

Chapter 1

Exploring the Black Magic Fusion 7 Studio Interface

Learning Objectives

After completing this chapter, you will be able to:

- *Start the Black Magic Fusion 7 Studio interface*
- *Work with the Fusion interface*
- *Understand the functions of various tools in Fusion*
- *Open, save, and close a composition*

INTRODUCTION TO Blackmagic Design Fusion 7 Studio

Welcome to the world of Fusion, a node-based compositing software, that helps in creating visual effects and digital compositing for an array of films and commercials. Formerly known as Digital Fusion, it is used to combine two or more images and video sequences. Fusion has a node-based interface in which intricate processes are developed by linking up different nodes, called tools. It provides you greater flexibility and helps improve the artistic creativity. This software was originally developed by New York Production & Design in 1987 for its in-house use. Fusion has found its application in a number of movies, such as Avatar, Terminator Salvation, Final Destination II, and so on.

In this chapter, you will learn how to start Fusion as well as to load and save an image in Fusion. Also, you will explore the interface of Fusion.

Starting Blackmagic Design Fusion 7 Studio

To start Blackmagic Design Fusion 7 Studio, choose **Start > All Programs > Blackmagic Design > Fusion > Fusion** from the **taskbar**, refer to Figure 1-1; the default Fusion interface will be displayed with its different components, as shown in Figure 1-2.

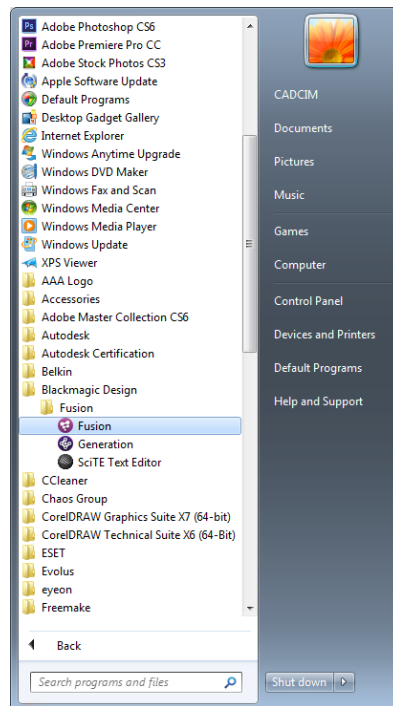


Figure 1-1 Starting *Fusion* from the taskbar

Fusion 7 Studio INTERFACE

The Fusion 7 Studio interface consists of menubar, Display Views, Work area, and Time Ruler, refer to Figure 1-2. These components of Fusion interface are discussed next.

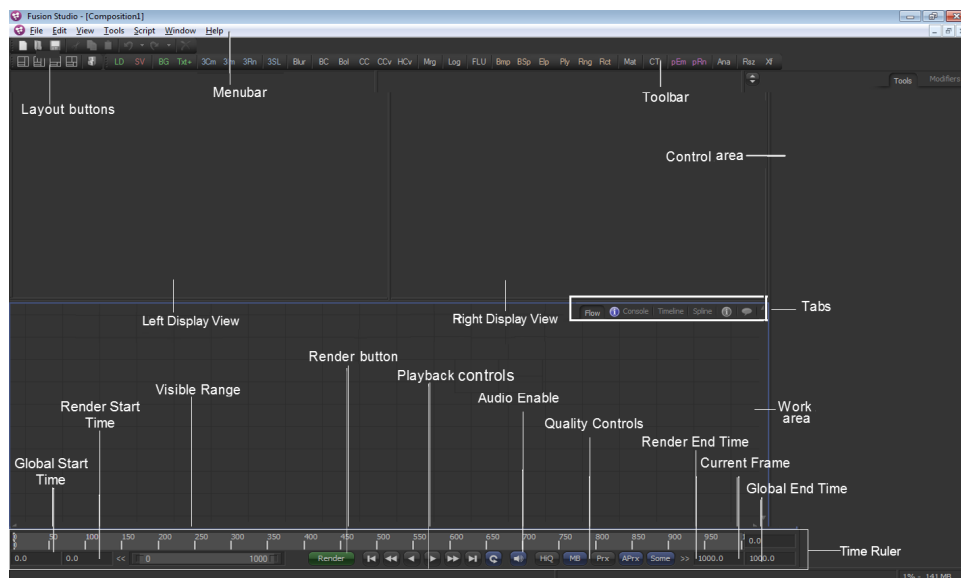


Figure 1-2 The Fusion 7 Studio interface

Menubar

The menubar is located on the top of the Fusion 7 Studio interface. It is used to access disk operations, editing functions, various tools, built-in scripts, and Fusion documentation.

Display View Area

The Display View area is used to view the output of the tools. By default, there are two views, namely left Display View and right Display View, refer to Figure 1-2. In this area, you can switch between the single view and separate views of a composite image by using the layout buttons in the toolbar.

Control Area

The Control area is located on the right of the Fusion interface and has two tabs: **Tools** and **Modifiers**. In the **Tools** tab, the attributes of a tool are specified. In the **Modifiers** tab, the modifiers will appear only if they are applied to the tool. The modifiers are used to create values for a control.

Work Area

The Work area is available below the Display Views, refer to Figure 1-2. It consists of six tabs. These tabs are discussed next.

Flow Tab

The **Flow** tab is used to create a network of tools. This network is formed by connecting nodes of the tools with the help of pipes. This tab is active by default.

Console Tab

The **Console** tab is used to display errors and status messages. This tab also displays output for scripts as well as render statistics.

Timeline Tab

The **Timeline** tab is used to adjust the timing of footage in a composition.

Spline Tab

The **Spline** tab is used to edit the animation curves, paths, and modifiers.

Comments Tab

The **Comments** tab is used to store comments and notes about a composition.

Chat Tab

The **Chat** tab is used to share comments with other users of the composition.

Time Ruler

The Time Ruler is available below the Work area. The Time Ruler consists of total number of frames in the current time segment. It consists of Timeline, buttons, and fields which are discussed next.

Global Start Time and Global End Time

These fields are used to define the length of a composition in frames.

Render Start Time and Render End Time

These fields are used to represent the frames of a composition's output for the final and preview renders.

Render Button

This button is used for rendering the composition.

Playback Controls

These buttons are used to control the playback of a composition.

Audio Enable

This is a toggle button is used to enable or disable the audio in the composition.

Quality Controls

The buttons in this category help you to control the quality of a composition. There are five buttons in this category, **HiQ**(high quality), **MB** (Motion Blur), **Prx** (Proxy), **APrx** (Auto proxy), and **Some**. Generally, Fusion shows a low resolution version of the composition in the Display Views to provide faster interactive performance. With default settings, Fusion skips anti-aliasing, motion blur, and other computationally expensive processes. You can use the buttons in the **Quality** control category to re-enable these features. When the **MB** and **HiQ** buttons are chosen, Fusion will display the output exactly what is seen during a final render. The **Some** button is a toggle button that you can use to toggle between three modes: **Some**, **None**, and **All**. With default mode (**Some**), Fusion render the tools that are required to display image in the Display Views. The **None** mode is used to prevent interactive rendering of the tools. The **All** mode is used to force all tools to render.

