the tracker position, choose **Reset | Tracker**.



paint* supports 3D Studio MAX in two ways:

- In 3D Studio MAX, there is a paint* plug-in that allows you to use paint* project files as textures. You can also create a live connection between paint* and 3D Studio MAX to create textures and animations in context with the 3D object. That is, you can see the texture being updated on the object.
- paint* includes 3D Post plug-ins that use additional 3D information that is stored in an RLA file. You can apply 3D Post effects because the file includes Z-Depth and Object ID information.

Note: The features described in this lesson are available only in paint* option 2.

In this lesson:

- Install the files for the paint* / 3D Studio MAX connection
- Create an animated material map
- Select and modify individual objects within an RLA object
- Create Fog and Depth of Field effects.

Using the 3D Studio Texture Plug-in

Install the Plug-in Files

If you have 3D Studio MAX release 2 (or later versions) installed on your computer, you can use paint* to create material maps interactively in 3D Studio MAX. (The connectivity features and plug-ins will not work with previous versions of 3D Studio MAX).

Note: You only have to perform the next steps once after you install paint*.

1. On your computer's hard drive, open the paint*\Kinetix\3dsmax2\Plugins folder.
2. Copy the *Ipp.bmi* and *Iptex.dlt* files to the 3dsmax2\Plugins folder on your computer's hard drive.

Note: In this instruction, 3dsmax2 is the folder where 3D Studio MAX is installed.

3. Start paint*.

When paint* starts, it loads the plug-ins automatically.

4. Exit paint*.

Open the 3D Studio MAX Project

Before starting the lesson, play the *Blob.avi* clip using Media Player (or a similar program). This finished clip shows an animated material map on the Blob object. This clip is also given in Quicktime format.

The *Blob.max* project is a 3D object that will be used to show the paint / 3D Studio MAX connection. The *AniRect.ipp* file is a paint* project that includes an animated rectangle and the *Abalone.jpg* image.

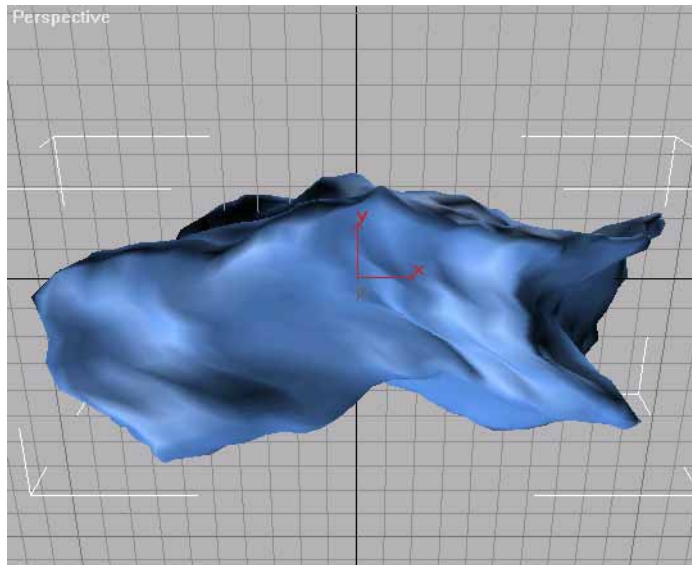
1. Start 3D Studio MAX.

If it is already started, close any open projects.

2. Choose **File | Open**.

In the dialog, select the *Blob.max* project and click the Open button.

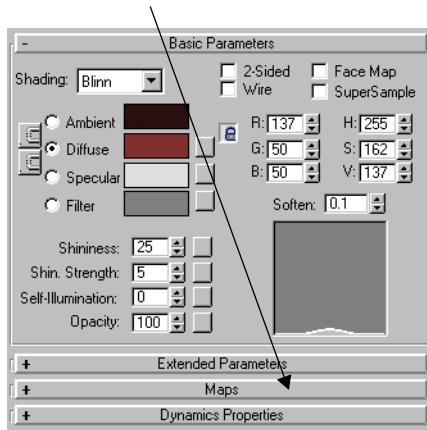
3. Click on the object in the Perspective viewport to select it.



