HitFilm Pro

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FXHOME

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8. Licensing Details

1. Learning HitFilm

Thank you for using HitFilm. We are sure you are going to benefit from this unique combination of video editor and compositor. There are many resources available for learning how to use the software, including this written user guide, extensive video tutorials, sample projects, and a helpful community forum.

Both HitFilm Pro and HitFilm Express are covered in this manual.

Since this manual applies to both HitFilm Express and HitFilm Pro, all interface images in this manual will use the Dark Theme, which is available in both HitFilm Pro and HitFilm Express, rather than using the Express-only light theme. The layout of the interface and the icons are the same in both themes, only the colors are different.

HitFilm Pro

HitFilm Pro is our flagship product, and includes every feature and tool we have developed for HitFilm. Everything discussed in this manual applies to HitFilm Pro, and all features and tools discussed are immediately available in HitFilm Pro.

HitFilm Express

HitFilm Express is our free product. It includes all the features required for editing and basic compositing and effects creation, but lacks some of the more advanced features available in the Pro version.

The User Guide

This manual provides an overview of all of HitFilm's features. It is a convenient way to look up details about any specific tool or function of the software.

This user guide is for both **HitFilm Pro** and **HitFilm Express**. Some features will only be available in HitFilm Express if you purchase optional add-on packs which contain those features. Any features which require purchase of add-ons will be tagged with this label: **EXPRESS ADD-ON**

Video Tutorials

The HitFilm YouTube channel releases a new video every week. You'll find over 50 hours of video tutorials, all available for free. When possible, project files are included with the tutorials, so you can follow along. Check out the show over on our <u>YouTube channel</u>.

If you're completely new to HitFilm or filmmaking we highly recommend watching our The Basics video playlist. <u>Watch them now</u>.

The HitFilm.com Community

The HitFilm.com community is always ready to help out with tips and techniques. <u>Head over to the forum</u> to see what's going on and ask questions.

1.1. What's New

Each update to HitFilm brings a combination of performance improvements and new or upgraded tools. Since version 8, HitFilm Pro and HitFilm Express are on parity, so the updates apply to both versions. For a detailed overview of what has changed in each update, please see the Update History pages of our website:

HitFilm Pro Update History HitFilm Express Update History

1.2. Installation & Activation

The latest version of HitFilm can always be downloaded from HitFilm.com. If you're trying the demo, <u>you can</u> <u>find it here</u>. If you've already purchased, you can <u>download it from your account</u>.

System Requirements

In order for HitFilm to run properly, it is necessary that it be installed on a system which meets or exceeds the following requirements.

- **Operating System:** 64-bit version of Windows 8 or Windows 10; MacOS 10.12 Sierra, MacOS 10.13 High Sierra or MacOS 10.14 Mojave
- Storage: 1.2 GB free hard disk space for installation
- Processor: 4th Generation Intel® Core™ Processors or AMD equivalent
- RAM: 4 GB (8 GB or more recommended)
- Graphics Processor: Graphics processor with at least 1 GB video memory.
 2GB or more video memory recommended for 4K UHD.
 Earliest graphics cards HitFilm supports:
 - NVIDIA: GeForce 600 (Kepler) Series (2012)
 - AMD: Radeon R5 240 (2013)
 - Intel: HD Graphics 5000 (GT3) (2013)
- Graphics Card Drivers: It is very important to have up-to-date drivers for your graphics card when using HitFilm.

For Mac users, the drivers are built into the OS and do not need to be updated separately. For Windows users, it is recommended that you regularly check the website of your graphics card manufacturer (NVIDIA, AMD or Intel) for their latest drivers each month. The update built into Windows does not always report all updates, so it is recommended that you visit the manufacturer's site rather than rely on the Windows update for your drivers.

• **Internet:** Internet connection required for online activation and web services. Offline activation is possible as well, but web services will be absent from the software.

Demo Mode

After installation, HitFilm will start in demo mode. You can activate the demo software using a serial code at any time to remove all demo restrictions. While the software is in demo mode, the following restrictions will be in effect:

- Watermarked Exports: All exports created with the demo will be watermarked.
- No OFX Plugin Support: Third party plugins are not supported in the demo, so tools such as Boris 3D Objects and Mocha HitFilm are not available until HitFilm is activated. If you wish to evaluate these products, you can download demos of third party products from their manufacturers.

Activating

If you have purchased HitFilm Pro you can activate it immediately to use all of its features. For HitFilm Express, anyone can register for a free serial code to activate the software.

When you start the software, choose Activate from the welcome screen.

Follow the on-screen instructions to activate your software. Your serial code will be registered to your account at http://fxhome.com/account, so if it's the first time you have activated the software, you can find the serial code there.

You can also activate by going to File > Options and then selecting the Activation tab.

Installing on Another Computer

HitFilm Express and add-ons can be activated on a single computer at a time. The HitFilm Pro license allows up to 3 concurrent activations. For both versions, you can manage your activations in your <u>online</u> <u>account</u>.

If you exceed your number of activations your earliest activation will be deactivated and return to demo mode.

You can transfer to a new machine and reinstall as many times as you want, so there's no need to worry about losing your purchased software. it is permanently stored in your online account, so you can access it any time, from any location, as often and as many times as you need to.

2. HitFilm Express Add-On Packs

Both HitFilm Pro and HitFilm Express are covered in this manual.

Since this manual applies to both HitFilm Express and HitFilm Pro, all interface images in this manual will use the Dark Theme, which is available in both HitFilm Pro and HitFilm Express, rather than using the Express-only light theme. The layout of the interface and the icons are the same in both themes, only the colors are different.

HitFilm Pro

HitFilm Pro is our flagship product, and includes every feature and tool we have developed for HitFilm. Everything discussed in this manual applies to HitFilm Pro, and all features and tools discussed are immediately available in HitFilm Pro.

HitFilm Express

HitFilm Express is our free product. It includes all the features required for editing and basic compositing and effects creation, but lacks some of the more advanced features available in the Pro version.

Light Theme and Dark Theme

HitFilm Express uses a light interface by default. The Dark Theme is available as a purchase add-on, in the Starter bundle on this page: https://fxhome.com/hitfilm-express/pwyw

Add-on Packs EXPRESS ADD-ON

For users who don't require everything included in the Pro version, but who would benefit from adding just a few of those features to their Express software, we offer a wide range of HitFilm Express Add-on packs for purchase. All effects included in Add-On Packs can be tested in the free software.

Throughout this manual, the green Express Add-On icon seen above will identify all features which can be activated in HitFilm Express by purchasing an Add-On pack.

The available add-on packs are as follows:

360° Video

360°: Toolkit Pack	360°: Neon Lights Pack	360°: VFX Pack
360° Blur	360° Animated Lasers	360° Bulge
360° Channel Blur	360° Lightsword (2-Point Auto)	360° Fractal Noise
360° Fisheye Converter	360° Lightsword (4-Point Manual)	360° Glow
360° Unsharpen	360° Lightsword (Glow Only)	360° Glow Darks
360° Text	360° Neon Path	360° Magnify
360° View Panel	360° View Panel	360° Twirl
		360° View Panel

3D

3D: Gunfire Pack	3D: Generate Pack	3D: Model Render Pack	3D: Particles Pack
Gunfire (3D)	Extrude	3D Model Import	Particle Simulator (3D)
	Bend	HDR Import	
	Bevel	Wireframe	
	Rotate	16-Bit Color Support	

3rd Party Tools

Boris 3D Objects Pack	Mocha HitFilm Pack*
Boris 3D Objects	Mocha HitFilm

Color

Color: Starter Pack	Color: Cine Pack	Color: Correction Pack	Color: Looks Pack	Color: LUT Pack	Color: Scopes Pack
Exposure	Cine Style	YUV Color Correction	Bleach Bypass	LUT	Histogram
Vibrance	Classic Cine Style	YUV Color Transform	Duo Tone	Grading Transfer	Parade
Shadows & Highlights		Color Correction Wheels	Leave Color		Vectorscope
Custom Gray		16-Bit Color Support	Channel Time Shift		Waveform

Color Phase		Color Vibrance	Scopes Panel
Channel Mixer		Channel Blur	16-Bit Color Support
16-Bit Color Support			

Compositing

Composite: Toolkit Pack	Composite: Pro Keying Pack
Wire Removal	Chroma Key
Projector	
Clone	
Channel Swapper	

Editing

Edit: Starter Pack	Edit: Beautify Pack	Edit: Repair Pack
Text	Bilateral Blur	Denoise
Split Screen Masking	Pro Skin Retouch	Grain Removal
PiP		Rolling Shutter
Vertical Video		
Action Cam Crop		

General

Behaviors: Starter Pack	Motion: Audio Visual Pack	Motion: Puppet Pack	Audio: Toolkit Pack
Attract To	Atomic Particles	Puppet	Doppler Shift
Drag	Audio Spectrum		Noise Reduction
Follow	Audio Waveform		Equalizer
Mix Parent Position			Compressor
Repel From			
Rotate By Layer			

Visual Effects

VFX: Starter Pack	VFX: Damage Pack	VFX: Distortion Pack	VFX: Lighting Pack
Shatter	Film Damage	Energy Distortion	Anamorphic Lens Flares
3D Extrusion	Film Grain	Fluid Distortion	Gleam
Fire	TV Damage	Smoke Distortion	Flicker
Blood Spray		Lens Distortion	Auto Volumetrics
Animated Lasers			
VFX: Lighting 2 Pack	VFX: Neon Lights Pack	VFX: Retro Pack	VFX: Retro Pack 2
Light Leak	Lightsword Ultra (2-Point Auto)	Pulp Sci-Fi Title Crawl	Dot Matrix
Light Rays	Lightsword Ultra (4-Point Manual)	Hyperdrive	Pixel Sort
Light Streaks	Lightsword Ultra (Glow Only)	Scan Lines	Lens Dirt
Light Leak Transitions	Neon Path	Half Tone Color	Block Displacement

3. A Note for Mac Users

This manual uses screenshots and terminology from the Windows version. Mac users should be aware of some minor interface and functionality differences, as outlined below.

