CANOMA™

User Guide

for Windows® and Macintosh®

Trademarks

MetaCreations and the MetaCreations logo are registered trademarks of MetaCreations Corporation. Canoma is a trademark of MetaCreations Corporation.

“Macintosh” is a registered trademark of Apple Computer, Incorporated. “Windows” is a registered trademarks of Microsoft Corporation. “Pentium” is a registered trademark and “i486” is a trademark of Intel Corporation. All other product names mentioned in the manual and other documentation are used for identification purposes only and may be trademarks or registered trademarks of their respective companies. Registered and unregistered trademarks used herein are the exclusive property of their respective owners. MetaCreations Corp. makes no claim to any such marks, nor willingly or knowingly misused or misapplied such marks.

Copyright

This manual, as well as the software described in it is furnished under license and may only be used or copied in accordance with the terms of such license. Program ©1999 MetaCreations Corporation, including the look and feel of the product. MetaCreations Canoma User Guide ©1999 MetaCreations Corporation. No part of this guide may be reproduced in any form or by any means without the prior written permission of MetaCreations Corporation.

Notice

Before using this software or reading this user guide, make sure you have read, understood and agreed to the license contained in the back of the Canoma User Guide.

Credits

Canoma was Engineered by Tilman Reinhardt, Robert Seidl, Luc Heinrich, and Gerald Guyomard, with support from Arnoud Berry, Brian Wagner, Seath Ahrens, and Alexei Lebedev. Installer by Carin Lew.

User Interface Design by Robert Bailey.

Product Management by Robert Seidl.

Quality Assurance Testing management by Michael Cinque. Quality Assurance Testing by Brian Romero, Joe Grover, Steve Rathmann, John Taylor, Eric Gruye, and Dan Huver.

The Canoma User Guide was written by Linda Stevens, assisted by Robert Seidl and Tilman Reinhardt; project managment by Linda Stevens and Erick Vera; layout design by Tish Loosley

Art Directed by Brian Moose; manual illustration by Aaron Begley, Quick Reference Card design and layout by Jeffry Schwartley; Box Design by Nathan Harris.

Thanks to John Leddy and Pierre Berkaloff for their support.

Some images provided by Photodisc.

MetaCreations
The Creative Web Company

Contents

Welcome to Canoma

What is Canoma?. 14

When You Have Questions. 18

Technical Support. 19

Installing Canoma. 20

Application Overview

The Canoma Workspace. 24

Status Tips. 28

About Canoma. 28

Accessing the MetaCreations Web Site. . . .28

Tutorial

Welcome 30

Creating a 3D Model 30

Lesson1: Pinning Corners 30

Lesson 2: Viewing Progress 33

Lesson 3: Adding Textures and a Ground Plane 34

Filling in the Details 35

Lesson 1: Adding a Second Image 35

Lesson 2: Modeling Nearby Objects 38

Lesson 3: Adding a Close-up Image 40

Lesson 4: Editing Textures 41

Creating a Building Model 42

Lesson 1: Starting with One Object 42
Lesson 2: Completing the Job 44
Reducing Confusion 45
Lesson 3: Navigating Through a Model 45

Aligning Objects Precisely 46

Lesson 1: Using Glue 46

Picking Up Speed 50

Lesson 1: Duplicating Similar Elements 50
Lesson 2: Adding Detail 52
Lesson 3: Adding a Ground Plane 53

Canoma Basics

Introduction 56

Customizing Canoma 56

Setting Canoma Preferences 56
Saving Workspace Customizations 56
Using the Active Guide 57
Choosing a 2D Image Editing Application and Image Format 57

Setting Up Your Workspace 57

Working in the Project Window 57
Using the Camera Controls 58
Understanding the Toolbar 58

Changing Canoma Colors 58

Creating a Canoma Project 60

Organizing the Project Folder 60

Using 2D Images 60

Creating 3D Models 60

Adding Texture 61

Creating Animations 61

Undoing Operations 61

Saving and Closing 62

Saving the Project 62

Closing Canoma 62

Importing, Exporting, and Rendering 62

Importing 62

Exporting 63

Rendering 2D Images 64

Rendering Animations 65

Preparing Projects

Taking Photographs 68

What Works Best 68

Using Several Photographs 68

Working from Overviews to Detailed Photos . . .69

Don’t Move Things 69

One Photo, One Image File 69

Modifying Photos 69

Controlling Exposure and Lighting 70
Handling Camera Location 70

Building Projects

How Canoma Works 74
Modeling 3D Objects 74
Using 2D Source Images 74
Modeling from the Ground Up 74
Always Calculating 74
Before You Start 75
Using the Canoma Workspace 75
The Project Window 75
Camera Controls 76
2D Image Palette 76
Selecting Colors 76
Working with Canoma Projects 76
Working with Objects 77
Matching Objects to Photo Elements 77
Selecting the Correct Object 77
Objects with Editable Polyline Contours. 85
Calibrating a Scene 88
Adding an Object 88
Setting Selection Based Options 88
Selecting an Object 89
Deleting an Object 89