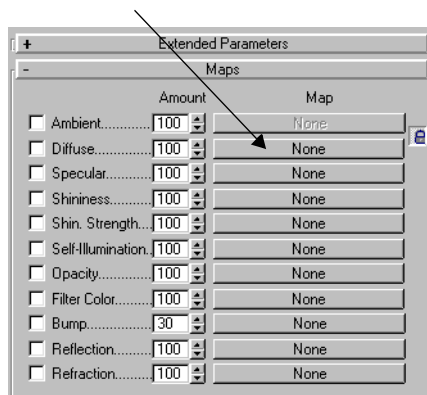
Create an Animated Material Map



1. Choose **Tools | Material Editor** or click the Material Editor button.
2. Click the Maps rollout.



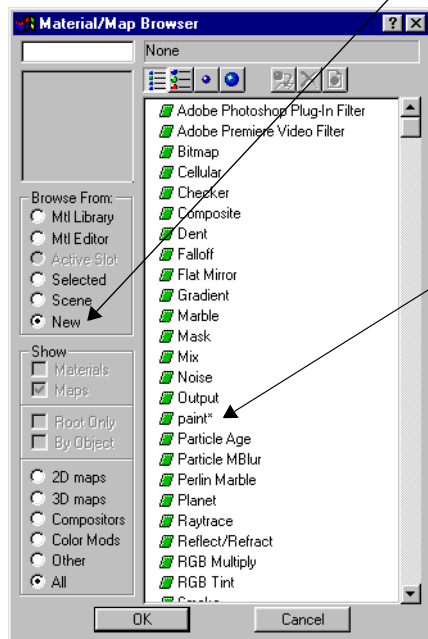
3. Click the Map button for Diffuse.



A paint* project can be used for any of the maps.

4. The Material/Map Browser window appears.

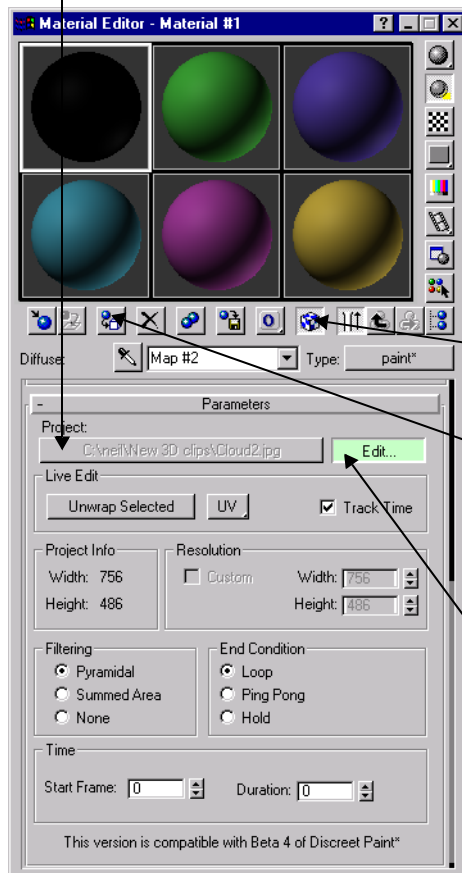
a) If it is not already selected, click the New radio button in the Browse From box.



b) Double-click the paint* item in the list.

In the Material Editor, a blank material appears in the selected material slot.

5. Set the parameters in the Parameters rollout:
 - a) If the rollout is not open, click the Parameters rollout.
 - b) Click the Project button.



c) In the Open Project dialog, select *AniRect.ipp* and click Open.

The paint* project is applied to the material.

d) Click the Show Map in Viewport button.

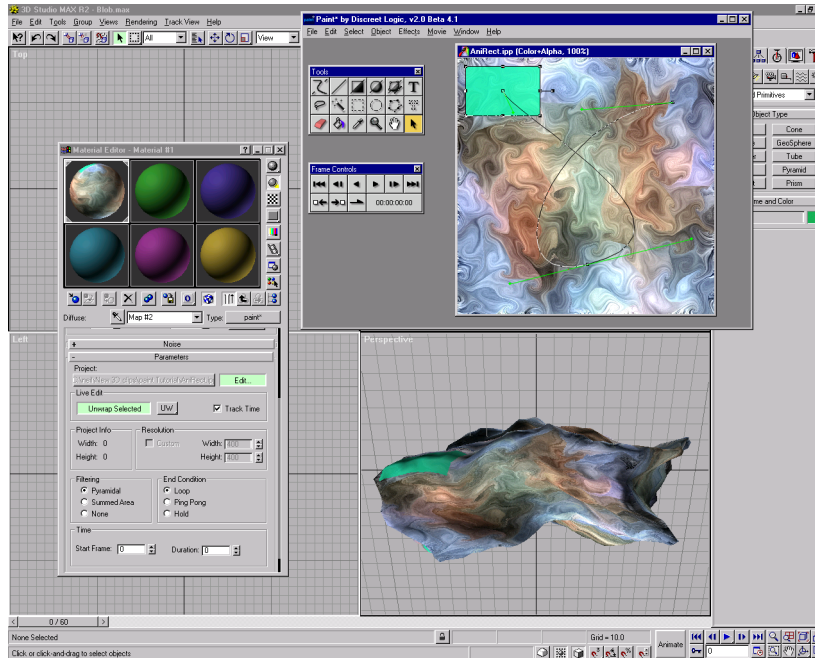
e) Click the Assign Material to Selection button.