File, Preferences & Workspace Menus

In addition to the File and Workspace menus that are part of the HitFilm interface, the File and Workspace menus can be found in the standard Mac menu bar at the top of the screen.

Import Formats

Core supported import formats include:

- Apple ProRes 4444, 422
- H.264, H.263
- MPEG-4, MPEG-2, MPEG-1
- Photo-JPEG
- DV, DVCPRO, DVCPRO HD
- PNG encoded MOV, 32-bit and 24-bit

Note that the Windows .AVI format is not supported in the Mac version.

Export Formats

Additional supported export formats include:

 Quicktime .MOV: AVC/H.264, Apple Pro Res 422, Apple Pro Res 4444 (24-bit & 32-bit) & Photo-JPEG.
 Note that the Windows .AVI format is not supported in the Mac version.

Keyboard Shortcuts

All keyboard shortcuts use the standard Apple CMD key instead of the Windows Ctrl key.

3D Model Import Library

The Mac version may detect additional groups when importing 3D models.

4. The HitFilm Workflow

The HitFilm product line provides you with several workflow options so that you can integrate HitFilm technology into your projects.

HitFilm

The core HitFilm software is standalone and requires no additional software. It includes an editor, a powerful compositor with a unified 3D workspace and over 500 effects. Switching between the editor and your visual effects shots is as easy as changing tabs in your web browser. Two variants are available: HitFilm Express, which is free, and HitFilm Pro.

Academy Award-winning planar tracking is provided by Mocha HitFilm, a special version of Mocha from Boris FX. 3D Objects from Boris FX is also included, for advanced 3D titles.

You can import 3D objects into HitFilm Pro and create sophisticated particle effects without requiring additional 3rd party plugins. This functionality is also available in HitFilm Express, through the purchase of the 3D: Model Render add-on pack.

OpenFX

HitFilm Pro is OpenFX compliant. This means you can add additional functionality to the software from other plugin developers such as GenArts, NewBlue FX, Red Giant and RE:Vision. OpenFX is a Pro Exclusive feature, and is not available in HitFilm Express.

Compatible OpenFX plugins that are installed on your system will appear in the Effects panel alongside the standard HitFilm effects library.

Find out more about HitFilm Pro's OpenFX compliancy here.

Ignite

The Ignite collections of plugins make many of HitFilm's effects available in your other video software, including Premiere Pro, After Effects, Final Cut Pro X, Motion, Vegas Pro, Catalyst Edit, DaVinci Resolve, NUKE, EDIUS, and Avid Media Composer.

The Ignite Pro plugins mirror many of the effects inside HitFilm Pro itself. This means you can choose

whether to work with HitFilm technology inside HitFilm Pro or your established editor.

Find out more about Ignite Pro here.

Ignite Express, a smaller collection of the same plugins, is available for free, and works within the same host programs as Ignite Pro. Learn more about <u>Ignite Express here.</u>

Vegas Integration

HitFilm Pro includes direct integration with the latest version of Vegas Pro. If you are editing in Vegas, you can send a video clip to HitFilm for further compositing or effects work, then move back to Vegas without rendering. The HitFilm project is placed on the Vegas timeline, where it can be edited like other media objects. This integration ensures optimum quality by eliminating the need to render the scene repeatedly, which could introduce generational quality loss.

4.1. Getting Started

HitFilm is designed to be easy to learn and use while providing a lot of power. If you have any experience with other video products you will find the interface familiar and easy to pick up, but even if you are complete beginner you will be up and running in no time.

Basic Workflow

In its most basic form, the workflow is as follows:

- Open a project: Create a New project or Open an existing project from the Home screen or File menu.
- **Import media:** Import the video, audio, still images or other media that you wish to edit, using the Import button in the Media panel.
- Edit media to timeline: Select portions of your media to add to the timeline, and sequence the files on the timeline to create your desired result.
- Export: Export the contents of your timeline to create a new video file.

The Screens of the HitFilm Interface

HitFilm uses two separate screens, each providing a specific set of features. You can switch between these different screens at any time while working on a project using the Window menu, or the corresponding keyboard shortcuts for each screen.

Home Screen



The **HOME** screen (**CTRL+1** or **CMND+1** on Mac) is the first screen you will see when you launch HitFilm. It provides quick access to your saved projects and highlights new tutorials, articles and community activity. You can also access this user guide via the Home screen.

• To start a new project, click the **New** button on the Home screen. <u>Find out more about creating</u> <u>projects here</u>.

Edit Screen



Your work in HitFilm takes place on the **EDIT** screen (**CTRL+2** or **CMND+2** on Mac). This is where you'll find the editor and compositor timelines, the Viewer and the effects library. It is where you import your media assets, combine them to create your project, and export your completed project into a new video file, which you can view outside of HitFilm.

4.2. Options

HitFilm's setup can be changed from the Options window, which can be found in the File menu. The options windows contains multiple tabs. Each tab contains controls and options for a specific aspect of the software.

Full details of each tab are available on the following pages.

- <u>General</u>
- <u>Display</u>
- <u>Render</u>
- Quality Profiles
- Prompts & Warnings
- Labels
- <u>Cache</u>
- Pre-Render
- Auto Save
- Shortcuts
- Export
- <u>Activation</u>

4.2.1. General Options

General

This tab contains options that pertain to general usage of the software.

Options			×
Options General Display Render Quality Profiles Prompts & Warnings Labels Cache Pre-Render Auto Save Shortcuts Export Activation	Maximum Undo*: Default Template: Plane/Image/Text Default Duration: Composite Shot Default Duration: Timeline Default Duration: Audio Waveforms: Include scrue Use relative Close all me Play audio v Use logariti Show help i Hide full scrue	30 levels 1080p Full HD @ 29.97 fps 300 frames 00:00:30:00 00:05:00:00 RMS Amplitude een layout when saving projects e paths in saved projects edia files when application is not active when scrubbing timeline mic waveform scaling inks reen preview when application is not active since a preview when application is not active	× · · · · · · · · · · · · · · · · · · ·
	Changes to settings marked with	a 🍟 will take effect when you next start the application.	
Cancel Restore	e 'General' Defaults		ок

- Maximum Undo: HitFilm tracks all of your actions, so that you can undo mistakes or go back if you change your mind. This frees you to experiment without worry, since you can revert to earlier settings at any time. Maximum Undo defines the total number of history states that will be logged by HitFilm. Logging more actions will require more memory. Find out more about using your action history.
- **Default Template:** Choose the template which will be selected by default when new timeline is created.
- **Plane/Image Default Duration:** Unlike videos, planes and images do not have a specific duration. This setting determines their initial duration when you add them to a timeline.
- **Composite Shot Default Duration:** When creating a new composite shot this is used as the default duration, unless the composite shot is based on existing media.
- Timeline Default Duration: When starting a new project, this is used as the default duration for the

editor timeline.

- Audio Waveforms: The editor timeline displays a waveform for audio clips. For additional information on waveforms, see <u>Working With Audio</u>.
 - Channel List: Displays individual waveforms for each channel in the audio stream and is a common representation of audio. So you'll see one waveform for mono audio, 2 waveforms for stereo, and 6 waveforms for 5.1 surround sound. It can be useful in order to see where a particular channel has silence, for example.
 - Channel Composite: This simply draws all waveforms from the audio stream over the top of each other. So you only ever see one waveform even if the source has stereo or 5.1. This view isn't particularly useful for detailed work but can be helpful if there is limited screen space and you still want to see a waveform plotted.
 - RMS Amplitude: Similar to Channel Composite, this displays a single graph of all channels in the audio stream, but instead of plotting a waveform it shows the average levels of the audio signal over time. Viewing an average of audio levels in this way is a better method to determine its volume than inspecting a waveform because it is a better approximation of how our ears and brains perceive loudness.