Working with the Layout

There are various predefined layout styles available in Fusion. These styles can be accessed by choosing the layout buttons which are located below the toolbar, refer to Figure 1-3. In Fusion, you can also make modifications in different areas of the layout. The methods to make such modifications are discussed next.



Figure 1-3 The layout buttons

- 1. To change the size of Display Views, move the cursor over the divider line between them; a double-headed arrow will be displayed, as shown in Figure 1-4. You can drag the divider line to either side to resize the Display Views.
- 2. To change the size of the Work area, move the cursor over the divider line between the Display Views and Work area; a double-headed arrow cursor will be displayed, as shown in Figure 1-5. Drag to resize the Work area.
- 3. To change the size of the Control area, move the cursor over the divider line between the Display Views and Control area; a double-headed arrow will be displayed, as shown in Figure 1-6. Drag the divider line to resize the Control area.

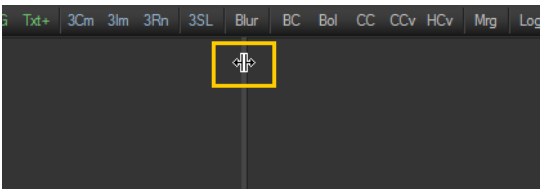


Figure 1-4 Resizing the Display View

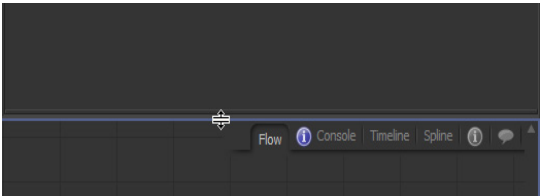


Figure 1-5 Resizing the Work area

USING THE TOOLBAR

The toolbar is located below the menubar. It is used to access commonly used tools in Fusion, refer to Figure 1-7. You can also access the tools in Fusion 7 Studio from the **Tools** menu in the menubar, as shown in Figure 1-8. The tools in the **Tools** menu are discussed next.

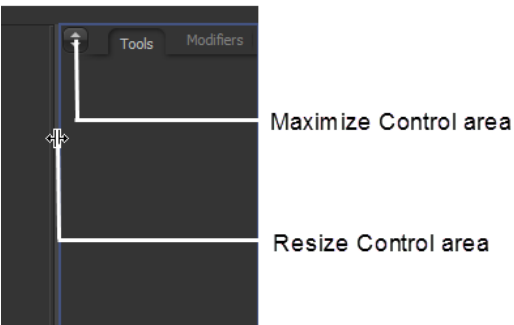


Figure 1-6 Resizing the Control area

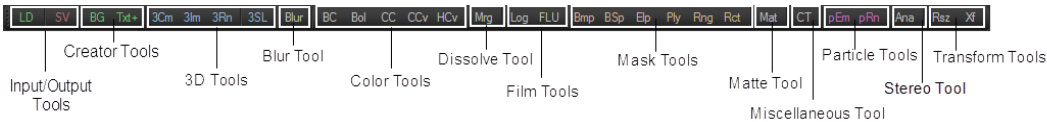


Figure 1-7 The Fusion toolbar

3D Tools

The 3D tools are used to apply light, assign shaders, apply textures, and so on to an object. These tools can be accessed by choosing **Tools > 3D** from the menubar, refer to Figure 1-9.

Light

The tools under the Light category are used to illuminate a scene. These tools can be accessed by choosing **Tools > 3D > Light** from the menubar, refer to Figure 1-10.

The tools in this category are discussed next.

Ambient Light

This tool is used to illuminate a 3D scene globally from all directions.

Directional Light

This tool is used to simulate a distant light source which casts parallel light rays in single direction.

Point Light

This tool is used to illuminate a scene by emitting the light in all directions.

Spot Light

This tool is used to simulate a conical shaped focussed beam of light. This is the only light in Fusion which casts shadows.

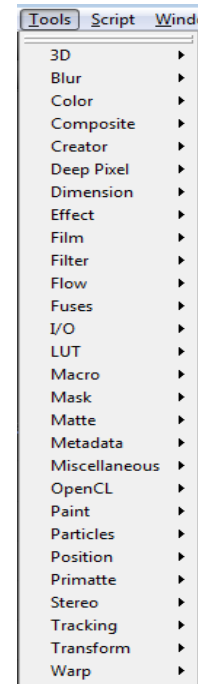


Figure 1-8 The Tools menu

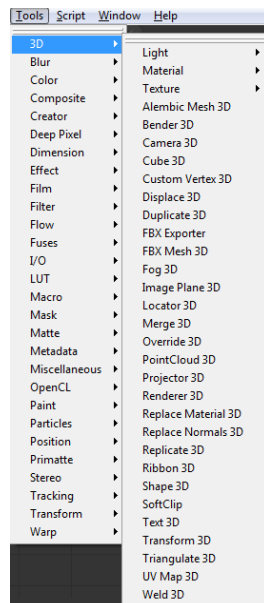


Figure 1-9 The 3D tools

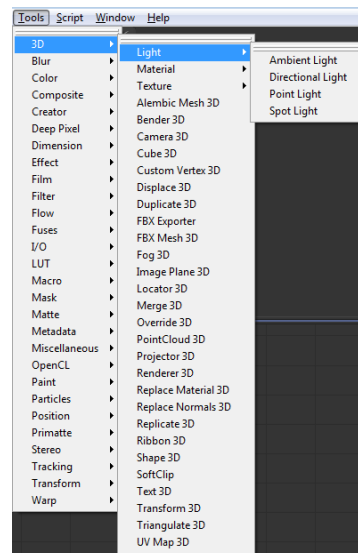


Figure 1-10 The Light tools

Material

Materials are used to add realism to a scene. A material defines how a 3D object reflects or transmits light. You can apply materials to an object by using the Material tools. The Material

tools can be accessed by choosing **Tools > 3D > Material** from the menubar, refer to Figure 1-11. The tools used for applying material are discussed next.

Blinn

This tool is used to apply basic illumination material on a 3D object.

Channel Boolean

This tool is used to modify the channels of a 3D object by using mathematical operations.

CookTorrance

The use of this tool is similar to that of the **Blinn** tool. However, the specular highlights are calculated using Fresnel/ Beckham equation when this tool is used. This tool is mainly used to shade shiny and highly reflective surfaces.

Mtl Merge

This tool is used to combine two different materials to form a complex shader.

Phong

This tool is used to simulate shiny plastic surfaces. It produces highlights similar to that produced by the **Blinn** tool.

Reflect

This tool is used to add environment map reflection and refraction to the material. It is usually connected with basic material to form a reflection or refraction pattern.

Stereo Mix

This tool is used to apply separate materials to the left and right eyes in a stereo pair.

Ward

This material is applied to a 3D object to give it a brushed metal look. The highlights can be adjusted in the U or V direction of the mapping coordinates.

Texture

Texture is a bitmap that can be wrapped on a 3D object to change the appearance of the existing texture. The tools in the Texture category can be accessed by choosing **Tools > 3D > Texture** from the menubar, as shown in Figure 1-12. The tools in this category are discussed next.

BumpMap

This tool is used to convert a bitmap to a bump material.