Checking Object Information 89

Stacking Objects 90

Duplicating Objects 91

Pinning Objects 92

Viewing Projects in Progress 93

Using Beads 93

Defining Edges 93

Using Glue 94

Gluing Objects Together 94

Deleting All Constraints 94

Using Solo Mode 95

Using Shadows 95

Displaying the Background Image 96

Avoiding Model Stress 96

Working with Texture 97

Adding Textures 97

Stealing Textures 97

Adding More Detail 98

Using the 2D Image Palette 99

Viewing Models

Positioning the View of Your Model 102

Using Canoma Camera Controls 102

Using the Trackball 102
Using the Cross Controls 103
Using the In-View Navigation Controls 104
Banking Control 104
Field of View 105

Zooming and Panning 105

Zooming 105
Panning 106

Resetting the Viewpoint 106

Editing Textures

Retouching or Editing Textures in 2D . . .110

Editing for 2D Renders 111

Using the Alpha Channel 112

Creating Animations

How Animation Works in Canoma 116

Creating an Animation 116

Using the Animation Controls 116
Creating Keyframes 116

Setting Animation Options 117

Previewing an Animation 117

Rendering an Animation 118

Advanced Modeling

Modeling Objects 120

Adding Source Images 120
Free vs. Constrained Parameters 121
Misleading Canoma and Stressing a Model 121
Listening to the Canoma “Heartbeat” 122
Using Geometric Tricks 122

Establishing Perspective 123

Starting Simple 123
Modeling the First Image 123
Using Temporary “Helper” Objects 124

Creating the Same Orientation 124

Duplicating Objects 125

Freeing Necessary Parameters 126

Monitoring Stress in the Model 126

Using Glue to Align Objects 127

Using Point To Point Glue 128
Don’t "overglue" 128
Using Point to Edge Glue 130
Creating a Balcony 132

1

Welcome to Canoma

What's in this Chapter:

What is Canoma? 14

What Can You Do with Canoma? 15

When You Have Questions 18

About your User Guide 18

Technical Support 19

Installing Canoma 20

What is Canoma?

Canoma lets you quickly create photorealistic 3D models from scanned or digital photographs, without extensive 3D modeling skills. No need for specialized equipment or calibrations. Canoma even works on historical photographs. Canoma models can be posted on Web sites or in electronic catalogs, or imported into traditional 3D modeling and animation software. Canoma is a perfect companion to other Web authoring tools.

Easier to learn than traditional 3D programs (with all their modes, tools, and windows), Canoma lets 2D graphic illustrators and designers create and manipulate realistic 3D models—applying all their retouching and filtering skills to 3D objects.

Here's how Canoma works:

- Take one or more photos of what you want to model in 3D. More photos mean greater detail.
- Select 3D shapes (called objects or pimitives,) then pin them to the corners of objects in your photograph. (There are ways to also control edges and alignment.)
- Preview your 3D creation—move in for a close-up look or away, rotate around the model, or just walk through it! Canoma adds texture to your model right from your photographs.
- You can edit areas of texture, letting Canoma open your favorite 2D program, present you with a head on 2D view of the area to edit, then watch as Canoma reapplies the edited texture in proper perspective!
- Create animations or export your 3D model to other 3D programs or for use on the Web.

The Canoma workspace.

What Can You Do with Canoma?

With Canoma you can create very realistic three-dimensional (3D) computer models from one or more photographs, a process called image-assisted modeling. Canoma models have simple geometries and use photographs as texture source, allowing the pixels to do the work of making your models look good.

Select the face of a Canoma model, bring up a 2D pixel editing tool, such as Painter or Photoshop, and retouch the surface texture, add text, or apply a 2D filter. Watch Canoma reapply the altered pixels, while retaining 3D perspective.

3D models can be rotated and viewed from different directions, allowing customers to thoroughly inspect product or merchandise models. Once 3D models are completed, you can create a simple animation or "walk through", even publish those on the internet.