Note that RMS amplitude is still only a loose correlation or rough guide. There are many factors which affect human perception of loudness which are not included in an RMS graph, such as the frequency of sounds. (Our ears are more or less sensitive to different frequencies, meaning that the same power does not always result in the same perceived loudness.)

- Include Screen Layout When Saving Projects: When activated, your interface layout is stored in the project file. The layout in a project file will override the default workspace layout.
- Use Relative Paths in Saved Projects: Projects can include absolute or relative references to media file paths. When using relative paths, media is located relative to the project file itself. As long as the folder structure relative to the project file is maintained this makes it easy to transfer to a different computer or to use cloud storage.
- Close All Media Files When Application is Not Active: Some of HitFilm's media libraries are able to 'lock' media files, preventing any changes to the source files while you are working in HitFilm. This option forces all media to be closed and unlocked when you switch to a different application, so that you can make external changes to your media. When you switch back to HitFilm after making external changes, your media will be updated to reflect the changes. Note that this may impact performance when switching back to HitFilm.
- **Play Audio When Scrubbing Timeline:** HitFilm can play audio as you manually move the playhead around your timeline.
- Use Logarithmic Waveform Scaling: Logarithmic waveforms more accurately depict the logarithmic

nature of the db scale, and often make waveforms easier to read.

- **Show Help Links:** Question mark icons in the corner of panels provide quick access to relevant pages in the user guide. These can be turned off to save space if you wish.
- **Hide Full Screen Preview When Application is not Active:** The full screen preview allows you to view HitFilm's video output full screen on a second display. Enabling this option means that when HitFilm is not the active application, the second display will cease showing the video output, and return to the desktop.

4.2.2. Interface Options

Interface

The Interface options control various aspects of the HitFilm interface.

- Enable High DPI scaling (set display scaling to 125% or greater): Allows the interface components to be scaled when using a High DPI display.
- Show Quick Actions in Menubar: Shows or hides the Open, Save, and Undo/Redo icons in the menubar.
- **Hide full screen preview when application is not active:** When running the software with a full screen preview on a secondary display, enabling this option hides the full screen preview when VEGAS Effects is not active, so the secondary display can be used for other purposes.
- Use the native color picker: Disables the VEGAS Effects color picker, and uses the default color picker for the operating system.

4.2.3. Display Options

Display

The Display options control how your project is displayed within the VEGAS Effects interface. The options here are defaults which will be used when creating new projects. All settings can be changed at any time within any project, as your workflow requires.

Options		×
General Display Render	The options listed here are defaults and will be used when creating new projects. Media Panel	
Render Men Quality Profiles Dis Prompts & Warnings Dis Labels A Cache A Pre-Render A Auto Save Shortcuts Export Activation	Display Mode: Preview Mode Arrange By: Name Group By: Media Editor Sequence Video Track Size: Large Audio Track Size: Large Preview Mode: Full	• • •
	Viewer Show checkerboard background for 2D Views Show checkerboard background for 3D Views Show checkerboard background for 3D Views Show floor plane (3D Views only) Show mouse coordinates Show controls during playback Show effect controls Show motion path Motion Path:	:
Cancel Restore 'D	Display' Defaults	ок
duricer Restore D	Jopin Denaits	ON

Media Panel

• Display Mode: When media is imported into your project, you can control how it is displayed in the

Media panel.

- **Preview Mode** shows a thumbnail of each item, with the details printed beside it.
- **List Mode** lists them by name, without a preview image, so you can fit more items into the available space.
- Arrange By: Media can be arranged alphabetically by Name, or grouped together by Type.
- Group By: Your imported assets can grouped by Media, or by Folder.

Editor Sequence

- Video Track Size: Larger track sizes allow for larger thumbnails, so you can more easily see the contents of objects on the timeline. Smaller track sizes allow more tracks to be visible on the timeline at once.
- Audio Track Size: Larger track sizes allow for larger thumbnails, so you can more easily see the contents of objects on the timeline. Smaller track sizes allow more tracks to be visible on the timeline at once.
- Preview Mode: Controls how the contents of video objects are displayed on the timeline.
 - **None:** displays no thumbnail images, and offers the fastest performance.
 - Start/End: shows thumbnails only at the first frame and last frame of the clip. This gives you some visual reference of the contents of the clip, with minimal processing to keep performance optimal.
 - Full: displays thumbnails throughout the runtime of the video clip. This is the easiest option for clearly seeing what clips you are working on, but can negatively impact performance on some slower systems.

Viewer

- Show Checkerboard Background for 2D Views: By default, a checkerboard pattern is displayed to indicate areas of transparency within the Viewer in 2D composites. You can disable it here if you prefer.
- Show Checkerboard Background for 3D Views: By default, 3D timelines use a black background to indicate areas of transparency within the Viewer. You can enable the checkerboard view here, if you prefer.
- Show Floor Plane (3D Views Only): The floor plane can be useful for visualizing the spacial relationships between objects in 3D space. but if you prefer to disable it, to more clearly see your objects in the viewer, you can disable the floor plane here.
- Show Mouse Coordinates: When enabled, the exact X and Y coordinates of the cursor position within the viewer will be displayed in the bottom right corner of the Viewer.
- Show Controls During Playback: Normally, the controls on the viewer are hidden during playback, so the contents of your project can be viewed without distraction. Enable this option if you want the controls to remain visible.
- Show Effect Controls: Many effects in HitFilm feature controls on the viewer that allow you to visually adjust the effect settings. if you find them distracting, or want to hide them for any other reason, you can do so here.
- Show Motion Path: The motion path provides a visual representation of the movement of a layer across multiple keyframes.
- **Motion Path:** You can set the number of keyframes which are displayed in the motion path here. More keyframes gives you a wider view of how the layer is moving, but may impact performance.

4.2.4. Render Options

Render

The Render options control the default render settings used by HitFilm when new projects are created. The settings used by any individual project can still be edited at any time at **File > Project Settings**.

Options			×
General Display Render Quality Profiles Prompts & Warnings Labels Cache Pre-Render Auto Save Shortcuts Export Activation	Default Color Bit Depth: Default Antialiasing Mode: Default Reflection Map Size: Default Shadow Map Size: Maximum 3D Model Map Size:	8-bit Integer 4x MSAA 512 pixels 2048 pixels 4096 pixels Limit video decoding to 8-bit regardless of project render sets	▼ ↓ ↓ ↓ tings
Cancel Restore	e 'Render' Defaults		ок

- **Default Color Bit Depth:** Higher bit depth creates higher fidelity images but will increase rendering times, especially on less powerful hardware.
- **Default Antialiasing Mode:** Antialiasing is used to create perceptibly higher quality edge detail. HitFilm supports multiple antialiasing types depending on the capabilities of your hardware. Higher numbers can give higher quality results, and may increase processing times.
- **Default Reflection Map Size:** The quality of 3D model reflections can be controlled using the resolution of the reflection maps. Larger reflection maps will create higher quality reflections at the cost of performance. The default setting of 512 pixels looks good in most circumstances other than close-ups.
- **Default Shadow Map Size:** The quality of shadows can be controlled using the resolution of the shadow maps. Larger shadow maps will create smoother edges on shadows, at the cost of performance.
- **Default Maximum 3D Model Map Size:** The quality of 3D model textures is dependent on the resolution of the texture maps. Larger texture maps will create higher quality reflections, but will also impact performance. Some hardware may not be capable of handling very high resolution maps.
- · Limit Video Decoding to 8-bit regardless of Project render settings: Processing 10-bit or 12-bit

files at their native color depth offers improved visual quality, but may slow performance.

Color Bit Depth

HitFilm can operate in 8-bit integer, 16-bit or 32-bit float modes, or 16-bit or 32-bit linear modes.

- **8-Bit Integer** is limited to 8 bits per channel, restricting colors between 0-255 values. 8-bit integer will render more quickly than 16-bit float.
- **16-Bit Float** allows for increased dynamic range, retaining detail in highlights and shadows. 16-bit float will take longer to calculate and render, but produces higher quality results. **EXPRESS ADD-ON**
- 16-Bit Float Linear Color While standard gamma color is adjusted to better correspond to human perception, Linear Color can make it easier to predict the results when blending colors and tones.
 EXPRESS ADD-ON
- **32-Bit Float** allows for very high dynamic range, retaining maximum detail in highlights and shadows. This is particularly useful during grading or when designing visually extreme effects. 32-bit float will take longer to calculate and render, but produces the highest quality results. 32-bit Float is only available in HitFilm Pro.
- **32-Bit Float Linear Color** While standard gamma color is adjusted to better correspond to human perception, Linear Color can make it easier to predict the results when blending colors and tones.