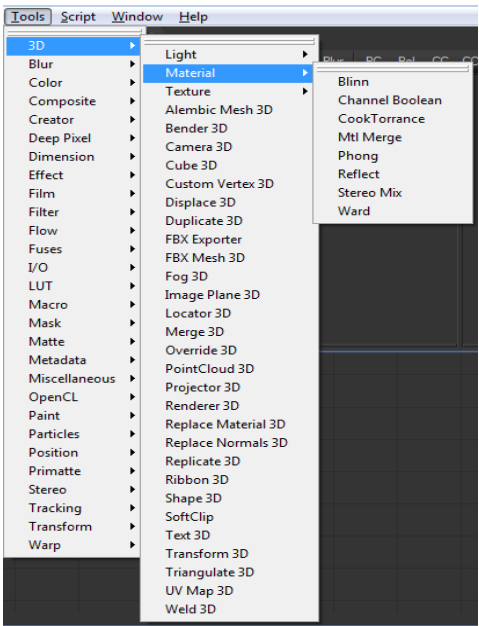


Figure 1-11 The Material tools

Catcher

This tool is used to intercept projections cast from the **Projector 3D** and **Camera 3D** tools. The projections are then converted to a texture map and applied by the **Catcher** material to the geometry it is connected to.

CubeMap

This tool is used to create texture maps using separate images for each face of the cube. It also provides coordinates for texture rotation.

Falloff

This tool is used to blend two materials based on the incidence angle between the object on which the material is applied and the camera.

Fast Noise Texture

This tool is used to generate a noise texture directly as a material on an object.

Gradient

This tool is used to apply texture on an object with a variety of gradients types.

SphereMap

This tool is used to create a spherical texture map from an image.

Texture 2D

This tool is used to convert an image to a 3D material.

Texture Transform

This tool is used to translate, rotate, and scale image textures on the input material along the U, V, and W axes.

Alembic Mesh 3D

Alembic is a file format for meshes and animated scenes. You can easily import an Alembic mesh in Fusion using this option.

Bender 3D

This tool is used to bend, taper, or twist a 3D geometry. However, it only affects the geometry in a 3D scene.

Camera 3D

This tool is used to create a virtual camera through which a 3D scene can be viewed.

Cube 3D

This tool is used to create a simple cube. On using this tool, six additional image inputs for each face are displayed. You can apply texture on these faces individually.

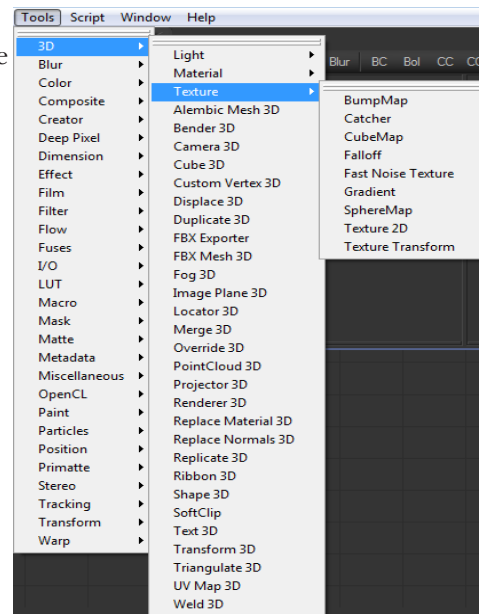


Figure 1-12 The Texture tools

Displace 3D

This tool is used to displace vertices along normals based on a reference image.

Duplicate 3D

This tool is used to duplicate a geometry in a 3D scene. You can create repeating transformation patterns using this tool.

FBX Exporter

This tool is used to export a Fusion 3D scene to the FBX interchange format. It also supports formats like *.3ds*, *.dae*, *.dxf*, and *.obj*.

FBX Mesh 3D

This tool is used to import complex polygonal geometry saved using the FBX format. It imports geometry in the *FBX*, *OBJ*, *3DS*, *DAE*, and *DXF* file formats.

**Note**

In Fusion 7's 3D system you can import geometry from FBX and Alembic file formats, as well as OBJ, 3DS, and Collada formats. Now, you can easily import meshes with millions of polygons, complex shaders, Ambient Occlusion, Deep Volumetric Atmospherics, Particles Systems, and so on.

Fog 3D

This tool is used to generate depth-based fog in a 3D scene.

Image Plane 3D

This tool is used to create a 2D planar geometry in 3D space.

Locator 3D

This tool is used to transform, scale, or rotate a point in 3D space along 2D coordinates so that other tools can use it as a part of expressions.

Merge 3D

This tool is used to merge 3D elements into 3D environment.

Override 3D

This tool is used to override settings of a 3D object in a 3D scene.

PointCloud 3D

This tool is used to create a point cloud by importing a 3D scene and collects all the null points created by a 3D tracking software.

Projector 3D

This tool is used to project an image onto a 3D geometry.

Renderer 3D

This tool is used to render 3D environment into a 2D image by using one of the cameras present in the scene. It supports two render engines: Software and Open GL.

Replace Material 3D

This tool is used to change the material applied to all geometries in the input scene with its own material input.

Replace Normal 3D

The **Replace Normal 3D** tool is used to replace the normals on geometry. The geometry must have texture coordinates. All geometry in the scene is affected except the lights, camera, point clouds, and locators. Other non mesh tools are not affected by this tool.

Replicate 3D

The **Replicate 3D** tool is used to replicate two or more geometries at the position of the target vertices. The geometries can be replicated at the vertices of a mesh. You can also replace particles with the geometry. You can apply various transformations for each copy of replicated geometry.

Ribbon 3D

Ribbon 3D is used to generate a segments or a line between two points. You can use this tool for creating motion graphics art work.

Shape 3D

This tool is used to create a basic primitive 3D shape including planes, spheres, and cylinders, which can be transformed, rotated, scaled, and rendered.

SoftClip

This tool is used to fade out the geometry or particles which are close to the camera.

Text 3D

This tool is a 3D version of the 2D **Text+** tool. Most of the controls found in this tool are similar to that of the **Text+** tool except that it supports all shading elements. The **Text+** tool will be discussed later in this chapter.

Transform 3D

This tool is used to translate, scale, and rotate 3D objects in a scene.

UV Map 3D

This tool is used to replace the UV texture coordinates on the geometry in a scene.

Weld 3D

This tool is used to weld adjustment vertices. It does not weld normals, texture coordinates, or any other vertex stream.

Blur Tools

Blur tools are used to blur or sharpen an image. These tools can be accessed by choosing **Tools > Blur** from the menubar, as shown in Figure 1-13. The Blur tools are discussed next.

Blur

This tool is used to blur the input image.

Defocus

This tool is used to defocus an image by simulating an out-of-focus camera lens effect.

Directional Blur

This tool is used to create directional and radial blurs. It is also useful in creating motion blur glow.

Glow

This tool is used to generate glow effect on an image by blurring an image and then brightening the image to produce glow.

Sharpen

This tool is used to enhance the detail of an image.

Soft Glow

This tool is used to simulate natural and soft glow effects in an image.

Unsharp Mask

This tool is used to sharpen only the edges within an image.