Canoma lends itself well to regular, man-made objects. Amorphous or very complex shapes that may occur in nature such as trees, mountains, or curved objects can also be approximated, using simple stand-in geometry. Canoma also supports translation sweeps or extrusion, which allows a polyline contour to be swept along a straight axis.

On-line Catalogs

You can publish a Web catalog full of Canoma models. For example, you could use Canoma to create a catalog of "hard goods", such as furniture or appliances, then output it in the Metastream format.

Examples of models created for catalogs.

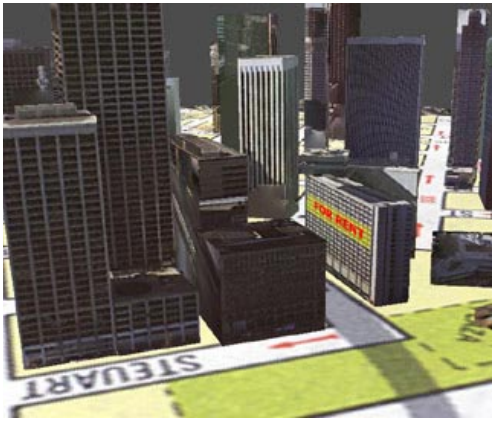
The Metastream format is widely distributed by Microsoft and Intel and can be downloaded for free from www.metastream.com. Metastream uses small, compact files and outputs a single file that is easy to maintain and post.

Streaming a 3D image allows customers to experience instant gratification, as they manipulate a 3D object. High quality, interactive vending, all from within a standard Web browser.

Canoma creates quick, low-polygon count, photorealistic models. This can be a fast, cost-effective way of disseminating information, without the security risk that distributing detailed blueprints from a CAD program could introduce.

Web Sites, Travel and Tourism, Commercial Real Estate

A 3D preview of property can be a strong sales incentive for online travel, real estate sales, or vacation rentals. Entertainment, restaurant, and hotel information sites all benefit from the photorealistic 3D models.



A Canoma model created from a photo of San Francisco. The "For Rent" sign was added using a 2D pixel editing program.

Interior/Exterior Design and Remodeling

If the project is to remodel a kitchen, bathroom or the outside of a house, a photograph session and a quick modeling session—without becoming a wizard—creates a model of how the project looks right now. Repeat site visits are replaced by a photorealistic 3D model, that's always available for a design meeting.

- Using the texture editing feature, you and your 2D pixel editing tool, such as Painter or Photoshop, can make changes to surfaces or simulate different lighting.
- With Canoma's animation feature, you can "walk" perspective clients through the suggested changes.

Walking through a kitchen model.

- With a 3D program you can go further, changing tiles, sliding in a new dishwasher, or actually trying out planned spotlights to illuminate that kitchen counter.

Before

After

Spotlights added to a Canoma model in a 3D program.

Graphic Design and Advertising

Industrial design and graphic artists can take existing products and packaging, extract the graphics, and edit the designs. They can create animations or place a package in a different environment.

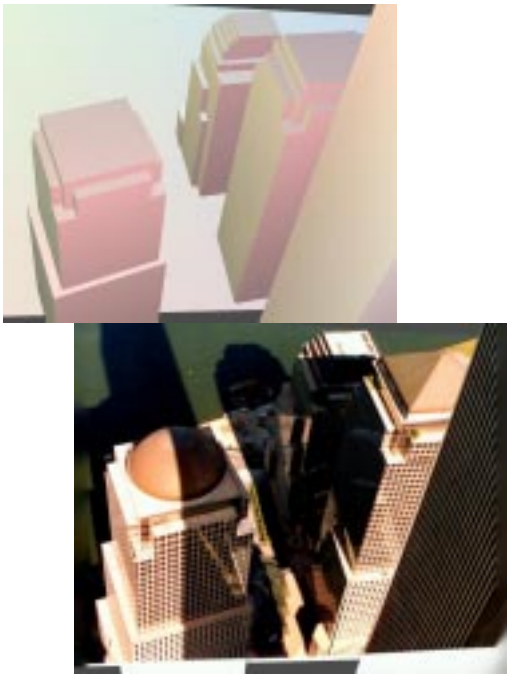
It's easy to add billboards, place advertising on buses, and change details—all in photorealistic perspective, using only Canoma and your favorite 2D image editing program. You can output the results as 3D models, rendered 2D images, or even animations.

You can edit Canoma models with an image-editor.