You can change the color bit depth at any point in a project. One option is to carry out most of your work using the 8-bit integer mode, so you can work more quickly, then switch to a higher bit depth for the final render. 32-bit Float – Linear Color is only available in HitFilm Pro.

Antialiasing Mode:

Antialiasing is used to reduce 'aliasing' on diagonal lines during rendering. Antialiasing is always used during the final export and can be turned on and off while working inside HitFilm.

HitFilm Pro supports multiple antialiasing methods. The number and types of available methods will depend on your computer's video card. The further down the list of available options the bigger the performance impact and the finer the rendering quality.

<u>More information on CSAA</u> (external resource). <u>More information on MSAA</u> (external resource).

Reflection Map size:

The quality of 3D model reflections can be controlled using the reflection map. Larger reflection maps will create higher quality reflections at the cost of performance.

Note the difference in the images below. The first image has a reflection map resolution of just 256, which is too low for anything other than long distance shots:



Compare it to this version, which uses a reflection map resolution of 1024:



The reflection in the second image is much more defined. The default setting of 512 works well for most projects, but you may want to increase the reflection map size for close-ups or projects where visual fidelity is the priority. You can set the Reflection Map size to any value up to 4096 pixels.

Shadow Map Size:

This performs a similar function to the reflection map size, but for rendered 3D shadows. The default shadow resolution of 2048 pixels is suitable for many projects but can be adjusted to suit your specific needs. A lower resolution, such as 512, will create lower quality shadows with more visible edges. However, performance will be improved so for long distance shots this may be a good trade-off. Conversely, increasing the shadow map to 4096 pixels will create a higher quality shadow at the expense of

performance. You can change the shadow map at any point during a project, so one approach is to use a small shadow map while working on your project, then increase it to the required resolution prior to final export.

Maximum 3D Model Map size EXPRESS ADD-ON

3D models usually include texture files. HitFilm supports diffuse, specular, normal and bump textures, each of which exists as a separate image file. Given that models can also include multiple materials, each with four available texture slots, the memory usage can become intensive if a model makes use of multiple textures. Some GPUs are unable to handle several 4K textures at full resolution, and even if your GPU is powerful enough it will still experience a performance impact.

This setting provides an easy way to manage texture files without needing to manually resize the textures outside of HitFilm. That maximum 3D model map size puts an upper cap on the resolution of all 3D model textures. Any textures larger than the maximum will be automatically downscaled to the maximum value. If your model uses multiple 6K textures, this is a convenient way to easily downscale them to 2K on the fly.

As this can be adjusted at any time, this is a highly efficient way to control quality and performance. While animating your models and setting up your scene you may not need high quality textures, so reducing the maximum to 512 can yield a major performance boost; you can then raise the max to 4096 prior to exporting.

Note that textures smaller than the maximum 3D model map size will not be affected.

Also take a look at the <u>Introducing the Viewer</u> chapter for information on managing performance while working on projects.

4.2.5. Quality Profiles Options

Quality Profiles

You can set up four Quality Profiles in HitFilm, for use with video playback and paused images in the software. Each profile can store a separate set of viewer option settings, so you can quickly switch between Final, Draft, Quick, and Fastest. You can then independently assign playback and pause in the software to use any of these profiles. This allows you to use lower quality settings for playback than when viewing the paused image during editing, which ensures smooth playback while still giving you a quality image to work with while editing. You can edit all four of the profiles if you want to customize the specific settings used for each one.

The options for each profile can be edited by opening the File menu, clicking the Options button, and then selecting the Quality Profiles tab. This will open the following tab of the options screen:

These profiles are used for both Playback Quality and Paused Quality. The defaults are listed below, but you can customize all four profiles however you prefer. In this tab, there are 6 options you can turn on or off for each of the four profiles. The defaults are listed below, but you can customize all four profiles however you prefer.

- **2D Effects**: Toggles rendering of 2D effects on and off. By default, this option is enabled in Final, Draft, and Quick modes.
- Lights: Toggles rendering of 3D Lights on and off. By default, this option is enabled in Final and Draft

modes.

- **Shadows:** Toggles rendering of 3D Shadows on and off. By default, this option is enabled in Final and Draft modes.
- **Reflections:** Toggles rendering of Reflections on and off. By default, this option is only enabled in Final mode.
- **Motion Blur:** Toggles rendering of Motion blur on and off. By default, this option is only enabled in Final mode.
- **Depth of Field:** Toggles rendering of Depth of Field on and off. By default, this option is only enabled in Final mode.

4.2.6. Prompts & Warnings Options

Prompts & Warnings

HitFilm will notify you in certain situations. You can turn these alerts on and off according to your preference.



- **Prompt me when the media doesn't match editor timeline:** Adding a clip to an empty editor timeline will give you the option of matching the editor project settings to those of the media. When this option is disabled, the editor project settings will be automatically updated to match the first clip that is added, without an alert being displayed.
- **Prompt me when adding tasks to the export queue:** When a timeline is added to the Export queue, HitFilm will ask if you want to continue editing, or export immediately.
- **Prompt me before converting 2D composite shots to 3D:** If a 3D layer is added to a 2D composite shot, HitFilm will ask whether you want to add a 3D camera. When this option is disabled, a camera will automatically be added when necessary, without a prompt being displayed.
- **Prompt me before converting 3D composite shots to 2D:** Displays a notification when the last 3D camera is being removed from a composite shot, as this will also remove 3D layers from the timeline.
- **Prompt me before removing export tasks from the export queue:** When export tasks are deleted from the Export Queue, by default a warning confirms that you want to delete them. You can disable that warning here.

- **Prompt me on launch if my GPU is unsupported:** HitFilm will check your hardware to confirm whether the GPU meets the requirements for the software to function properly. If the hardware is below the minimum requirements, a warning will notify you.
- **Prompt me on launch if my GPU driver is unsupported or out of date:** Outdated drivers can cause errors or unexpected results in HitFilm. When this option is enabled, HitFilm will automatically check for outdated drivers on launch, so you can make sure you are fully up to date.
- **Prompt me before oversized particle textures:** Large texture sources can impact performance of particle based effect, including the Particle Simulator, Gunfire, and Quick 3D effects.
- **Prompt me for the project settings to use before creating a new project:** When you create a new project, having this option enabled will automatically open the Project Settings dialog, where you can choose the resolution, frame rate, and other settings for the project.

4.2.7. Labels Options

Labels

The color labels used to identify or organize timeline items can be edited here. In addition to being able to change the name or color associated with each label, you can also set defaults in the Options, if you wish to label media by type.

Options						×
Options General Display Render Quality Profiles Prompts & Warnings Labels Cache Pre-Render Auto Save Shortcuts Export Activation	Defaults Media: Image: Plane: Composite Shot: 3D Effect Layer: Camera Layer: Light Layer: Point Layer: Text Layer: 3D Model Layer:	None None None None None None None None	 * *<	Labels 1: 7 2: [3: 5 4: 5 5: (6: [7: N 8: F 9: N 10: N 11: (Fomato	×
				11: (12: (13: H	Citron Glaucous Hunter Green	1
				14: F 15: (16: [Rose Vale	
Cancel Restore	'Labels' Defaults					ок

Defaults

If you want to use labels to identify specific kinds of media in your projects, you can setup defaults here, so you don't need to apply labels individually to each timeline item. There is a listing for each kind of timeline item, so you can customize each one to your own preference.

To set a default:

- 1. Locate the kind of item you want to apply a label to.
- 2. Open the menu next to that item.
- 3. Select the color label you wish to use.
- 4. Click OK at the bottom right of the Options window to apply your changes.

Once this is done, each time you add a new item to any timeline of that kind, it will automatically receive your chosen color label.

Labels

Each of the 16 color labels has a name and a color swatch. If you want to use your own customized names or colors, you can easily do so.

- **Name:** To edit the name of a label, double-click the existing name, then type in the new name you want to use.
- **Color:** To edit the color of a label, double-click the color swatch to open the color picker. Select the new color you want to use, and click OK to close the color picker.

4.2.8. Cache Options

Cache

Caching is used to improve performance while you're using HitFilm.

Options			×
General Interface	RAM Preview Max Usag	e: 4096 MB 🛟 Low High	
Display Render	Media		
Quality Profiles Prompts & Warnings	Database*:	/Users/axelwilkinson/Library/Caches/FXHOME/HitFilm Pro/Media/cache.db Select File	
Labels	Cache*:	/Users/axelwilkinson/Library/Caches/FXHOME/HitFilm Pro/Media/Files Select Folder	
Cache	Keep Unused Files:	30 Days 🗘 🗇 Delete All Files	
Pre-Render Auto Save Shortcuts	Usage:	0 bytes	
Export	OpenFX		
Activation		📋 Delete OpenFX Plugins Cache	
	Changes to	settings marked with a '*' will take effect when you next start the application.	
Cancel Restore	'Cache' Defaults	c	ж

RAM Preview is one form of caching, used to temporarily render a section of your timeline into memory for real-time playback. You can set the amount of your system RAM allocated to RAM previews here. Higher values will allow more frames to be previewed.

