



WATCHOUT™

Version 5.2



SENSATION CREATION

TABLE OF CONTENTS

1	INTRODUCTION	7	4	PRODUCTION	59
	System Overview.....	8		Stage.....	59
	Software Overview.....	12		Media.....	61
2	INSTALLATION	15		Timeline.....	64
	Software.....	15		Tween Tracks.....	69
	Network.....	16		Opacity.....	72
	License Keys.....	16		Volume.....	72
	Display Devices.....	17		Scale.....	72
	Projection Screen.....	17		Rotation Z.....	73
	Sound.....	17		Rotation X and Y.....	73
	Live Video Input.....	18		Anchor Point.....	74
	MIDI and DMX-512.....	19		Position.....	75
	VNC Server Software.....	20		3D/Stereoscopy.....	78
	Computer Settings.....	22	5	PRESENTATION	79
	Display Computer Settings.....	27		Connecting to the Display Computers.....	79
3	MEDIA	33		Running the Presentation.....	81
	Still Images.....	34		External Control.....	83
	Moving Images.....	37		Timecode Control.....	84
	Audio.....	45		Stereoscopic Presentations.....	86
	Live Video.....	47	6	USING COMPOSITIONS	87
	Computer Screen.....	47		Creating a Composition.....	88
	Network Video.....	48		Adding Cues.....	90
	Dynamic Images.....	50		Using the Composition.....	91
	Text.....	52		Nesting Compositions.....	92
	DMX-512 Recording.....	57			

7	WINDOWS	95	10	CUES	167
	Stage Window	97		Cue Specifications	170
	Main Timeline Window	101		Tween Tracks	179
	Auxiliary Timeline Window	106		Control Cue	193
	Composition Window	106	11	INPUTS AND OUTPUTS	197
	Media Window	107		Inputs	197
	Input Window	110		Outputs	204
	Output Window	110	12	TASKS AND EXPRESSIONS	209
	Task Window	111		Auxiliary Timeline	210
	Status Window	112		Expression	212
	Message Window	113	13	DYNAMIC IMAGES	217
8	COMMANDS	115		Serving Still Images	218
	File Menu	115		Serving SWF Files	219
	Edit Menu	125		Dynamic Image Parameters	221
	Stage Menu	131	A	SYSTEM REQUIREMENTS	223
	Preview Menu	135		Computer	223
	Media Menu	139		Live Video Input	224
	Timeline Menu	151		Network	224
	Tween Menu	155	B	COMPUTER ISSUES	225
	Window Menu	155		Dedicated Computer	225
	Help Menu	155		Windows 7 UAC Settings	227
9	DISPLAYS	157		General Performance	229
	Display Specifications	158		Display Performance	235
	Geometry Correction	160		Other Issues	236
	Color & Stereoscopy	165		Cloning a Computer	237
	Using Multiple Display Outputs	166			

C	DISPLAY ISSUES	239
	Display Technologies	239
	Wiring.....	242
	General Troubleshooting	243
	Jerky Movements	243
	Banding.....	245
	Hot-Spots	248
	Creeping Shades	248
	Optical Linearity	249
	Stereoscopic Projection	249
D	PRODUCTION COMPUTER PROTOCOL	251
	List of Commands	253
E	DISPLAY CLUSTER PROTOCOL	257
	Control Options.....	257
	Commands and Responses	260
	List of Commands	262
	Feedback.....	269
	Command ID Tagging.....	274
F	MIDI SHOW CONTROL	275
	INDEX	277

Dataton WATCHOUT™ software and this manual
© Copyright 2012, DATATON AB ("Dataton"). All
rights reserved.

Dataton and the Dataton logo are registered trademarks
of DATATON AB. WATCHOUT and PICKUP are trade-
marks of DATATON AB. All other company and product
names are trademarks or registered trademarks of their
respective owners. Use of a term in this publication
should not be regarded as affecting the validity of any
trademark.

QuickTime and the QuickTime logo are trademarks used
under license. The QuickTime logo is registered in the
U.S. and other countries.

The information in this manual has been carefully
checked and is believed to be accurate. However,
Dataton assumes no responsibility for any inaccuracies
or errors in this manual or the products described. In no
event will Dataton be liable for direct, indirect, special,
incidental, or consequential damages resulting from any
defect or omission in this manual, even if advised of the
possibility of such damages. The technical information
contained herein regarding features and specifications
is subject to change without notice.

Products or manufacturers mentioned do not constitute a
recommendation or endorsement by Dataton.

Dataton AB
Box 454
SE-581 05 LINKÖPING
Sweden

<http://www.dataton.com/>

Phone: +46-13-10 24 50
Fax: +46-13-13 84 45
E-mail: info@dataton.se

Technical Support: support@dataton.se

WATCHOUT Suggestions: watchout@dataton.se

1 INTRODUCTION

Welcome to Dataton WATCHOUT™, a fully digital, multi-screen display technology. It combines the qualities of traditional multi-image with digital imagery, video and the graphics power of contemporary computer technology. Use it with projectors for large, seamless images, or hook it up to monitors, video wall cubes or plasma screens for other creative screen arrangements.

About This Manual

This manual is divided into the following parts:

- An introduction section, giving you the big picture. Start here if you're a new user or just having your first look at WATCHOUT.
- A reference section, describing all windows, menus, commands and other details. Refer to this section to learn more about specific functions
- A number of appendices with additional information related to particular areas of the product, such as live video inputs and external control protocols.
- ◆ **HINT:** If you're reading the electronic version of this manual, the table of contents, index and all cross references can be clicked to jump directly to the referenced page.

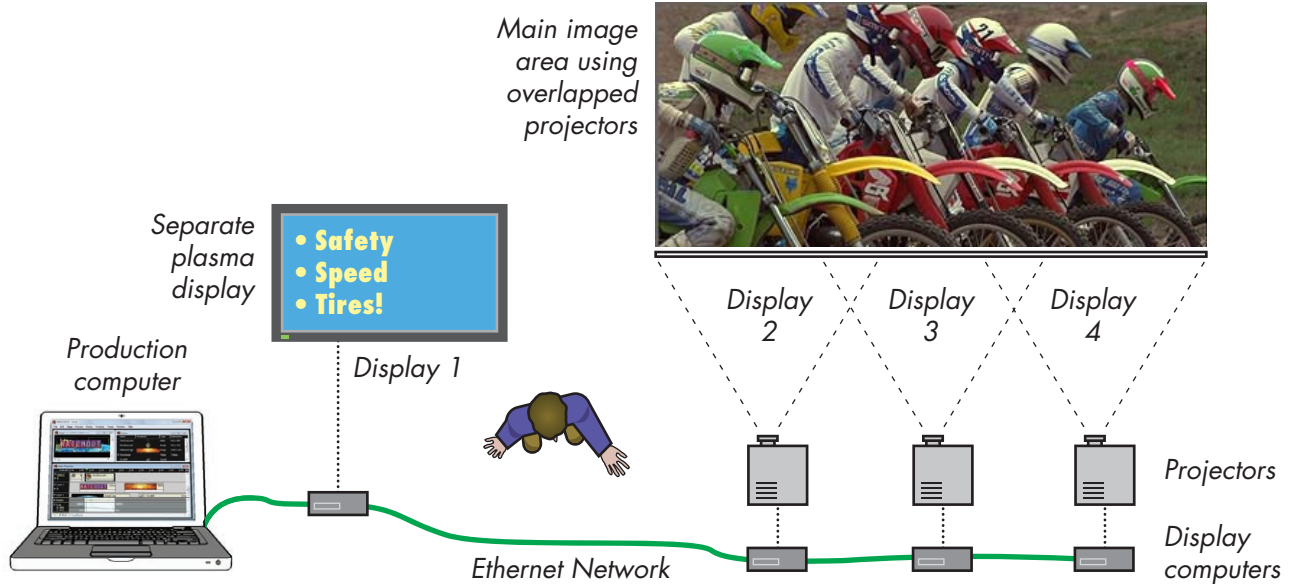
WATCHOUT Version 5

This manual refers to WATCHOUT version 5. The latest version of the software and its documentation can always be obtained from:

<http://www.dataton.com/watchout/support/downloads>

SYSTEM OVERVIEW

This section provides a brief introduction to the various components in a very basic WATCHOUT system, and how they fit together.



Production Computer

This is the focal point for your WATCHOUT production work. This is where you collect all the source material, or media, to create your presentation. Using the WATCHOUT production software (see page 13), you simply drag media into your presentation, positioning it in the Stage window and along the Timeline.

The production computer talks to the display computers through the network, transferring media files for you as required, as well as controlling the playback of the show. It can also be used for audio playback while running the show.

Display Computers

You need one display computer for each display device, or group of display devices, used in your presentation (projector, monitor, etc). Display computers handle all the hard work associated with rendering still images and video. They also apply edge blends and can play sound files.

The fact that the system can use multiple display computers means it is scalable to virtually any size; as more displays are added, you can also add more computing power to drive these displays. A display computer may drive up to six displays, depending on hardware and performance requirements.

Network

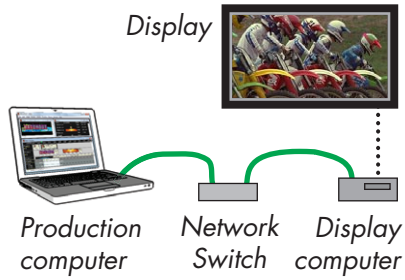
The network ties the parts together, allowing the production computer to manage all display computers. The network is created by connecting the computers to a common hub or switch (not shown in the overview illustration).

As you add new media to your presentation, or revise existing media, these changes are automatically propagated, via the network, to the appropriate display computers. The network also transfers your display configurations, timeline programming and other aspects of your presentation to the display computer. With all this material residing on the display computers, very little information needs to be sent over the network during playback, avoiding network congestion.

Display Devices

WATCHOUT can be used with virtually any display device that can be connected to a computer, such as projectors, LCD and plasma displays. See “Display Issues” on page 239 for more details.

Minimal System Configuration



Although you can use the WATCHOUT production software on its own in order to get acquainted, you won't be able to appreciate the full power of WATCHOUT until you connect some display computers. The illustration to the left shows a minimal system, consisting of the following components:

- A computer running WATCHOUT production software.
- A computer running WATCHOUT display software
- A display device (for example, a monitor or a projector).
- A network, connecting the two computers together via a hub or switch.

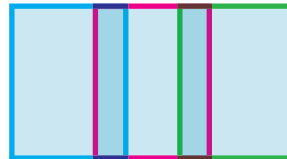
In addition, each computer in a system running WATCHOUT must have a WATCHOUT license key connected (see "License Keys" on page 16).

- ◆ **NOTE:** The production software can be used on its own without a license key. License keys are required for using the display software.

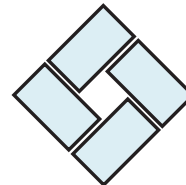
Alternative Display Layouts



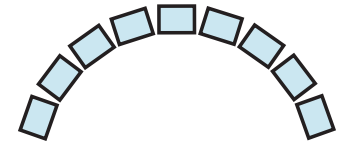
Plasma display column



Vertically oriented, edge-blended projectors



Diamond-shaped display cluster



Arch built using multiple LCD displays

WATCHOUT is very flexible in terms of how you arrange the displays. The illustrations below show some more unusual display arrangements. In addition, WATCHOUT also supports projection on curved surfaces (see "Geometry Correction" on page 160).

Images, Sound and Video

A WATCHOUT presentation uses multiple media, such as still images, video clips, sound files, etc. WATCHOUT accepts a wide variety of still image and video file formats. Transparent areas (alpha channel) are supported in both still images and video files. For more details on the various kinds of media supported by WATCHOUT, see “Media” on page 33.

Live Feeds

In addition to pre-produced content, WATCHOUT can also incorporate live feeds of various kinds:

- Video camera, e.g., for integrating a live image of a speaker into the presentation.
- Other external feeds, such as a DVD player or a satellite link.
- Computer graphics, e.g., a PowerPoint presentations.
- RSS feeds or other external data sources managed through the WATCHOUT Dynamic Image Server (see page 217).

Some live feeds require additional hardware, such as capture cards, in order to bring the signal into WATCHOUT (see “Live Video” on page 47). In other cases, the external feed can be brought into the system through the network.

External Control



WATCHOUT can be combined with other systems and technologies to build entire presentation environments. Use a touch panel, an iPhone, iPad, or similar device, as an interactive front-end, controlling any number of WATCHOUT clusters. Connect other devices and systems to WATCHOUT using a computer network, serial port, MIDI, DMX-512 or a timecode feed (see separate sections and appendices for details on external interface options).

SOFTWARE OVERVIEW

Stage Window

This section gives a brief introduction to the WATCHOUT production software.

The Stage window allows you to organize the displays (screen areas) to reflect their expected placement. It also provides a preview of the end result, and allows you to manipulate the placement and movement of images.

Timeline

Media files are dragged from your hard disk into a timeline window, where they appear as cues. Each cue features a thumbnail icon of the media. You determine timing and duration by adjusting the position and length of these cues. The horizontal layers in the timeline window represent the order of overlapping images, back-to-front.

Media

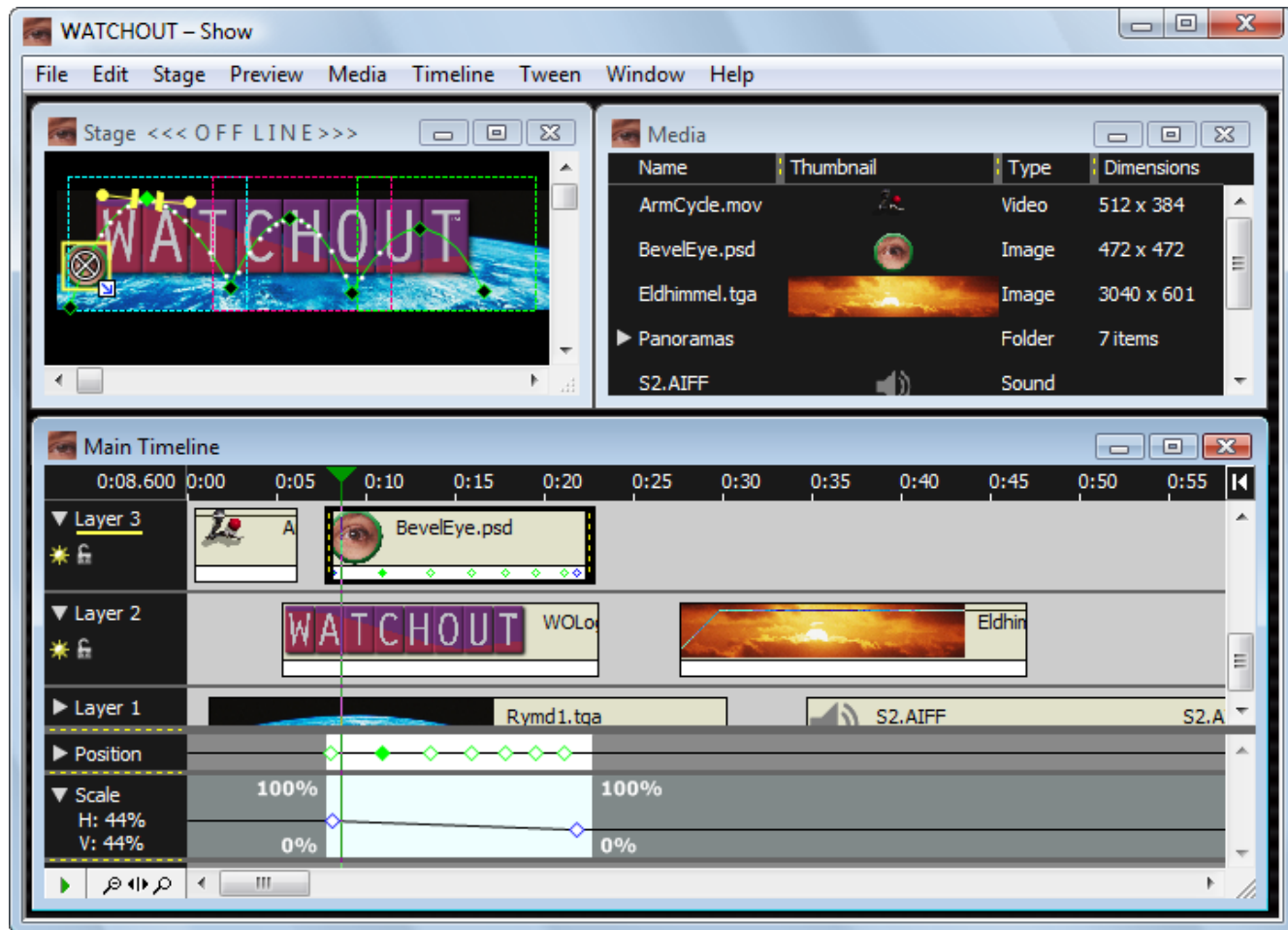
As media is added, thumbnails representing the media files also appear in the Media window. This acts as a central repository for all media used in your presentation. It provides information about each media file, and allows the file to be easily accessed for editing or other purposes.

Cues and Tween Tracks

The cues in the timeline window can be enhanced by applying tween tracks. Tween tracks control the dynamic behavior of media on stage, such as position, size or transparency.

System Management

As you make changes to the presentation, those changes can be transferred to all the display computers by a single keystroke. This automatically transfers any media you have added, or modified, to the relevant display computers and shows the result on screen. As the media files and cues are cached locally on each display computer, the show is ready to run at any time by simply pressing the spacebar.



WATCHOUT Training Videos

To learn more about WATCHOUT, you may want to watch the training videos available here:

<http://dataton.com/watchout/support/training>

Where to Go From Here

To use WATCHOUT for running actual, full-scale presentations, you need to hook up display computers and projectors (or other display devices) as shown on page 8. Chapter 2 provides details on setting up and configuring a complete system.

In addition to the computers and display devices, you also need to acquire WATCHOUT license keys (see “License Keys” on page 16).

2 INSTALLATION

This chapter tells you how to install the required software components as well as how to hook up the hardware.

SOFTWARE



WATCHOUT
Installer

Obtain the “WATCHOUT Installer”, either from the WATCHOUT license key or by downloading it from

<http://www.dataton.com/watchout/support/downloads>

Run the installer and follow the on-screen instructions. This installs both the production and display software components, adding them to your Start menu.

◆ **NOTE:** If you intend to use the computer primarily for WATCHOUT, first read the section titled “Dedicated Computer” on page 225.

Installing QuickTime



Quicktime
Installer

In addition to WATCHOUT, you also need to install Apple QuickTime, available on the WATCHOUT license key or from:

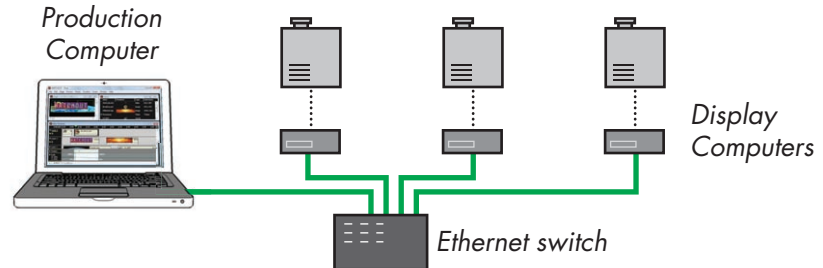
<http://www.apple.com/quicktime/download/>

NETWORK

The production computer and all display computers must be interconnected using a TCP/IP compatible Ethernet network, which comes standard on most computers. Wireless networks are generally not recommended.

Stand-alone System

Connect all computers to a hub or switch.



For stand-alone operation of a WATCHOUT system, this is usually all you need to do in terms of hardware hook-up.

LICENSE KEYS



Each computer in the system requires a WATCHOUT license key, including the production computer. Plug the key into any free USB (Universal Serial Bus) port on the computer.

- ◆ **NOTE:** You can run the production software off-line without a license key connected. A key is needed when you go on-line to communicate with the display computers.

DISPLAY DEVICES

WATCHOUT can be used with most display technologies, including DLP and LCD projectors, LCD monitors, video wall cubes and plasma screens. Generally speaking, you can use any display device that's compatible with the display card in the display computer.

For projection purposes, DLP projectors with a high contrast ratio (2000:1 or better) is recommended. See "Display Issues" on page 239 for further details on various kinds of displays, and how to connect them to WATCHOUT.

PROJECTION SCREEN

As in all multi-screen projection applications, it is important to choose the screen material with caution. Make sure you buy your screen material from a screen manufacturer familiar with the requirements of multi-image projection, or similar applications.

For front projection, avoid using high-gain, or "silver" screens. Such screens often cause uneven brightness or banding when using multiple projectors and/or when viewing from non-optimal angles. See "Banding" on page 245.

A related problem when using rear projection screens is the "hot-spot" caused by the projection lens showing through the projection surface. See "Rear Projection" on page 245.

SOUND



Sound output jack symbols.

Sound can be provided through any of the display computers, or through the production computer. Simply connect the sound output from the computer (usually a 3.5 mm mini-jack) to the amplifier or powered speakers.

If you need to run the computer's line level audio signal a long distance, you should use an audio line level transformer. This converts the unbalanced signal coming from the computer to a balanced signal, thereby reducing the risk of hum and noise when connected to a professional audio amplifier.

Using Multiple Sound Channels

You can have multiple display computers playing at the same time, thereby providing multiple audio channels. The synchronization between computers is generally good enough for multi-language support or special effects sound tracks, but not for true, phase accurate, multi-channel sound reproduction.

Another option is to install a multi-channel sound card in a display computer. Such sound cards can handle up to eight phase accurate sound channels. See “Multi-Channel Audio” on page 45 for more details.

LIVE VIDEO INPUT

WATCHOUT can integrate live video feeds using video input devices, such as capture cards. This may be a camera feed, a satellite link or the image displayed by another computer (for example, a Microsoft PowerPoint® presentation). For examples on some suitable video input solutions, see “Live Video Input” on page 224.

Feeding Multiple Display Computers

The video signal must be fed to each computer where it’s supposed to appear. For instance, if your system uses five display computers, and you want to show a live video image straddling two of those five display areas, both those display computers must be fitted with the same kind of capture card, and the video signal must be fed to the same input on both cards.

A video DA (distribution amplifier) may be required to distribute the signal to multiple inputs. Such devices are available from companies such as Extron and Kramer Electronics:

<http://www.kramer.co.il/>

<http://www.extron.com/>

Software Driver Installation

Most capture cards require specialized software drivers. Although such a driver is usually delivered with the card on a CD-ROM, it's often a good idea to check the manufacturer's web site for the latest driver version. For a list of suitable capture cards, see "Live Video Input" on page 224.

WATCHOUT Configuration

Configure each WATCHOUT display computer that will show live video as described under "Add Live Video" on page 145. Optionally, you can also choose to show live video in the Stage window of the production computer (see "Video In" on page 124).

MIDI AND DMX-512

WATCHOUT can communicate with other devices using the MIDI and DMX-512 industry standard protocols, as well as devices connected through a serial or network data link. MIDI communication requires a Windows compatible MIDI interface, which is often connected through a USB port. Follow the instructions included with your MIDI interface to install any required software or drivers.

See "Inputs and Outputs" on page 197 for more details.

If you want to use the Computer Screen media item in WATCHOUT to integrate a live computer display into your presentation (for example, to display Excel or Powerpoint as part of a speaker-support presentation), you must install VNC server software on the remote computer. This must be a separate computer – it can not be one of the computers running WATCHOUT software.

- ◆ **NOTE:** This software is not required for basic WATCHOUT functions. You only need to install this software if you want to use the “Computer Screen” feature (see “Add Computer Screen” on page 143).

VNC (Virtual Network Computing) server software is available for a wide variety of operating systems. The instructions below describe its installation under Windows. VNC is free software, available in several forms:

<http://www.realvnc.com/>

<http://ultravnc.sourceforge.net/>

Download the VNC server software from one of the above locations, and follow its installation instructions. When using Windows 7, you’re advised to start the VNC server software as a user mode application.

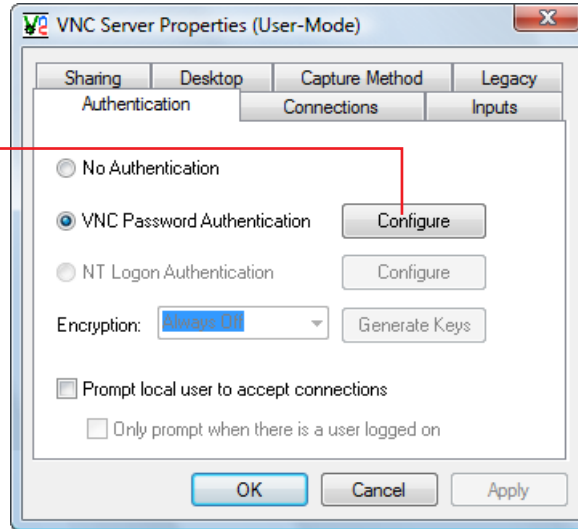
For best performance, use a reasonably fast computer to run the VNC server software and the application you wish to incorporate into your presentation (for example, Powerpoint).

Make sure that the VNC server computer is connected to the WATCHOUT network, and has a fixed, known IP number in its TCP/IP settings (see page 24). This IP number and other TCP/IP parameters must match the network to which it is connected. Also verify that its firewall is disabled, or that the VNC port 5900 is open in the firewall (see “Firewall Settings” on page 25).

The first time you run the VNC server software, you will be prompted to enter a password. The VNC server software then appears as an icon in the lower right corner of the screen while running. Pointing at this icon displays the IP number of the VNC server. Double-click the icon to change the settings.

VNC Server software settings.

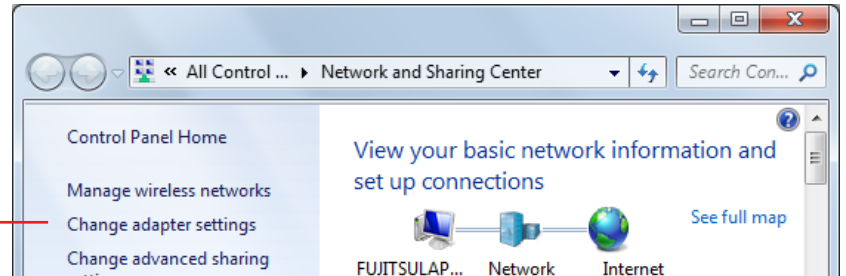
Enter the desired VNC server password here.



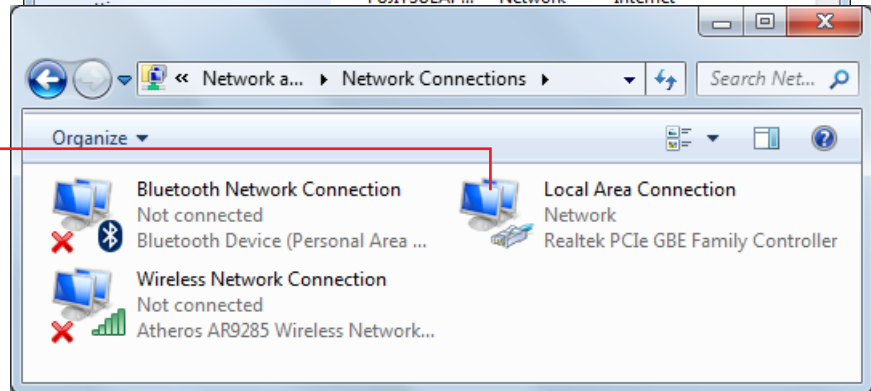
COMPUTER SETTINGS

Each computer needs to be configured for TCP/IP networking. Click the Start button and choose Control Panel. Open the “Network and Sharing Center”. Make sure there’s a “Local Area Connection” shown in the list.

Click “Change adapter settings”.

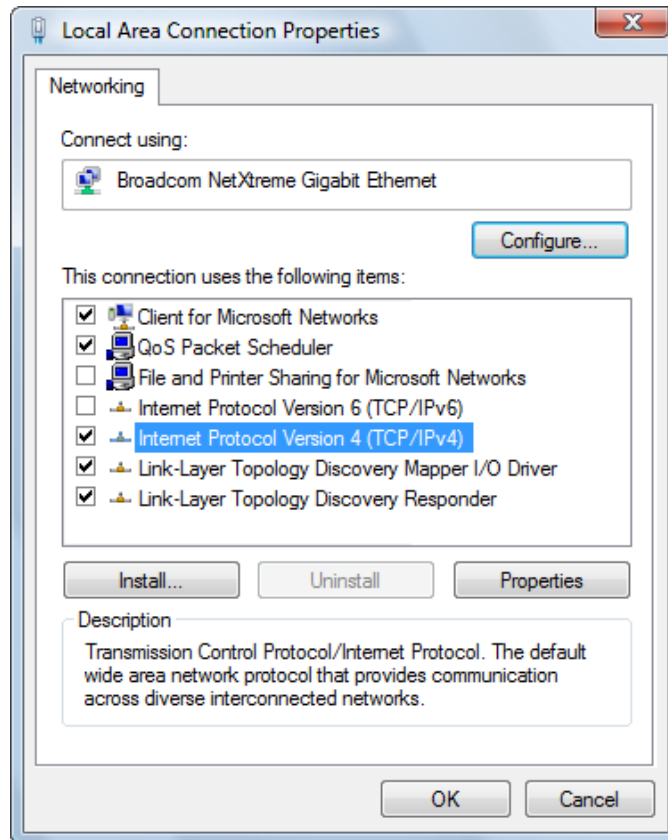


Right-click your local network connection and choose “Properties”.



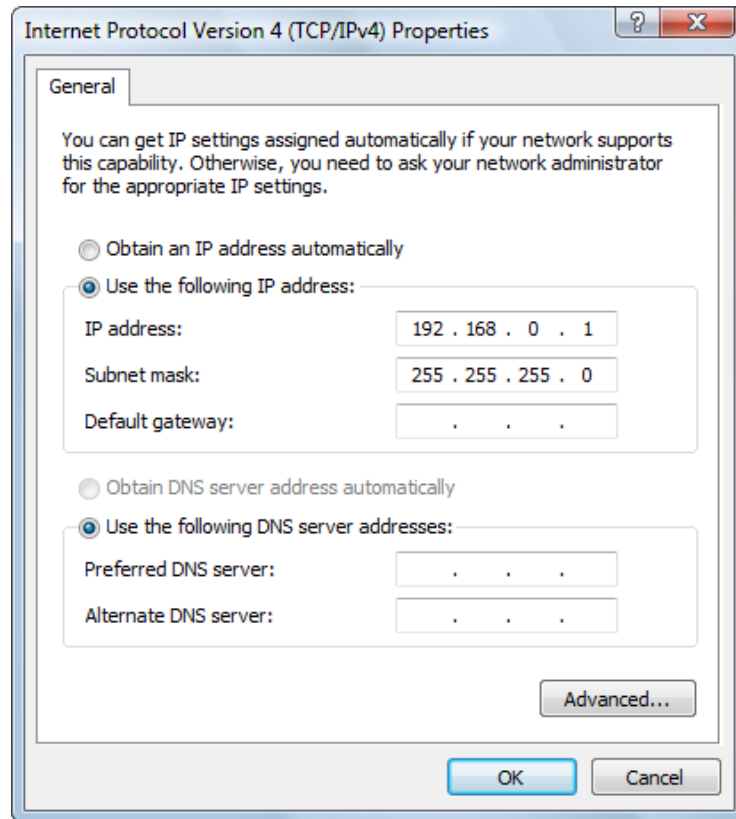
Click “Change adapter settings”, then right-click your Local Area Connection and choose “Properties”. You may need to type your password to continue configuration at this point.

Ensure that “Internet Protocol Version 4 (TCP/IPv4)” is available and selected.



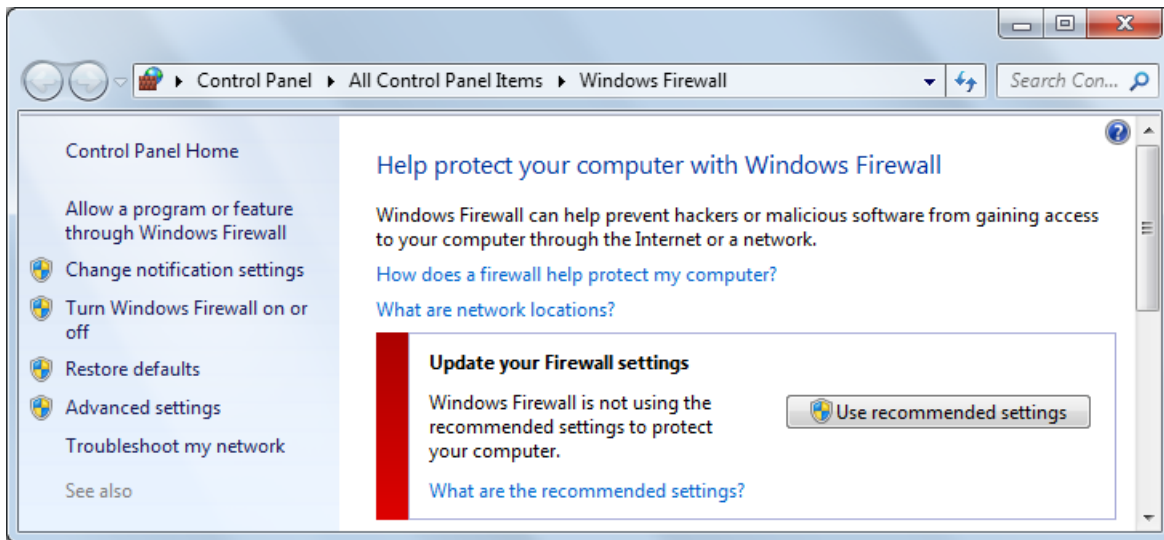
Choose “Internet Protocol Version 4 (TCP/IPv4)”, click “Properties...” and enter the numbers as shown below.

- ◆ **NOTE:** The example shown is appropriate if you’re building a stand-alone system. If your WATCHOUT subnet is connected to a larger network, you should consult your network administrator.



Firewall Settings

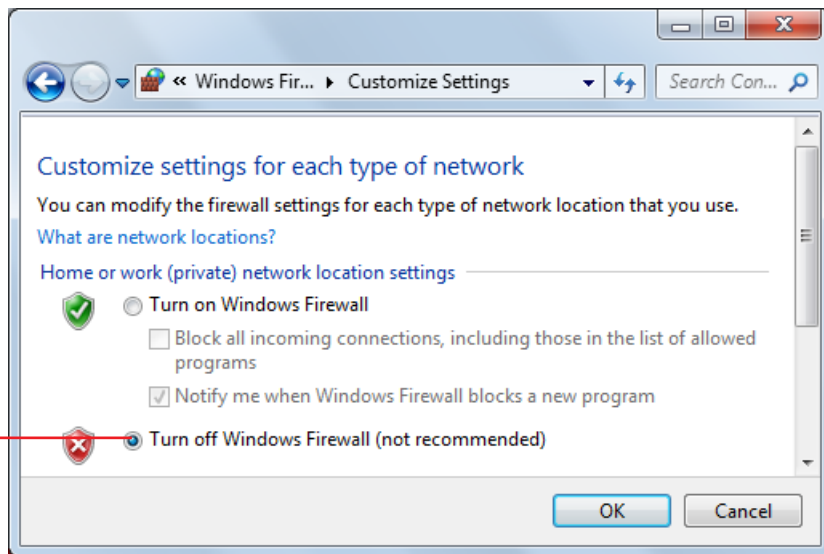
The Windows firewall may interfere with normal operation of WATCHOUT. You can avoid this either by disabling the firewall, or by configuring the firewall to allow WATCHOUT to function. To disable the firewall, open the “Windows Firewall” control panel, as shown below.



If the firewall is on, click “Turn Windows Firewall on or off.” This opens the “Windows Firewall Settings” window (see next page), allowing you to turn off the firewall.

- ▲ **IMPORTANT:** A WATCHOUT system should not be accessible from the Internet, or other external network. If you need to access the Internet from your system, use a separate firewall device to protect your complete system from security attacks.

The firewall feature should be turned off. Otherwise it may interfere with the ability to connect to and download media files to the display computers.



- ◆ **NOTE:** As an alternative to disabling the firewall entirely, you may configure the firewall to allow WATCHOUT and any other related functions to pass through. Please consult your computer's documentation for details on how to configure the Windows firewall.

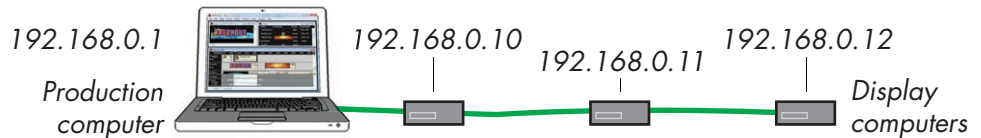
DISPLAY COMPUTER SETTINGS

To achieve best performance and reliability in your WATCHOUT system, you need to adjust several settings on all your display computers. Most of the settings below are found by clicking the Start button and choosing Control Panel.

Network

Open the “Network and Sharing Center” control panel and configure TCP/IP as described on preceding pages. Specify a unique IP number for each display computer by changing the last group of IP address digits.

As an example: in a system consisting of one production computer and three display computers, you would end up with IP addresses assigned like this:

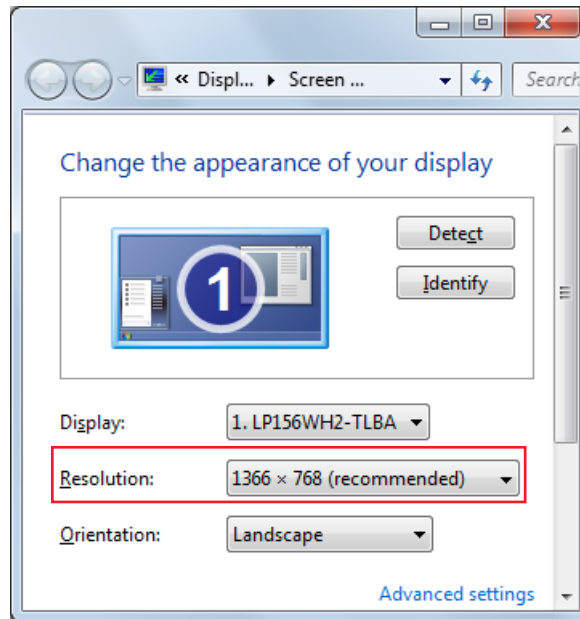


If your WATCHOUT subnet is not stand-alone but connected to a larger network, you should consult your network administrator for the correct IP number, subnet mask, and other parameters.

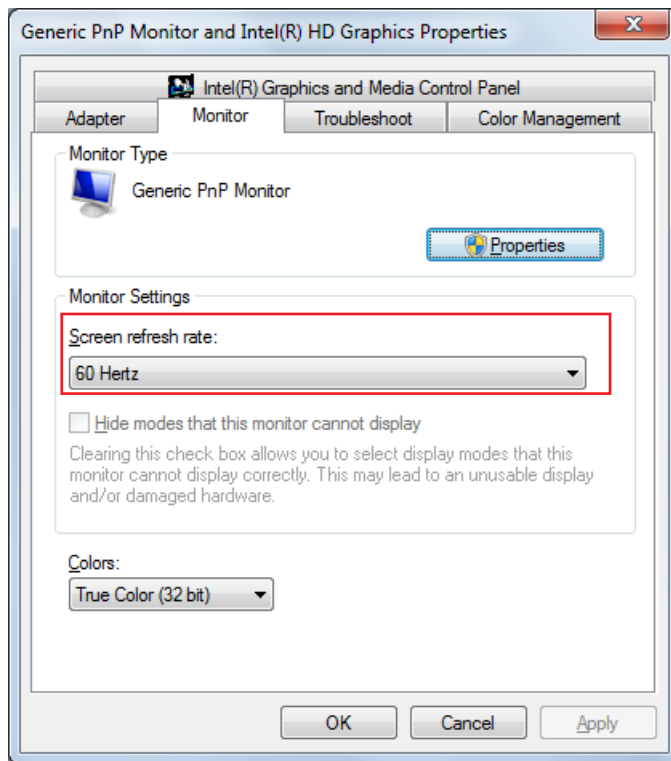
- ▲ **IMPORTANT:** Each display computer must be manually assigned a unique IP address. Unlike the production computer, the display computers may not use automatic (dynamic) IP number assignment.

Display Properties

- Right-click your computer's desktop and choose "Screen Resolution."
- Set "Resolution" to match the desired resolution for the display. If you have multiple displays connected, select each display and set its resolution and other parameters.
- ◆ **IMPORTANT:** When connecting multiple displays to one display computer, all those displays must be set to the same resolution and connect to a single graphics card.



- Click “Advanced settings.”
- Click the Monitor tab and set “Colors” to “True Color” and “Screen refresh rate” as set in the “Display Framerate” according to your WATCHOUT presentation (see page 121), and click OK.



If you don't intend to use video, or if you have mixed PAL and NTSC video, choose "60 fps" in the WATCHOUT Preferences dialog box, and set the display's refresh frequency to 60 Hz.

- ◆ **NOTE:** Some video projectors and LCD displays work better at 60 fps than other refresh rates even when displaying PAL video. If you experience jerky motion and/or video playback, you may want to try setting both the WATCHOUT Preferences and your display computers to 60 fps/Hertz.

Some system configurations don't allow you to change the refresh rate. In this case, the Refresh rate option will not be shown under the Adapter tab. This may vary depending on the display card, display card drivers and the display connected to the system.

- ▲ **IMPORTANT:** While WATCHOUT will attempt to set the display resolution automatically, setting the resolution manually is usually preferable. The reason is that many display adapters don't allow WATCHOUT to set the most optimal display refresh frequency. By setting the display resolution and refresh frequency manually before starting WATCHOUT, you avoid the risk of getting a non-optimal display frequency.

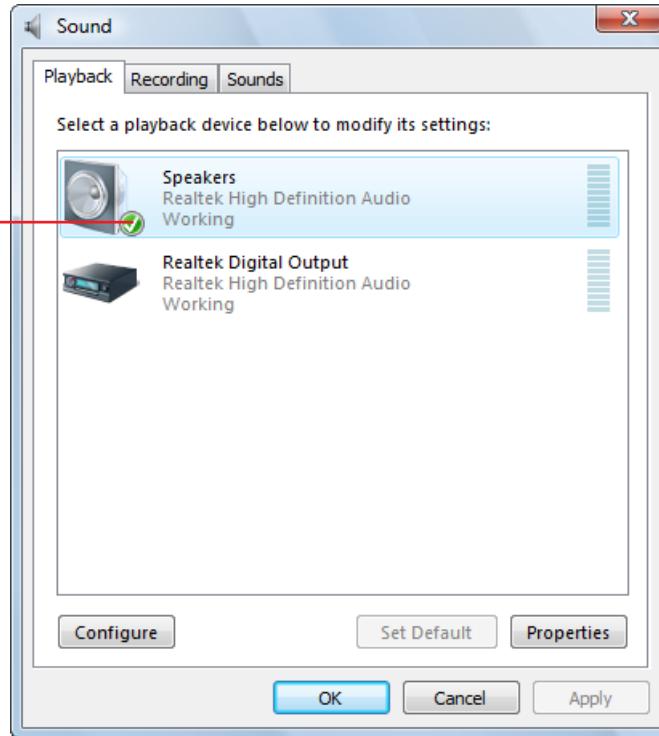
Windows 7 UAC Settings

When using display computers in a dedicated, unattended manner, you may want to disable the User Access Control feature of Windows 7. If not, Windows may occasionally display a confirmation dialog for certain operations, requiring an administrator user to enter a password. See "Windows 7 UAC Settings" on page 227 for more details.

Sound Settings

When using a display computer for sound playback, you must enable the correct sound output and turn up its volume. Open the Sound control panel and make sure the correct output is activated. If not, select the desired playback device and click "Set Default".

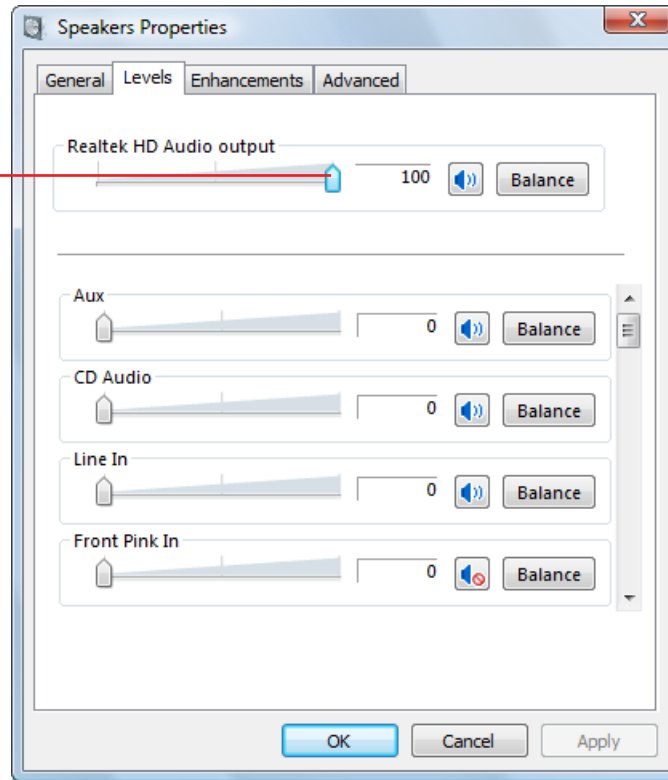
Indicates the currently active (default) sound output port.



Once you have selected the desired output in the list shown on the previous page, click Properties and turn up the volume under the Levels tab.

Turn up the volume.

- ◆ **NOTE:** The look of this window may vary depending on the features of your audio interface.



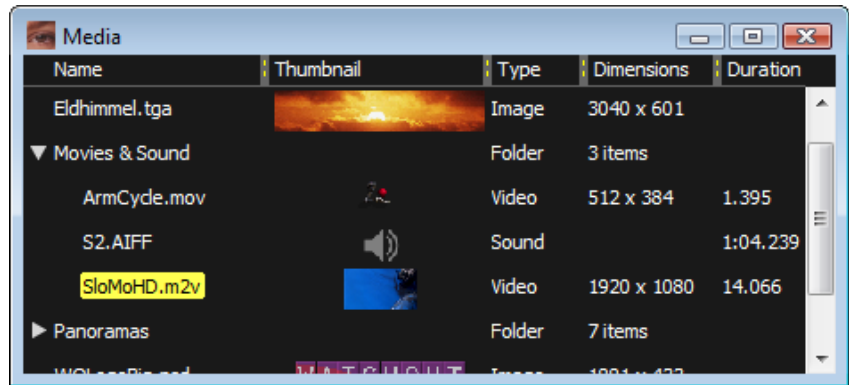
3 MEDIA

WATCHOUT is a compositing tool; it does not include any media creation or editing functions. All media to be used in your presentation must be supplied and edited using other means.

This chapter provides an overview of the media and file formats supported by WATCHOUT, as well as examples of popular applications used to create or edit such media files.

- ▲ **IMPORTANT:** Keep a show's media files in a folder that is located in the same folder as the WATCHOUT show file, or in a sub-folder. This allows the software to use relative file access paths, making it easier to move the show to another disk or computer.

Various kinds of media in the WATCHOUT Media window.



STILL IMAGES

Still images can be used as backgrounds or superimposed on other images. You can control the degree of transparency, scaling, rotation and other effects for all images (stills as well as moving images).

Supported Formats

WATCHOUT reads most popular image formats, including BMP, GIF, JPEG, Photoshop, PICT, PNG, Targa and TIFF.