Note: You can also drag the material and drop it on the object. For example, you can drag the sphere with the material onto the Blob.

f) Click the Edit button. This action opens paint*.

If you click the Edit button without a project selected, paint* is opened with a new project. For this lesson, we are live-editing an existing project.

6. Arrange the paint* window to see both paint* and 3D Studio MAX on your screen. For example, you can reduce the size of the paint* window.



7. In paint*, click the Object Edit tool on the Tools palette.
Notice that the rectangle is already keyframed.
8. Drag the Filled Rectangle around in the Project window. As you move it, the material map in 3D Studio MAX changes in real-time.
All changes you make to the paint* project are applied to the animated material. For example, you can adjust the path, size, and color of the rectangle.
9. Render the animation in 3D Studio MAX:
 - a) Choose **Rendering | Render**.
 - b) In the Render Scene dialog, select Active Time Segment.
 - c) Click the Render button.
10. Exit 3D Studio MAX and exit paint*.

You do not need to save the changes to either project.

Using RLA files from 3D Studio MAX in paint*

In 3D Studio MAX, you can output a file in the RLA format, which can then be opened in paint*. The extra information saved with this format allows you to:

- Select individual 3D objects and apply effects to them
- Use 3D Post plug-ins to apply effects to a plane or object in the 3D space

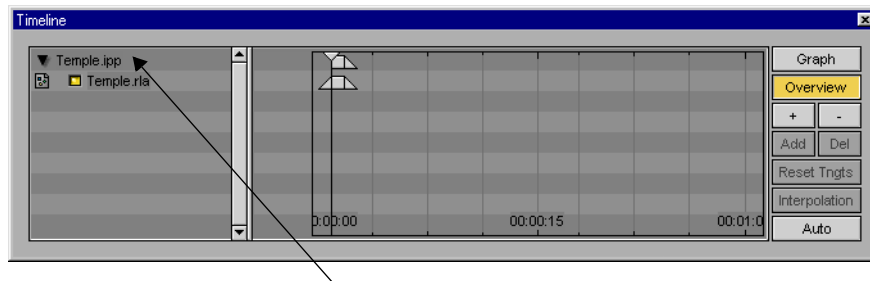
To work with 3D Studio MAX objects in paint*, you must save the RLA file with the Z-Depth and Object channels. The Z-Depth channel contains the original distance from the camera for each pixel. The Object channel contains Object ID numbers, which you can assign to objects in 3D Studio MAX (before creating the RLA file). You should also include the Z-Coverage channel to improve anti-aliasing.

Open the RLA File in paint*

The files for this part of the lesson are in the Lessons\Lesson4 folder. The *Temple.rla* image is used to show G-Buffer Object Selection and the 3D Post effects.

1. Start paint*.
2. Choose **File | Open**.

In the Open dialog, select the *Temple.rla* image and click the Open button.



In the Timeline, notice that a Temple project was automatically created.

Apply the 3D Fog and 3D Depth of Field Effects

The Fog and Depth of Field effects use the Z Channel to create effects that change according to the Z-Depth of the 3D layer.