- The Low button sets it to 25% of your total installed RAM.
- The High button sets it to 75% of your total installed RAM.

You can also manually enter any value up to 100% of your installed RAM. However, setting the maximum above 75% could begin to negatively impact the RAM preview performance, since some RAM is also required for the operating system and running other software.

For full details on using RAM preview, see Introducing the Viewer.

Media

HitFilm automatically stores background cache files of imported media, to improve media performance.

- **Database:** Specifies the location of the cache database.
- Cache: Specifies the location of the cache files.
- Keep Unused Files: Old cache files will be automatically deleted after a specified number of days.
- **Usage:** The Usage cannot be edited directly, but it provides an indication of how much space is being used by the cache.
- Delete All Files: Removes all cache files immediately, regardless of how old they are.

HitFilm must be restarted before changes to the Cache settings will take effect.

OpenFX

The OpenFX cache is used to speed up the loading process for third party OFX effects. If there are problems loading the effects, or if effects installed on your system do not appear in the software, clearing the cache can often eliminate any issues.

• Delete OpenFX Plugins Cache: Removes all OpenFX cache files immediately.

4.2.9. Pre-Render Options

Pre-Render

The pre-render system enables background rendering of composite shots and media files. This enables real time playback even of complex visual effects shots. Full details of using Pre-Renders in your workflow are available in <u>Pre-Rendering</u>.

The options for Pre-Renders can be set up here.

Options				×
General Display Render Quality Profiles Prompts & Warnings Labels Cache Pre-Render Auto Save Shortcuts Export Activation	Media Directory:	/Users/axelwilkinson/Library/App ✓ Use Pre-Renders For Export □ Limit Pre-Render Directory Size	lication Suppc B	rowse Renders
Cancel Restore	e 'Pre-Render' Defaults			ок

- Media Directory: The location for storing pre-render files.
- Use Pre-Renders For Export: When exporting your final render, HitFilm can use your pre-renders to reduce overall rendering time.
- Limit Pre-Render Directory Size: Specifies the maximum size of the pre-render folder. Enabling this option will add the following settings:
 - 1. Maximum Size: Sets the maximum size of pre-render storage, in MB.
 - 2. Usage: Displays the percentage of your allocated pre-render storage which is being used.

• **Delete All Pre-Renders:** Removes all pre-renders from the current pre-render folder destination. Note that this cannot be undone.

4.2.10. Auto Save Options

Auto Save

When Auto Save is enabled, HitFilm automatically saves your project at regular intervals, in case of power failure or other system failure.

Options			×
General Display Render	Auto Save Frequency:	 Enable Project Auto Saving 10 minute(s) 	
Quality Profiles Prompts & Warnings Labels Cache Pre-Render Auto Save Shortcuts	Auto Save Project Path:	/Users/axelwilkinson/Documents/FXHOME	Browse
Export Activation Cancel Restore	e 'Auto Save' Defaults		ок

- Enable Project Auto Saving: Toggles auto saving on or off. By default it is on.
- Auto Save Frequency: You can change the frequency and storage location for auto saving, or turn it off entirely. Note that large project files can take a few second to save, so may cause momentary pauses during auto saving.
- Auto Save Project Path: Sets the location where the auto saved version of the project will be stored. Auto saves are stored separately to your main project file so that they do not interfere with your master project. Auto saves are only created if the project has been changed since the last manual save. Each auto save will create a new project file. Once you manually save your project any prior auto saves will be cleared and the auto save frequency will begin again.

If the software does not close normally, such as during a power cut, the next time you start the software you will be given the option to recover the most recent auto-save.

4.2.11. Shortcuts Options

Shortcuts

Many tools and functions in HitFilm can be selected or accessed using keyboard shortcuts. Getting familiar with the keyboard shortcuts can greatly speed up your workflow. If you prefer to use your own shortcut settings, rather than the defaults, any shortcut can be edited to suit your preferences.

To change an assigned shortcut key, click in the shortcut column for the command and then press the desired key combination.

You can use the search box at the top of the window to quickly find a specific shortcut.

Options			×
General Display	Search in Shortcuts		
Render	General		
Quality Profiles	Common timeline		
Prompts & Warnings	👻 Editor sequence timeline		
Labels	Select Tool	v	ତ
Cache	Hand Tool	н	Ø
Pre-Render	Snap On/Off		Θ
Auto Save	Slice Tool	с	Θ
Shortcuts	Slip Edit Tool	Y	0
Export	Slide Edit Tool	U	Ø
Activation	Ripple Edit Tool	R	ତ
	Roll Edit Tool	E	Ð
	Ripple Delete	∖⊗	9
	Make Composite Shot	жм	ତ
	Rate Stretch Tool	s	ତ
	Link video and audio clips	% \	ତ
	Unlink video and audio clips	ሰ መ	ତ
	Composite shot timeline		
	▶ Trimmer		
	▶ Viewer		
Cancel Restore	e 'Shortcuts' Defaults		ок

To edit a shortcut, click on the current key combo to select it, then type in the new key combo you wish to use.

To the right of each shortcut is a **Reset** button, which can be used to reset that shortcut to its default setting. At the bottom of the Shortcuts tab is a **Reset All Shortcuts** button, which will reset all shortcuts to the defaults listed below.

General

- Undo Ctrl+Z
- Redo Ctrl*+*Y
- New Project Ctrl+N
- Open Project Ctrl+O
- Save Project Ctrl+S
- Save As Ctrl+Alt+S
- Exit Alt+F4
- Delete Del
- Rename F2
- Cut Ctrl+X
- Copy Ctrl+C
- Paste Ctrl+V
- Duplicate Ctrl+D
- Select All Ctrl+A
- Reset Ctrl+R
- Create New Composite Shot Ctrl+Shift+N
- Create New Plane Ctrl+Shift+A
- Import Media Ctrl+O
- Switch to Home Screen Ctrl+1
- Switch to Project Screen Ctrl+2
- Switch to Edit Screen Ctrl+3
- Switch to Export Screen Ctrl+4

Common Timeline

- Set In Point I
- Set Out Point O
- Set In and Out Points to Content P
- Set In and Out Points to View (no default)
- Move Playhead to Start of Timeline Home
- Move Playhead to End of Timeline End
- Jump to Time Ctrl+J (highlights current time indicator)
- Play/Pause Space
- RAM Preview Alt+L
- Previous Frame ,
- Next Frame .
- Jump Back by 10 Frames Shift+,
- Jump Forward by 10 Frames Shift+.

- Previous Edit Point Page up
- Next Edit Point Page down
- Increase Timeline Scale Ctrl++
- Decrease Timeline Scale Ctrl+-
- Scroll to Playhead Ctrl+Home
- Previous Keyframe Alt+,
- Next Keyframe Alt+.
- Add/Remove Keyframe Alt+T
- Slice Selected Objects/Layers Ctrl+Shift+D
- Move Playhead to In Point Shift+I
- Move Playhead to Out Point Shift+O
- Remove Attributes Shift+CTRL+X
- Paste Attributes **Shift+CTRL+V**
- Remove Effects Option+CTRL+V
- Fit to Frame (no default)
- Fit to Frame Width (no default)
- Fit to Frame Height (no default)
- Center in Frame (no default)
- + Remove All Color Labels From the Selection ${\bf 0}$
- Apply Color Label 1 to the Selection 1
- Apply Color Label 2 to the Selection 2
- Apply Color Label 3 to the Selection 3
- Apply Color Label 4 to the Selection 4
- Apply Color Label 5 to the Selection 5
- Apply Color Label 6 to the Selection 6
- Apply Color Label 7 to the Selection 7
- Apply Color Label 8 to the Selection 8
- Apply Color Label 9 to the Selection 9

Editor Sequence Timeline

- Select Tool V
- Hand Tool H
- Snap On/Off Shift+S
- Slice Tool C
- Slip Edit Tool Y
- Slide Edit Tool U
- Ripple Edit Tool R
- Roll Edit Tool E

- Ripple Delete Alt+Delete
- Make Composite Shot Ctrl+M
- Rate Stretch Tool S
- Link Video and Audio Clips CTRL+\
- Unlink Video and Audio Clips Shift+CTRL+\

Composite Shot Timeline

- Select Tool V
- Hand Tool H
- Slice Tool C
- Snap On/Off Shift+S
- Open New Layer Menu Ctrl+Alt+N
- New Plane Layer Ctrl+Alt+A
- New Camera Layer Ctrl+Alt+C
- New Light Layer Ctrl+Alt+L
- New Grade Layer Ctrl+Alt+G
- New Text Layer Ctrl+Alt+T
- New Point Layer Ctrl+Alt+P
- Move Layer(s) to Playhead (No Default)
- Make Composite Shot Ctrl+M
- Rate Stretch Tool S