Preferably, use an image format native to the application used to create/edit the images. For example, if you use Photoshop to edit images, save the images as Photoshop files. Although most image editing applications support saving or exporting to other file formats, doing so may cause a loss of information. This can make it difficult to edit the image later.

▲ **IMPORTANT:** In order to use Photoshop images with WATCHOUT, files must be saved with “Maximize PSD File Compatibility” enabled. This Photoshop option is found under Preferences, File Handling, File Compatibility.

For photographic images (for example, scanned or shot using a digital camera), JPEG at a high quality setting often provides the best compromise between image quality and file size. Keep in mind that JPEG is a lossy compression format. This means that minor, normally unnoticeable, details in the original image may be lost in the compression process.

For computer-generated images with large, smooth areas (for example, screenshots), PNG is a suitable cross-platform format.

Transparency

Some image formats include transparency information in addition to the image itself. This transparency information is sometimes referred to as an “alpha channel”, although some image editing applications use this term for other functions. Transparency can be used to create non-square images, holes inside images or semi-transparent areas, such as drop shadows. Photoshop, PNG, TIFF and Targa file are examples of file formats that support transparency.



Background image.



Image with a transparent background and a semi-transparent shadow.



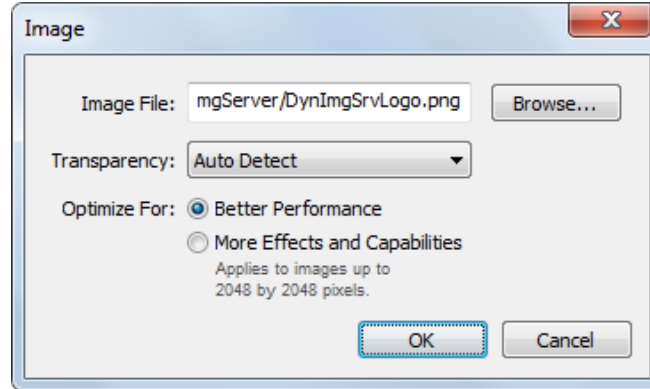
Result when composited in WATCHOUT.

- ▲ **CAUTION:** Even if an application supports writing to a particular file format, it may not support transparency in that format. Perform tests with images to determine the suitability of particular formats and applications.

WATCHOUT supports most methods used for encoding transparency into images. Which method to use is usually determined automatically. If not, you can specify this manually by opening the Specifications dialog box for the image and choosing the desired encoding (see “Transparency” on page 142).

Image Specifications

Double-click the name of an image in the Media window to change its specifications. Click the Browse button to link the media item to another file. This updates all cues to show the newly selected image instead.



Transparency

In most cases, WATCHOUT can determine the kind of alpha channel (transparency) being used in the image, if any. If the automatic detection fails, choose the correct type of alpha channel here.

Optimize For...

WATCHOUT normally optimizes all images for best possible playback performance. However, this may occasionally limit your options when attempting to apply advanced features to an image, such as external control of its position or size (see page 178). To allow the use of such advanced features, choose “More Effects and Capabilities” instead.

▲ **IMPORTANT:** Do not choose “More Effects and Capabilities” unless you need to, as doing so increases the load on your computer. This option is not available for images larger than 2048 pixels in either direction.

MOVING IMAGES

WATCHOUT can play back movies and videos saved in a Windows Media (DirectShow) or QuickTime-compatible format, such as MOV, WMV, AVI, DV and MPEG-1/2/4 (including H.264/AVC).

High Definition Video

WATCHOUT supports high definition video using either MPEG-2, H.264 or the Windows Media 9 format.

Video can be encoded by, for example, the Grass Valley ProCoder:

http://www.grassvalley.com/products/procoder_3

Another excellent and very flexible encoder is TMPEGEnc Video Mastering Works:

<http://tmpgenc.pegasys-inc.com/en/index.html>

Telestream Episode is a popular choice, available for both MacOS X and Windows, providing support for a wide variety of formats:

<http://www.telestream.net/episode/overview.htm>

◆ **NOTE:** Windows Media as well as H.264 HD content requires a comparatively fast computer. MPEG-2 content will play on less powerful computers.

When shooting and encoding high definition content, a progressive (that is, non-interlaced) format is preferable (for example, “30p”).

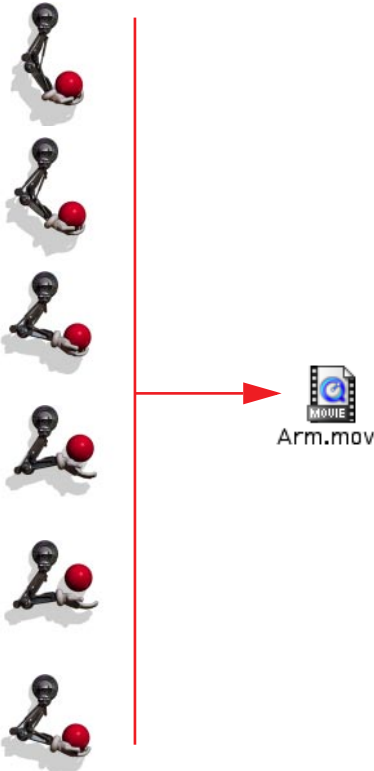
Computer-generated Animations

When using computer-generated moving images, you must specify the frame rate and resolution of the resulting movie during rendering. Generally, when combining computer generated and pre-recorded video material, the frame rate is dictated by the live material. Alternatively, if your playback computer is fast enough, match the rendered frame rate to the WATCHOUT display frame rate (see “Display Framerate” on page 121); for example, 60 fps progressive.

It’s often advantageous to use smaller, computer generated, moving images layered on top of larger still images. By rendering only the parts of an image that actually move, not only do you lower the burden on the playback machine, but you also reduce rendering times. Keep in mind that you can make non-square movies, or even holes inside movies, by using transparency options in supporting applications and codecs.

As computer generated movies are by nature resolution independent, it is also possible to make movies that are much larger than a single display area. Very large movies may need to be pre-split in order to be used in WATCHOUT (see “Pre-splitting Large Movies” on page 42), depending on the performance of the display computers.

Assembling Individual Frames



Some applications, most notably 3D animation software, often save the resulting frames as individual image files. This may also be the case when scanning images frame by frame from film. Such a sequence of images must be converted into a movie file, with the appropriate frame rate, before it can be incorporated into WATCHOUT. This can be done using, for example, Adobe After Effects or Apple QuickTime.

The individual images must be saved as files all ending in a frame number. This number precedes the file name extension: for example, File001.tga, File002.tga, File003.tga, etc.

Assembling using Adobe After Effects. To assemble a movie from still images using Adobe After Effects, choose “Import, Footage File” on the File menu, select the first file in the sequence, and select the “<Format> Sequence” checkbox. The desired frame rate can be specified in Preferences prior to importing the images, or can be altered at any time by choosing “Interpret Footage, Main” on the File menu.

Assembling using QuickTime Pro. Choose “Open Image Sequence” on the File menu, select the first image to import and specify the desired frame rate.

◆ **NOTE:** Many video encoding applications can also encode directly from an image sequence.

Using Transparency



Computer generated movie with transparent background and semi-transparent drop shadow playing over a background image.

Some applications support inclusion of transparency information in the generated movie file. Such transparency can either come from the source material (for example, a computer generated animation), or be added afterwards (for example a mask applied to a video clip).

Being able to create arbitrarily shaped movies, or movies with holes in them, means you can combine moving and still images in many creative ways.

In order to include transparency information in the movie file, you must choose the QuickTime Animation codec set to use “Millions+” of colors. The “+” at the end stands for the transparency information. This is sometimes called “Millions+Alpha”. You must also use an application that’s capable of reproducing and/or generating transparency information, such as Adobe After Effects.

- ◆ **HINT:** In many cases, a clean green or blue background can be used instead of true transparency. Simply apply WATCHOUT’s Key tween track to the video (see “Key (Green/Blue)” on page 185).

Video Compression

Due to the large amount of raw data in a video stream, storing and playing back uncompressed video is usually not feasible. Video compression is based on the concept of codecs. A codec (which stands for compressor/decompressor) is the part of the editing and display technology responsible for storing and playing back compressed digitized video.

There’s a wide variety of codecs available, each optimized for a particular kind of source material and playback requirements. WATCHOUT supports both Apple QuickTime and Microsoft DirectShow codec technologies for playback. Here’s a rundown of some of the more commonly used codecs:

MPEG-2. High quality. Used on DVD video discs. Optimized for camera video at normal frame sizes. Also supports high definition formats with some encoders (see “High Definition Video” on page 37). The WATCHOUT MPEG-2 decoder performs de-interlacing automatically when required.

Quicktime Animation. Very low compression. Optimized for computer-generated material. Supports transparency when set to “Millions+” of colors.

DV. High quality. Medium compression. Optimized for video editing. Generated directly by most digital video camcorders. Native frame size is fixed, based on video format’s frame size. For best performance, use the AVI file format for DV content to be used with WATCHOUT.

Windows Media 9. High quality. Flexible in terms of frame size (useful for making tall or narrow movies), frame rate and interlacing/progressive options. Demanding on processor speed when using high resolutions.

H.264/AVC. High quality. Flexible in terms of frame size (varies with encoder). Demanding on processor speed when using high resolutions.

Choosing the right codec and codec settings for your source material and playback hardware may require some experimentation.

Recommended Compression Formats

Although WATCHOUT supports most video file formats, some formats tend to give better results. As a general guideline, use MPEG-2, Windows Media 9 or H.264 unless an alpha channel is required, in which case QuickTime Animation is the recommended codec. WM9 as well as H.264 requires more processor power, but provides greater flexibility than MPEG-2 in terms of supported frame sizes.

Pre-splitting Large Movies

Modern computers are generally capable of playing at least one high definition video file. Fast computers may be able to play several high definition videos at the same time. As long as what you need to play fits within the realm of your computer's capabilities, you should generally choose among the MPEG-2, H.264 or Windows Media high definition formats.

However, for extremely large movies, spanning numerous displays, even modern computers may not be fast enough to handle the required resolution as one large movie. This applies in particular to computer generated movies, which can be made at any resolution and frame rate your animation software is capable of producing. Such very large movies can be played by splitting them into individual pieces, where each piece includes only the portion of the frame that will play on each display.

While this splitter function is built into WATCHOUT for still images, it is not handled automatically for moving images. The primary reason for this difference is that the original, large movie would most likely have to be compressed in order to be stored and distributed to the display computers. To split the movie, the display computers would have to decompress each frame, split it and then re-compress the result again for final playback. This would mean that each movie frame will be compressed twice. The end result would be a loss of image quality.

In addition to this quality aspect, there are also storage and bandwidth considerations related to distributing and storing the original (large) movie in order to split it, as well as the processing time involved in compressing it twice. The latter would be significant for such a large movie, particularly to achieve the best quality.



A 1200 x 480 movie to be pre-split across two overlapping 800 by 600 display areas.



Crop right by 480 pixels.



Crop left by 480 pixels.

This can all be avoided by splitting the image using the originating application, prior to compression. Most applications allow you to crop the output to any desired rectangle. In some cases, you can even set up batches to generate all the individual movie files in one go.

As an example, assume that you have two 800 by 600 pixel displays with a 30% overlap, and want to display a movie of 1200 by 480 pixels, the split would appear as in the illustration to the left.

◆ **NOTE:** These figures are only chosen as an example. Most modern computers would be able to play such a movie as is, without pre-splitting it.

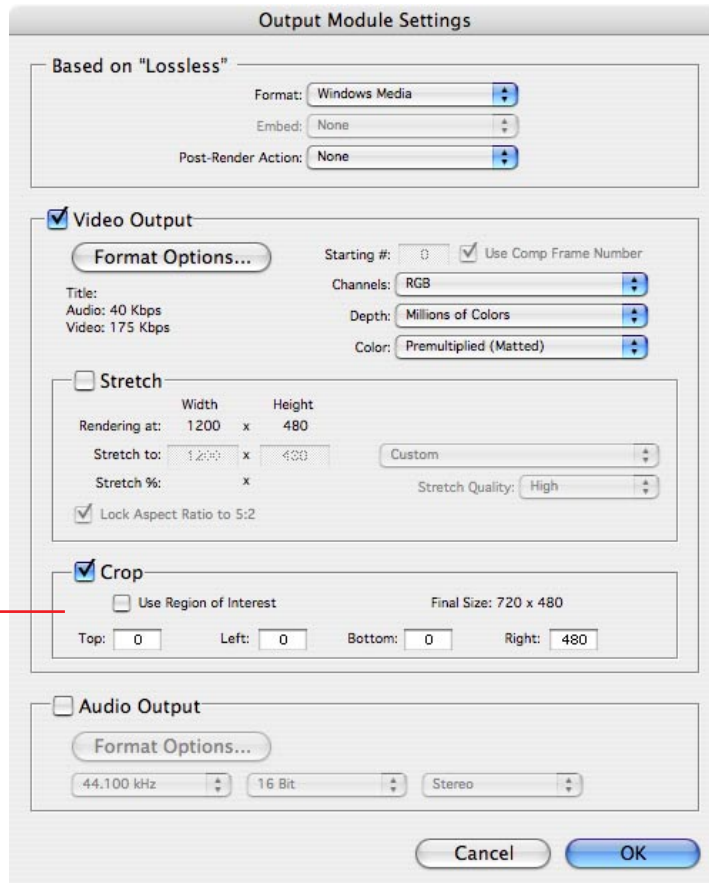
Include the overlap in the split, since the portion of the image in the overlap will have to play on both displays. Likewise, if the displays aren't overlapping you will have to factor in any gap between the edges of the display areas by specifying a corresponding gap when making the split.

Most applications specify cropping relative to the initial image size. This means that the bottom and right edges need to be calculated based on the height and width of the original (large) image.

▲ **IMPORTANT:** When splitting a large movie into smaller pieces like this, avoid using a compressed movie as the source. Doing so would introduce an additional de-compression/re-compression step, resulting in lower quality. Thus, whenever possible, start out with the original material, such as individual, computer-generated, image files.

Save the resulting files into a separate folder. Give each file the name of the WATCHOUT display on which it will appear. Select "Pre-split for Multiple Displays" and link the Video Proxy to the folder (see "Add Proxy" on page 139).

This is how you would split a movie using Adobe After Effects:



Crop the resulting movie as required on each side.

AUDIO

Audio waveform displayed inside cue on timeline.

Audio is used in WATCHOUT in a way that's very similar to moving images. Simply bring the sound file into WATCHOUT and place its icon on the display in the Stage window where you want the sound file to play.



- ◆ **NOTE:** Do not place the sound file's icon so that it straddles multiple displays, unless you specifically want the same sound file to play from multiple display computers.

Audio File Formats

WATCHOUT can generally play any sound file compatible with Windows Media Player. However, the recommended sound file format is WAV. There's usually no reason to use a compressed sound file format, such as MP3, and the additional decompression step adds unnecessary load. The size of uncompressed sound files is usually not an issue with the kind of computers used to play back WATCHOUT presentations.

Multi-Channel Audio

WATCHOUT can play back multi-channel audio using a suitable sound card (see page 18). Multi-channel sound files are saved as WAV files using the "Wave Format Extensible" file format. Some applications capable of saving multi-channel WAV files include Steinberg Nuendo, Digidesign ProTools and Adobe Audition.

Free tools are also available for creating multi-channel WAV files from a number of single-channel WAV files. For example the "CDP Multi-Channel ToolKit", found here:

<http://www.cs.bath.ac.uk/~rwd/mctools.html>

Using Embedded Audio

Some video files contain an audio track in addition to the video. In this case, the sound will play from the same display computer(s) as the video does. If you don't want this, cut the sound track out of the movie and place it in a file of its own, thereby ending up with two media files: one containing the video and one the audio. This allows you to place them separately in WATCHOUT, making the sound play from any computer.

You can use QuickTime Pro or any QuickTime compatible video editing software to split the audio and video tracks of a QuickTime movie into two separate movies. In QuickTime Player, open the composite movie and choose "Show Movie Properties" on the Window menu. Select the sound track and click "Extract". This extracts the sound track into its own movie, which you can then save as an AIFF or WAV file using the Export command on the File menu.

◆ **NOTE:** If your video file is not QuickTime compatible, you may not be able to extract the audio from it. Try opening the file using a video editing application, which may allow you to extract audio into a separate track, which can then be exported.

In WATCHOUT, add both the video and the sound as separate cues. You can now position them independently in the Stage window, allowing the sound track to play through any display computer.

LIVE VIDEO

Live video can be integrated into your presentation. This is particularly useful in speaker support applications, since it allows you to bring an image of the speaker onto the screen. It can also be used to play video from DVD or other external video playback devices, or to use video originating from satellite links or video conference feeds.

Video is brought into WATCHOUT by connecting the video source directly to each display computer that will show the live video. This minimizes the delay in the video signal – important for speaker support applications – while maximizing the quality by avoiding compressing the video signal. See “Live Video Input” on page 224 for more details.

From a production viewpoint, you can use the live video image like any other still image or video played from disk. Simply add the live video object to the Media window and drag it onto the Stage or Timeline from there. See “Add Live Video” on page 145 for more details.

COMPUTER SCREEN

Just like you can display a live video feed in your presentation, you can also incorporate a live image of what appears on a computer's screen. This can be used to show Excel graphics, Powerpoint slides, a Web browser, or similar software applications, as part of your presentation.

The image displayed on the source computer's screen is sent continuously via the network to the WATCHOUT display computers, where WATCHOUT composites it with other media. For example, you can put a plain Powerpoint presentation on top of a large, high-resolution background, thereby enhancing it with all the high-quality presentation capabilities of WATCHOUT.

The computer to supply the image must have VNC server software installed and configured. See “VNC Server Software” on page 20 for more details.

From a production point of view, you use the live computer image just like any other image. Simply add a Computer Screen object to the Media window and drag it onto the Stage or Timeline from there. See “Add Computer Screen” on page 143 for more details.

Using an RGB Capture Card



An RGB capture card.

Although the VNC-based solution discussed above provides excellent image quality at virtually no additional cost, it does require a fast computer for running the VNC server software. Even so, it may not provide full frame rate, and may hamper the performance of the computer somewhat, since it has to handle both the VNC server and the application being displayed (for example, Powerpoint).

As an alternative, you could use an RGB or DVI capture card to bring the computer into WATCHOUT. This solution is essentially identical to the “Live Video” input, described above. However, it requires a different capture card that can be connected to the source computer instead of a video camera.

An example of an RGB capture card is the Datapath VisionRGB:

<http://www.datapath.co.uk/products/video-capture-cards>

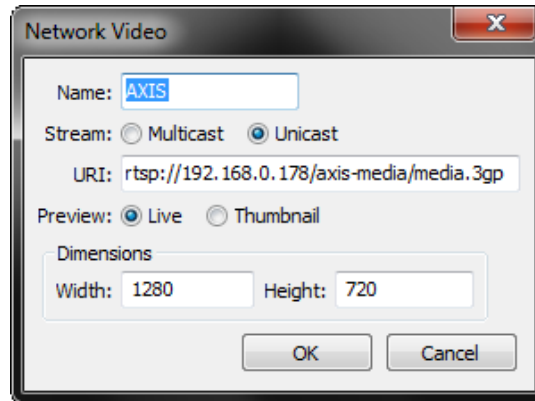
Some computers have an HDMI output, or can be used with a DVI-to-HDMI adaptor cable, in which case you may be able to use an HDMI capture card for computer display purposes (see “Live Video Input” on page 224).

NETWORK VIDEO

This media type is similar to Live Video, except that video is received via the network rather than using a capture card. It can be used with network-enabled video cameras and other devices, applications and services capable of sending video over the network. WATCHOUT supports standard streaming protocols such as RTP and RTSP and video encoding formats such as H.264 or MPEG-2.

The advantage of this media type is that it requires no additional hardware installed in the computer and that it adds new kinds of video sources. A possible disadvantage is the noticeable delay incurred by the network stream processing, making it unsuitable for on-camera speaker display (IMAG), or other applications calling for low latency.

Assuming that you have such a network streaming source available, it can now be incorporated into your presentation by choosing “Add Network Video” on the Media menu. Specify a name for the source, such as the name of a network-attached camera.



Stream Choose whether the data is sent as a multicast or unicast stream. In general, unicast is preferred. Use multicast only if the video stream will be shown by multiple display computers simultaneously. This setting doesn't apply to RTP streams.

URI Enter the Uniform Resource Identifier of the stream's source. The details here vary with the camera or application sending the stream, so you need to consult the device's documentation. As an example, an AXIS network camera used the following URI (where the group of digits is the IP address assigned to the camera):

```
rtsp://192.168.0.178/axis-media/media.amp
```

Preview Select "Live" to see the network video in the Stage window. Generally, use this setting only for initial testing purposes, or when using a multicast stream (see above). For final playback, you're advised to use the "Thumbnail" preview mode.

Dimensions Enter the width and height of the video stream's image, as dictated by the originating device. In the example above, this is the native resolution of the video camera.

DYNAMIC IMAGES

The WATCHOUT Dynamic Image Server allows you to incorporate dynamic data into your presentation, such as:

- Still images that can be updated live by simply dropping a new image into a folder.
- Graphs obtained from databases or other sources.
- Up-to-the-minute news, available from online providers such as CNN.
- Live stock quotes.

To use dynamic content in your presentation:

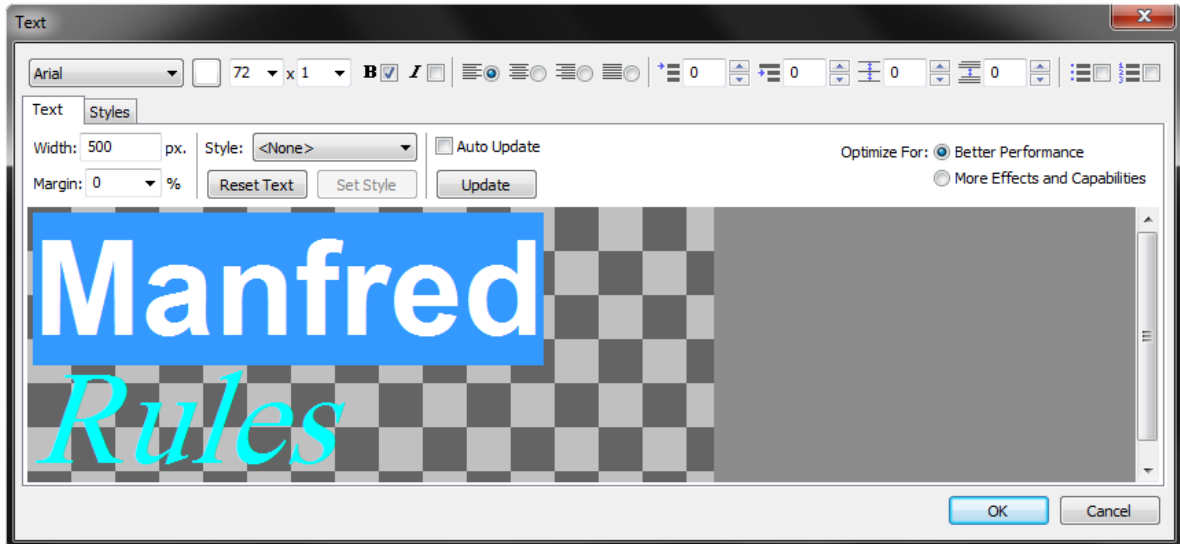
- Make sure the WATCHOUT Dynamic Image Server is running on a computer accessible from your display computers via the network.

- Provide content for the image server in the form of still images or Flash (SWF) files.
- Choose “Add Dynamic Image” on the Media menu to add the corresponding media item to your presentation (see page 148).
- Drag the media item onto the Stage or Timeline to make it appear on screen.

Please refer to “Dynamic Images” on page 217 for more details on how to use this feature.

TEXT

This media type makes it easy to add headings and other texts to your WATCHOUT show without having to use an external program, such as Adobe Photoshop. To add a text to your presentation, choose “Add Text” on the Media menu, enter your text in the checkerboard area and click OK.



To display the resulting text, drag it onto a timeline and position it on stage. The text is shown on a transparent background and is used like a still image. As the text is rendered on the production computer, you don't need to have the fonts installed on your display computers. To change the text, double-click it in the Media window or Alt-double-click the cue.

Width

Specifies the width of the resulting text image, in pixels. The height will be determined automatically by the amount and format of the text.

Font menu

Choose any font installed on your production computer and apply it to the selected text. Note that you must select some text before you can apply a new font. The same goes for most other settings, as they apply on a per-character basis.

Text Color

The color swatch next to the Font menu specifies the color of the text. Again, first select some text then click the button to choose a color.

Font Size and Scale Factor



This menu, in conjunction with the scale factor, determines the size of the text as displayed in your presentation. For small to medium sized text, keep the scale factor set to 1 and adjust the font size. For very large text, use the scale factor to scale the rendered text while keeping the edited text at a manageable size. The scale factor also governs other dimensions, such as the size of any drop shadow, but does not apply to the Width setting.

Bold and Italics

These checkboxes apply the corresponding styles to the selected text.

Text Alignment



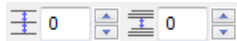
The alignment radio buttons align paragraphs to the left, center, right or adjusted on both sides. Although adjusted text isn't shown as such in the dialog box, the rendered text will be adjusted.

Text Indentation



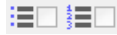
The Indent and Hanging Indent settings indent the selected text by the specified amount. Note that these settings apply to entire paragraphs.

Leading and Paragraph Spacing



These fields control the spacing of lines and paragraphs in the selected text. Use negative numbers to tighten the spacing.

Bullets and Numbering



These checkboxes display a bullet or a paragraph count in front of each selected paragraph. Use the Hanging Indent setting to control the distance between this embellishment and the text itself.

Margin

Adds additional spacing on both sides of the text, as a percentage of the font size. This may be required to account for certain italicized fonts.

Style

Chooses a common text style, as defined under the Style tab (see page 55).

Reset Text

Resets the text, removing any local overrides, so it matches the style selected on the Style menu.

Set Style

Updates the style selected on the Style menu to match the currently selected text. Doing so affects all texts using this style.

Update and Auto Update

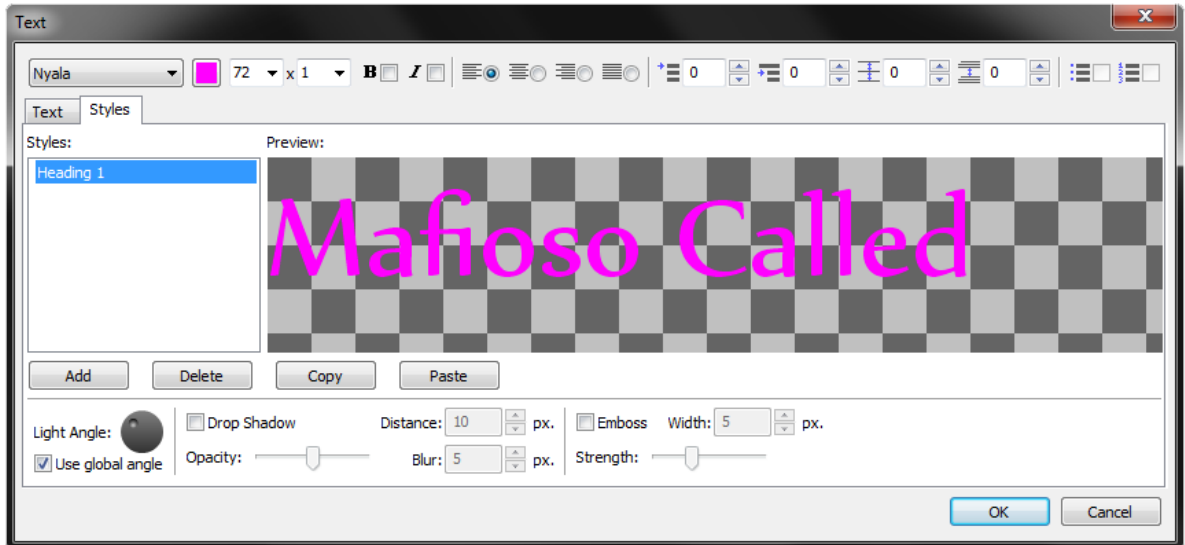
Click “Update” to see the result of your changes in the Stage window (assuming the text being edited is currently displayed). If you select the “Auto Update” checkbox, the stage will automatically update whenever you make changes. This may be time-consuming when rendering large texts - especially when also applying effects.

Optimize For...

This setting serves the same purpose as for still images, and has the same restrictions (see “Optimize For...” on page 36).

Style

You may define text settings that can subsequently be applied across several Text media items, thus maintaining a consistent style throughout your presentation. To define a style, click the Styles tab in any Text media item.



A non-editable preview text is displayed in the checkerboard area of the window. If you have typed anything into the Text media item, that text will be used for the preview. Otherwise, a default text sample is shown.

Change any of the settings (Font, Size, Color, etc) using the controls along the top of the window. The preview area shows the result. Style settings apply to the entire text, so you don't need to select anything before changing settings.

Add/Delete Style

Click Add to create a new, named style based on the current settings, then enter a style name. To delete a style, first select it in the list, then click Delete.

Text Effects

The controls along the bottom of the window allow you to add a drop shadow and emboss effect to the rendered text. Your settings here are reflected in the preview area of the Styles tab, but do not appear in the main editing area of the Text tab.

A text style with Emboss and Drop Shadow effects applied.



Mafioso Called

◆ **NOTE:** Applying a drop shadow effect renders the image slightly wider than the specified Width setting in order to accommodate the shadow without causing the text to re-flow.

Light Angle

Controls the perceived angle of light expressed by the emboss and drop shadow effects. Setting the light angle to be from the top left causes the drop shadow to appear below and to the right of the text. Select “Use global angle” to use a common angle across all styles with this option selected, or uncheck this checkbox to set the angle independently for the current style.

Applying a Style

Once a style has been defined in this way, you can apply it using the Style menu on the Text tab. Note that local overrides applied to the text take precedence over style settings. Click the “Reset Text” button to remove all local overrides, setting all the text according to its style.

Transferring Styles Between Shows

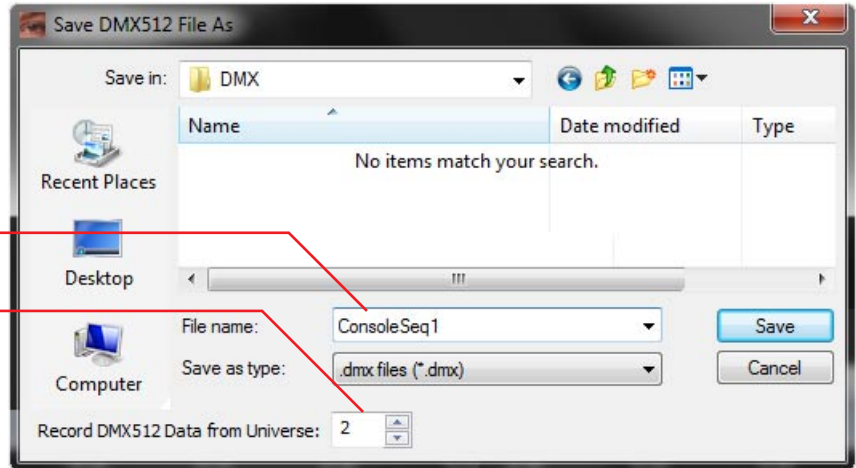
Use the Copy button to copy selected styles to the clipboard. You can then paste those styles into another show to establish the same set of styles.

DMX-512 RECORDING

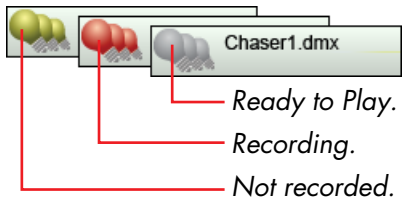
WATCHOUT can control individual lighting channels directly (see “DMX-512 Output” on page 205). However, when using numerous lighting channels, or moving lights, a dedicated lighting console is generally required. By recording the data from the console into WATCHOUT, you can then simplify such systems by removing the console and use WATCHOUT to play back the lighting control as it was recorded. Assuming that you have a lighting console connected to your network using the Artnet protocol, you can record its programming by choosing “Add DMX512 Recording” on the Media menu.

Specify a file for storing the recorded DMX512 data. Save this file in/under the folder containing the current show file.

Choose the Artnet Universe number used by the lighting console. Only data sent on this universe will be recorded.



- ◆ **NOTE:** If your lighting console doesn't support Artnet directly, this requires a DMX512-to-Artnet adapter. See page 201 for more details.

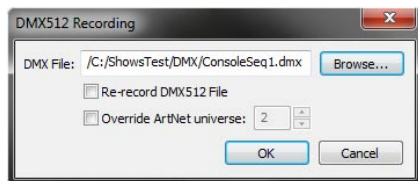


- Drag this new item from the Media window onto a timeline. Note that the symbol on the cue is displayed in yellow, indicating that it is ready to be recorded. Place this cue where you want the recording to start, and extend it to cover the duration of the recording.
- Run the timeline along with the lighting console. You may simply start WATCHOUT and cue the console manually. Alternatively, use timecode to synchronize them.
- As the timeline reaches the cue, recording commences, as indicated by the lamp symbol on the cue turning red. Allow the timeline to run for the entire duration of the cue.
- Once recording is complete, the lamp symbol on the cue becomes gray.
- Disconnect the lighting console from the network, or switch it off.

Play the WATCHOUT timeline again. The recorded DMX512 data will now be played back by the cue. An Artnet-to-DMX512 adapter is required unless your fixtures/dimmers accept Artnet directly.

You can use the Fade tween track of the cue to modulate the intensity of the recorded channels, if desired.

- ◆ **NOTE:** Do not use the Fade tween track if any recorded channels use 16 bit precision – often used by moving lights and similar devices.



If you make a mistake during the recording, or simply want to do another take, you can reset the recording to its initial state by double-clicking it in the Media window and selecting the "Re-record DMX512 File" checkbox. This dialog box also allows you to play the recording back using a different Artnet universe than the one recorded.

4 PRODUCTION

This chapter goes through the steps required to produce a presentation using WATCHOUT. It assumes that you have already produced the source media assets, as described in the previous chapter.

STAGE

The Stage window allows you to arrange the display areas and provides a preview of your presentation. Portions of images that appear inside a display will be shown by that physical display. By arranging displays side by side or vertically, you can make images span multiple displays.

Adding and Removing Displays

To add a display to the Stage window, choose “Add Display” on the Stage menu. This menu item provides a choice of standard display sizes. Once a display has been added, set its IP address and other settings through its Specifications dialog box (see “Display Specifications” on page 158).

To remove a display, select the display by clicking it with the mouse so it shows a bold outline, then choose Clear on the Edit menu.

- ◆ **NOTE:** If “Online” is selected on the Stage menu, you can not add or manipulate any displays.

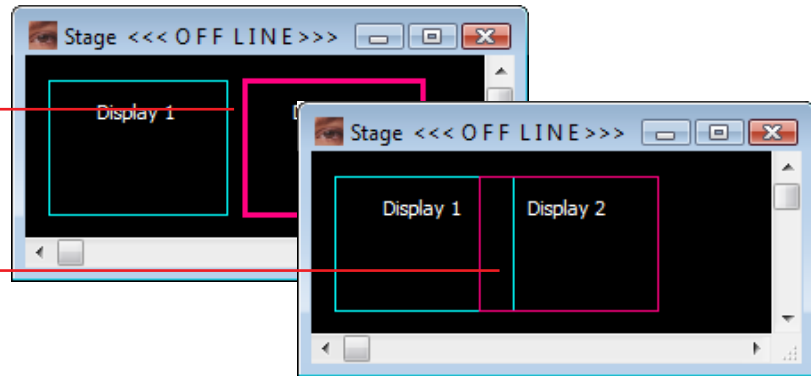
Arranging Displays

Displays may overlap each other. When they do, images that span multiple displays will be automatically blended at the edges. Alternatively, displays can be positioned edge-to-edge, or with a small gap between them, for a videowall look. By positioning the displays in the Stage window according to the actual

arrangement and separation of the monitors or image areas, images that span multiple display areas will line up properly.

Displays deliberately set apart to account for the frame on LCD or plasma screens.

Overlapping displays using projectors.



To arrange the displays, simply drag them to their desired positions using the mouse. Alternatively, you can position them numerically by selecting a display and choosing Specifications on the Edit menu. Type in the desired position, in pixels, relative to the upper left corner of the Stage (see "Display Specifications" on page 158).

- ◆ **NOTES:** The Stage window must be selected in order to manipulate the displays. To select the Stage window, click its title bar. You can not select the Stage window by clicking inside the window, as this is used to select and move images when the window is not active. If the "Online" item on the Stage menu is activated, you can not select, change or delete displays.

Complex Display Arrangements

If you have complex display arrangements, such as multiple display areas or different sets of display showing the same part of the stage, use Stage Tiers to keep them apart. See “Tier” on page 133.

MEDIA

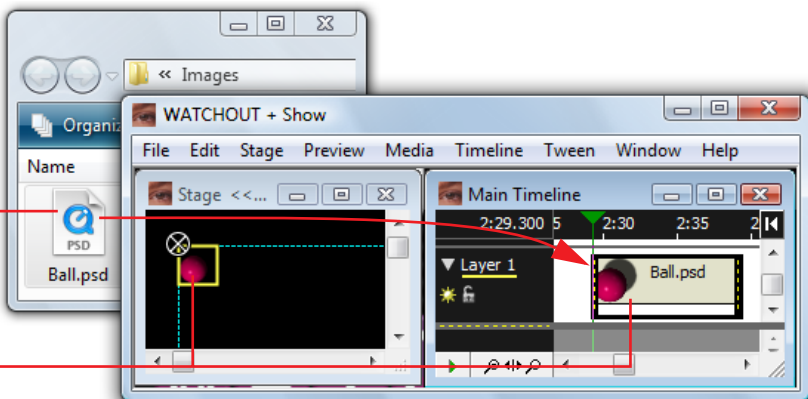
The term “media” refers to moving and still images as well as sound. These media types are treated in very similar ways, with only minor differences where appropriate. See Chapter 3 “Media” for more details.

Adding Media

To add media to your presentation, choose “Add Media File...” on the Media menu, or simply drag the media file to the desired position in the Timeline or Stage window. Media can be dragged from the folder where it is stored, or you can drag media items from the WATCHOUT Media window.

Media file dragged into timeline...

...appears as a cue in the timeline as well as being displayed in the Stage window.



- ▲ **IMPORTANT:** Whenever possible, store media files in a sub-folder of the folder containing your WATCHOUT show file. This allows WATCHOUT to use relative file paths, making it easier to move the show elsewhere.

Editing a Media File

To open a media file in its designated editing application, double-click its thumbnail in the Media window, or Alt-double-click an associated cue in the Timeline. To track down the media item associated with a cue, double-click the cue and click “Locate Media”.

Refreshing Media Information

After making changes to media files, choose “Refresh” on the Media menu to load those changes into WATCHOUT. Choose “Update” on the Stage menu to update the display computers with these changes as well.

Purging Unused Media

After working with a show for a while, you may have added many media items that are not included in the final version. These media references persist in the Media window, regardless of whether any cues actually use them. To remove such unused media from the Media window, choose “Select Unused” on the Media menu and then “Clear” on the Edit menu (see page 150).

- ◆ **NOTE:** This operation will only remove unused entries from the Media window. It will not remove any files from your hard disk.

Changing the File Association of a Media List Item

Sometimes, when editing a media file, you may want to keep both the old and the new version of the file around, in case you change your mind. In this case, you end up with two or more similar media files with different names. To change the link between an item in the Media window and a file, double-click

the file name in the Media window and choose another file. This will affect all cues that use this media list item.

◆ **NOTE:** You can only relink it to another file of the same kind. You can not change from an image file to a sound file, for example.

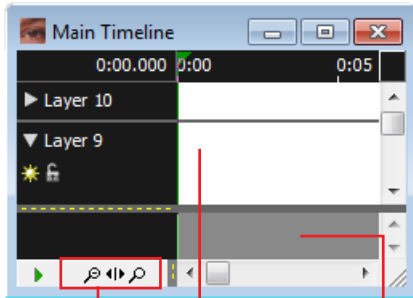
Using Media Proxies

Occasionally, you may want to use media in your presentation but can not import it simply by dragging. This would happen in the following cases:

- The media file isn't recognized by the production computer, but you know it can be handled by the display computers. Perhaps the media requires a specialized codec in the playback computer which is not available in the production computer.
- The media file is a large movie that has been pre-split into multiple files (see "Pre-splitting Large Movies" on page 42).
- You want to incorporate stereoscopic video into your presentation, using separate left-eye/right-eye video files.
- The media may not yet be available, or may for other reasons need to be provided or replaced manually on the display computer at a later time.

Use a media proxy to accommodate any of these cases. Once a media proxy has been added to the media list, it can be used on the timeline just like other media items. See "Add Proxy" on page 139 for more details.

TIMELINE



Zoom button, cue area and tween pane.

The Main Timeline window shows the temporal relation of cues and effects, as well as the layering of overlapping media. Cues control the display and presentation of media, and use tween tracks to control various aspects of the media.

The amount of time displayed in the timeline window can be controlled using the button in the lower left corner. Zoom in to increase the precision by which you can position cues and set their duration, or zoom out to get a better overview. The center part of the button allows you to change the scale gradually. Changing the time scale has no effect on the behavior of the timeline or its cues. See “Main Timeline Window” on page 101 for more details

Tween tracks are used to animate properties of media cues, such as position and opacity, over time. The tween tracks of the currently selected cue appear at the bottom of the timeline window, called the tween pane. See “Tween Tracks” on page 179 for more details.

- ◆ **HINT:** When tween tracks are visible, you can toggle between the cue and tween panes using the Tab key.

Adding Media Cues

To add a media cue to the timeline, drag the media onto the timeline and drop it at the desired layer and time position, as shown on page 61. Cues can be dragged along the timeline to change their timing relationship. Select multiple cues by Shift-clicking the cues, or by clicking and dragging diagonally, starting from a point where there are no cues.

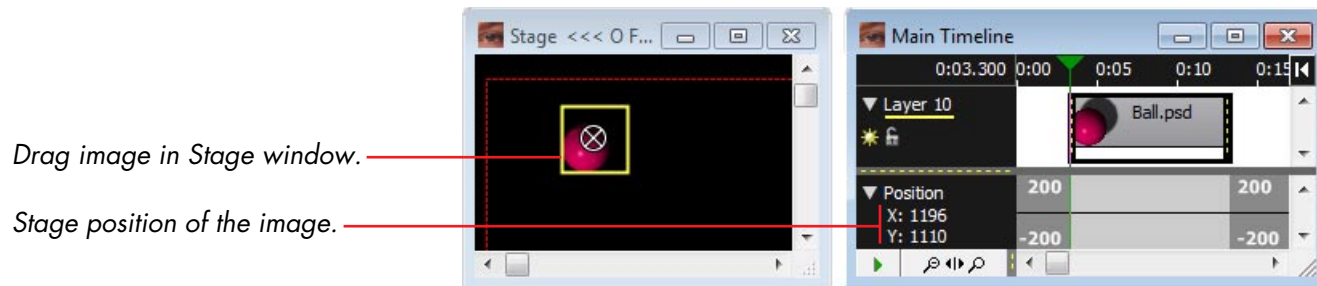
- ◆ **IMPORTANT:** Do not overlap cues on the same layer. Doing so may cause images to display incorrectly. When you want images to overlap in time, always put their cues on separate layers. Overlapping cues are indicated by a red warning line above the cues.

Positioning Media on Stage

When media is added to the timeline, it also appears in the upper left corner of the top/left display in the Stage window. To make the image appear elsewhere, drag the image's preview in the Stage window, or double-click the cue to set the position numerically.

- ◆ **HINT:** For precise positioning of selected images, hold down the Control key and press the Arrow keys to nudge the image one pixel at a time. Add the Shift key to move ten pixels at a time.

When using a Position tween track to make images move, the current position of the image is shown numerically in the tween track's header area. Click the triangle to reveal the numeric position.



If the image isn't visible in the Stage window, it may be obscured by a larger image in front. You can hide the large image by clicking the yellow sun icon in its layer title area (see "Disabling Layer Preview" on page 103).

- ▲ **IMPORTANT:** Make sure that the timeline window is selected before attempting to drag the image in the Stage window.

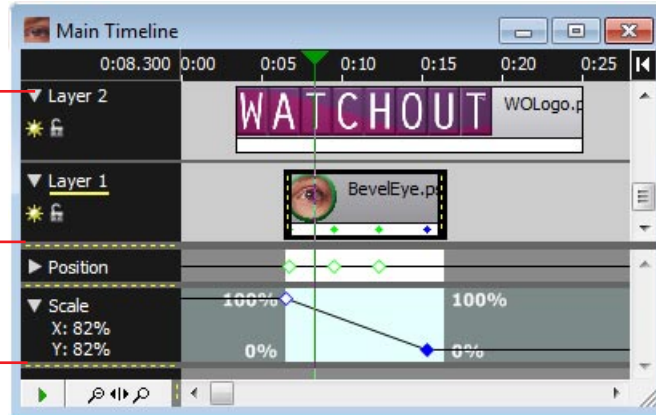
Layering Media

The horizontal layers in the timeline window allow you to control the stacking order of images in the Stage window. To move an image towards the front, drag its cue up to a layer with a higher number. To move the cue without changing its time position, press the Shift key while dragging. Use the commands on the Timeline menu to add or remove layers.

Click the triangle to expand the layer to see the entire cue.

Drag to move the partition between the cue pane and the tween pane.

Drag to resize the tween track.



Changing the Media Association of a Cue

You can change the media association of a cue by dragging new media onto the cue. This changes the media association of that cue only, while retaining all other relevant properties.

- ◆ **HINT:** This can be used to duplicate a complex move or other effect using different media. First make a copy of the cue to re-use, then replace its media association as described above.

Changing a Cue's Duration

When adding moving images or sound, the duration of the cue is set to the duration of the file. When adding still images to the timeline, the duration is set to a default value. Change the duration by selecting the cue and dragging the vertical bar located at either end of the cue.

- ◆ **NOTE:** If the cue has any tween tracks, their tween points will, by default, remain stationary in relation to the timeline. To make the tween tracks contract or expand with the cue, press the Alt key while dragging the bar.

A video or sound file can be cut short by shortening the cue. Increasing the cue's duration beyond the actual length of the media will make a video stop at its last frame. See also "Looping" on page 175 for more options.

- ◆ **NOTE:** Dragging the start of a moving image cue changes the starting time along the timeline only. It does not affect the in-time of the movie. To change the in-time, double click the cue and change its "In-Time" value.

Aligning Cues in Time

Use the Snap command on the Edit menu to align objects in time. Cues snap to adjacent cues. Tween points snap to other tween points in the same cue. Cues and tween points also snap to the current time position.

- ◆ **HINT:** To line up a number of objects in time, first position the current time indicator then de-select "Click Jumps to Time" on the Timeline menu (see page 151). You can now use the current time indicator as a ruler for aligning cues and tween points.