1. Choose **Effects | 3D Post | 3D Fog**.

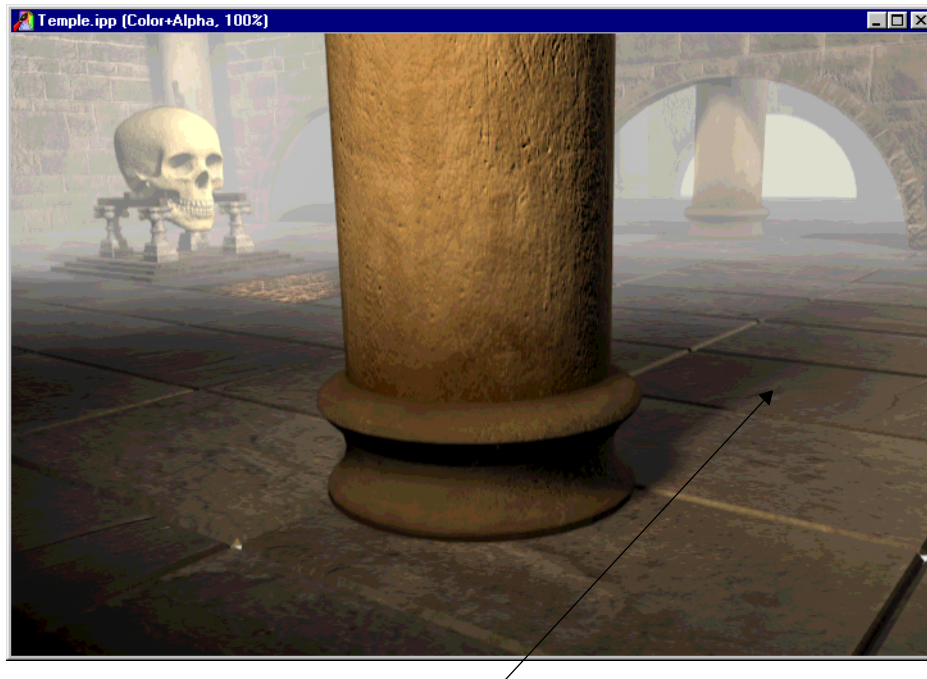
The Project window becomes white since the fog is initially applied with a Falloff distance of 0.00.

Note: You may have to turn the Temple object off and on in the Timeline to refresh the display.

2. Adjust the Falloff Distance slider to 655.35.

3. Set the Near Plane field:

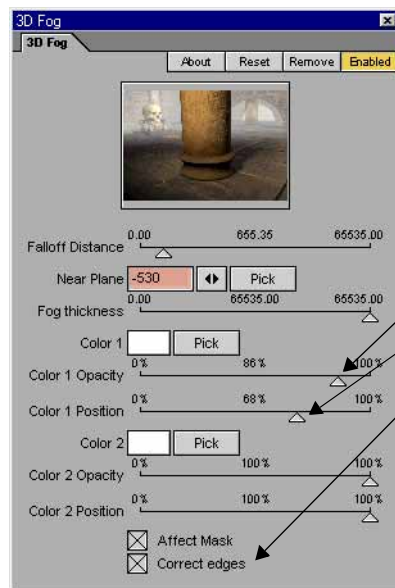
- a) Click the Pick button for Near Plane.



- b) In the Project window, click on a tile that is farther back than the column.

Note: You can also type the value -530 in the Near Plane field.

4. Adjust the other Fog parameters:



- a) Adjust the Color 1 Opacity slider to 86%.
- b) Adjust the Color 1 Position slider to 68%.
- c) Click on the Correct Edges check-box to activate it.
- Also, make sure the Affect Mask check-box is activated.

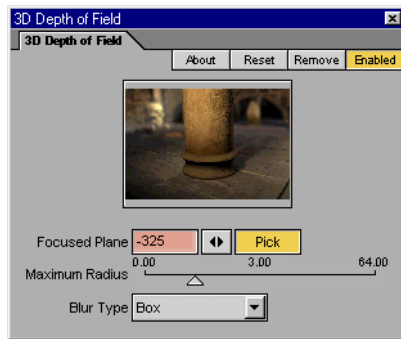
5. Close the 3D Fog palette.

You can compare your image to the rendered image *Temple_fog.jpg*.

6. Before continuing with the next effect, turn off the Fog effect in the Timeline.

Select the Show/Hide box next to the object.

7. Choose **Effects | 3D Post | 3D Depth of Field**.



8. Click the Pick button.
9. Click on the column in the Project window.

Note: Instead of picking the Z coordinate, you can type the focal length in the Focused Plane field. The value for the column is approximately -325.

10. Adjust the Maximum Radius slider to 3.00 and close the 3D Depth of Field palette.



Notice how you lose focus on the skull and background. You can compare your image to the rendered image *Temple_depth.jpg*.

11. Before continuing with the next step, turn off the Depth of Field effect in the Timeline.
Select the Show/Hide box next to the object.

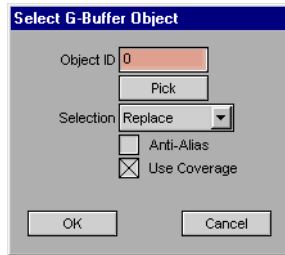
Apply Effects to Objects within an RLA File

Before creating the RLA file in 3D Studio MAX, you can assign Object ID numbers to objects. In paint*, these numbers are used to marquee-select individual objects and apply effects to them.