Trimmer

- Set In Point I
- Set Out Point O
- Previous Frame ,
- Next Frame .
- Move Playhead to Start Home
- Move Playhead to End End
- Move Playhead to In Point Shift+I
- Move Playhead to Out Point Shift+O
- Play/Pause Space
- Toggle Loop Playback Ctrl+L
- Shuttle Left J
- Shuttle Right L
- Shuttle Stop K
- Insert Media on the Current Timeline B
- Overlay Media on the Current Timeline N

Viewer Panel

- Select Tool V
- Hand Tool H
- Text Tool T
- Rectangle Mask Tool R
- Ellipse Mask Tool E
- Freehand Mask Tool F
- Orbit tool B
- Set Mask Point(s) to Linear Ctrl+Alt+Shift+L
- Set Mask Point(s) to Curved Ctrl+Alt+Shift+C
- Toggle Full Screen Preview Alt+CTRL+F
- Move Position Left by 1 Pixel Left Arrow
- Move Position Right by 1 Pixel Right Arrow
- Move Position Up by 1 Pixel Up Arrow
- Move Position Down by 1 Pixel Down Arrow
- Move Position Left by 10 Pixels Shift+Left Arrow
- Move Position Right by 10 Pixels Shift+Right Arrow
- Move Position Up by 10 Pixels Shift+Up Arrow
- Move Position Down by 10 Pixels Shift+Down Arrow

4.2.12. Export Options

Export

Options				×
General Display	Default Export Directory:	/Users/axelwilkinson/I	Desktop	Browse
Render	Default Snapshot Directory:	/Users/axelwilkinson/I	Library/Applic	Browse
Quality Profiles Prompts & Warnings	Time Format:	Natural	-	
Labels	Display Export Previews:	Every Frame		
Cache Pre-Render Auto Save Shortcuts		 Remove known file e Display timeline thu Beep speaker on con 	extensions from (mbnails noletion	export names
Export Activation				
Cancel Restore	'Export' Defaults			ок

- **Default Directory Export:** The default Output location to which exported files are saved.
- Default Snapshot Directory: The default location to which export snapshots are saved.
- **Time Format:** Sets the format used to display the Elapsed Time and Remaining Time for each export task.
 - 1. * Natural: 2 minutes and 33 seconds, the format you would naturally use when speaking.
 - 2. * Timecode: 2:33, the format used for timecode throughout the rest of the HitFilm interface.
 - 3. * Seconds: 153 Seconds, the format is listed in seconds only
 - 4. Display Export Previews: The Preview Panel of the Export Screen shows a preview of the export progress. You can disable that preview by selecting Never here. Every Frame is the default option, but you can also select Every Second, to only render one preview per second.
 - 5. **Remove known file extensions from export names:** Having this option enabled ensures that you don't get duplicate file extensions in the names of your exported files.
 - 6. Display timeline thumbnails: Enable or disable thumbnails for timelines in the Project panel.
 - 7. **Beep speaker on completion:** Enables an audible notification when an export task is completed.

4.2.13. Activation Options

Activation

The activation section of the Options window displays details about your software's activation status. This is where you can find your hardware ID, which you may need if you contact HitFilm technical support.

You can also choose to activate or deactivate the software from here. See <u>Installation & Activation</u> for more information.

Options		×	
General Display Render Quality Profiles Prompts & Warnings Labels Cache Pre-Render Auto Save Shortcuts Export	Licensed To: Activation ID: License ID: Hardware ID:	Your Name Will Appear Here Your Unique Activation ID Will Appear Here Your License ID Will Appear Here A Hardware ID Unique to Your Computer Will Appear Here	
Activation		Deactivate Program	
Cancel		ОК	

HitFilm Pro: If you have purchased HitFilm Pro you can activate it immediately to enable all export options and third party OFX plugins.

• **HitFilm Express:** For our free product, HitFilm Express, anyone can register for a free serial code to activate the software.

In both cases the activation process is the same.

- 1. When you start the software, choose Activate & Unlock from the welcome screen.
 - a. You can also access the activation screen by selecting **File > Options** and clicking the **Activation** tab. Then click the Activate button.
- 2. Enter the **Email** and **Password** for the account that contains your serial code. Your serial code can always be accessed at http://fxhome.com/account
- 3. Click Login to activate the software.
 - a. If you did not purchase the software from FXhome, and do not have an account yet, then in step 2 click the **Create An Account** link.
 - b. Fill in the information you wish to use for your account, and the serial code you were provided when you purchased.
 - c. Click **Signup** to create an account and register and activate the software.

Follow the on-screen instructions to activate your software. Your serial code will be registered to your account at http://fxhome.com/account, so if it's the first time you have activated the software, you can find the serial code there.

4.3. Starting A Project

After starting HitFilm Pro you are presented with the Home screen. From here you can quickly access your recently saved projects, or create a new project.

Clicking the New button will open the Project Settings dialog, where you set up your initial project settings:

Ρ	ROJECT SETTINGS	
	1080p Full HD @ 30 fps 🔹	E Û
VIDEO		
	1920 pixels	
	1080 pixels	
Frame Rate:	30	
Aspect Ratio:	Square Pixels (1.0)	
AUDIO		
Sample Rate:	48000 Hz	
RENDERING		
Color Bit Depth:	8-bit Integer	
Antialiasing Mode:	4x MSAA	
Reflection Map Size:	2048 pixels	÷
Shadow Map Size:	2048 pixels	\$
Maximum 3D Model Map Size:	1920 pixels	
	START COMPOSITING	EDITING

Template

• **Templates** are provided for most common video formats up to 8k resolution. The **Save** icon to the right of the templates menu allows you to save your current settings as a new template, for future access.

Video

It is advisable to be familiar with the formatting details of the footage you will be editing, before you begin your project. If you know the resolution, frame rate, and aspect ratio of your footage, enter that information here. If you don't know these settings, then don't worry. You can skip them for now, and HitFilm can adjust the settings for you later, to match the video files you import.

- Width: The width in pixels you want your project to use. The maximum supported resolution will depend on your hardware. See Resolution below for full details.
- **Height:** The height in pixels you want your project to use. The maximum supported resolution will depend on your hardware. See Resolution below for full details.
- Frame Rate: The number of frames per second that you want your project to use. This should be the same frame rate that you wish to export your project to. In most cases, it will also be the same frame rate as your imported video.
- Aspect Ratio: The pixel aspect ratio that you want your project to use. This should almost always be set to square. Some cameras create anamorphic video, which is compressed horizontally when recorded, and requires the pixels to be stretched horizontally when displayed. Even when you plan to import anamorphic video files, it is usually best to set up your project with a square pixel aspect ratio. Any anamorphic video you import will then be conformed to standard square pixels, so it can be viewed correctly, without distortion, in any context.

Supported Project Resolutions

The project resolution which HitFilm will support is dependent on the amount of video RAM on your GPU. HitFilm Express supports resolutions up to 4K DCI (4096 × 2160). HitFilm Pro supports resolutions up to 8K.

- Less than 1GB of video RAM supports resolutions up to 1920×1088
- **1GB of RAM up to 4GB** will support resolutions up to 4096 × 4096
- 4GB or more of video RAM will support resolutions up to 8192 × 8192.

Regardless of hardware, the maximum resolution available in HitFilm Express is 4K DCI, 4096 × 2160.

Audio

Select the sample rate that you wish to use for your project. In general, this should be the same sample rate used by your audio files. If you will be importing audio files with multiple sample rates, your project should use the Sample rate at which you wish to export.

Rendering

The Rendering settings affect the quality at which your project is rendered. In general, higher settings create higher quality results, at the expense of slower performance. You may want to adjust some of these settings periodically while working on a project, using lower settings while working to increase productivity, then switching to higher settings to evaluate quality, or for your final export. You can also set default values for these settings in the General tab of the HitFilm Options (Preferences on Mac).

- HitFilm Express supports 8-bit color. Several of the available Add-On packs add support for 16-bit color. 32-bit color is only available in HitFilm Pro.
- **Color Bit Depth:** Higher bit depth creates higher fidelity images but will increase rendering times, especially on less powerful hardware.
- Antialiasing Mode: Antialiasing is used to create perceptibly higher quality edge detail. HitFilm supports multiple antialiasing types depending on the capabilities of your hardware. Higher numbers can give higher quality results, and may increase processing times.
- **Reflection Map Size:** The quality of 3D model reflections can be controlled using the resolution of the reflection maps. Larger reflection maps will create higher quality reflections at the cost of performance. The default setting of 512 pixels looks good in most circumstances other than close-ups.
- **Shadow Map Size:** The quality of shadows can be controlled using the resolution of the shadow maps. Larger shadow maps will create smoother edges on shadows, at the cost of performance.
- Maximum 3D Model Map Size: The quality of 3D model textures is dependent on the resolution of the texture maps. Larger texture maps will create higher quality reflections, but will also impact performance. Some hardware may not be capable of handling very high resolution maps.