VariBlur

This tool is used to add per pixel blur to an image. It uses a second image to control the magnitude of the blur.

Vector Motion Blur

This tool is used to create directional blur on an input image based on the vector channel.

Color Tools

Color tools are used to adjust the appearance of the images in a composition, make tonal adjustment, set gain, make gamma correction, and so on. These tools can be accessed by choosing **Tools > Color** from the menubar, as shown in Figure 1-14. The tools in this category are discussed next.

Auto Gain

This tool is used to adjust the color range of an image automatically to set the darkest and brightest pixels to the user-specified values.

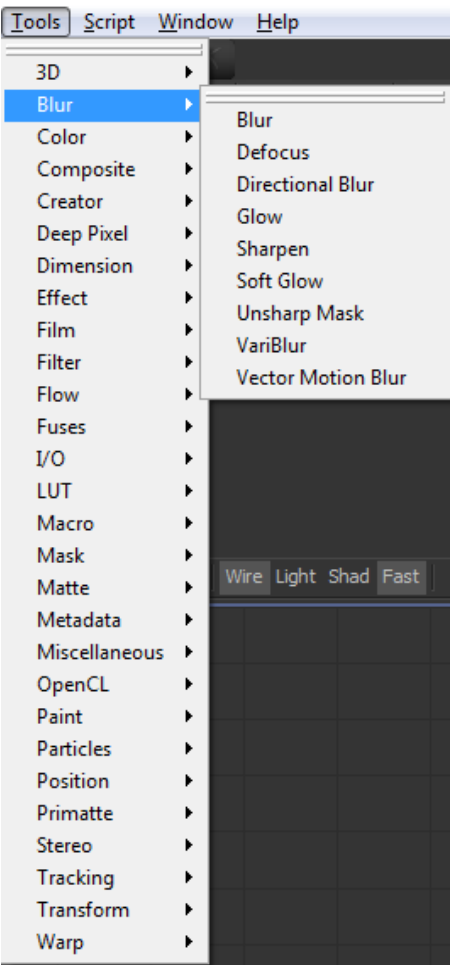


Figure 1-13 The Blur tools

Brightness / Contrast

This tool is used to control the gain, brightness, contrast, gamma, and saturation of an input image.

Channel Booleans

This tool is used to perform mathematical and logical operations on channels of an image.

Color Corrector

This tool is used to adjust the appearance of an image. It helps to correct the color with the help of histograms, levels, curves, and color compression functions.

Color Curves

This tool is used to perform LUT (Look Up Tables) color manipulations. It is an animatable spline-based tool.

Color Gain

This tool is used to adjust the gain, gamma, saturation, and hue of an image. It renders faster as compared to the **Color Corrector** tool.

Color Matrix

This tool is used to modify values independently in different color channels.

Color Space

This tool is used to convert a color space from one format to another. The default color space in Fusion is RGB (Red, Green, Blue).

Gamut

This tool is used to convert a color from one gamut to another.

Hue Curves

This tool is used to adjust the color of an image by using spline curves. This tool is different from other color correction tools because this tool allows you to manipulate the splines to restrict the tools effect to a range of colors.

OCIO CDLTransform

Fusion supports the OCIO (Open Color IO) workflow specified by Sony Imageworks. The color pipeline is made up from a set of color transformations defined by the OCIO-specific configuration files. The extension of these is *.ocio*.

OCIO ColorSpace

This tool allows for color space conversions based on an OCIO Configuration file. The RGB color space defines a color as the percentages of red, green, and blue hues mixed together.

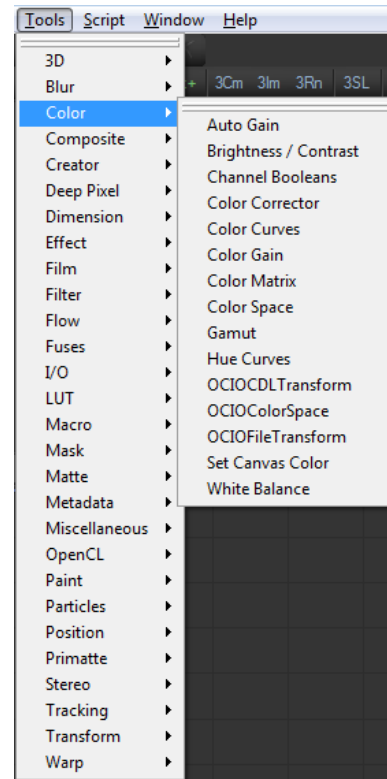


Figure 1-14 The Color tools

OCIO File Transform

This tool is used to control the LUT files.

Set Canvas Color

This tool is used to set the color of the workspace A workspace is the area beyond the defined pixels within an image (the DOD).

White Balance

This tool is used to correct the color casts in an image which are usually caused by incorrect setup of a camera or lighting conditions.

Composite Tools

Composite tools are used to combine two images to form a single image. The composite tools can be accessed by choosing **Tools > Composite** from the menubar, refer to Figure 1-15. The Composite tools are discussed next.

Dissolve

This tool is used to dissolve/mix two images together, thereby providing a gradual transition between the two images. It generates a smooth transition between foreground and background images.

Merge

This tool is used to combine two images: background and foreground. This operation is based on the alpha channel associated with the foreground.

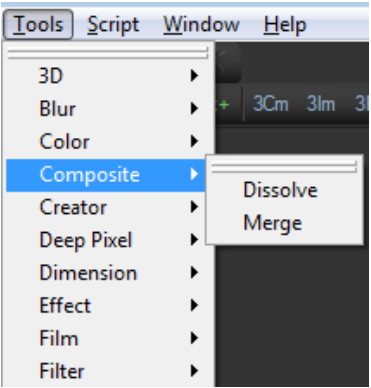


Figure 1-15 The Composite tools

Creator Tools

Creator tools are used to produce solid backgrounds, noise, fractal pattern, and 2D text. These tools can be accessed by choosing **Tools > Creator** from the menubar, as shown in Figure 1-16. The Creator tools are discussed next.

Background

This tool is used to produce color backgrounds and also complex loopable gradients.

DaySky

This tool is used to create a procedural sky pattern based on a specific time and location on earth.

FastNoise

This tool is used to create a wide variety of noise effects using gradients such as procedural skies.

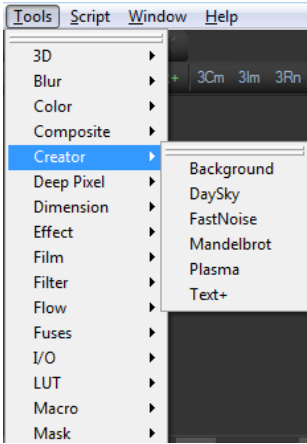


Figure 1-16 The Creator tools

Mandelbrot

This tool is used to generate an image based on the Mandelbrot fractal theory set.

Plasma

This tool is used to create circular shapes, thereby generating a plasma-like effect.

Text+

This tool is used to create 2D characters capable of 3D transformations. It also provides multiple styles and shading options to be applied on the text.

Deep Pixel Tools

Deep Pixel tools are used to generate various effects based on the Z-depth of the image. These tools can be accessed by choosing **Tools > Deep Pixel** from the menubar, refer to Figure 1-17. The different Deep Pixel tools are discussed next.