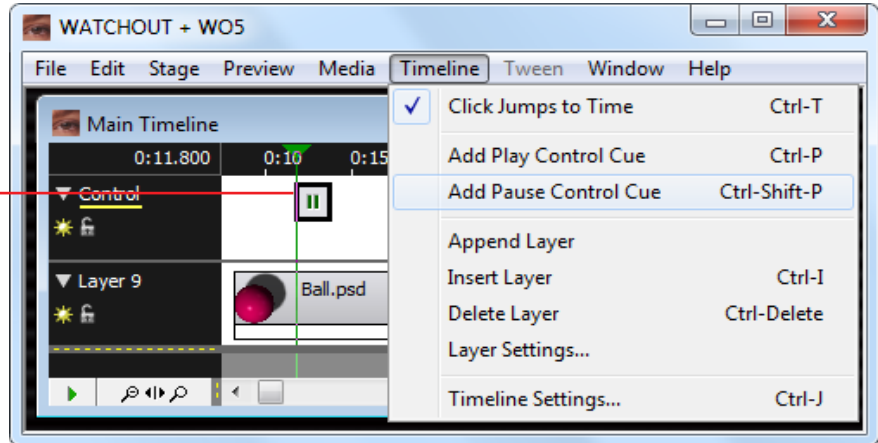
Cue Specifications

In addition to direct manipulation of cues in the Timeline window, you can also set most parameters numerically using the Cue Specifications dialog box. Select the cue and choose Specifications on the Edit menu, or simply double-click the cue. See "Cue Specifications" on page 170 for more details.

Using Control Cues

In addition to media cues, you can also add control cues to the timeline by choosing “Add Control Cue” on the Timeline menu. When reached during playback, a Control cue set to Pause causes the timeline to halt. This is useful when cueing a presentation manually.

Adding a Control cue to the current layer of the timeline.



- ◆ **NOTE:** If you want a Control cue to coincide with the start of another cue, then put the Control cue on a separate layer. If you don't do this, the Control cue may be hidden behind the other cue. You may want to dedicate a layer for control cues only.

Control cues provide many other functions for managing the flow of your presentation. This is often useful for speaker support or other situations where live elements or other forms of interaction are involved. For more details, see “Looping and Jumping” on page 81 and “Control Cue” on page 193.

TWEEN TRACKS

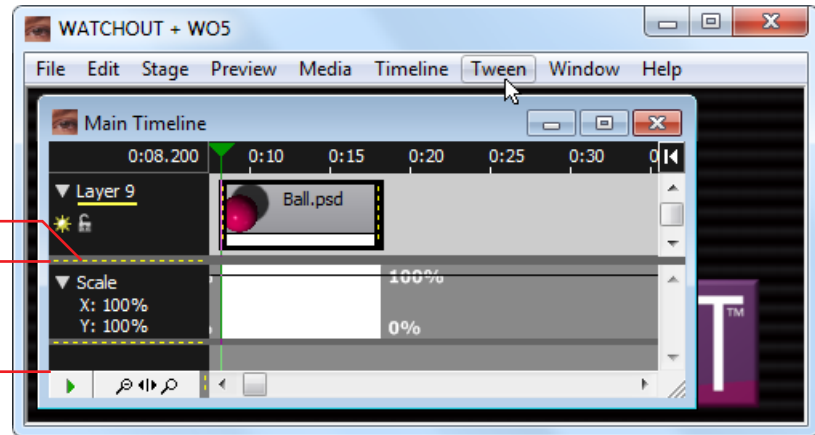
Tween tracks control the behavior of media dynamically throughout the cue. For instance, you can use an Opacity tween track to make an image fade in and out, or a Volume tween track to reduce the volume of a sound or movie file.

Adding and Removing a Tween Track

To add a tween track, first select the cue then chose the desired type of tween track on the Tween menu. Likewise, remove a tween track by de-selecting it on the Tween menu.

Drag this partition to enlarge the tween pane.

Tween pane.



The tween tracks of the selected cue appear in the tween pane at the bottom of the Timeline window. Drag the partition to see more tween tracks. Likewise, you can adjust the height of a tween track to see more details.

Adding Points

Adding a tween track to a cue generally has no effect in itself unless you use it to change the value governed by the tween track. This is done by adding and adjusting tween points along the tween track. These tween points provide values acting as key-frames along the cue's tween track.

To add a tween point, click anywhere on the curve in the tween track where there isn't already a tween point. To edit the value of a tween point, drag it using the mouse. For better precision, first enlarge the tween track by dragging the partition between the tween tracks. Select multiple tween points to move them together. Press the Shift key while dragging to constrain the movement of the tween points.

◆ **NOTE:** Normally, tween points can't be dragged past their neighbors. To relax this constraint, press the Alt key while dragging.

Removing, Cutting and Pasting Tween Points

Select multiple tween points by Shift-clicking, or by dragging from a position outside all tween points. The selected tween points can then be edited using commands on the Edit menu. This makes it easy to move complex tween tracks from one cue to another, by simply copying and pasting the tween points.

Stretching Tween Tracks

When changing the length of a cue by dragging its end, you have the option of either leaving its tween points at their current time positions or making them expand and contract with the cue, as if the cue was a rubber band. Press the Alt key during the drag to get the rubber band effect.

Corners and Smooth Tween Points

For simple values, there are two kinds of tween points: corners and smooth points.

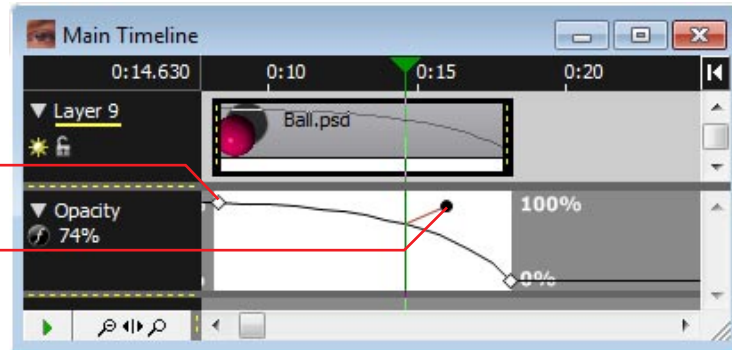
◆ **NOTE:** Position tween tracks use a different method to create smooth motion, as described on page 75.

A corner is represented by a diamond-shaped tween point. A sequence of corner points causes the value to change gradually, and linearly, between the points. Often, this is the desired behavior, particularly when controlling opacity or volume.

A smooth point is represented by a round tween point, and is added by Control-clicking. It acts as a pin attached to the curve by a rubber band. When you move the smooth point away from the curve, the rubber band stretches, causing the curve to bend.

Add a corner point by clicking the curve.

Add a smooth tween point by Control-clicking.



Editing Tween Points Numerically

To edit a tween point numerically, double-click to open its dialog box. See the description of each type of tween track under “Tween Tracks” on page 179 for more details.

External Control of Tween Tracks

Tween tracks can also be controlled by external inputs. Those are indicated by a round formula button under the title of the tween track. See “Controlling Tween Tracks” on page 202 for more details.

OPACITY

Use an opacity tween track to fade objects in and out, or to make objects semi-transparent. An opacity tween track can be applied to all images. See “Opacity” on page 180 for more details.

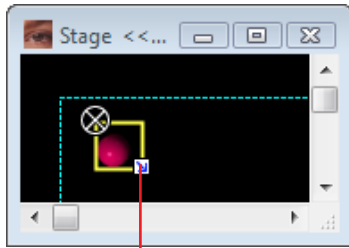
To cross-fade from one image to another, you only need to fade the opacity of the image at the front. You don’t need to do anything to the image behind it, as this will be obscured by the front image unless the front image contains transparent or semi-transparent areas. In this case, you may also need to fade out the image below to perform a smooth cross-fade.

VOLUME

Use a volume tween track to control the volume of sounds and movies containing embedded audio. You can play several sounds simultaneously, and cross fade between them by fading up one while fading out the other. See “Volume” on page 180 for more details.

- ◆ **NOTE:** When no volume tween track is being applied, the volume is set to the value specified in the Preferences dialog box (see “Default Audio Volume” on page 121).

SCALE



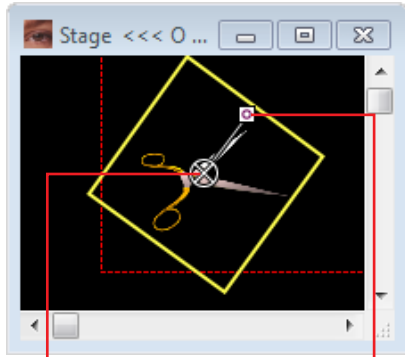
Scaling handle.

Use a scale tween track to change the size of images. This is particularly useful for playing video material at full screen size, but can also be used as an effect for both still and moving images. In addition to dragging the tween point, you can also adjust the scale by dragging the scaling handle. This appears in the lower right corner of the image after adding a Scale tween track. Press Shift while dragging to maintain the aspect ratio of the image.

- ◆ **HINT:** By using negative scale values, you can flip or mirror the image. See “Scale” on page 181 for more details.

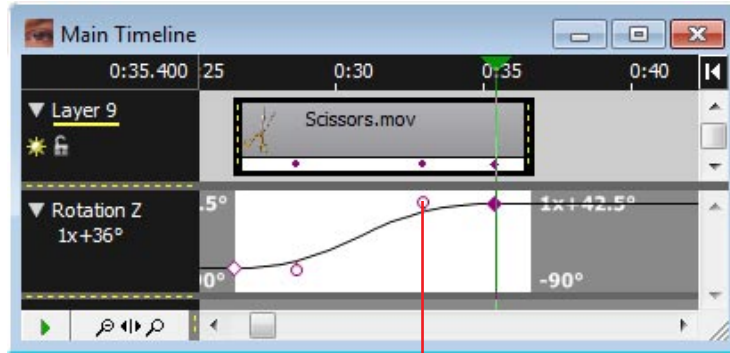
ROTATION Z

Use a rotation tween track to control the angle of images, or to make an image rotate over time. Rotate the image by dragging the rotation handle or the rotation tween point. You can rotate by degrees as well as by number of revolutions (or a combination of the two). See “Rotation Z” on page 184.



Anchor point.

Rotate by dragging the rotation handle...



...or by dragging a rotation tween point.

- ◆ **NOTE:** The rotation handle may be hidden underneath the anchor point. If so, either move the anchor point as described below, or drag the tween point to adjust the angle.

ROTATION X AND Y

These tween tracks are similar to Rotation Z, but allow you to rotate images around the X (horizontal) or Y (vertical) axes, providing a perspective view of the image.

- ◆ **NOTE:** The amount of perspective being applied is controlled by the Perspective slider in the 3D tab of the Preferences dialog box.

ANCHOR POINT

Images scale and rotate around the anchor point. The anchor point is indicated by a white crosshair in the Stage window (see illustration above). To change the anchor point, double-click the cue and change the values under “Anchor Position within Image”. See “Cue Specifications” on page 170 and “Anchor Position” on page 172 for more details.

POSITION

Use the position tween track to position an image on stage, or to make an image move along a path. Select one or several images on stage, then drag them in the Stage window. Alternatively, press an arrow key while holding down the Control key to move the selected images one pixel at a time. Press the Shift key as well to move in 10 pixel increments.

- ◆ **HINT:** The initial stage position can also be changed numerically inside the cue's dialog box. If you change this for a cue that has a motion path, the entire motion path moves. Use the Move command on the Edit menu to move multiple images together after selecting their cues (see page 127).

Editing Position Points

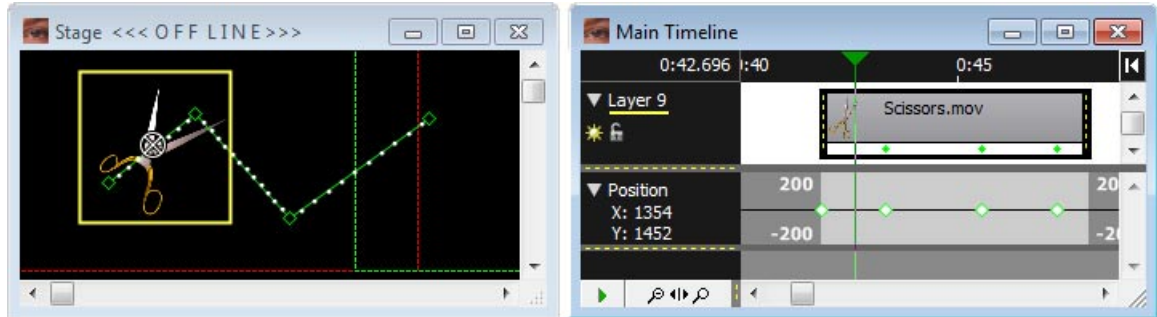
To make an image arrive at a specific stage location at a particular time, first add a tween point at the desired time, then position the image in the Stage window as described above.

- ◆ **NOTE:** To change the stage position of an already existing tween point, make sure the timeline is positioned at that point before moving the image. If not, a new tween point will be added instead. To ensure that the timeline is positioned at a tween point, first de-select all tween points, then click the tween point with "Click Jumps to Time" selected on the Timeline menu.

Alternatively, drag one of the handles attached to the motion path in the Stage window, or double-click the handle or tween point to type in the desired stage position of the image.

Moving Along a Path

To make the image move along a path, first add a tween point by clicking at the desired time position along the tween track, then drag the image to the desired position in the Stage window. A line indicates the image's motion path in the Stage window.

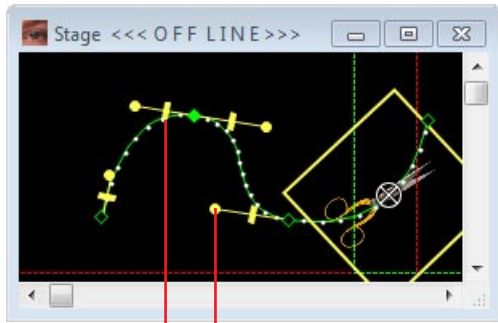


Controlling the Speed of Motion

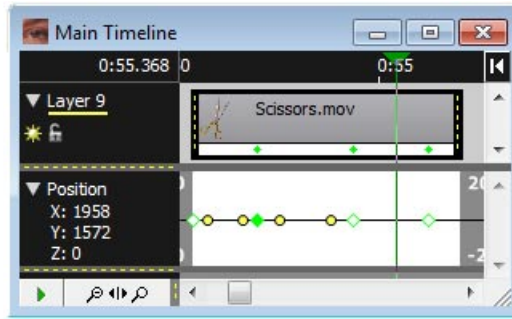
Double-click a position tween point to change its incoming or outgoing speed. A value of 1 indicates nominal speed, with smaller values being slower and greater values being faster. The speed is indicated by the white dots along the motion path, with dots spaced farther apart indicating faster motion.

Moving Along a Curved Path

By default, a Position tween point acts as a corner along the motion path. To move smoothly through a point, double-click the point and select Smooth. You can control the incoming and outgoing segment independently. Selecting the Smooth option reveals a yellow direction handle, controlling the path of motion into or out from that point. Close the dialog box and drag the direction handle to create a curve. In the illustration below, smooth points have been set to move the image along an S-shaped curve.



Speed handle. Direction handle.



Dragging the direction handle farther away from the point increases the curvature. Add tween points for better control over the path's shape.

- ◆ **HINT:** To make an image rotate while moving, so that it always points along the motion path, double-click the cue and select "Auto-orient along Motion Path" (see page 178).

3D Motion Paths

Images can also be moved along the Z axis, or using a 3-dimensional motion path. To change the Z position of a position tween point, drag the point vertically in the tween track. Double-click the tween point to set the value numerically. If the image moves away from you (positive Z), it appears smaller according to distance as well as the amount of perspective set by the Perspective slider in the 3D tab of the Preferences dialog box.

3D/STEREOSCOPY

WATCHOUT allows you to produce and present stereoscopic presentations, to be viewed using appropriate display technology and glasses. These are sometimes referred to as 3D presentations, giving a perceived three-dimensional viewing experience. Such presentations can incorporate still images as well as video. They take advantage of the 3D capabilities of WATCHOUT, in many cases creating the stereoscopic effect with no additional production effort, since it can be calculated from the 3D position of media elements.

Still Images and Small Video

When using still images and small video elements, it is generally sufficient to place them at the proper depth (Z position). Hence, to make an object appear closer to the viewer, move it to a negative Z position rather than merely scaling it up to make it look larger. The amount of stereoscopy derived from the Z position is controlled by the “Eye Distance” setting (see “Eye Distance” on page 125).

Large Stereoscopic Video

Large or full-screen videos will not reproduce with a stereoscopic effect by merely changing the Z position. Instead, the entire video needs to be produced as stereoscopic footage, with separate left/right eye video files originating from two cameras or a specialized stereoscopic camera. Use a Video Proxy to incorporate such a video into your presentation (see “Stereoscopic” on page 140). High-resolution stereoscopic stock footage is available from companies such as Artbeats:

<http://www.artbeats.com/s3d>

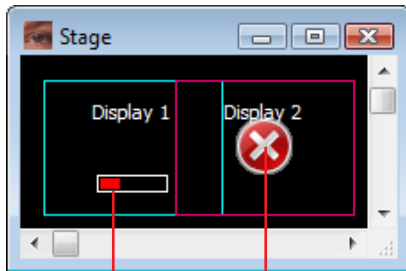
Stereoscopic Projection

You need specialized display or projection technology to show a stereoscopic presentation, combined with stereoscopic glasses worn by all viewers. See “Stereoscopic Presentations” on page 86 for more details.

5 PRESENTATION

This chapter tells you how to take your WATCHOUT presentation from your production computer onto the display computers, and run the presentation. It discusses the various ways in which your presentation can be used and controlled.

CONNECTING TO THE DISPLAY COMPUTERS



Progress bar shown during transfer of files.

Unable to connect to this computer.

After installing and configuring the production and display computers, producing the presentation, and starting the display software on each display computer, you can select "Online" on the Stage menu. This causes the production computer to connect to the display computers and transfer all required information to them, ready for playback. A progress bar indicates the transfer of files to each display computer.

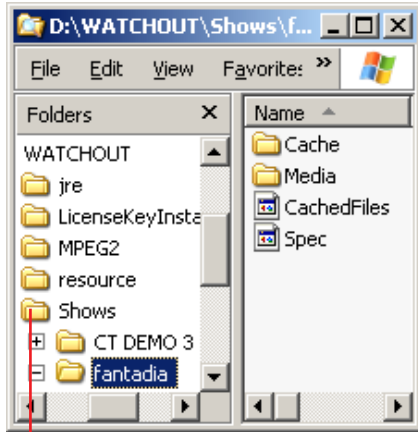
Failure to connect to a display computer is indicated by an error icon in the Stage window. If you get a error icon, quit the WATCHOUT display software on the offending display computer and double-check the network configuration to ensure that it has been set up properly (see "Network" on page 16 and "Computer Settings" on page 22). Also confirm that the IP address of the display computer matches the settings in the Display Specifications dialog box (see "Display Specifications" on page 158).

Any further problems encountered after connecting to the display computers will be reported in the Message window in WATCHOUT and/or on the display computer's screen.

Quitting the Display Software

To quit the display software, press Ctrl-X or Alt-F4 on the display computer.

Downloading Media



The “Shows” folder contains a folder related to each show that has been transferred to the display computer.

Whenever you go online, WATCHOUT will check to make sure that all required media files have been transferred to the display computers. WATCHOUT will only transfer the files actually required on the individual computer. If you modify a media file, WATCHOUT will detect this and transfer the updated file.

While media files are being transferred to a display computer, a progress bar will be shown in that display in the Stage window, as well as on the display computer itself. You may continue working in WATCHOUT while files are being transferred, but you will not be able to further update or access the display until the previous update has completed.

- ◆ **HINT:** You can stop an update in progress by deselecting “Online” on the Stage menu. The transfer will stop once the current file has been transferred.

Note that all media files transferred to the display computer will remain there until removed manually. The media related to a show is stored in a folder with the name of the show. This is located in a “Shows” folder in the same folder as the WATCHOUT display software application.

After using a display computer to run a show, you may want to clean up the Shows folder by putting its contents into the trash and emptying the trash before using that computer to run another show. This stops old shows from occupying hard disk space unnecessarily.

- ◆ **NOTE:** If you for any reason remove the “Cache” folder, then remember to remove the “CachedFiles” file as well. This file is used to keep track of what’s in the “Cache” folder. If you experience problems displaying certain images, you may try removing the “Cache” folder and the “CachedFiles” file. WATCHOUT will re-create this file the next time you open the show.

Updating the Stage

If you make changes to your show while online, transfer them to the display computers using the “Update” command on the Stage menu. This includes adding new media or cues.

RUNNING THE PRESENTATION

Once all media has been transferred to the display computers, the WATCHOUT logo on the display computers will disappear. You are now ready to run your presentation. To run it, click the play button in the lower left corner of the Timeline window, or press the spacebar.

You can jump to any point along the timeline by clicking in the time ruler at the top of the Timeline window (see also “Timeline Settings” on page 152).

Manual Control

For speaker support, or other manually controlled presentations, add Control cues to the timeline. When run, WATCHOUT performs the instructions embedded in the cue – for example, pauses or jumps to another position along the timeline (see “Looping and Jumping” on page 81).

You can also use Control cues to instantly go to any location in your presentation. Give the cue the same name as one of the function keys on your computer’s keyboard (for example, name it “F1”), then press that function key to jump straight to it. See “Add Play / Pause Control Cue” on page 151.

Looping and Jumping

Use a Control cue to loop any segment of the timeline (see “Add Play / Pause Control Cue” on page 151 and “Control Cue” on page 193). By combining this with the QuickFind feature (page 129) and the Standby command (page 134), you can gracefully exit loops or jump to other sections of the presentation.

External Control Options



DMX512
MIDI

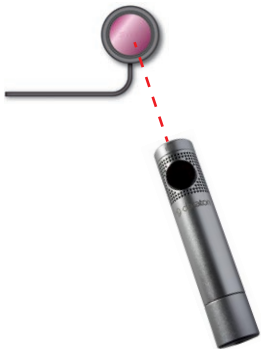
You can use a touch panel, such as an iPhone/iPad, or other external control system to remotely control your WATCHOUT presentation, as well as the presentation environment. Since WATCHOUT uses the ubiquitous TCP/IP protocol, it can communicate with virtually any computer system or device.

◆ **HINT:** Download the free WATCHOUT Remote app for iPhone:

<http://itunes.apple.com/us/app/id426344171>

Furthermore, using the MIDI and DMX-512 input capabilities, WATCHOUT can be controlled using any device that can speak those industry-standard communications languages.

Personalized or Multi-lingual Audio



For museums, visitor centers, and similar places where personalized or multi-lingual audio is desired, you can use WATCHOUT together with Dataton PICKUP. PICKUP plays the audio of the presentation, and acts as a remote control for starting the presentation.

<http://www.dataton.com/pickup/>

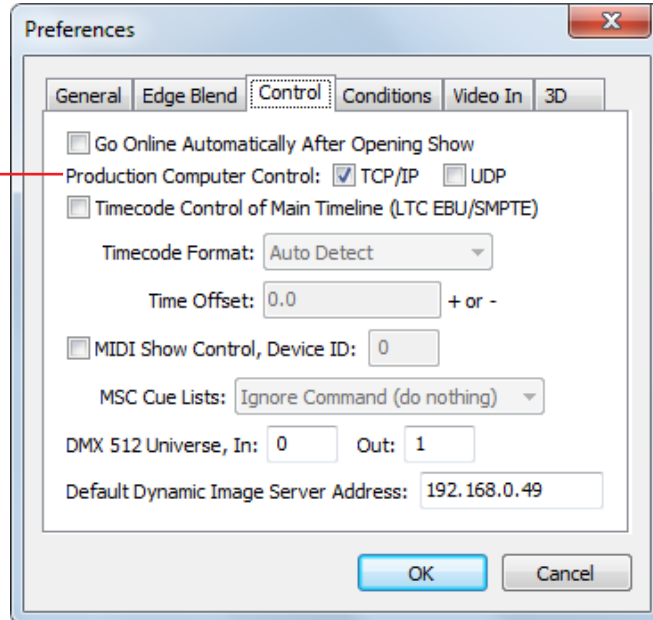
To integrate PICKUP with your WATCHOUT display clusters, use the Dataton NETWORK TRANSPONDER, which connects to your Ethernet network. In addition to acting as an IR transponder for PICKUP it also controls your WATCHOUT presentations. It provides advanced features such as synchronized audio playback. It can also match the language selection between PICKUP and WATCHOUT by means of controlling the conditional layers in WATCHOUT (see “Condition” on page 104).

EXTERNAL CONTROL

For more complex applications, you may want to integrate WATCHOUT with other control systems. This can be accomplished by means of external control of your WATCHOUT system through the network.

To control the production computer, connect the external controller to the network and activate the TCP/IP control port in the Preferences dialog box.

Activates external control through the network port on the production computer.



See page 251 for more details on how to control WATCHOUT from a touch panel or another computer via the network.

Display Cluster Control

Instead of controlling the WATCHOUT production software, as discussed above, you may choose to control a cluster of display computers directly. This removes the need for a production computer during playback. Please see “Display Cluster Protocol” on page 257 for details.

TIMECODE CONTROL

WATCHOUT can accept a standard timecode signal for controlling the main timeline. This timecode synchronization feature uses the LTC format according to the EBU or SMPTE standards. You can control either the production computer or the display cluster.

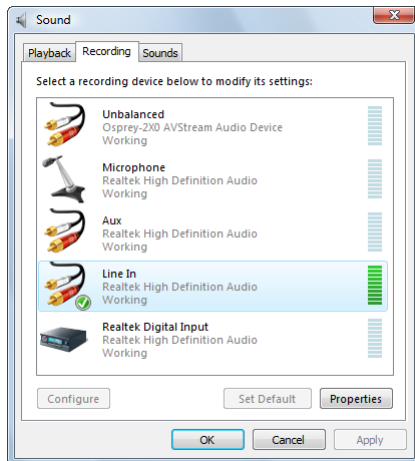
Controlling the Production Computer

To control the production computer, select the “Timecode Control of Main Timeline” checkbox under Preferences, Control (as seen on the previous page). Specify the timecode format and any offset to be applied. Connect the timecode signal to Line In connector of the production computer. Starting the timecode feed should now start the main timeline at the position specified by the timecode.

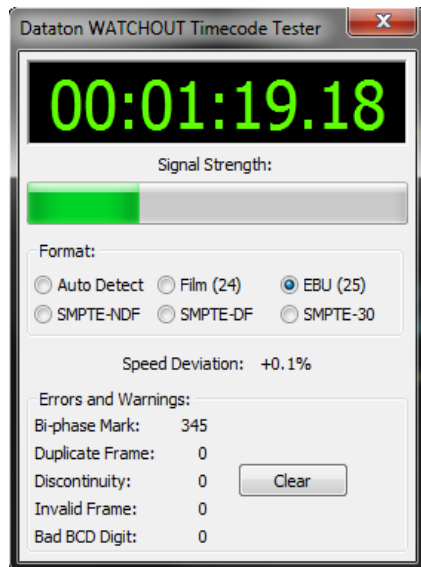
▲ **IMPORTANT:** Make sure that the correct sound input port is selected in the Sound Control Panel shown to the left, and that the input volume is turned up, indicated by the green bar next to the active recording device.

You can use the separate Timecode Tester application (see next page) on the production computer to troubleshoot any timecode issues.

◆ **HINT:** Add a “Timecode Position” item to the Status window to view the current timecode being received. See “Status Window” on page 112.



Controlling the Display Cluster



The WATCHOUT Timecode Reader application, used to troubleshoot timecode problems.

Connect the timecode signal to Line In of the primary display computer and activate timecode synchronization using the timecodeMode command, as described on page 268.

◆ **NOTE:** This method can not be used in conjunction with the WATCHOUT production software. When the production software goes online, it temporarily disables any timecode input to the cluster.

Use the separate WATCHOUT Timecode Tester application on the primary computer in the cluster to verify proper timecode reception, quality and signal level. Connect the timecode signal to the Line In connector. Choose the appropriate input using the Sound Control Panel, as shown on the previous page.

◆ **HINT:** Use the Windows Sound Control Panel to adjust the input level, if required. Note that this setting is system-wide.

Quit the Timecode Tester after using it. Do not leave it running when starting WATCHOUT display software, which contains its own timecode reader.

STEREOSCOPIC PRESENTATIONS

WATCHOUT includes full support for stereoscopic (“3D”) presentations. In terms of production, you can create the stereoscopic effect through proper positioning of images along the Z axis, or by incorporating stereoscopic video into your presentation. See “3D/Stereoscopy” on page 78 for more details.

You must use separate outputs from WATCHOUT for the left and right eye channels. Set the left/right channel assignment in the settings dialog box of each display accordingly. See “Stereoscopic Assignment” on page 166 for more details.

Since the left/right displays must occupy the same position in the Stage window, you must place all left-channel displays on one stage tier and all right-channel displays on another tier. This provides proper edge blending among displays on the same tier. See “Using Stage Tiers for Complex Display Arrangements” on page 98 for more details.

To present a stereoscopic production, you need projectors fitted with the appropriate filters or other suitable stereoscopic technology. Your viewers must wear glasses matching the stereoscopic filter technology used in the projectors. In most cases, passive glasses are recommended. See “Stereoscopic Projection” on page 249 for more details.

6 USING COMPOSITIONS

A composition allows you to group a set of cues together on their own sub-timeline. This can then be used from other timelines similar to how you can play a video. A composition makes it easy to re-use or re-arrange show sections or short snippets. It also makes it easier to apply the same effect to a group of media elements – for instance, to move and scale a set of images together.

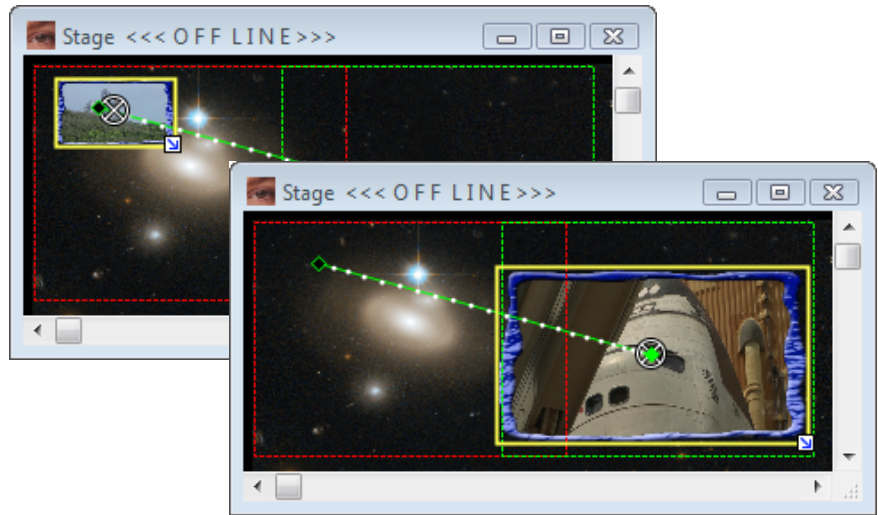
A composition behaves like other media elements, such as still images and video clips. It lives in the Media window, from where you can drag it onto any timeline to use it. You can use a composition any number of times – you can even play multiple instances of a composition at the same time.

Similar to a video clip, a composition has a duration and may contain motion. However, as a composition is created within WATCHOUT, there's no rendering time or other delays involved in changing it. A composition can be looped and/or free running, making it easy to create motion of indefinite duration within WATCHOUT.

A Basic Example

For example, assume you want to add a frame to a video clip, and then make the video clip move across the screen while scaling it up at the same time. Although you could do this by applying the motion and the scaling to the video and the frame image individually, it's often hard to make the two move together in a cohesive way. Instead, you can add both elements to a composition without applying any motion and scaling to the individual elements. Then use the resulting composition from the main timeline, applying the motion and scaling to the composition as a whole.

Moving and scaling a video together with a surrounding still image frame.

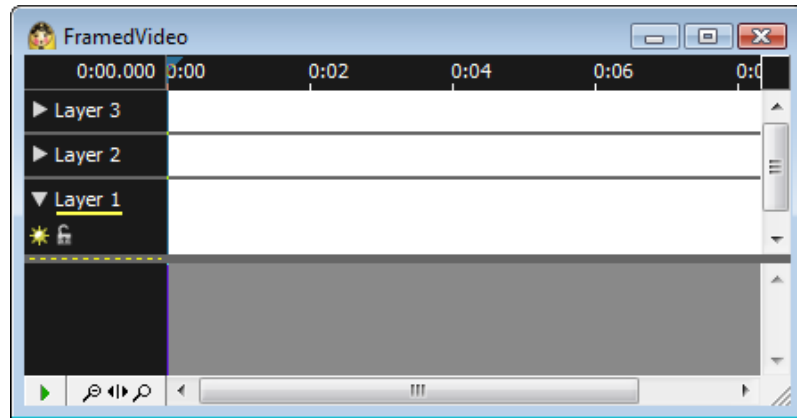


CREATING A COMPOSITION

Start by choosing “Add Composition” on the Media menu. Give the composition a name, and type a suitable size into the “Reference Frame” field. In this case, it is a good idea to make the reference frame just slightly larger than the still image frame around the video. This reference frame will be used later when manipulating the composition as a whole from the main timeline. See “Add Composition” on page 143 for more details.

Open the composition's timeline window by double-clicking the newly added composition item in the Media window.

The timeline window of a new composition.



Notice that the content of the Stage window changes when the composition window appears. Instead of showing the display rectangles, it now shows the reference frame of the composition. While editing a composition, its preview appears in the Stage window, temporarily replacing the preview of the displays. To restore the Stage window to its usual state, select the main timeline window.

To change the size of the reference frame, or any other composition setting, choose "Timeline Settings" on the Timeline menu while the composition's window is active.

ADDING CUES

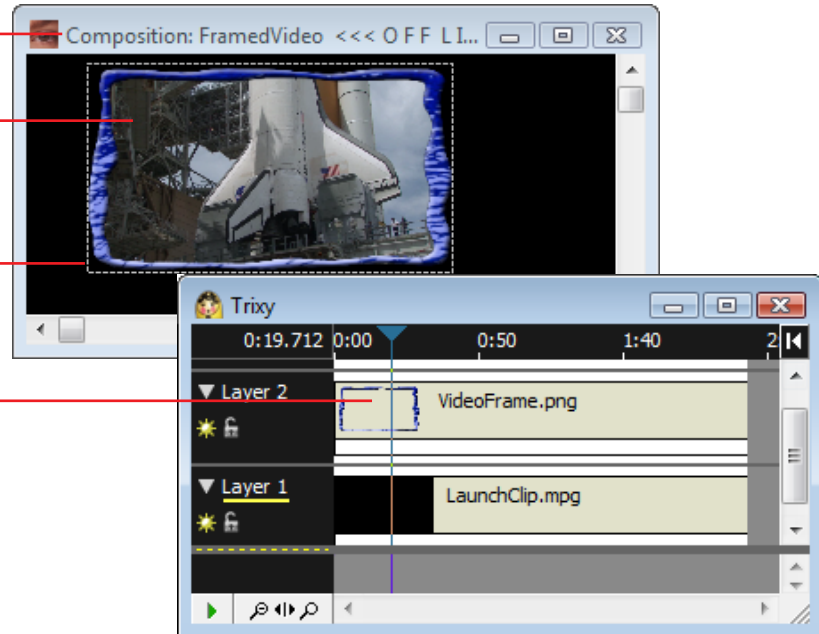
You add cues to a composition in the same way as you do to other timelines. In this example, we will add a video with a still image frame on top. Drag those images onto the composition's timeline. Their preview will appear in the Stage window.

Composition preview mode.

Stage window content temporarily replaced to show a preview of the composition.

This rectangle represents the composition's reference frame.

Media added to the composition's timeline.



When you've added the media to the composition, close its timeline window. This restores the Stage window to its normal preview mode.

USING THE COMPOSITION

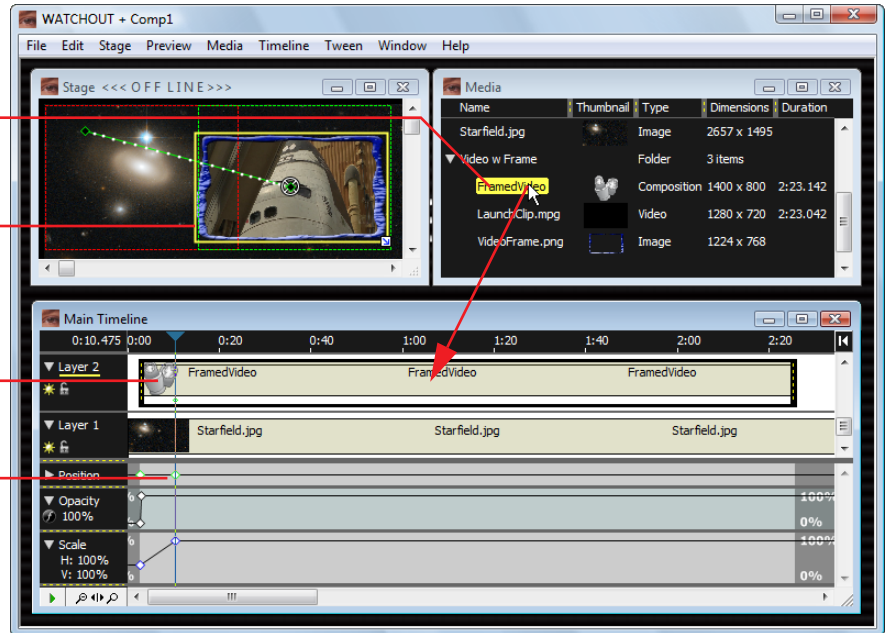
To use your newly created composition as a whole, simply drag it from the Media window onto the main timeline.

Drag a composition from the Media window onto the Main Timeline.

The yellow selection rectangle around the composition corresponds to its reference frame.

A composition cue appears on the Main Timeline.

Add tween tracks to move and scale the entire composition.



- ◆ **HINT:** To open a composition's timeline window from the Main Timeline, press Alt then double-click the composition cue.

NESTING COMPOSITIONS

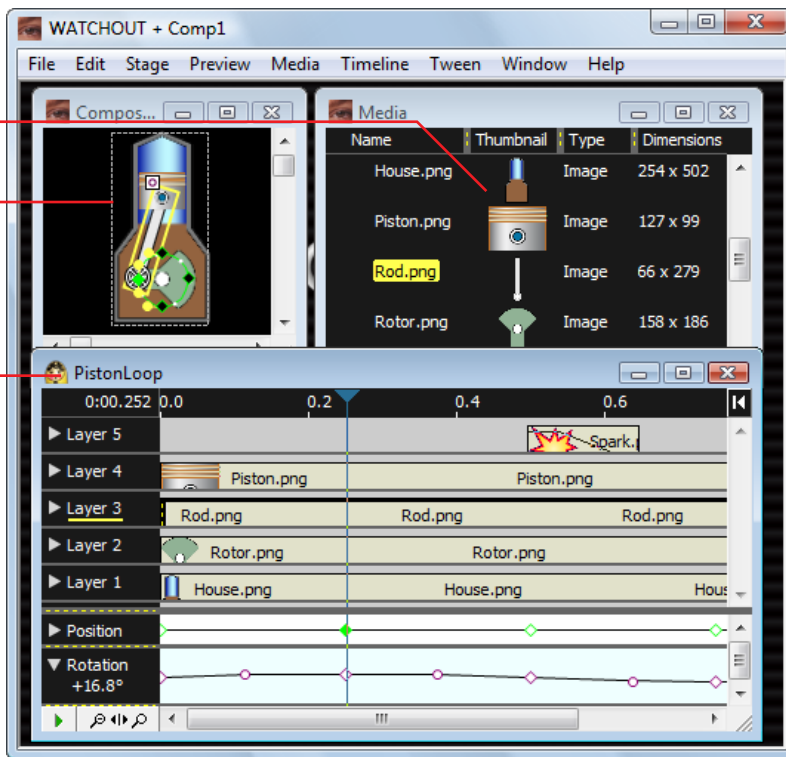
A composition may be used inside other compositions. This can be applied in a hierarchical fashion to build complex animations one step at a time. This example shows how to build a four cylinder car as a composition, starting by creating a single cylinder from still image parts.

Still image components.

Preview of the PistonLoop composition.

Composition timeline to make one full revolution of the engine.

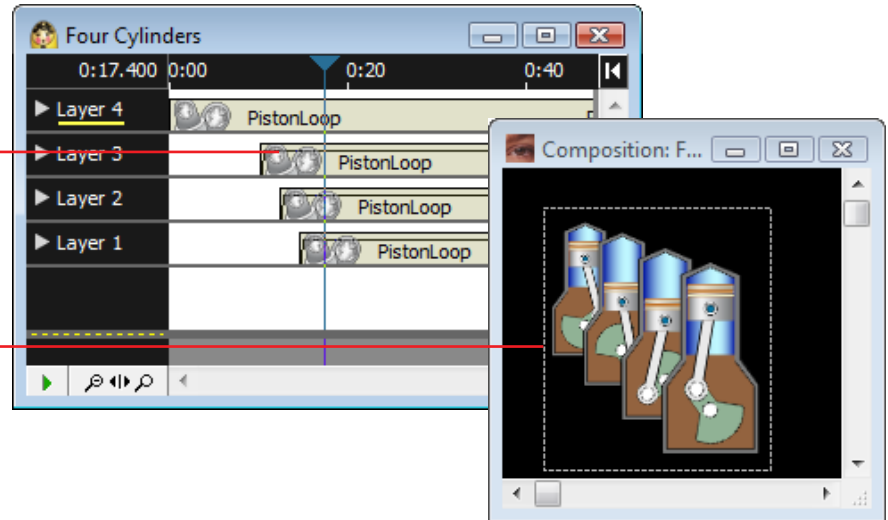
- ◆ **NOTE:** Select “Lock Duration” in the “Timeline Settings” dialog box of the composition, and set its duration to one second (see “Lock Duration” on page 154).



Once the single “Piston Loop” composition works as desired, go ahead and create the next, outer composition, naming it “Four Cylinders”. Add four copies of the “Piston Loop” to this composition by dragging them from the Media Window into the “Four Cylinders” timeline window.

Add four instances of the “Piston Loop” composition. Scale down all but the frontmost instance by increments of 10% each, and offset their positions as shown.

Stage window preview of the resulting “Four Cylinders” composition.



Since the “Piston Loop” contains a single engine revolution only, you need to set each of the “Piston Loop” cues on the “Four Cylinders” timeline to loop. This behavior is selected in the Composition Cue specifications dialog box, shown by double-clicking the cues.

Drag out the tail end of all four cues to about one minute to give enough running time to play with at the next level.

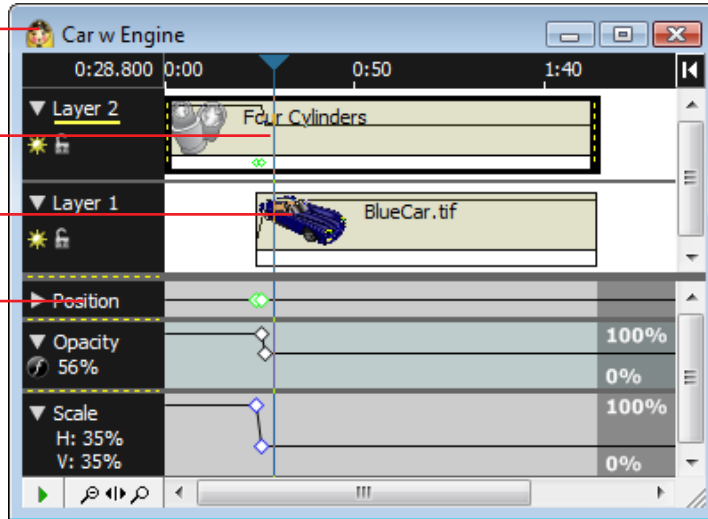
Once the complete engine works as desired, create the next outer level. This level puts the complete cylinder engine into a car. While we could have done this last step on the main timeline, doing it as yet another composition makes it easier to do things with the car as a whole, such as driving it off stage.

Create a “Car w Engine” composition.

Add a cue for the “Four Cylinders” sub-composition.

Fade up an image of a car.

Use Position and Scale tween tracks to put the engine into the car.



Finally, drag the “Car w Engine” composition from the Media window onto the main timeline. Add a Position tween track to make the car (including its engine) drive off the stage after a while.

◆ **NOTE:** The complete engine animation, as shown above, is included with WATCHOUT.

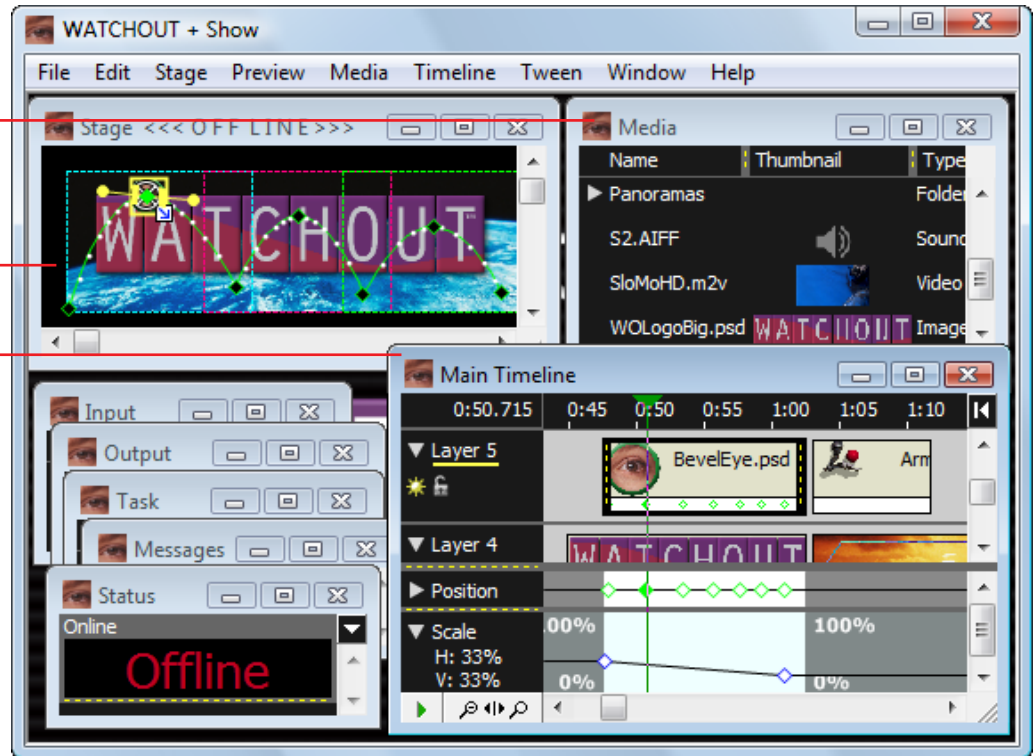
7 WINDOWS

Media window, listing all media used in your presentation.

Stage window, showing the display areas and a preview of the presentation.

Main Timeline window, showing the layers, cues and tween tracks.

Other windows are described later in this chapter.



Manipulating Windows

All WATCHOUT windows reside inside a desktop window, with a menu bar running along its top. You can resize the desktop window by dragging any of its outer borders or corners. Minimize or maximize it using the buttons in the upper right corner. Clicking the close box is equivalent to choosing Quit on the File menu.

Move a WATCHOUT window by dragging its title bar. Resize a window by dragging any of its corners or outer borders. Minimize and maximize a window using the buttons in the upper right corner.