Additional details about these render settings are available on the <u>Render Options</u> page of this manual.

You can return and edit your Project settings at any time through the File menu, by clicking **File > Project Settings**.

4.4. The Interface

Elements of the Interface: Containers and Panels

The HitFilm interface is designed using a mixture of **Containers** and **Panels**, and is fully customizable. A container can hold multiple panels. Each panel will have a tab, and you can click any tab to make that panel visible in the container.



Containers

You can customize the size and layout of the containers in various ways:

- The size of containers can be adjusted by dragging on the container's edges.
- Containers can be moved around the screen by clicking and dragging on an empty area of the container's title bar.
- Dragging one container over another container will display a 4-way drop zone indicator.



As you drag the container onto any zone, a blue line appears along the corresponding edge of the container, indicating where the container will be placed when you drop it. Dropping the container onto the relevant zone will insert the container to the left/right/top/bottom of the affected container, wherever the blue line was.

The Container Hamburger Menu

Each container has a hamburger menu on the right-hand side of its title bar. This menu gives you access to controls for that container.



- Float Container: Select this option to float the container out of the main HitFilm interface, and into its own window. You can then drag that window to any location on your screen, or if you are using multiple displays on your system, you can drag the window to a secondary display.
- Select Panel...: All panels currently open in the container will be listed here. A green checkmark indicates the active panel. Select any panel from this list to make it the active panel. In the image above, Effects and Text are the current panels listed in the menu.
- Add Panel...: Use this menu to add additional panels to the menu. In the menu, all panels which are not currently open in the software will be available. Select any panel to open it into the container.
 Panels which are already open in the software will be greyed out.

Floating Containers

Containers can also be separated from the main interface and moved into their own 'floating' windows. These can then be dragged anywhere around your desktop. This can be useful for computer setups using multiple displays, for example.

To float a container, simply right click its title bar and select Float Container.

To move a floating container back into the main interface click the workspace icon in the floating container's title bar.

You can also drag a floating panel back into the interface, by choosing a new container location and dragging the tab of the floating panel into the header of that container.

The Window Menu

The Window menu is your center for navigating and customizing the interface. It displays controls for turning individual panels on and off, switching between workspaces, and managing your custom workspaces.



Panels

The largest area of the Window Menu lists the individual panels which make up the interface of the Edit Screen. Each panel can be shown or hidden, to limit the visible controls for what you need for your current task. Particularly if you have a smaller display, hiding controls that you don't need will make more room for the controls you do need, so you can better see what you are doing and keep things efficient. Selecting any panel in the list will toggle its visibility. If the panel is not already open, it will be opened in a new container on the right side of the interface.

- Panels can be moved between containers by clicking and dragging on the panel's tab.
- New panels can also be opened directly into any existing container, using the burger menu for that container.

• Any panel can also be closed through the burger menu for that panel.

Almost all panels included in the HitFilm interface are listed in the panels menu, and can be toggled visible or hidden at any time. A green check mark indicates visible panels. Panels without a check mark are currently hidden. Details about each panel are available on <u>The Panels</u> page of this manual.

Some panels are permanent, and must always be visible:

- Editor: The Editor timeline cannot be hidden, and is not listed in the Window menu.
- Media: The Media panel cannot be hidden, and is not listed in the Window menu.
- Text: The Text panel cannot be hidden, and is not listed in the Window menu.
- Viewer: The Viewer panel cannot be hidden, and is not listed in the Window menu.

Workspaces

Workspaces are preset combinations of panels in a specific layout, to help you quickly display the tools needed for specific tasks. HitFilm offers a variety of standard workspaces, to suit many common tasks.

- 360 Video Editing: Optimized for working with 360 degree video.
- All Panels: A feature-rich workspace with all panels enabled. Easy access to all editing and compositing features, if you have a large enough display to fit it.
- Audio: Focuses on the Audio mixer and other tools for editing and fine tuning your audio tracks.
- **Classic:** Based on the default layout in HitFilm 2 Ultimate. This retro option might be more familiar to users coming from a very early version of the software.
- Colorist: Scopes and large viewports facilitate accuracy and ease of use while you work on dialing in perfect colors.
- Compositing: Optimized for compositing, with emphasis on the controls and effects panels.
- Editing: Optimized for editing, with emphasis on the trimmer, media panel and viewer. This workspace is ideal for reviewing the contents of each clip in your media panel, selecting the portions you want to use in the trimmer, and adding them to the timeline.
- **Organize:** Makes it easier to organize complex projects, when you have numerous imported files to go through, select, and rename.

Designing Your Own Workspaces

If you customize the interface to use a different layout than any of the default workspaces, you can save your own layout to create a new workspace template. Details on how to customize the layout of the panels and containers that make up the HitFilm interface are provided above.

When you have a layout that you wish to save for later use, open the Window menu and select Workspace

> Save Workspace. A new window will appear, where you can name your new workspace. After you click OK, your new workspace will be available through the Window > Workspaces menu.

Screens

The final item in the menu gives you direct access to the other screen of the interface.

- **Back to Home:** When you are on the Edit screen, this option will be shown, and takes you to the Home screen, where you can access online training content, the user manual, and a list of your recent projects.
- **Back to Edit:** When you are on the Home screen, this option is shown, and takes you to the Edit screen, where your projects are constructed and all editing and compositing is done.

4.4.1. The Panels

The HitFilm interface is made up of a number of panels, which are displayed as tabs within containers in the interface. Each panel serves a specific purpose. Details regarding each panel are provided below.

• More information on arranging the panels and customizing the interface can be found on the <u>The</u> <u>Interface</u> page.

360 Viewer EXPRESS ADD-ON

The 360 Viewer panel provides a spherical wrapped view of 360 footage. Opening this panel alongside the Viewer means you can edit 360 video directly in the Viewer, while seeing exactly what your audience will see in the 360 Viewer.

Audio Mixer

The Audio Mixer panel provides tools for mixing the audio tracks on the Editor timeline. Meters are given for each track, to monitor their levels. The levels of individual tracks and their stereo pan can be adjusted, so they fit properly into the mix with the other tracks. Tracks can also be easily muted or soloed.

 The page on <u>Working with Audio</u> provides additional details on reading meters and using the Audio Mixer.

Controls

The Controls panel displays all the controls, properties and values used by the selected layer, and allows you to edit them.

· Additional details are available in Introducing the Controls Panel.

Effects

The Effects panel contains all of the effects that can be applied to your layers, as well as some effects that create their own layers. It also contains presets, and allows you to create and organize your own presets using the effects built into HitFilm.

• The individual effects are covered in detail in the Visual Effects chapter of the manual.
History

The History panel shows a log of the most recent changes made in the software, and allows you to undo or redo them by moving through the list. It is covered in greater detail on the <u>History & Undo/Redo</u> page.

Layer

The Layer panel shows the original contents of the currently selected layer, before any effects or Transform adjustments are applied. It is primarily used for tracking.

Layout

The Layout panel provides quick tools for precise adjustment of the position properties of your selection.

• Full details are available in Introducing the Layout Panel.

Lifetime EXPRESS ADD-ON

The Lifetime panel is used by the particle simulator. It allows you to modify the behavior of particles over the course of their life, after they are emitted.

• Detailed information is available in the Lifetime Panel page of the chapter on the Particle Simulator.

Media

The Media panel stores all the media files imported into your project. You can organize your media assets there, as well as access and modify their Properties and import new files.

• More information on using the media panel is provided in Introducing the Media Panel.

The Media panel is permanent, and cannot be removed from the interface.

Meters

The audio Meters panel provides a dynamic readout of the audio levels of your project so you can adjust the audio levels appropriately. Then you can adjust the levels to ensure your project is audible, but not so high

that the audio is distorted by peaking.

• To learn more about working with audio and using meters, see the page on Working with Audio.

Processor

The Processor panel is used to manage your pre-renders. It shows all pre-renders currently being generated, and provides controls to pause, resume, and cancel any pre-renders being processed.

• Further details are available in Pre-rendering.

Scopes EXPRESS ADD-ON

The Scopes panel allows you to precisely monitor the color of your project, to help with making color corrections and ensure that color ranges fall within specified standards. This is important to ensure that colors are accurately reproduced when the finished program is broadcast later. It provides a Vectorscope, a Waveform monitor, a Histogram, and a RGB Parade.

 More information on the individual scopes and how to use them is available in the <u>Introducing Scopes</u> page.

Text

The Text panel is used to adjust the properties of Text layers.

Full details can be found in <u>Creating Text & Titles</u>.

The Text panel is permanent, and cannot be removed from the interface.

