

Spectrum™

Release 8.2

Template User Guide

Manual Part No. 28-0375

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In Harmonic documents, special symbols and fonts to call your attention to important information.

-  **DANGER:** The Danger symbol indicates information that, if ignored, can cause physical harm to you.
-  **CAUTION:** The Caution symbol indicates information that, if ignored, can adversely affect the performance of your Harmonic product, or that can make a procedure needlessly difficult.
-  **NOTE:** The Note symbol indicates especially important information you need, or it may provide additional information that applies in only some carefully delineated circumstances.
-  **IMPORTANT:** The Important symbol indicates information that should stand out when you are reading product details and procedural information.
-  **TIP:** The Tip symbol indicates parenthetical information that is not necessary for performing a given procedure, but which, if followed, makes the procedure easier, smoother, or more efficient.

In addition to these symbols, this guide may use the following text conventions:

Convention	Explanation
Typed Command	Indicates the text that you type in at the keyboard prompt.
Ctrl, Ctrl + Shift	A key or key sequence to press.
http://www.harmonicinc.com	The italics in blue text to indicate Cross-references, and hyperlinked cross-references in online documents.
Bold	Indicates a button to click, or a menu item to select.
Screen Output	The text that is displayed on a computer screen.
<i>Emphasis</i>	The italics text used for emphasis and document references.

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Chapter 1

Introduction


The Harmonic Template Authoring Package is a custom authoring tool for integrating video graphics and branding on your Spectrum playout device.

 **IMPORTANT:** The templates and files included in the Template Authoring Package are examples only, and are provided as is. Harmonic assumes no responsibility or liability if the provided templates do not work as expected in expanded workflows.

- [About the Template Authoring Package](#)
- [Adobe tools for template authoring](#)
- [Sample templates](#)
- [Harmonic Template Widget Library](#)


About the Template Authoring Package


The Template Authoring Package contains both blank and sample `.fla` files that can be turned into `.swf` files for playout on your Spectrum playout device.

 **NOTE:** To create a project from scratch, you should use a blank template. If you prefer to create a custom template that does not use one of the blank or sample files, you must first properly configure Flash Professional and the ActionScript settings for your project.

Contents

Learn which folders and files make up the Template Authoring Package.

Folder name	Description
external-key-fill	Contains the external Key/Fill templates that, when loaded onto a layer, enable the external Key/Fill feature.
project	<p>Contains the Flash ActionScript files written by Harmonic that are needed to play a template.</p> <p>HarmonicTemplate.swc (compiled ActionScript) is included in the <code>.swf</code> file when you publish a template.</p> <p> IMPORTANT: Harmonic recommends that all project files be placed in the <code>project</code> folder in order for published <code>.swf</code> files to contain the necessary Harmonic-provided ActionScript code.</p>

Folder name	Description
samples	<p>Contains the following subfolders:</p> <ul style="list-style-type: none"> <code>sources</code>: Contains <code>.fla</code> files of the sample templates and blank templates for each supported raster size. <code>templates</code>: Contains <code>.swf</code> files of the sample templates for each supported raster size. <p> NOTE: Within the <code>sources</code> and <code>templates</code> folders, the <code>anysize</code> folder contains open caption templates and source files.</p>
widgets	Contains the Harmonic Widget Library. Harmonic widgets are Flash components that can be used for building templates.

Supported file types

Your Spectrum playback device supports a variety of file types.

Graphics

- `.swf` (Shockwave Flash Movie)
- `.flv` (Flash Video)
- `.mp4` (MPEG-4)
- `.png` (Portable Network Graphic)
- `.jpg/.jpeg` (Joint Photographic Experts Group)
- `.tga` (Targa Graphic)
- `.gif` (Graphical Interchange Format)
- `.bmp` (Bitmap Image)
- `.tif/.tiff` (Tagged Image File)

 **NOTE:** JPEG file compression and planar formats within `.tif` files are not supported.

Audio

- `.wav` (Waveform Audio File Format)
- `.aiff` (Audio Interchange File Format)

 **NOTE:** Playback of audio embedded in a `.swf` file is not supported.

For best performance, Harmonic recommends the following audio settings: 48 kHz, 24-bit, up to 16 channels.

Bundled files

Spectrum X and ChannelPort will play out bundled files in a `.zip` file.

Supported raster sizes

Harmonic blank and sample templates are available in each supported raster size.

- 2160p60, 3840x2160 (Spectrum X only)
- 2160p50, 3840x2160 (Spectrum X only)

- 1080p60, 1920x1080
- 1080p50, 1920x1080
- 1080i60, 1920x1080
- 1080i50, 1920x1080
- 720p60, 1280x720
- 720p50, 1280x720
- 625-16x9, 1024x576
- 625-4x3, 768x576
- 525-16x9, 864x486
- 525-4x3, 648x486

Adobe tools for template authoring

Review which Adobe® tools are required or recommended for authoring `.swf`, `.flv`, and `.mp4` templates for the Spectrum X and ChannelPort.

Shockwave Flash Movie (`.swf`) templates

Spectrum X and ChannelPort support `.swf` files that are compatible with Flash Player 10.3 and ActionScript 3.0. At this time, Harmonic recommends authoring `.swf` templates in Flash Professional® CS6, and the procedures in this guide for creating and customizing `.swf` templates are based on the Flash Professional CS6 environment.



NOTE: Adobe® Animate CC is the next generation of Flash Professional, and is very similar in terms of usage. If you wish to use Animate CC for authoring `.swf` files for the Spectrum X and ChannelPort, your template project must be configured for Flash Player 10.3 and ActionScript 3.0.



IMPORTANT: You must use Flash Professional CS6 if your template project requires Text Layout Framework (TLF). The Harmonic Advanced Text Field Widget and Advanced Text Scroll Widget use TLF.

Flash video (`.flv`) templates

At this time, After Effects CS6 or Media Encoder CS6 is required for authoring `.flv` templates for the Spectrum X and ChannelPort.

MPEG-4 (`.mp4`) templates

At this time, Harmonic recommends using After Effects CS6 or Media Encoder CS6 for authoring `.mp4` templates for the Spectrum X and ChannelPort.



NOTE: After Effects CS6 and Media Encoder CS6 do not support 3840x2160 `.mp4` files at 50 or 59.94 Hz. Instead, use After Effects CC or Media Encoder CC to author `.mp4` templates at this resolution and frame rate.

Sample templates

The Template Authoring Package includes a variety of sample .swf templates.

Dynamic text field templates

These templates contain Harmonic text field widgets that can be updated after the template has been loaded onto your Spectrum playout device.

Dynamic text banner

The following figure shows the second text field of the Dynamic Text Banner (or Now, Next, Later) template.



Figure 1-1: Dynamic text banner template

The template contains several layers of Flash animation, as shown below.

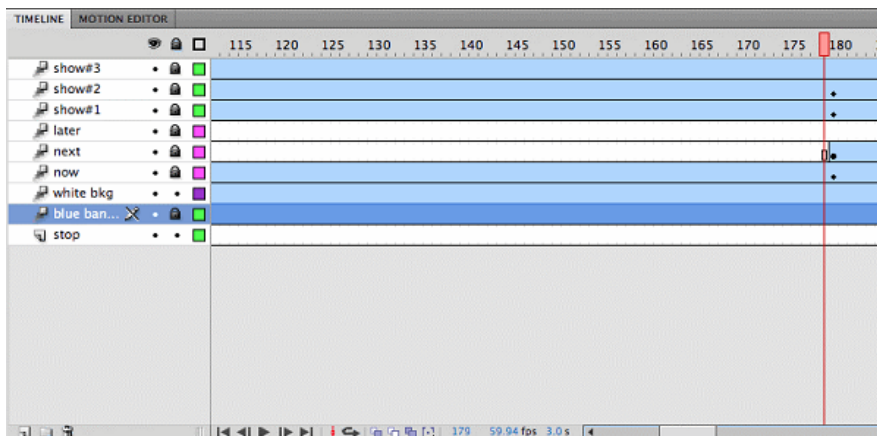


Figure 1-2: Dynamic text banner Flash layers

Full-page dynamic text banner

This template contains multiple instances of the Harmonic text field widget and uses a .jpeg file for the background image. The dynamic text field containing the time animates from the left, and the dynamic text field animates from the right.

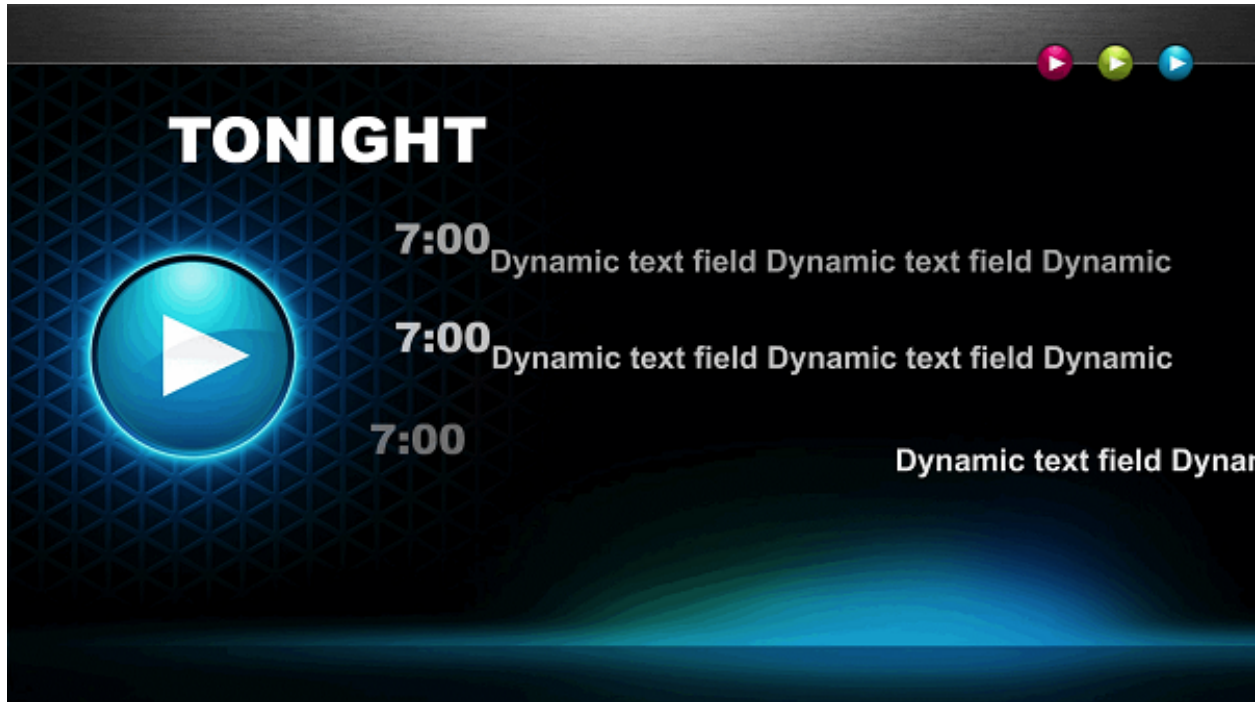


Figure 1-3: Full-page dynamic text banner template

This template contains several layers of Flash animation, as shown below.

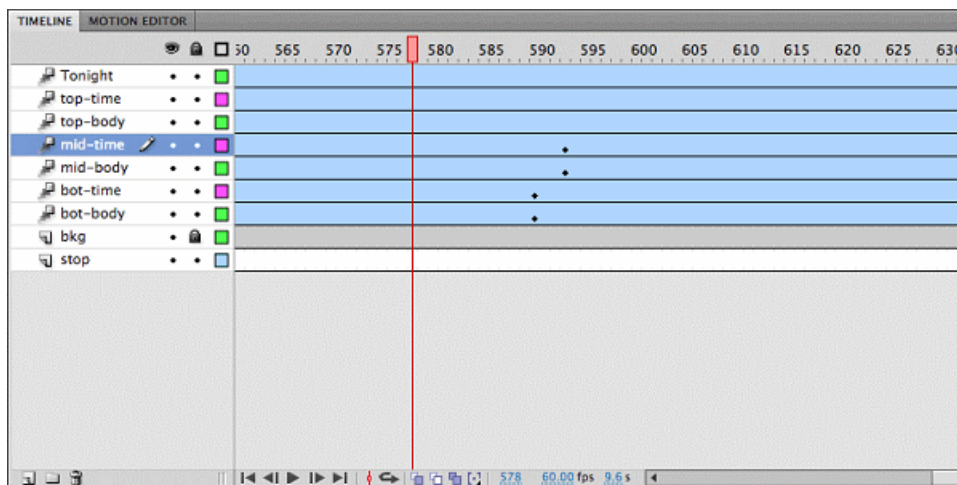


Figure 1-4: Full-page dynamic text banner Flash layers

Countdown template

This template contains the Harmonic Text Field widget and the Harmonic Countdown widget.

After the template is loaded, a numeric value (in seconds) can be entered in the text field of the template. When the countdown is complete, the template will hide its contents.



Figure 1-5: Countdown template

This template contains several layers of Flash animation, as shown below.

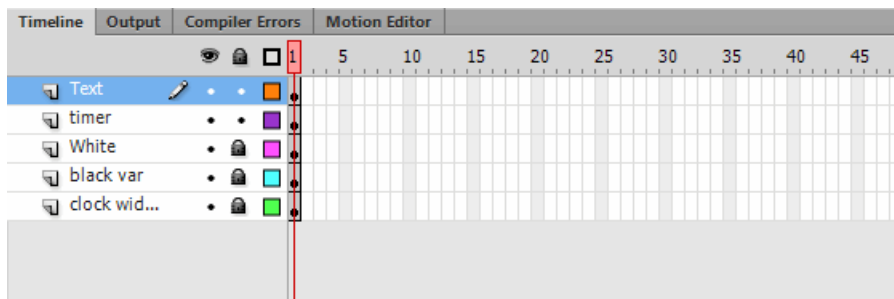


Figure 1-6: Flash layers

Regulatory templates

Regulatory templates contain a single .png image file that has been placed on the Flash stage.

Each regulatory template uses only one layer in Flash. The following templates are available:

- TV-Y
- Closed Captioning
- TV-14
- TV-MA
- E/I (Educational and Informational)



Figure 1-7: TV-Y template

EAS templates

Three EAS templates are available. Each contains the Harmonic Text Scroll widget, and uses one layer in Flash.

The following templates are provided:

- EAS Warning
- EAS Watch
- EAS Advisory



NOTE: EAS templates are placed on the highest graphics layer to ensure they are not obscured by other graphics. If your Spectrum playout device is configured to support an EAS, be sure to reserve the highest layer for EAS templates.



Figure 1-8: EAS warning template

Pillar Boxes template

This template contains two .png image files (one for each side of the screen) that have been manipulated on the Flash stage. The template uses one layer in Flash.



Figure 1-9: Pillar boxes template

Logo Loop templates

Two versions of this template are provided. One contains a Flash video and the other contains a sequence of .png image files that have been placed on the Flash stage.

The Logo Loop template uses one layer of animation in Flash. When played, the animation will continue to loop until it is stopped.



Figure 1-10: Logo Loop template in which the animation (in blue) is captured toward the end of the loop

Three-point Animation templates

This template contains a Flash video with an intro section, a loop section, and an outro section.

The template depicts the following animations:

1. The laser animation slides in from the right of the screen.

2. When the laser animation reaches the left boundary of the template, it reverses its direction, and the Harmonic logo appears on the screen.
3. The laser animation slides in from the right of the screen again. When it reaches the left boundary of the template, it reverses direction, and the Harmonic logo disappears from the screen.

The example below shows the three-point animation template in the second part of its animation.



Figure 1-11: Three-point animation template

The template contains several layers of Flash animation, as shown below.

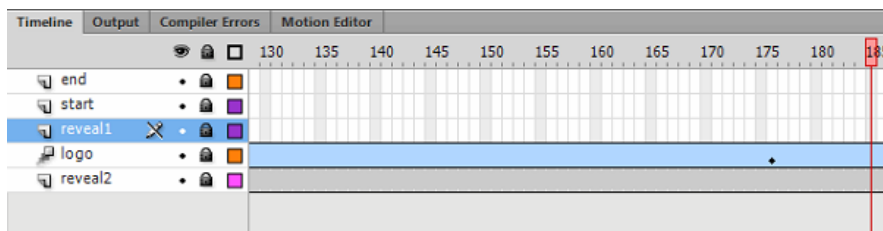


Figure 1-12: Flash layers

Additional information

[Configuring three-point animations](#) on page 50

News Ticker template

This template contains the Harmonic Clock widget, the Harmonic Advanced Text Scroll widget, and a static .png image file that has been placed on the Flash stage.

You can configure the News Ticker template to fetch data from an RSS feed or from a text file. You can also update the text field of the News Ticker template when you preview the template using FXTool or Preview Tool.



Figure 1-13: News ticker template

This template contains several layers of Flash animation, as shown below.

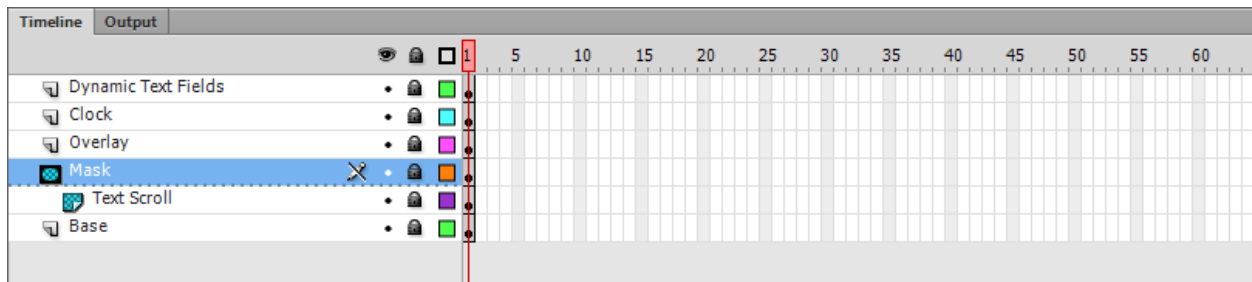


Figure 1-14: Flash layers

Dual DVE Side-by-Side template

This template contains dual DVE component widgets and a .jpeg file for the background image.

The Dual DVE Side-by-Side template begins with a full-screen video, and then “squeezes” the video back toward the left side of the screen. As the video is “squeezed” back, a blue background image appears, and a second DVE is introduced from the bottom right-hand side of the screen.



Figure 1-15: Dual DVE side-by-side template

The Dual DVE Side-by-Side template contains several layers of Flash animation, as shown below.

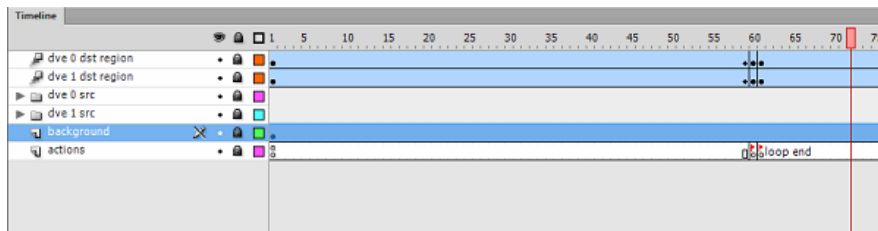


Figure 1-16: Flash layers

Additional information

[Using the blank Harmonic Dual DVE template on page 61](#)

DVE Squeezeback template

This template contains the Harmonic DVE widgets and a graphics folder that contains several .png files and a collection of movie clips.

The DVE Squeezeback template begins with a full-screen video, and then “squeezes” the video back toward the top-left portion of the screen. As the video is “squeezed back” a border and the Harmonic logo slide in to frame the video.

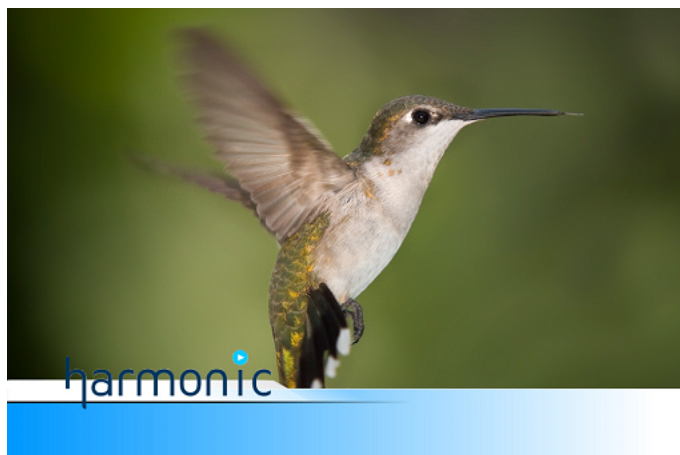


Figure 1-17: DVE squeezeback template in 1280x720

The DVE Squeezeback template contains several layers of Flash animation, as shown below.

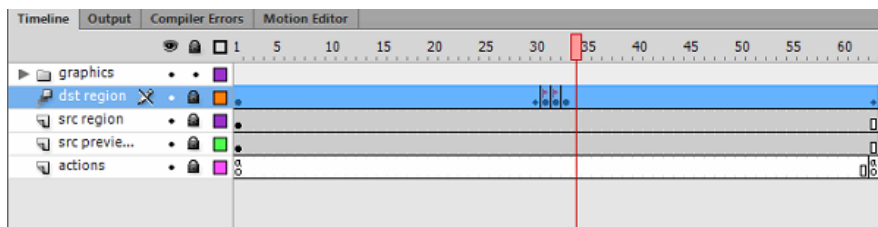


Figure 1-18: Flash layers

Additional information

[Using the blank DVE template on page 59](#)

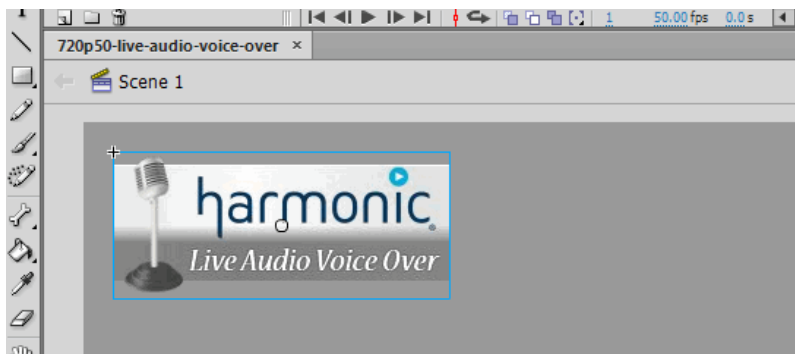
Live Audio Voiceover template

This template contains the Harmonic Live Audio Voiceover widget, and is intended for use only with live audio (not recorded audio).

When this template is faded up, it allows the input of the AES channel to supersede any other audio that is active on the Spectrum playout device. The audio voiceover template may be used in conjunction with Harmonic EAS templates.



NOTE: When you open the Live Audio Voiceover template in Flash Professional, you will see a graphic, shown below. When the template is loaded, however, the graphic becomes transparent.



Open Caption templates

Harmonic provides sample open caption templates and source files.

After you install the Template Authoring Package, you can find Open Caption templates here: `Harmonic-template-authoring.zip\samples\templates\anysize\OpenCaptions`. This folder contains `.swf` files, which are open caption templates for various languages.

The source code for the open caption templates is located here: `Harmonic-template-authoring.zip\samples\sources\anysize\OpenCaptions`. Inside each sub-folder you will find `.fla` files, which are the sources for the open caption templates.

Route Master Connection template

If you have Polaris Live: Route as a licensed feature, you can control input from an upstream router using the Route Master Connection template.

The Route Master Connection template is stored in the `anysize/Polaris/RouteMasterConnection` folder. It contains two dynamic text fields that automation can use to control the behavior of the router.


- Text Field 0: defines the IP address and port of the upstream router and uses the following format: `<ip address>:<port>`.
- Text Field 1: defines the upstream router's source and destination mapping and uses the following format: `<src>:<dest>`

Load the template onto your Spectrum playout device and use the Oxtel `UpdateTextField` command to interact with the template.