Depth Blur

This tool is used to generate the focal length or depth of field effects.

Fog

This tool is used to simulate fog effect on a 3D rendered image. It uses Z buffer channel to generate the 3D fog effect.

Shader

This tool is used to control lighting, reflection mapping, and 3D shading of elements in the rendered image. It uses X, Y, and Z normal maps in the image to control the light.

SSAO

SSAO stand for Screenspace ambient occlusion. It generates global lighting effects in a 3D scenes.

Texture

This tool is used to control the texture mapping of an element in a rendered image. It can also be used to replace current texture of an image. It relies on the U and V map channels in the rendered image.

Effect Tools

Effect tools are used to generate various effects. These tools can be accessed by choosing **Tools > Effect** from the menubar, as shown in Figure 1-18. The various Effect tools are discussed next.

Highlight

This tool is used to create star-shaped highlights in the bright areas of an image.

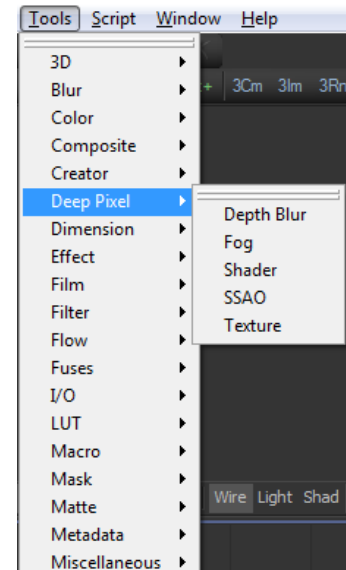


Figure 1-17 The Deep Pixel tools

Hot Spot

This tool is used to create lens flare, spotlight, and burn/dodge effect on an image.

Pseudo Color

This tool is used to create color variations, based on the waveforms generated by the tool controls.

Shadow

This tool is used to generate shadows based on the alpha channel information of an image.

Trails

This tool is used to generate trails effect. It first creates a frame buffer, then it takes the image data from the previous frames, and then merges that data over the current frame.

TV

This tool is used to replicate the flaws seen in analog television broadcasts and screens.

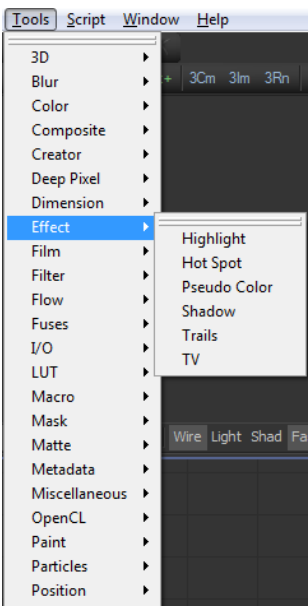


Figure 1-18 The Effect tools

Film Tools

Film tools are used to work with films. These tools can be accessed by choosing **Tools > Film** from the menubar, as shown in Figure 1-19. The various Film tools are discussed next.

Cineon Log

This tool is used to convert an image data from logarithmic to linear.

File LUT

This tool is used to apply Look Up Table (LUT) to the image.

Film Grain

This tool is used to apply grain to an image so that the grain resembles the grain profiles of the modern film stocks.

Grain

This tool is used to apply simulated grain to a video or 3D rendered image sequence.

Light Trim

This tool is used to emulate film scanner light trims. Generally, it is used with linear logarithmic images.

Remove Noise

This tool is used to remove noise from an image sequence.

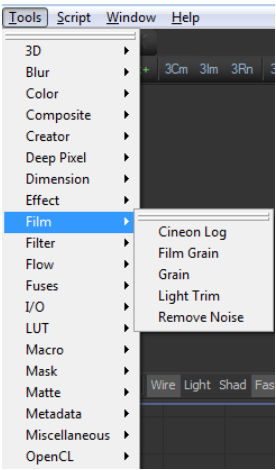


Figure 1-19 The Film tools

Filter Tools

Filter tools are used to filter the RGB and alpha channels from an image. These tools can be accessed by choosing **Tools > Filter** from the menubar, as shown in Figure 1-20. The various Filter tools are discussed next.

Rank Filter

This tool is used to sort the pixel by value and then replace the color of all pixels by the color of the pixel with the specified rank.

Flow Tools

Flow tools are used to manage tool tiles in the **Flow** area. These tools can be accessed by choosing **Tools > Flow** from the menubar, refer to Figure 1-21. The various Flow tools are discussed next.

Sticky Note

This tool is used to write notes and comments for the specific area of a composition.

Underlay

This tool is used to visually organize the tool tiles in the **Flow** area.

Fuse Tools

The Fuse tools are created by using scripting language (eyeonScript). Fuses are like normal tools and they contain scripting commands. These tools can be accessed by choosing **Tools > Fuses** from the menubar.

I/O Tools

I/O tools are used to load or import and save an image sequence. I/O represents Input and Output. These tools can be accessed by choosing **Tools > I/O** from the menubar, refer to Figure 1-22. The various I/O tools are discussed next.

Loader

This tool is used to select and load the footage from hard-drive or network storage.

Saver

This tool is used to write the render of a composition to disk.

Macro Tools

These tools are used to collapse the complex tool effects into single customized tool.

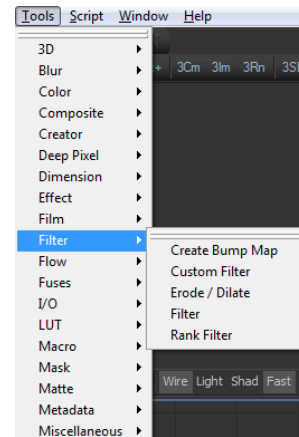


Figure 1-20 The Filter tools

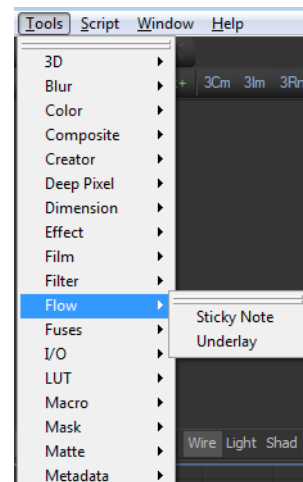


Figure 1-21 The Flow tools

Mask Tools

Mask tools are used to mask out an area of an image. Each mask has its own set of controls unique to that mask type. These tools can be accessed by choosing **Tools > Mask** from the menubar, as shown in Figure 1-23. The various Mask tools are discussed next.

Bitmap

This tool allows an image from the flow to act as a mask.

BSpline

This tool is used to create smooth mask by using the B-spline handles.

Ellipse

This tool is used to create a mask by using circular shapes.

Mask Paint

This tool is used to directly paint on the mask images using mouse pointer as a brush.

Polygon

This tool is used to mask irregular-shaped objects.

Ranges

This tool is used to generate masks based on the tonal range.

Rectangle

This tool is used to create a rectangular or square shape mask.

Triangle

This tool is used to create a mask that has no centre, size, or angle control.

Wand

This tool is used to mask out an image based on the magic wand style selection.