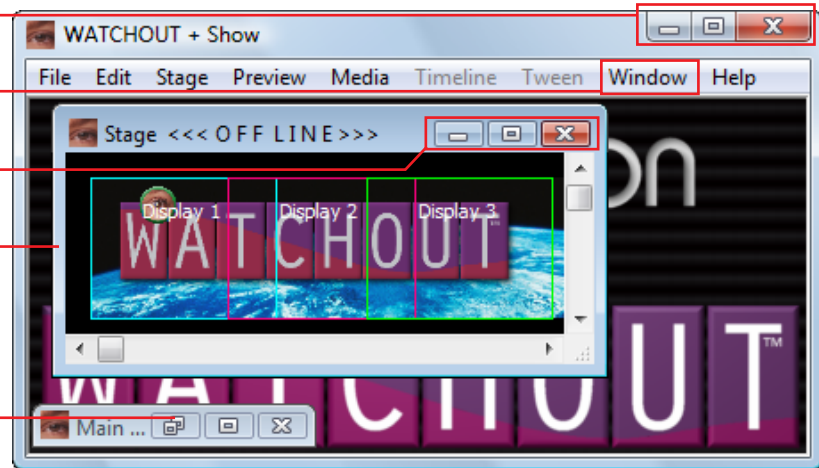
Minimize, maximize or close the WATCHOUT desktop.

Use the Window menu to open most windows.

Minimize, maximize or close the window.

Drag border or corner to resize.

*Minimized windows.
Click to restore.*



Opening Windows

Most windows are opened through the Window menu. Hence, if you accidentally close a window, look here to re-open it. See "Window Menu" on page 155.

STAGE WINDOW

The Stage window is used to add and arrange the display areas used in the presentation. It also provides a preview of your presentation as you move along the timeline, and lets you to position media on stage.

On/Off line indicator, corresponding to the "Online" Stage menu item.

Displays added to the Stage window.

Selected display.



Control-Alt-drag to scroll the window using the hand cursor.

Adding Displays

To add a display to the Stage window, choose Add Display on the Stage menu. See "Adding and Removing Displays" on page 59 as well as "Displays" on page 157 for more details.

Setting the Stage Scale

Set the viewing scale for displays and images using the Scale command on the Stage menu. Alternatively, you can interactively set the scale by clicking in the Stage window while holding down the Control key. This displays a magnifying glass that allows you to zoom in at the clicked location. Drag with the magnifying glass to zoom to a specific area. Control-Shift-Click to zoom out.

Adding Media

Add media to your presentation by dragging it to the desired location in the Stage window. A corresponding cue will be added to the timeline window at the currently selected layer and time position. To remove the media from the stage window, remove the corresponding cue from the timeline.

Positioning Media on Stage

You can position media on stage by dragging its preview in the Stage window. To do so, first select the timeline window, then drag the image in the Stage window. Press the Shift key to constrain the move. See “Positioning Media on Stage” on page 65. Double-click a Cue or an individual Position tween point to edit the position numerically (see “Initial Stage Position” on page 172 and “Position” on page 182).

▲ **IMPORTANT:** To change a position tween point, first click the tween point to go to its exact time position, then move the image. If you don’t go to the tween point first, a new tween point may be added instead.

Using Stage Tiers for Complex Display Arrangements

The straightforward method of adding displays to the stage, as described on the previous page, works fine in most cases. However, more complex display arrangements call for a different approach.

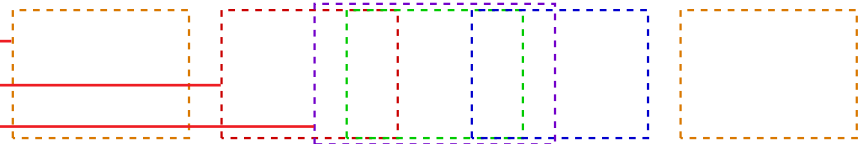
Assume, for example, that you want to make a display layout consisting of a main area with three overlapping (edge blended) projectors, plus one detached projector on either side, and finally a high-resolution plasma display showing the center part of the screen. This plasma display could be placed outside the theater, as a preview display. The detached projection screens on either side of the center area will generally be used as part of the main show, but will occasionally show different images to augment the center screen.

Desired display layout:

Side displays (yellow)

Center area (red, green, blue)

Larger, separate plasma (purple).



Merely adding all six displays to the stage will not work as desired for the following reasons:

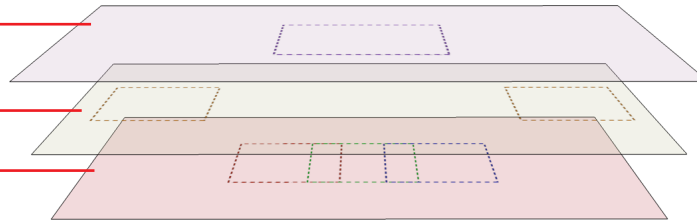
- The large plasma display overlapping the three projectors in the center will cause WATCHOUT to attempt to edge blend all these four displays (overlapping displays automatically get an edge-blend gradient).
- Panning large images sideways on the large center area, or on the side screens, will make those images intrude on the adjacent display areas. That's OK while using all five projectors as a single, large canvas, but undesirable when using the side displays independently.

You can overcome these problems by placing each set of displays on their own stage tier. Stage tiers act as independent, named levels on the stage. Edge blending occurs only among displays on the same tier. Furthermore, timeline layers can be associated with specific tiers only, preventing their images from spilling onto displays on other tiers.

Tier "Plasma" with the single plasma display.

Tier "Sides:"

Tier "Main" with the three overlapped projectors.



To create additional tiers, choose "Tier: Add" on the Stage menu (see page 133). To add displays to a specific tier, first select that tier on the Tier sub-menu of the Stage menu. To associate a timeline layer with a stage tier, see "Stage Tiers" on page 105.

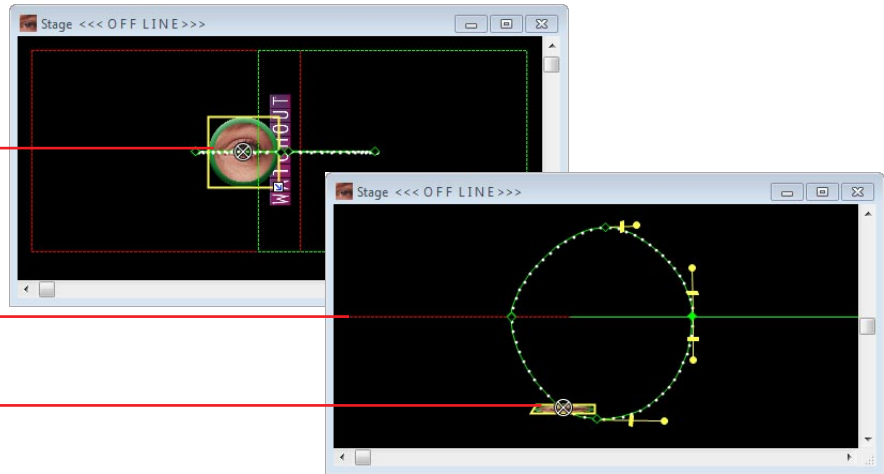
3D Views

When working with images positioned in 3D space, or rotated around their X or Y axes, it is sometimes hard to see where things are if you only view them from the front. For instance, if you want to make one image orbit another image along a horizontal plane, the motion path will look like a straight line when viewed from the front. Choose "View Top" on the Stage menu to view the stage from the top.

Orbiting image viewed from the front.

Displays appear as lines when viewed from the top.

Orbiting image and motion path viewed from the top.



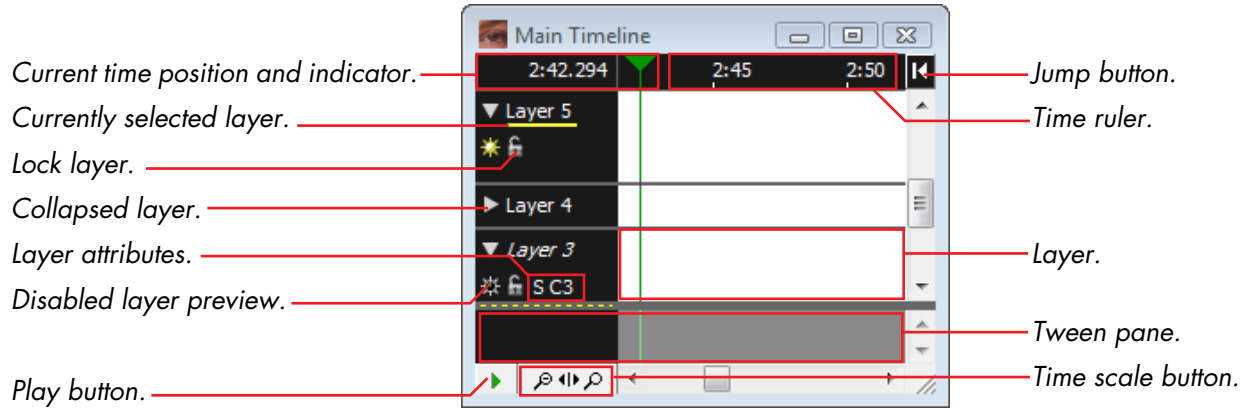
Likewise, for vertical motion, the stage can be viewed from the left. By alternating between these three views, you can create elaborate three-dimensional motion paths.

Previewing Without Perspective

The Stage window generally shows images in 3D space using the perspective set in Preferences. Deselect Perspective on the Preview menu to view and edit images using an ortographic (non-perspective) view.

MAIN TIMELINE WINDOW

The timeline window holds the cues that make up your presentation. Cues are arranged along layers, representing the back-to-front stacking order of images on stage. Increasing layer numbers move the image closer to the front.



Using the Scroll Wheel

By default, the scroll wheel on the mouse scrolls windows vertically. The scroll wheel can be combined with the following modifier keys in the timeline window:

- Shift: Scrolls the timeline horizontally.
- Control: Moves the current time position in 0.1 second increments.
- Control+Shift: Moves the current time position in 1 second increments.

Time Position Indicator

The current time position is indicated by a vertical line through the Timeline window. Its color indicates the “Click Jumps to Time” mode (see page 151).

Setting the Current Time Position

Click the time ruler to jump to a time position. To set the time numerically, choose “Timeline Settings” on the Timeline menu. To go to the beginning of a cue, or to a tween point, click it with “Click Jumps to Time” selected on the Timeline menu (see “Click Jumps to Time” on page 151).

Adjusting the Time Scale

Click the magnifying glass areas of the time scale button to zoom in and out by a fixed amount. Pressing the ‘+’ and ‘-’ keys on the numeric keypad has the same effect. Drag the center of the button to change the scale gradually.

The Jump Button

Click the jump button, located to the right of the time ruler, to jump to the current time position if scrolled out of view, or to jump back to the previous start time. Pressing the asterisk key on the numeric keypad has the same effect.

Starting and Stopping

Click the play button to start and stop playback. If the stage is online, this also controls playback on screen. Pressing the spacebar is equivalent to clicking the play button. Pressing 0 on the numeric keypad starts playback, Esc stops playback.

Adding Cues

To add a cue, drag media from your hard disk or the Media window to a timeline or the Stage window. See Chapter 10 for more details on cues.

Selecting the Current Layer

Click a layer’s name to make it the currently selected layer. When pasting an individual cue, it will be pasted at the current time and layer. Likewise, when adding media by dragging into the Stage window, a new cue will appear at the currently selected time and layer.

Changing Layer Height

Click the collapse triangle to minimize and restore the layer height. Shift-click to collapse/expand all layers.

Adding and Removing Layers

Layers can be added, removed and renamed using the corresponding commands on the Timeline menu (page 103).

Disabling Layer Preview

To disable the layer preview in the Stage window, click the layer preview symbol to turn it off. Shift-click to disable/enable all layers. Disabling a layer allows you to manipulate images in the Stage window that otherwise would have been covered by other images. Disabling a layer's preview has no effect on its playback on screen.

Locking a Layer

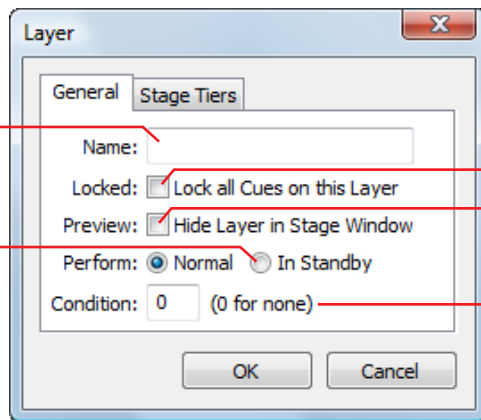
To lock a layer, click the padlock symbol. Cues on locked layers can't be selected or changed. Nor can you add new cues to a locked layer.

Layer Name and Attributes

To change the name or other attributes of a layer, first select the layer then choose "Layer Settings" on the Timeline menu.

Layer name.

Images and other media on this layer are displayed when in Standby mode only.



Locks the layer.

Disables layer preview.

For conditional layers, enter a layer condition number here. Set to zero for a normal (unconditional) layer.

- Lock all Cues on this Layer** This checkbox is equivalent to the padlock symbol in the layer’s header pane. Selecting it prevents cues on this layer from being changed or deleted.
- Hide Layer in Stage Window** This checkbox is equivalent to the sunshine symbol in the layer’s header pane. See “Disabling Layer Preview” on page 103.
- Perform Normal/In Standby** By selecting “In Standby”, images and other media on this layer will perform only when in Standby mode. This allows you to keep, for example, a background image ready to be displayed at any time, thereby avoiding going to a black screen when activating the standby mode (see “Standby” on page 134).
- Normally, the Stage window doesn’t preview media controlled from such standby layers. You can override this using the “Preview Standby Layers” command on the Stage menu (see “Preview Standby Layers” on page 137).
- ▲ **IMPORTANT:** In order to be available to the Standby command at any time, media on standby layers consume processor and memory resources even while *not* in standby. Avoid using multiple standby layers at the same time or playing video or other heavy-duty content on standby layers. Generally, use only a single, large background image at a time.
- Condition** Media associated with cues on a conditional layer will perform only when that condition is enabled in the Preferences dialog box (see “Enabled Layer Conditions” on page 123). This can be used to keep, for example, multiple language versions of a show in the same file, allowing the desired language version to be activated by enabling its associated condition.

Normally, the Stage window previews media on enabled conditional layers only. You can override this using the Preview menu (see “No / All / Enabled Conditional Layers” on page 137).

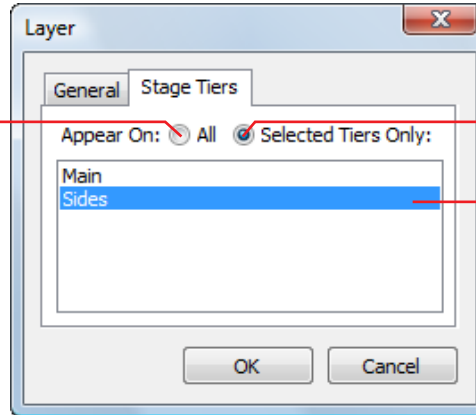
- ◆ **NOTE:** The name of a conditional or standby layer is shown in *italics* in the Timeline window.

Stage Tiers

Click the “Stage Tiers” tab to constrain cues on this layer to a specific stage tier or set of tiers (see “Using Stage Tiers for Complex Display Arrangements” on page 98 for an overview of stage tiers).

Normally, cues appear on displays on all stage tiers.

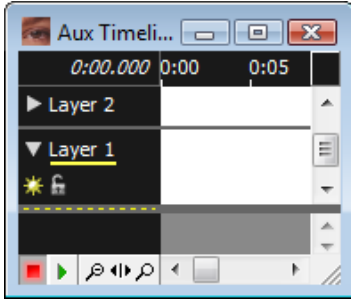
- ◆ **NOTE:** You must add tiers to the Stage window before you can assign layers to specific tiers (see page 133).



Click here to restrict cues on this layer to specific tiers only...

...then select the desired set of tiers in this list.

AUXILIARY TIMELINE WINDOW

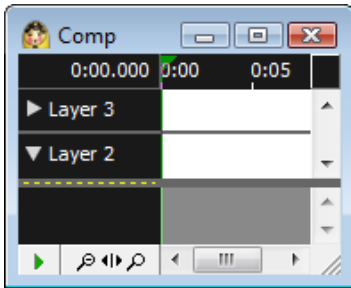


The window associated with an auxiliary timeline is very similar to the main timeline window. The main differences are:

- An auxiliary timeline can be stopped. This is indicated by a red Stop button in its lower left corner. When stopped, it doesn't contribute to the stage.
- The auxiliary timeline's window is opened by double-clicking its name in the Task window. Name the auxiliary timeline by choosing "Timeline Settings" on the Timeline menu while the auxiliary timeline's window is active.

To create an auxiliary timeline, choose "Add Auxiliary Timeline" from the window menu of the Task window (see "Task Window" on page 111). For more details, see "Auxiliary Timeline" on page 210.

COMPOSITION WINDOW



The window associated with a composition resembles the main timeline window in the way it is operated. However, its purpose is quite different. Unlike the main timeline and auxiliary timelines, its output doesn't appear directly on stage. Instead, you use the composition from another timeline similar to playing a video clip. See Chapter 6 "Using Compositions" for details.

Create a composition by choosing "Add Composition" on the Media menu. A new composition item appears in the Media window. To open the timeline window of a composition, double-click its name in the Media window. Use the "Timeline Settings" command on the Timeline menu to change the name or other properties of a composition (such as its reference frame).

- ◆ **NOTE:** When opening a composition, its preview will temporarily replace the normal content of the Stage window. This doesn't affect the image shown by any display computers. Close the composition to restore the Stage window.

MEDIA WINDOW

The Media window lists all media items that have been added to the presentation. It provides a thumbnail preview of each item, along with a description of its name, type, file location, size and other information, as appropriate for each kind of media.

Drag to change column width.

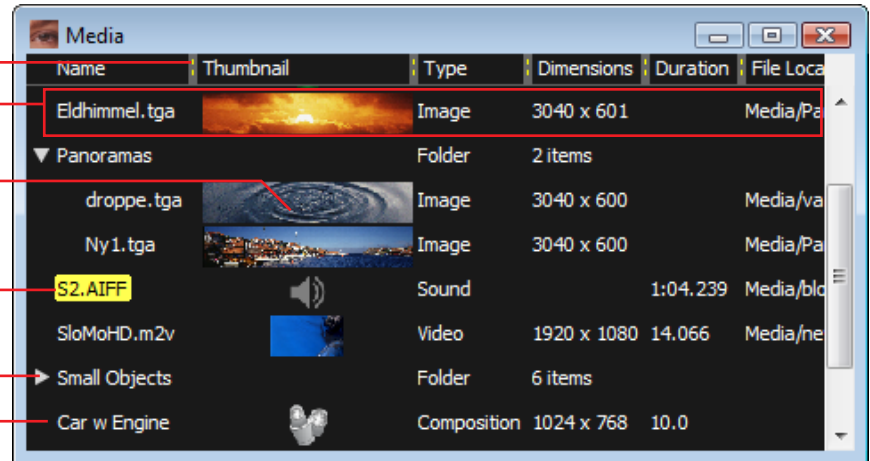
Thumbnail and description of each media item.

Double-click thumbnail to open media file in its associated application.

Double-click name to edit the media specification.

Group media items into folders.

Double-click to open Composition's timeline.



Adding Media

Add new media by dragging files from your hard disk into the Media window, or by choosing "Add Media File..." on the Media menu. Files dragged directly into the Timeline or Stage windows are automatically added to the Media window as well. Each media file used in your presentation will only appear once in the Media window, regardless of how many times it is being used.

Removing Media

Remove individual media items by selecting them and choosing "Clear" on the Edit menu. Remove all unused media items from the Media window by first

choosing “Select Unused” on the Media menu. It is not possible to remove media that’s currently in use in the presentation. Removing media list items in this way does not affect the files stored on your computer’s hard disk.

- ◆ **HINT:** Use the Find command in the Timeline window to track down media references by the name of the media item.

File Location

Indicates the location of each media file. If the file is located in or under the folder in which the presentation itself is saved, the path to the file will be relative to this folder. Otherwise, it will be an absolute path, beginning with a ‘/’-character.

- ▲ **IMPORTANT:** If possible, store media files in a sub-folder of the folder containing the presentation file, since this allows the use of relative path names. Doing so allows you to move the entire presentation to another folder, disk or computer intact. Using absolute path names may cause problems if the specified location is not available after moving the presentation.
- ◆ **HINT:** If you change you mind concerning file locations, you may move the files to a more appropriate location (for example, to a folder under the folder containing the show file), and then use the Find/Replace command to update the locations in the Media window accordingly. See “Find/Replace” on page 128.

Changing the File Association

You can change the file associated with a particular media list item by double-clicking its name and choosing another file. This will affect all cues associated with this media list item. You can only replace a media file with another of the same type.

Editing the Media File

To open a media file in its associated application, double-click its thumbnail. This provides convenient access to a media file in order to view or edit it.

- ◆ **NOTE:** Your computer must have been set up properly in order to associate each file type with the appropriate application.
- ◆ **HINT:** You can also open the media file associated with a cue by Alt-double-clicking the cue on its timeline.

Refreshing Media Information

After editing media files, update the Media list in WATCHOUT accordingly by choosing “Refresh” on the Media menu. See “Refresh” on page 149 for more details.

Grouping Media Items into Folders

Media items can be arranged into groups. Chose “New Folder” on the Media menu to create a folder then drag the desired media items onto the folder. Double-click the folder’s name to change it. Click the triangle to show or hide the content of the folder.

- ◆ **NOTE:** Folders in the media window have no relation to folders on your computer’s hard disk. They are merely a way to organize items in the Media window. Creating or removing folders from the Media window will not create or remove any folders on your hard disk.

Adding a Media Proxy

In some cases, media files can not simply be dragged into the Media list (see page 63 for some examples). Instead, you can add a proxy item to the Media window using the “Add Proxy” command on the Media menu. See “Add Proxy” on page 139 for more details.

INPUT WINDOW

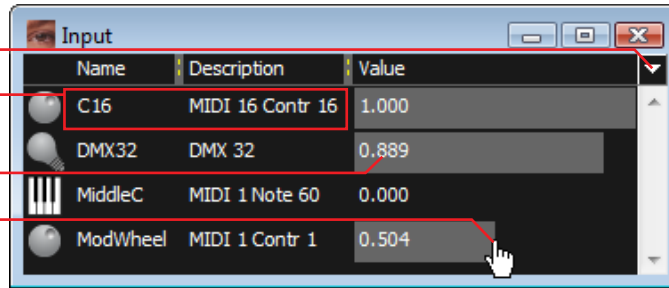
The Input Window lists external inputs available for use in expressions. Expressions are used to control tween track parameters and to trigger tasks.

Click to add more inputs.

Name and description of each input.

Current input value.

Drag to simulate a change in value.



For details on the various kinds of inputs see page 197. For more on Expressions, see page 212.

OUTPUT WINDOW

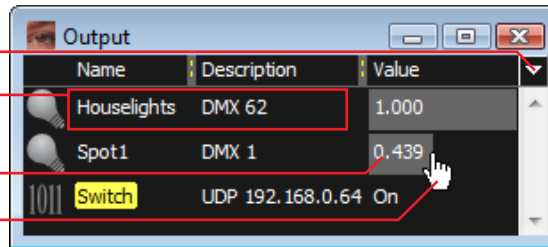
The Output Window lists outputs allowing you to control external devices using cues. To create a cue for an output, drag the output onto a timeline. See "Outputs" on page 204 for more details.

Click to add more outputs.

Name and description of each output.

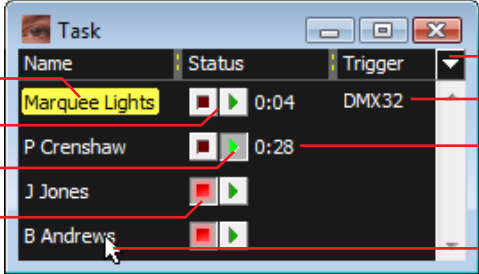
Current output value.

Drag to change the value manually.



TASK WINDOW

The Task window lists all the auxiliary timelines of your presentation, along with their status and triggering expression.



The screenshot shows a window titled "Task" with a table of auxiliary timelines. The table has three columns: Name, Status, and Trigger. The rows are: Marquee Lights (Status: Paused, Trigger: DMX32), P Crenshaw (Status: Playing, Trigger: 0:28), J Jones (Status: Stopped, Trigger: 0:28), and B Andrews (Status: Stopped, Trigger: 0:28). Red lines connect text labels to specific elements in the window.

Name	Status	Trigger
Marquee Lights	Paused	DMX32
P Crenshaw	Playing	0:28
J Jones	Stopped	0:28
B Andrews	Stopped	0:28

Double-click to open the timeline. — Points to the "Marquee Lights" row.

Paused timeline. — Points to the "Paused" status icon for "Marquee Lights".

Playing timeline. — Points to the "Playing" status icon for "P Crenshaw".

Stopped timeline. — Points to the "Stopped" status icon for "J Jones".

Click to add more tasks. — Points to the "+" button in the Trigger column header.

Task's triggering expression. — Points to the "DMX32" trigger for "Marquee Lights".

Timeline's time position. — Points to the "0:28" time position for "P Crenshaw".

Drag tasks vertically in list to re-arrange their front-to-back ordering on stage. — Points to the "B Andrews" row.

The status of each task is shown in the Status column. An auxiliary timeline can be in either of three states, as indicated by the two buttons (see illustration above). While stopped, its cues have no effect on the stage.

An auxiliary timeline can be started by either of the following events:

- Manually, for instance by clicking the Play symbol in the Task list.
- By external inputs, using its triggering expression (see page 212).
- By another timeline, using a Control cue set to target the auxiliary timeline.

For more details see "Auxiliary Timeline" on page 210 and "Control Cue" on page 193.

Changing the Stacking Order

An auxiliary timeline always performs in front of the main timeline on stage. When multiple auxiliary timelines are active at the same time, their front-to-back stacking order is typically controlled by their order in the Task window.

To move an auxiliary timeline closer to the front, drag it towards the top of the Task window.

- ◆ **NOTE:** This behavior can be overridden in the Timeline Settings dialog box of an auxiliary timeline. Here you can choose that it always starts out as frontmost, regardless of its position in the Task window (see “Auxiliary Timeline Settings” on page 152).

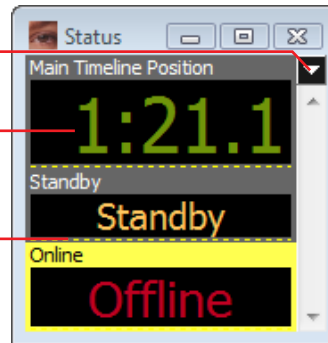
STATUS WINDOW

The status window provides a user-configurable set of status items that can be sized as desired.

Click to add status items.

Double-click an item to change its settings, such as color.

Drag divider to re-size the item.



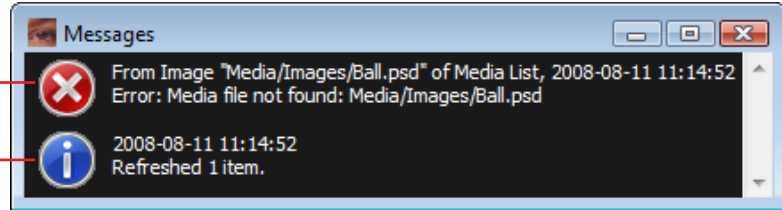
To configure a status item, double-click it in the Status window then change its settings (such as color and other properties). To remove a status item, select it with the mouse then choose “Clear” on the Edit menu.

MESSAGE WINDOW

The Message window lists the messages sent to you by WATCHOUT. Such messages may originate from the production software or from the display computers. Some messages are merely informative while others indicate errors requiring your attention.

An error message from a media list item telling you that it can't find its associated media file.

An information message reporting the result of the Refresh command.



◆ **NOTE:** The Message window appears automatically when a message is posted. To avoid this, move the window to the side instead of closing it.

Removing Messages

To remove messages, select them (either by Shift-clicking or by choosing "Select All" on the Edit menu) then choose "Clear" on the Edit menu.

8 COMMANDS

FILE MENU

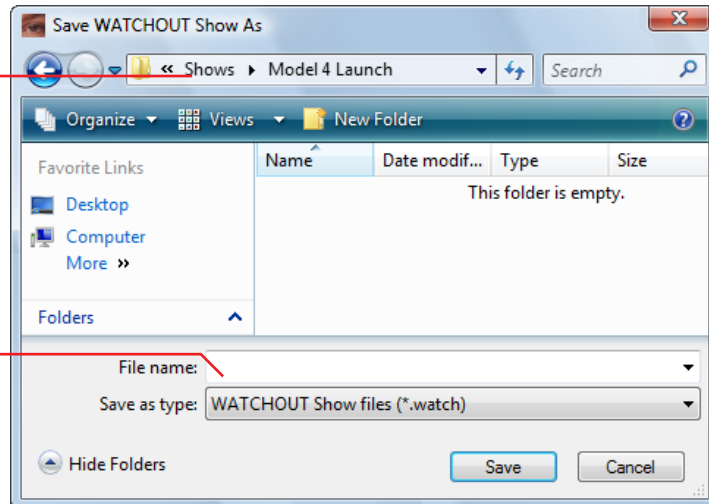
The File menu provides commands related to the entire presentation, such as Opening old presentations or creating new ones.

New

Creates a new presentation, specifying the name and location of the WATCHOUT presentation.

Navigate to the desired folder using this control and by double-clicking folders in the list.

Type the name of the show here, then click Save.



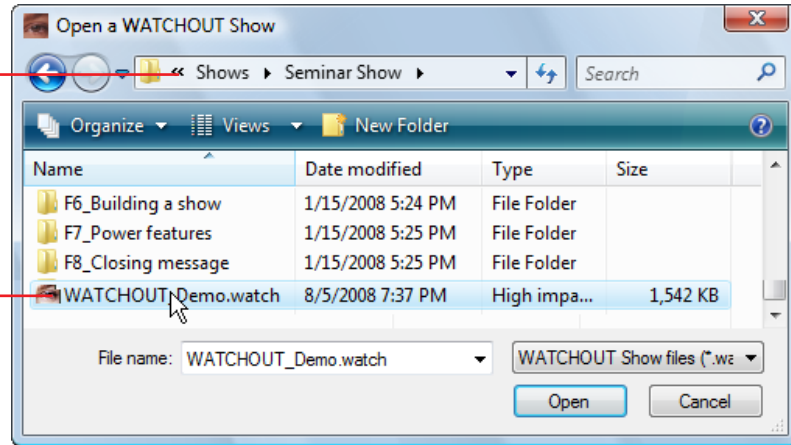
- ◆ **HINT:** To re-use objects such as display arrangements and cues, simply copy them from the old presentation then paste them in the new one.

Open

Opens an existing WATCHOUT presentation.

Navigate to the containing folder.

Select the desired show then click Open.



Open Recent

Provides a list of recently opened presentations. Choosing an item from the sub-menu opens the selected presentation.

Save

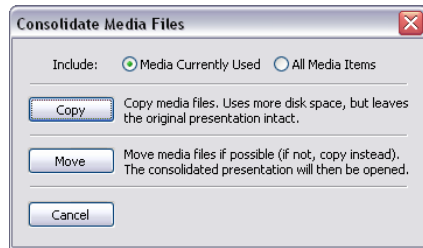
Saves the presentation that is currently open.

Save a Copy As

Saves a copy of the presentation that is currently open. This is useful for saving backup copies without changing the name of the current presentation.

- ◆ **NOTE:** Opening and using such a copy without changing it back to its original name will cause a new set of media to be downloaded to all display computers under the new show name.

Consolidate To



Moves or copies the entire presentation, including its media files, to a folder. You can use this command to consolidate all the relevant files in preparation prior to burning the presentation onto a DVD.

This command is also useful if you've been using media files stored on servers or removable disks, or if you want to weed out unused media files intermixed with files actually used in the presentation.

In addition to collecting your media files, this command also updates the access paths accordingly in the Media window, and stores this updated copy of the presentation file in the consolidated folder. When using Copy, the old presentation is not affected.

When you give this command, first choose an empty folder for your consolidated presentation. You're then presented with the dialog box shown below, allowing you to choose whether to copy or move the media files.

Include. Choose "Media Currently Used" to remove unused media items from the Media window, excluding those from the consolidation (the files will stay where they are). Choose "All Media Items" to include all media items and files listed in the Media window, regardless of whether they are used or not.

Copy. Creates a new copy of your presentation, leaving the current media files and the presentation file as they are. This is the safest option, but may require more time and disk space, since it entails making new copies of the media files.

▲ **IMPORTANT:** Unless you choose "All Media Items", only media actively used in the presentation is copied. Unused media items (including compositions) are removed from the Media window in the consolidated version of

the show. Unused media files are left in their old locations, and are not copied or moved.

Move. Instead of copying them, this moves all actively used media files that reside on the same volume as the target folder. This is much faster and requires no additional disk space for files already located on the target volume. Media files residing on other disks, partitions or servers will be copied, however. The consolidated presentation is then opened automatically.

- ▲ **IMPORTANT:** Since the Move option moves media files away from the locations specified in the original presentation, you will no longer be able to use the old presentation file as media it refers to has been moved. A new copy of the presentation file is created in the consolidated folder with the updated media file references.

Export Movie

Exports the main timeline of your show as a QuickTime movie. The movie file can then be sent off for client approval, posted to a web site, or similar.

- ◆ **NOTE:** Before choosing this command, set up the Stage window to define the scale and area to be exported. Only the displays currently visible in the Stage window will be exported. This can be used to export a smaller portion of a very large stage. Areas outside the displays that are currently visible in the Stage window will be cropped or blanked out in the resulting file. Also, if your show uses conditional layers, set the desired set of layer conditions in the Preferences box before exporting.

When you choose the “Export Movie” command, a Save dialog will be shown, allowing you to name the resulting movie file. This dialog box also allows you to limit which part of the timeline to export, and to control the compression

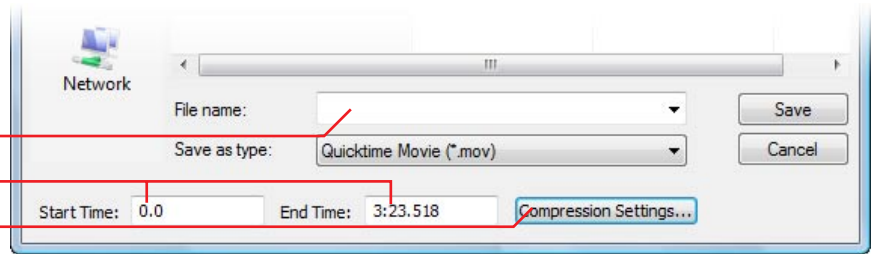
being used. The formats available may vary depending on the version of Quicktime you have installed.

Navigate to the desired folder.

Name of the new movie.

Portion of timeline to save.

How to compress the movie.



Exporting an Auxiliary timeline

To export an auxiliary timeline, first open and select its window, then choose “Export Movie” on the File menu.

Export Audio



Exports a stereo mix-down of the audio from the main timeline of your show, as a Wave-file. This is particularly useful for exporting audio to PICKUP. The resulting WAVE file can then be imported into iTunes, which converts it into MP3 format for PICKUP.

- ◆ **NOTE:** If your show contains multiple languages controlled by conditional layers, make sure you enable the desired set of conditional layers before exporting the sound track.

Quit

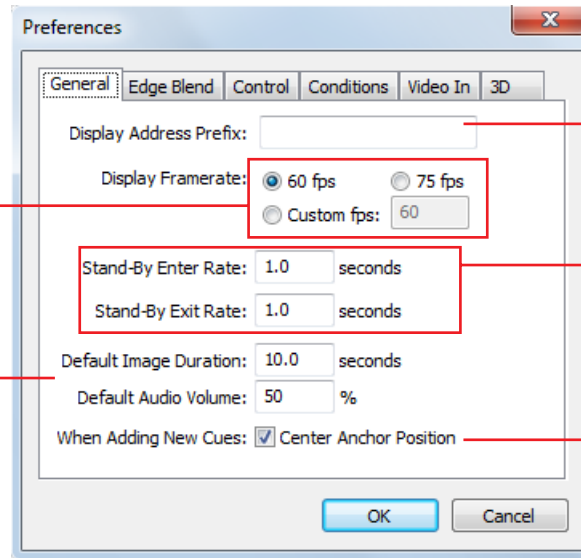
Quits WATCHOUT after optionally saving any changes.

Preferences

Allows you to specify miscellaneous settings of the presentation.

Sets the frame rate to be used by your display computers.

Default image duration for new image cues and volume level for audio and video cues.



Enter the common part of your display computer's IP addresses.

Determines the fade rates for the Standby command.

Default anchor position for new image cues.

Display Address Prefix

The IP addresses assigned to the displays usually only differ in the last few digits (see illustration on page 24). By entering the common initial part in this field, you then only have to enter the last few digits into the specifications dialog box of each individual display (see "Address" on page 158).

▲ **IMPORTANT:** You must enter the period that separates the last two groups of digits here. The complete IP address is made by simply concatenating the contents of the "Display Address Prefix" field with the contents of the display's Address field.

Display Framerate

Specifies the frame rate used by the display computers. This setting lets WATCHOUT optimize its behavior to match the frame rate of any video being used in the presentation, as well as the display devices. Your display computers should use a matching refresh rate (see page 28 for more information).

Standby Rates

Specifies the fade out and fade in rates for the standby command (page 134).

Default Image Duration

Display duration used for images added to timelines.

Default Audio Volume

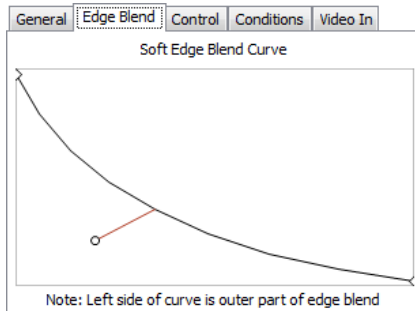
Volume level used to play audio *not* governed by a Volume tween track. Set this to a value below 100% to provide for some additional headroom when controlling the playback volume.

Center Anchor Position

When checked, the anchor point will be aligned with the center of the image when you drag an image to a timeline or the Stage window. See “Anchor Position” on page 172.

Edge Blend

Drag the round dot to adjust the edge blend curve. Although it is possible to add more points to the curve, this is generally not required. The same curve is applied to all edges. The left of the curve corresponds to the outer (dark) edge of the gradient. Your display computers must be online for you to see the effect of the edge blend curve while changing it.



▲ **IMPORTANT:** Before attempting to adjust the edge blend curve, make sure your projectors are set up properly (see page 246). If not, it may be impossible to get a proper edge blend.

Double-click a point to view and edit its value numerically, or to change its type. This also allows you to precisely copy the edge blend curve from one presentation to another.

◆ **HINT:** Enlarge the window for better precision in adjusting the curve.

Control

This tab provides various options for controlling the WATCHOUT production software from the outside.

◆ **NOTE:** For more control options, see “Inputs” on page 197.

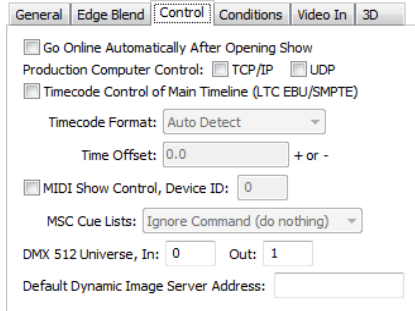
Go Online Automatically. When selected, WATCHOUT will automatically attempt to connect to the display computers when opening this show.

Production Computer Control (TCP and UDP). Activates external control of the WATCHOUT production software. This allows you to control your WATCHOUT presentation from a touch panel or other computers and control systems. The control protocol has provisions for positioning, starting and stopping the presentation, as well as other miscellaneous functions. See “Production Computer Protocol” on page 251.

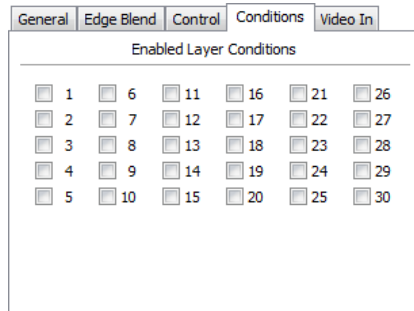
◆ **NOTE:** This control feature is not to be confused with the display cluster control capability, described in Appendix E. While they both perform similar functions, one controls the production computer and the other controls the display computers directly, without the need for any production computer being present during playback.

Timecode Control of Main Timeline. Enables synchronization of the main timeline of the production software by an external timecode signal. When selected, also specify the format of the expected timecode as well as any offset to be added to the external timecode to make it match up with the timeline. Use a negative offset if the external timecode specifies a later time position. See “Timecode Control” on page 84 for more details.

MIDI Show Control. Enables control of WATCHOUT using the MIDI Show Control protocol, available in many lighting consoles. See “MIDI Show Control” on page 275 for details on the various options.



Enabled Layer Conditions



DMX-512 Universe. Specifies the Artnet protocol “universe” number to be used to receive and transmit DMX-512 data. This relates to the DMX-512 Input and Output respectively. See page 201 for more details on how to use DMX-512.

Default Dynamic Image Server Address. The default server address used by Dynamic Image media items, if not specified explicitly (see “Add Dynamic Image” on page 148).

Specifies which layer conditions will be enabled. Each layer in the Timeline window can be associated with a condition (see “Condition” on page 104), in which case media on that layer will only appear when the corresponding condition is enabled. You can specify any combination of conditions.

Layer conditions are particularly useful together with external control of display clusters, either using Dataton PICKUP (see “Personalized or Multi-lingual Audio” on page 82) or other external control means (see Appendix E “Display Cluster Protocol”). For instance, the set of enabled layers in WATCHOUT can be governed by the language selection in PICKUP; matching texts and other language-dependent images in the presentation.

- ◆ **NOTE:** The Stage window normally previews media from enabled layers only. This behavior is governed by the “Preview Options” sub-menu on the Stage menu.

Video In

General	Edge Blend	Control	Conditions	Video In
Device 1:	Osprey-210 Video Device 1			
Device 2:	None			
Device 3:	None			
Device 4:	None			
Device 5:	None			
Device 6:	None			
Device 7:	None			
Device 8:	None			

Associates video input cards in the production computer with video input device numbers, subsequently used in “Live Video” media (see “Live Video” on page 47). This allows you to view live video in the production computer, if desired. It serves the same purpose in the production computer as the “Video In” menu does in the display software (see illustration under “Add Live Video” on page 145).

◆ **NOTE:** The “Video In” settings in the Preferences dialog box apply *only* to the production computer. Each display computer has its own, independent assignment of video input devices. This allows you to have different configurations of capture cards in the various computers.

If you don’t want to preview live video in the production computer’s Stage window, choose the “Thumbnail” stage preview mode in the “Live Video” media item (see “Live Video” on page 47). Doing so still allows you to assign video input device numbers for use in the display computers, while disregarding any setting for the corresponding video input device number in the production software. In this case, you can ignore the settings in the “Video In” section of the Preferences dialog box.

3D Perspective and Stereoscopy



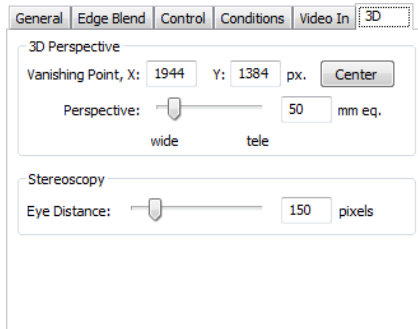
Vanishing point symbol.

These settings control the perspective of images rotated or moved in 3D space.

Vanishing Point. As images move away from the viewer along the Z axis, they move towards the vanishing point. In general, you want this point to be at the center of the stage, which can be accomplished by clicking the Center button. You can also enter the coordinate of the vanishing point manually. The position of the vanishing point is indicated by a symbol in the Stage window, displayed only while editing the settings in the Preferences dialog box.

Perspective. Images rotated around the X or Y axes appear distorted according to the perspective. A smaller value results in a more exaggerated

perspective. You may think of this value as controlling the focal length of a lens used to view the images, where a wide angle lens (smaller value) results in a more pronounced perspective. This value also controls the degree to which images moved along the Z axis (towards or away from the viewer) change their apparent size.



◆ **HINT:** Sometimes, the perspective effect can make it harder to edit the position and orientation of images in the Stage window. If so, turn off the perspective using the Perspective command (see page 136). This command affects the preview only – not images displayed on screen.

Eye Distance. When displaying images using stereoscopic projection, this setting controls the amount of left/right image separation that's applied as a function of the distance from the zero parallax plane (i.e., the screen). Depending on the physical size of the screen used to view the presentation, you may need to adjust this value. For comfortable viewing, the left/right separation should not exceed 60 mm on screen (approximately 2.4 inches). See "3D/Stereoscopy" on page 78 for more details.

▲ **IMPORTANT:** This setting has no effect on stereoscopic video being used in your presentation, as the eye separation has already been baked into the video itself. Attempt to keep the amount of physical eye separation of stereoscopic video within the same limits as other stereoscopic images, as mentioned above.

EDIT MENU

The Edit menu contains commands applying to the current window or currently selected objects (for example, displays, cues or tween points).

Undo/Redo

Reverts recent changes you've made to the presentation.

Cut

Transfers selected objects to the clipboard, allowing them to be pasted in elsewhere. Use this, for example, to move cues to another position along the timeline, or to another presentations.

Copy

Copies selected objects to the clipboard, allowing the copies to be pasted in elsewhere. Use this, for example, to transfer display configurations or cues between presentations.

◆ **NOTE:** When transferring cues between presentations in this way, any media associated with these cues will transfer along with the cues, and will be automatically added to the Media window in the target presentation.

Paste

Pastes the most recently cut or copied objects into the current window.

Clear

Removes selected objects without altering the contents of the clipboard.

Select All

Selects all objects in the current window.

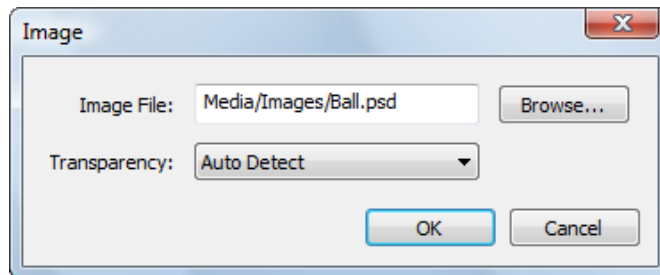
Select to End

Applies to timeline windows. Selects all cues from the current time position and forward.

Specifications

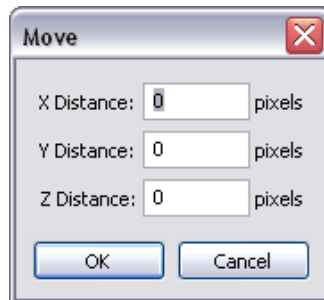
Opens the Specifications dialog box for the selected object. This is equivalent to pressing the Enter key or double-clicking the object.

Example specifications dialog box for a still image.



See "Display Specifications" on page 158 and "Cue Specifications" on page 170 for more details. For media proxy items, see page 139.

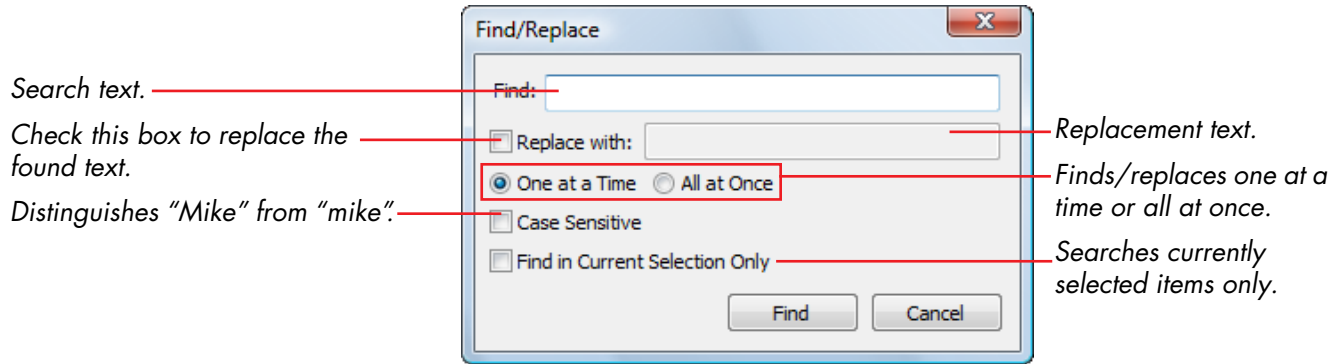
Move



Moves the selected objects by a specified number of pixels. Applies to cues and displays. When applied to cues, it moves the stage positions of media displayed by the cues.