Harmonic Template Widget Library

The Widget Library contains Flash components created by Harmonic that can be added to Flash projects.

Once the widget is in your Flash project library, it can be dragged onto the stage and manipulated in your project. For example, you can re-size the widget or change its font, text size, or text color. After you save your project in the `project` folder, you can edit the ActionScript code of the widget to customize its behavior.

 **IMPORTANT:** Editing the ActionScript is an advanced procedure, and errors could make the template incapable of being played. Some widgets contain commentary for editing the ActionScript code correctly.

The follow widgets are available:

Harmonic Clock	Contains ActionScript code that will update the clock accordingly once it is placed in a Flash project.
Harmonic Text Field	Contains ActionScript code that allows the text field to be updated dynamically (for example, via an automation system).
Harmonic Text Scroll	Contains the same ActionScript code as the Harmonic Text Field widget, but also contains ActionScript that scrolls the text across the text field. The speed and orientation of this scroll (right-to-left, left-to-right) can be controlled through the ActionScript code.
Harmonic Advanced Text Field and Advanced Text Scroll	Used for languages that contain complex characters or right-to-left or bi-directional text. These widgets contain ActionScript code that supports Adobe's Text Layout Framework.
Harmonic Countdown	Contains ActionScript code that allows a text field to be updated (for example, via an automation system) with a numeric value, in seconds, that will countdown to zero when the template is loaded, and the layer is faded up.
Harmonic Voiceover	Contains ActionScript code that controls the live audio voiceover mixer.
Harmonic Anchor Override	Contains ActionScript code that allows templates that are smaller than the raster size to be anchored to one of nine fixed locations on the stage. When used, the widget overrides the default layer anchor point configured in <code>SystemManager</code> .

Additional information

[Using Harmonic widgets](#) on page 36

DVE components

DVE widgets contain ActionScript code that provides various functionality for the DVE template.

DVE widgets are stored in the `DVE Components` folder. The following widgets are available:

Harmonic DVE Src Preview Region	Contains ActionScript code that represents the input to the DVE in the Flash Desktop environment.
Harmonic DVE Src Region	Contains ActionScript code that controls the crop functionality of the DVE.
Harmonic DVE Dst Region	Contains ActionScript code that controls the scale and position functionality of the DVE.
Harmonic DVE Audio Duck Level and Audio Mix Level	These widgets contain ActionScript code that maps the audio duck level and audio mix level of a DVE, in decibels, to the alpha value of the widget. When used in conjunction, the Audio Duck Level widget can be used to lower the background audio of the DVE, and the Audio Mix Level widget can be used to raise new audio to the DVE. Versions of the widgets are also available for Dual DVE templates.
Dual DVE Components	This folder contains two additional folders: one folder with DVE widgets for DVE 0, and one folder with DVE widgets for DVE 1. These DVE widgets contain ActionScript code that provides functionality for the Dual DVE template.

Chapter 2

Getting started

Find instructions for installing the Template Authoring Package, guidelines for creating templates that render quickly and smoothly, and other information to help you get started with your template project.

- [Installing the Template Authoring Package](#)
- [Overview of authoring and publishing templates in Flash Professional](#)
- [About primary and secondary template file names](#)
- [Template authoring guidelines](#)

Installing the Template Authoring Package

The Template Authoring Package is available from the Harmonic software downloads site. Contact Technical Support for login information.

For ease of use, Harmonic recommends that you store the Template Authoring Package in the same location you store your Flash projects.

1. From the Harmonic downloads site, navigate to the Template Authoring Package available with your Spectrum downloads.
2. Download the `HarmonicTemplatesAndTools-v[version_number]-SWandDoc.exe`.
3. Unzip `Harmonic-template-authoring.zip`, and set a destination path on your computer.



NOTE: The destination path can be any location from which you want to work (for example, `C:\Users\[yourname]\Desktop\FishProjects\Harmonic-template-authoring`). However, you will need to access the `project` folder in the Template Authoring Package throughout the procedures in this guide.

Overview of authoring and publishing templates in Flash Professional

Follow this basic process when authoring templates in Flash Professional.

1. Verify your raster size and frame rate.
2. Start your Flash project by doing one of the following:

- From the Template Authoring Package directory, copy the sample `.fla` file you wish to work with to the `project` folder.



IMPORTANT: If the `.fla` file is in a folder with other files that support it, you must copy all the supporting files to the project folder as well.

- From the Template Authoring Package directory, copy the blank `.fla` file you wish to work with to the `project` folder.



NOTE: If you do not wish to use a blank or sample `.fla` file, you may create a custom template. However, you must first properly configure Flash Professional and the ActionScript settings for your project.

3. Open the `.fla` file in Flash Professional.

4. Save your file with a new file name.



CAUTION: Do not use the following characters in the file name of your template: \ / " % #.

5. If you are resizing the template to be smaller than full raster size, ensure that you apply the anchor override widget to the template, or ensure that layer anchor points have been configured in `SystemManager`.
6. View, edit, or add visual elements to the template as desired.
7. When you are ready to publish your template as a `.swf` file, click **File > Publish**. The published `.swf` file saves to the `project` folder.
8. Copy the `.swf` file from the `project` folder to the graphics directory on your Spectrum video server.

The template can now be played on your Spectrum playout device.

About controlling the MovieClip timeline in Flash Professional

MovieClip objects allow you to control animations from within the template.

All Harmonic templates are derived from the Flash MovieClip class. The Spectrum playout device controls the main timeline of a template in response to Oxtel commands. For example, after loading a template, the playout device stops the main timeline if the layer is invisible, and then starts the timeline once the layer starts fading in. If the template contains customized ActionScript code that tries to control the main timeline using methods such as “`stop()`,” “`play()`,” or “`gotoAndPlay()`,” the playout device will not be able to control the timeline. This can lead to unexpected behavior, and template animations may not play correctly.

To avoid conflicts, create MovieClip objects for any animations that you wish to control from within the template. These objects have their own timelines, and their animations can be controlled through ActionScript to achieve the desired effects.

About primary and secondary template file names

If you have licensed Independent Branding for your Spectrum playout device, you must distinguish between primary and secondary versions of templates by using either the folder method or the basename extension method.

The naming convention you choose depends on the settings you have configured in `SystemManager`.

Table 2-1: Template naming methods


Option	Description
Folder method	<p>With this method, you name primary and secondary template versions identically. Primary templates are stored in <code>gfx.dir</code>, while secondary templates are stored in a subfolder.</p> <p>In the following example, <code>gfx.dir</code> stores primary templates (in this case, HD), and the subfolder stores secondary templates (in this case, SD):</p> <pre>/fs0/gfx.dir/foo.swf</pre> <pre>/fs0/gfx.dir/SD/foo.swf</pre>
Baseline extension method	<p>With this method, you apply a baseline extension to each file name to indicate which output the template will be used for, and then save all templates in <code>gfx.dir</code>.</p> <p>In the example below, the baseline extensions "HD1" and "HD2" indicate which output the template is intended for:</p> <pre>/fs0/gfx.dir/fooHD1.swf</pre> <pre>/fs0/gfx.dir/fooHD2.swf</pre>

Template authoring guidelines

Follow these guidelines to ensure that graphics render quickly and animation plays smoothly.

Guidelines for authoring UHD templates

Note these important guidelines for authoring UHD templates.

- By default, blank and sample `.fla` files are full raster size.
-  **IMPORTANT:** Harmonic recommends that you re-size the stage to be just large enough to contain the graphic, and then use anchor points to position the template on the stage. This improves performance by reducing the number of transparent pixels that must be rendered. Use full-size templates only when necessary. For example, DVE squeezeback and pillar box templates should be full raster size.
- A "safe" image has been added to the blank and sample `.fla` files to represent the area of the stage that contains active video. This can help you determine the location of the smaller stage size on a full raster.
- When creating Flash video templates in Media Encoder or After Effects CS6, the highest resolution available is 1920 x 1080. As a result, Harmonic recommends that you use anchor points for `.flv` templates in UHD workflows.
- Adobe After Effects CS6 and Adobe Media Encoder CS6 do not support 3840x2160 `.mp4` files at 50 or 59.94 Hz. Instead, use After Effects CC to create the composition, and then render the `.mp4` in Media Encoder CC.
- At this time, Harmonic does not support the Monitor Out template in 3840 x 2160.

Additional information

[Applying the anchor override widget on page 47](#)

Performance considerations

In general, for your animation to play smoothly, your animated content should render completely within a frame time and maintain its frame rate over time.

Unlike a video clip, graphics designed to play on a Harmonic device are a collection of assets and instructions. These assets are interpreted by a renderer running on the playout device.

The “look” of an animation can be achieved with different methods, but the best method is not always obvious. Simple changes can have dramatic effects on the rendering times of your graphics. Consider the following factors that will affect performance:

- The size of the screen area your animation will use
- The complexity of your animation
- The types of elements used within your animation
- Additional effects applied to elements within the animation (for example, masks, filters, or pixel benders)

When you load several layers of templates, each active layer is interpreted by independent renderers that all share access to the same CPU and memory resources. When animations on different layers have the same processing and rendering times, some layer-to-layer interference effects may be observed.

Flash renderer types

The Flash renderer on your Spectrum playout device behaves differently than desktop and browser-based Flash renderers.

Desktop and browser-based Flash renderers have non-constant, wide-ranging frame rates and capabilities. However, the Flash renderer on your Harmonic device has a stage frame rate that is strictly controlled by the field rate of the primary video format.

When authoring graphics for playout on the Spectrum playout device, please note the following:

- Changing the stage frame rate within ActionScript will have no effect on the graphic when it is played.
- When the template receives the ENTER_FRAME event, the template will play at 59.94 Hz (for 525 video) or at 50 Hz (for 625 video) no matter what other settings you specify in Flash Professional or in the ActionScript.

Graceful degradation

If you load a template onto a layer that requires more than a frame time to render, your Spectrum playout device is designed to gracefully degrade displaying the content.

In other words, if a layer is expected to produce a new image every frame time, the content of the template will repeat until new content has been rendered. This can happen when one or more templates have been loaded.

Please note the following guidelines for minimizing visible degradation in your animated templates:

- If templates change very little or not at all (for example, a static regulatory template in the corner of the screen), degradation is undetectable.
- If templates contain objects that move quickly, degradation is less noticeable.

- If templates use animation at a constant rate, degradation may appear as a “stutter” or “glitch.” These “stutters” or “glitches” are momentary changes in the frame rate of the animation.
- If your animated template is authored at a constant rate, animate the template at an integer multiple of pixels per frame time. Moving at exactly one pixel or less per frame time is noticeable if any degradation occurs in the animation.
- If possible, use as few high-contrast objects that move at constant rates as possible. Try to keep the animation running within a frame time.
- If possible, fade in and fade out to animate objects in your template rather than animating them at a constant fixed rate.
- If possible, apply ease-in and ease-out on any motion-based tween.

Many factors apply when developing animation with little to no degradation, but a full discourse on motion perception and animation is outside the scope of this document. For additional information, please refer to the following sources:

- <http://en.wikipedia.org/wiki/Animation>
- http://en.wikipedia.org/wiki/Motion_perception
- http://en.wikipedia.org/wiki/12_basic_principles_of_animation
- “Advanced Character Animation in Flash” (http://www.adobe.com/devnet/flash/articles/adv_char_anima.html)
- “A Primer on Animation Techniques” (<http://www.albinoblacksheep.com/flash/animationprimer>)

Gradient fills

Gradient fills are computed regions of color and alpha. They are frequently used to soften elements or provide subtle details around other elements.

In general, gradients render quicker than static images derived from image files (for example, .bmp files, .jpg files, and .png files) and render slower than simple solid fills.

Please note the following guidelines when working with gradient fills:

- Gradient fills are approximately 71% more expensive to render per pixel than a simple solid fill.
- Filling 60% of the screen with a gradient will require approximately an entire frame time.

Static Bitmap

A simple static image (for example, a .bmp file, a .jpeg file, or .gif file) is the most common element used in a template.

Flash Professional encodes the imported image into the template in either a lossless or a lossy format. Static images encoded in the lossless format will generate a larger template file but will render on the screen with no compression-related artifacts. Static images encoded in the lossy format will generate a smaller template file but may exhibit compression artifacts when displayed on the screen.

When you load a template with encoded images, the images must be decoded on the first reference to the image before the image can be displayed on the screen. When the image is decoded, it will be converted into a native RGB or ARGB format that can be displayed on the screen. This initial decode time can take several milliseconds.

However, once the images are decoded, future uses of the images will not take any additional time.

In general, 24-bit images render faster than 32-bit images. Thirty-two-bit images with a per-pixel alpha channel take longer to compute the resulting ARGB pixel value than a 24-bit image without per-pixel alpha channel.

Image rendering time is proportional to the final resulting pixel area of the image on screen. Smaller images will render faster than larger images. If a large image is rendered and only part of the image is visible on the screen (for example, an animation moves the image from off screen and onto the screen), the rendering time is still proportional to the total on-screen area of the image.

Please note the following guidelines when working with static bitmaps:

- Bitmaps take approximately two times longer to render than gradient fills.
- Bitmaps take approximately four times longer to render than solid fills.

Embedded video

You can embed a Flash video (.flv) file when you author a template.

Embedded Flash videos require substantially more time to render than other objects (for example, solid fills, gradient fills, or static bitmaps). Please note the following about working with Flash videos:

- Templates that contain Flash videos with smaller file sizes provide better quality.
- If you need an embedded video to play at a lower frame rate, consider spreading the frames of the embedded video throughout the timeline of your template.

Text

Please note important guidelines when authoring templates with text.

- Smaller glyphs render faster than larger glyphs.
- Text fields with fewer glyphs render faster than text fields with more glyphs.
- Text field transforms (for example, rotation or scaling) do not significantly change the rendering time of the text. The transforms are proportional to the effective pixel area covered by the text.
- Changing the color of the text is the same as re-rendering all of the text.
- Filters, such as drop shadows, blurs, and glows must be re-computed when the text is rendered or updated.
- The playout device requires more time to re-render text fields than to render text fields and cache the resulting pixels.
- The time it takes to render a specific embedded font for the first time is longer than subsequent renderings of the same font.
- Larger point sizes of text require more time to render than smaller point sizes of text.
- Templates authored with high quality anti-aliasing with sub-pixel resolutions will affect performance during playout.
- Templates authored with filters (for example, drop shadows, blurs, and glows) will affect performance during playout.
- Templates authored with text animations will affect performance during playout.
- Templates authored with text fields that update after they appear on the screen will affect performance during playout.

It is outside the scope of this document to fully describe the rich text rendering capabilities of Flash Professional. For detailed information about the TextField class, refer to: http://help.adobe.com/en_US/FlashPlatform/reference/actionscript/3/flash/text/TextField.html. For detailed information about the TextFormat class, refer to: http://help.adobe.com/en_US/FlashPlatform/reference/actionscript/3/flash/text/TextFormat.html.

About the pixel area of a template

When you play a template, instructions within the template dictate how and when pixels of the template are rendered.

Rendering performance varies with content and has a complicated relationship with each component of a template. Templates that do not change from frame to frame are very easy and efficient to render. The primary exception to that rule is when you are fading a layer up or down. In such cases, every change in alpha for that layer will cause the playout device to redraw all the content currently on the screen.

You can estimate the performance of your template by considering the total pixel area of your template. Objects that cover smaller areas of the screen render faster than objects that cover larger areas of the screen. For example, changing the color of a 10 × 10 rectangle is always faster than changing the color of a 1920x1080 rectangle, no matter how either rectangle was authored.

Audio performance

Review important guidelines for working with `.aiff` and `.wav` audio formats.

For the best performance of these audio formats, Harmonic recommends the following encoding configuration:

- Up to 16 channels
- 24 bits
- 48 KHz

You can also export audio in Flash video (`.flv`) and H.264-encoded MPEG-4 (`.mp4`) files created with Media Encoder and After Effects.

For the best performance of these formats, Harmonic recommends the following encoding configuration:

- `.flv`: 128 kbps (`.mp3` bit rate)
- `.mp4`: 48 KHz (for best processing), 44.1KHz, or 32 KHz, 2 channels, AAC audio

Best practices for great performance

- You may resize templates to be smaller than full raster size; however, ensure that you assign anchor points for graphic layers in `<keyword keyref="manager_a"/>` so that the template will load in the desired position. In Flash Professional, you can also use the `<keyword keyref="company_name"/>` Anchor Override widget to position a template on the stage.
- If you need a solid area of color, use a rectangular fill. Rectangular fills render faster than static bitmap images (for example, `.jpeg` files, `.gif` files, and `.png` files).
- If you need a gradient, use a gradient rather than an image of a gradient. In other words, author a gradient in Flash Professional rather than using a pre-rendered bitmap image of a gradient.
- If you do not need per-pixel alpha in your bitmap objects, use a 24-bit `.png` file rather than a 32-bit `.png` file.
- If you do not need a mask applied to an object, do not use one. Filters affect the amount of time it takes an object to render.
- If you are importing static images to your project, and if during animation those images may be transformed or scaled, you may want to select “Allow Smoothing” for better quality when the animation is rendered. This will affect the amount of time it takes to render the image.
- If you are importing static images to your project, you may want to select “Lossless Encoding” for better quality when the animation is rendered.
- Embed any fonts you intend to use in your template. This will ensure that they render correctly.

- If you author your animation based on time rather than on every ENTER_FRAME event, your animations will appear to run more smoothly over non-constant frame rates if your content rendering time is near the edge of a frame time boundary.
- If your template takes too long to render, spread your template across two or more active loaded layers. Render operations on one layer are single-threaded.
- If one method of authoring a template performs poorly, do not be afraid to try different a different method.

Setting up a custom template in Flash Professional

If you would like to create a custom template that does not use one of the Harmonic .fla files included in the Template Authoring package, you must first properly configure Flash Professional and the ActionScript settings for your custom project.



IMPORTANT: A custom template will not play if it is not properly configured. Be sure to follow the procedures in this section in order.

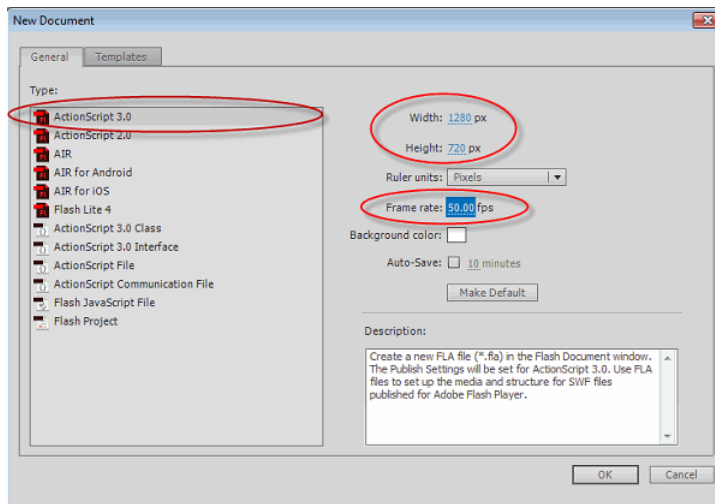
1. [Configuring Flash Professional](#)
2. [Applying ActionScript code to a custom template](#)
3. [Customizing ActionScript code](#)
4. [Adding an event listener for accessing Flash stage properties](#)

Configuring Flash Professional


When starting a new project, you need to configure Flash Professional to support Flash Player 10.3 as well as ActionScript 3.0.

1. Click **File > New** to create a new Flash Professional project.
The **New Document** dialog box appears.
2. Under **Type**, select **ActionScript 3.0**.
3. Set the appropriate width, height, and frame rate for the project.

Example:

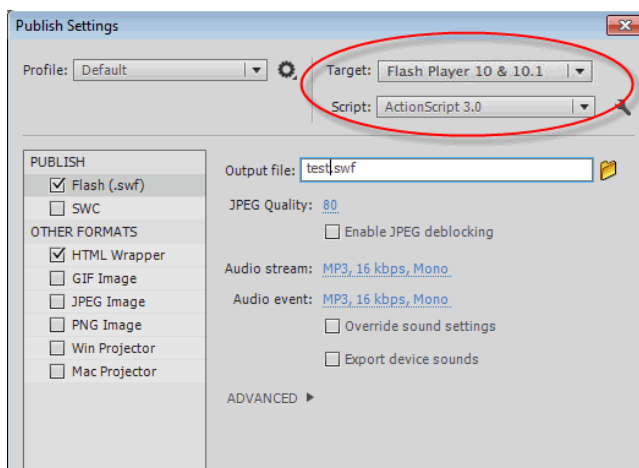


4. Click **OK**.


 **NOTE:** All templates should be authored at progressive frame sizes, and the frame rate should be set to 50 or 60 frames per second.

5. Click **File > Publish Settings** to open the Publish Settings dialog box.

Example:



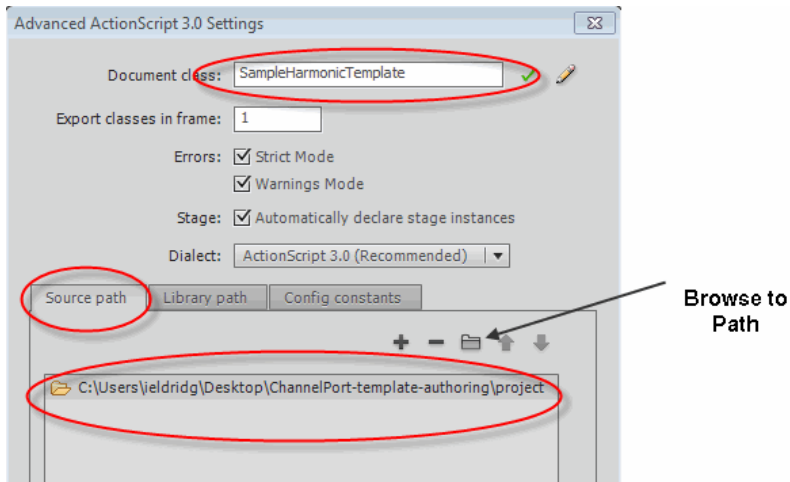
6. From the **Player** drop-down box, select **Flash Player 10.3**.
7. Click **OK**.
8. Save your project.
Harmonic recommends that you save your project in the `project` folder.

 **NOTE:** Do not use the following characters in the file name: \ / " % #.

Applying ActionScript code to a custom template

In order for your custom template to be controlled by the playout device, the `.swf` file needs to contain specific ActionScript code that has been written by Harmonic.

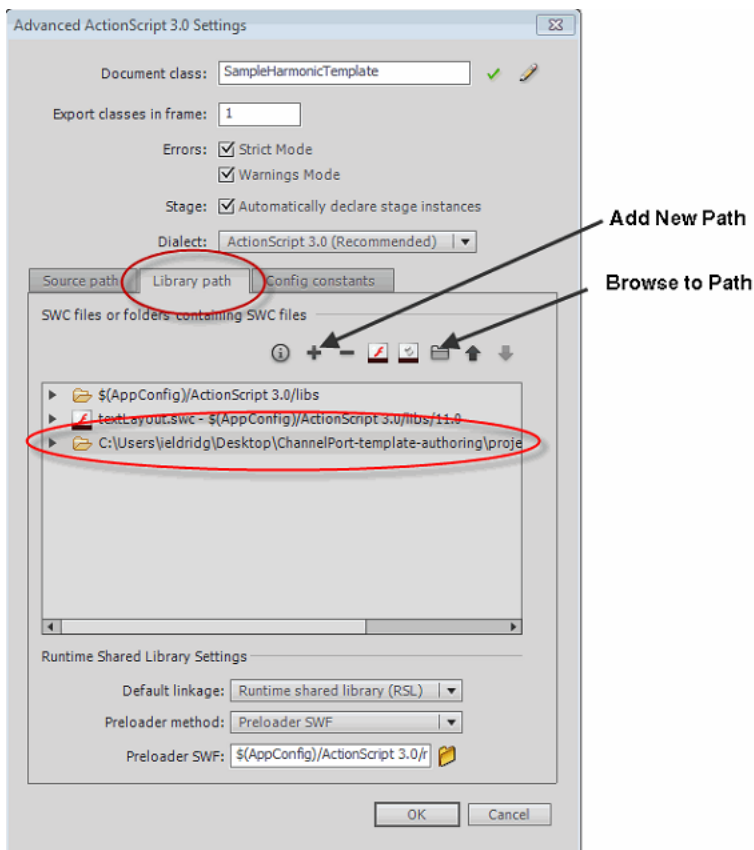
1. In Flash Professional, select **File > ActionScript Settings** to display the **Advanced ActionScript 3.0 Settings** dialog box.
2. In the **Document class** field, type `SampleHarmonicTemplate`.
3. From the **Source path** tab, click the **Browse to Path** icon to browse to the location where you saved your template.
4. Select the required folder.
The selected folder appears in the **Source path** tab, as shown below.