1. On the Tools palette, click the Object Edit tool.

2. Choose **Select | G-Buffer Object**.



3. Individual items within an RLA file can be selected provided they have different Object IDs:

a) Click the Pick button.

When you click the button, the dialog disappears.

b) In the Project window, click on the tile to the left of the column.



A marquee appears around the tile's edges.

Note: If you know the Object ID for a particular object, you can type it in the Object ID field in the Select G-Buffer Object dialog and then click OK.

The tile is now the only object selected in the entire Nexxus image.

4. Add another tile to the marquee-selection:

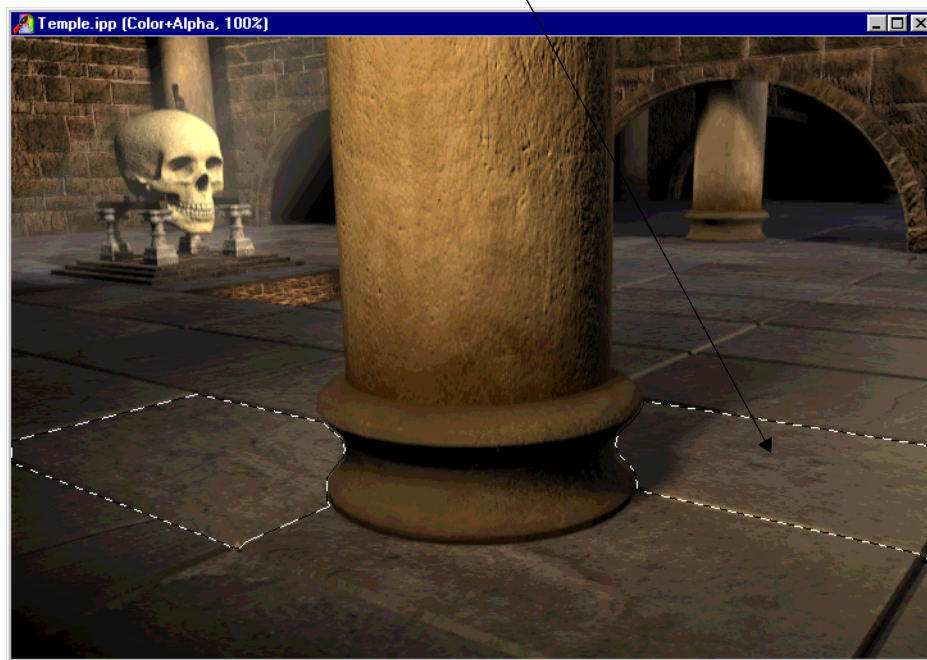
a) Choose **Select | G-Buffer Object**.

b) In the Select G-Buffer Object dialog, select Add from the Selection list.

c) Click the Pick button.

When you click the button, the dialog disappears.

d) In the Project window, click on the tile to the right of the column.



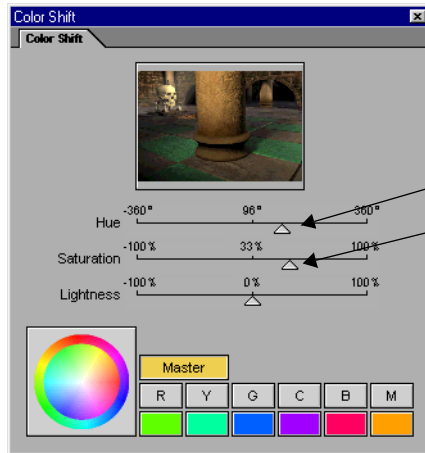
The selection now includes two objects with different Object IDs.

5. Repeat instruction 4 several times to create a checker-board pattern on the floor.

Note: You can only select a tile if it has an Object ID number.

6. Apply a Color Shift effect to the selected tiles:

a) Choose **Effects | Color Correction | Color Shift**.



b) Adjust the Hue slider to 96%.

c) Adjust the Saturation slider to 33%.

d) Close the Effects palette.

The selected tiles become green. G-Buffer Object Selection is particularly useful when only certain objects need to be modified.

7. Choose **Select | Hide Marquee**.

You can compare your image to the rendered image *Temple_tiles.jpg*.

This concludes the 3D Studio MAX lesson for paint*.



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