Find/Replace

Finds and optionally replaces specified text. When applied to the Media window, this allows you to locate media items by specifying the name of the media file, or any part of its path name. The command operates on the information shown in the “File Location” column of the Media window, indicating the relative or absolute path to the media file.



You can use the Replace function to update the path to media files after they have been moved to another disk or folder. For instance, if you start out with your media files on a shared server during the early stage of production, you may later want to move all media files into a sub-folder of the folder containing the presentation file. After transferring the files, use the Find/Replace command to change the absolute part of the path name (beginning with a '/' character) to a relative (that is, beginning with the name of a folder located in the same folder as your presentation).

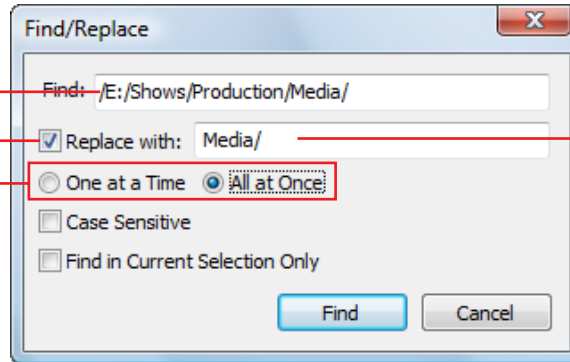
As an example, assume that the media files were stored in a folder named "WATCHOUT/Production1/Media" on a network volume named "E:" during

production. You have now copied these files into a folder named “Media” located in the same folder as the WATCHOUT presentation file. You would then enter the following values into the Find/Replace dialog box to update all relevant media paths accordingly.

A leading ‘/’ character indicates an absolute path.

Check to replace.

Choose “All at Once” to change all matching items, or “One at a Time” to review each change before proceeding.



NOTE: No leading ‘/’ character indicates a folder relative to the folder containing the presentation file.

Finding Cues

The Find command can also be used in timeline windows. In this case, it allows you to search for Control cues by name or media cues by the name of their associated media. The latter is useful in finding cues using a particular media item. The timeline is first searched in the forward direction from the current time position. If not found, it is then searched backwards.

Using QuickFind

The QuickFind feature allows you to jump straight to a Control cue by pressing a single function key on the keyboard. Simply name the cues F1, F2, F3, etc, and then press the corresponding function key. See “Using Find and Quick-Find” on page 195 for more details.

Find/Replace Again

Repeats the most recent Find/Replace command.

Snap

When enabled, objects exert gravity on each other as they are dragged with the mouse, making them snap together. This makes it easier to align images, cues and tween points.

- When dragged in the Stage window, images will snap to the edge, center or corner of displays and other images.
- Cues will snap to adjacent cues when dragged in a timeline window.
- Tween points snap to other tween points within the same cue, as well as to the beginning and end of the cue.
- Cues and tween points snap to the current time position. For this to work, first turn off “Click Jumps to Time” on the Timeline menu.
- ◆ **HINT:** When working in a crowded stage window, it may be hard to see what’s snapping to what. If so, zoom in on the area of interest (see “Setting the Stage Scale” on page 97) and disable the preview of layers that get in the way (see “Disabling Layer Preview” on page 103).

STAGE MENU

Add Display

The Stage menu applies specifically to the contents of the Stage window.

Adds a new display of the specified size to the Stage window. After adding a display, open its specifications dialog box to enter its specifications (see “Display Specifications” on page 158).

▲ **IMPORTANT:** Displays can not be added while Online is selected on the Stage menu.

The secondary menu provides some common display sizes as shortcuts. You can, however, enter any size in the display’s dialog box as long as it is supported by the physical display and the interface card in the display computer.

◆ **NOTE:** Displays are added to the current stage tier (see “Using Stage Tiers for Complex Display Arrangements” on page 98). Move displays between tiers using the Cut and Paste commands

Scale

Sets the viewing scale of the Stage window. A larger preview gives you greater precision in positioning displays and images using the mouse.

◆ **HINT:** In addition to these fixed scale factors, you can zoom to any area of interest using the mouse while holding down the Control key (see “Setting the Stage Scale” on page 97).

View

Rotates the Stage window preview so that you can view images, motion paths and other elements from the left or top instead of the front. This is useful when positioning images in 3D space, or editing complex motion paths. See “3D Views” on page 100.

Manage Display Computer

The commands on this sub-menu allows you to operate the display computers from the production computer. This is particularly useful if the display computers have no mouse or keyboard connected.

Remote Access

Opens a remote access window onto the desktop of displays selected in the Stage window. For this to work, WATCHOUT display software has to be running on the display computer. The WATCHOUT display software will be reduced to its window mode, allowing you to see the desktop of the display computer. While in this mode, you can interact directly with the display computer, for instance to delete files, defragment hard drives or similar house-keeping chores.

◆ **NOTE:** Take care not to do anything that causes the display software to close, as doing so also terminates the remote access session.

End the remote access session by closing the desktop window of the display computer. WATCHOUT display software will be restored to its full screen mode by the Online command.

Power Down

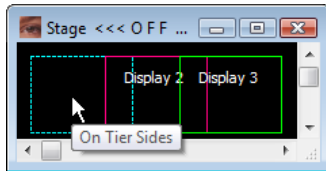
Turns off the power of selected or all display computers. This quits WATCHOUT display software, terminates Windows and turns off the computer. As part of this procedure, the WATCHOUT production software also learns the hardware address of the display computers, which can then be used by the Power Up command.

Power Up

Sends a “Wake on LAN” command via the network to selected or all display computers. If properly configured, this will power up the computer(s) as if their power switch had just been pressed. Put a shortcut to the WATCHOUT display software into the Startup folder of the display computer to make it launch WATCHOUT automatically.

- ▲ **IMPORTANT:** There are a two prerequisites for this command to work:
 - The computer must be configured to “Wake on LAN” (sometimes referred to as “Magic Packet”). This setting may be found under the “Power Management” tab of the Local Area Network Connection’s Properties dialog box, or in the computer’s BIOS settings.
 - The production computer must at some point have given the Power Down command to that display computer, allowing it to learn the computers network card hardware address.

Tier



Manages stage tiers, which are useful for building elaborate display arrangements (see “Using Stage Tiers for Complex Display Arrangements” on page 98).

Main

Selects the main stage tier. There’s always at least one stage tier. Any additional stage tiers will be listed below “Main” on this sub-menu.

- ◆ **NOTE:** In order to add or manipulate displays, you must first select their stage tier using this menu. Inaccessible displays are shown with a dotted outline in the Stage window, and a small text will appear when you point at such a display, telling you which tier it resides on.

Add

Adds another tier to the stage, and selects it as the current tier. Any displays you add or paste will now go onto this tier.

Rename

Allows you to change the name of the currently selected stage tier.

Online

Connects the production computer to the display computers. Once connected, the display computers will follow you as you jump around on the timeline and start/stop the presentation.

◆ **NOTE:** Choosing “Online” also locks all displays in the Stage window. You must deselect “Online” in order to make any changes in the Stage window.

A stop sign inside a display in the Stage window indicates failed connection to that display computer (see “Connecting to the Display Computers” on page 79). Other errors are reported in the Message window.

Update

Updates all connected display computers with any changes you’ve made to the presentation, including transferring new or modified media files to the display computers.

Standby

Causes all display computers to fade to black, or to the image of any standby layer (see “Perform Normal/In Standby” on page 104). Also fades the audio. Useful if you want to pause the show in a smooth way – possibly to jump to another position along the timeline. Give the command again to restore normal image display. While online in standby mode, an indicator is shown at the top of the stage window.

◆ **HINT:** A standby indicator can also be added to the Status window (see page 112).

The fade-out and fade-in times for the Standby command are set in the Preferences dialog box (page 120).

PREVIEW MENU

The items on this menu control the preview of cues shown in the Stage window. These commands do not affect the display computers or what appears on their outputs.

Click Selects Frontmost Image

When this option is selected, clicking an image preview in the Stage window always selects the corresponding cue in the Timeline window. While this is the most natural behavior in many cases, it may get in your way if you want to move an image that appears partially obscured behind another image. In this case, uncheck this menu option, select the cue corresponding to the image to be moved, then drag the image in the Stage window.

Preview Quality

Control the overall preview quality of images in the Stage window using the following four commands.

Wireframe. Displays all images as boxes with the name of the media item, rather than showing the image. This is sometimes useful when trying to position images, or to track down images obscured by other images.

Thumbnails. Uses low resolution thumbnails of images and video for the Stage window preview. While the image quality in this mode is very low, its performance is high – particularly when dealing with numerous, very large images.

Video as Thumbnails. Uses low resolution thumbnails as video preview. Speeds up editing of presentations that have many large video clips playing at the same time.

Best Quality. Renders high quality preview of all cues except those explicitly set to “Stage Preview: Reduced” (page 175).

- ◆ **HINT:** As an alternative to selecting global thumbnail preview for images or video, you can set individual cues to preview as thumbnails by selecting “Reduced” on the “Stage Preview” pop-up menu in each cue.

Perspective

In general, you want the Stage preview to match what you see on screen in terms of image placement and perspective. However, the perspective view can make some editing operations harder. If so, you can turn off the perspective preview using this command, causing the Stage window preview to appear in an orthographic mode.

- ◆ **NOTE:** The amount of perspective applied to images rotated or positioned in 3D space is controlled by the Perspective slider in Preferences (see page 124)

Masked by Displays.

Masks images to the areas inside the displays. This provides a more accurate representation of what is actually shown by the display computers. However, it also makes it harder to edit the presentation, since images positioned outside the displays disappear.

Outline Dimmed Images

When an image is dimmed using an opacity tween track, it may become hard to see and manipulate in the Stage window. Selecting this option causes a thin frame to be displayed around such images, making them easier to see.

Play Audio Media

By default, the production computer plays audio cues for all displays. You can turn off this behavior using this menu option, thereby reducing the processing overhead associated with audio playback.

Preview Standby Layers

When activated, the Stage window will show the same images as the display computers while in standby mode (that is, any images from standby layers – see “Perform Normal/In Standby” on page 104). This allows you to edit such images through the Stage window.

However, in most cases, you probably prefer to see the normal images in the Stage window even while in standby mode, in order to preview and possibly edit those while the display computers show the standby images. This can be accomplished by un-checking the “Preview Standby Layers” menu item.

No / All / Enabled Conditional Layers

These three menu items control to what extent images originating from conditional layers appear in the Stage window. (See “Condition” on page 104 and “Enabled Layer Conditions” on page 123 for more information on conditional layers.) Generally, you want images originating from enabled layers only to appear in the Stage window, which is accomplished by choosing “Enabled Conditional Layers”. To preview images from all conditional layers, regardless of whether or not they are enabled in the Preferences dialog box, select “All Conditional Layers”.

All / Active / Specific Stage Tiers

Just as timeline layers can use conditions to enable/disable their cues (as described in the previous paragraph), timeline layers can also be associated with stage tiers. Cues on such a layer will only appear on displays on those specific tiers. The commands in this group of the Preview menu control what’s shown in the Stage window in this case. By selecting “All Stage Tiers”, the Stage window will preview cues regardless of their stage tier association. Select “Active Stage Tier” to preview cues on layers associated with the tier

specified on the Stage Tier sub-menu. Selecting “Specific Tiers” brings up a dialog box where you choose any combination of stage tiers to preview.

- ◆ **NOTE:** Layers set to All Stage Tiers in their Timeline Layer Settings dialog box (see page 151) will always be included in the preview, regardless of the preview mode chosen using these menu options.

Background Color

Sets the background color of the Stage window. If your source material is hard to see on the default (black) background, then change to another color.

MEDIA MENU

Add Media File

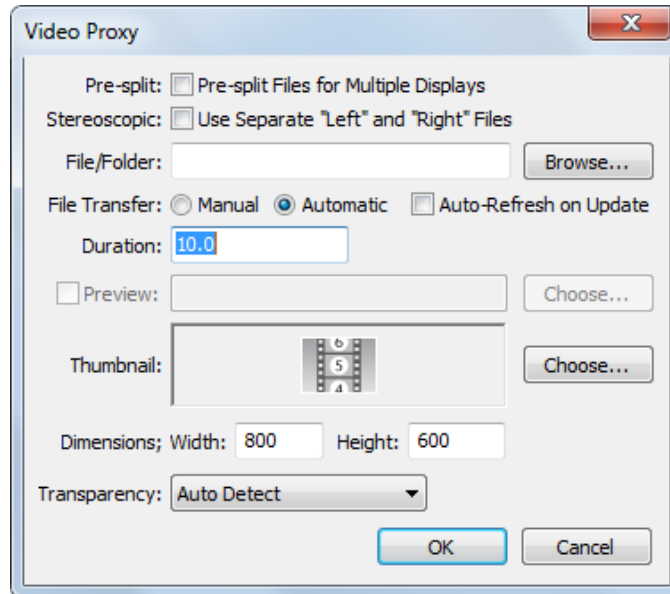
The Media menu applies specifically to the contents of the Media window.

Opens a dialog box where you can choose a file to be added to the Media window. Alternatively, simply drag the file into the Media, Stage or Timeline window.

Add Proxy

Adds a proxy media item of the kind specified. Use a proxy to handle media that can not be added simply by dragging into the Media window, as described under "Using Media Proxies" on page 63.

◆ **NOTE:** Available options vary based on the kind of proxy added.



Pre-split This option applies to video media only. Check this if you have pre-split a large movie, as described on page 42. In this case, the resulting files must be placed in a folder specified in the File/Folder field. This folder must contain one file per display intersecting the movie, each file named after its target display.

For example, assume you have a large video called "LargeMovie.mpg" that intersects two displays named "Display 1" and "Display 2". You would then pre-split the video into two files. Name those files "Display 1.mpg" and "Display 2.mpg" and put them in a folder named "LargeMovie". Finally, specify that folder in the File/Folder field of the video proxy.

◆ **IMPORTANT:** Always append the proper file extension to the name of either the video files or the folder containing the pre-split files. This is needed to ensure that the correct video playback mechanism is used. By default, Windows may not display filename extensions. To show file extensions, choose "Folder Options" on the Tools menu in Windows Explorer, click the View tab, and uncheck "Hide extensions for known file types".

Stereoscopic Select this option to play stereoscopic video. In this case, you must supply separate files corresponding to the left and right eye's viewpoint. Those files must be placed in a folder selected using the Browse button. Name the files Left and Right respectively, appending the proper file type extension. See "3D/Stereoscopy" on page 78 for more details.

You can combine Pre-split and Stereoscopic videos by naming each video according to the display as well as its eye affinity, separated by a dash. For instance, to present a stereoscopic pre-split across two edge-blended projection screen areas, name the files as follows:

Display 1-Left.mpg
Display 1-Right.mpg

Display 2-Left.mpg
Display 2-Right.mpg

File/Folder	The title of this field reads “Folder” if “Pre-split Files for Multiple Displays” or “Use Separate Left and Right Files” is selected, otherwise it reads “File”. In this field you specify the file or folder associated with the media item. You can use the “Choose” button next to the field to choose an existing file/folder. If you set “File Transfer” to “Manual”, you would instead type the fictive, relative path to a file that may not exist on the production computer, but will be provided manually to the display computer.
File Transfer	Specifies whether the file will be transferred manually or automatically from the production computer to the display computers. Normally, you would choose “Automatic”. You may choose “Manual” if the file is to be provided later, directly to the display computer, or if the file is not yet available. <ul style="list-style-type: none"> ◆ NOTE: If you choose “Automatic”, WATCHOUT will make sure that the file/folder you specified actually exists prior to closing the dialog box. If you choose “Manual”, it becomes your responsibility to provide the file, and WATCHOUT will not verify its existence.
Auto-Refresh on Update	If selected, an updated media file associated with this proxy will be transferred to the display computers whenever you use the Stage Update command, without first having to use the Media Refresh command. <ul style="list-style-type: none"> ▲ IMPORTANT: When using this feature, media files must maintain their original size. If required, you can plan ahead by making the original larger than necessary to accommodate future changes.
Duration	Enter the duration of the media here. Applies to moving images (video) and sound only.
Preview	Allows you to choose a scaled down version of a large pre-split video for preview purposes. If not specified, the thumbnail image will be shown instead in the Stage window preview.

- Thumbnail** Allows you to choose a thumbnail image to represent the proxy in the Media window, inside cues and in the Stage window preview. If not specified, a default icon will be displayed.
- Dimension** Specifies the size of the image. Applies to still and moving images.
- Transparency** Allows you to specify whether the image contains transparent areas, as well as the form of transparency used. Normally, WATCHOUT determines this from the information in the media file, but when using a proxy, you must specify this manually. Setting this incorrectly may cause the image to display without transparency or not at all. Applies to still and moving images.

The types of transparency supported by WATCHOUT includes:

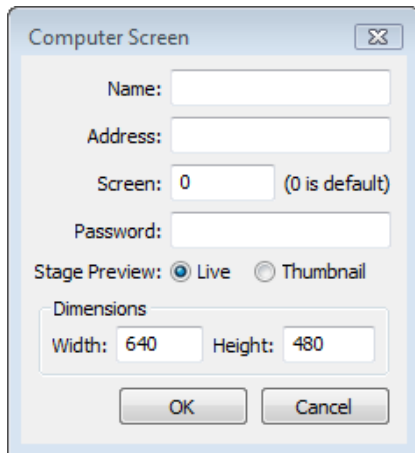
- **None.** The image or video has no alpha channel.
- **Straight Alpha.** The transparency information affects the alpha channel of the image only.
- **Pre-multiplied with White.** The transparency affects both the alpha channel and the pixels in the image so that the pixels in fully transparent areas are white. This is often used in material produced for printing purposes.
- **Pre-multiplied with Black.** The transparency affects both the alpha channel and the pixels in the image so that the pixels in fully transparent areas are black. This is often used in material produced for video compositing purposes.

Add Composition

Add a Composition to the Media window. A composition allows you to group images together (including their tween tracks) in a way that can subsequently be used as a media item on other timelines. See Chapter 6 “Using Compositions” for some examples.

See “Composition Settings” on page 154 for a description of the fields in the dialog box shown by this command.

Add Computer Screen



This feature allows you to incorporate a live image of a computer screen into WATCHOUT. This can be used to show Excel graphics, Powerpoint slides, a Web browser, or similar software applications, as part of your presentation.

The image displayed on the source computer’s screen is sent continuously via the network to the WATCHOUT display computers, where WATCHOUT composites it with other media. For example, you can put a plain Powerpoint presentation on top of a large, high-resolution background, thereby enhancing it with all the high-quality presentation capabilities of WATCHOUT.

To incorporate such a computer screen into your presentation, follow these steps:

- Install, activate and configure VNC server software on the remote computer (see “VNC Server Software” on page 20).
- Add a Computer Screen media item to the Media list using this command on the Media menu. Configure it as described below.
- Drag the computer screen object from the Media list onto the Stage, and program it using cues as any other image element.

The same capabilities apply to computer screen images as any other images. For instance, you can program its position, scale and opacity. Since the

images are sent across the network to all display computers, you can show the computer display across multiple display computers.

Computer Screen Settings. In the Computer Screen dialog box, type the IP number of the remote computer into the Address field, and the VNC password into the Password field. Set Dimensions to the size of the display of the VNC server (reducing the resolution may improve performance).

The Screen field is rarely used, and should generally be set to zero. It may be used with some implementations of VNC server software which support multiple screens or work-spaces.

Set “Stage Preview” to “Live” if you want to preview the Computer Screen in the Stage window of the production software. Otherwise, set this to “Thumbnail”. This setting affects the Stage window preview only – not what’s shown by the display computers.

◆ **NOTE:** The computer that’s being viewed does not require a WATCHOUT license key.

Add Live Video

This feature allows you to display live video, such as a camera feed, as part of your WATCHOUT presentation. The live video feed must be connected to each display computer that is expected to show it. For instance, if you want to show live video across two displays, the video signal must be fed to both display computers (typically using a video distribution amplifier). See “Live Video Input” on page 224 and page 18 for more details.

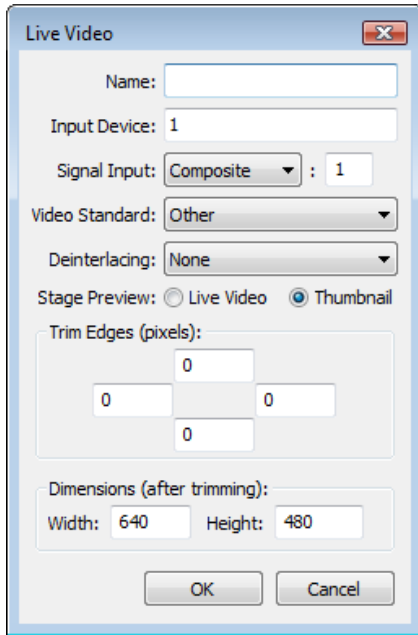
To activate the Live Video feature, follow these steps:

- Start WATCHOUT display software on the display computer.
- Press Ctrl-W to switch to window mode.
- On the “Video In” menu, make sure that your video input device is associated with the desired device number.
- Connect a video source to the video input.

Associate a video input device number with your video input(s).

Video inputs available on the display computer appear here.





To use Live Video in your presentation, do as follows:

- Add a Live Video media item to the Media list using the command on the Media menu, configuring it as described below.
- Drag the Live Video object from the Media list onto the Stage or a timeline, just like any other media object.

Live Video supports the same capabilities as video played from disk, allowing you to program its position, scale, rotation and opacity.

To show live video across multiple displays, you must connect the video signal to each of those display computers. Furthermore, this video signal must be associated with the same input number on each display computer that is to display it. See “Live Video Input” on page 18 for more details.

Live Video Settings

In the Live Video Media dialog box, set “Input Device” to the device number selected on the “Video In” menu shown in the illustration on page 145. Set the “Signal Input” and “Video Standard” as appropriate for your video connection and source. If your video input interface has multiple inputs for the same kind of signal, enter the desired input number in the field to the right of the “Signal Input” pop-up menu.

- ◆ **NOTE:** Although WATCHOUT does support FireWire inputs, this kind of signal is generally not recommended. A FireWire video feed introduces a significant delay in the video processing, as well as reducing performance and image quality due to the DV data compression.

Deinterlacing. Video originating from most video cameras uses an interlaced signal, just like a PAL or NTSC TV set. Presenting such a video signal on a non-interlaced display device, such as a video projector or other display

device designed to be used with computers, results in visual artifacts often referred to as “combing” around the edges of moving objects. Use the Deinterlacing pop-up menu, set to “Good Quality” or “Best Quality” to rectify this problem when required.

- ▲ **IMPORTANT:** Do not use this feature unless necessary. Some video material and some cameras that can be set to a “progressive scan” mode do not need deinterlacing, and using it may reduce the image quality.

Stage Preview. Set to “Live” if you want to preview the Live Video in the Stage window of the production computer. Otherwise, set this to “Thumbnail”. This setting affects the Stage window preview only – not what’s shown by the display computers.

- ◆ **NOTE:** In order to preview Live Video in the Stage window of the production computer, this computer must have the appropriate video capture capabilities, and the video signal to preview. Set the input associations for the production computer in Preferences (see “Video In” on page 124).

Trim Edges. The fringes of a video signal sometimes contain noise. These four fields allow you to selectively trim each of the edges of the video image to remove such noise.

Dimensions. For most video standards, the dimensions are fixed by the standard. However, when selecting “Other” on the “Video Standard” pop-up menu, you can manually enter the desired dimensions. Use this, for example, to enter the size of a computer signal brought into WATCHOUT using a DVI or VGA capture card (see page 224).

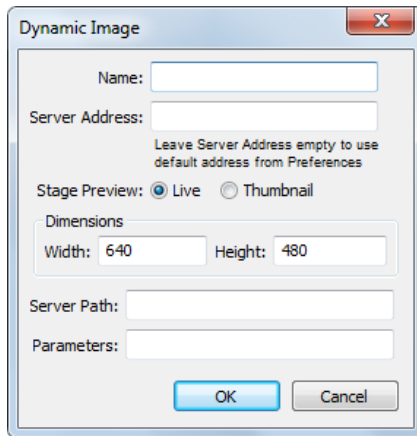
- ◆ **NOTE:** The dimensions shown are after any edge trimming. For example, if the original image is 640 by 480 and you trim 10 pixels at each edge, the resulting dimensions become 620 by 460.

Using Multiple Video Inputs

WATCHOUT supports up to eight video input devices. The number of video inputs that can be displayed simultaneously depends on your computer hardware, type of video input device, etc.

Most video input devices have multiple connectors – often for different kinds of video signals (for example, Composite and S-Video). You specify which one to use in the Live Video media dialog box. Add more Live Video media objects to access different inputs on the same device. Generally, you can only display one input at a time from any given device. Furthermore, it's generally not possible to make a clean switch back-to-back from one signal to another on the same input device. You need to leave a couple of seconds between the end of the cue displaying one input and the beginning of the cue displaying the other.

Add Dynamic Image



Adds a media item for viewing images originating from a “WATCHOUT Dynamic Image Server” (see page 217).

Name. The name used to refer to the media item.

Server Address. The IP number of the computer running the dynamic image server application. If left blank, WATCHOUT will use the address specified in the Preferences dialog box (see “Default Dynamic Image Server Address” on page 123).

Stage Preview. Controls whether the production software’s Stage window will display the live dynamic image or a static place-holder.

◆ **NOTE:** Live preview is not supported when running the dynamic image server software on the WATCHOUT production computer.

Width/Height. The dimensions of the dynamic image. Generally, this should match the actual source image file. But in some cases it may be conve-

nient to enter a different value here, which will make the dynamic image server scale the image accordingly.

Server Path. The path to the still image or SWF file on the dynamic image server. This is specified relative to the location of the image server application. For example, if a file named “CNN_News.swf” is in a folder named DynImg, located next to the “WATCHOUT Image Server” application, set this to:

```
DynImg/CNN_News.swf
```

Use the `-f` command line parameter to specify an alternate location of the served content (see “Alternate File Location” on page 218).

Parameters. Additional parameters passed to the dynamic image being served. See “Dynamic Image Parameters” on page 221 for details.

New Folder

Adds a new folder to the Media window, allowing you to group related media items. Any such group of media in the Media window is independent of the folders on your hard disk, and serves merely as a means to organize items in the Media window.

Large Thumbnails

Displays larger thumbnail images in the Media window. This gives a better preview of each image, but reduces the number of items visible in the list.

◆ **NOTE:** The size of wide thumbnails in the Media window is also affected by the width of the Thumbnail column. Make this column wider to see wide thumbnails.

Refresh

Refreshes items in the Media list by reloading their information from the associated media files. A dialog is displayed allowing you to refresh media

that has been changed or all media regardless of the file's last modified timestamp.

Select Unused

Selects all unused items in the Media window. After reviewing the selection, you can choose Clear on the Edit menu to remove the unused media items.

▲ **IMPORTANT:** Only media items directly or indirectly associated with cues on the Main Timeline, or any auxiliary timeline, are considered as being used. Specifically, media items used in compositions are only considered used when the composition itself is being used. Hence, you can prevent a composition and its media from being considered unused by adding it to an auxiliary timeline.

TIMELINE MENU

Click Jumps to Time

The Timeline menu applies specifically to the contents of timeline windows. It is only available when a timeline window is selected.

Deselect this option to keep the time position stationary while manipulating cues and tween points. The state of this mode is reflected by the color of the current time indicator.

- ◆ **HINT:** Turn off this option to use the current time indicator as a ruler for aligning cues and tween points. See “Snap” on page 130 for more details.

Add Play / Pause Control Cue

Adds a Control cue at the current time and selected layer. When reached during playback, the cue will perform its programmed action. See “Control Cue” on page 193 for full details.

- ◆ **HINT:** When using Control cues, dedicate a layer rather than mixing them with other cues. This makes them easier to find and prevents them from getting obscured by other cues.

Adding and Removing Layers

Choose “Append Layer” to append a layer to the timeline, or choose “Insert Layer” to insert a layer in front of the current layer. Choose “Delete Layer” to delete the current layer. A layer containing cues can not be deleted.

Layer Settings

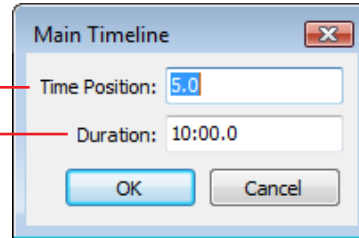
Opens a dialog box that allows you to rename the layer as well as set various layer attributes. See “Layer Name and Attributes” on page 103 for more details.

Timeline Settings

Choosing this command while the Main Timeline Window is active will display the settings associated with the main timeline.

Jump to specified time position.

*Total duration of the timeline.
Extended automatically as more
cues are appended.*



◆ **HINT:** Typing a value into the "Time Position" field jumps to that time. This is often more accurate than trying to click a specific time in the time ruler.

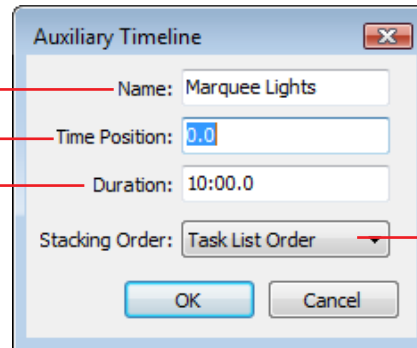
Auxiliary Timeline Settings

Choose the "Timeline Settings" command to displays the settings for an active auxiliary timeline window.

*The name of the auxiliary time-
line (shown in the Task window).*

Jump to specified time position.

*Total duration of the timeline.
Extended automatically as more
cues are appended.*



*Rendering order in relation to
other auxiliary timelines.*

Stacking Order; Task List Order

This is the default stacking order. In this mode, multiple active auxiliary timelines render their images in the order in which they are listed in the Task window. You can change this order by dragging tasks up or down in the Task window, thereby affecting how multiple, active and overlapping auxiliary timelines interact on screen.

Always on Top

In this mode, the auxiliary timeline will render its images on top of all other auxiliary timelines set to “Task List Order” or “Always on Top” when activated. This is useful, for example, when you have a group of mutually exclusive timelines, where each new timeline started should supersede the previous one.

◆ **HINT:** You can then use a Control cue to stop the previous auxiliary timeline in the group. See “Controlling Other Timelines” on page 194.

Above Edge Blend

In this mode, the auxiliary timeline will render its images on top of all other timelines when activated. Furthermore, no edge blend will be applied to its images. This is useful in two specific cases:

- When displaying line-up images. During line-up you want to see the full image all the way out to the edge to make sure that the image fits precisely onto the display chip in the projector.
- When showing a live video image on a display partially intersecting other displays lacking capture cards for this live video input. Putting this live video image on an auxiliary timeline set to render above the edge blend avoids the feathered edge that would otherwise be applied to the intersecting areas.

Composition Settings

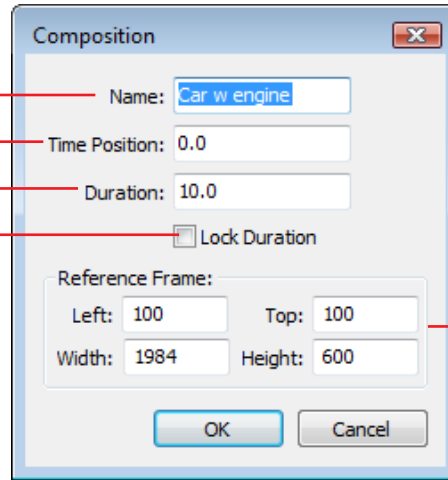
To display its settings, choose “Timeline Settings” while a composition’s timeline window is active.

The name of the composition (shown in the Media window).

Jump to specified time position.

Duration of the composition.

When selected, the composition’s duration will not be automatically extended.



The reference frame is displayed as a gray, dotted rectangle in the Stage window while editing the composition. It is also used to manipulate the composition when subsequently used from other timelines.

Lock Duration

This option is useful for compositions designed to be looped. Often such a loop is designed with a particular cycle time in mind, set as the duration of the composition. In this case, check this option to avoid having the duration extended automatically as cues are added or edited.

Reference Frame

By default, the reference frame is set to enclose all displays on the current stage tier when the composition is created. You can set the reference frame to any size you want, but it is generally a good idea to make it about the same size as its content. This frame is displayed as a gray rectangle in the Stage window while the composition’s timeline window is active. Furthermore, it is also used

to select and manipulate the composition as a whole when used as a media item on other timelines.

- ◆ **NOTE:** The reference frame doesn't constrain or clip the content of the composition. Images may extend outside the reference frame if desired.

TWEEN MENU

The Tween menu is available when a media cue is selected. It allows you to add tween tracks to the cue. Likewise, tween tracks can be removed by unchecking the corresponding item on the Tween menu.

- ◆ **NOTE:** The items available on the Tween menu vary depending on the selected media cue. For instance, Volume tweening is only available for sounds and videos – not for still images.

Read more about the various kinds of tween tracks on page 179.

WINDOW MENU

This menu provides access to all standard windows, such as Stage, Media, Main Timeline, etc. Other windows, such as Composition and Auxiliary Timeline windows are appended to this menu while open, providing a quick way to switch among them.

- ◆ **NOTE:** To open an Auxiliary Timeline or Composition window, double-click the corresponding entry in the Task and Media windows respectively. A Composition window can also be opened by Alt-double-clicking a cue for that composition.

HELP MENU

This menu provides quick access to the WATCHOUT User's Guide and the release notes with the latest news on the current version.

9 DISPLAYS

Displays include projectors, monitors, video wall cubes and plasma screens. Make sure you install and configure your displays properly, as described on page 17. Read more about different display technologies on page 239.

Adding Displays

To add a display to the Stage window, choose “Add Display” on the Stage menu. This menu includes most standard display sizes. The size can be altered afterwards using the “Display Specifications” dialog box (page 158).

- ◆ **NOTE:** Displays can be grouped into stage tiers. When using multiple tiers, new displays are added to the current tier. Likewise, you must select the proper tier before you can manipulate its displays. See “Using Stage Tiers for Complex Display Arrangements” on page 98 for more details.

Selecting Displays

Click a display to select it. Shift-click to select multiple displays. Alternatively, drag from a point outside all displays to use the selection rectangle. To de-select all displays, click outside all displays in the Stage window.

- ◆ **NOTE:** You must activate the Stage window before you can select displays. To activate the Stage window, click its title bar. Displays can not be manipulated if “Online” on the Stage menu is active.

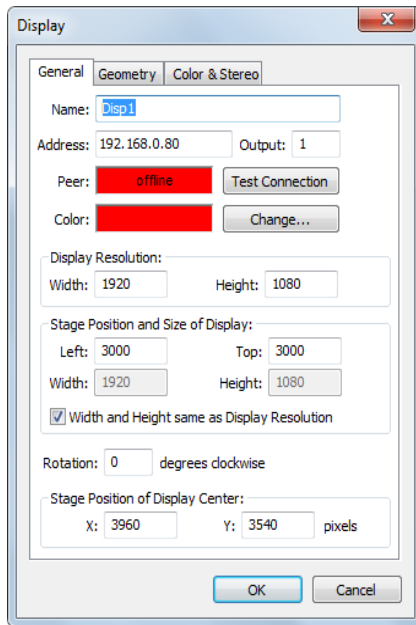
Positioning Displays

Drag a display to the desired position using the mouse. Press the Shift key while dragging to constrain the movement to horizontal or vertical only. For best precision, enter the exact position using the “Display Specifications” dialog box (page 158).

Removing and Duplicating Displays

To remove a display, first select it, then choose “Cut” or “Clear” on the Edit menu. To duplicate it, first choose “Copy” then paste the duplicate back into the Stage window. When pasting a display, keep in mind that the duplicate initially occupies the *exact same location* in the Stage window as the original did. You must move the duplicate to another location and change its name and address before using it.

DISPLAY SPECIFICATIONS



Double-click a display to open its Display Specifications dialog box. You must activate the Stage window before you can select displays. To activate the Stage window, click its title bar. Displays can not be manipulated if “Online” on the Stage menu is active.

Name. Specifies the name of the display.

▲ **IMPORTANT:** This name is also used to identify pre-split movie files, as described under “Pre-splitting Large Movies” on page 42. Thus, if you use such pre-split movies, you should not change the name of the display after creating those movies, or you’ll have to rename the movies accordingly.

Address. Specifies the IP address of the display computer that manages this display. This is typically the numeric address of the display. However, if the display computer is accessible by name (by means of a Domain Name Server), you may enter the DNS name in this field instead.

◆ **HINT:** In most cases, all display computers are on the same subnet, which means that the first part of their IP address is identical, and only the last group of digits differ (as shown in the illustration on page 27). In this case, you can enter the common part of the address in Preferences (see “Display Address Prefix” on page 120), and then enter only the last group of digits in the Display Specifications dialog box. For instance, if the complete

address is “192.168.0.51”, you would put “192.168.0.” into the “Display Address Prefix” field in Preferences (note the trailing period), and then put 51 into the Address field in “Display Specifications”.

Output. Selects the output number of the graphics card to which the display is connected. This allows you to drive multiple displays from one computer by entering the same Address but different Output numbers.

Peer and Test Connection. Indicates the on-line status of the associated display computer. You can use the “Test Connection” button to verify the ability to connect to that particular display computer. This can be useful when troubleshooting a system.

Color and Change. Allows you to change the color of the display’s outline in the Status window.

Display Resolution. Physical resolution used by the display computer for the signal fed to its projector or other display device. WATCHOUT allows you to specify any resolution. However, the allowable settings are ultimately determined by the display device and graphics card.

▲ **IMPORTANT:** When using multiple outputs from a single display computer, all outputs must use the same resolution.

Stage Position and Size. Determines the position and dimension of the display in the Stage Window. Normally, the dimension here matches the physical resolution of the display. You can override this by deselecting “Width and Height same as Display Resolution”, allowing you to enter different values. Doing so will make WATCHOUT scale the image to match the resolution.

◆ **HINT:** This is particularly useful if you have to play a show made for a specific resolution on projectors that can’t handle that resolution.

Rotation. Rotates the display to an arbitrary angle. This allows you to use a vertical display format, as well as other creative display arrangements as shown in the illustration under “Alternative Display Layouts” on page 10.

◆ **NOTE:** Edge blending will only work properly between displays that are on the same stage tier with the same rotation angle and stage size.

Stage Position of Display Center. This field is similar to the Left and Top fields in the “Stage Position of Display” field above, but indicates the center of the display rather than the top left corner. The center is often more relevant when the display is rotated to an arbitrary angle.

GEOMETRY CORRECTION

These settings allow you to compensate for any errors caused by projection off-axis (perspective), on a curved surface or for minor optical distortion.

◆ **NOTE:** Projecting straight from the front on a flat surface always gives the best image. Use geometry correction only when absolutely necessary.

The numeric fields at the bottom of the dialog box show values corresponding to the currently selected point and handle. The buttons next to each numeric field adjust the value with single pixel accuracy.

◆ **HINT:** Go online before opening the Display dialog box to see the changes on screen as you make them.

Corner Shapes. Adds bezier handles to the corners, allowing you to compensate for minor optical distortion, often associated with wide-angle lenses (as exemplified on page 249).

Constrain Points. Limits the freedom by which points can be moved to keep them within realistic bounds. For example, it doesn’t allow points to be moved outside the active display area. Deselect this checkbox for increased flexibility.

Smooth. Avoids abrupt kinks in points by keeping all tangents straight. Uncheck to allow opposing handles to move independently of each other.

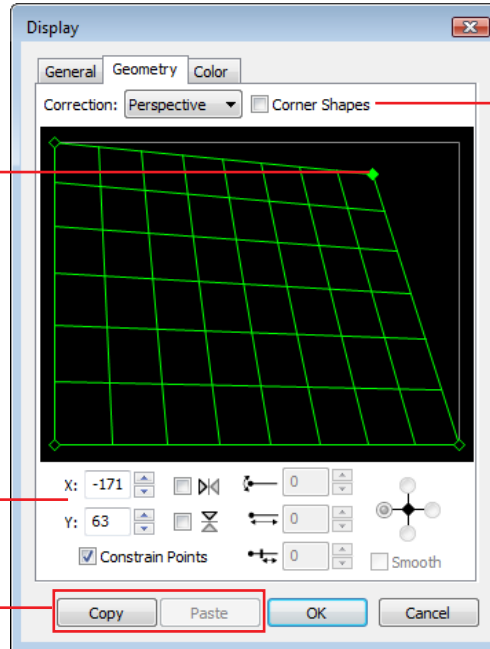
Perspective Correction

To compensate for the keystone-shaped image caused by off-axis projection, choose Perspective on the Correction pop-up menu and drag the corners of the grid until the image appears rectangular on screen.

Drag a corner point to adjust the perspective.

The location of the selected point can be adjusted numerically.

Used to transfer the geometry settings to other displays.



Enable "Corner Shapes" to compensate for optical distortion.

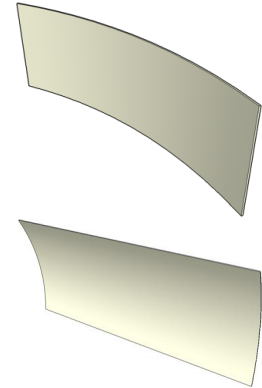
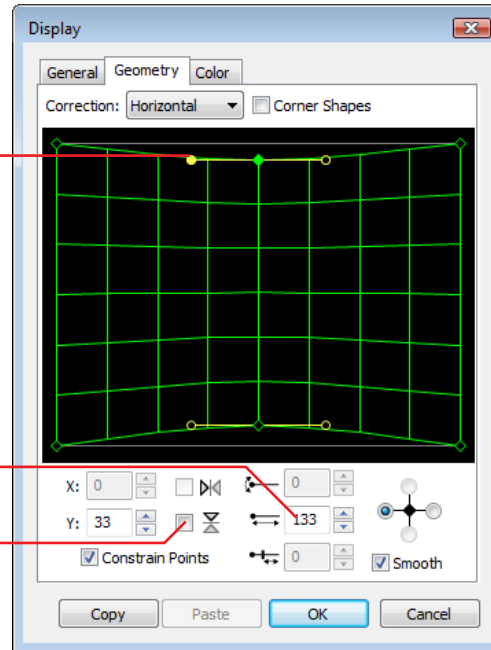
Horizontal or Vertical Correction

Adds bezier handles to the top/bottom or left/right sides, allowing you to compensate for projection on a curved surface.

Adjust the curvature by dragging the yellow handles.

Sets the curvature numerically.

Mirrors adjustments vertically.



Examples of screens requiring horizontal and vertical correction respectively.

- ◆ **HINT:** If projecting from a plane at the center of the screen, select the mirroring checkbox to adjust both sides together. You may need to uncheck this checkbox for the final adjustments.

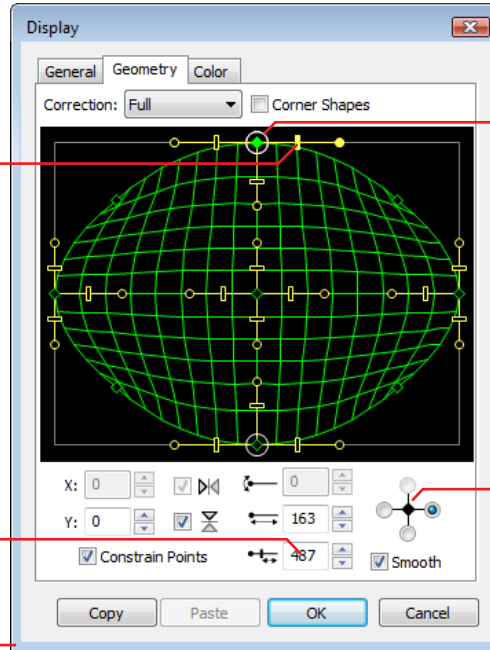
Full Correction

Adds bezier handles to all sides, allowing you to compensate for projection on spherical surfaces.

Rectangular handles control the distribution of grid lines.

Sets distribution of grid lines numerically.

Drag a corner of the dialog box to enlarge it for better precision.



White circles indicate mirrored adjustments of points.

Selects one of the handles attached to each point.

Examples of spherical surfaces requiring full correction.



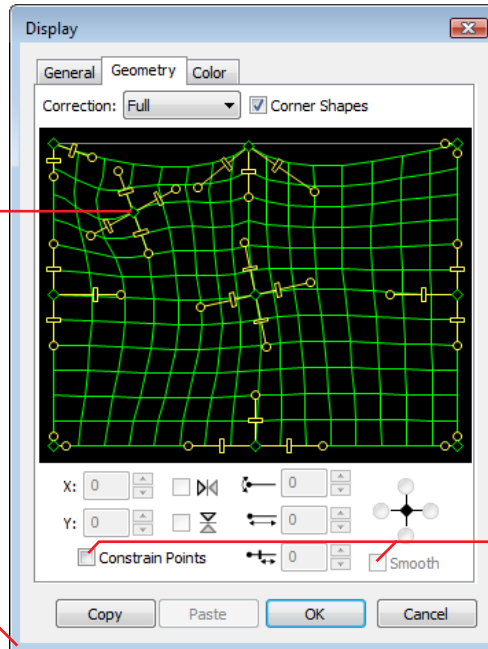
Adding Correction Points

In Full correction mode, you can add control points to the grid by Control clicking at the desired location. This can be used to handle geometry adjustments when projecting on asymmetric or uneven surfaces, such as a three dimensional map.

Control-click in grid to add points.

To delete such a point, select it and press the Delete key.

Drag a corner of the dialog box to enlarge it for better precision.

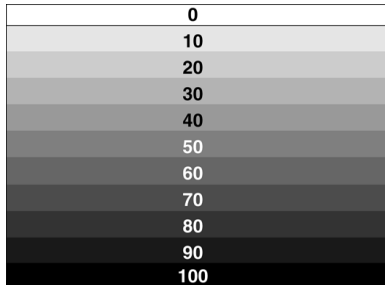


For maximum flexibility in adjusting points, deselect Constrain and Smooth.

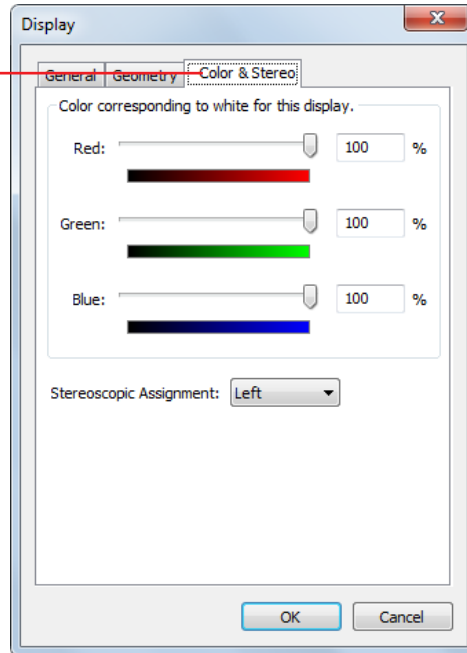
COLOR & STEREOSCOPY

Ideally, all projectors in a system should be properly color matched. However, sometimes you may have to deal with projectors with different lamp life or other minor discrepancies. In such cases, WATCHOUT lets you adjust the color balance of a display device, making the overall image look more uniform.