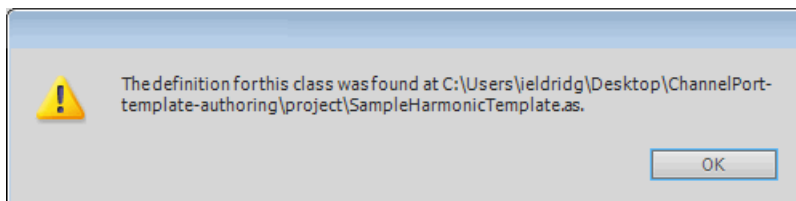
5. From the **Library path** tab, click the **Add New Path** icon.
6. Click the **Browse to Path** icon to browse to the location where you saved your template, and then select that location.

NOTE: Do not delete any folders already listed under the **Library path** tab. Doing so could cause the template not to play.

The selected folder appears in the **Library path** tab, as shown below.



7. Verify your settings by clicking the check mark icon to the right of the **Document Class** field. A dialog should appear indicating that the definition of the document class was found in the correct folder.



Customizing ActionScript code

You can modify the behavior of your template by customizing the ActionScript code.

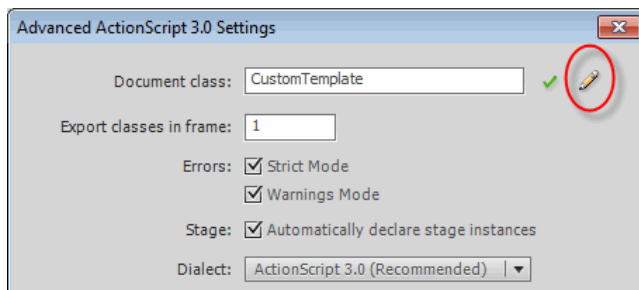
Implementing a customized action in a template involves the following:

- Editing the **Document class** field and giving it a unique name (for example, `CustomTemplate`).
- Customizing the ActionScript of the “CustomTemplate” class.

To customize the ActionScript code:

1. Set up your Flash project.
2. Click **File > ActionScript Settings**.
3. In the **Document class** field, type in a new, unique name, for example `CustomTemplate`.
4. Click the pencil icon.

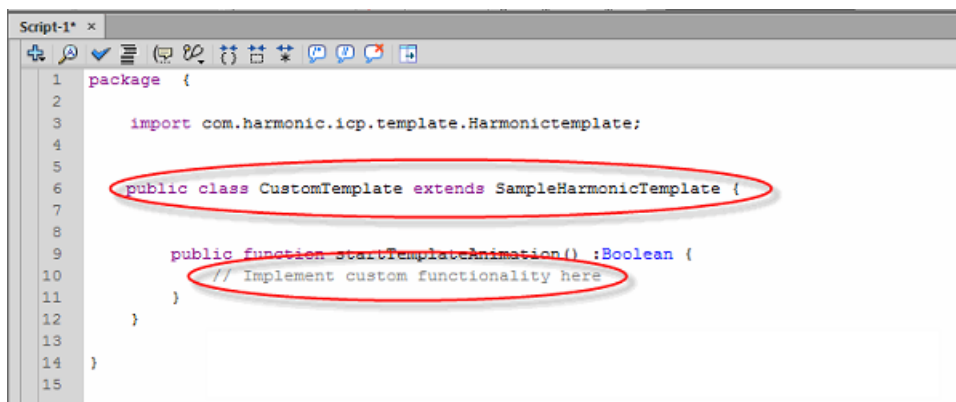
Example:



An ActionScript file opens.

5. Change the value for `[public class]` to `CustomTemplate`.
6. Change the value for `[extends]` to `HarmonicTemplate`.
7. Type in the custom functionality.

Example:



8. Save the file using the following file name: `CustomTemplate.as`.

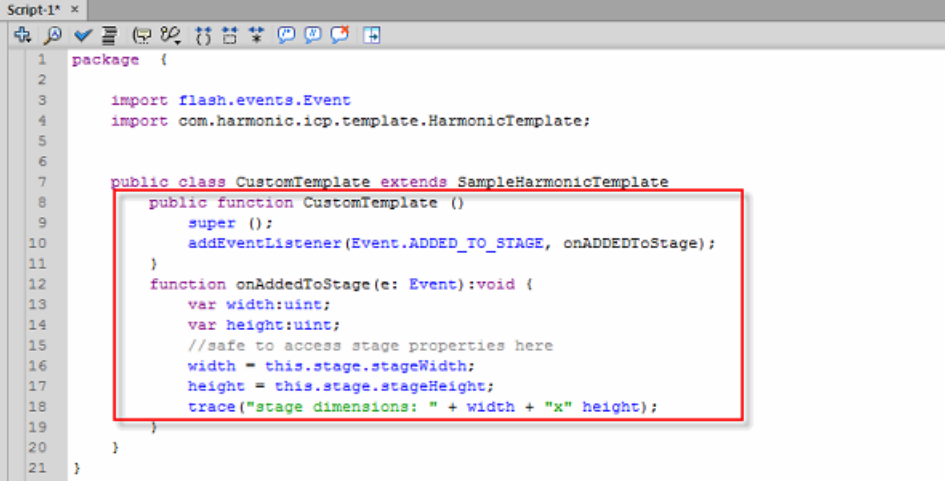
Adding an event listener for accessing Flash stage properties

To detect when the template has been put on the Flash stage, add an event listener to your ActionScript code.

When you load a template, the playout device controls when the template is added to the Flash stage. This is different from the Flash player, where the `.swf` file is attached to the stage immediately. Your ActionScript code cannot access the stage properties, such as the width or height, until the template has been added to the Flash stage.

1. Set up your Flash project.
2. In the ActionScript file, change the **public class** portion of the file to read `CustomTemplate`.
3. Change the **extends** portion of the file to read `SampleHarmonicTemplate`.
4. Add the event listener for accessing Flash Stage properties by extending the ActionScript code, as shown below:

Example:



```
Script-1* x
1 package {
2
3     import flash.events.Event
4     import com.harmonic.icp.template.HarmonicTemplate;
5
6
7     public class CustomTemplate extends SampleHarmonicTemplate
8     {
9         public function CustomTemplate ()
10        {
11            super ();
12            addEventListener(Event.ADDED_TO_STAGE, onADDEDToStage);
13        }
14        function onAddedToStage(e: Event):void {
15            var width:uint;
16            var height:uint;
17            //safe to access stage properties here
18            width = this.stage.stageWidth;
19            height = this.stage.stageHeight;
20            trace("stage dimensions: " + width + "x" height);
21        }
22    }
23 }
```

Chapter 4

Using Harmonic widgets

The Harmonic Template Widget Library contains Flash components that can be added to Flash projects.

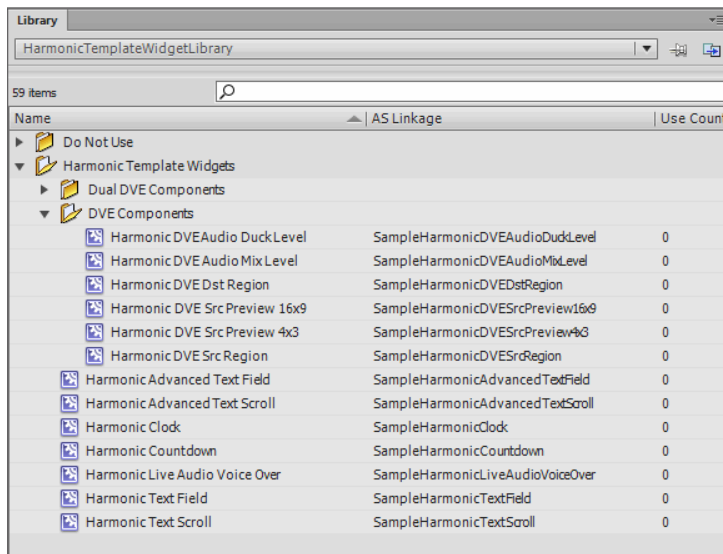
- *Applying a Harmonic widget to your Flash project*
- *Applying advanced text widgets*
- *Resizing dynamic text fields*
- *Naming multiple instances of a dynamic text field*
- *Creating a custom text field widget*
- *Setting up multiple, unique text fields*
- *Guidelines for working with text field widgets*
- *About dynamically loading files in a template*
- *Applying the anchor override widget*


Applying a Harmonic widget to your Flash project

The Harmonic Template Widget Library contains Flash components that can be added to Flash projects.

1. Set up your Flash project.
2. In Flash, click **File > Open** and select the Template Authoring Package folder.
3. Open the `widgets` folder, and select the **HarmonicTemplateWidgetLibrary fla**.
4. Select the **Library** tab.
If the **Library** tab is not available, click **Window > Library**.
5. Select **HarmonicTemplateWidgetLibrary** from the library drop-down menu.

Example:





6. Copy the widget you need from the **Widget Library**.
7. From the **Library** drop-down menu, open your Flash project library.
8. Paste the widget into your Flash project library.
Once the widget is in your Flash project library, it can be dragged onto the stage and manipulated in your project. For example, you can re-size the text field widget or change its font, text size, and text color.
9. Save your file.
 **CAUTION:** Do not use the following characters in the file name: \ / " % #.
10. Click **File > Publish** to publish your file as a `.swf` file.
The published `.swf` file is saved to the `project` folder.
11. Copy the `.swf` file from the `project` folder to your configured graphics directory on the video server.

After you copy the `.swf` file to the graphics directory on the video server, it can be played on your Spectrum payout device.

Customizing the widget's ActionScript

You can modify the behavior of a widget by editing the ActionScript code that controls it.

-  **IMPORTANT:** Editing the ActionScript is an advanced procedure, and errors could make the template incapable of being played. Some widgets contain commentary for editing the ActionScript code correctly.
-  **NOTE:** Your Flash project must be saved in the `project` folder in order to edit the ActionScript.

1. In your Flash project, select the **Library** tab.
If the **Library** tab is not available, click **Window > Library**.

2. Right-click the widget and select **Edit Class**.
An ActionScript file will appear that can be manipulated as needed.

Applying advanced text widgets

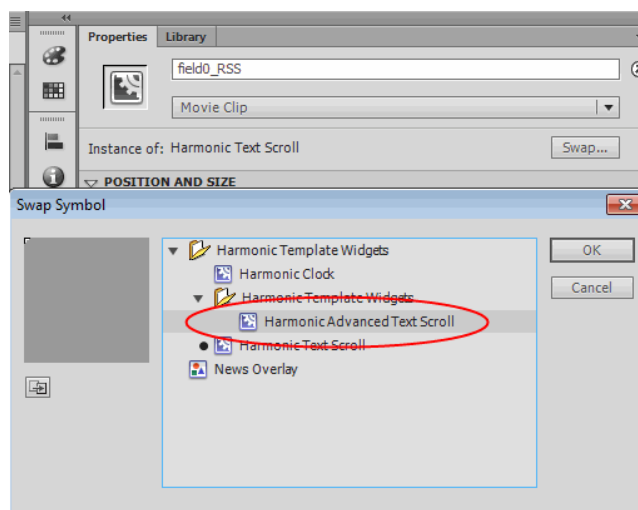
The Harmonic advanced text widgets should be used for languages that contain complex characters, or right-to-left or bi-directional text.

The Harmonic Template Widget Library contains two advanced text widgets: the Advanced Text Field and the Advanced Text Scroll. You can add these widgets to a custom or blank Harmonic template. If using a sample Harmonic template, you can also replace a regular text field or text scroll widget with an advanced text widget.

IMPORTANT: You must use Flash Professional CS6 when authoring a template that contains Harmonic advanced text widgets.

1. Set up your Flash project.
 - NOTE:** If you are using a Harmonic template and the `.fla` file is in a folder with other files that support it, you must copy all the supporting files to the `project` folder as well.
2. Open the **Widget Library** and copy the desired advanced text widget to your project library.
3. To replace a regular text widget in a sample Harmonic template, do the following:
 - a. In the Flash timeline, unlock the layer containing the text scroll, and select the text scroll widget on the Flash stage.
 - b. Click **Window > Properties** to open the **Properties** dialog box.
 - c. Click **Swap** to open the **Swap Symbol** dialog box.
 - d. Select the advanced text widget and click **OK**.

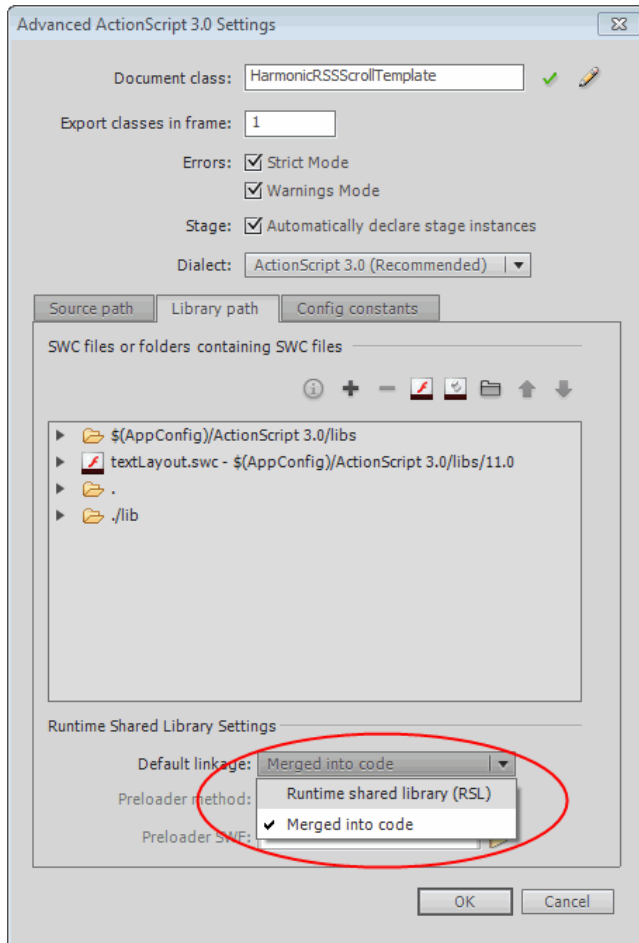
Example:




4. Drag the advanced text widget to the Flash stage and manipulate it as needed.

5. Click **File > ActionScript Settings**.
6. From the **Advanced ActionScript 3.0 Settings**, click the **Library path** tab.
7. In the **Default Linkage** drop-down menu, select **Merged into code**.

Example:



8. Save your file.
-  **CAUTION:** Do not use the following characters in the file name: \ / " % #.
9. Click **File > Publish** to publish your file as a `.swf` file.
The published `.swf` file is saved to the `project` folder.
10. Copy the `.swf` file from the `project` folder to your configured graphics directory on the video server.

After you copy the `.swf` file to the graphics directory on the video server, it can be played on your Spectrum playout device.

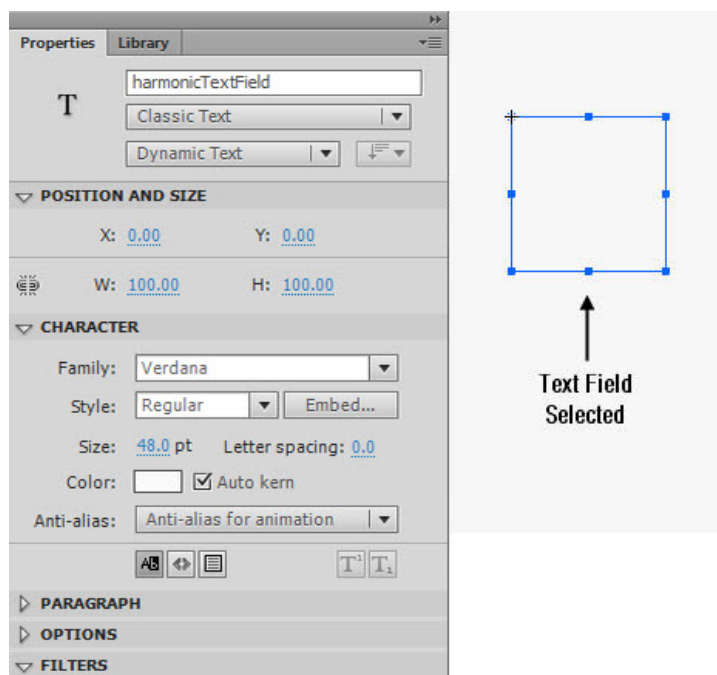
Resizing dynamic text fields

The Dynamic Text Field widget is a Flash MovieClip that contains a 100 × 100 text field.

To change the size of a dynamic text field, you must open the MovieClip and edit the width and height of the contained text field. If you edit the size of the container MovieClip instead of the text field, Flash will stretch the rendered fonts and thus distort your graphic.

1. Set up your Flash project.
2. Drag the Text Field widget to the stage.
3. Select the widget, and select the **Properties** tab.

Example:



4. In the **Properties** dialog box, resize the text field as needed.

⚠ **IMPORTANT:** Always edit the internal text field to set the size of the dynamic text field. Always edit the container MovieClip component to set the position of the text field and to use it in motion tweens.

Naming multiple instances of a dynamic text field


Any time you have multiple instances of the same dynamic text field in use in one project, you need to give each instance of the text field a unique name.

In some cases, you may have several instances of the same dynamic text field template in use in one project (for example, a Now, Next, and Later template). All dynamic text fields must have an instance name that adheres to the following rules:

- The instance name for each field must start with the word “field.”
- The instance name must be followed by a number that indicates the box number for the field.
- Optionally, you can include a label in the instance name to help identify the field. Add an underscore (_) after the number, and then enter the label text.

The following example shows a valid template field instance name: `field3_Later`.

To rename dynamic text field instances:

1. Set up your Flash project.
2. Drag the text field widget to the stage.
3. Click the widget, and select **Properties**.
4. In the **Instance** field, type in the new instance name.
 **NOTE:** Follow the supplied conventions when naming the instance.
5. Repeat Step 2 through Step 4 to name additional instances of the text field widget used in your project.

Creating a custom text field widget

Ensure that you have read guidelines for working with text field widgets before you create a custom text field widget.

1. Set up your custom template in Flash Professional.
2. Copy the text field widget from the library, and paste it into your Flash project library.
3. Rename the text field widget.

Example: Custom Text Field

4. Open the **Advanced ActionScript 3.0 Settings** dialog box for “Custom Text Field” and then rename the **Document class** name.

Example: CustomTextField

5. From the **Source path** tab, click the **Browse to Path** icon to browse to the `project` folder, and then select it.
6. From the **Library path** tab, click the **Browse to Path** icon to browse to the `project` folder, and then select it.

If you are storing your project file in the same location as the Template Authoring Package, you can type a period to represent the current directory.

7. Drag the text field widget onto the stage and, if desired, edit the widget.
You can re-size the text field and change the display properties (for example the font, text size, and text color).



IMPORTANT: The internal text field has an instance name of "harmonicTextField". Do not change this instance name or the text field type (Classic Text, Dynamic Text). If you change this information, the widget will not function correctly.

Additional information

[Setting up a custom template in Flash Professional](#) on page 30

Setting up multiple, unique text fields

Learn how to set up several instances of a unique text field in one project (for example, each text field has a different function, shape, or font).

1. [Reconfigure the text field widget properties.](#)
2. [Copy the reconfigured text field widget for additional instances.](#)

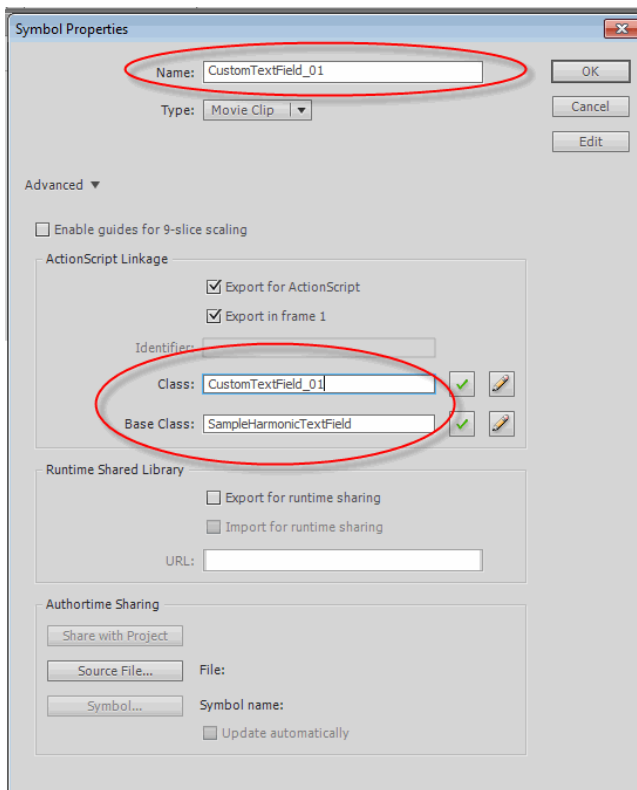
After you've copied the widgets, you can alter the text fields as needed.

Reconfiguring the text field widget properties

You must reconfigure a text field widget before you can insert multiple instances of the widget into a template.

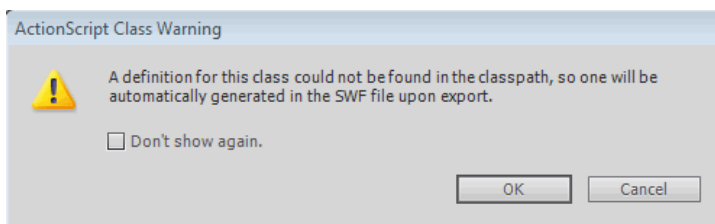
1. Set up your Flash project.
2. Right-click the text field widget and select **Properties**.
The **Symbol Properties** dialog box appears.
3. Select **Advanced**.
4. Type in a new, unique name for this symbol.
Example: For example, CustomTextField_01.
5. Select the **Export for ActionScript** check box.
6. Copy the text that appears in the **Class** field ("SampleHarmonicTextfield") and then paste that text into the **Base Class** field.
7. In the **Class** field, type in a new, unique name.

Example: CustomTextField_1



8. Click **OK**.

An error message will appear indicating that a definition for the class could not be found in the class path.



9. Click **OK**.

10. Extend the ActionScript file for the custom template as follows:

- a. Right-click the widget symbol, and select **Edit Class**.
An ActionScript file appears.
- b. Edit the extends portion of the file to read `SampleHarmonicTextField`.

Example:



- c. Save the edited ActionScript file in the same location as your .fla file.

The widget can now be copied for additional instances.

Copying a reconfigured text field widget for additional instances

Complete this procedure for each text field instance the template requires.

1. In the **Widget Library**, tight-click the reconfigured widget and select **Duplicate**. The **Symbol Properties** dialog will appear.