Architecture, Urban Planning, Property Development

Architects can produce rough models of areas where new buildings are planned, then integrate the photorealistic model produced in Canoma with the detailed engineering model of

the planned building, giving everyone a good preview of how a building might fit into the neighborhood.



A Canoma model generated from a photo of the New York skyline can let you see how a new building might look in the cityscape.

Computer Game Developers and 3D Artists

With Canoma, you can quickly model a house or office, change some textures, add in a few monsters, and really try out ideas. 3D artists can use Canoma to create quick photorealistic clip objects that can be used to enhance existing 3D models and animations.

Canoma models of complete houses or interiors can serve as starting points for more detailed 3D modeling, since they provide scene measurements and object dimensions.

When You Have Questions

You can find answers to most of your questions in the following ways:

- Canoma User Guide - Providing all the information you need to get the most out of Canoma. The User Guide is also provided as a PDF file on the Canoma CD.
- Online Help - Providing direct access to specific chapters in the User Guide. Online Help contains the same information as the User Guide. Adobe Acrobat Reader software is required to read online Help or the PDF version of the User Guide. Adobe Acrobat Reader software is on the Canoma CD or downloadable for free from www.adobe.com.
- Status line tips - Check the bottom of your screen for UI related information.
- Active Guide - Text can pace you through the creation and application of your first few primitives. The Active Guide goes away after you've gained some experience or you can turn it off in the program preferences.

About your User Guide

The Canoma User Guide is for both Macintosh and Windows. By convention, Macintosh commands precede Windows commands in the text. For example, Command/Ctrl+I, is equivalent to the Macintosh Command-I and the Windows Ctrl+I. For simplicity, the term "folder" refers to directories as well as folders. The Canoma interface for Macintosh and Windows platforms is identical, unless otherwise specified.

When a modifier key differs between the Macintosh and Windows platform, the Macintosh modifier is listed first followed by a slash and the Windows modifier key. Option/Alt means Macintosh users press the Option key and Windows users press Alt.

There are several conventions used to identify paths to certain tools and controls. The convention to a menu follows the rule of the **menu name > menu item**. The convention to a palette follows the rule of the **palette name: subpalette name**. The convention to a palette menu follows the rule of **palette name: palette menu> menu item**.

Technical Support

MetaSupport is a portfolio of free and fee-based support options designed to provide quality support to you.

The options are as follows:

FREE On-line Support

On-line support is available on our Web site at www.metacreations.com 24 hours a day, 7 days a week. Access a list of Frequently Asked Questions (FAQs) for each product and find solutions immediately. If, after searching our on-line options, you still need assistance, you can contact MetaCreations Technical Support through one of the Telephone Support Services listed here.

Telephone Support

- **Standard Support**

  Talk person to person with technical support representatives and get answers to installation, configuration and general usage questions. Each product has its own support duration. The length of the complimentary support period depends on whether your MetaCreations product is a Level I (receive 90 days of complimentary support for a first-time purchase, or 30 days for an upgrade) or Level II (receive complimentary support for one incident for a first-time or upgrade purchase) product. The support period begins with your first call into MetaCreations Technical Support, provided you have registered the product.

  Toll call: **831-430-4200**

- **Premium Pay as You Go**

  When your standard support period ends, you can now receive priority access personal service regarding installation, configuration and general usage questions from our qualified support specialists. You pay a flat fee that covers all of the necessary support for the particular incident.

  Toll-free call: **888-456-6382**

- **Premium Plus Annual Contract**

  Annual support contracts are available to meet your ongoing support needs. Sign up for an annual support agreement to receive one year of toll-free priority access person-to-person assistance. Get answers to installation, configuration and general usage questions.

  - To order toll-free call: **800-846-0111**
  - For support toll-free call: **800-683-5872**

For a list of **currently supported Level I and Level II products** and the **Telephone Support options pricing**, please visit our web-site at www.metacreations.com.

Technicians are available **Monday through Friday, 6am to 5pm Pacific Time**.

How to Contact Us

- Free On-line Support: www.metacreations.com
- Standard Support: Toll call 831-430-4200
- Premium Pay As You Go: Toll-free call 888-456-6382
- Premium Plus Annual Contract:
  - To order toll-free call: 800-846-0111
  - For support toll-free call: 800-683-5872

International Support

The telephone support services listed here are available only in the U.S. and Canada. However, if you live outside of the U.S. and Canada, you can still access our free on-line support, and you can contact a local MetaCreations distributor or other third party that may provide technical support in your area. Visit our World Wide Web site at

www.metacreations.com

for information about how to contact a MetaCreations distributor in your country.