Matte Tools

Matte tools are used to generate alpha channels by removing selected colors from the footage. These tools can be accessed by choosing **Tools > Matte** from the menubar, as shown in Figure 1-24. The Matte tools are discussed next.

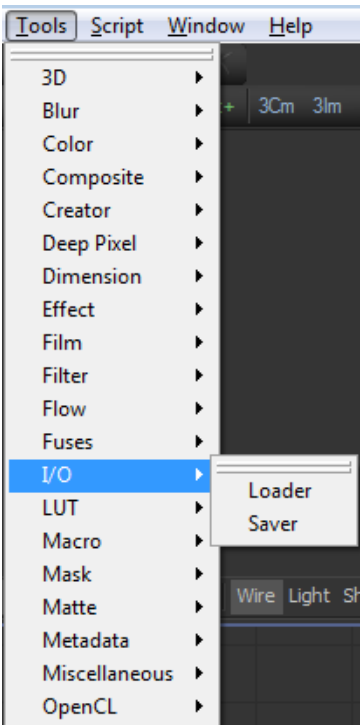


Figure 1-22 The I/O tools

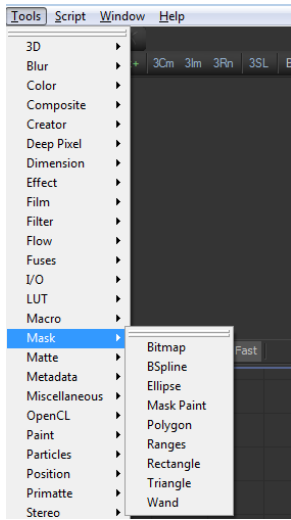


Figure 1-23 The Mask tools

Evaluation Copy. Do not reproduce. For information visit www.cadcam.com

Alpha Divide

This tool is used to divide an input image with its alpha channel.

Alpha Multiply

This tool is used to multiply an input image with its alpha channel.

Chroma Keyer

This tool is used to generate an alpha channel by removing selected colors from the image.

Difference Keyer

This tool is used to create matte based on the differences between the two images.

Luma Keyer

This tool is used to generate an alpha channel by using the luminance of an image.

Matte Control

This tool is used to manipulate an existing alpha channel.

Ultra Keyer

This tool is used to pull a key from the images using the bluescreen and greenscreen backgrounds.

Metadata Tools

Metadata tools are used for storing data within the data. These tools can be accessed by choosing **Tools > Metadata** from the menubar; refer to Figure 1-25. The Metadata tools are discussed next.

Copy Metadata

This tool is used to copy and filter the metadata.

Set Metadata

This tool is used to set the metadata.

Set Time Code

This tool is used to insert dynamic time code values into the metadata table based on the FPS settings.

Miscellaneous Tools

These tools can be accessed by choosing **Tools > Miscellaneous** from the menubar; as shown in Figure 1-26. The Miscellaneous tools are discussed next.

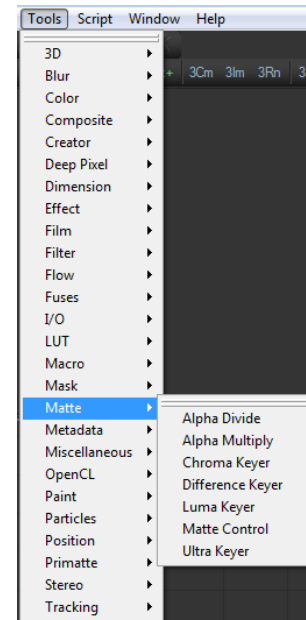


Figure 1-24 The Matte tools

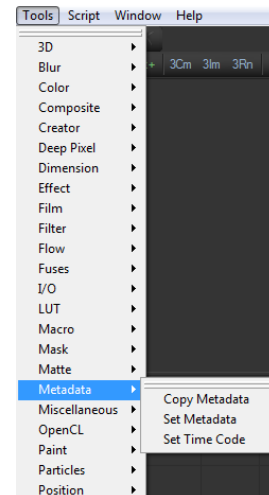


Figure 1-25 The Metadata tools

Auto Domain

This tool is used to set the Domain of Definition (DoD) of an image automatically.

Change Depth

This tool is used to change bits per channel depth of an image.

Custom Tool

This tool is used to create custom expressions and filters to modify an image.

Fields

This tool offers several functions related to interlaced video frames.

RunCommand

This tool is used to execute external commands or batch files at certain points while rendering.

Set Domain

This tool is used to set the active area of an image without changing its physical dimension.

Time Speed

This tool is used to speed up, slow down, reverse, or delay the image sequences.

Time Stretcher

This tool is used to animate the speed of the clip.

OpenCL Tools

These tools are OpenCL (Open Computing Language) clones of source native compiled tools. Open CL language allows you to take the full advantage of modern day graphic cards.

These tools can be accessed by choosing **Tools > OpenCL** from the menubar.

Paint Tool

This tool is used to paint directly on the image by using brush strokes. It is used for cloning, wire removal, and masking. This tool can be accessed by choosing **Tools > Paint** from the menubar.

Particles Tools

Particles are computer generated points in 3D space and help in creating a wide variety of effects. These tools can be accessed

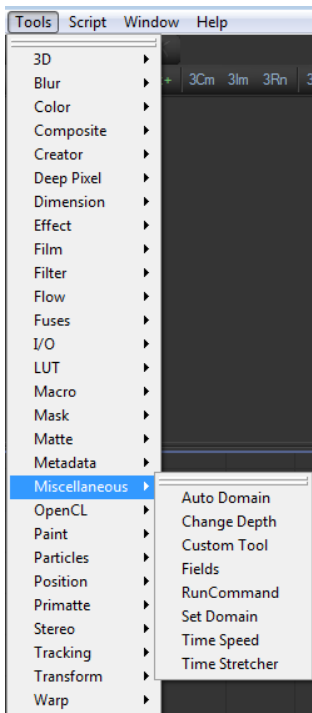


Figure 1-26 The Miscellaneous tools



Figure 1-27 The Particles tools

by choosing **Tools > Particles** from the menubar, as shown in Figure 1-27. The Particles tools are discussed next.

pAvoid

This tool is used to create an area within an image so that the affected particles do not enter or cross.

pBounce

This tool is used to create an area wherein the particles will bounce away when they come in contact with it.

pChangeStyle

This tool is used to change the appearance and style of particles when they come in contact with a defined region.

pCustom

This tool is used to create custom expressions. These expressions affect the properties of the particles.

pDirectionalForce

This tool is used to apply a unidirectional force. As a result, on invoking this tool, particles move along the defined direction.

pEmitter

This tool is used to emit particles. It is the first tool in a particle tools network.

pFlock

This tool is used to simulate the behavior of organic systems such as a flock of birds. Each particle attempts to stay close to the other particle.

pFriction

This tool is used to apply friction to particles on a specified region.

pGradientForce

This tool is used to increase the speed of particles by a force generated by gradients. Particles accelerate from white to black area of the gradient.

pImageEmitter

This tool is used to emit particles from an input image. The color of the particles depends on the input image.

pKill

This tool is used to kill the particle, if it crosses or intersects the tool's region.

pMerge

This tool is used to combine particles from two different emitters.

pPointForce

This tool is used to attract or repel particles within its sphere of influence by applying a force to them.

pRender

This tool is used to convert a particle system to 2D image.

pSpawn

This tool is used to spawn particles from existing particles, thereby making each affected particle produce more particles on its own.

pTangentForce

This tool is used to apply a tangential force on particles.

pTurbulence

This tool is used to generate frequency-based turbulence to particles.

pVortex

This tool is used to apply a circular force to each particle in the particle system.