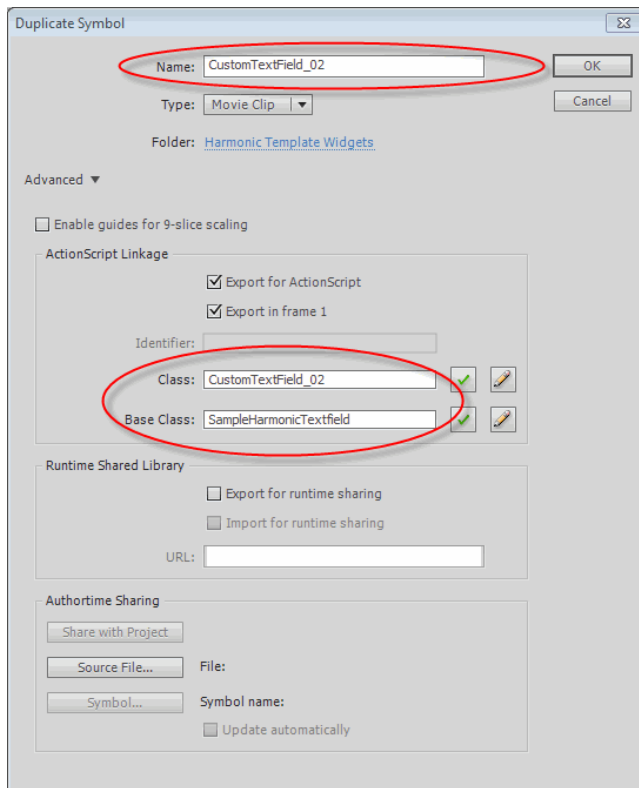
2. Type in a new, unique name for this symbol.

Example: CustomTextField_2

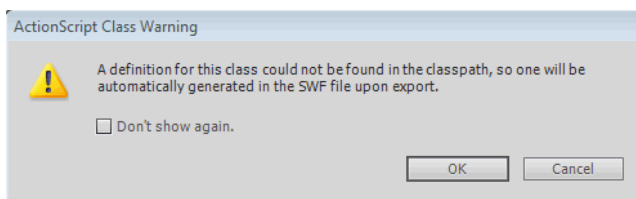
3. Select the **Export for ActionScript** check box.

4. Copy the text that appears in the **Class** field ("SampleHarmonicTextField") and then paste that text into the **Base Class** field.

Example:



5. In the **Class** field, type in a new unique name,
Example: CustomHarmonicTextField_2
6. Click **OK**.
 An error message will appear indicating that a definition for the class could not be found in the class path.



7. Click **OK**.
8. Extend the ActionScript file for the custom template as follows:
 - a. Right-click the widget symbol, and select **Edit Class**.
 An ActionScript file appears.
 - b. Edit the extends portion of the file to read `SampleHarmonicTextField`.

Example:



- c. Save the edited ActionScript file in the same location as your .fla file.
9. Repeat steps 1 - 8 to copy additional instances of the text field widget.

After you have copied the total number of text fields you need, you can drag the text fields onto the stage and manipulate them as desired.

Guidelines for working with text field widgets

Follow these guidelines to ensure that your text field widgets play correctly.

- Size the text field to match the longest text string you expect that field to display.
- Embed any fonts you intend to use in your Flash project. This will ensure that they render correctly.
- You can add filters, such as a drop shadow, but be aware that these filters may cause the template to have a longer render time.
- The internal text field of the text field widget has an instance name of “harmonicTextField,” as shown below.



IMPORTANT: Do not change this instance name or the text field type (for example, Classic Text, Dynamic Text). If you do, the widget will not function correctly.

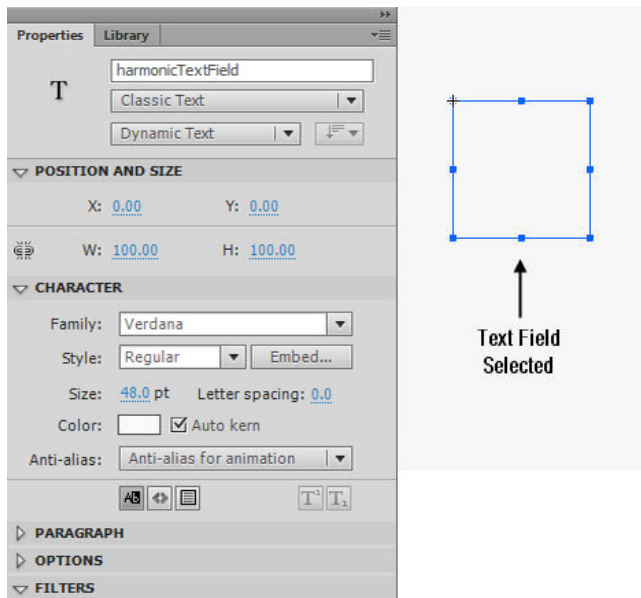


Figure 4-1: Text field widget properties

About dynamically loading files in a template

To dynamically update a text field or load an image into a template, the file must first be stored in the graphics directory on the video server.

Before the template can dynamically access a text or image file, the ActionScript code of the template needs to be edited. Specifically, the pseudo-directory “templates” must be pre-pended to the path of the file being loaded.

For example, if you wanted to update the text field of a template with the contents of file named `credits.txt`, the ActionScript would need to be edited to use the path `templates/credits.txt` to load the file.

IMPORTANT: Editing the ActionScript is an advanced procedure, and errors could make the template incapable of being played. Some widgets contain commentary for editing the ActionScript code correctly.

Applying the anchor override widget

The anchor widget allows you to specify the desired anchor point for a template that is smaller than the full raster size. When used, the widget overrides the default layer anchor point configured in SystemManager.

For more information about configuring anchor points for graphic layers, refer to “Graphics Anchor” in the *Harmonic SystemManager User Guide*.

1. Set up your Flash project.
2. Adjust the stage size to be just large enough to contain the desired graphic.



IMPORTANT: With UHD workflows, Harmonic recommends that you use full-size templates only when necessary. For example, DVE squeezeback and pillar box templates should be full raster size. This improves performance by reducing the number of transparent pixels that must be rendered.

3. Add the desired graphic to the template.
4. Open the **Widget Library** and copy the Anchor Override widget you need, then paste it into your Flash project library.
5. Drag the Anchor Override widget onto the stage.
You can place the widget anywhere on the stage. The widget becomes transparent when the template is loaded onto the playout device.
6. Save your file.



CAUTION: Do not use the following characters in the file name: \ / " % #.

7. Click **File > Publish** to publish your file as a `.swf` file.
The published `.swf` file is saved to the `project` folder.
8. Copy the `.swf` file to your configured graphics directory on the video server.

About template anchor points

Anchor points enable you to create templates that are smaller than the raster size. This can improve performance by reducing the number of transparent pixels that must be rendered.

Anchor points can be used across all supported raster sizes, but are particularly important in UHD workflows. You can configure anchor points per graphic layer in SystemManager or Spectrum Management. When authoring templates in Flash Professional, you can apply a Harmonic Anchor Override widget, which overrides the pre-configured layer anchor point.

In the following image, the anchor points are represented by the red squares. The blue squares are an example of how a small template will be placed when loaded on a layer with the corresponding anchor point.



NOTE: If a small template is loaded onto a graphic layer and no anchor point is configured, the template is positioned in the upper left corner by default.

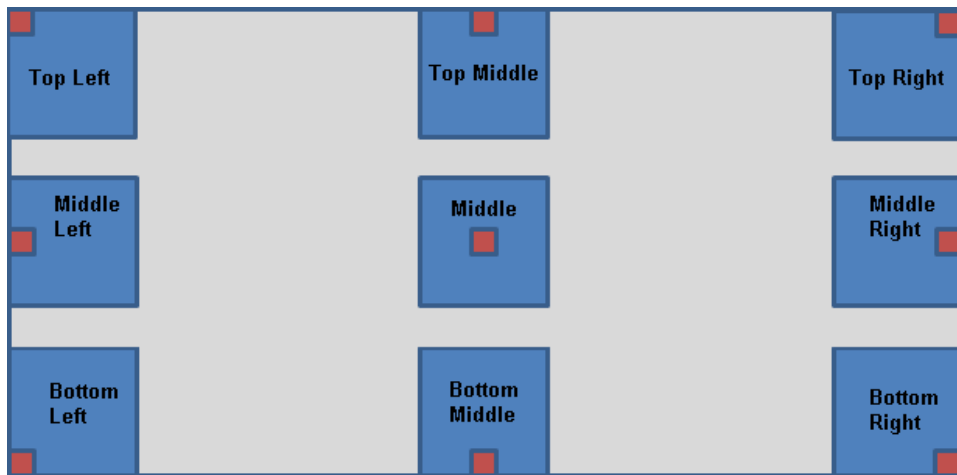


Figure 4-2: Anchor points


Configuring three-point animations

In three-point animation, the template will play the intro and then stay on the loop section until it receives a command to play the outro.

To enable this functionality, you must provide the following frame labels in Flash:

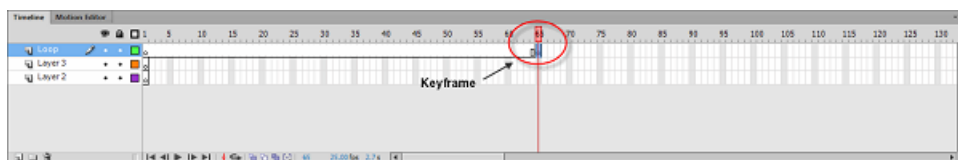
- A frame label called **loop start** on the first frame of the looped section.
- A frame label called **loop end** on the last frame of the looped section.

1. Set up your Flash project.

 **NOTE:** The Template Authoring Package contains a sample three-point animation in the `Sample` templates folder.

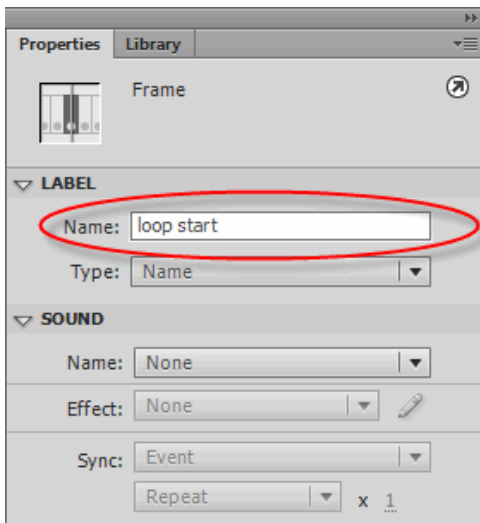
2. Click **Insert > Timeline > Layer** to add a new layer to the project.
3. Double-click the new layer, and give it a title (for example, `Loop`).
4. On the first frame of the loop section (in other words, the first frame after the end of the introduction), right-click the timeline and select **Insert Keyframe**.

Example:

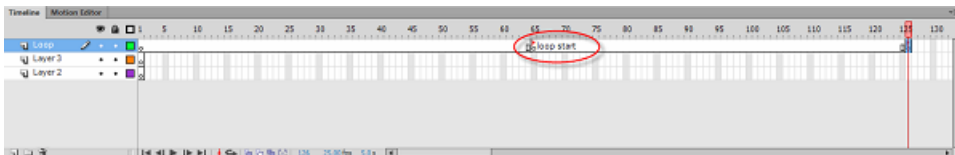


5. Click **Window > Properties > Label**, and type `loop start` in the **Name** box.

Example:

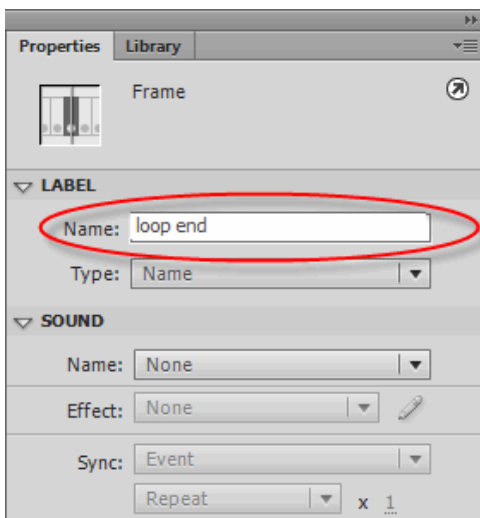


The label, "loop start", appears in the timeline.



6. Add a blank keyframe on the last frame of the loop section (in other words, the last frame before the start of the outro).
7. Click **Window > Properties > Label**, and type `loop end` in the **Name** box.

Example:



The label, **loop end**, appears in the timeline.

8. View, edit, or add visual elements to the template as desired.
9. Save your file.



CAUTION: Do not use the following characters in the file name: \ / " % #.

10. Click **File > Publish** to publish your file as a `.swf` file.

The published `.swf` file will be saved to the `project` folder.

11. Copy the `.swf` file to your configured graphics directory on the video server.

After you copy the `.swf` file to the graphics directory on the video server, it can be played on your Spectrum playout device.

Chapter 6

Authoring DVE templates

The templates that control the DVE(s) must be authored using Adobe® Flash® Professional CS6. Harmonic recommends starting with one of the blank DVE templates that has been provided in the Template Authoring Package.

- [About Digital Video Effects](#)
- [About the Harmonic blank DVE templates](#)
- [Using the blank DVE template](#)
- [Using the blank Harmonic Dual DVE template](#)
- [Editing ActionScript to control DVE properties](#)
- [Creating a border on a DVE template](#)
- [Creating a full-screen slate reveal](#)
- [Using audio duck and mix widgets in a dual DVE template](#)

About Digital Video Effects

A digital video effect (DVE) is where the video is cropped by the SrcRegion, scaled and positioned by the DstRegion, and then composited with the underlying video.

When a DVE template is played on your Spectrum playout device, it can contain video from a clip, the Mixer output, or an External input. When you preview your DVE templates in the desktop Flash environment, the Src Preview represents the input to the DVE.

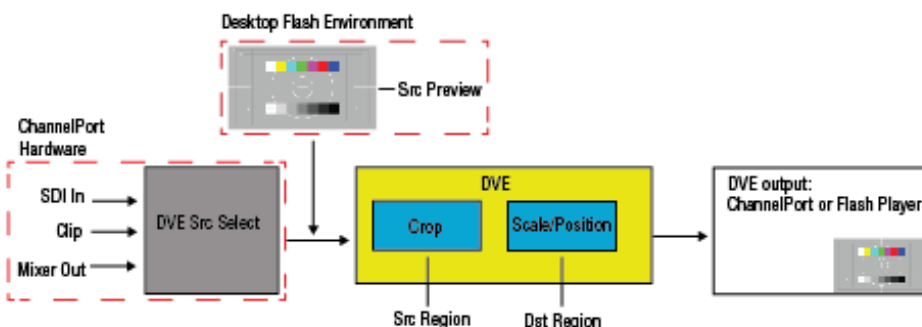


Figure 6-1: Single DVE

If your Spectrum playout device has been configured for Enhanced Channel mode, you may have up to two DVEs loaded at once, either as two DVEs in a single template or as single DVEs in two templates.

A Dual DVE template, for each frame rate and raster size, can be found in the Template Authoring Package. Dual DVE templates contain the same components as single DVE templates.

DVE output example

View an example of single DVE output in the desktop Flash environment.

Once the Src Region is cropped and the Dst Region is scaled and positioned, a DVE has been created, as shown below.

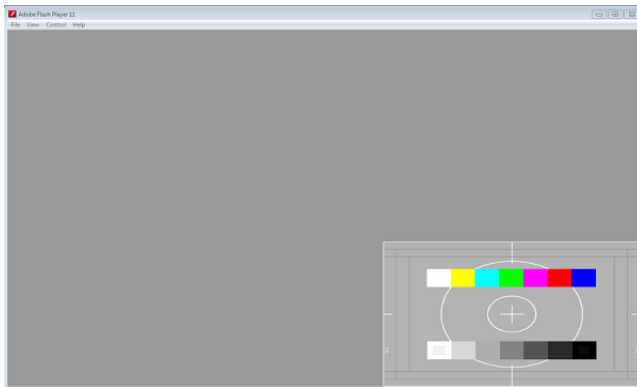


Figure 6-2: DVE output in desktop Flash environment



Figure 6-3: Dual DVE output in desktop Flash environment

About the Harmonic blank DVE templates

Understand the components of the blank DVE and blank dual DVE templates.

Layers

The DVE templates contain the following layers on the Flash Professional timeline.

Layer	Description
Actions layer	Contains ActionScript code that controls DVE properties.
Src Preview layer	A test pattern that represents the input to the DVE; in other words, the video that will be affected by the DVE template. The screen resolution should match that of the stage.
Src Region layer	A white transparency that represents the portion of the Src Preview that will be active in the DVE. Essentially, the Src Region is the result of the Src Preview being cropped.
Dst Region layer	A blue transparency that defines how Src Regions are scaled and positioned in a DVE template.

In the dual DVE template, each DVE has its own Src Preview, Src Region, and Dst Region layers, as shown below.

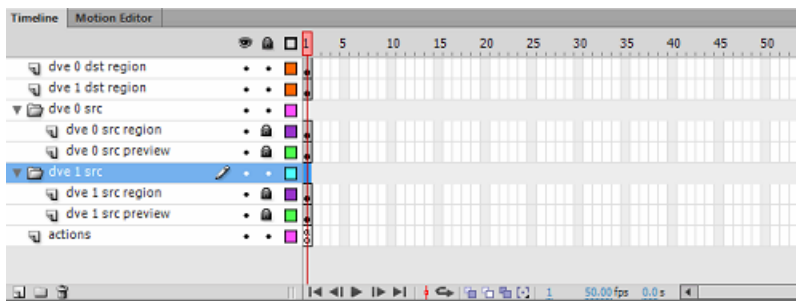


Figure 6-4: Dual DVE template layers

IMPORTANT: The DVE will not work properly if the regions are not sized correctly in relation to one another. The Src Region should never be larger than the Src Preview. The Dst Region should never be larger than the Src Region.

Harmonic DVE widgets

The blank DVE templates also contain the following Harmonic DVE widgets:

- DVE Src Preview Region widget
- DVE Src Region widget
- DVE Dst Region widget

IMPORTANT: All DVE template widgets must be present in the first frame of the template. Otherwise, the template will not run correctly.

Src region layer

The **src region** layer represents the portion of the **src preview** that will be active in the DVE. Essentially, the **src region** is the result of the **src preview** being cropped.

IMPORTANT: The Src Region should never be larger than the Src Preview.

The following properties of the Src Region are used to crop the DVE:

- **x:** the x position of the crop
- **y:** the y position of the crop
- **Width:** the width of the crop region

- **Height:** the height of the crop region

These properties can be accessed by clicking **Window > Properties**, and then selecting the **src region** layer from the timeline. Once the Src Region of the DVE is defined, it can be scaled and defined, the Dst Region can be scaled and positioned.

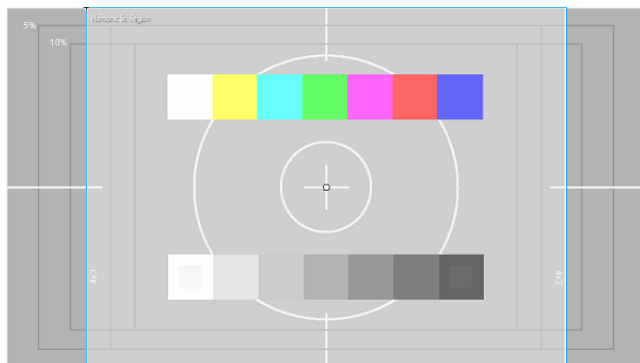


Figure 6-5: Src Region cropped to the center 4x3 region of a 16x9 output

- ⚠ **IMPORTANT:** If your primary graphics format is NTSC, there may be closed captioning (CC) present on line 21 of SDI input or from IMX clips. The full 486 line **Src Region** will include these lines. To avoid including these lines in the DVE, crop off the top three lines of the source using the **Src Region**. Line 0 is above the CC. Line 1 corresponds to line 21, and line 2 corresponds to line 284 (CC in field 2). To crop the top three lines of the source, in the **Properties** dialog for both the Src and Dst Regions, change the **y** axis value to 3 and the **Height** value to 483.

Dst region layer

The **dst region** layer defines how Src Regions are scaled and positioned in a DVE template.

- ⚠ **IMPORTANT:** The Dst Region should never be larger than the Src Region.

The following properties of the Dst Region are used to crop the DVE:

- **x:** the x position of the crop
- **y:** the y position of the crop
- **Width:** the width of the crop region
- **Height:** the height of the crop region

These properties can be accessed by clicking **Window > Properties**, and then selecting the **dst region** layer from the timeline.

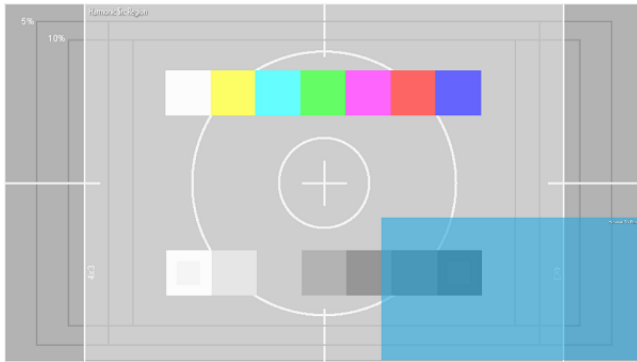


Figure 6-6: Dst Region of a 4x3 Src Region, scaled and positioned in the lower right corner of the screen



NOTE: The Dst Region layer is marked by a blue transparency. If necessary, this layer can be hidden until you are ready to use it. In the timeline, select the Dst Region layer, and click the show/hide button under the eye.



Figure 6-7: Dual DVE Dst Regions of a 4x3 Src Region, scaled and positioned in the lower corners of the screen



NOTE: The Dst Region layer of DVE 0 is marked by a blue transparency; the DST Region layer of DVE 1 is marked by a green transparency. If necessary, these layers can be hidden until you are ready to use them. In the timeline, select the Dst Region layers, and click the show/hide button under the eye.

Src preview layer

The **src preview** layer represents the input to the DVE; in other words, it represents the video that will be affected by the DVE template.

In the sample Harmonic DVE templates, the **src preview** layer is represented by a test pattern, as shown below.

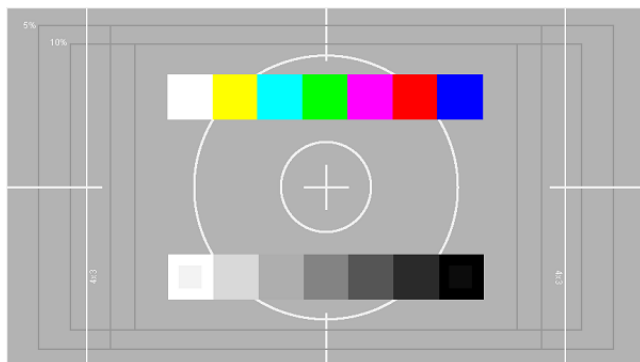


Figure 6-8: Src preview layer test pattern

Since the **src preview** layer is a preview of the input of the DVE, its screen resolution should match the screen resolution of the stage.



NOTE: In each blank DVE template, the **src preview** layer is already properly configured for the corresponding raster size, and the layer is locked.

The input to the DVE depends on the Spectrum module you are using and the channel mode you have configured. Refer to the following table:

Table 6-1: ChannelPort 8100 module

Standard Channel	Enhanced Channel
<ul style="list-style-type: none"> • Player • External In • Mixer Output 	<ul style="list-style-type: none"> • Player A, B • External In 1, 2 • Mixer Output

Table 6-2: ChannelPort 8200 module

Standard Channel	Enhanced Channel
<ul style="list-style-type: none"> • Player • External In 1, 2 • Mixer Output 	<ul style="list-style-type: none"> • Player A, B • External In 1-6 • Mixer Output


Table 6-3: Spectrum X

Standard Channel	Enhanced Channel	UHD
<ul style="list-style-type: none"> • Player • External In 1, 2 • Mixer Output 	<ul style="list-style-type: none"> • Player A, B • External In 1-6 • Mixer Output 	<ul style="list-style-type: none"> • Player • External In 1, 2 • Mixer Output


Using the blank DVE template

Learn how to use a blank Harmonic DVE .fla file to crop a 16:9 image to a 4:3 image and position that on the bottom right corner of the screen.