Select the Color & Stereo tab to make minor adjustments to the color balance of a display device.



Use a test image showing gray bars to adjust the color balance.



- ◆ **NOTE:** Display computers need to be online for you to see the changes as you move the sliders.

Stereoscopic Assignment

Controls the stereoscopic channel reproduced by this display device. You must use separate projectors for the images reproduced for each eye in a stereoscopic presentation. Select the appropriate eye affinity on this menu. Leave this set to None for normal (non-stereoscopic) presentations.

For proper reproduction, each projector in a stereoscopic pair must be equipped with filters matching those used in the glasses worn by the viewers. Please contact your projector vendor for details on supported 3D projection technologies. See “Stereoscopic Presentations” on page 86 for more details.

▲ **IMPORTANT:** You must place the related left and right eye projectors at the same stage position. To avoid WATCHOUT attempting to create edge blends for those overlapping projection areas, place the set of left eye and right eye projectors on separate stage tiers (see “Tier” on page 133).

USING MULTIPLE DISPLAY OUTPUTS

WATCHOUT supports up to six displays connected to one display computer. These displays operate independently of each other. Each display can be freely positioned and rotated. The number of displays that can be connected to a display computer depends on the number of graphics card outputs available.

To drive multiple displays from one computer, first make sure the displays appear in the Windows Display Control Panel (see page 28). Then enter the Output number of each display in its Display Settings dialog box (page 159), using the same computer Address for these displays. Note that all outputs from one display computer must use the same resolution.

◆ **IMPORTANT:** Connecting multiple displays to one computer increases the load on that computer. You will need a more powerful computer, with a multi-core CPU and a fast disk drive or SSD, to drive multiple displays. For best performance, you may need to limit the number of displays.

10 CUES

Cues are the active objects of WATCHOUT. They control when media appear on stage, as well as more dynamic behavior such as positioning and opacity. Cues exist on layers in timeline windows. The layers determine the stacking order of media on stage.

Adding Cues

To add a cue to a layer in a timeline window, drag a Media window item, or a media file, to the layer or the Stage window. Media files can be dragged directly from your hard disk.

▲ **IMPORTANT:** Whenever possible, keep all media used in a presentation in a sub-folder of the folder containing the show file. Doing so allows WATCHOUT to refer to the file using a relative path specification, making it easier to move the presentation with all its media references intact.

When you drag media into the Stage window, the cue will appear on the currently selected layer (as indicated by a yellow line under the layer's name) and at the current time position. When dragging into the timeline, the cue appears at the layer and time you drag it to.

Selecting and Positioning Cues

Click a cue to select it. Shift-click to select multiple cues. Alternatively, drag from a point outside all cues to use the selection rectangle. Use "Select All" on the Edit menu to select all cues on all layers. To de-select all cues, click in the white space of any layer in the Timeline window.

You can also select a cue by clicking its preview image in the Stage window. This allows you to determine which cue corresponds to a particular image on stage.

To position selected cues, drag them using the mouse. To drag cues to another layer without altering their time positions, press the Shift key while dragging.

If you want to position a cue numerically, cut it, go to the desired time position using the Timeline Settings dialog box (page 152), then paste it. Alternatively, use the cue's dialog box (see "Cue Specifications" on page 170).

Selecting Cues using the Arrow Keys

Press the right or left arrow keys on the keyboard to select the next or previous cue on the currently selected layer. Pressing the Shift key as well selects the next or previous cue on any layer. Pressing the up and down arrow keys changes the currently selected layer.

Cutting, Pasting and Deleting Cues

Use Cut, Copy and Paste on the Edit menu to move or copy cues within a presentation or to other presentations via the clipboard. When transferring cues to other presentations in this way, any media associated with those cues will automatically be added to the target presentation.

To delete cues without altering the content of clipboard, select the cues then choose "Clear" on the Edit menu.

Changing a Cue's Media Position On Stage

Cues contain information on where the media will appear on stage. To change the stage position, do one of the following:

- Drag the preview image in the Stage window. You can change the stage position of multiple cues at the same time by first selecting those cues.

- For precise adjustments press Control-arrow. Add the Shift key for greater increments.
- Double-click a cue and change its “Initial Stage Position”. If the cue has a Position tween track, this will relocate the entire motion path.
- Double-click one of the cue’s Position tween points.
- ▲ **IMPORTANT:** If a cue has a Position tween track, click the desired tween point to go to its time before moving the image using the mouse or the arrow keys. If the timeline isn’t positioned exactly at the tween point, a new point will be added. This assumes “Click Jumps to Time” is selected on the Timeline menu.
- ◆ **HINT:** You can move the stage position of multiple cues using the Move command (page 127). This is particularly useful when merging cues from shows having different display positions.

The stage position of the anchor point is shown numerically in its Position tween track, if any. See “Positioning Media on Stage” on page 65.

Changing a Cue’s Duration



Drag either end to change the duration of all selected cues.

To change the duration of selected cues, drag the bar at either end of a cue. If the cue has tween points, they will remain stationary in relation to the timeline. To stretch the tween points with the cue, press the Alt key while dragging the end of the cue.

- ◆ **HINT:** Either end of the cue will snap to the current time position if “Snap” is selected (see “Snap” on page 130). For this to work, you must first deselect “Click Jumps to Time” on the Timeline menu.

To set the duration precisely, type the desired duration into the cue's dialog box (see "Cue Specifications" on page 170).

- ◆ **NOTE:** If you extend the duration of a movie beyond its natural duration, it will by default stop at the last frame. Alternatively, you can make the movie run repeatedly in a loop by choosing the "Loop" behavior in the cue (see "Looping" on page 175).

Replacing a Cue's Media

To change the media associated with a cue, drag new media onto the cue. You can drag either an item from the Media window, or a new media file from your hard disk.

- ◆ **HINT:** If you want to replace *all* instances of a certain media file, you can change the file association of the item in the Media window instead, as described under "Changing the File Association" on page 108. Doing so will affect all cues associated with that media item.

CUE SPECIFICATIONS

Specifies the settings of the current cue. The options available vary with the kind of media that is controlled by the cue. To open a cue's specifications dialog box, select the cue and choose "Specifications" on the Edit menu, or simply double-click the cue.

The time when the media will appear on stage.

Starting offset into sound or video.

Stage position of anchor point at the start of the cue.

Position of anchor point within image, relative to image's top left corner.

Video Cue

Basic Advanced

Time: 7.65

Duration: 27.8

Pre-Roll: 0.0 Automatic

In-Time: 0.0

Media: Locate Media
BartGlow2.m2v

Initial Stage Position:
X: 3711 Y: 3400 Z: 3

Anchor Position within Image:
X: 712 Y: 400 Z: 0

Set To: Top Left Center

OK Cancel

How long the media remains visible on stage.

Media will be pre-rolled automatically (uncheck to specify pre-roll time manually).

Locates associated item in the Media window.

Sets the top-left or center position for anchor point.

In-Time

Specifies a starting offset for a sound or movie. For example, a certain movie may have ten seconds of black at the beginning. To skip those ten seconds, set the in-time to 10.

Anchor Position

Determines the position of the image anchor, relative to the upper left corner of the image. The anchor of a selected cue is displayed as a crossed circle in the Stage window. When scaling or rotating an image, the anchor specifies the point that remains stationary.

- ◆ **HINT:** A checkbox in the Preferences dialog box determines the initial position of the anchor point for new cues. See “Center Anchor Position” on page 121.

Initial Stage Position

If the cue has no Position tween track, this field controls its media position on stage. Otherwise, this is the position of the first tween point. Changing this position moves the entire motion path, if any.

- ◆ **HINT:** To move the position and motion paths of a set of cues, first select the cues, then choose Move on the Edit menu.

Locate Media

Locates the associated item in the Media window, automatically opening any enclosing folder.

- ◆ **HINT:** Double-clicking a cue on a timeline while pressing the Alt key opens its associated media item. This shortcut is particularly handy when you want to open a Composition associated with a cue, as it allows you to go straight from the cue into the Composition.

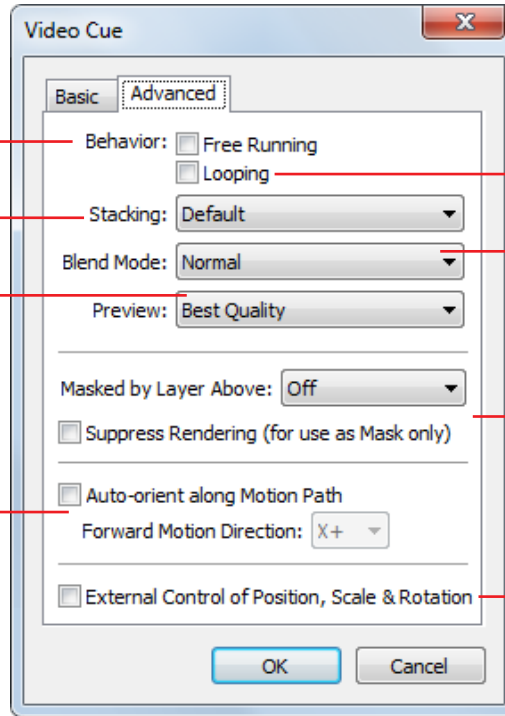
Advanced Cue Specifications

Continue to play even if timeline stops.

Controls how overlapping images cover each other.

The stage window preview quality of this cue.

Make the image rotate automatically to point in the direction of its motion path, and controls what image axis to consider as pointing forward.



Loop sound or movie when cue is extended past media's natural duration.

Controls how overlapping images blend together.

Allows an image to be masked by the image on the layer above, and to suppress rendering of the image used as mask.

Allows for external control of position, scale and rotation using an Input.

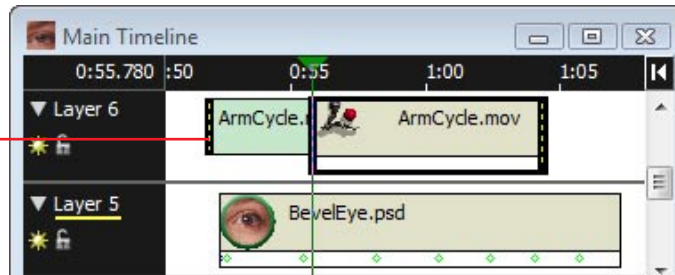
Pre-Roll

Video needs to be pre-loaded and prepared a few seconds ahead of its appearance. When set to "Automatic", this time is calculated automatically. This is the appropriate setting in most cases.

However, certain video files may require extensive computer resources when prepared. This may have an adverse effect on already visible, moving media. Although this is unavoidable, you may be able to reduce the impact by moving the moment when the preparation occurs backwards to a more appropriate time.

When specifying the pre-roll time manually, a pre-roll indicator appears in the timeline window. Adjust the pre-roll time by dragging the start of this indicator.

Pre-roll indicator. Drag to change pre-roll time.



Free Running

Causes sound, movie or composition media to continue to play even if the timeline is paused. This is particularly useful in speaker support or conference situations, where you may be cueing the timeline manually. While waiting at a pause cue, you may still want to have something moving on stage.

- ◆ **HINT:** Free Running and Loop behavior can be combined to create continuous playback of undetermined duration.

Looping

Causes sound or movie media to loop (re-start from the beginning) when played past its duration. This is particularly useful for short, cyclical animations, where the movie then contains only a single cycle.

- ◆ **NOTE:** To see the effect of this behavior, the duration of the cue must be extended past the media's natural duration, or made free-running.

Stacking

When using WATCHOUT in its traditional 2D mode, images originating from higher timeline layers cover images from lower layers. This is the behavior obtained when choosing "By Layer". However, when positioning and moving images along the Z axis (towards or away from the viewer), you may want images closer to the viewer to always appear in front of more distant objects. In many cases, this can be accomplished by placing the cues onto layers in a matching order, which is the preferable solution. When this is not possible, choose "By Z-Depth" instead, to make images with lower Z position appear in front of images with higher Z position.

- ◆ **NOTE:** Images with transparent or semi-transparent areas may not blend with other objects as expected when using "By Z-Depth". If so, re-arrange the cues onto layers in the desired front-to-back order.

The "Default" option is identical to "By Layers" for cues on the Main Timeline or Auxiliary timelines. For cues in compositions, this setting makes images inherit the corresponding setting of the cue that plays the composition.

Preview

Controls the maximum Stage window preview quality. Set to "Reduced" to preview the image using its thumbnail. Set to "None" to suppress preview

altogether. When set to anything besides “Best Quality”, the name of the cue is shown in *italics* to indicate this.

- ◆ **NOTE:** The preview quality is ultimately constrained by the setting on the Preview menu (see “Preview Quality” on page 135). The cue setting specifies the *maximum* quality by which the cue will be previewed.

Blend Mode

These options control how the image interacts with other images that it overlaps on stage. They perform similar to those with the same name in applications such as Adobe Photoshop.

- **Normal** makes the top image completely cover the bottom image (unless it has transparent areas or opacity applied).
- **Add** results in a very bright image, suitable for adding highlights to other images. Black areas in the overlapping image have no effect.
- **Multiply** results in a darkened image. White areas in the overlapping image have no effect.
- **Screen** is similar to Add, but softer and often produces a more pleasant effect.
- **Lighten** keeps the lightest parts of the images.
- **Darken** keeps the darkest parts of the images
- **Linear Burn** is similar to the Multiple mode, but produces a more intense result.

Masked by Layer Above

Allows you to use one image or video as a mask for another one. The image to be used as a mask must be placed on the layer immediately above the one to be masked. If the mask image has an alpha channel, choose the “Alpha

Mask” mode. Otherwise chose “Luma Mask” to use the brightness of the image to create the mask. Choose the “Inverted” version of each mask mode to reverse the mask.

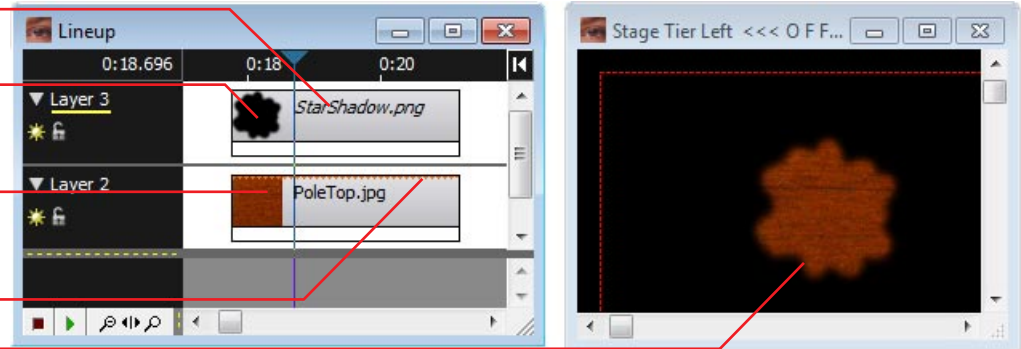
Italics indicate “Suppress Rendering” selected.

Image used as mask with “Suppress Rendering” selected.

Image being masked, with “Alpha Mask” selected.

Red dots indicate mask.

Resulting image.



Masking is indicated by red dots running along the top of the masked cue.

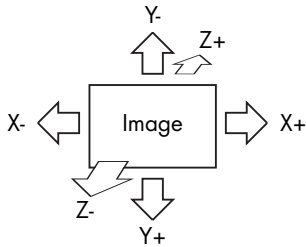
Suppress Rendering

When using an image as a mask, you often don't want the image itself to be rendered – only its masking effect. Select this checkbox in the cue that controls the image used as a mask to obtain only the mask effect.

- ◆ **NOTE:** Select “Masked by Layer Above” in the cue of the image being masked, and select “Suppress Rendering” in the cue of the image being used as a mask.

When this option is selected, the cue's name is shown in italics

Auto-orient along Motion Path



External Control of Position, Rotation and Scale

Causes an image to rotate according to its motion direction at any given time. This is useful when animating an object that should always point along the path of motion, such as an airplane (see illustration on page 76).

The “Forward Motion Direction” options control the orientation of the image as it moves along the motion path. Choose the direction you want to be considered forward, with the default value being the right edge of the image (X+).

- ◆ **NOTE:** In some cases you may also need to apply Rotation to the image to make it point in the desired direction.

Usually, you control image position, rotation and scaling using the corresponding tween tracks alone. However, you may occasionally want to control these parameters from an external source, such as a MIDI or DMX input, or via the network (see “Inputs” on page 197). Select this checkbox to allow for such external control. Add the desired tween track and use its formula button to assign the control source to the desired parameters (see “Controlling Tween Tracks” on page 202).

- ▲ **IMPORTANT:** Selecting this option significantly increases the load on all your computers. Do not choose this option unless necessary.
- ◆ **NOTE:** For still images, this option is only available when “More Effects and Capabilities” is selected for the image (see page 36).

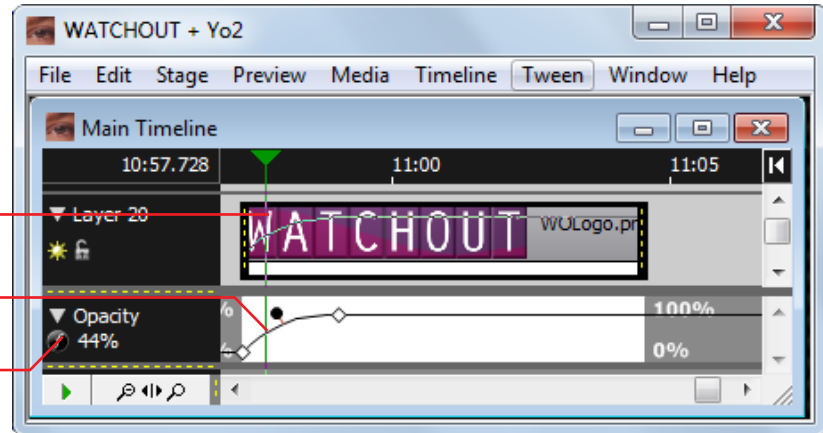
TWEEN TRACKS

Tween tracks control the appearance of media on stage over time. Depending on the type of media associated with the cue, you can add one or more tween tracks. Opacity, Position, Scale, Rotation, Crop, Color and Tint apply to images. Volume applies to movies and audio media. Most tween tracks also apply to composition cues.

To add or remove a tween track, first select the cue then choose the desired type on the Tween menu.

Tween tracks of the selected cue appear in the tween pane.

Formula button linking the tween track to an external control input.

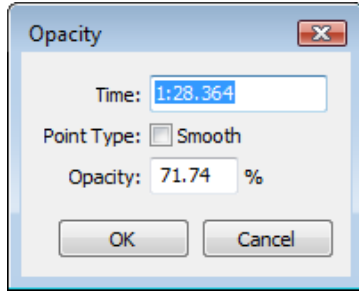


The following pages describe each kind of tween track. See also “Tween Tracks” on page 69 for more details on how to use tween tracks in general.

External Control of Tween Tracks

Most parameters can be controlled by external inputs, or by a combination of tween track and external input. Those are indicated by a round formula button, as shown in the illustration above. See “Controlling Tween Tracks” on page 202 for more details. See also “External Control of Position, Rotation and Scale” on page 178.

Opacity



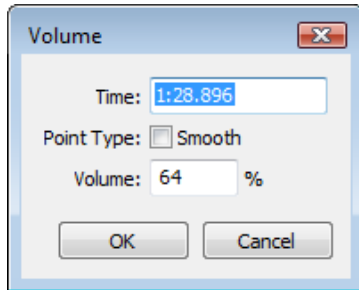
Controls the opacity (transparency) of an image. To change the opacity, either drag the tween point vertically in the tween track, or double-click it to change its value numerically. See “Opacity” on page 72 for more details.

The “Time Position” field specifies the position of the tween point along the timeline. This must be a time within the time span occupied by the cue.

The “Smooth” checkbox allows you to change a corner point into a smooth point, and vice versa.

- ◆ **HINT:** The opacity curve is also displayed in the cue’s body, allowing you to see it even when the cue isn’t selected.

Volume



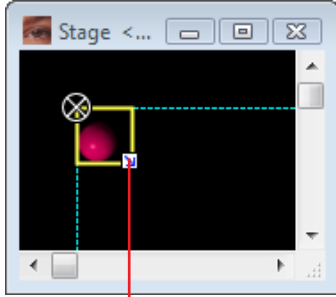
Controls the audio volume of audio media and video containing audio. Its behavior is identical to that of the Opacity tween point, described above. See “Volume” on page 72 for more details.

- ◆ **HINT:** The volume curve is also displayed in the body of a cue assigned to an audio media item, allowing you to see the curve even when the cue isn’t selected.
- ◆ **NOTE:** When a Volume tween track isn’t used, the volume is controlled by a setting in the Preferences dialog box (see “Default Audio Volume” on page 121).

Balance

Controls the left/right audio channel balance. Applies to audio media and video media containing audio.

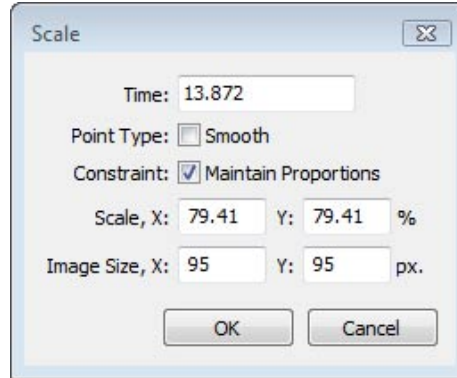
Scale



As an alternative to the Scale dialog box, simply drag the scaling handle. Press Shift to maintain the image's proportions as you drag.

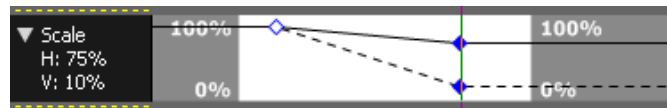
Non-uniform scaling results in a split scale curve, allowing you to adjust horizontal and vertical scaling independently.

Scales an image in relation to its anchor position (see "Anchor Position" on page 172).

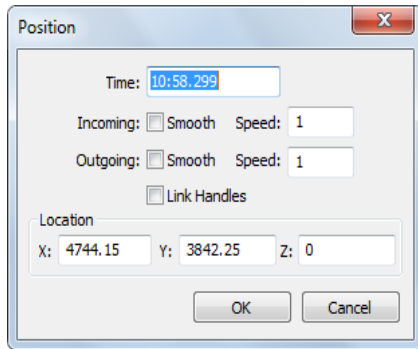


You can specify either the scale factor (relative to the image's natural size), or the desired size of the image on stage. Negative values flip the image.

To scale the width and height by different values, first uncheck the "Maintain Proportions" checkbox.



Position



Positions an image on stage. To change the position, drag the image or one of the motion path handles shown in the Stage window when the cue is selected. To set the position numerically, double-click the Position tween point and type the desired position of the anchor point into the “Location” field.

◆ **HINT:** To move the entire motion path, first select all the Position tween points, then drag the image. Or use the Move command on the Edit menu.

The “Speed” fields control the speed of motion into or out from the point. A value of 1 results in the normal speed required to move linearly to the next point. Smaller values make the image go slower and greater values go faster. The speed is indicated by white dots along the motion path (see below), and can also be controlled using the speed handles (visible only for smooth points).

Using the Z position field, you can move the image along the Z axis, away from or towards the viewer. The Z position can also be controlled by dragging the Position tween point vertically, with the position indicated numerically next to the tween track. Moving the image along the Z axis changes its perceived size according to the amount of perspective selected in the Preferences dialog box. When images move away from the viewer, they move toward the vanishing point, which is also set in the Preferences dialog box. See “3D Perspective and Stereoscopy” on page 124.

Normally, images overlap and obscure each other according to their layer order. When using Z position, you may want images closer to the viewer to obscure images farther away. If so, select “By Z-Depth” in the cue’s specifications (see “Stacking” on page 175).

When positioning images along the Z axis, it may be hard to see where the image is when viewed from the front. If so, choose “View, Left” or “View, Top” on the Stage menu to rotate the stage preview. These views also allow you to

edit the Z position by dragging the image or its position tween points in the Stage window.

- ◆ **HINT:** In some cases, it may be easier to edit the position of an image in the Stage window by first deselecting Perspective on the preview menu (see “Perspective” on page 136).

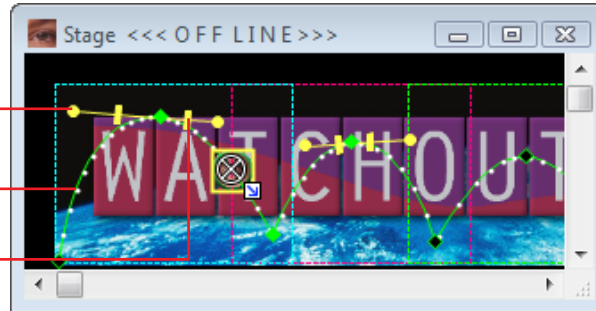
Moving along a Path

The “Smooth” checkboxes allow you to create curved motion paths, as shown under “Moving Along a Curved Path” on page 76. When selected, a direction handle appears attached to the point, controlling the direction of motion into or out from the point.

Smooth Position tween points create a curved path.

White dots along the motion path indicate the speed of motion.

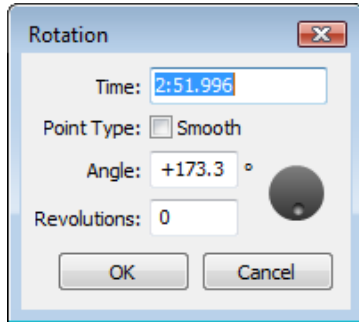
Speed control handle.



Link Handles

Select “Link Handles” to make sure that the motion through a tween point is perfectly smooth. When selected, the directional handles on either side of the point are linked so they always point in opposite directions.

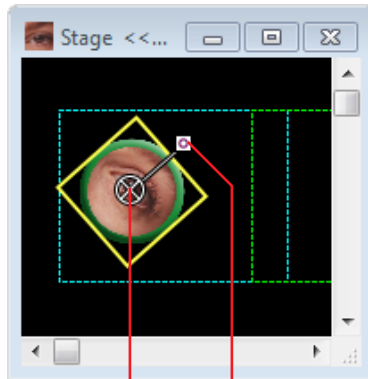
Rotation Z



Rotates an image around its anchor point (see “Anchor Position” on page 172). You can rotate the image by a specified number of revolutions or degrees, or a combination of the two. (For example, to rotate 2.5 times, set Revolutions to 2 and Degrees to 180.)

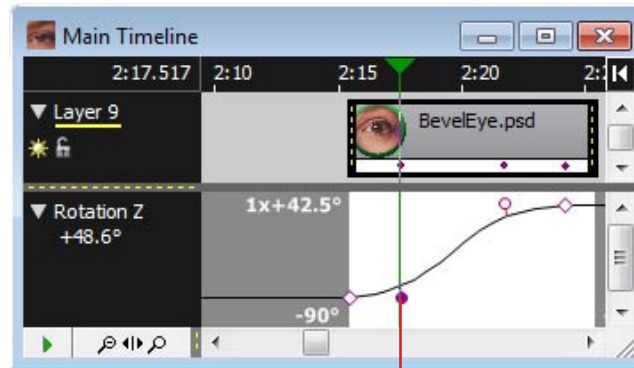
Alternatively, drag the rotation handle in the Stage window or the Rotation tween point in the tween pane.

- ◆ **HINT:** You can also make an image rotate automatically to orient itself along a motion path, as described on page 178.



Anchor point.

Rotate by dragging the handle...



...or a rotation tween point.

Rotation X and Y

Similar to the Rotation Z tween track described on the previous page, but rotates the image around its X (horizontal) or Y (vertical) axes instead, making it appear in perspective. The amount of perspective applied is specified in the Preferences dialog box (see “3D Perspective and Stereoscopy” on page 124).

- ◆ **HINT:** To edit the amount of X or Y Rotation interactively in the Stage window, first change the viewpoint using the View command on the Stage menu (see “View” on page 131).

Key (Green/Blue)

Makes a green or blue background transparent. This is sometimes referred to as a “green screen” or “chromakey” effect, and is typically used with live video, although it can be used with any kind of image. Adjust the Threshold and Contrast parameters for best effect.

- ◆ **HINT:** For non-rectangular video playback, you can often use a pure green or blue background, combined with this tween track, as an alternative to a true alpha channel. This allows you to use more efficient video codecs than QuickTime Animation, such as MPEG-2 or H.264.

Key (Selective)

Makes any specific, pure color transparent. This can, for example, be used to make a black background transparent (sometimes referred to as a “luma keyer”). Select the color using the color swatch, then adjust the Threshold and Softness parameters for the desired effect.

- ◆ **HINT:** Use this feature to display Powerpoint slides, fed through a capture card Live Video or a Computer Screen media item, on top of a background produced in WATCHOUT. Specify a suitable background color in the Powerpoint presentation, which is then made transparent using this effect.

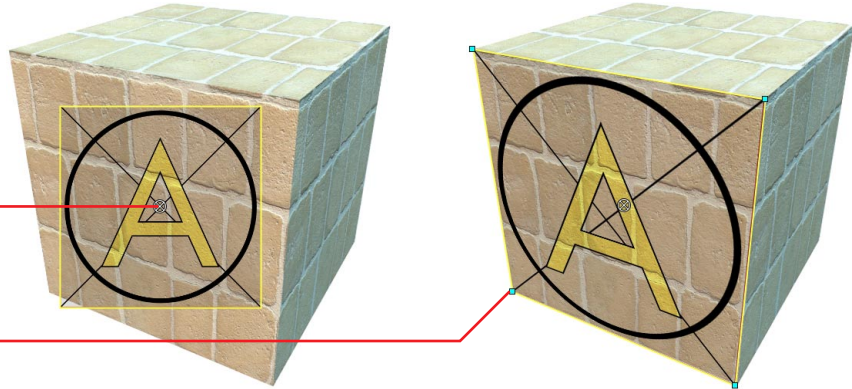
Corners

Offsets the four corners of an image individually, allowing it to be mapped onto another image or real-world object. As the corners are moved, the image changes accordingly to obtain a matching perspective (see below). While this alters the perceived perspective of the image, the image remains flat (2D).

An image being mapped onto an object using a Corners tween track to position each of its four corners.

Original image.

Corners pinned to a target object.



- ◆ **HINT:** This tween track can also be used to skew the image by moving either the top or right-hand side control points.

Wipe

The various Wipe effects make an image appear gradually, starting from one edge or corner and progressing towards the other. To see the effect, ramp up the Completion parameter from 0 to 100% over time. Change the Angle parameter to control the direction of the wipe. Adjust other parameters to your liking by changing the parameter while the Completion value is around 50%.

Black & White

Makes the image monochrome based on the color chosen in the Hue and Saturation parameters. Adjust the Mix parameter to restore some amount of the original color, if desired.

- ◆ **HINT:** The “Black & White” effect, with a carefully chosen source color, often gives a better result than using the “Hue & Saturation” effect to desaturate the image.

Contrast & Brightness

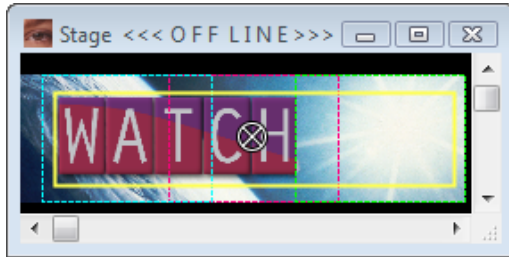
Adjusts the contrast and brightness of the image. This effect uses a spline curve to adjust these values, similar to how you may use the “Curves” command in Photoshop, thereby avoiding clipping in bright or dark areas.

Keep Color

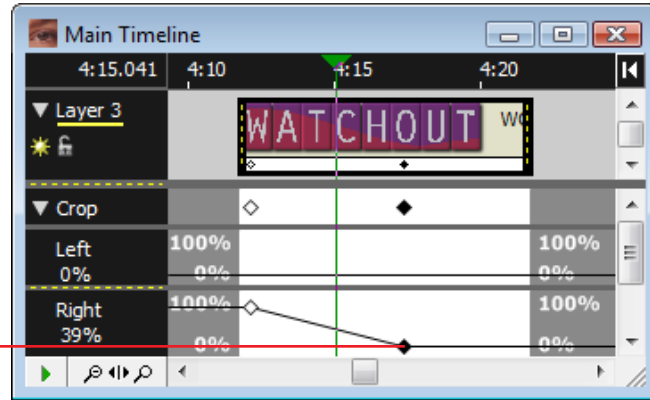
Makes the image mostly monochrome, while retaining a certain color range. First select the color to keep by clicking the color swatch or by adjusting the Hue, Saturation and Brightness tween tracks. Then adjust the Tolerance and Softness until you achieve the desired effect.

Crop

Use a Crop tween track to move the edges of an image inwards. You can use this to remove unwanted parts of an image, or as a creative effect to make text or other elements appear gradually, as in the example shown below.



Adjust the cropping by dragging the tween point corresponding to the desired edge, or double-click the point to set its value numerically.



Here the right edge of the image is cropped in a decreasing manner, revealing the logo as a wipe effect, from left to right.

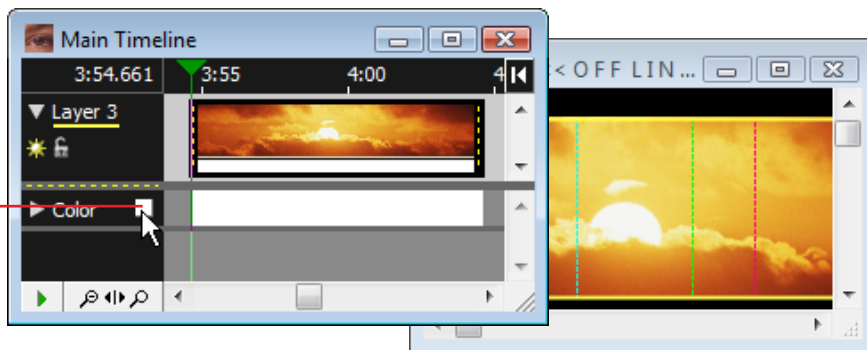
- ◆ **HINT:** To specify a precise amount, double-click a tween point and enter the value as a percentage or in pixels.

Color

Use a Color tween track to specify the overall color of an image. The colors in the image will be multiplied by the color you choose. You can think of the Color tween track as the color of a light source illuminating the image. Normally, the color of this light source is white. By changing the brightness or color of this light source, you can influence the overall brightness or color of the image.

Start by selecting an image cue on the timeline and choosing “Color” on the Tween menu to add the tween track. The default color is white, as indicated by the small color swatch next to the tween track name. Click this swatch to change the color.

Click this button to change the color.



This brings up a dialog box allowing you to specify the color. Choose among the following color models:

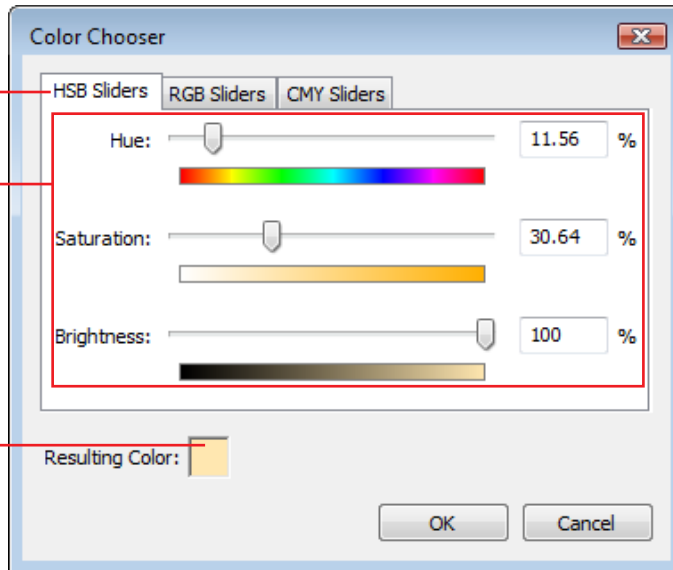
- HSB Sliders specifies the color by first picking a hue (a specific color) and then the saturation (the amount of that color) and brightness of the color. This intuitive color model is familiar to many artists and painters.

- RGB Sliders specifies the color using an additive method based on the amount of the three primary colors Red, Green and Blue. This color model is often familiar to users with a web or computer background.
- CMY Sliders specifies the color using a subtractive method, where you specify the filter density of an imaginative set of Cyan, Magenta and Yellow filters. This model may be familiar to you if you come from a lighting background, where filters are often used to control the color of a light.

Choose a color model.

Specify the color with the sliders, or numerically in the text fields.

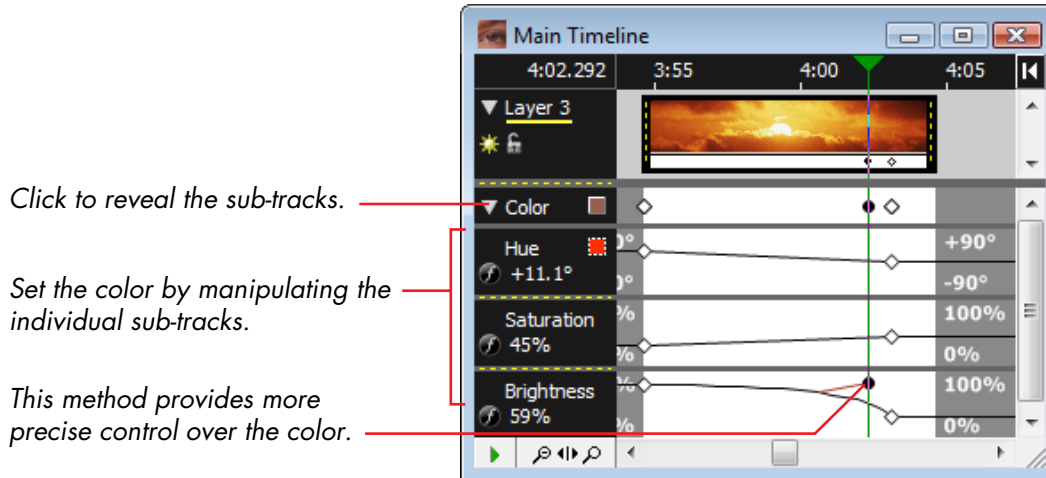
This swatch indicates the resulting color.



- ◆ **NOTE:** It doesn't matter which of the three methods you use to specify the color. Use the method that feels most familiar to you.

When using the HSB model, note that merely changing the Hue has no effect unless you also specify a saturation and brightness greater than zero. Watch the “Resulting Color” swatch as you drag the sliders to see the resulting color. The preview in the Status window shows the color as applied to the image.

An alternative way of specifying the color is to open the Color tween track to reveal its sub-tracks.



◆ **NOTE:** The sub-tracks always use the HSB color model.

◆ **HINT:** Double-click a tween point to set its value numerically. As the hue is specified by its color wheel angle, you can use this method to create rainbow cycles by making the hue go through several revolutions.

Tint

Use a Tint tween track to add color to an image. You can think of the Tint tween track as specifying the color of translucent spray paint added to the image. Normally, the Tint color is black, meaning that no color is added.

Another way of contrasting the Color and Tint tween tracks is to say that the Color tween track primarily affects the bright areas of the image, while the Tint tween track mainly affects the dark areas.

◆ **HINT:** You can combine both Color and Tint on the same image.

Specify the color to be added using the same methods as described above for the Color tween track.

Hue & Saturation

Allows you to re-map the color spectrum of an image, as well as adjusting its color saturation contrast and brightness.

Hue Rotates the color spectrum of the image so that the chosen hue corresponds red in the original image. This can be used for minor color balance adjustments all the way up to color inversion

Saturation Adjusts the color saturation.

Gain Changes the contrast of the image by multiplying all its pixels by the specified amount.

◆ **NOTE:** This may result in clipping in bright areas. If you only want to change the contrast, use the “Contrast & Brightness” effect instead.

Offset Changes the brightness of the image by adding the chosen amount to its pixels.

◆ **HINT:** You can invert the image by setting the Gain to -100% and Offset to 100%.

Channel Mixer

Re-mixes any amount of the original Red, Green and Blue color components to the Red, Green and Blue color components of the resulting image.

CONTROL CUE

The Control cue governs the behavior of timelines. The cue is performed when the timeline runs past it. The Control cue can be used to make a timeline pause, or jump to another position (by time or by name). To create a Control cue, choose "Add Control Cue" on the Timeline menu (see page 151).

Cue name. Used to jump to a named position. Name cues F1 through F12 to use function keys.

Control the enclosing timeline or another, specified timeline.

Time position or Control cue name to jump to.

Makes the timeline stop, pause or run (possibly after jumping).

The screenshot shows the 'Control Cue' dialog box with the following fields and options:

- Name: F2
- Time: 8.918
- Tell Timeline: Current Named: []
- Jump to: []
 - Time Position: 0.0
 - Control Cue Named: []
- Search Reverse Only
- Stop (applies to Auxiliary Timeline only)
- Pause Run
- Jump-to-Run Delay: 0.0
- Buttons: OK, Cancel

Name of auxiliary timeline to control.

Makes timeline jump to a time position or a named Control cue.

Jumps backwards only when jumping to a named cue.

Introduces a delay between the jump and the restart.

Creating Loops

You can use the “Jump to” option to create loops – causing a section of the timeline to be repeated. When jumping, you have the option of automatically restarting the timeline after the jump. In this case, it is often a good idea to introduce a delay of a second or so to allow the display computers to catch up before starting. This is done using the “Jump-to-Run Delay” field.

To exit such a loop, use the QuickFind feature described below, possibly in conjunction with the Standby command (see “Standby” on page 134).

Another option for creating loops is to use a free-running and looping composition. While slightly more complex, it gives better control over the loop exit. To use that method, proceed as follows:

- Put the entire loop into a composition (see Chapter 10).
- Start it using a composition cue (see page 91).
- Select Loop and Free Running in the cue to make the composition loop.
- Make the Main Timeline pause during the loop.
- To continue after the pause, fade out the looping composition cue.

Controlling Other Timelines

A Control cue can also be used to start, stop and position auxiliary timelines. To do so, select “Tell Timeline: Named” in the cue, then enter the name of an auxiliary timeline into the field.

- ◆ **HINT:** To name an auxiliary timeline, choose “Timeline Settings” while its timeline window is open. Do not change the name of an auxiliary timeline after creating control cues targeting it, or you will break the connection.

Using Find and QuickFind

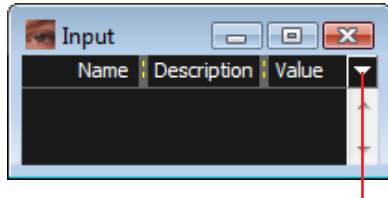
Named Control cues can be used with the Find command to locate a position along the timeline by name. A QuickFind feature allows you to instantly jump to positions using the computer's function keys. To use this feature, simply name the Control cues "F1", "F2", etc, as in the example on the previous page.

- ▲ **IMPORTANT:** The Control cue's name field is case sensitive. When using function key names, type an upper case F.

11 INPUTS AND OUTPUTS

Inputs and outputs act as gateways between WATCHOUT and other external devices. Using industry-standard protocols, such as DMX-512, MIDI, TCP/IP and Serial data communication, you can interact with the presentation environment in many creative ways.

INPUTS



Click this button to add an input.

Inputs receive signals from the outside world. Those signals can then be used to control and influence the behavior of WATCHOUT by starting and stopping timelines and by controlling various cue parameters.

To create an input, first open the Input window using the Window menu, then choose “Add...” from the pop-up menu located in the upper right corner of the Input window. Depending on the type of input chosen, this displays a dialog box allowing you to enter its specifications. See the following sections for details on the various kinds of inputs.

◆ **NOTE:** When you are using the production computer, inputs are managed there. When not using a production computer, inputs are managed by the primary display computer in each cluster.

Generic Input

Use a generic Input when you want to control its value using the WATCHOUT control protocol. The default range of a generic input is 0 through 1, although you may set the upper limit to any positive value using the Limit field in the Generic Input’s dialog box. To control a generic input, use the `setInput` command (see “`setInput`” on page 256 and page 267).

Connecting a MIDI device



Connect your MIDI device to a USB port (or other suitable MIDI interface) on your WATCHOUT computer. Many newer devices come with a direct USB connection. Older MIDI devices often use a standard 5-pin DIN connector, in which case you need a MIDI-to-USB adaptor, or other Windows-compatible MIDI interface.

▲ **IMPORTANT:** When using the production software, connect your MIDI interface to the production computer. Otherwise, connect it to the primary display computer. Turn on and connect your MIDI interface and devices to your computer before starting WATCHOUT.

MIDI Controller Input

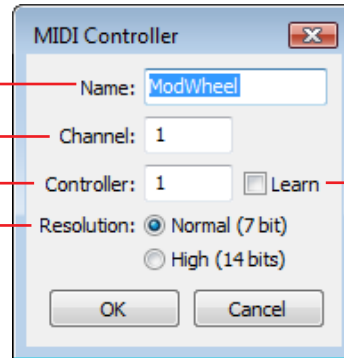
A MIDI Controller Input brings in a knob or slider from a keyboard, or similar signal from a MIDI-compatible device or software. This type of MIDI data is sometimes referred to as a “Continuous Controller”, “Control Change” or “CC” message.

The name used to refer to this input in expressions.

Channel used for the message.

MIDI controller number.

Data resolution for the controller (usually 7 bits).



Click “Learn” and move the controller to pick up the channel and controller numbers automatically.



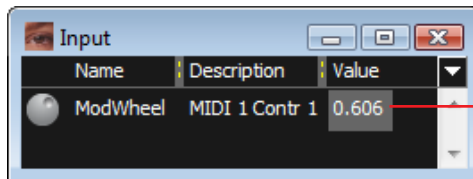
A MIDI device with controller knobs and note keys.

Enter the MIDI channel number and controller number to use, if you know them. If not, click “Learn” and move the controller.

- ◆ **NOTE:** The controller number used in the MIDI protocol is often not the same as any number next to the knob on the device. Furthermore, many devices have programmable controllers, so the actual controller number may vary depending on the device’s configuration.

Do not select “Resolution: High” unless you know for a fact that the controller transmits high resolution data. Regardless of the resolution being used, WATCHOUT normalizes all controller inputs to a number in the range 0 through 1, as indicated in the Input window’s Value column.

When done, click OK in the MIDI Controller dialog box. Verify proper operation of the input by moving the controller and observing the bar graph in the Input window.



Indicates the current controller input value.

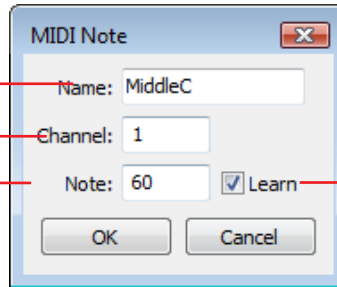
MIDI Note Input

A MIDI Note Input brings in MIDI keyboard messages, often referred to as “Note On/Note Off” messages.

The name used to refer to this input in expressions.

Channel the message is sent on.

MIDI note number.



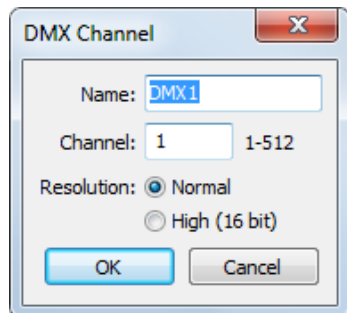
Click “Learn” and press the key to pick up the channel and note numbers automatically.