Installing Canoma

Installation instructions are provided for both Windows and Macintosh. Follow the instructions appropriate to your system.

Note	Canoma is intended for local installation only. Do not attempt to install it onto a network server.

System Requirements (Windows)

- Pentium processor
- Windows 95, Windows 98, Windows NT
- 32 mb free RAM (48+ mb recommended)
- 50 mb of hard-disk space
- 16 bit color (24 bit recommended)
- CD Rom drive (for install)

System Requirements (Macintosh)

- Power PC
- System 8.0 or higher
- 32 mb free RAM (48+ mb recommended)
- 50 mb hard-disk space
- 16 bit color (24 bit recommended)
- CD Rom drive (for install)

Web Installation

To install Canoma from the Web:

1. Go to the MetaCreations Web site.
2. Follow the instructions on the Web site to download the appropriate self-installing executable file (Windows or Macintosh).
3. Double-click the file to run it.
4. Follow the instructions provided by the installer. The installation dialog displays an important ReadMe.
5. Click Yes/Accept after reading the complete ReadMe.

Windows CD Installation

To install Canoma from a CD:

1. Launch Windows.
2. Insert the Canoma CD-ROM into your computer's CD-ROM drive. The Install Canoma dialog appears.
3. Double-click the Canoma icon.
4. Follow the instructions provided by the installer. The installation dialog displays an important ReadMe.
5. Click Yes after reading the complete ReadMe.

Macintosh CD Installation

To install Canoma on a Macintosh:

1. Insert the Canoma CD-ROM into your computer's CD-ROM drive. The Install Canoma dialog appears.
2. Double-click the Canoma icon.
3. Follow the instructions provided by the installer. The installation dialog displays an important ReadMe.
4. Click Accept after reading the complete ReadMe.

Canoma Installation Tip

- Macintosh tip: Increase available RAM available to Canoma by allocating unused RAM to Canoma. This can allow Canoma to run faster and handle larger files or larger renderings.

  Be sure to leave some RAM for the system software, though! System software needs to be able to dynamically allocate RAM to itself when required.

2

Application Overview

What's in this Chapter:

Introduction 24

The Canoma Workspace 24

Status Tips 28

About Canoma 28

Accessing the MetaCreations Web Site . . .28

Introduction

Canoma lets you quickly create 3D models from scanned or digital photographs. Canoma models can then be posted on Web sites, used in electronic catalogs, imported into traditional 3D modeling and animation software, or rendered as 2D image files.

The Canoma Workspace

This section leads you through the Canoma Workspace.

The first thing you'll notice about Canoma is that it doesn't have traditional floating palettes and toolbars. All of Canoma's features are integrated into the Workspace, which takes over your entire screen. This helps keep everything uncluttered and easy to locate.

The Canoma Workspace takes over your screen and provides access to the Canoma controls.

Your operating system's standard menus and windows are still available from within Canoma. You can switch between Canoma and other applications, such as 2D paint programs, Web browsers, or 3D programs.

On Windows, Canoma always runs maximized. You can't reduce the window size, although you can minimize the Canoma window, using the minimize control or switch applications, using ALT-TAB or the application buttons in the Task Bar. On the Macintosh, you can switch applications by clicking inside the window for the other application or by using the Application List.

The Canoma Workspace is very flexible. Several controls "float" over the Workspace and can be moved by dragging them to other locations on the application workspace.

The Canoma Project Window

The Canoma Project Window is a square shaped window inside the Canoma application window. It's where you construct and view a Canoma model.

The Project Window is used when you edit your models, manipulating object wireframes in Edit mode. It's your work area where you'll pin 3D objects to picture elements. The Project Window can be resized to suit your needs (grab

it by the lower left corner) and moved to another part of the Canoma workspace (by the title bar.)

The Canoma Project Window is where you construct 3D model.

The Project Window is also where you view the 3D models you create. The view you see of your model in the Project Window is taken through a stationary "camera." You can reposition the Canoma camera in order to view your model from different angles or distances. When you view a 3D model, you're in a three dimensional space. That means you can even view your model from below or above.

The Canoma Project Window is where you view your 3D models.

Just outside the Project Window are some information displays and buttons. Along the top of the window is the title of your project and its size. To the top right of the window are three buttons that toggle display options on and off. To the bottom right of the window are buttons that let you change the color for program elements such as the background, selected objects, unselected objects, objects in the stress display, shadows, and object constraints.