Before you begin

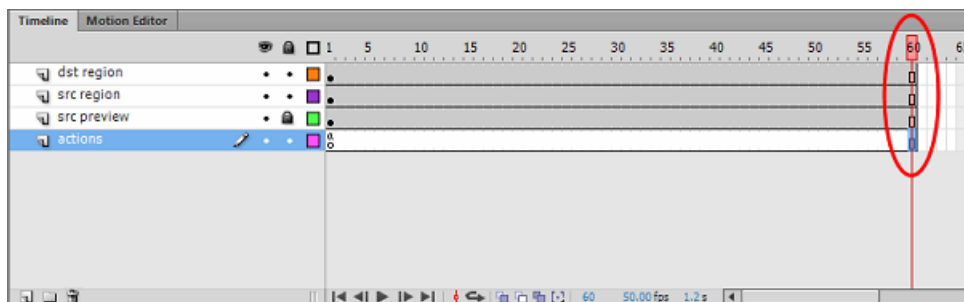
 **NOTE:** Before beginning a template project, verify your raster size and frame rate.

1. From the Template Authoring Package, open the `samples` folder.
2. Open the `sources` folder.
3. Open the folder for the raster size and frame rate you want to work in, and copy the `blank-dve.fla` file from that folder to the `project` folder.
4. In Flash Professional, open the `blank-dve.fla` file you copied to the `project` folder.

 **TIP:** To hide the Dst Region until you are ready to configure it, in the timeline, click the show/hide button under the eye.

5. Use the Src Region to define the crop area:
 - a. In the timeline, click **src region**.
 - b. On the Flash stage, select the Src Region.
 - c. Click and drag the corner of the free transform box to set the 4x3 area.
6. In the timeline, for all layers, right-click the last frame of the DVE transition, and select **Insert Frame**.

Example:



7. In the timeline, click **dst region**.
If the Dst Region was previously hidden, in the timeline, click the show/hide button under the eye.
8. In the timeline of the `dst region` layer, right-click the timeline, and select **Create Motion Tween**.
9. Click and drag the blue transparency to animate, or scale and position, the Dst Region, as illustrated below.

Example:



Figure 6-9: Before scaling and positioning

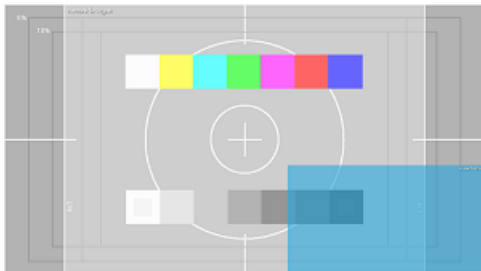


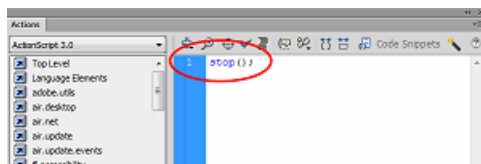
Figure 6-10: After scaling and positioning



NOTE: The Dst Region can also be scaled and positioned using the **Properties** dialog. Click **Windows > Properties**, and then select the Dst Region layer.

10. Set the animation to stop on the last frame (otherwise, the DVE transition will continually loop).
 - a. In the Timeline of the actions layer, right-click the last frame and select **Insert Blank Keyframe**.
 - b. Right-click the newly created blank keyframe and select **Actions**.
 - c. In the ActionScript editor, on line 1, type `stop();`, as shown below.

Example:



- d. Close the ActionScript editor.
11. If you have not already done so, save your file.
12. Click **File > Publish** to publish your file as a `.swf` file.
The published `.swf` file will be saved to the `project` folder.
13. Copy the `.swf` file from the `project` folder to your configured graphics directory on the video server to preview it.



NOTE: Unless you change the properties of the Actions layer, the DVE template will display the SDI Input the first time it is played.

Using the blank Harmonic Dual DVE template

In this procedure, learn how to use a blank Harmonic Dual DVE .fla file to create a “side-by-side” DVE.

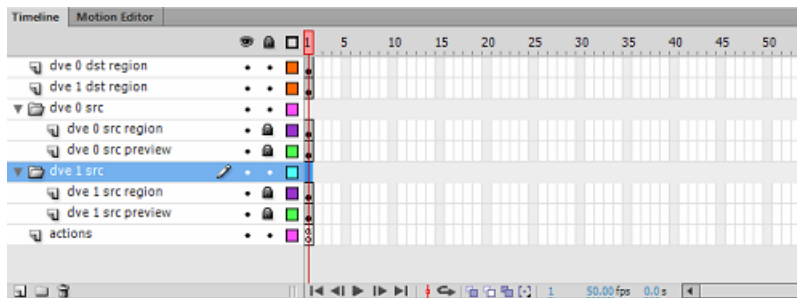
To take advantage of Dual DVE functionality, you can create two single DVE templates, and load each template on a different graphics layer to control the DVEs. Or, you can control two DVEs from a single template by modifying the blank Dual DVE .fla file in the Template Authoring Package. Dual DVE templates are available in each supported raster size and frame rate. The Template Authoring Package also contains sample Dual DVE templates that you can view.

Before you begin

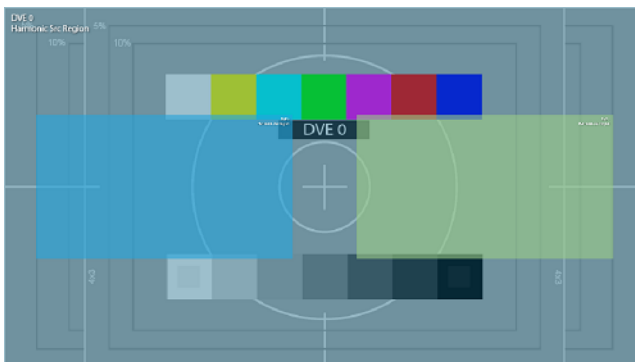
Before beginning your project, verify your raster size and frame rate.

1. From the Template Authoring Package directory, open the `samples` folder.
2. Open the `sources` folder.
3. Open the folder for the raster size and frame rate you want to work in.
4. Copy the `blank-dual-dve.fla` file from that folder to the `project` folder.
5. In Flash Professional, open the `blank-dual-dve.fla` file you copied to the `project` folder. The timeline contains the SrcPreview, SrcRegion, and DstRegion layers for each DVE.

Example:

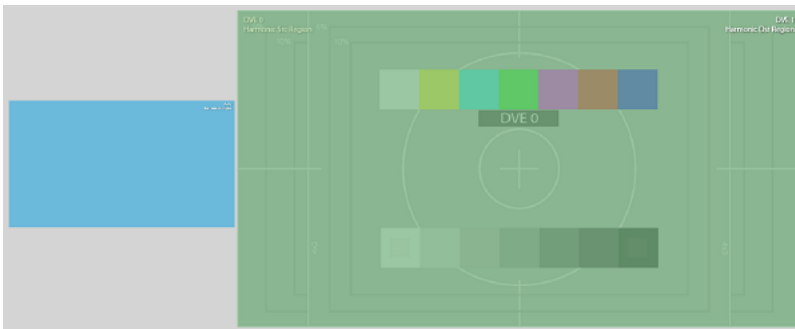


The Dual DVE template will appear on the Flash stage, as shown below.



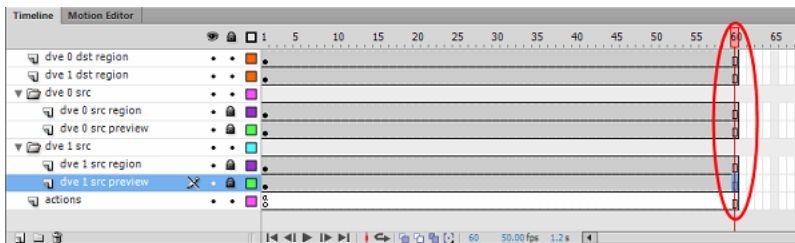
6. Position the **DVE 0 Dst Region** (marked by a blue transparency) off to the left side of the stage, as follows:
 - a. In the timeline, click **dve 0 dst region**.
 - b. On the Flash stage, select **DVE 0 Harmonic Dst Region**.
 - c. Click and drag the object to the left side of the screen.
7. Resize **DVE 1 Dst Region** (marked by a green transparency) to fill the entire Flash stage, as follows:
 - a. In the timeline, click **dve 1 dst region**.
 - b. On the Flash stage, select **DVE 1 Harmonic Dst Region**.
 - c. In the **Properties** tab, set the **x** axis value to 0, the **y** axis value to 0, the **width** value to the horizontal size of the stage, and the **height** value to the vertical size of the stage.

Your stage should appear as shown below.



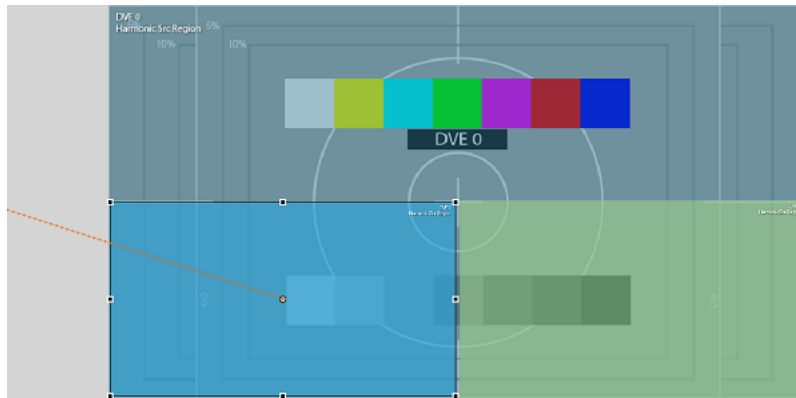
8. In the timeline, for all layers, right-click the last frame of the Dual DVE transition, and select **Insert Frame**.

Example:



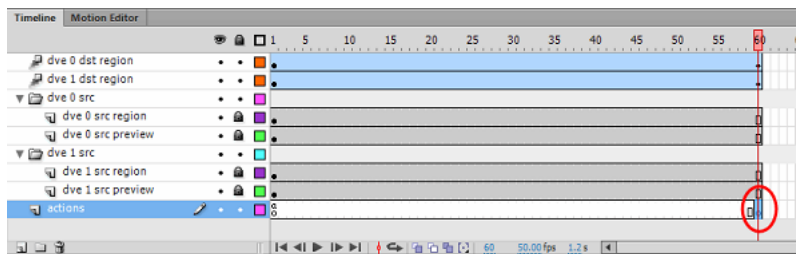
9. Create the transition for DVE 0, as follows:
 - a. In the timeline of the **dve 0 dst region** layer, right-click the timeline and select **Create Motion Tween**.
 - b. On the last frame, position the **dve 0 dst region**, as shown below. The orange line represents the path of DVE 0.

Example:



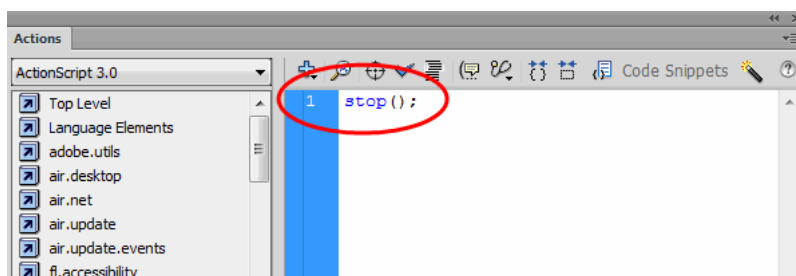
10. If you have not already done so, save your file.
11. Set the animation to stop on the last frame (otherwise, the DVE transition will continually loop).
 - a. In the Timeline of the **actions** layer, right-click the last frame and select **Insert Blank Keyframe**.

Example:



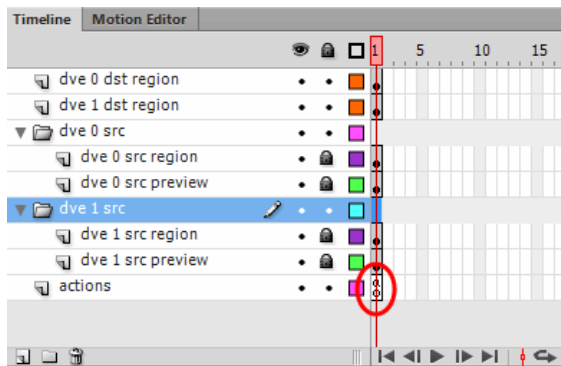
- b. Right-click the newly created blank keyframe and select **Actions**.
- c. In the ActionScript editor, on line 1, type `stop();`, as shown below.

Example:



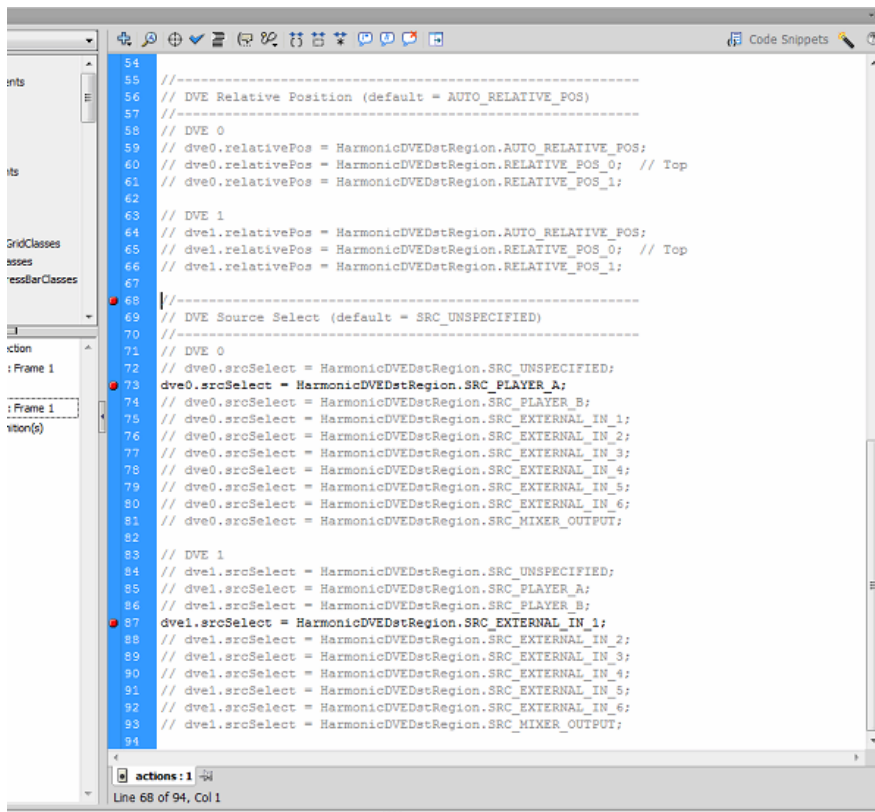
- d. Close the ActionScript editor.
12. Select the sources for each DVE, as follows:
 - a. In the timeline of the **actions** layer, right-click the first frame and select **Actions**.

Example:



- b. In the ActionScript editor, locate the commented out ActionScript code titled **DVE Source Select**.
- c. Uncomment the **Source Select** that you want for DVE 0 and DVE 1, as shown below. The input to the DVE can be an External input, a clip player, or the mixer output.

Example:



- d. Close the ActionScript editor.

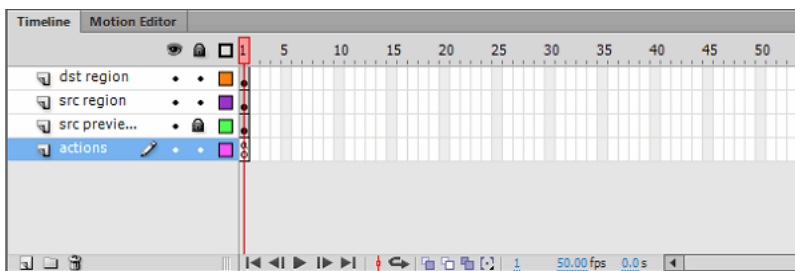
13. Click **File > Publish** to publish your file as a .swf file. The published .swf file is saved to the project folder.
14. Copy the .swf file from the project folder to your configured graphics directory on the video server to preview it.

Editing ActionScript to control DVE properties

Harmonic DVE templates contain ActionScript code that can be edited to control various properties of a DVE.

1. From the Template Authoring Package, open the `samples` folder.
2. Open the `sources` folder.
3. Open the folder for the raster size and frame rate you want to work in, and then copy the blank DVE `.fla` file from that folder to the `project` folder.
4. In Flash Professional, open the `.fla` file you copied to the `project` folder.
5. Edit your DVE template as desired.
6. In the DVE template timeline, on the **actions** layer, right-click the first frame.

Example:



7. Select **Actions**.
You can also access the ActionScript by selecting the **actions** layer and then **Window > Actions**.
An ActionScript file appears, as shown below.

```

1 import com.harmonic.icp.template.HarmonicDVEDstRegion;
2
3 //-----
4 // The Harmonic DVE Dst Region's instance name has been
5 // preset to 'dve'. Use this name to reference the object's
6 // properties.
7 //-----
8
9 //-----
10 // Enable/Disable the DVE (default = true)
11 //-----
12 // dve.enable = true;
13 // dve.enable = false;
14
15 //-----
16 // Enable/Disable the DVE Hole Punch (default = true)
17 //-----
18 // dve.enableHPT = true;
19 // dve.enableHPT = false;
20
21 //-----
22 // DVE Blend Mode (default = BLEND_WITH_VIDEO)
23 //-----
24 // dve.dveBlendMode = HarmonicDVEDstRegion.BLEND_WITH_VIDEO;
25 // dve.dveBlendMode = HarmonicDVEDstRegion.BLEND_WITH_GRAPHICS;
26
27 //-----
28 // DVE Blend Mode (default = AUTO_STACK_POS)
29 //-----
30 // dve.stackPos = HarmonicDVEDstRegion.TOP_MOST_STACK_POS;
31 // dve.stackPos = HarmonicDVEDstRegion.BOTTOM_MOST_STACK_POS;
32
33 //-----
34 // DVE Source Select (default = SRC_UNSPECIFIED)
35 //-----
36 // dve.srcSelect = HarmonicDVEDstRegion.SRC_UNSPECIFIED;
37 // dve.srcSelect = HarmonicDVEDstRegion.SRC_CLIP;
38 // dve.srcSelect = HarmonicDVEDstRegion.SRC_SDI;
39 // dve.srcSelect = HarmonicDVEDstRegion.SRC_MIXER_OUTPUT;

```

8. To edit a property of the DVE template, uncomment that property, as shown below.


Example:

```

9 //-----
10 // Enable/Disable the DVE (default = true)
11 //-----
12 // dve.enable = true;
13 // dve.enable = false;
14
15 //-----
16 // Enable/Disable the DVE Hole Punch (default = true)
17 //-----
18 // dve.enableHPT = true;
19 // dve.enableHPT = false;
20
21 //-----
22 // DVE Blend Mode (default = BLEND_WITH_VIDEO)
23 //-----
24 // dve.dveBlendMode = HarmonicDVEDstRegion.BLEND_WITH_VIDEO;
25 // dve.dveBlendMode = HarmonicDVEDstRegion.BLEND_WITH_GRAPHICS;
26
27 //-----
28 // DVE Blend Mode (default = AUTO_STACK_POS)
29 //-----
30 // dve.stackPos = HarmonicDVEDstRegion.TOP_MOST_STACK_POS;
31 // dve.stackPos = HarmonicDVEDstRegion.BOTTOM_MOST_STACK_POS;
32
33 //-----
34 // DVE Source Select (default = SRC_UNSPECIFIED)
35 //-----
36 // dve.srcSelect = HarmonicDVEDstRegion.SRC_UNSPECIFIED;
37 // dve.srcSelect = HarmonicDVEDstRegion.SRC_CLIP;
38 // dve.srcSelect = HarmonicDVEDstRegion.SRC_SDI;
39 // dve.srcSelect = HarmonicDVEDstRegion.SRC_MIXER_OUTPUT;

```

In this example, the boolean value for enabling/disabling the DVE Hole Punch Technology (HPT) has been uncommented to "false" (disabled).

 **NOTE:** The ActionScript code has been commented to reveal the default values for each property.

9. Close the ActionScript window.

10. If you have not already done so, save your file.
11. Click **File > Publish** to publish your file as a `.swf` file.
The published `.swf` file will be saved to the `project` folder.
12. Copy the `.swf` file from the `project` folder to your configured graphics directory on the video server to preview it.


DVE properties: enable

This DVE property is a boolean property that enables/disables the DVE.

- `True`: the DVE is enabled (default)
- `False`: the DVE is disabled

DVE properties: srcSelect

This DVE property controls the input source of the DVE.

Value	Description
<code>SRC_UNSPECIFIED</code>	<p>The source is unspecified.</p> <p> NOTE: This is the default value. However, the first time a DVE template is used, it will display an External Input.</p>
<code>SRC_PLAYER</code>	<p>The source is a player. In Enhanced Channel mode, you may set the source to <code>SRC_PLAYER_A</code> or <code>SRC_PLAYER_B</code>.</p>
<code>SRC_EXTERNAL_IN</code>	<p>The source is an external input. If your Harmonic playout device is configured for Enhanced Channel, you may specify which external input to use, for example:</p> <ul style="list-style-type: none"> • <code>EXTERNAL_IN_1</code> • <code>EXTERNAL_IN_2</code>
<code>SRC_MIXER_OUTPUT</code>	<p>The source is the mixer output.</p>

DVE properties: enableHPT

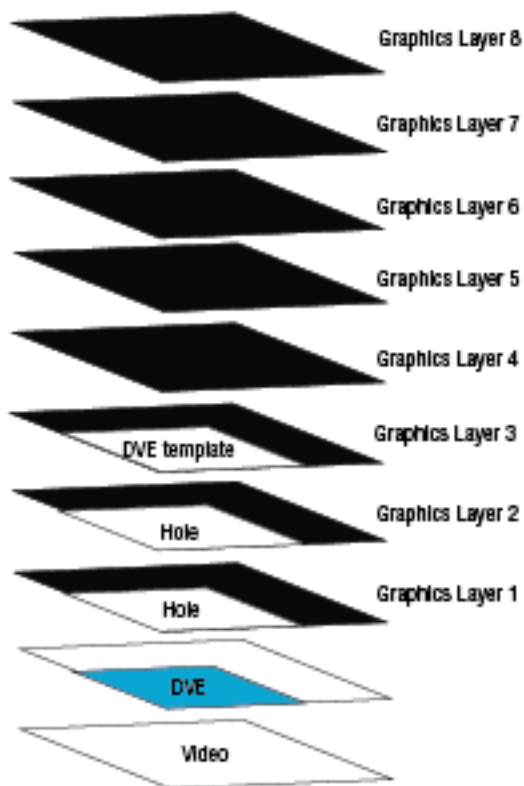
When a DVE template is loaded on a graphics layer, a region in all the graphics layers below that template is cleared so that the DVE can be seen. This functionality is called Hole Punch Technology (HPT).

In the following example, if a DVE template is loaded on graphics layer 3 with HPT enabled, a transparent region will be created on graphic layers 2 and 1. Essentially graphic layers 2 and 1 will be “under” the DVE and, as a result, not visible. Any templates placed on graphic layers 4 through 8 will be visible “above” the DVE.

This DVE property is a boolean property:

- `True`: HPT is enabled (default)
- `False`: HPT is disabled.

Example: DVE HPT enabled



DVE properties: dveBlendMode

This DVE property controls how alpha is applied to the DVE.