Position Tools

The Position tools are used to work with masks and volumetrics for images having XYZ position channels. These tools can be accessed by choosing **Tools > Position** from the menubar, as shown in Figure 1-28. The Position tools are discussed next.

Volume Fog

This tool is used to create volumetric fog on images containing XYZ Position channels.

Volume Mask

This tool is used to create volumetric masks from images containing XYZ Position channels.

Z to WorldPos

This tool is used to either generate a world position pass from a Z-channel and a 3D camera or a Z-channel from a world position pass and a 3D camera.

Primatte Tool

The **Primatte** tool is an advanced green/blue screen keyer. It provides advanced techniques for extremely fine manipulations of the color regions. This tool can be accessed by choosing **Tools > Primatte** from the menubar.

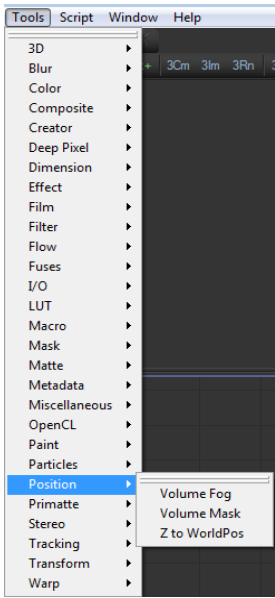


Figure 1-28 The Position tools

Stereo Tools

Stereo tools are used for creating and processing stereoscopic images. These tools can be accessed by choosing **Tools > Stereo** from the menubar; refer to Figure 1-29. The Stereo tools are discussed next.

Anaglyph

This tool is used to create stereoscopic images by combining the left and the right eye images.

Combiner

This tool is used to stack two stereoscopic images side by side or on top of each other.

Splitter

This tool takes input of the **Combiner** tool and provides two output images one each for the left and right eyes.

Tracking Tool

This tool is used to detect and follow pixel patterns across frames in an image sequence. Additionally, you can use this tool for stabilizing and reverse stabilizing an image sequence.

Transform Tools

These tools are used to transform a 2D image by moving, scaling, or rotating it. These tools can be accessed by choosing **Tools > Transform** from the menubar; refer to Figure 1-30. The Transform tools are discussed next.

Camera Shake

This tool is used to generate a variety of camera shake style motions from organic to mechanical.

Crop

This tool is used to crop a portion of an image or offset the image into a larger image area.

DVE

This tool is used to transform an image and also to add perspective to an image.

Letterbox

This tool is used to change the frame size and aspect ratio of an input image to the frame size and aspect ratio of another image.

Resize

This tool is used to increase or decrease the resolution of an image.

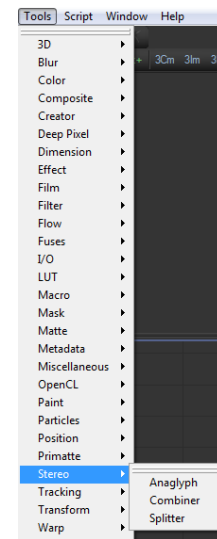


Figure 1-29 The Stereo tools

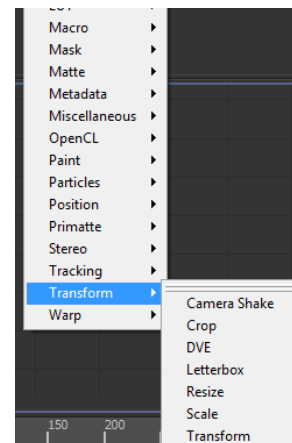


Figure 1-30 The Transform tools

Scale

This tool is similar to the **Resize** tool but it uses relative dimensions to specify the changes.

Transform

This tool is used for 2D transformations of an image.

Warp Tools

Warp tools are used to distort the input image. These tools can be accessed by choosing **Tools > Warp** from the menubar, as shown in Figure 1-31. The various Warp tools are discussed next.

Coordinate Space

This tool is used to modify the coordinate space of an input image from rectangular to polar and polar to rectangular.

Corner Positioner

This tool is used to modify the position of four corners of an image interactively.

Dent

This tool is used to distort an image by creating a circular deformation.

Displace

This tool is used to displace/refract an image based on the displacement map.

Drip

This tool is used to create ripple effects of different shapes in an image such as circular, square, and so on.

Grid Warp

This tool is used to deform an image by using a 2D deformation grid which has flexible vertices.

Lens Distort

This tool is used to add or remove the lens distortion in an image.

Perspective Positioner

This tool is used to modify the position of an image by adjusting corner points to remove the perspective from an image.

Vector Distortion

This tool is used to distort the input image along the X and Y axes individually based on vector channel data.

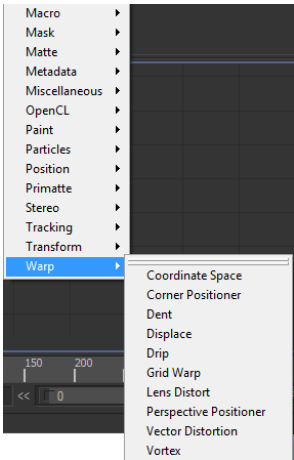


Figure 1-31 The Warp tools

Vortex

This tool is used to create a swirling whirlpool effect on the specified region of an image.

OPENING A COMPOSITION

To open a composition in Fusion, choose **File > Open** from the menubar; the **Open** dialog box will be displayed, as shown in Figure 1-32. In this dialog box, navigate to the desired folder and select the composition. Next, choose the **Open** button; the composition will be displayed.

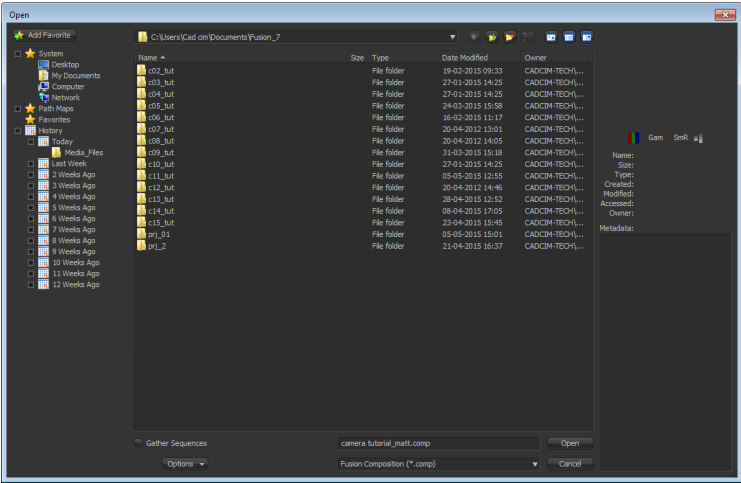


Figure 1-32 The Open dialog box



Note
The extension of Fusion file is .comp

SAVING A COMPOSITION

To save a composition, choose **File > Save** from the menubar. Alternatively, press CTRL+S; the **Save File** dialog box will be displayed, as shown in Figure 1-33. Now, enter the desired name of the composition and then choose the **Save** button.