When done, click OK in the MIDI Note dialog box, Verify proper operation of the input by pressing the key and observing the bar graph in the Input window. If the keyboard has velocity sensitivity, the velocity is indicated by the magnitude of the value.

DMX-512 Input



DMX-to-Ethernet adapters from Enttec and Kissbox.



A DMX-512 Input brings in the value of a DMX channel. DMX-512 is a protocol used by most lighting consoles, dimmers, moving lights and other similar devices.

WATCHOUT uses the computer network to receive DMX data using the Artnet protocol (see <http://www.artisticlicence.com/>). Many modern lighting consoles can send Artnet over an Ethernet network. In other cases, a DMX-to-Ethernet adapter must be used. In either case, you need to know the DMX channel number(s) to be used for WATCHOUT, as well as the Artnet Universe number used to send those channels.

You must configure WATCHOUT to receive that specific Artnet Universe number. This is done under the Control tab in the Preferences dialog box (see “DMX-512 Universe” on page 123).

Add a “DMX-512 Input” to the Input window. When done, click OK in the DMX Channel dialog box, and verify proper operation of the input by moving the fader for the specified channel and observing the bar graph in the Input window. WATCHOUT normalizes DMX values to a number in the range 0 through 1, as indicated in the Input window’s Value column.

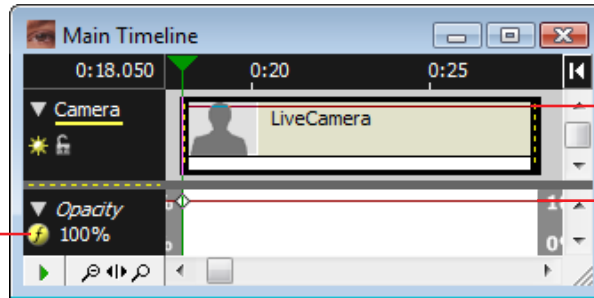
Resolution. Some lighting consoles support high resolution (16 bit) values. Such high resolution values are generally required to control, for example, the position of images in WATCHOUT, since the standard 8 bit DMX resolution (0...255) is too low for this purpose.

If your console is capable of outputting 16 bit DMX values, choose “High (16 bits)” for the Resolution setting, and enter the base (coarse) channel number. WATCHOUT will derive the coarse 8 bits from this channel and the fine 8 bits from the following channel.

Controlling Tween Tracks

Inputs can be used to control parameters of cues, similar to the way tween tracks are used. This provides external control over most parameters. To use this capability, add the desired type of tween track to the cue, then click the formula button located in the header area of the tween track. You may need to click the triangle in the tween track header to reveal the formula button. Some tween tracks have multiple controllable parameters.

The formula button allows you to control a parameter using an input. The button turns yellow to indicate that such control is in effect.



A red tween track curve indicates that the parameter is overridden by a formula.

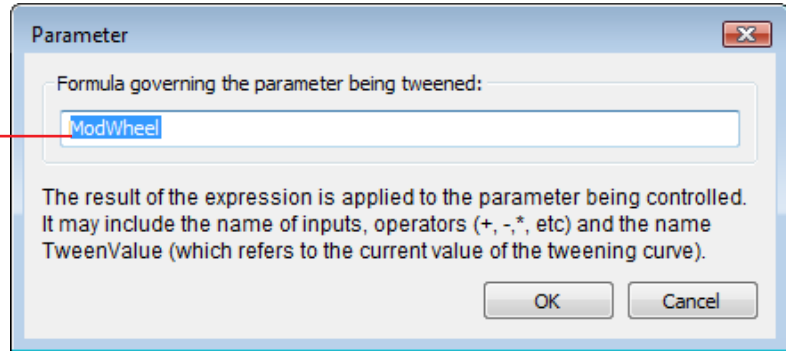
Clicking the formula button brings up a dialog box allowing you to enter the control formula. By default, the formula consists only of the TweenValue item.

- ◆ **NOTE:** In order to access the formula of some tween tracks, such as Position, Scale and Rotation, you must first enable this in the cue's settings (see "External Control of Position, Rotation and Scale" on page 178). For still images, you must also select "More Effects and Capabilities" in the media's specification (see "Optimize For..." on page 36).

Some tween tracks, such as Position, contain multiple values, one for each dimension controlled by the tween track (such as X, Y and X position).

The TweenValue identifier represents the tween track itself. To control the parameter using an input, simply enter the name of the input instead.

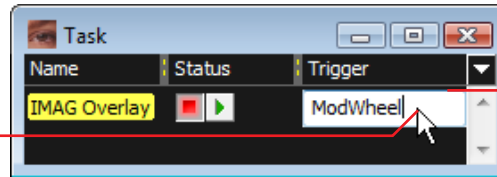
Enter the name of an input to control the parameter using that input. This example uses a MIDI controller, as shown on page 198. Or enter a formula combining inputs, numerical constants, operators and the original TweenValue. See “Expression” on page 212 for more details.



Triggering Tasks

You can use an input to start an auxiliary timeline by entering the name of the input in the Trigger column of the Task window.

Click in the Trigger column of a task to enter its starting condition.



A red border around the field indicates an error in the formula.

Press Enter to complete the formula. The task will be started whenever the value of the formula entered in the Trigger column becomes non-zero. You can create more elaborate starting conditions by entering a more complex formula including multiple inputs, numeric constants and operators. See “Expression” on page 212 for more details.

- ▲ **IMPORTANT:** Most media cues need some time to prepare before they will appear properly on stage. Therefore, it is generally a good idea not to put such cues at the very beginning of an auxiliary timeline. Leave about a second or so empty at the beginning of the timeline.
- ◆ **HINT:** You can only use a trigger to start a task – not to stop it. To stop a task, use another task with a timeline containing a control cue that targets the timeline to be stopped. Trigger this second task using the desired condition. See “Controlling Other Timelines” on page 194 for more details.

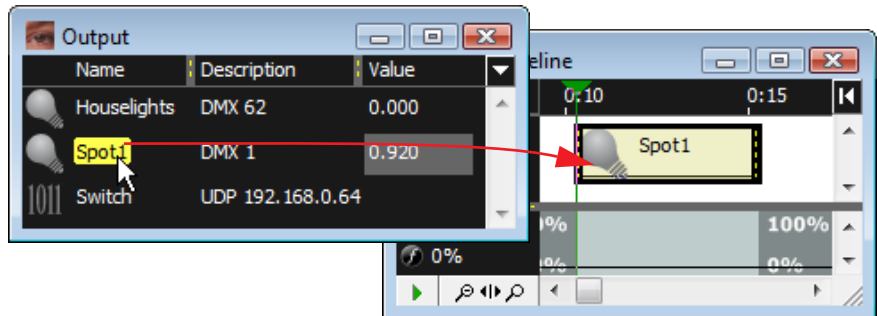
OUTPUTS

Use Outputs to send data to other devices and systems from WATCHOUT. To create an output, click the menu button in the upper right corner of the Output window and choose “Add...” (see “Output Window” on page 110).

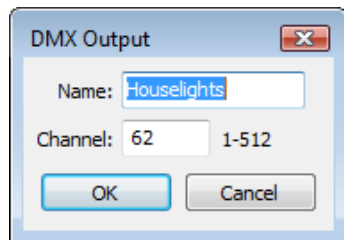
Creating Output Cues

Outputs are controlled using cues. To create a cue for an output, drag the output from the Output window onto a timeline.

Drag an output to a timeline to create a cue for it.



DMX-512 Output



Use a DMX-512 Output to control lighting and other devices which accept the DMX-512 protocol. Specify the DMX channel number to use in the dialog box, as shown to the left, and give the output a descriptive name.

You must also configure WATCHOUT to transmit DMX data on the Artnet Universe number used by the device(s) to be controlled. This is done under the Control tab in the Preferences dialog box (see “DMX-512 Universe” on page 123). All devices controlled by WATCHOUT must be in the same Artnet universe.

If the devices being controlled don’t have an Ethernet connector accepting the Artnet protocol, you need an Ethernet-to-DMX interface, as shown under “DMX-512 Input” on page 201.

A DMX-512 Output is controlled using a Fade cue, created by dragging the output onto a timeline, as seen on page 204. This cue contains a single tween track, allowing you to control the DMX output.

- ◆ **IMPORTANT:** The DMX output is only controlled while the cue is active. Jumping to positions on the timeline between Fade cues will not change the output. To control an output over the entire duration of a timeline, the Fade cue must have the same duration as the timeline.
- ◆ **NOTE:** If you have multiple cues controlling the same output at the same time (for example on separate timelines), the highest value will be chosen.

String Output

Use a String Output to control devices that accept text strings or other discrete data packets through a serial or Ethernet port. For example, you can tell a projector to power down by sending it a command through a serial port on its display computer.

Select the kind of data port to use on this menu.

For a network port, enter its IP address and port number here.

Select the desired IP protocol.

String Output

Output Port Name: Switch

Network Port (TCP or UDP)

Network Address: 192.168.0.64

IP Port Number: 3002

Protocol: TCP UDP

OK Cancel

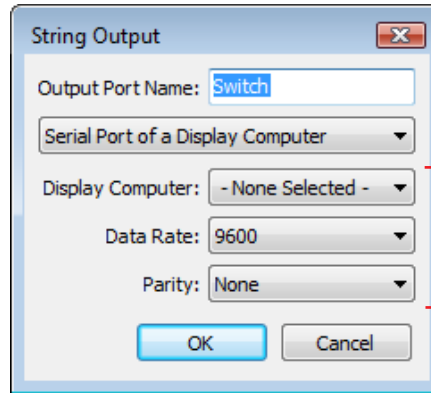
The settings in this part of the String Output dialog box are specific for the kind of port selected on the menu above.

Using a Network Port

When using a network port, you must know the IP number (or DNS name) and port number of the device to be controlled. You must also specify a protocol type. UDP is a rudimentary protocol used by many simple devices, while TCP is more common on computer-based systems. When using the TCP protocol, WATCHOUT will open the connection (if not already open), send the data packet, and close the connection after about a minute of inactivity.

Using a Serial Port

To use a serial port, connect the device to the COM1 port on any display computer, and select that display computer on the pop-up menu in the String Output dialog box. Select the data rate and parity mode according to the specifications of the device being controlled.



Select a display computer that has a serial port available, and set its communications parameters according to the specifications of the device to be controlled.

For more details on serial data communication and wiring, see

http://en.wikipedia.org/wiki/Serial_port

<http://www.airborn.com.au/rs232.html>

Sending a Data String

A String Output is controlled using a String Cue, created by dragging the output onto a timeline (see “Creating Output Cues” on page 204).

Name the cue to state its purpose.

Enter the data to send to the device here. This can be plain text, hexadecimal data bytes, or a combination of both. Prefix each two-digit hexadecimal byte with a \$-sign.

The screenshot shows a dialog box titled "String Cue". It has a close button (X) in the top right corner. Below the title bar, there are two input fields: "Name: On" and "Time: 20.874". Below these is a section labeled "Data to Send:" with a text area containing "[ON]\$0D". Below the text area is a note: "To send arbitrary data, type a dollar sign followed by two hexadecimal digits. For example, to send a Carriage Return, type \$0D." At the bottom of the dialog are two buttons: "OK" and "Cancel".

- ◆ **NOTE:** The data is sent only when the timeline plays across the cue. It is not sent when jumping to or past the cue.

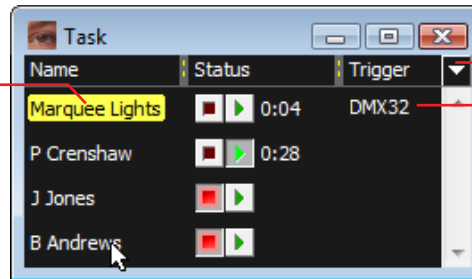
12 TASKS AND EXPRESSIONS

The Task window allows you to create multiple auxiliary timelines, and to specify their triggering conditions using expressions. Auxiliary timelines behave very much like the main timeline, but can be started and stopped independently.

If an auxiliary timeline displays images on stage, those images will appear on top of any images originating from the main timeline. You can control the order in which images from multiple, concurrent auxiliary timelines interact by dragging the tasks to the desired order in the Task window.

Drag a task towards the top of the Task list to make its images appear in front of other tasks' images.

See "Task Window" on page 111 for more information.



Click to add more tasks.

Task's triggering expression.

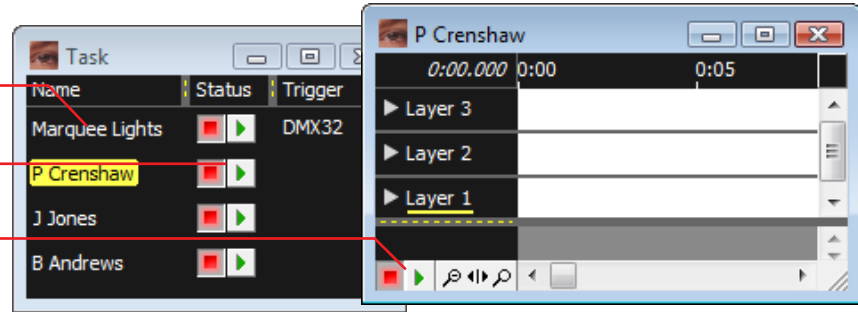
AUXILIARY TIMELINE

Double-clicking an item in the Task list opens its associated auxiliary timeline.

Double-click the task name to open its timeline.

Click here to start, stop or pause the auxiliary timeline...

...or click here after opening its timeline window.



◆ **HINT:** Change the name shown in the Task list by first opening the auxiliary timeline and then choosing “Timeline Settings” on the Timeline menu.

Starting and Stopping Manually

An auxiliary timeline has three primary modes:

- Stopped (red stop button is illuminated). In this mode, the timeline doesn't contribute to the stage.
- Paused (neither button is illuminated). In this mode, the time isn't moving, but any cues at the current time position does contribute to the stage.
- Playing (green play button is illuminated).

You can control these modes manually by clicking the buttons either in the Task window or in the lower left corner of an open auxiliary timeline window.

◆ **NOTE:** You don't need to open an auxiliary timeline to run it. Just click its play button in the Task window.

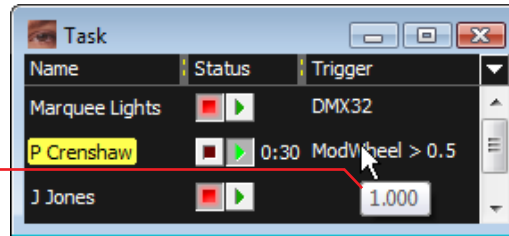
Starting from an Input

Alternatively, you can trigger an auxiliary timeline using an external signal, brought in as an input in the Input window. For details on how to configure inputs see page 197. “Triggering Tasks” on page 203 describes how you use an input to trigger a task. The task will be started when the value of the triggering expression becomes non-zero. This expression may combine multiple inputs and constants using operators (see “Expression” on page 212). For example, to trigger a task when the input goes above 50%, enter an expression such as this one:

```
ModWheel > 0.5
```

- ◆ **NOTE:** The task will be triggered only when the value of the expression goes from being zero to being non-zero. In order to trigger the task again, the value must first return to zero.

To see the current value of an expression, point at the expression using the mouse.



Starting from Another Timeline

You can use a Control cue to position, start, stop or pause an auxiliary timeline from another timeline. See “Controlling Other Timelines” on page 194.

- ◆ **NOTE:** You can not control the Main Timeline from an auxiliary timeline. Only Control cues on the Main Timeline can control the Main Timeline.

Stopping an Auxiliary Timeline

An auxiliary timeline will stop automatically after playing to its end.

- ◆ **HINT:** Set the length of an auxiliary timeline using the Timeline Settings command on the Timeline menu while the auxiliary timeline’s window is active.

Alternatively, use a Control cue (either on the timeline itself, or on another timeline) to stop it. When stopped, its images will disappear from the stage.

EXPRESSION

An expression is a simple mathematical formula, combining values such as inputs and numeric constants using operators in a way that yields a numeric result. Expressions are used to:

- Start tasks, as described on page 211 and under “Triggering Tasks” on page 203.
- Influence tween tasks (see “Controlling Tween Tracks” on page 202).

In its most basic form, an expression consists of a single value, such as an input (this example assumes that an input with the name “ModWheel” exists in the Input window – see “MIDI Controller Input” on page 198):

`ModWheel`

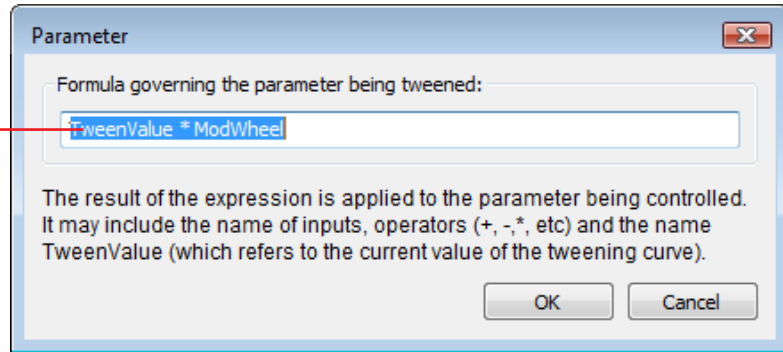
If this expression is used in the Trigger column of the Task window, that task will be started when the ModWheel’s value becomes non-zero (that is, when the modulation wheel on the attached MIDI device is moved from its zero position).

Likewise, if this expression is used as a formula for an Opacity tween track, the opacity will be controlled only by the modulation wheel (that is, the value of the tween track itself will have no effect).

Using Numeric Operators

In some cases, you may want to combine multiple values. For instance, in the previous example, you may change the expression so that the modulation wheel modulates the value of the cue's Opacity tween track by entering the following expression into its formula dialog box:

Enter an expression for a tween track by clicking its formula button (see page 202).



This expression combines the value of the ModWheel input with the value coming from the tween track itself by using the TweenValue identifier, which provides the enclosing tween track's current value. Since both values are in the range 0 through 1, multiplying them in this way will work as desired.

Alternatively, you may want to combine the two values so that the opacity can be controlled by either the tween track or the modulation wheel. This can be accomplished by changing the formula to

TweenValue + ModWheel

Now the resulting image will appear on stage if the tween track or the external input says so. Note that if both the tween track and the input are at their maximum value, the result of the expression will be 2. However, the opacity

value is effectively clipped to the range 0 through 1 (as the image can't be more than fully opaque or fully transparent). Most parameters work in this way, with the notable exception of the color hue, as it allows the color wheel to be rotated multiple revolutions.

Using Relational Operators

When using expressions to trigger tasks, it is often useful to specify a threshold for the triggering value. If the input is used on its own, the task will be triggered as soon as the input leaves zero. If you prefer the input to exceed a certain value, you can use a “greater than” operator to test for this:

```
ModWheel > 0.5
```

This operator yields a value that is 1 if the value on the left hand side is greater than the value on the right hand side, otherwise its value is 0. Likewise, if you want to trigger the task when the value becomes zero (rather than when it leaves zero), you can write:

```
ModWheel = 0
```

This uses the “equals” operator, yielding 1 if the value on the left is the same as the value on the right, else it yields 0.

Using Logical Operators

Occasionally you may want to create more complex triggering conditions, combining multiple inputs, so that the task will only be triggered when all conditions are met. That can be accomplished using the “and” operator:

```
ModWheel > 0.5 && MiddleC
```

This will trigger the task when the modulation wheel is above 50% and the MiddleC key is pressed (assuming here that MiddleC is a MIDI Note input).

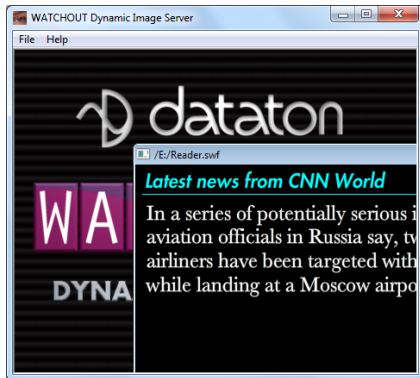
List of Operators

This is a list of the operators supported by WATCHOUT, shown in their order of precedence.

Operator	Description
()	Parenthesis. Used to group sub-expressions.
-	Unary Minus.
* / %	Multiplication, Division and Modulo.
+ -	Addition and Subtraction.
< <= > >= = !=	Less Than, Less Than or Equal To, Greater Than, Greater Than or Equal To, Equal, Not Equal.
&&	Logical And.
	Logical Or.

Most operators work as expected. The Modulo operator yields the remainder of an integer division. All other numeric operators yield results with fractional digits. All relational operators (<, >, etcetera) yield 1 if the relation is true, 0 if it is false. Likewise, the logical operators yield 1 for true and 0 for false.

13 DYNAMIC IMAGES



The WATCHOUT Image Server is a separate program that allows you to incorporate up-to-date text, images and graphics into your presentation. It renders the requested images, and sends the result to your display computers via the network. This is somewhat similar to the way a VNC Server provides images for a “Computer Screen” media item, but provides for greater flexibility and programmability.

Being a server application, the program doesn’t offer much in terms of user interface. It simply runs on a computer connected to the network and responds to image requests from WATCHOUT. Using the Open command on the File menu, you can manually open supported files to preview them on screen. Images are also displayed while they’re being served to WATCHOUT.

- ◆ **NOTE:** As the Image Server runs as a separate application, it requires its own WATCHOUT license key.

Image Types

The Image Server can serve two types of images:

- A still image.
- A SWF file (Adobe Flash).

For still images, the Image Server accepts the same kinds of images that you can generally use with WATCHOUT. It supports transparency information for files that include such data.

Alternate File Location

By default, image files are served from a folder relative to the location of the Image Server application. If you want to keep your dynamic images elsewhere, pass the `-f` command line parameter to the Image Server application to specify the location of the folder. Put this option into a shortcut used to start the image server, possibly located in the Startup folder of the computer, so that the shortcut's Target field reads something like this:

```
"C:\WATCHOUT 5\ImageServer.exe" -f D:\DynImages
```

Enclose the image folder path within double-quotes as well if it contains spaces.

SERVING STILL IMAGES

By providing a still image through the Image Server, you may change the image at any moment. Whenever the image is replaced on the image server, it will immediately appear on all displays currently showing it. To update the image on the server, simply drop a new image file into the folder containing the old one, with the same name and dimensions as the old image.

You can provide the updated image in any way you like. For instance, you may run a web server on the same computer, configured to allow files to be uploaded to the image folder being watched by the Image Server. This web server can provide a web interface for manual uploading of images, or interact with smart camera phones via the Internet.

Alternatively, you may have a custom application that updates the image on a regular basis, based on some external data or other events. This application can run on the same computer as the WATCHOUT Image Server, or another computer connected over the network. From the Image Server's point of view it doesn't matter where the image comes from. As soon as it is changed, it will be updated on screen accordingly.

SERVING SWF FILES

For even greater flexibility, you may choose to serve Flash (SWF) files. Such a file can dynamically generate and update text, graphics and other image elements, and can interact with various data sources. SWF files are produced using Adobe Flash Professional. By combining high quality text and graphics rendering with a powerful, network-aware programming language, Flash allows you to create custom solutions with very little effort.

In order to serve SWF files, you must install the Adobe Flash Player 10.3 or later on the Image Server computer. This is available as a free download:

<http://get.adobe.com/flashplayer/>

- ▲ **IMPORTANT:** Since the SWF files served by the Image Server reside locally on the Image Server computer, you may need to grant additional rights to those files in order to access network resources. To do so, go to Control Panel, Flash Player. Click the Advanced tab, then Trusted Location Settings. Click the “Add...” button and add the folder(s) containing SWF files to be served by the Image Server.

Sourcing Flash Content

There are many sites on the internet dedicated to providing Flash examples and tutorials. This is a great source for simple flash content, such as live clocks, stock tickers, news readers, etc. In many cases, such content can simply be dropped into your Image Server folder and used as-is.

- ▲ **IMPORTANT:** Since you’re going to run the SWF files on your local computer, with a relaxed security sandbox based on the “trusted location settings” set above, only use SWF files from sources you trust.
- ◆ **NOTE:** Keep in mind that such content may be copyrighted. Always check its license before including it in your presentations.

Example SWF: A News Reader

To develop custom solutions, you need to be familiar with Flash Professional and its ActionScript programming language, which is used to create live data. The example below shows a complete news reader for displaying the latest news from CNN:

```
var rssXML:XML; // RSS feed data is loaded here
var rssLoader:URLLoader = new URLLoader();
var rssURL:URLRequest = new URLRequest("http://rss.cnn.com/rss/edition_world.rss");
var timer : Timer = new Timer(10000); // For updating the display on a regular basis
```

```
rssLoader.addEventListener(Event.COMPLETE, rssLoaded);
rssLoader.load(rssURL);
```

```
function rssLoaded(evt:Event):void {
    var firstCall : Boolean = !rssXML;
    rssXML = XML(rssLoader.data);
    if (firstCall) {
        updateDisplay(null); // Draw first time right away
        timer.addEventListener(TimerEvent.TIMER, updateDisplay);
        timer.start(); // Display other news every 10 seconds
    }
}
```

```
function updateDisplay(evt : TimerEvent) : void {
    var itemCount : uint = rssXML.channel.item.length();
    if (itemCount) { // Has something to display
        var pick : uint = Math.random() * (itemCount-1);
        displayField.htmlText = rssXML.channel.item[pick].description;
    }
}
```

Displaying Server Files

Put the image and SWF files to be served into a folder on the computer running the WATCHOUT Image Server application. Typically, this folder is located in the same folder as the Image Server application. Alternatively, add a command line parameter when starting the Image Server application to put the image folder elsewhere (see “Alternate File Location” on page 218).

You can test a file manually using the Open command in the Image Server application. This will display the image on screen if it is compatible with the image Server application.

To display an image in your WATCHOUT presentation, add it as a media item to the Media window of your WATCHOUT presentation (see “Add Dynamic Image” on page 148), then drag it onto stage and update your display computers. The image should now be requested from the Dynamic Image Server, and displayed on screen.

- ◆ **NOTE:** You can also preview dynamic images in the production software, if specified in the dynamic media item. This feature is not available if you run the Image Server on the same computer as the WATCHOUT production software.

DYNAMIC IMAGE PARAMETERS

In addition to the basic settings, such as the dimensions and location of the image being served, you can also provide additional parameters to the dynamic image. The parameters available vary with the type of image served.

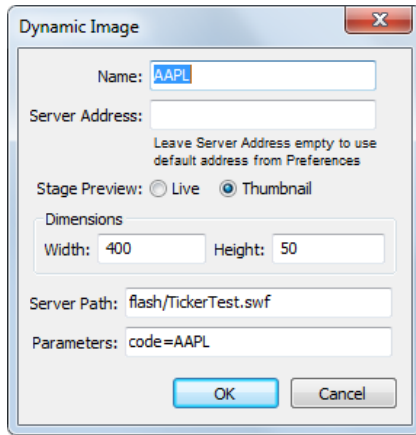
Missing Still Images

Still images support only the single, optional parameter:

```
missingImageIsOK
```

to indicate that a missing image should be displayed as entirely transparent, rather than giving an error message.

Flash Parameters



For SWF images, any parameters specified in the Dynamic Image Specifications dialog box are passed to the SWF similar to how parameters are passed from a web page. This allows you to customize a single SWF file in various ways, without having to modify the SWF file itself.

For example, when creating a stock quote display SWF, you may not know what company to display. Instead of hard-coding the company identifier into the SWF file, pass it as a parameter by putting it into the “Parameters” field of the dynamic media item, as shown on the left.

You can then access this “code” parameter, as well as any other parameters you may want to pass, from the loaderInfo object in the SWF file like this:

```
loaderInfo.parameters.code
```

This parameter can be sent to a web service providing live stock quotes, such as the one available from Yahoo.

A SYSTEM REQUIREMENTS

COMPUTER

▲ **IMPORTANT:** These are minimum system requirements. Faster processor, faster memory, SSD or faster hard disk with cache memory, faster graphics card with more video memory, etc, will enhance performance. Some functions (for example, live video integration) require additional hardware.

This appendix lists what you need in order to install WATCHOUT on a PC.

A WATCHOUT computer has the following *minimum* system requirements:

- Intel or AMD dual core processor (quad core to drive multiple displays).
- USB port.
- Ethernet port.
- SATA hard disk (SSD recommended to drive multiple displays).
- 2 GB RAM (3 GB to drive multiple displays).
- PCI Express 16x video card slot.
- Modern ATI or nVidia graphics card with 256 MB of video memory (1GB if driving multiple displays).
- High quality audio output or sound card/interface.
- Windows XP Home (Windows 7 Home to drive multiple displays).
- DirectX 9c (included in Windows 7).
- ◆ **NOTE:** It is generally not recommended to mix different kinds of computers or graphics cards in one display cluster.

LIVE VIDEO INPUT

To integrate live video into WATCHOUT, each display computer used to show live video must be equipped with a suitable video input, and its driver software must be installed. Some capture cards support multiple Composite and S-Video inputs, while some support more advanced video signal standards.

Suitable video input solutions include:

- Black Magic Design DeckLink SDI, Duo, Studio or HD Extreme, accepting SDI/HDSDI signals. Studio also accepts analog. Intensity Pro accepts HDMI and analog.

<http://blackmagic-design.com/>

- Datapath VisionRGB cards accepts VGA/DVI/HDMI computer signal.

<http://www.datapath.co.uk/>

NETWORK

The production and display computers must be connected using a TCP/IP compatible network.

A typical system has 100 MBit Ethernet network ports on all computers and a high-quality Ethernet switch with the required number of ports to connect the computers.

A wireless network may work, but is generally not recommended for reliability reasons.

B COMPUTER ISSUES

While the basic configuration of the display computer outlined in Chapter 2 “Installation” is sufficient in many cases, some computers require additional work to achieve best possible performance. This section provides some general hints and pointers on how to proceed.

DEDICATED COMPUTER

If you intend to use a computer primarily as a WATCHOUT display computer, it probably makes sense to re-format the hard disk and then install only Windows, required device drivers and WATCHOUT. This avoids many problems caused by various pieces of software that are often pre-installed on computers, or that may have accumulated over time.

- ◆ **NOTE:** You don’t have to re-format your hard disk in order to use WATCHOUT. This is an advanced procedure that helps in obtaining the best possible performance. You can apply all other adjustments described in this appendix even if you choose not to dedicate the computer to WATCHOUT.

Formatting the Disk and Installing Windows

To prepare your computer in this way, first make sure that the hard disk doesn’t contain any important information. You should perform a backup if you’re unsure about the content of the hard disk. Then start the computer from the Windows installation disk, and follow the on-screen instructions. Early on in the installation procedure, you will be asked where to install Windows. As part of this, you will get the opportunity to remove the existing partitions and create new ones, which you should do.

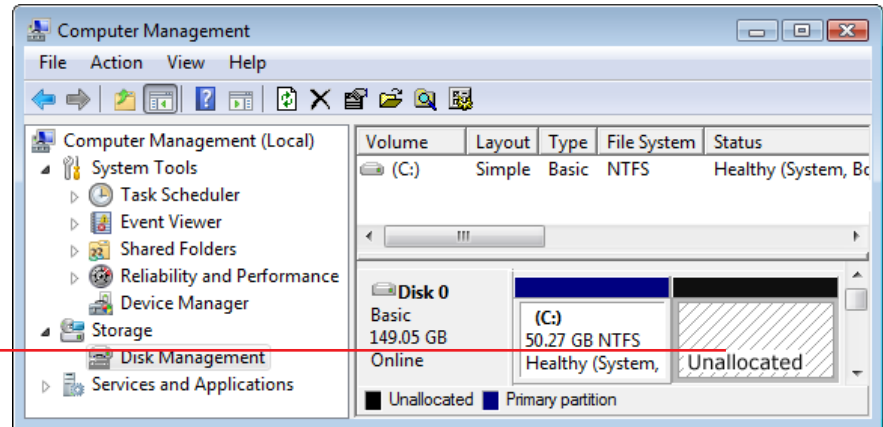
For best performance, you should create a smaller (50 GB or so) partition for Windows, and any other applications you may want to install. This partition will become the C: drive. Leave the remainder of the disk unformatted for now.

Proceed with installing Windows on the newly created, small partition. Once that's done, install required device drivers (graphics or sound card drivers, etc), and perform any additional adjustments mentioned in this appendix.

Installing WATCHOUT

Before installing WATCHOUT, you need to format the remaining space of the hard disk. Choose Start > Programs > Administrative Tools > Computer Management, then click Disk Management in the list.

Right-click on the Unallocated space and choose "New Partition". Proceed with creating a primary partition of the maximum size.



- ▲ **IMPORTANT:** On the last page of the "New Partition Wizard", choose the NTFS file system with an "Allocation Unit Size" of 32K. Generally, it is OK to also select "Perform a Quick Format".

Specifying a larger than usual allocation size greatly reduces the tendency of disk fragmentation, at the cost of a small amount of wasted disk space. Given the fact that most WATCHOUT media files tend to be rather large, this should not have any practical disadvantages.

Once the formatting is complete, the new partition will appear as the D: disk drive. Create a WATCHOUT folder on this disk, and install WATCHOUT to this disk using the Installer, as described on page 15. When given the opportunity to specify where to install WATCHOUT, chose the newly created WATCHOUT folder on the D: drive.

WINDOWS 7 UAC SETTINGS

The User Access Control (UAC) feature of Windows 7 may interfere with certain functions in WATCHOUT, particularly when running on unattended display computers. UAC, per definition, assumes that there is a user. WATCHOUT display software is often run in an unattended way, with no user standing by to click buttons or type passwords. Furthermore, you generally shouldn't run WATCHOUT on networks that have direct Internet access, or any other kind of unrelated (and possibly harmful) traffic. Under those specific circumstances, you're better off without UAC, since it tends to cause more problems than it solves.

Things that UAC will interfere with, if enabled:

- Downloading of shows. WATCHOUT display software traditionally stores its shows in the Shows folder, located in the same folder as the application. This is a not permitted under UAC, and Windows will therefore relocate the folder to another location. While this works OK as far as WATCHOUT is concerned, it may interfere with other methods of accessing the Shows folder, or just be confusing when you go looking for it.

- Remote updating of WATCHOUT software and components. Since an application under UAC doesn't have permission to write to its own program folder, or manage its components, those functions will generally fail under UAC. Instead, you must manually install updates on each display computer, with UAC prompting you for you administrator password.

For a regular PC, used to surf the web, the User Access Control is a good thing. However, for an unattended computer running only WATCHOUT display software on a private network, often without a keyboard connected, it doesn't make any sense.

To turn off the UAC:

- Click Start Menu, Control Panel, Action Center.
- Click Change User Account Control Settings.
- Drag the slider to Never Notify.
- Click OK and restart your computer.

You may need to take additional measures if you have already used a display computer with UAC enabled, and then choose to disable it. As disabling UAC also removes the automatic folder redirection, WATCHOUT will no longer see its previous Shows folder, and will therefore create a new one, downloading your shows anew. To avoid this problem after disabling the UAC, move the Shows folder to its traditional location inside the WATCHOUT Programs folder before restarting WATCHOUT

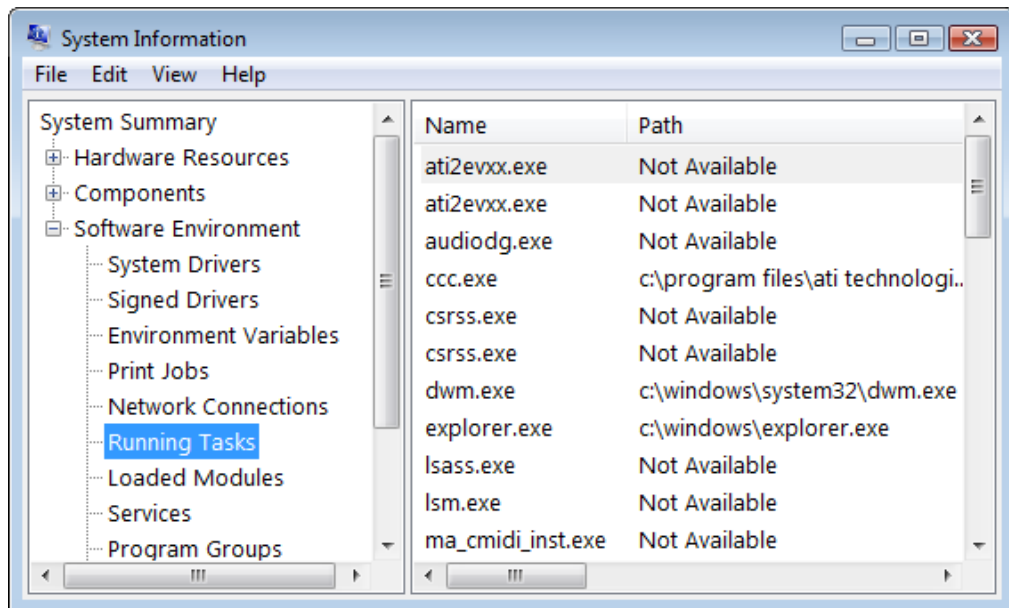
GENERAL PERFORMANCE

The performance of a PC is often degraded by numerous small programs and services running in the background. Such programs consume considerable system resources, and may serve no purpose on a WATCHOUT display computer. You can enhance performance by identifying and removing, or disabling, such programs.

Identifying Background Programs

To identify any unwanted background applications or services, first close all open windows then click the Start button and choose Programs > Accessories > System Tools > System Information. Select "Software Environment, Running Tasks" in the list to the left. The list to the right displays all currently running programs (see illustration on page 230). Look specifically for tasks whose path is anything but "c:\windows\system...".

To see which programs that are automatically started, choose "Software Environment, Startup Programs" in the list to the left.



- ◆ **HINT:** The names listed in the Running Tasks and Startup Programs lists are often cryptic, and may be hard to associate with a particular program. In this case, looking at the path leading to the program's file can provide a valuable hint. In particular, if the program is installed under "c:\Program Files\...", you should be able to learn more by looking inside its installation folder.

Removing Background Programs

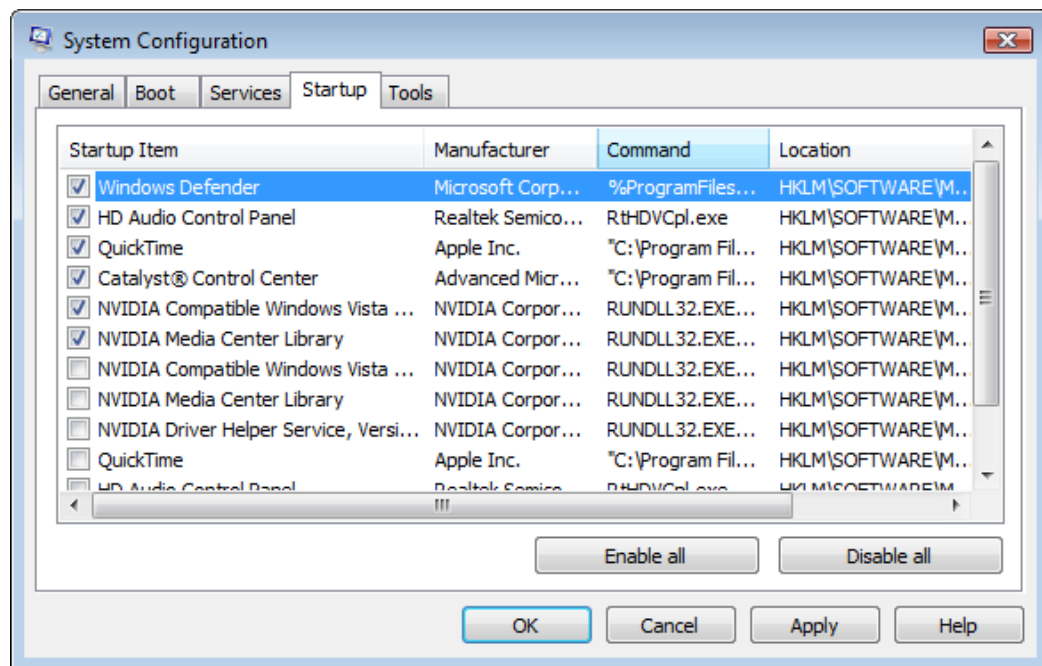
Once you have identified any undesired background programs, you should either remove or disable them. If you know you won't need a background program, remove it from the computer.

To remove a program, open the "Programs and Features" control panel, choose the program, and click "Uninstall". Follow the subsequent instructions on how to remove or uninstall the program.

If you're uncertain about removing the program, or if the program doesn't appear in the "Programs and Features" control panel, you may instead choose to disable it. This can sometimes be done with configuration options in the program itself. Other programs don't offer this capability, forcing you to either uninstall the program or disable it using other means.

Background programs often identify themselves by an icon on the taskbar, in the lower right corner of the screen. Right-click such an icon to open its menu. Sometimes the menu includes a "Disable", "Close" or "Do Not Load" item. It may include "Open", "Configure" or "Properties" items that allow you to set various options, including the automatic loading of the program at start-up. After disabling a program in this way, restart the computer to verify that the program is no longer active. Some programs only allow you to disable them temporarily, and will then load again the next time you start the computer.

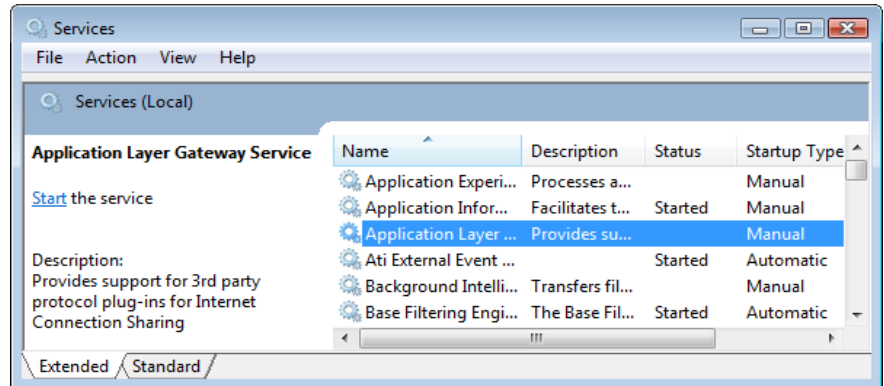
Another way to locate and disable startup programs is by using the System Configuration utility. To open this utility, click the Start button and choose Run. Enter “msconfig” into the Run dialog box. Click the “Startup” tab. You can turn off any undesired startup item by unchecking its checkbox.



System Services

- ◆ **NOTE:** If the “Administrative Tools” are unavailable, right-click the task bar and choose Properties to display the “Taskbar and Start Menu Properties”. Click the “Start Menu” tab. Click the “Customize” button. In the list, make sure that “System Administrative Tools” (or “Display Administrative Tools” if using the Classic Start menu) is enabled.

Most background activities are not run as regular programs, but as System Services. You can view the installed system services by clicking the Services tab in the System Configuration utility (see previous page). This also indicates the manufacturer of each service. In general, do not disable services by unchecking them in the Services tab of the System Configuration utility. Instead, choose Start > Programs > Administrative Tools > Services.



This list provides detailed information on each service. Select a service in the list for a description. There are numerous services, many of which are not needed on a computer dedicated to running WATCHOUT display software. Not all services are running – only those listed as “Started”. To disable a service, double-click it and set its “Startup Type” to Disabled.

For more information on what the various services do, and which ones you may disable (or set to “Manual”), visit one of the many web sites dedicated to tweaking Windows for better performance.

Defragmenting the Disk

After using WATCHOUT for some time, adding and removing media or other files, the hard disk may become fragmented. A fragmented hard disk significantly increases the time and effort required to access and display images and video. Defragmenting the disk restores it to its optimal working condition. To defragment your disk, choose Start > Programs > Accessories > System Tools > Disk Defragmenter. Wait for the program to analyze your disks, then click “Defragment Now”.

- ◆ **NOTE:** Formatting the disk with a large allocation unit size, as described under “Installing WATCHOUT” on page 226, greatly reduces the tendency of fragmentation, but doesn’t eliminate it.

If your computer has additional disks or partitions, you should defragment those as well. However, if you’ve partitioned the disk into a Windows and a WATCHOUT partition, the Windows partition should not need to be defragmented very often, since it really doesn’t change much.

If you also want to remove old shows from the disk, do so before you defragment the disk (see page 80).

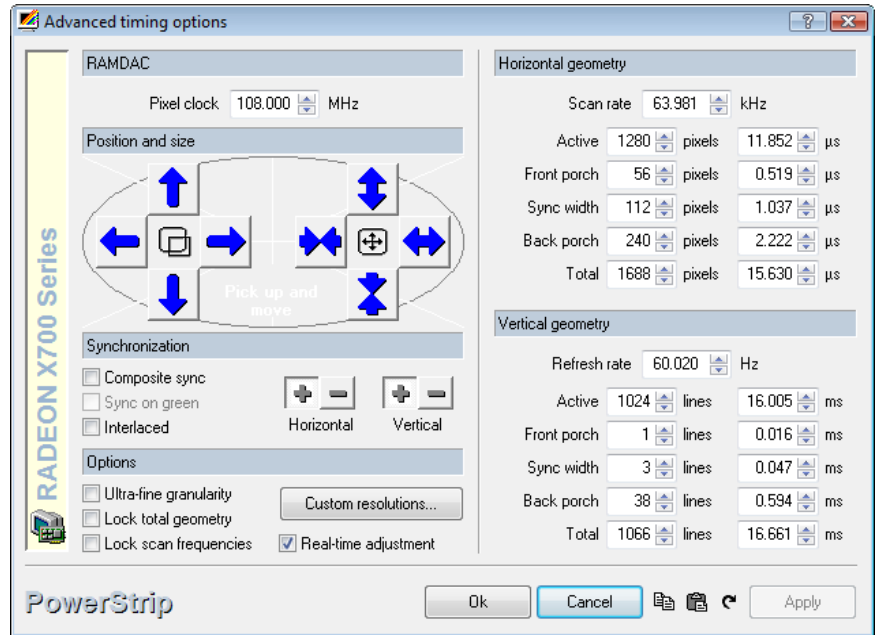
- ▲ **IMPORTANT:** The Disk Defragmenter can be set to run automatically on a schedule. In general, you shouldn’t use this feature on a dedicated WATCHOUT display computer. If you do decide to enable this feature, make sure it runs at a time where you’re unlikely to be using your WATCHOUT system.

Using a Solid State Drive

If possible, choose an SSD drive for storing your WATCHOUT show data on each display computer. This avoids the problem of disk fragmentation mentioned above, and provides much faster access to the media files.

DISPLAY PERFORMANCE

WATCHOUT is based on the latest technology in computers and graphics cards. For this to work optimally, both the computer and the graphics card must be properly installed and configured. One of the more useful utilities available to verify and control the operation of the graphics card is PowerStrip:



PowerStrip is shareware, and is available from:

<http://www.entechtaiwan.com/>

Display Drivers and DirectX

If you run into display problems or system errors, it's often a good idea to look for an updated display driver, either from the card's manufacturer or the chipset manufacturer (i.e., ATI/AMD or nVidia). WATCHOUT also requires DirectX 9 or later – a standard part of Window Vista. You can download the latest version of DirectX from:

<http://www.microsoft.com/directx>

OTHER ISSUES

Video Playback

This section lists some other issues known to cause problems from time to time.

Some DVD player programs – often included with graphics cards or DVD drives – may interfere with the ability of WATCHOUT to play back video content (including some related audio formats). To solve this problem, uninstall the DVD player application and all its components.