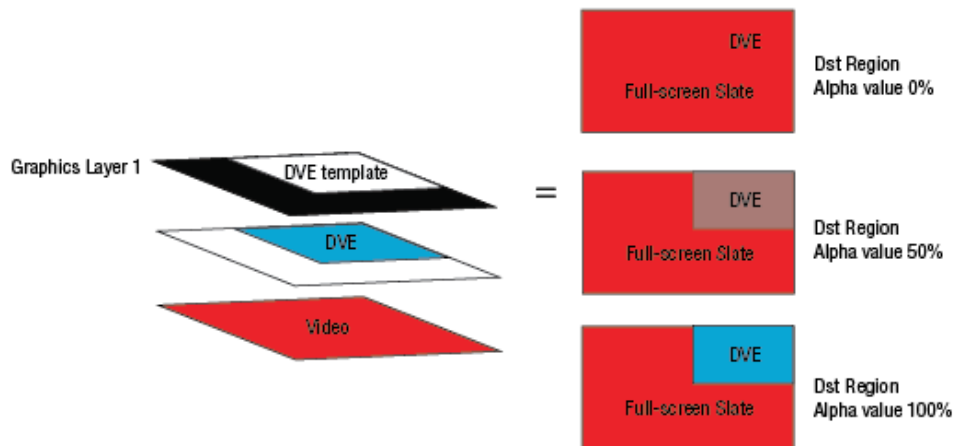
- **BLEND_WITH_VIDEO:** (Default) The alpha value of the Dst Region is applied to the DVE and affects how the DVE blends with the underlying video.
- **BLEND_WITH_GRAPHICS:** The inverse of the alpha value of the Dst Region is applied to the DVE, and the inverse of the alpha value is applied to the regions of the lower layers affected by the DVE. The DVE alpha value is set to 100% to achieve a semi-transparent DVE over graphics.



NOTE: To control the alpha value when authoring a DVE, click the Dst Region on the Flash stage, and then click **Windows > Properties > Color Effect**, and from the **Style** drop-down menu, select **Alpha**.

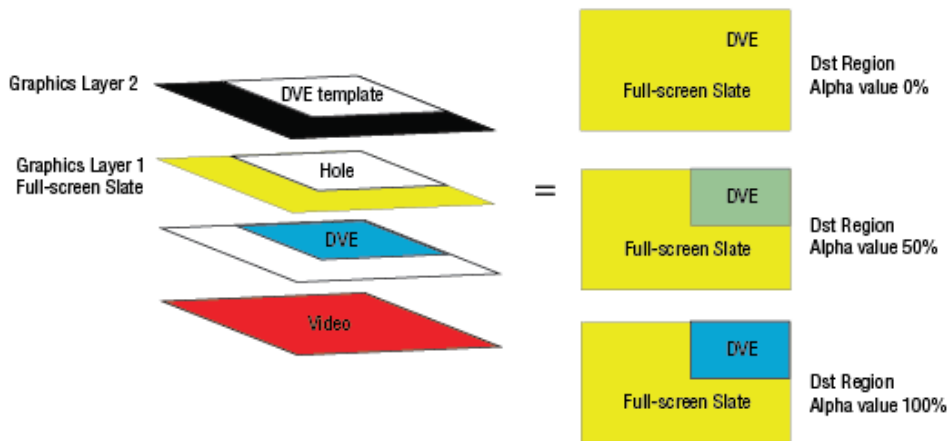
Example: BLEND_WITH_VIDEO

If a DVE template is loaded on graphics layer 1, and the dveBlendMode is set to BLEND_WITH_VIDEO, the DVE will blend with the video layer. The amount of blending is dependent on the alpha value set on the Dst Region.



Example: BLEND_WITH_GRAPHICS

If a DVE template is loaded on graphics layer 2, and the `dveBlendMode` is set to `BLEND_WITH_GRAPHICS`, the DVE will blend with the full-screen slate loaded on graphics layer 1, and the video layer will be totally obscured. The amount of blending is dependent on the alpha value set on the Dst Region.



DVE properties: stackPos

This DVE property controls where the DVE is located relative to other graphics in the template.

- `AUTO_STACK_POS`: (Default) The DVE is positioned depending on where the DST Region layer is located in the timeline of the template.
- `BOTTOM_MOST_STACK_POS`: Places the DVE below all other graphics in the template. Any graphics above the DVE will be seen.
- `TOP_MOST_STACK_POS`: Places the DVE above all other graphics in the template. Any graphics below the DVE will not be seen.

In the blank Harmonic DVE template, the DST Region is by default the first layer in the timeline, as shown below.

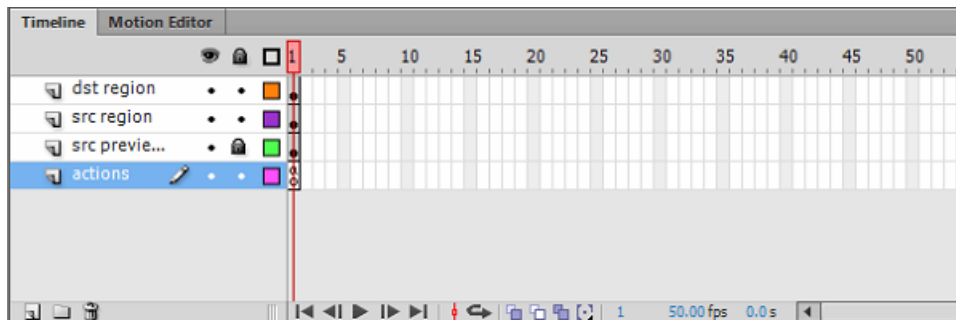


Figure 6-11: DST Region in template timeline

If no changes are made, the auto-stack property sets the DST Region to `TOP_MOST_STACK_POS`. If a new layer is placed above the DST Region, the auto-stack property sets the DST Region to `BOTTOM_MOST_STACK_POS`.

The **stackPos** property can be used to create a border on a DVE or to create a full-screen slate reveal.

When Dual DVEs are used with other graphics in a template, and both DVEs have the same stack position (in other words, if both DVEs are above or below other graphics), the **stackPos** property will determine the stacking order of the DVEs in relation to the other graphics in the template.

DVE properties: relativePos

This DVE property is an integer property that defines the stacking position of a DVE relative to another DVE in the template.



NOTE: This property only applies when Dual DVE templates are used with other graphics in the template, and both DVEs have the same stack position (in other words, if both DVEs are above or below other graphics in the template).

- `AUTO_RELATIVE_POS`: The DVEs will be positioned depending on where the DST Region layer for each DVE is located in the timeline of the Dual DVE template.

For example, if the **dve 0 dst region** is above the **dve 1 dst region** in the timeline of the template, DVE 0 will be stacked above DVE 1.

- `RELATIVE_POS_0`: The DVE will be positioned above the other DVE in the template.
- `RELATIVE_POS_1`: The DVE will be positioned below the other DVE in the template.

Creating a border on a DVE template

A DVE template can be authored to contain a border around the DVE.

The border graphic must be contained in a separate layer on the timeline of the DVE template, and the Dst Region should be set to `BOTTOM_MOST_STACK_POS`.

1. From the Template Authoring package directory, open the `samples` folder.
2. Open the `sources` folder.

3. Open the folder for the raster size and frame rate you want to work in, and copy the blank DVE `.fla` file from that folder to the `project` folder.
4. In Flash Professional, open the `.fla` file you copied to the `project` folder.
5. Edit and animate (scale and position) the Dst Region as desired.
6. Right-click the first frame of the **actions** layer, and select **Actions**.
An ActionScript file opens.
7. In the ActionScript file, uncomment the entry for `BOTTOM_MOST_STACK_POS`.
8. In the timeline, create a new layer above the Dst Region layer, and call it `border`.
9. Edit and animate the border to match the editing and animation of the Dst Region.
10. If you have not already done so, save your file.
11. Click **File > Publish** to publish your file as a `.swf` file.
The published `.swf` file will be saved to the `project` folder.
12. Copy the `.swf` file to your configured graphics directory on the video server to preview it.

When this DVE template is played, the border will appear above the DVE.

Creating a full-screen slate reveal

A DVE template can be authored to reveal a full-screen slate.

The Dst Region should be set to the `TOP_MOST_STACK_POS`.

1. From the Template Authoring package directory, open the `samples` folder.
2. Open the `sources` folder.
3. Open the folder for the raster size and frame rate you want to work in, and copy the blank DVE `.fla` file from that folder to the `project` folder.
4. In Flash Professional, open the blank DVE `.fla` file you copied to the `project` folder.
5. Edit and animate (scale and position) the Dst Region as desired.
6. Right-click the first frame of the **actions** layer, and select **Actions**.
An ActionScript file opens.
7. In the ActionScript file, uncomment the entry for `TOP_MOST_STACK_POS`.
8. If you have not already done so, save your file.
9. Click **File > Publish** to publish your file as a `.swf` file.
The published `.swf` file will be saved to the `project` folder.
10. Copy the `.swf` file to your configured graphics directory on the video server to preview it.



IMPORTANT: When using FXTool or PreviewTool to preview the full-screen slate reveal, place the DVE template on a layer above the full-screen slate template.

Using audio duck and mix widgets in a dual DVE template

You can use audio duck and mix widgets to create a template in which the audio is lowered in one DVE and raised in the other.

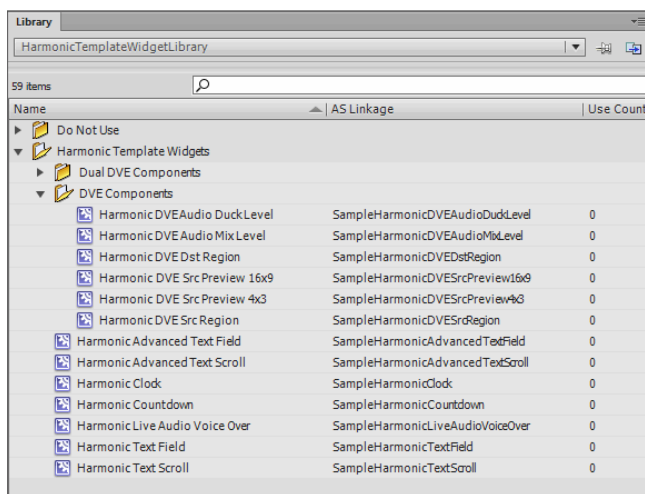
Consider the following scenario: DVE 1 is active, full-screen with audio. DVE 0 comes in from the left-side of the screen and causes DVE 1 to “squeeze back.” When DVE 0 comes in, its audio is “mixed” in, and the audio of DVE 1 is “ducked.” After a few moments, DVE 0 is “squeezed off” the screen, and DVE 1 returns to full screen. When DVE 0 is removed, its audio is “ducked,” and the audio of DVE 1 is “mixed” back in.

The sample Harmonic dual DVE side-by-side template already contains the audio widgets.

1. From the Template Authoring Package directory, open the `samples` folder.
2. Open the `sources` folder.
3. Open the folder for the raster size and frame rate you want to work in, and copy the `blank-dual-dve.fla` file from that folder to the project folder.
4. In Flash Professional, open the `blank-dual-dve.fla` file you copied to the `project` folder.
5. Click **File > Open** and select the Template Authoring Package.
6. Open the `widgets` folder, and open the **HarmonicTemplateWidgetLibrary**.
7. From the **Library** tab, select `HarmonicTemplateWidgetLibrary.fla` from the library drop-down menu, as shown below.

If the **Library** tab is not available, click **Window > Library**.

Example:



8. From the `Dual DVE Components` folder in the Widget Library, open the `DVE 0` and `DVE 1` folders, copy the Audio Duck and Mix Level widgets, and paste them into the corresponding folder in your Dual DVE project library.

9. Drag each audio widget for each DVE just off the Flash stage.
If you do place them on the stage, the widgets will not be displayed on the output of the playout device.
10. If you want to create an audio effect (in other words, make the audio slowly fade in or out), add a new layer in the timeline and create a motion tween for the widget.
11. To set the decibel levels, adjust the alpha for each widget as follows:
 - a. Select each widget you want to adjust, and click **Window > Properties**.
 - b. Select **Color Effect**, and from the **Style** drop-down menu, select **Alpha**.
 - c. Set the alpha as desired.
12. Make any other changes you need, and save your work.
13. Click **File > Publish** to publish your file as a `.swf` file.
The published `.swf` file will be saved to the `project` folder.
14. Copy the `.swf` file to your configured graphics directory on the video server to preview it.

Alpha settings for decibel levels

When an audio duck level or audio mix level widget is applied to a template, the decibel level is controlled by the alpha settings of the widget.

Alpha Value	Decibel (dB)	Audio Effect
0.0	-100 dBo dB	no volume
0.5	-50 dB	low volume
1.0	0 dB	full volume

Using the Monitor Out template


The Monitor Out template allows you to display active player and mixer information for your channel superimposed over your primary output while playing a clean output to air over the secondary output.

- [Customizing the Monitor Out template](#)
- [Guidelines for customizing the Monitor Out template](#)

Customizing the Monitor Out template

To create your own Monitor Out template, start with the sample template provided in `samples/sources/[raster_size]/MonitorOut`, and then customize the `ActionScript` and the **timecode** text field.


Monitor Out information can include the mixer state, player name, player state, player looping, clip name (for loaded and cued clips), time until next clip, a player preview generated by the DVE, transport status (PLAY, REW, FF, PAUSE, IDLE), and timecode.


 **NOTE:** The Monitor Out functionality is not supported for a UHD channel.

Modifying the ActionScript

The `CustomMonitorOut` class is `ActionScript` code that defines the main document class for the template.

The `CustomMonitorOut` class is derived from `MonitorOut`, which is then derived from `HarmonicTemplate`.

 **TIP:** The `HarmonicMonitorOutStandard.as` or `HarmonicMonitorOutEnhanced.as` `ActionScript` files can be used as a reference for customizing the Monitor Out template.

 **NOTE:** The `MonitorOut` class code is included in the sample, but it is not intended to be modified.



- In the `CustomMonitorOut` class code, modify the following four functions:

Function	Description
constructor	Add any initialization code here to the template. This will be dependent on your customization. Make sure that the super() function is called so that base class constructors get called.
getTimecode-BackgroundColor	Defines the background color of the rendered timecode.
getTimecode-BackgroundAlpha	Defines the background alpha of the rendered timecode
handleKeyValue	<p>This function is the main interface for handling the dynamic portion of the Monitor Out functionality. During run-time, the playout device will send information to the template via the updateTextField function located in the MonitorOut base class. The base class will parse the string and separate the contents into "key/value" pairs. It will then call the overridden handleKeyValue function that you will need to implement.</p> <p>In the header of the <code>MonitorOut.as</code> file, fill in the desired behavior for Key/Value pairs. You only need to use the key/value pairs that are applicable to your configuration. There is a section for the Standard Channel configuration as well as the Enhanced Channel configuration.</p>

Customizing the Timecode text field

The properties this text field determine the x, y, width, height, foreground color, foreground alpha, background color, and background alpha of the rendered timecode. This information is queried once the template is loaded by the Monitor Out feature.

Modify the timecode text field properties as follows:

Option	Description
x	Use the Flash editor to position the text field at the desired location.
y	Use the Flash editor to position the text field at the desired location.
width	<p>Use the Flash editor to set the width of the text field to the desired size.</p> <p> NOTE: The internally rendered timecode will attempt to fill this space. As a result, what is viewed in the Flash editor will not be the same as what is rendered by the playout device.</p>
height	<p>Use the Flash editor to set the height of the text field to the desired size.</p> <p> NOTE: The internally rendered timecode will attempt to fill this space. As a result, what is viewed in the Flash editor will not be the same as what is rendered by the playout device.</p>
foreground color	In the Flash editor, use the Color property of the text field to set the foreground color.
foreground alpha	In the Flash editor, use the Color property of the text field to set the foreground alpha.

Option	Description
background color	To change the background color, edit the main CustomMonitorOut document class by clicking on the stage and then clicking the pencil icon on the Document class . The background color value is located in the <code>getTimecodeBackgroundColor</code> function. The return value is a 24-bit RGB value. Examples: Red = <code>0xFF0000</code> , Green = <code>0x00FF00</code> , Blue = <code>0x0000FF</code> .
background alpha	To change the background alpha, edit the main CustomMonitorOut document class by clicking on the stage and then clicking the pencil icon on the Document class . The background alpha value is located in the <code>getTimecodeBackgroundAlpha</code> function. The return value is a number: 0.0 = transparent, 1.0 = opaque

Guidelines for customizing the Monitor Out template

Follow these guidelines for customizing the Monitor Out template.

- Create the graphical assets inside a MovieClip (one MovieClip for each asset).
- Drag the movie clip onto the stage and provide it an instance name. This will allow it to be accessed from the ActionScript.
- In the CustomMonitorOut constructor:
 - Get references to the graphical assets by using the `DisplayObjectContainer::getChildByName()` function. The name should be the same as the instance name provided in the guideline above.
 - Store the reference in a member variable so that it can be accessed later.
 - Set the visible property on all MovieClip objects to `false`. This makes all graphical assets invisible.
- In the CustomMonitorOut::handleKeyValue() function:
 - Create a switch statement on the 'key' MovieClip.
 - Add code to set the visible property of the stored MovieClip objects based on the 'value' parameter.

Using external key/fill

Spectrum modules that have been licensed for Enhanced Channel mode support a single or dual pair of external Key/Fill inputs.

- [About external key/fill](#)
- [Configuring external key/fill](#)
- [Key/fill limitations, restrictions, and notes](#)

About external key/fill

When external key/fill input is activated, live video content received on the external inputs of a Spectrum module can be placed on any graphics layer, and then be blended and stacked with other supported graphics content.

The per-pixel transparency of the Fill input is determined by the per-pixel luma of the Key input, with black corresponding to fully transparent, and white corresponding to fully opaque.

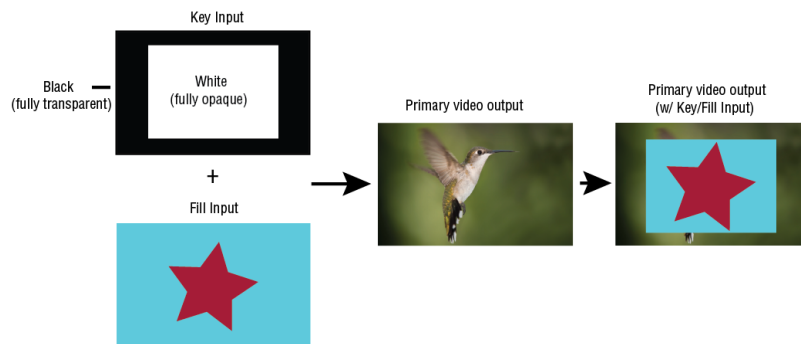



Figure 8-1: External key/fill diagram

You can control external Key/Fill inputs using the Key/Fill files that are available in the Template Authoring Package. The following files are included:

File	Description
extkeyfill.ekf	Does not specify an input pair. Can be used on ChannelPort 8100 or 8200 modules. If loaded on an 8200 module, extkeyfill.ekf will select Key/Fill pair 1 by default.

File	Description
<code>extkeyfill11.ekf</code>	Specifies Key/Fill input pair 1 on ChannelPort 8200 modules and Spectrum X. Can be used on ChannelPort 8100 modules.
<code>extkeyfill12.ekf</code>	Specifies Key/Fill input pair 2 on ChannelPort 8200 modules and Spectrum X.

 **NOTE:** If two Key/Fill pairs are used, only one pair can be active at one time.

You can load a Key/Fill template on any graphic layer, with other graphics above or below it. Refer to the following diagram.

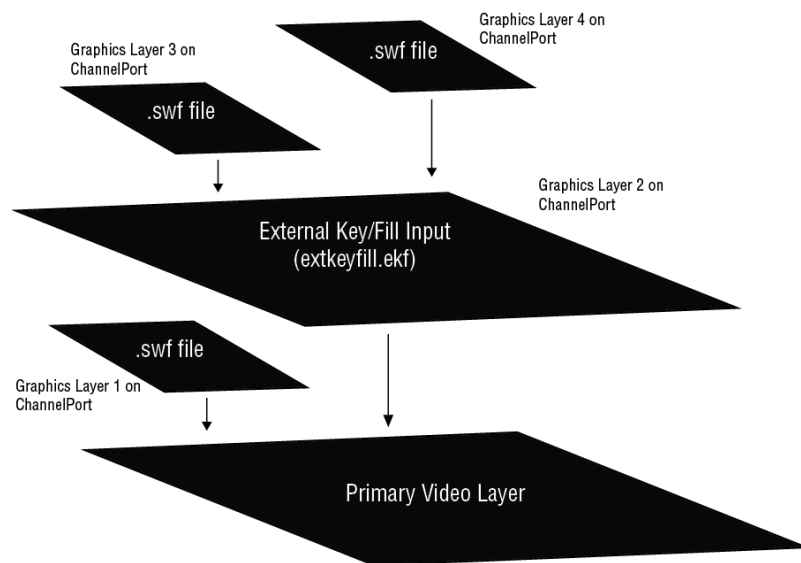


Figure 8-2: Layering `extkeyfill.ekf`

Configuring external key/fill

Your Spectrum module must be licensed for Enhanced Channel mode in order to configure this feature.

Refer to “Enabling Enhanced Channel Mode” in the *Harmonic SystemManager User Guide* for information on configuring your Spectrum device for Enhanced Channel.

1. Connect external sources of Key and Fill inputs to the correct external inputs on the rear panel.



IMPORTANT: The incoming video content for both Key and Fill inputs must be reference aligned and in the same video output format as the primary video output format of the playout device.

2. From the Template Authoring Package directory, open the `external-key-fill` folder.
3. Copy the necessary `extkeyfill1.ekf` file, and paste it into the graphics directory on your Spectrum video server.

You may now load the `extkeyfill1.ekf` file onto any layer to preview the Key/Fill input in FXTool or PreviewTool.

External key/fill module inputs

Find Key/fill inputs for the ChannelPort 8100, 8200 and the Spectrum X.

Module	Key	Fill
ChannelPort 8100	External IN 1	External IN 2
ChannelPort 8200 and Spectrum X	External IN 1 (Key 1) External IN 4 (Key 2)	External IN 2 (Fill 1) External IN 5 (Fill 2)

Key/fill limitations, restrictions, and notes

Key and Fill inputs that are not reference aligned and in the same format as the primary video output format of the playout device are not supported.

For ChannelPort 8200 modules: If you have inputs on both Key/Fill pairs and you load `extkeyfill1.ekf` and `extkeyfill2.ekf`, the key/fill pair on the higher layer will be the one displayed in the output.

If your Spectrum X or ChannelPort is configured for Independent Branding mode, external Key/Fill is supported on the HD output, but will not show on the SD output. External key/fill will only be shown on the SD output if all of the following are true:

- The playout device is configured for Enhanced Channel
- SD is the primary video output format
- External key/fill inputs are reference aligned and in an SD format identical to the primary SD video output

While SD-native formats are defined by non-square pixel aspect ratios, graphics played out on your Spectrum module are rendered in square-pixel resolutions. When external Key/Fill inputs are applied to SD formats, edge softening and other rendering artifacts may be visible in content that has high-frequency characteristics along the horizontal axis. These artifacts may be more visible in 16:9 SD formats than in 4:3 SD formats because of the difference in pixel aspect ratios. For best results when applying external Key/Fill content to SD formats, minimize high-frequency transitions in the Key/Fill content.


Creating Flash videos and MPEG-4 files

Your Spectrum payout device supports templates encoded as Flash Video (`.flv`) files with alpha (transparency) and MPEG-4 (`.mp4`) files.

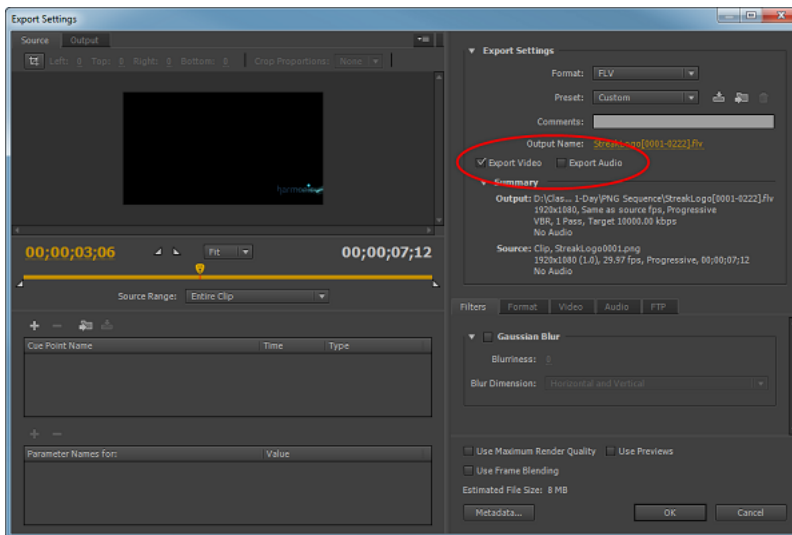
- [Creating a Flash video file with Alpha using Media Encoder CS6](#)
- [Creating a Flash video file with Alpha using After Effects CS6](#)
- [About MPEG-4 layering](#)
- [Creating an MPEG-4 file using Media Encoder CS6](#)
- [Creating an MPEG-4 file using After Effects CS6](#)
- [Creating a UHD MPEG-4 file in After Effects CC and Media Encoder CC](#)

Creating a Flash video file with Alpha using Media Encoder CS6

You can use Media Encoder CS6 to encode a large sequence of image files (for example, `.tga` files) that will be exported as a `.flv` file with alpha and played as a graphic template.