Camera Controls

Use the Camera Controls to change the position and function of the viewing camera.

Tip

If you're familiar with Bryce 3D or Poser by MetaCreations, the Camera Controls feel very familiar.

The Edit and View buttons switch between:

- Edit mode, where you can see the wireframe objects that make up your model and

- View mode, where you can see the untextured or textured 3D model.

The Camera Crosses let you move the view of the camera specifically along X, Y, and Z axis. The Camera Trackball lets you rotate the camera in any direction and around any axis. The Banking and Field of View control spheres tilt your Camera and act like a wide-angle lens control. Refer to "Positioning the View of Your Model" on page 102 for more about positioning the camera around your model.

Use the Camera Controls to adjust the position of the 3D viewing camera.

The Creation Tab

The Creation Tab contains the 3D objects, like boxes, rectangles, and even editable polyline contours. Select one of these 3D objects, position it, then "pin" it to an element in your photograph. Once pinned into place, Canoma uses that placement information to create a 3D model, which can then be "covered" with the pixels from your photographs.

Use the scrollbar on the Creation Tab to view all the objects you can choose.

Refer to "Working with Objects" on page 77 for more about the Creation Tab.

The Toolbar

The Canoma Toolbar holds the tools you'll use to manipulate objects, view your work, and apply or edit textures. Click a button to activate that tool.

The Toolbar contains (from left to right):

- **Arrow** (select, pin, or apply beads)
- **Glue** (glue objects together)
- **Zoom** and **Pan** (move into, away from, or around your scene)
- **Point Pen** (add/delete polyline contour points)
- **Texture Brush** (change textures at a pixel level)
- **Quick and Quality Textures** (apply photograph pixels as textures for your 3D scene)

When a tool is selected, it is highlighted in the Toolbar. At the top of the Toolbar is a title that identifies which tool is active.

The Canoma Toolbar.

Selecting Objects

You can use the Object List to easily select an object in your scene. The Information button brings up a dialog of object settings for the selected object. You can even switch into Solo Mode, where it's easier to see just the object that you're working with.

Click the Information button for object settings, then use Solo Mode to focus on one object at a time.

2D Image Palette

A thumbnail of your photograph is displayed on the 2D Image Palette. This is a thumbnail of the active image. The 2D Image Palette opens downward to reveal all the photographs in your project. Refer to "Using 2D Source Images" on page 74 for more about using the 2D Image Views window.

The 2D Image palette.

Texture Controls

The Texture Controls apply the pixels of your photograph to your 3D model. You can use Quick Texture (fast) or Quality Texture (slower, uses more memory, but looks better.) You can also use the Texture Resolution popup to choose a resolution setting for the textures you apply.

Choose Quick or Quality Texture, as well as a resolution setting.

Refer to "Working with Texture" on page 97 for more information about adding Texture.

The Animation Tab

The Animation Tab holds the controls you need to use in order to quickly define key frames and set options to create an animation. Move the camera, take a "snapshot," move the camera, take another snapshot, then Canoma completes the work by interpolating between the keyframes you've snapped or "filling in the gaps."

The Animation Controls.

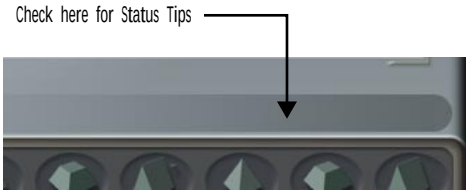
The Animation Tab contains controls for adding and deleting keyframes, a looping option, a way to set the playback duration, and buttons for previewing your animation. Refer to "Previewing an Animation" on page 117 for more about the animation controls.

The Menu Bar

The Canoma Menu Bar contains eight menus: the File menu, the Edit menu, the View menu, the Model menu, the Texture menu, the Animation menu, the Window menu, and the Help menu. These menus provide another method of access to the Canoma feature set.

Status Tips

As you move the cursor over an element of the Canoma workspace, text in the lower right corner of the screen explains the purpose of each. Use Status Tips to "browse" around the work area and become familiar with Canoma tools, palettes, and dialogs.



Status Tips help you become familiar with Canoma tools, palettes, and dialogs.

About Canoma

You can view information about which version of Canoma you are using.

To see Canoma information:

- Click the word Canoma.

Accessing the MetaCreations Web Site

You can access the MetaCreations Web Site directly from within the Canoma program.

To access the MetaCreations Web Site:

- Click the word MetaCreations. This launches your browser and opens the MetaCreations Web Site.