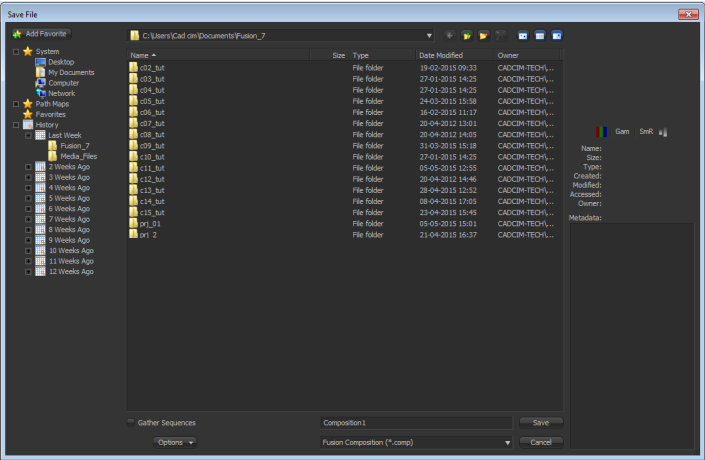


Figure 1-33 The Save File dialog box

Evaluation Copy. Do not reproduce. For information visit www.cadcam.com

CLOSING A COMPOSITION

To close a composition, choose **File > Close** from the menubar; a message box will be displayed, as shown in Figure 1-34. Choose the **Yes** button to save the changes made, the **No** button to discard the changes, or the **Cancel** button to close the message box.

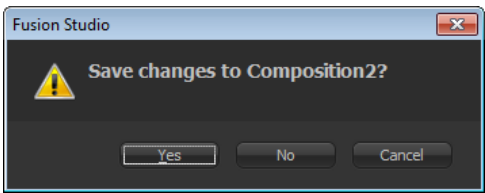


Figure 1-34 A message box prompting to save the changes made

Using the Undo and Redo Commands in Fusion

In Fusion, you can use the **Undo** and **Redo** commands to undo and redo the steps performed earlier. To undo a step, choose **Edit > Undo** from the menubar or press CTRL + Z. To redo a step, choose **Edit > Redo** from the menubar or press CTRL+Y. You can also delete tools by first selecting them and then pressing DEL.

General HotKeys

In Fusion, you can invoke some of the commands by using hotkeys. The main hotkeys and their functions are given next.

Hotkey	Function
CTRL+ N	Creates a new composition
CTRL + O	Opens an existing composition
CTRL + S	Saves the composition
CTRL + Z	Used to undo the last action performed
CTRL+ Y	Used to redo the last action performed
CTRL + X or SHIFT+DEL	Cuts the selected item in the clipboard
CTRL + C	Copies the selected tools in the clipboard
CTRL + G	Creates a group of selected tools
CTRL + V	Pastes the selected tools from the clipboard
[Moves forward one frame on the timeline
]	Moves backward one frame on the timeline
ALT + [Advances to the next keyframe
ALT +]	Moves back to the previous keyframe

Function Keys

The function keys are used to perform various functions. The main function keys and their functions are given next.

Key	Function
F1	Displays the help for the selected tool
F2	Renames the selected tools
F4	Maximizes and restores the selected area
F5	Activates the Flow area in the Work area
F6	Activates the Console area in the Work area
F7	Activates the Timeline area in the Work area
F8	Activates the Spline area in the Work area
F11	Activates the Modifiers area in the Control area
F12	Displays the Render Settings dialog box

Display Views Keys

These keys are used to view the composition in different channels. These keys and their functions are given next.

Key	Function
R	Displays the red channel in the selected Display View
G	Displays the green channel in the selected Display View
B	Displays the blue channel in the selected Display View
A	Displays the alpha channel in the selected Display View
Z	Displays the Z channel in the selected Display View
C	Displays full color image in the selected Display View
V	Displays the selected sub views in the Display View
SHIFT + V	Swaps the content of the Display View and sub view
CTRL + L	Locks the Display View
CTRL + Q	Toggles quad view in the selected Display View
CTRL + K	Toggles the Show Controls button
CTRL + G	Toggles the display of guides
SHIFT + H	Toggles the display of handles on spline keypoints
, (comma)	Switches the view to use the A image buffer
. (period)	Switches the view to use the B image buffer
/	Switches the view so that it shows both the A and B buffers and enables splitwipe

Flow Area Keys

These keys are used to perform various functions in the **Flow** area. These keys and their functions are given next.

Key	Function
CTRL + F	Displays the Find tools dialog box
CTRL + L	Toggles the lock mode of the selected tool
V	Toggles the display of the navigator

Spline Area Keys

These keys are used to perform various functions in the **Spline** area. These keys and their functions are given next.

Key	Function
S	Smoothens the curve of the selected points on a spline or polyline
V	Reverses the selected keyframes on a spline
CTRL + drag	Copies the selected points on a spline

Time Ruler Keys

These keys are used to perform functions in the Time Ruler area. These keys and their functions are given next.

Key	Function
CTRL + SHIFT+ double-click	Sets the render range to the slider range
CTRL + Drag	Sets the render range to frames enclosed by dragging mouse

Self-Evaluation Test

Answer the following questions and then compare them to those given at the end of this chapter:

- Which of the following components is located at the bottom of the Fusion interface?
 - Control area
 - Timeline
 - Toolbar
 - Display View
- The _____ is located on the right of the Fusion interface.
- The Work area consists of _____ tabs.
- The _____ tool is used to combine two images.
- The _____ View displays the output of the tools in a composition.
- The _____ tool uses luminance of an image to create the alpha channel.
- The _____ tool is used to increase or decrease the resolution of an image.

8. The _____ tool is used to load a footage.
9. The _____ tool is used to color-correct the image.
10. The **Dissolve** and **Merge** tools are Composite tools. (T/F).

Review Questions

Answer the following questions:

1. Which of the following Material tools is used to modify 3D material by using mathematical operations?

(a) Mtl Merge	(b) Ward
(c) Phong	(d) Channel Boolean
2. Which of the following Mask tools is used to mask an irregular shape?

(a) Range	(b) Polygon
(c) Triangle	(d) Ellipse
3. Which of the following combinations of shortcut keys is used to open a new composition?

(a) CTRL+O	(b) CTRL+S
(c) CTRL+N	(d) CTRL+Z
4. The Work area is located below the _____ views.
5. The **Mask** tool comprises of _____ tools.
6. The extension of a Fusion file is _____ .
7. The _____ tool is used to stabilize or destabilize an image sequence.
8. The _____ light emits light in all directions.
9. The I/O tools help you load and save an image. (T/F)
10. The **Soft Glow** tool is used to give natural and soft glow effect to an image. (T/F)

Answers to Self-Evaluation Test

1. b, 2. Control area, 3. six, 4. **Merge**, 5. Display, 6. **Luma Keyer**, 7. **Resize**, 8. **Loader**, 9. **Color Corrector**, 10. T