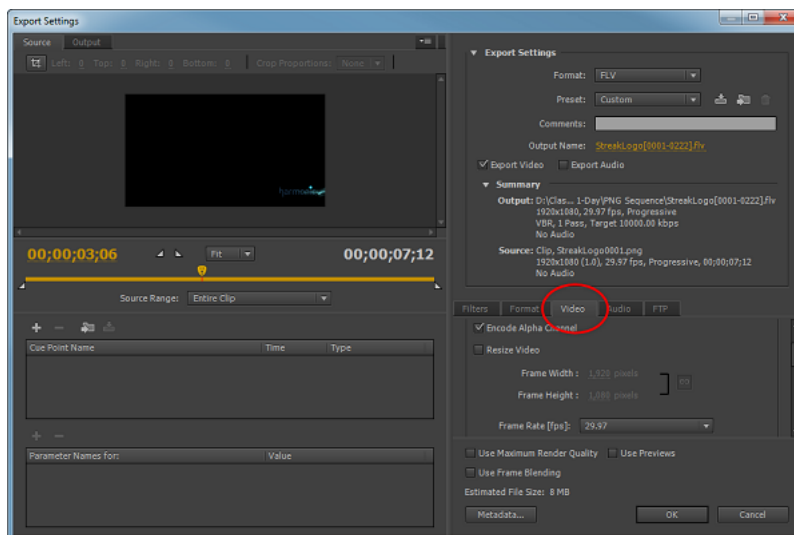
1. In Media Encoder, click **File > Add Source**, and choose the necessary file(s).
 **NOTE:** If you are adding an image sequence, in the **Open** dialog box, click the first file in the sequence, and select the **Enable Sequence** check box.
2. From the **Format** drop-down menu, select **FLV**.
3. From the **Preset** drop-down menu, select the appropriate resolution and frame rate, and then click **OK**.
 **NOTE:** The highest resolution available for `.flv` files is 1920 x 1080. If the `.flv` template will be used in UHD output, be sure that you have configured anchor points per layer so that the template will be loaded in the desired position.
4. Click **FLV** to open the **Export Settings** dialog box.
5. In the **Export Settings** dialog, configure the following settings:
 - a. Select the check box for **Export Video**.
 - b. If you do not want to export audio with your file, clear the check box for **Export Audio**.
 - c. Ensure that **Use Maximum Render Quality** is cleared (default).
 - d. Ensure that **Use Frame Blending** is cleared (default).

Example:



6. On the **Filters** tab, make sure the check box for **Gaussian Blur** is cleared (default).
7. On the **Video** tab, configure the following settings:
 - a. Select the check box for **Encode Alpha Channel**.
 - b. Make sure the check box for **Resize Video** is cleared (default) or is set to the target resolution.
 - c. From the **Frame Rate** drop-down menu, select the necessary frame rate.
 - d. Make sure the check box for **Render at Maximum Depth** is cleared (default)

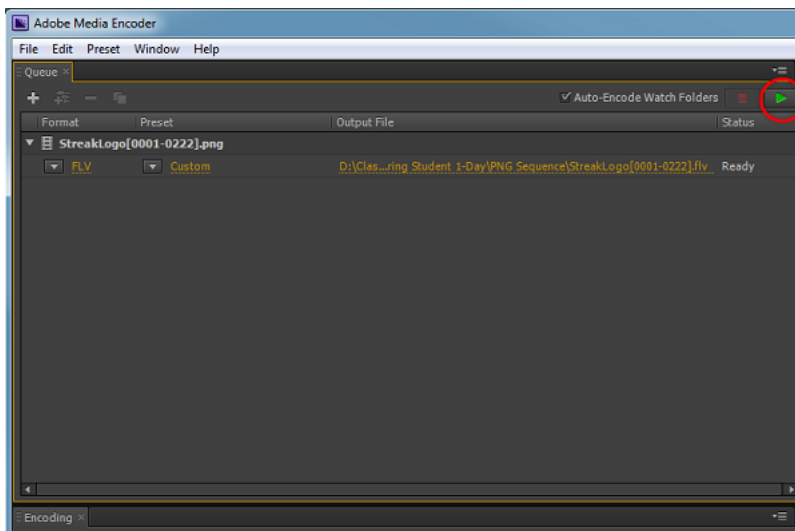
Example:



8. On the **Video** tab, scroll down to the **Bitrate Settings**, and make sure the check box for **VBR** is selected (default).
9. On the **Video** tab, scroll down to the **Advanced Settings**, and configure the following settings:

- a. Select the check box for **Set Key Frame Distance**, and set the Key Frame Distance to 72.
 NOTE: A key frame distance of 72 frames is suitable for most videos; however, you may adjust the key frame distance based on the content of the video. For instance, for motion-heavy video, a shorter key frame distance increases the visual quality. Bear in mind that a shorter key frame distance also results in a larger file size, while a longer key frame distance reduces the file size.
 - b. Select the check box for **Simple Profile**.
 - c. Make sure the **Undershoot [% target]** is set to 90 (default).
 - d. From the **Quality** drop-down box, select **Best**.
10. If you want to include audio with your file, click the **Audio** tab and then configure the following settings:
 - a. In the **Basic Audio Settings** area, for **Output Channels**, make sure **Stereo** is selected (default).
 - b. In the **Bitrate Settings** area, from the **Bitrate** drop-down menu, select **128** (default).
 11. Click **OK**.
 12. From the **Queue** area, click **Start Queue**.
You can view the encode process from the **Encoding** area.

Example:



13. When the encode is complete, copy the `.flv` file to your configured graphics directory on the video server.

The `.flv` file can now be played on your Spectrum playout device.

Creating a Flash video file with Alpha using After Effects CS6

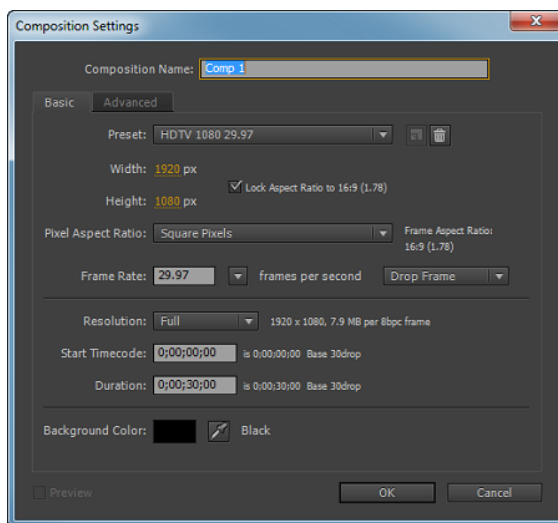
You can use After Effects CS6 to encode a large sequence of image files (for example, .tga files) that will be exported as an .flv file with alpha and played as a graphic template.

1. In After Effects, select **Composition > New Composition**.
2. In the **Composition Settings** dialog, select the appropriate resolution, frame rate, and duration.



NOTE: The highest resolution available for .flv files is 1920 x 1080. If the .flv template will be used in UHD output, be sure that you have configured anchor points per layer so that the template will be loaded in the desired position.

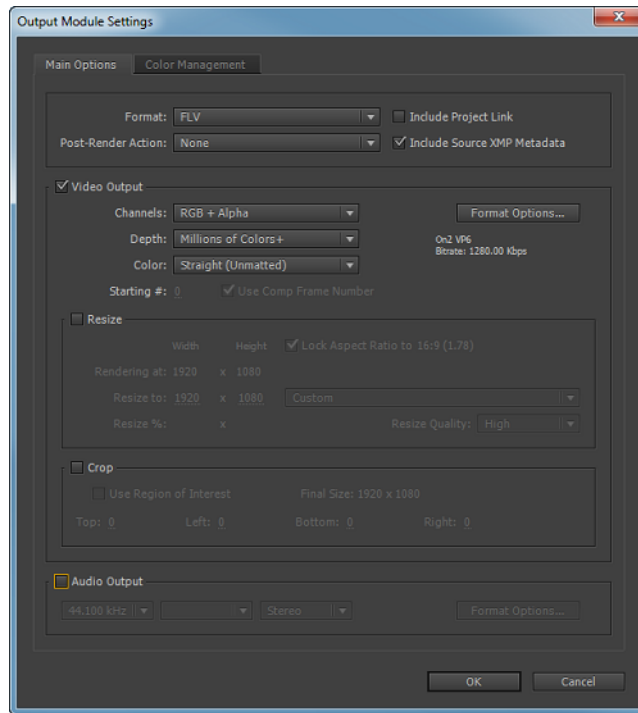
Example:



3. Click **OK**.
4. Select **File > Import > File**.

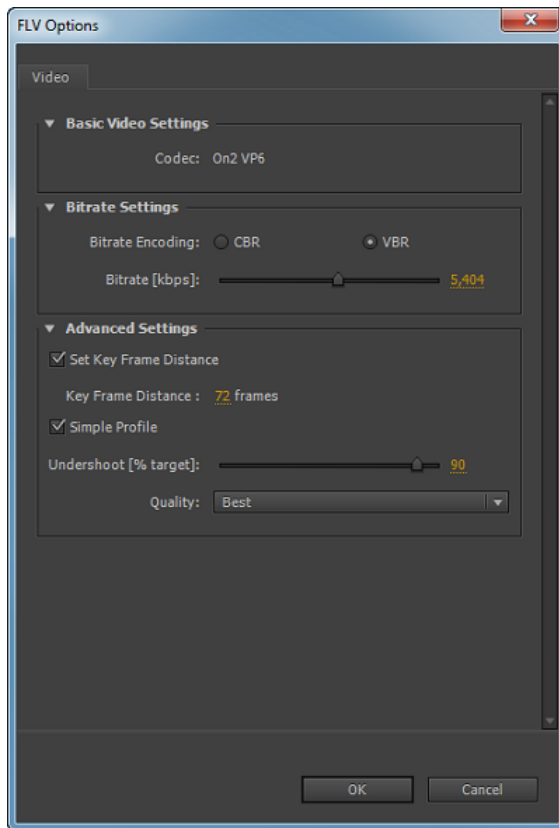
NOTE: If you are adding an image sequence, in the **Open** dialog box, click the first file in the sequence, and select the **Enable Sequence** check box.
5. In the **Project** area, right-click the imported sequence, and select **Interpret Footage > Main**.
6. In the **Interpret Footage** dialog box, make sure the value for **Assume this frame rate** matches the target frame rate.
7. Drag your new composition to the **Render Queue** area.
8. From the **Output Module** drop-down menu, select **FLV with Alpha**.
9. Click **FLV with Alpha** to open the **Output Module Settings** dialog box.
10. Configure the following settings:
 - a. Select the check box for **Include Source XMP Metadata**.
 - b. If you do not want to export audio with your file, clear the check box for **Audio Output**.

Example:




11. In the **Video Output** area, from the **Color** drop-down menu, select **Straight (Unmatted)**.
12. In the **Video Output** area, click **Format Options** to open the **FLV Options** dialog box.

Example:



13. In the **Bitrate Settings** area, configure the following settings:
 - a. Select **VBR** bitrate encoding.
 - b. Set the **Bitrate** to 5,404 kbps.
14. In the **Advanced Settings** area, configure the following settings:
 - a. Select the check box for **Set Key Frame Distance**, and set the Key Frame Distance to 72.

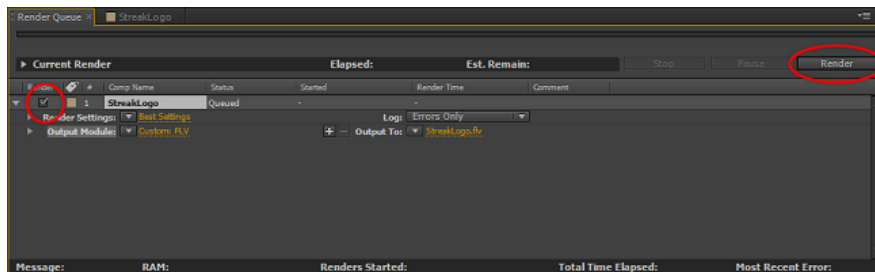
 **NOTE:** A key frame distance of 72 frames is suitable for most videos; however, you may adjust the key frame distance based on the content of the video. For instance, for motion-heavy video, a shorter key frame distance increases the visual quality. Bear in mind that a shorter key frame distance also results in a larger file size, while a longer key frame distance reduces the file size.
 - b. Select the check box for **Simple Profile**.
 - c. From the **Quality** drop-down menu, select **Best**.
15. If you want to include audio with your file, do the following:
 - a. Click **Format Options**.
 - b. Click the **Audio** tab.
 - c. In the **Bitrate Settings** area, from the **Bitrate** drop-down menu, select **128** (default).
16. Click **OK** to close the **FLV Options** dialog box.
17. Click **OK** to close the **Output Module Settings** dialog box.

18. Select the **Render Queue** tab, and then double-click the **Output To** field to name the file.

NOTE: If the **Render Queue** tab is not available, go to **Window > Render Queue**.

19. Select the **Render** check box for your composition, and then click **Render**.

Example:



20. When the encode is complete, copy the `.flv` file to your graphics directory on the video server.

The `.flv` file can now be played on your Spectrum playout device.

About MPEG-4 layering

The format `.mp4` (MPEG-4) is a wrapper format for a video file that has been encoded with the H.264 encoding process.

The following figure a sample method of layering graphics using an `.mp4` file and other template types.

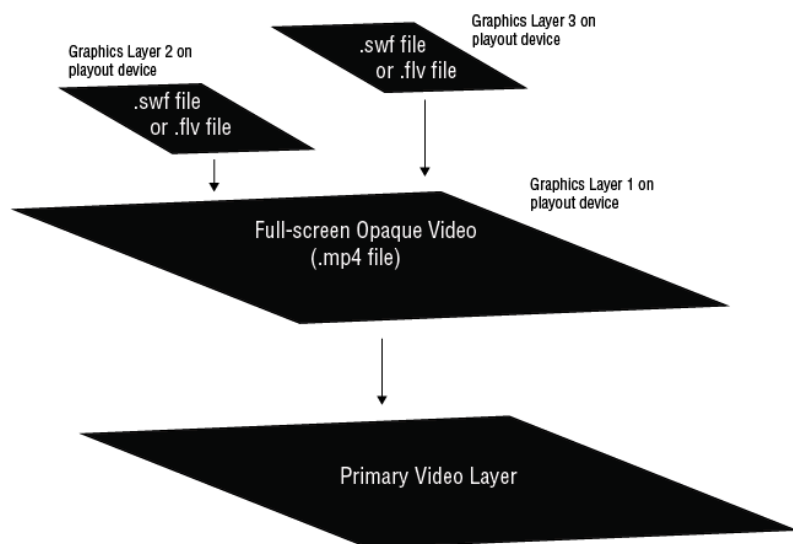


Figure 9-1: Layering `.mp4` file

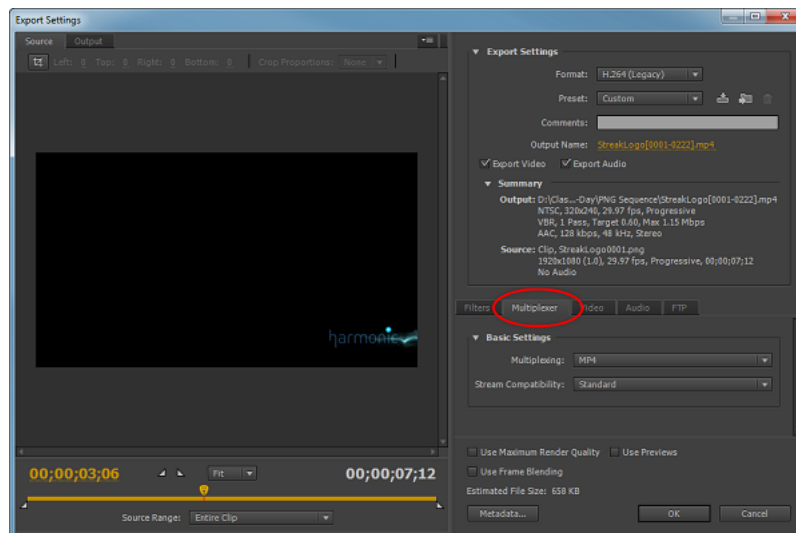
Creating an MPEG-4 file using Media Encoder CS6

You can use Media Encoder CS6 to encode a large sequence of image files (for example, .tga files) as an .mp4 file that can be played as a full-screen opaque graphic template or video.

1. In Media Encoder, click **File > Add**, and choose the necessary file(s).

NOTE: If you are adding an image sequence, in the **Open** dialog box, click the first file in the sequence, and select the **Enable Sequence** check box.
2. From the **Format** drop-down menu, select **H.264 (Legacy)**.
3. Click **H.264 (Legacy)** to open the **Export Settings** dialog box.
4. In the **Export Settings** area, configure the following settings:
 - a. Select the check box for **Export Video**.
 - b. If you do not want to export audio with your file, clear the check box for **Export Audio**.
5. On the **Filters** tab, make sure the check box for **Gaussian Blur** is cleared (default).
6. From the **Multiplexer** tab, configure the following settings:
 - a. From the **Multiplexing** drop-down menu, select **MP4**.
 - b. From the **Stream Compatibility** drop-down menu, select **Standard**.

Example:

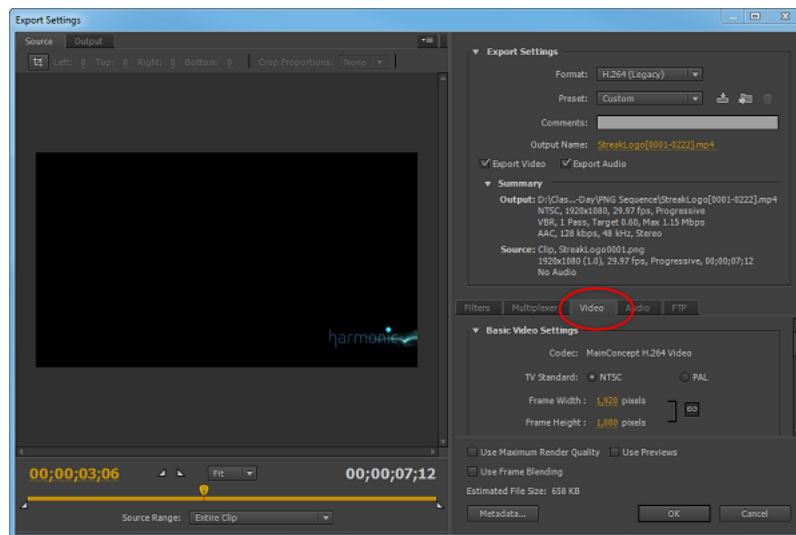


7. From the **Video** tab, configure the following settings:
 - a. In the **Basic Video Settings** area, from the **Profile** drop-down menu, select **Main**.
 - b. From the **Level** drop-down menu, select **4.1**.
 - c. From the **Frame Rate** drop-down menu, select the appropriate frame rate.

NOTE: Media Encoder CS6 does not support 3840x2160 .mp4 files at 50 or 59.94 Hz.

- d. If necessary, change the **Frame Width**.
The **Frame Height** changes automatically based on your selection.
- e. Make sure the check box for **Render at Maximum Depth** is cleared (default).
- f. In the **Bitrate Settings** area, from the **Bitrate Encoding** drop-down menu, select **VBR, 1 Pass**.
- g. Set the **Target Bitrate** to 32 Mbps.
- h. Set the **Maximum Bitrate** to 40 Mbps.
- i. In the **Advanced Settings** area, make sure that the check box for **Set Key Frame Distance** is cleared (default).

Example:



8. If you want to include Audio with your file, click the **Audio** tab, and configure the following settings:
 - a. In the **Audio Format Settings** area, for **Audio Format**, select **AAC** (default).
 - b. In the **Basic Audio Settings** area, from the **Codec** drop-down menu, make sure **AAC** is selected (default).
 - c. From the **Output Channels** drop-down menu, select **Stereo** (default).
 - d. From the **Frequency** drop-down menu, select **48 kHz** (for best performance).
 - e. From the **Audio Quality** drop-down menu, select **High** (default).
 - f. In the **Bitrate Settings** area, from the **Bitrate** drop-down menu, select **56** (default).
 - g. In the **Advanced Settings** area, for **Precendence**, select **Frequency** (default).
9. Click **OK**.
10. In the **Queue** area, click **Start Queue**.
You can view the encode process from the **Encoding** area.
11. When the encode is complete, copy the MPEG-4 file to your graphics directory on the video server.

The .mp4 file can now be played on your Spectrum playout device.

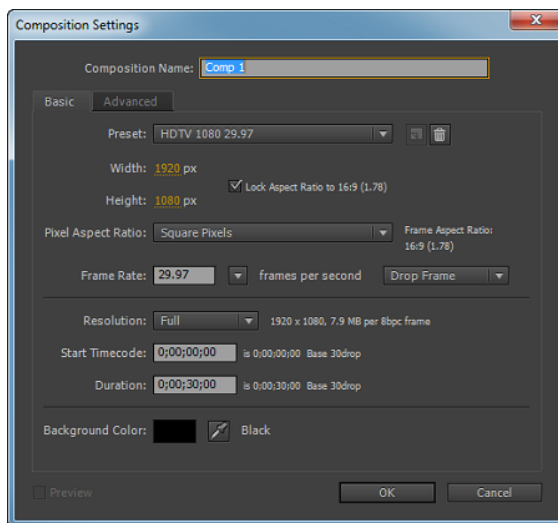
Creating an MPEG-4 file using After Effects CS6

You can use After Effects CS6 to encode a large sequence of image files (for example, .tga files) as an .mp4 file that can be played as a full-screen opaque graphic template or video.


1. In After Effects, select **Composition > New Composition**.
2. Select the appropriate resolution, frame rate, and duration.