Sound Playback

You need to install the proper software driver for the sound card installed in your computer. The driver received with your computer, operating system or sound card is usually sufficient, but you should check the sound card manufacturer's web site to make sure you have the latest driver version installed – particularly if you're experiencing sound playback-related problems.

When installing or updating sound card driver software, avoid installing other associated software. Additional software is often provided that will run as background applications. You may have to check for and remove such software after installing/upgrading sound card drivers (see "Removing Background Programs" on page 231).

Defect Drivers

Performance and reliability problems may be caused by defect software drivers. Such problems can be hard to diagnose. More often than not, it's easier to start from scratch by re-formatting the hard disk and re-installing Windows and required device drivers only (see "Formatting the Disk and Installing Windows" on page 225).

CLONING A COMPUTER

A WATCHOUT system typically uses multiple, identical playback computers. Performing the above trouble-shooting and tuning operations on multiple computers is tedious. An alternative is to get one display computer working properly, and then clone its hard disk to the others. This, of course, assumes that they all have the same hardware configuration.

A fast and convenient method for cloning the hard disk is to use True Image, from Acronis:

<http://www.acronis.com/>

Using this program, you can clone a hard disk to another computer either across a network or using a CD-ROM.

- ▲ **IMPORTANT:** While the cloning procedure copies everything on the hard drive, it does not perform any firmware (BIOS) or similar upgrade automatically. You may need to perform any motherboard upgrades manually after cloning the disk.

C DISPLAY ISSUES

WATCHOUT can be used with most display technologies, including DLP and LCD projectors, LCD monitors, LED walls, video wall cubes and plasma screens. Generally, you can use any display device that's compatible with the display card in the display computer.

Avoid mixing brands and models of displays on adjacent or overlapping areas, since they most likely will differ in their image reproduction. As the light intensity and color temperature of many projectors may degrade over time, try to use projectors that have been in use roughly the same number of hours.

DISPLAY TECHNOLOGIES

The following sections provide an overview of display technologies, with special emphasis on aspects related to WATCHOUT.

DLP Projectors



DLP (Digital Light Processor) uses a microscopic mirror chip to modulate the light (see <http://www.dlp.com/>). This display technology has the advantage of being 100% digital, resulting in excellent, long-term image stability and reliability – particularly when using a digital computer connection, such as DVI (see “DVI Connector” on page 242).

An issue with some DLP projectors is the lack of true black. The poor black level produced by some projectors often results in gray banding in overlapping image areas. This is particularly noticeable in a totally dark room, and, conversely, is less of an issue in installations at, for example, a shopping mall, a trade-show or similar environment. This problem is magnified when using

very bright projectors on a small screen. Avoid using stronger projectors than necessary for your screen size and ambient lighting conditions.

The contrast ratio has greatly improved over time. Modern DLP projectors, utilizing second generation “black chip” Texas Instruments DLP technology, often provide a contrast ratio of 3000:1 or better.

Keep in mind that when using WATCHOUT with projectors, you get the combined brightness from multiple projectors. Hence, good contrast and color saturation is often more important than high brightness. Hence, choosing a “home cinema” projector may be better than an “office grade” projector due to the better color fidelity and often lower noise level of the former.

To determine the suitability of a particular model of projector, always perform proper tests under realistic screen size and lighting conditions. Details vary widely among manufacturers and projector models, and are not always stated on specification sheets.

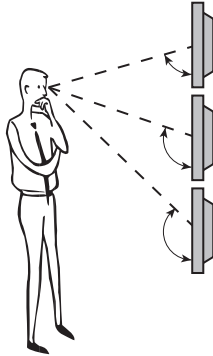
A good starting point when looking for a projector may be one of the many dedicated web sites, such as: <http://www.projectorcentral.com/>.

LCD Projectors

LCD (Liquid Crystal Display) projectors are in many ways similar to DLP projectors, and share many of the same advantages and disadvantages. Instead of bouncing the image off a mirror, an LCD projector uses a pass-through “filter” to modulate the light. The more analog nature of this technology means some LCD projectors may require more adjustment than DLP projectors, and exhibit less long-term stability.

Some LCD projectors suffer from a poor black level. The problem is often even more noticeable on LCD projectors than on DLP projectors, and there’s a wider span of variation due to the large number of LCD chip manufacturers. Always make realistic tests under the expected screen size and ambient lighting conditions. Use images of the kind you intend to use in the final presentation. Some test images with white, black, saturated colors, checkerboards and gradients are often useful too when evaluating projectors (see page 245).

LCD Display Panels



Modern LCD display panels typically have very good color matching, brightness and long-term stability – particularly when using a DVI cable. However, when using multiple LCD displays to build larger display areas, bear in mind the sometimes limited viewing angle.

Many LCD displays are designed for optimal image quality when viewed from the front, with image quality degrading as you move off-center. Often, the viewing angle is better when moving horizontally than when moving vertically (as would be the case when placing multiple, landscape-oriented, LCD displays in a column).

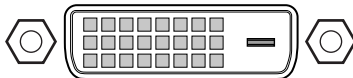
WIRING

When connecting the display to the display computer, keep the following in mind:

- Keep analog (VGA) cables short. If possible, place the display computer close to the display, powering both from the same outlet.
- If you must extend the cable, make sure you use high-grade extension cables and distribution amplifiers.

Usually, the display is connected by using an analog 15-pin, VGA-style connector or a digital DVI connector. Whenever possible, use DVI to connect the display computer to the projector. This avoids many of the analog-to-digital conversion problems associated with the VGA-style interface. If required, DVI cables can be extended using products available from Gefen (<http://www.gefen.com/>), Extron (<http://www.extron.com/>) and others.

DVI Connector



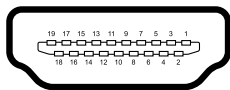
Digital Visual Interface connector.

The DVI (Digital Visual Interface; <http://www.ddwg.org/>) connector is popular on LCD displays and modern video projectors. As the data to be displayed is digital to begin with, it makes little sense to convert the signal to analog, pass it through a VGA-style connector, and then convert it back to digital form again in the display device. The DVI connector solves this by keeping the signal in the digital domain all the way.

The advantages include a rock-solid image, no pixel jitter and best possible image and color precision. This is usually provided with little, or no, need for manual adjustment, resulting in improved image consistency and stability.

The high speed digital signal makes it more difficult to run long cables or to distribute the signal to multiple display devices. Extension and distribution solutions based on CAT-5 cables and optical fibers are available from numerous manufacturers (for example, <http://www.gefen.com/>).

HDMI Connector



GENERAL TROUBLESHOOTING

Before You Begin

The HDMI connector is similar to the DVI connector in many ways, but is generally limited to carrying video standard resolutions (for example, 1280 x 720 or 1920 x 1080 pixels). In some cases, you can connect a DVI output to a HDMI input using a simple adaptor cable.

Just like the display computer, the kind of display or projector used has a major influence on the end result. This section provides additional guidance on determining the cause and possible remedy of display related problems.

Connect a regular CRT monitor to the output of your display computer to determine if the problem is introduced by the display technology or by the display computer. This is a good advice whenever you see unwanted phenomena in the displayed image – always plug in a CRT monitor (assuming you can find one). If the problem goes away, it's most likely caused by your display or projector, in which case you should read this appendix. If the problem shows up on the CRT monitor as well, you should instead focus on the display computer (see "Computer Issues" on page 225).

JERKY MOVEMENTS

An image moved using a Position track should move smoothly across the displays. Jerky movement may be caused by either the display computer or the display device itself. If the problem goes away when you view the output from the display computer on a CRT display, you've determined that the jerkiness is introduced by the display or projector you're using.

▲ **IMPORTANT:** When making these tests, you should preferably use a CRT monitor. If this is not possible, use a good quality LCD monitor. Some digital display devices introduce artefacts of their own. Also, you may want to unplug the problematic display and connect the test display while the display computer is running. If you restart the display computer, it may sense that

you've plugged in another display and change its behavior (for example, its refresh rate), thereby causing the problem you're troubleshooting to change or disappear.

The most common reason for such artefacts is lack of synchronization between the video signal fed to the display and its internal operation. This is sometimes a problem with digital display technologies, such as LCD and DLP. It is not a problem with CRT-based computer displays, since they're generally driven directly by the incoming analog video signal.

Even if your display device supports multiple frequencies, it may work best at one particular frequency. You may want to try setting both the display card and WATCHOUT to 60 Hz/fps even if you're using video optimized for other frame rates, since this is the optimal display frequency of many projectors and other display devices.

It is sometimes difficult to determine the optimal frequency of digital display devices, or whether the display device is at all capable of synchronizing its internal operation to the frame rate of the incoming video signal. Often, changing the programming to use other rates for moves and other effects can make artefacts less obvious. If possible, you may also try connecting the display computer to the display device using other means, for example using a digital DVI cable instead of the analog VGA.

Dropped Video Frames

Just as lack of synchronization in the display device can affect the smoothness of positioning and other effects created in WATCHOUT, it may have a similar impact on the video material used in your presentation. This is often particularly noticeable in slow zooms and pans, or in objects moving across.

If using a CRT or known good LCD display makes the video playback look considerably smoother, you're most likely experiencing synchronization problems introduced by the display or projector (see above).

BANDING

Gradients



This section deals with banding in smooth areas, either within a static image or in the overlap area of projected images.

When displaying images with smooth areas and gradients, limited resolution in the display may cause visible bands to appear. A good way of testing this is to display a smooth grayscale ramp, as in the example shown to the left. Such an image can easily be created in applications such as Adobe Illustrator or Photoshop. You may also want to create test images with vertical or radial gradients.

If such test images appear smooth on a good monitor, while exhibiting banding using your display device, the signal resolution of the display device is insufficient to reproduce all the steps in the gradient. Such problems are typically associated with low end, office grade projectors. Often, using a digital interface may avoid or solve such problems since it circumvents the analog-to-digital conversion step, which may be causing the loss of definition (see "DVI Connector" on page 242).

Rear Projection

When using rear projection, banding may be caused by the screen material. This may also occur when using high-gain front projection screens. Such banding can be identified by the fact that it moves with you as you walk along the screen.

The only way to avoid or solve such problems is to use a different screen material. Suitable low-gain screens for both front and rear projection are available

Edge Blend Areas

from most professional screen manufacturers (for example, “Aeroview 100” from Stewart Filmscreen Corporation; <http://www.stewartfilm.com/>).

Banding and other artefacts may appear in the overlap areas of edge-blended images. There are essentially three kinds of problems:

Too Dark, Bright or Uneven Overlap. It may be difficult to obtain a perfectly invisible edge blend for all image types. You may have to locate a typical or particularly problematic image in your presentation and tweak the edge blend curve using that image for the best possible result (see “Edge Blend” on page 121).

Non-linear Gamma Settings. Most LCD and DLP projectors have a gamma curve setting, often with a number of standard curves to choose from. In order to achieve maximum perceived brightness, such projectors often come preset to some high brightness gamma curve. While such a gamma curve may provide some additional brightness, its non-linear nature tends to interfere with the ability to achieve a smooth edge blend. Furthermore, it also results in washed-out colors and a general lack of contrast. To avoid this problem, chose a more linear gamma curve, often called “Photographic” or “Video”.

Projecting a grayscale gradient, or a set of gray bars (as seen in the test image on page 165) often reveals problems associated with a non-linear gamma. Attempt to find a setting that shows a linear gradient, or a clear distinction between each gray bar.

Gray Boxes in Dark Images. Due to the poor contrast ratio of some LCD and DLP based projectors, lighter areas in the overlaps of black, or very dark images are sometimes inevitable. You can minimize the effect by reducing the light output of the projectors (for instance, by switching to a “low brightness” or “economy” mode), or by increasing the ambient lighting in the

room. Often, however, the best solution is to avoid large, dark areas in the presentation altogether.

Thin, Dark or Bright Slivers

A slightly darker or brighter sliver along the edge-blend area is often the result of under or over-shooting the chip in the projector.

- ◆ **NOTE:** This problem is unusual when using DVI or HDMI interfaces, as those interfaces allow direct pixel addressing, and often provide no control over the image width or position.

Create a test image with a one or two pixel white edge. Put the image on an auxiliary timeline set to perform above the edge blend. Adjust the projector so that the image exactly fills the image area. Move the horizontal position of the image to the left so the leftmost row of pixels just disappears, then move it back so they reappear. Now adjust the image width to make the right edge of the image fit the image area precisely. You may have to repeat the position and width adjustments a couple of times, since changing one may affect the other.

Also ensure that the vertical position of the image shows the top and bottom row of pixels. There's usually no adjustment for the image height, but if there is, you may want to check that also.

HOT-SPOTS

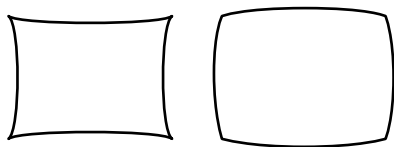
Hot-spots appear as bright areas near the center of front or rear-projected images. As you move your vantage point across the screen, these bright areas tend to move with you in relation to the projected image. The only way to solve such problems is to use another screen material. Suitable low-gain screens for both front and rear edge-blended projection are available from most professional screen manufacturers (see also “Rear Projection” on page 245).

CREEPING SHADES

When fading an image, you may sometimes see shades or ridges creeping across or around smooth image areas. These artefacts are somewhat reminiscent of the Newton rings sometimes seen with slide projectors. They are generally caused by lack of resolution, similar to the description under “Banding” on page 245.

The best way to diagnose these problems is to use a set of test images with horizontal, vertical and radial gradients. Fade such an image slowly and look for bands or rings moving across the image. Run the same test with a known good display. The solution for this problem is the same as outlined above under “Banding” on page 245.

OPTICAL LINEARITY



Pin-cushion and barrel distortion.

Correcting Optical Errors

STEREOSCOPIC PROJECTION

When using multiple overlapping projectors, optical linearity is important. Deficiencies in optics often show up as barrel or pin-cushion distortion. This may be particularly troublesome when using short-throw, wide angle lenses (often desirable for rear-projection).

The best way to avoid this problem is to choose projectors with high-grade optics, and to ensure that your optics are properly matched for the desired projection distance.

◆ **HINT:** If you're using zoom lenses, you may be able to obtain better linearity by changing the focal length and moving the projector accordingly.

If necessary, use the geometry correction feature built into WATCHOUT (page 160) to compensate for the distortion. Some projectors have similar capabilities built in.

Stereoscopic ("3D") projection uses twice as many projectors as regular presentations. Projectors are fitted with filters matching the filters used in the glasses worn by the viewers. Special care must be taken when choosing the screen material – particularly when using polarized filters. It may be hard to find a screen material that works well for polarized stereoscopic projection, while still avoiding hot-spots (see previous page).

An alternative to polarized filters is the Infitec color filters, as this technology is more accommodating in terms of screen material.

<http://www.infitec.de/>

D PRODUCTION COMPUTER PROTOCOL

Overview

You can control a WATCHOUT production computer from an external device, such as a touch panel or software capable of communicating using the TCP or UDP IP protocols.

- ◆ **NOTE:** While similar in its basic capabilities and commands, this protocol is different from the one described under “Display Cluster Protocol” on page 257. This protocol allows you to control the production computer, while the Display Cluster Protocol controls one or many display clusters, with no need for any production computer.

The production computer control protocol includes commands allowing you to

- Load a show from a specified file.
- Start, stop, position and run the timeline.
- Access the standby mode.

To control WATCHOUT production software in this way, you must choose “TCP/IP” or “UDP” as appropriate in the Preferences dialog box (see “Production Computer Control (TCP and UDP)” on page 122).

Command Format

To control WATCHOUT, open a connection to TCP/IP port number 3040 of the WATCHOUT production computer. UDP communications also uses port 3040. Each command is then sent as a string, terminated by a carriage return, line feed or CR/LF pair.

A command consists of a command name, sometimes followed by parameters. Commands are encoded using the UTF-8 UNICODE character format, which is downward compatible with ASCII strings.

▲ **IMPORTANT:** Commands containing non-ASCII characters – such as å, ä, ü, ç – must be encoded using the UTF-8 format.

String parameters are sent within double quotes. Backslash is used as an escape character (that is, to encode a double quote in a string, precede it with a backslash). To send a backslash character, use “\\” inside the string.

Commands are case sensitive. Successfully performed commands are not acknowledged.

Errors

If an error occurs while processing a command, an error response is returned:

```
Error <uint> <string> <string>\n
```

where the first parameter is an internal error code number, the second parameter is a quoted string containing the error message, and the third parameter is a copy of the offending command, also as a quoted string.

LIST OF COMMANDS

The table below shows the available commands, with some commands explained in more detail on the following pages.

Command	Parameters	Description
run	[<string>]	Run timeline from current position, optional aux timeline name.
halt	[<string>]	Stop at the current position, with optional auxiliary timeline name
kill	<string>	Stop and deactivate the named auxiliary timeline.
gotoTime	<uint>/<string> [<string>]	Go to a time position, specified in milliseconds or as a time. The second, optional, parameter selects an auxiliary timeline.
gotoControlCue	<string> [<bool> [<string>]]	Go to a named Control cue (name is case sensitive).
standBy	<bool>	Set the standby mode to true or false.
load	<string> [<uint> [<bool>]]	Load a show from specified file, with optional parameters.
online	<bool>	Control the online status of the production software.
update		Update the display computers.
enableLayerCond	<uint>	Set enabled layer conditions (see table on page 255).
setInput	<string> <float> [<uint>]	Set the value of a named Input, with optional fade-rate in mS.

gotoTime

Jumps to a time position along the timeline. The time can be specified in milliseconds:

```
gotoTime 60000
```

goes to one minute (60000 / 1000 = 60 seconds). Alternatively, specify the time as a string in the format "HH:MM:SS.mmm". A second parameter, if specified, selects an auxiliary timeline by name.

gotoControlCue

Jumps to the named Control cue. Returns an error if the cue can't be found. The name is specified within double quotes, and is case sensitive:

```
gotoControlCue "anders"
```

A second parameter, if specified as *true*, instructs WATCHOUT to search backwards only, starting at the current timeline position. Default is to search the entire timeline.

A third parameter, if specified, selects an auxiliary timeline by name. Default is the main timeline.

standBy

Enters or exits standby mode, where the parameter is *true* or *false* (without quotes).

```
standBy true
```

load

Condition	Number to Add
1	1
2	2
3	4
4	8
5	16
6	32
	...and so on.

Loads a show by name. The name is specified as a quoted string containing the full path to the file. The use of backslash characters in Windows path names conflicts with the use of the backslash as an escape character in this protocol. Either double the backslash characters, or use forward slashes instead (as shown in this example):

```
load "C:/Samples/ExampleShow.watch"
```

◆ **NOTE:** When using this load command, the production software will automatically go online after loading the show.

If desired, you can add a numeric parameter to override the conditional layer settings of the show being loaded. For example, to enable condition 1 and 2 only:

```
load "C:/Samples/ExampleShow.watch" 3
```

The number is a sum of the decimal numbers corresponding to each desired condition, as shown in the table to the left.

The last optional parameter is a boolean controlling whether the production software will go online or not, after loading the show (default value is true):

```
load "C:/Samples/ExampleShow.watch" 3 false
```

loads the specified show and sets its layer conditions, but remains offline.

setInput

Sets the value of a named input (see “Inputs” on page 197):

```
setInput "uno" 0.5
```

The value is generally in the range 0 through 1, but may be extended to cover a wider range using the Limit setting of the Generic Input (see “Generic Input” on page 197).

By prefixing the value with a plus or minus sign, you can adjust the value incrementally relative to its current setting. This example increases the value of the input by 0.1:

```
setInput "uno" +0.1
```

A third, optional parameter allows you to specify a transition rate, causing any property controlled by the input to change gradually to the specified target value. This parameter is specified in milliseconds.

- ◆ **NOTE:** While you would typically use this command to set the value of a Generic Input, you may use it to set the value for *any* input. If data is also provided by a MIDI or DMX-512 source, the latest data will take precedence.

E DISPLAY CLUSTER PROTOCOL

Overview

You can control a cluster of WATCHOUT display computers using a local command file or from a computer or other device capable of communicating using a serial port or the TCP/IP network protocol.

- ◆ **NOTE:** While similar to the production computer protocol described in the previous appendix, this protocol allows you to control WATCHOUT display clusters without a production computer being present in the system.

Preparation

Before attempting to control a cluster, ensure that the show has been successfully run from WATCHOUT production software (meaning that all media files have been transferred, etc). Then quit the WATCHOUT production software.

CONTROL OPTIONS

You can control the display cluster either using a file stored on the primary display computer in the cluster, or using commands sent via the network or through a serial port.

File-based Control

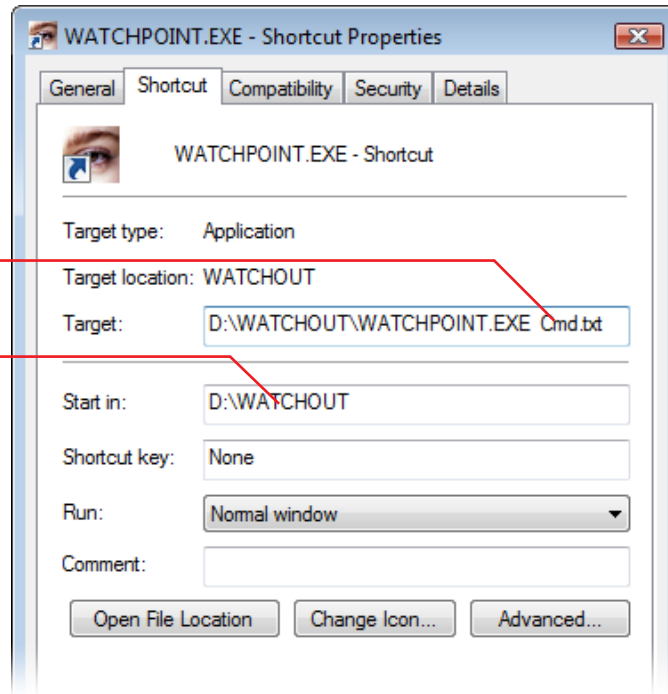
You can use a file stored on the primary display computer's hard disk to automatically perform most commands in this protocol when starting the display software. This can, for example, be used to set up a system that automatically loads and runs a show every time the computer is switched on.

The command file can be created using a text editor or word processor capable of saving as plain text. To perform those commands when starting the WATCHOUT display software, you provide the name of this command file as a command line parameter to the display software. If started using a shortcut

(possibly located in the Startup folder), add the name of the command file to the Target field of the shortcut.

Enter the name of the command file here. This example assumes that the file is stored in the folder where WATCHOUT is installed.

Make sure this is set to the folder where WATCHOUT is installed.



The example below shows the content of a command file that displays a message on the WATCHOUT screen, waits a few seconds, loads a show, waits

for any other computers in the WATCHOUT display cluster to become ready, and then runs the show.

```
authenticate 1
setLogoString "The show will begin shortly"
delay 5000
load "MyShow"
wait
run
```

See each individual command later in this appendix for details.

- ▲ **IMPORTANT:** If using non-ASCII characters in the show name (for example; å, ö, ü, ß), your text editor must be able to save the text using the UTF-8 encoding. If you're unsure about this, it's usually easiest to rename the show to avoid non-ASCII characters.
- ◆ **NOTE:** Any errors occurring while executing commands from such a command file are displayed in a console window. However, to see this window, you have to close the main WATCHOUT display window by pressing Ctrl-W. Keep this in mind if your command file doesn't work as expected.

Network Control

To control a WATCHOUT display cluster via the network, connect to TCP/IP port number 3039 of one of the WATCHOUT display computers. The computer you initiate communication with becomes the master of the cluster, and will automatically control the other cluster members, as specified by the presentation loaded using the "load" command.

Use a Telnet program to check the communication. Open the port specified above, then type “ping” and press Return. WATCHOUT will respond with a Ready message, stating its version number and some other details.

Serial Control

To control a WATCHOUT display cluster through a serial port, connect the controlling device to a serial port of one of the WATCHOUT display computers. The computer you connect to becomes the master of the cluster, and will automatically control the other cluster members, as specified by the presentation loaded using the “load” command.

No serial port is open by default. Use the serialPort command to open a serial port. Put this command into a text file, and use the file-based control feature to perform the serialPort command (see “File-based Control” on page 257).

COMMANDS AND RESPONSES

WATCHOUT uses a simple text format for its commands. Some commands may return a reply, error message or other kind of response to the controller. Such responses are also sent as text.

Authentication

Before you can give any command (with the exception of the “ping” command), you must specify the authentication level. To control WATCHOUT, you need authentication level 1:

```
authenticate 1
```

WATCHOUT responds with a Ready message. You can now send other commands.

Command Format

Each command is sent as a string, terminated by a carriage return, line feed or CR/LF pair. A command consists of a command name, sometimes followed by

parameters. Commands are case sensitive. Commands are encoded using the UTF-8 UNICODE character format, which is downward compatible with ASCII.

▲ **IMPORTANT:** When sending commands containing non-ASCII characters – such as å, ä, ü, ç – these must be encoded using the UTF-8 format.

Responses and Feedback

Most commands perform silently when successful. You can explicitly request acknowledgement from any command as described under “Command ID Tagging” on page 274.

Parameters

For commands that take parameters, parameters are separated by white-space only. Optional parameters are shown in square brackets, like this: [`<uint>`]. The parameter types are described below.

<string> String parameters are sent within double quotes:

```
"This is a string"
```

Backslash is used as an escape character (that is, to encode a double quote in a string, precede it with a backslash). To send a backslash character, use “\\” inside the string.

<uint> and <int> An unsigned or possibly signed decimal integral number:

```
123
```

<float> A possibly signed decimal number with an optional fractional part:

```
0.25
```

<bool> The keyword true or false, with no quotes:

```
true
```

LIST OF COMMANDS

The table below shows the available commands. Some are explained in greater depth on the page indicated in brackets.

Command	Description
ping	Do-nothing command causing a Ready feedback message to be sent.
authenticate	Perform authentication. Required prior to other commands [260].
load	Load a show and get ready to run [263].
run [<string>]	Start running, optionally specifying an auxiliary timeline name.
halt [<string>]	Stop running, optionally specifying an auxiliary timeline name.
kill <string>	Stop and deactivate the named auxiliary timeline.
gotoTime	Jump to a time position [264].
gotoControlCue	Jump to the time position of a named Control cue [264].
enableLayerCond	Turn conditional layers on or off [265].
standBy	Enter/exit standby mode [265].
getStatus	Retrieves name and status of the currently running show [265].
reset	Reset and stop all timelines.
setInput	Set the value of a named Input, with optional fade-rate in mS [267].
delay	Introduces a delay between commands (command file use only) [266].
wait	Waits for the entire display cluster to become established [266].
serialPort	Opens a serial port for control protocol use, specifying its parameters [267].
timecodeMode	Activates LTC (SMPTE/EBU) timecode control [268].

load

Load a complete show specification from a local file associated with the show name specified by the first parameter. Busy feedback may be sent to the host while loading, informing the host about the progress (see “Busy” on page 270). If errors occur, Error feedback is sent (see “Error” on page 271). Finally, a Ready feedback message is sent, regardless of whether any error occurred (see “Ready” on page 269).

```
load "Phantom"
```

Parameter	Description
<string>	Name of the show to be loaded.
[<bool>]	Manage cluster loading and feedback. Defaults to true.
[<bool>]	Designate as the master display computer. Defaults to true.
[<uint>]	Conditional layer enable flags, least significant bit is condition 1 (see table on page 255).

- ◆ **NOTE:** You can not specify a folder path to the show. The show must be present in the “Shows” folder, located in the same folder as the WATCHOUT display software.

gotoTime

Jump to the specified time position along the timeline.

```
gotoTime 5000
```

Parameter	Description
<uint> or <string>	Time position to go to, in milliseconds, or as a string in this format: "HH:MM:SS.FFF", where FFF is milliseconds.
[<string>]	Name of auxiliary timeline to control (omit for main timeline).

gotoControlCue

Jump to the time of specified Control cue. If the optional "reverse only" boolean is set to true, it searches for the Control cue only back in time from the current time position. Otherwise it searches first forward then reverse.

The command does not change the run mode of the timeline. If specified cue is not found, the timeline's state will not change, and a runtime error message to this effect will be returned.

```
gotoControlCue "William" true
```

Parameter	Description
<string>	Name of Control cue to look for.
[<bool>]	Search in reverse only if true. If false or not specified, then search both ways.
[<string>]	Name of auxiliary timeline to control (omit for main timeline).

enableLayerCond

Change the set of enabled layer conditions. While the layer conditions can be specified as part of the load command, this separate command allows the layer conditions to be changed without loading another show. The command takes a single, mandatory <uint> parameter with the same interpretation as the conditional layers parameter of the load command (see table on page 255).

setLogoString

Display the string parameter next to the WATCHOUT logo, when shown on screen. See example on page 259.

standBy

Enter/exit standby mode. In standby, the display and sound is muted, or media on standby layers – if any – is performed (see “Perform Normal/In Standby” on page 104). This mode can be entered/exited smoothly, by specifying a fade rate.

```
standBy true 1000
```

Fade out sound and image over one second and enter standby mode. If any standby layer is available, its media is performed instead.

Parameter	Description
<bool>	Enter standby if true, exit if false.
[<uint>]	Fade rate, in milliseconds. Defaults to zero if not specified.

getStatus

Get the current status of the WATCHOUT cluster master.

```
getStatus  
Reply "WO2Launch" false 0 true true false 122 true
```

Responds with a Reply with the following parameters:

Reply Parameter	Description
<string>	Name of the show. Empty string if no show loaded.
<bool>	Busy. True if the master display computer or any of its slaves is busy
<uint>	General health status of the cluster; 0: OK, 1: Suboptimal, 2: Problems, 3: Dead.
<bool>	Display is open (in its full screen mode).
<bool>	Show is active (ready to run).
<bool>	Programmer is on line.
[<uint>]	Current time position, in milliseconds (only included if show is active).
[<bool>]	Show is playing – false if paused (only included if show is active).
[<float>]	Timeline rate (nominally 1, only included if show is active).
[<bool>]	Standby mode (true if in standby, only included if show is active)

delay

Wait the number of milliseconds specified by the parameter before performing the next command in the file. See example on page 259.

◆ **NOTE:** Performed only when used in a command file.

wait

Wait for the display cluster to become fully established before proceeding with the next command in the file. Waits at most the number of milliseconds specified by the parameter. See example on page 259.

◆ **NOTE:** Performed only when used in a command file.

setInput

Sets the value of a named input (see “Inputs” on page 197).

Parameter	Description
<string>	The name of the input to set.
<float>	The desired value, optionally prefixed by + or - for incremental change.
[<uint>]	Optional transition rate, in milliseconds.

See “setInput” on page 256 for more details and an example.

serialPort

Open serial port for cluster control protocol use, setting its parameters.

```
serialPort true "COM1"
```

Parameter	Description
<bool>	Open (true) or close (false) the serial port.
<string>	The name of the serial port.
[<uint>]	Protocol selector. Must be 0. Default is 0.
[<uint>]	Data rate, in bits per second. Default is 9600.
[<uint>]	Number of data bits, 7 or 8. Default is 8.
[<uint>]	Number of stop bits, 1 or 2. Default is 1.
[<uint>]	Parity: 0 = none, 1 = odd, 2 = even. Default is none.

- ◆ **HINT:** For serial-only control, put the serialPort command into a text file, and use the file based control feature to perform the commands in this file (see “File-based Control” on page 257).

timecodeMode

Controls the LTC timecode receiver of the display computer. The timecode receiver is initially off. When turned on, incoming timecode will control the presentation as if using the run, halt and gotoTime commands. Furthermore, while playing, the presentation will be synchronized to the timecode.

```
timecodeMode 2 "-1:00:00"
```

Parameter	Description
<uint>	0 = receiver off, 1 = auto-detect format, 2 = EBU 25 fps, 3 = SMPTE 29.97 NDF, 4 = SMPTE 29.97 DF, 5 = SMPTE 30 ("B&W").
[<int> or <string>]	Time offset expressed in milliseconds, or as a string in this format: "HH:MM:SS.FFF", where FFF is milliseconds. Default is 0.

Avoid using the auto-detect mode whenever possible. Instead, specify the expected timecode format explicitly. Specifically, the SMPTE 30 ("B&W") format can not be detected automatically.

Use the separate Timecode Tester application to verify proper timecode reception, and to choose the appropriate input connector to use for the timecode signal (see "Timecode Control" on page 84).

- ◆ **HINT:** For stand-alone use of the timecode control feature, put this command into a text file, as described under "File-based Control" on page 257.
- ◆ **NOTE:** Timecode control of the display computer can't be used while the production software is online. In this case, use the corresponding feature of the production software instead. See "Controlling the Production Computer" on page 84.

FEEDBACK

The WATCHOUT cluster master sends feedback messages to the controller. Note that the controller must be prepared to receive such messages at any time – not only as a direct response to particular commands.

Most commands execute silently, unless an error occurs. Use the command ID tagging feature to force commands to be positively acknowledged, if desired (see “Command ID Tagging” on page 274). When using command ID tagging, any feedback message sent as a direct response to a command will be tagged by that command ID, and will be sent to the sender of that command.

Any spontaneous feedback message (that is, not directly associated with a particular command) will be sent to the most recently connected or authenticated controller.

Ready

Sent once when becomes ready after being busy (as indicated by one or more Busy messages). Also sent as response to the “ping” command.

Ready "2.0" "WATCHPOINT" "Windows" true

Feedback Parameter	Description
<string>	The version of the program.
<string>	The name of the program.
<string>	The name of the computer/OS.
<bool>	License key is up to date.
[<string>]	Address of originator (empty or omitted if originating from the master).

Busy

Sent repeatedly while busy doing lengthy tasks, such as downloading or caching files.

Busy "Transferring" "Media/Wilfred.jpg" 76

Note that either or both string parameters may be empty, in which case the controller should retain the previous values for these parameters and just update the progress value.

Feedback Parameter	Description
<string>	What is being done (for instance, "Transferring"). May be empty string.
<string>	The subject of the above action (for instance, a file name). May be empty.
<uint>	Percentage done so far, 0...100
[<string>]	Address of originator (empty or omitted if originating from the master).

Error

Sent when any error occurs, either as a direct result of a command, or for any other reason.

Feedback Parameter	Description
<uint>	Error kind: <ol style="list-style-type: none">1 Operating system error (for instance, a Win32 HRESULT).2 QuickTime error (Mac OSErr style).3 Rendering API error (that is, DirectX).4 Network errors (that is, WinSock).5 File server error (for example, file not found during download).6 Syntax/parser error (for instance, when loading a specification file).7 General runtime error – described by string.8 Authentication error.
<int> or <string>	Error number or description string. May be zero.
<string>	Excuse or explanation, may be empty string.
[<string>]	Address of originator (empty or omitted if originating from the master).

Operating System Error

Indicates a generic operating system error from the host's OS. Under Windows, this is a HRESULT that indicates failure, with the error code included as the second parameter (possibly decoded into an error message string). The third parameter may provide additional information.

QuickTime Error

Similar to the Operating System Error, but originating from QuickTime. This is treated separately from the OS errors since the QT errors use MacOS style error codes even under Windows. This kind of error typically originates from still image files, or from video files as they are opened or played. The third parameter generally contains the name of the offending media file.

Rendering API Error	Error occurred specifically related to rendering. This is similar to other operating system errors, except that you also know that it occurred while rendering. Sometimes, rendering errors occur due to display card driver issues, video memory or other hardware resource limitations.
Network Error	Error occurred specifically related to network communication. This is similar to other operating system errors, except that you also know that it occurred specifically while using the network. Sometimes, network errors are caused by network interface hardware or driver issues, the computer's network configuration, or problems on the network itself (for instance, a bad cable/hub or incorrectly configured router).
File Server Error	Error occurred when attempting to get a file from the media file server. The error number the same as those listed for the first Reply parameter in the File Transfer group. The Excuse string is typically the name of the required file.
Syntax/Parser Error	Indicates an error that occurred when reading structured data (such as a show specification file). Error code and excuse vary with the nature of the error.
General Runtime Error	Other errors, not covered by any of the above cases. Always described further by a string as the second parameter, as well as further information in the third parameter (optional).

Authentication Error The second parameter gives further details:

Value	Description
1	You have no authority.
2	Your authority is insufficient for this command.
3	In use by another Programmer.
4	Authentication challenge/response sequence failed.
5	Invalid authentication level.
6	Authentication level not allowed for port.
7	Command not allowed in read-only mode.

The third parameter may provide additional context information. For instance, in the case of being in use by another controller, it may provide information to identify that controller – such as its address.

Warning

Sent when a non-critical error occurs.

Warning "Low Memory: Primary Video 960 KB"

Feedback Parameter	Description
<string>	The warning message, as a quoted string.
[<string>]	Address of originator (empty or omitted if originating from the master).

Information

Sent to convey some general information.

Feedback Parameter	Description
<string>	The information message, as a quoted string.
[<string>]	Address of originator (empty or omitted if originating from the master).

Reply

A Reply feedback message is sent as a direct response to a query command (for instance, `getStatus` described on page 265). Use a command ID to positively associate the reply with the command.

The format of the reply parameter(s) depends on the command that caused the reply to be sent.

Quit

Sent when the application is about to quit (either due to a keyboard or other command). This message has no parameters.

COMMAND ID TAGGING

Commands may optionally be preceded by a command ID. This is any sequence of characters enclosed in square brackets. When used, at least one explicit reply is always sent for each command. The reply is then also tagged with the same ID:

```
[ 23 ]ping  
[ 23 ]Ready "2.0" "WATCHPOINT" "Windows" true
```

Use this feature if you want positive confirmation of commands, or to explicitly associate a feedback message with a command.

F MIDI SHOW CONTROL

MIDI Show Control (MSC) allows WATCHOUT to be controlled from a lighting console, or similar device capable of outputting MSC commands.

- ◆ **NOTE:** During production, connect your MIDI device to the production computer. When not using the production software, connect it to the primary display computer in the cluster.

In addition to enabling MIDI Show Control, you also have to specify the MSC Device ID (see page 122). This acts as a channel number for MSC commands, and must be set to the device ID number output by the console. In addition, WATCHOUT also recognizes the global “all call” device ID.

Some MSC commands allow a cue/list/path to be specified. WATCHOUT doesn’t use the “path” number. The “list” number can be handled in either of three ways, as specified in the WATCHOUT Preferences:

- **Ignore Command.** In this setting, the entire command will be discarded (not acted upon) if a list number is specified.
- **Map all to Main Timeline.** This setting ignores the cue list number, sending all such commands to the main timeline.
- **Map to Auxiliary Timelines.** If a cue list number is specified, the command will be applied to an Auxiliary Timeline with the same name (where the name must be numeric, to match the list number).

The cue number, if specified, makes WATCHOUT locate a Control cue with that name (that is, the name of the cue must be a number). The GO and TIMED GO, LOAD and STOP commands interpret cue number 0 as specifying “no cue”, allowing you to specify the cue list part only. This allows you to use the STOP command to stop an Auxiliary Timeline without necessarily specifying a particular cue by setting the cue number to zero.

The following is a description of each command, as it relates to WATCHOUT.

GO

If given without a cue/list specification, runs the main timeline.

If given with a cue but no list, locates the specified cue on the main timeline and runs from there. Does nothing if a cue with that name doesn't exist.

If given with cue and list, locates the specified cue on the specified Auxiliary timeline, and runs it from there (assuming cue lists are mapped to Auxiliary timelines). Does nothing if specified cue or timeline can't be found.

TIMED GO

Performs like GO, ignoring the time value specified.

STOP

Pauses the timeline, optionally locating the specified cue.

LOAD

Similar to GO, except that the timeline isn't run.

RESET

Stops all Auxiliary timelines (returning them to their inactive state) and reset the main timeline to its beginning.

ALL OFF

Enters Stand-By mode.

RESTORE

Exits Stand-By mode.

INDEX

Numerics

3D 86, 100, 124

A

acceleration 76

Add Composition command 143

adding a control cue 151

adding a display 131

adding a media proxy 139

Adobe After Effects 39

alpha channel 35, 36, 40, 142

anchor point 74

anchor point, in images 121

audio *see* sound

auxiliary timeline 203, 210

 settings 152

AVI 37

B

Background Color command 138

balance, audio 180

batch file 257

Best Quality command 136

black & white 187

blend mode 176

C

cache folder 80

CachedFiles 80

channel mixer 193

chromakey 185

Clear command 126

Click Selects Frontmost Image command 135

cluster control protocol 257

codec 40

color 189

color correction 165

color, keep 187

command file 257

composition 87, 143

 settings 154

computer screen 143

conditional layers, preview of 137

Consolidate command 117

contrast & brightness 187

control cue 151

Copy command 126

corners 186

crop 188

- cue 12, 64, 167
 - adding 102, 167
 - control 151
 - cutting 168
 - deleting 168
 - duration 67, 169
 - media position 168
 - pasting 168
 - pause 68
 - positioning 167
 - replacing media 66, 170
 - selecting 167
 - specifications 67, 170
 - string 208
 - tween track 69, 179
- curved screen 160
- Cut command 126

D

- DA (distribution amplifier) 18
- deinterlace
 - live video 146
- delay 266

- display 157
 - adding 59, 97, 131, 157
 - address 158
 - address prefix, in preferences 120
 - arranging 59
 - duplicating 158
 - DVI 242
 - geometry 160
 - installing 17
 - LCD 241
 - name 158
 - online 134
 - positioning 157
 - removing 158
 - selecting 157
 - specifications 158
 - stage position 159
- display computer 9
 - connecting to 79
 - quitting WATCHOUT 79
- DLP projector 239
- DMX-512 57, 201, 205
- DV 37
- DV video format 41
- DVI connector 242

E

- EBU timecode 84
- edge blend 121, 153, 160, 246

edit menu 125
enableLayerCond 265
Ethernet 16
Ethernet port 206
expression 203, 212
external control 83

F

file menu 115
find and replace 128
Find command 195
Find/Replace Again command 129
Find/Replace command 128
folder, in media window 149
frame rate 120
free running 174
function keys 195

G

gamma setting 246
geometry correction 160
 adding points 164
getStatus 265
gotoControlCue 254, 264

gotoTime 254, 264
green screen 185

H

HDMI 243
high definition video 37
hub 16
hue & saturation 192

I

image specifications 36
input 197
 controlling a tween track 202
 starting a task 203
in-time 172
IP address 27

J

jump button 102
jumping, in presentation 81

K

keying 185

L

- Large Thumbnails command 149
- layer 66
 - changing height 102
 - collapse 101
 - condition 104
 - current 102
 - deleting 151
 - disabling preview of 103
 - inserting 151
 - locking 103
 - renaming 151
 - selecting 102
 - settings 103, 151
- LCD display 241
- LCD projector 241
- license key 16
- link handles 183
- live video 145, 146
- live video input 18
- load 255, 263
- logical operators 214
- loop 81, 175, 193
- loop, timeline 194

M

- mask 176
- Masked by Displays command 136

- media 12, 61
 - adding 61, 107
 - changing file association 62, 108
 - changing path to files 128
 - downloading files 80
 - dragging to stage 97
 - editing file 62, 109
 - locating file 108
 - opening original 109
 - positioning 98, 168
 - proxy 63, 109, 139
 - purging unused 62
 - refreshing 62, 109, 149
 - removing 107
 - selecting unused 150
 - thumbnail size 149
 - window 107
- menu
 - edit 125
 - file 115
 - media 139
 - preview 135
 - stage 131
 - timeline 151
 - tween 155
 - window 155
- message 113
 - removing 113
- MIDI 198

MIDI show control, MSC 122, 275

MOV file format 37

movie 37

- assembling individual frames 39

- audio embedded in 46

- computer generated 38

- pre-splitting 42, 140

moving along a path 183

MPEG 37

MPEG-2 41

N

network 9

- connecting 16

- control 251, 257, 259

- requirements 224

NETWORK TRANSPONDER 82

network video 48

New Folder command 149

O

online 79, 134

opacity 35, 40, 72

- tweening 180

Open command 116

operator 215

optical distortion 160, 249

ortographic 100, 136

Outline Dimmed Images command 136

output 204

- DMX-512 205

- serial 207

- string 206

output cue, creating 204

P

Paste command 126

pause cue 68

perspective 100, 124, 136

perspective correction 161

PICKUP 82

play 102

Play Audio Media command 136

position

- animating 75

- editing 75

- moving along a path 76

- tweening of 182

preferences 120

pre-roll 173

presentation

- controlling 83

- looping 81

- making new 115

- manual control of 81

- opening 116

- saving 116

pre-splitting large movies 42

- preview
 - background color 138
 - conditional layers 137
 - outline dimmed images 136
 - stage tiers 137
 - standby layers 137
 - wireframe 135
- preview menu 135
- Preview Scale command 131
- Preview Standby Layers command 137
- production computer 8
 - control protocol 251
- progressive video 37
- projection screen 17
- projector
 - DLP 239
 - LCD 241
- protocol 251, 257
- proxy 63, 109, 139

Q

- QuickFind 195
- QuickTime
 - installing 15
 - obtaining 15

R

- reference frame 154
- Refresh Media command 109, 149

- relational operators 214
- rotation tweening 184
- rtp 48
- rtsp 48

S

- Save a Copy command 116
- Save command 116
- scale tweening 181
- scaling 72
- Select All command 126
- Select to End command 126
- Select Unused command 150
- serial control 83, 260
- serial port 207
- serialPort 267
- setInput 256, 267
- setLogoString 265
- skew, image 186
- SMPTE 84
- sound
 - file formats 45
 - installing 17
 - multi-channel 18, 45
 - producing 45
 - settings 31
- Specifications command 127
- speed of motion 76
- spherical projection 163

- stacking 175
- stacking order 153
- stage
 - adding displays 97
 - adding media 97
 - background color 138
 - online 134
 - positioning displays 159
 - positioning media preview 65, 98
 - preview 131
 - preview quality 135, 175
 - scale 97
 - tier 98, 133
 - updating 81, 134
- stage menu 131
- stage window 12, 59, 97
- standBy 254, 265
- stereoscopy 86, 125
- still image
 - formats 34
 - producing 34
- style, text 55
- sun icon, in layer header 103
- suppress rendering 177

T

- task 209
 - starting from input 203

- TCP/IP network 206, 251, 257
- text media 52
- text style 55
- Thumbnails command 135
- tier 133
 - preview of 137
- time scale, adjusting 102
- timecode 84, 268
- timecodeMode 268
- timeline 12, 64
 - adding cues to 64, 102
 - jump button 102
 - layer 66
 - playing 102
 - settings 152
 - starting 102
 - window 101
- timeline menu 151
- Timeline Settings command 152
- tint 192
- transparency 36, 185
 - pre-multiplied, straight 142
- transparency see opacity
- triangle, in layer header 101
- tween menu 155

- tween point 70
 - copying 70
 - corner 70
 - editing numerically 71
 - removing 70
 - smooth 70
- tween track 12, 69, 179
 - adding points to 70
 - opacity 72
 - position 75
 - red curve 202
 - rotation 73
 - scale 72
 - stretching 70
 - volume 72

U

- UDP 206
- UDP, TCP/IP, control protocol 122
- Undo command 125
- Update command 134
- USB port 16

V

- vanishing point 124
- velocity 76
- Video as Thumbnails command 135

- video distribution amplifier 18
- video see movie
- VNC 143
- volume 72
 - tweening 180

W

- wait 266
- warping 160
- WATCHOUT
 - installing 15
 - obtaining 15
 - screenshot 13
 - system overview 8
- window
 - media 107
 - message 113
 - overview 95
 - stage 97
 - timeline 101
- window menu 155
- Windows 22
- Windows Media 9 37
- wipe 186
- Wireframes command 135
- WMV file format 37