 **NOTE:** After Effects CS6 does not support 3840x2160 .mp4 files at 50 or 59.94 Hz.

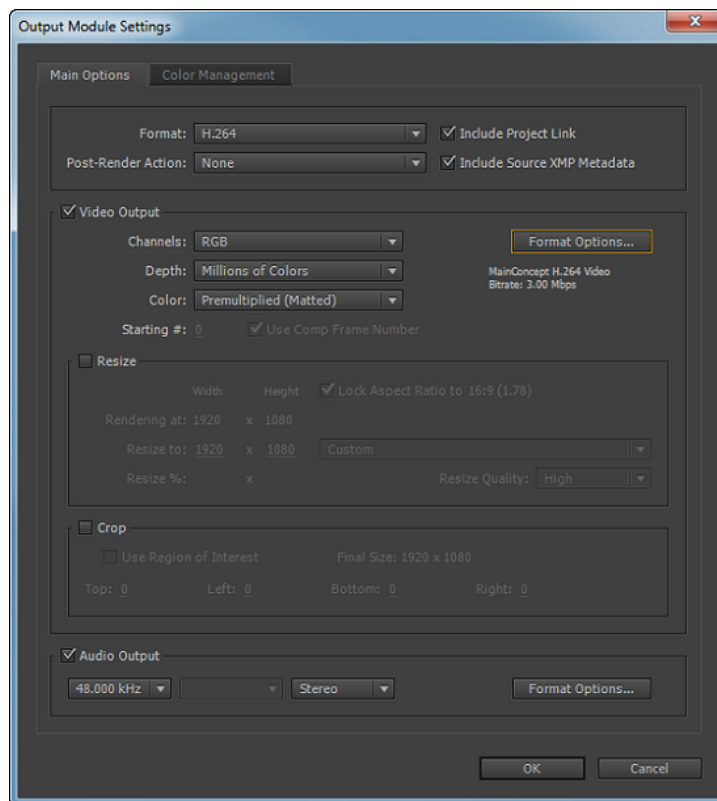
Example:



3. Click **OK**.
4. Select **File > Import > File**.

 **NOTE:** If you are adding an image sequence, in the **Open** dialog box, click the first file in the sequence, and select the **Enable Sequence** check box.
5. In the **Project** area, right-click the imported sequence, and select **Interpret Footage > Main**.
6. In the **Interpret Footage** dialog box, make sure the field for **Assume this frame rate** matches the target frame rate.
7. Drag your new composition to the **Render Queue** area.
8. From the **Output Module** drop-down menu, select **H.264**.
9. Click **H.264** to open the **Output Module Settings** dialog box, and then configure the following settings:
 - a. Select the check box for **Include Source XMP Metadata**.
 - b. If you do not want to export audio with your file, clear the check box for **Audio Output**.

Example:

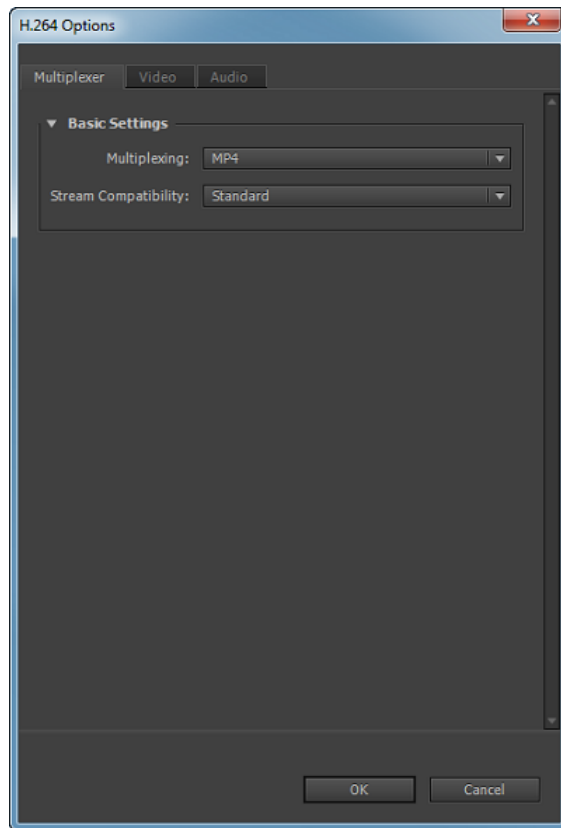


10. In the **Video Output** area, click **Format Options** to open the **H.264 Options** dialog box.

11. From the **Multiplexer** tab, configure the following settings:

- a. From the **Multiplexing** drop-down menu, select **MP4** (default).
- b. From the **Stream Compatibility** drop-down menu, select **Standard** (default).

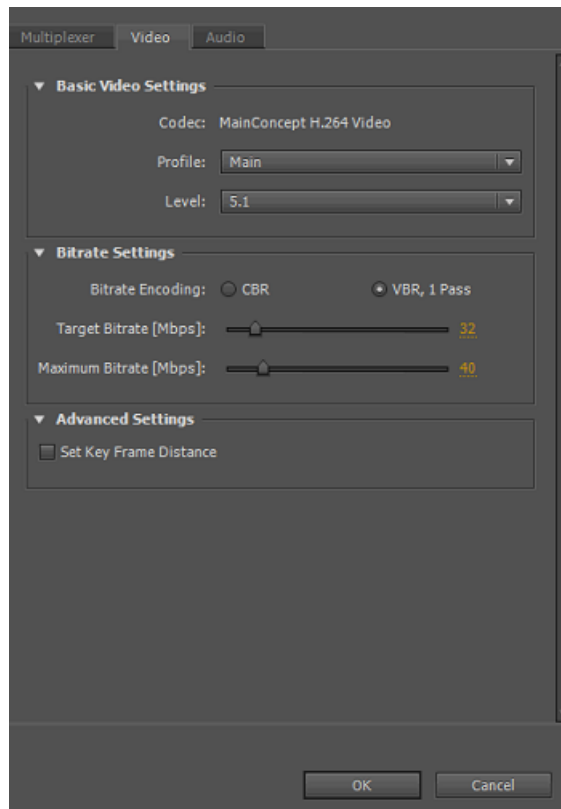
Example:



12. From the **Video** tab, configure the following settings:

- a. In the **Bitrate Settings** area, for **Bitrate Encoding**, select **VBR, 1 Pass**.
- b. For **Target Bitrate [Mbps]**, select **32**.
- c. For **Maximum Bitrate [Mbps]**, select **40**.

Example:



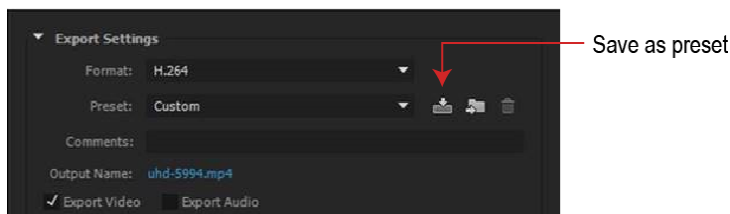
13. If you want to include audio with your file, do the following:
 - a. From the drop-down menu, select **48.000 KHz** (for best performance).
 - b. Click **Format Options**.
 - c. In the **Basic Audio Settings** area, from the **Codec** drop-down menu, select AAC (default).
 - d. From the **Audio Quality** drop-down menu, select **High** (default).
 - e. In the **Advanced Settings** area, for **Precedence**, select **Frequency**.
14. Click **OK** to close the **H.264 Options** dialog box.
15. Click **OK** to close the **Output Module Settings** dialog box.
16. Select the **Render Queue** tab, and double-click the **Output To** field and name the file.
If the **Render Queue** tab is not available, click **Window > Render Queue**. The **Render Queue** tab will appear at the bottom of the screen.
17. Select the **Render** check box for your composition, and click **Render**.
18. When the encode is complete, copy the **.mp4** file to your graphics directory on the video server.

The **.mp4** file can now be played on your Spectrum playout device.

Creating a UHD MPEG-4 file in After Effects CC and Media Encoder CC

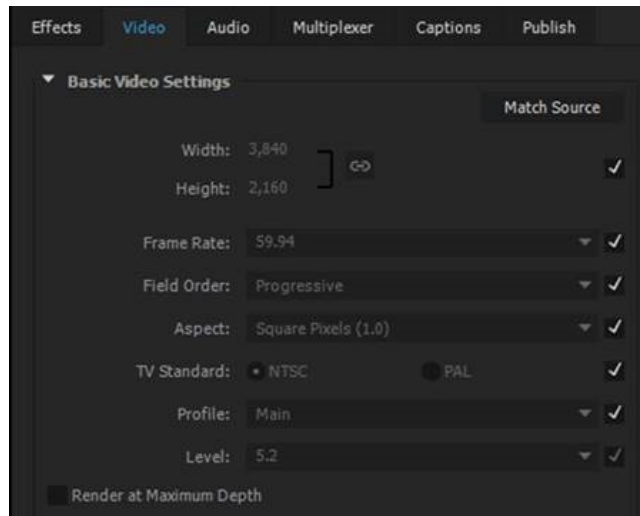
If you wish to create a 3840 x 2160 MPEG-4 file at 50 or 59.94 Hz, you must first create the composition in After Effects CC and then render the MPEG-4 in Media Encoder CC.

1. In After Effects CC, create a new composition as follows:
 - a. Select **Composition > New Composition**.
 - b. Select the appropriate resolution, frame rate, and duration.
 - c. Click **OK**.
 - d. Select **File > Import > File**.
 NOTE: If you are adding an image sequence, in the **Open** dialog box, click the first file in the sequence, and ensure that **Targa Sequence** or **PNG Sequence** is selected.
 - e. In the **Project** area, right-click the imported sequence, and select **Interpret Footage > Main**.
 - f. In the **Interpret Footage** dialog box, make sure the field for **Assume this frame rate** matches the target frame rate.
2. When you are ready to render the .mp4, click **Composition > Add to Adobe Media Encoder Queue**.
Media Encoder CC launches with the composition loaded in the **Render Queue** panel.
3. From the **Format** drop-down menu, select **H.264**.
4. Click **H.264** to open the **Export Settings** dialog, and then configure the following settings:
 TIP: You can save the following configuration as a preset. Click the **Save as preset** icon to the right of the **Preset** field, enter a unique name for the preset and then click **Save**.
 - a. Select the check box for **Export Video**.
 - b. If you do not want to export audio with your file, clear the check box for **Export Audio**.

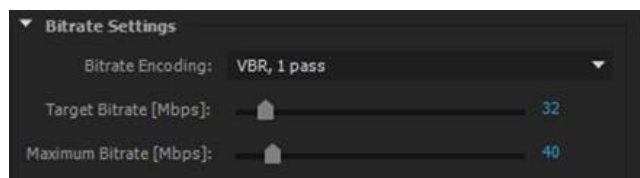


- c. On the **Effects** tab, add or remove all necessary effects.
- d. On the **Multiplexer** tab, configure the following settings:
 - From the **Multiplexer** drop-down menu, select **MP4**.
 - For **Stream Compatibility**, select **Standard**.
- e. On the **Video** tab, configure the following settings:

- Under **Basic Video Settings**, click **Match Source** if you wish to match the composition settings in After Effects CC; or, override the default settings as necessary (the default settings are sufficient).
- Ensure that the check box for **Render at Maximum Depth** is cleared.



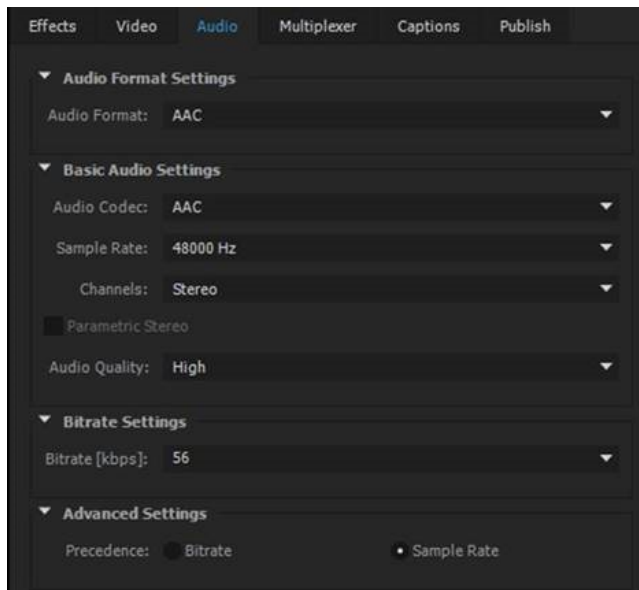
- From the **Bitrate Encoding** drop-down menu, select **VBR, 1 pass**.
- Set the **Target Bitrate [Mbps]** to 32.
- Set the **Maximum Bitrate [Mbps]** to 40.



- Under **Advanced Settings**, ensure that the check box for **Key Frame Distance** is cleared.

5. If you want to include Audio with your file, click the **Audio** tab, and then configure the following settings:

- From the **Audio Format** drop-down menu, select **AAC** (default).
- From the **Audio Codec** drop-down menu, select **AAC**.
- From the **Sample Rate** drop-down menu, select **48 kHz** (for best performance).
- From the **Channels** drop-down menu, select **Stereo** (default).
- From the **Audio Quality** drop-down menu, select **High** (default).
- From the **Bitrate** drop-down menu, select **56** (default).
- For **Precendence**, select **Sample Rate** (default).



6. Click **OK**.
7. In the **Queue** area, click **Start Queue**.
You can view the encode process from the **Encoding** area.
8. When the encode is complete, copy the MPEG-4 file to your graphics directory on the video server.

Chapter 10

Creating bundled files

Your Spectrum playout device supports playout of files that have been bundled in a `.zip` file. You may use any `.zip` file tool and any combination of the supported file types.

When your `.zip` file is ready, simply copy it to your configured graphics directory on your Spectrum video server.

- [Important notes about bundled files](#)
- [Supported file types](#)
- [Creating a `.zip` file playlist](#)

Important notes about bundled files

Read these important notes before creating a bundled file for your Spectrum playout device.

- Your Spectrum playout device will play only the FIRST THREE files in the `.zip` file, so Harmonic recommends building `.zip` files with only files you want to play.
- If there is no playlist specifying the order of playout, the order of playout cannot be guaranteed due to variations of bundling methods among ZIP creation tools.
- If you choose to have each `.flv` in a different folder in the `.zip` file, be sure to include only one playlist at the top of the directory. Also, Harmonic strongly recommends that you give each file a unique name to avoid potential file name conflicts.
- The amount of memory used by a single pre-loaded file is computed from the size of the file as it exists in the graphics directory. For `.zip` files, this value is based on the size of the `.zip` file, not the size of the extracted files. In other words, when the files are unbundled, there may not be enough memory to play the files correctly.
- For 720p outputs, make sure any video files bundled in the `.zip` file have an even number of frames.

Example `.zip` file

See an example `.zip` file that was created to contain `.flv` files for a three-point animation and a playlist.

`/fs0/gfx.dir/ThreePoint.zip/` contains the following files:

- `playlist.txt`
- `intro.flv`
- `loop.flv`
- `outro.flv`

Supported file types

Review which file types may be bundled in a `.zip` file.

- `.flv`
- `.mp4`
- `.jpeg` (or `.jpg`)
- `.bmp`
- `.tga`
- `.png`
- `.tiff` (or `.tif`)



NOTE: For image files, playout is dependent on the primary video frame rate. If no play count is specified in a playlist, the image will play out at the default value—which is one full frame time.

Creating a `.zip` file playlist

You can include a playlist in a `.zip` file to specify the order in which the bundled files will be played. Playlists for `.zip` files must use the `.txt` file format.



IMPORTANT: Playlists for bundled files must have the following file name: `playlist.txt`. Do not use any other characters or naming conventions. Also, include only one playlist file in a `.zip` file.

- Create a playlist that meets the following criteria:
 - There should be only one line of text per file to be played.
 - Each line of text contains the file name, and, if necessary, a play count descriptor (`playcount (n)`) or an end mode descriptor, such as `(end (still))` or `(end (disappear))`.
 - Add a space and then two dashes between the file name and the descriptor; add a space between the descriptor and the value.
 - If needed, you can comment the playlist using `#`.



NOTE: The ZIP renderer ignores case when matching file names.

The following is an example playlist for a `.zip` file containing three-point animation files:

```
#this is an example playlist

intro.flv

loop.flv --playcount 5

outro.flv --end disappear
```

Chapter 11

Troubleshooting tips

Find troubleshooting tips for problems you may encounter when playing graphic templates.

- *Encountering problems when loading graphic templates*
- *Template not visible or appears to be cropped*
- *Template animation running too fast or too slow*
- *Template animation is too slow or stutters (fps matches)*

Encountering problems when loading graphic templates

Find possible causes and troubleshooting tips for a `.swf` file that does not play when loaded.

The following could be causing the `.swf` file to not play:

- The `.swf` file cannot be parsed.
- The `.swf` file is not a valid Harmonic template.

To troubleshoot this problem:

- Verify that the `.swf` file was created correctly and contains the proper ActionScript code.
- If you are using a sample Harmonic Template, please try the following:
 - a. Be sure you save the sample Harmonic `.fla` file to the `project` folder in the Template Authoring Package before publishing the `.fla` file as a `.swf` file. The project folder contains ActionScript files written by Harmonic that allow your Flash project to be played on your Spectrum playout device.
 - b. If your published `.swf` file (which began as a sample Harmonic `.fla` file) cannot be played, validate that the `.swf` file was created correctly, and/or republish the `.swf` file.
- If you created a custom template and the published `.swf` file cannot be played, validate that the ActionScript settings in Flash Professional were configured properly, and/or republish the `.swf` file.



IMPORTANT: Custom templates that you create from scratch cannot be linked to the Harmonic ActionScript code just by saving the `.fla` file to the `project` folder in the Template Authoring Package. Additional steps are required to link custom templates to the ActionScript code.

Template not visible or appears to be cropped

Find possible causes and troubleshooting tips for a template that is not visible, or appears to be cropped during preview.

Note the following possible causes:

- The template is loaded on a layer that is not visible.
- The resolution of the template does not match the resolution of the primary video.

Try the following:

- Using FXTool, validate that the layer is set to “Visible.” If the layer is not “Visible,” click the **Fade In** button.
Refer to the *Spectrum X and ChannelPort Tools User Guide* for instructions on using FXTool.
- If the layer is faded in and “Visible,” but the template is still not visible, the active template may be cropped (for example, a 1920x1080 template was loaded on a primary video resolution of 1280x720). Use Flash Professional, Media Encoder, or After Effects to validate that the resolution of the template matches the resolution of the primary video, and/or republish the template.

Template animation running too fast or too slow

Find possible causes and troubleshooting tips for animation that appears to run too fast or too slow during preview.

Note the following possible causes:

- Animation is too slow: The frames per second (fps) setting of your `.swf` file is higher than the fps setting of the primary video.
- Animation is too fast: The fps setting of your `.swf` file is lower than the fps setting of the primary video.

Try the following:

- Use Flash Professional to validate that the fps setting of the `.swf` file matches the fps setting of the primary video, and/or republish the `.swf` file.



NOTE: For `.flv` files that appear to run too slow, in Media Encoder, validate that the **Simple Profile** check box is selected from the **Video** tab in the **Export Settings** dialog box.

Template animation is too slow or stutters (fps matches)

If the template animation is too slow or stutters, and you've confirmed that the fps of the `.swf` file matches that of the primary video, find possible causes.

In some cases, a `.swf` file will appear to be slow or stutter if the file cannot accurately render a new frame of graphics on every video field. When the `.swf` file is running slow, the last rendered frame will be repeated until a new frame is produced, which may result in a stutter.

- Refer to "Performance considerations" in this guide for more information on creating graphic templates that perform frame accurately.

Additional information

[Performance considerations](#) on page 25

Appendix A

Harmonic Technical Assistance Center contact information

A list of phone numbers, e-mail addresses, and important links for the Harmonic Technical Assistance Center (TAC).

Table A-1: Technical Assistance Center phone numbers and email addresses

Region	Telephone Technical Support	Email
Americas	888.673.4896 (888.MPEG.TWO)408.490.6477	support@harmonicinc.com
Europe, the Middle East and Africa (EMEA)	+44.1252.555.450	emeasupport@harmonicinc.com
India	+91.120.498.3199	apacsupport@harmonicinc.com
Russia	+7.495.926.4608	rusupport@harmonicinc.com
China	+86.10.6569.5580	chinasupport@harmonicinc.com
Japan	+81.3.5565.6737	japansupport@harmonicinc.com
Asia Pacific (APAC) – Other Territories	+852.3184.0045 +65.6542.0050	apacsupport@harmonicinc.com

Report an issue online

<http://www.harmonicinc.com/webform/report-issue-online>

Harmonic support website

<http://www.harmonicinc.com/content/technical-support>

Software download location for Cable Edge products

<ftp://ftp.harmonicinc.com>

Contact Harmonic Technical Publications

techdocs@harmonicinc.com

- [Harmonic corporate contact information](#)
- [Useful information for Technical Support](#)

Harmonic corporate contact information

Phone numbers and addresses for the corporate office.

Harmonic corporate address

4300 North First Street
San Jose, CA 95134
U.S.A.

Harmonic corporate telephone numbers

Tel. 1.800.788.1330 (from the U.S. and Canada)
Tel. +1.408.542.2500 (outside the U.S. and Canada)
Fax. +1.408.542.2511

Useful information for Technical Support

In order to expedite diagnosis and remediation, please gather helpful information about your Spectrum system as well as your SystemManager platform before contacting Technical Support.

Information about your Spectrum system

In the event of a component or device failure, please gather the following information about your Spectrum system before contacting Technical Support.

Technical Support may request the following information:

- **What is the model and serial number of the hardware involved?**

For Spectrum devices: from the **Home** tab in SystemManager, click the **Upgrade Firmware** icon in the left-hand column to display the **Upgrade Firmware** page. All Spectrum video servers in your system are listed in the **Spectrum Servers** section. Find the model numbers and serial numbers listed in their respective columns.

Scroll down to the **I/O modules** section to view the model numbers and serial numbers for I/O modules.

- **What is the name of the Player that is being used?**

From the **Configuration** tab in SystemManager, click the **Player Configuration** link in the left-hand column, and then click the name of the Spectrum video server. The **Player List** page for that device appears. The names and status of all players are listed.

- **What file format and bit rate is the Player configured for? (for example, MPEG, DV, or IMX?)**

From the **Configuration** tab in SystemManager, click the **Player Configuration** link in the left-hand column, and then click the name of the Spectrum video server. The **Player List** page for that device appears. From the player list, click the **Properties** link to view all the details for a player.

- **If the problem is related to Ingest or Payout of a clip, what is the Clip ID involved?**

The clip name or clip ID should be indicated by whatever software application you are using to play or record video. For ClipTool, clip names are displayed in the clip management area of the ClipTool main window.

- **What brand of Automation, if any, is being used for control?**

- **Is the Automation using VDCP or API for communication control?**

Information about the SystemManager client PC

Please gather information about the SystemManager client PC as well as the SystemManager database file before contacting Technical Support.

Technical Support may request the following information:

- SystemManager version

You can find the version here: **Help > Server Software**.

- Windows operating system installed on the SystemManager client PC

The run command `winver` shows the Windows operating system running on the client PC.

- Amount of memory installed on the SystemManager platform

Open the **System Properties** dialog on the client PC to find the amount of memory installed.

- The SystemManager database file from the SystemManager platform or client PC

This file is located on the SystemManager platform at `D:\Omneon\Manager\omdb\manager.oda`. Or, if you are using a client PC with a single C: partition, it will be in the same directory on the C: drive.


Gathering drive failure information

In the event of a drive failure, before contacting Technical Support, please gather the requested information to assist in drive problem diagnosis and remediation.

1. Provide the following general details about the drive failure:


- Site Location
- Server Name
- Date of Failure
- Time of Failure
- Description of Failure

2. Collect the following information from the **Spectrum Server Properties** page in SystemManager:

 **TIP:** To view the **Spectrum Server Properties** page in SystemManager, from the **System Diagram** page of the **Configuration** tab, click the icon for your Spectrum video server. Then, from the **Physical Configuration** tab, click the icon for your Spectrum.

- Firmware Version
- Host Name
- Serial Number

3. Collect the following information from the **Drive Properties** page:

 **TIP:** To view **Drive Properties**, from the **Configuration** tab, click **Disk Utilities**, then click the icon for your Spectrum server. From the second **Disk Utilities** page, click the icon for the drive that has failed.

- Disk GUID
- Disk Serial Number
- Disk Size (GB)

4. From your SystemManager platform or client PC, use Windows Explorer to navigate to the following directory:

\\IPADDR\FSNAME\om(serial_number_of_director)\logs

- IPADDR = IP address or host name if using DNS
- FSNAME = file system name

5. Locate `Badblockhistory.txt` and the log file that coincides with the date/time of the failure.

`Badblockhistory.txt`

Note the naming of the log files: `syslog_(server_name)_NNNN_YYYY_MM_DD_hh_mm_ss.log`, where

- NNNN = serial number of unit
- YYYY = year of log start
- MM = month of log start
- DD = day of log start
- hh = hour of log start
- mm = minute of log start
- ss = second of log start

What to do next

Once you obtain a Return Authorization Number (RA) from Harmonic Technical Support, email a copy of the requested file(s) to Technical Support and quote the RA number in the email.