Timeline

The timeline is where you arrange and manipulate your media to create your project.

There are two kinds of timelines in HitFilm; the Editor and Composite Shot timelines. Each project contains one Editor timeline, which is permanent. Each project can contain an unlimited number of composite shot timelines, or no composite shot timelines at all.

• Both kinds of timelines are covered extensively in Introducing the Two Timelines.

The Timeline panel is permanent, and cannot be removed from the interface.

Track

The Track panel contains the controls used to perform 2D tracking on video layers.

• To learn how to track a layer, and to get familiar with the controls, please refer to the chapter on <u>Tracking</u>.

Trimmer

The trimmer panel allows you to load a specific video clip from the media panel for review, or to select a portion of the clip to add to your timeline.

• To learn more about trimming clips, please see the <u>Trimming Assets</u> page of the Editing chapter.

Viewer

The Viewer is where you see the combined results of your timeline. All media assets and effects used on the timeline will be displayed in the Viewer. You can playback the timeline there to view the results. You can also directly edit the position of layers within the Viewer, and edit the contents of some layers by creating masks or entering text.

 There are many options available in the viewer, and they are covered in detail in <u>Introducing the</u> <u>Viewer</u>.

The Viewer panel is permanent, and cannot be removed from the interface.

4.5. Saving & Loading Projects

Saving a project file gives you the ability to work on a project over several sessions. All of your project decisions are saved into a HitFilm project file. The next time you load the project file you can continue from exactly where you left it.

Project media is not included in the project file. If you move the project file to a different computer you will need to copy or transfer any media files imported into the project as well.

If you want to create a new video file which can be played outside of HitFilm, see the chapter on Exporting.

Saving Your Project

The quickest and easiest way to save your project is to use the keyboard shortcut, **Ctrl+S**. Alternately, you can click the Save button on the navigation bar. If it is the first time you have saved the project, you will need to specify a location for the file. Once the project has a name, saving will update the saved project file to contain the current contents of the open project.

Solution: Use the keyboard shortcut Ctrl+S to Save your project.

The File menu also has **Save** and **Save As** options. Save As can be used to create a new copy of the project file on your computer, after which clicking the Save icon will save to the newer project.

If the Save icon is dark gray it means that you have not made any changes to your project since you last saved.

Hovering the mouse over the Save icon will display the location of the project file on your computer.

HitFilm also has an auto-save feature built in, which allows the software to save your project at regular intervals. This allows you to recover your work in the event of a power failure or similar situations. To learn more about setting up Auto Save, please see the page on the <u>HitFilm Options</u> window.

Loading Projects

To load a project select **Open** from the Home screen or File menu, then locate the project file on your

computer.

You can also select from a list of recent projects in the File menu, and on the Home screen.

Importing Projects & Composite Shots

You can import composite shots from one project into another project. This is useful for transferring visual effects shots and templates between projects, or for importing data created in mocha HitFilm.

In the Media panel, click the triangular menu button to the right of the Import... button and select Composite Shot.



You can then select either a project file or a composite shot file to import into your current project. When importing a project file HitFilm will analyze the file and display a list of available composite shots. You can select specific composite shots to import.



Imported composite shots will be listed in new folders in the Media panel. If any of the composite shots contain embedded composite shots, these will also be imported. The editor timeline from one project can not be imported into another using this method. If you wish to move your editor timeline from one project to another, you must first export it, to create a new video file. The new file created can then be imported into a new HitFilm project.

For more information on composite shots see Introducing the two timelines.

4.5.1. Auto Save

HitFilm includes an auto-save feature to help in cases where the software or your system fails unexpectedly. After a crash, the next time you open HitFilm, it will check if there are any auto-save files available. If a file is found, a dialog will appear, asking how you would like to proceed, and providing an opportunity to recover the project.

Reco	vered Projec	ts		×
HitFiln	n Pro has dis	covered unsaved	projects:	
▼ Dr	agon.hfp			
	Saved Wed	Jan 8 12:50:01 20	020	
	Saved Wed	Jan 8 12:45:01 20)20	
	Saved Wed	Jan 8 12:44:01 20)20	
Ope	n Project	Save Project	Delete Project	Cancel

Configuring Auto-Save

The auto-save function is enabled by default, and will create a backup copy of your project every 10 minutes. It can be configured in the Auto Save Options.

• Select File > Options, then click on the Auto Save tab.

Here you can change the frequency of the auto save, select the location where the auto-save files are stored, or disable auto save entirely. See <u>Auto Save Options</u> for complete details.

Recovering An Auto Save

When HitFilm closes unexpectedly, the next time the software is launched it will check for any auto-saved projects which are newer than the last manually saved state. If one is found, the **Recovered Projects** dialog

appears:

Recovered Project	ts		×
HitFilm Pro has dis	covered unsaved	projects:	
Dragon.hfp			
Open Project	Save Project	Delete Project	Cancel

All project files with available auto-save states will be listed. Click the triangle next to any project to view the available save states for that project:

Recovered Project	ts		×
HitFilm Pro has dis	covered unsaved	projects:	
▼ Dragon.hfp			
Saved Wed	Jan 8 12:50:01 20	020	
Saved Wed	Jan 8 12:45:01 20	020	
Saved Wed	Jan 8 12:44:01 20	020	
Open Project	Save Project	Delete Project	Cancel

Select any auto-save state, and the buttons at the bottom of the dialog will be enabled, providing controls for how to handle the auto-save.

- **Open Project:** Opens the auto-save file in HitFilm. The project can then be edited or manually saved.
- Save Project: Allows you to save the project to a standard .hfp file, which can subsequently be opened at any time.
- Delete Project: If you know you won't be needing a particular auto-save, you can delete it using this
 option.
- Cancel: Closes the Recovered Projects window without altering the auto-save projects.

4.6. Introducing the Media Panel

The media panel is where you import and manage all of the media assets used in your project. You can import video, images, audio, 3D models, and arrange and organize all of those assets for use during editing. In addition, re-usable assets created in HitFilm, such as planes and composite shots, are stored and organized in the Media panel, so they can be accessed at any time.



When you first start a project your Media panel will be empty. As you bring files into the project or create assets in HitFilm they will be added to the list of items in the Media panel.

Media assets can include:

· Video, image and audio files. If you're editing a film you'll probably have lots of these. Working with

these files inside HitFilm never makes direct alterations to the source files on your hard drive.

- **3D models** are imported from disk like a video but are then stored inside the project file. Note that although the 3D model geometry data is included in the project file, associated textures are not. If you transfer or archive a project make sure you include any required textures. Alembic animation files are not stored inside the project and are treated like other media files.
- **Planes** are special colored rectangles which can be created inside HitFilm. These are very useful and can be heavily customized with the addition of effects and mask shapes.
- **Composite Shots** are special layer-based timelines designed specifically for creating visual effects, titles and animations.

All items in the Media panel can be dragged onto any timeline in the project. Items can be used multiple times in the same project and even on the same timeline.

When you add an item from the Media panel to a timeline it creates a new clip or layer (depending on the type of timeline). You can then heavily customize that specific instance of the clip or layer, without affecting the main item in the Media panel.

For more information on the Media panel see:

- 1. Importing files
- 2. Organizing media
- 3. Media properties
- 4. Adding clips to the timeline
- 5. Synchronizing Audio and Video

4.7. Introducing the Two Timelines

HitFilm's timelines are where you'll make most of your project decisions. Timelines represent your video sequences, with time running from left to right.

There are two different types of timeline: the **Editor Timeline**, where you perform 2D track-based video editing, and **Composite Shots**, where you create layered visual effects and motion graphics in 2D or a fully 3D environment. HitFilm has one editor timeline per project. In contrast, you can have as many composite shot timelines as you want, and new composite shots can be created at any time.

Switching between timelines is as easy as changing tabs in your web browser, making for a fast, efficient workflow.

There are many similarities between the timelines. Many tools are available in both, and the playhead works the same in both cases. It's also important to understand the key differences.

The Editor Timeline

The editor timeline is track-based. Each track can contain multiple clips in sequence, one after another. This makes it very easy to edit your videos. Here's what it looks like:



In the above example you can see there are several video and audio tracks. You can have an unlimited number of tracks in the editor. This can be used for simple animation and compositing (picture in picture during a vlog or presentation), adding titles and logos, or for actual editing, as you can see in the example above. The Editor timeline is always 2D and allows for basic animation. For more complex animations or for working in 3D, you will want to use a Composite Shot timeline, explained below.

See Editing for full information about using the editor timeline.

Composite Shot Timelines

Composite shot timelines are layer-based. Each layer contains a single asset which can be highly customized, enabling you to carry out sophisticated compositing tasks. Composite shots offer more comprehensive animation tools than the Editor timeline, and provide access to HitFilm's native 3D compositing environment.

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		O Opacity		100.0 %								
		O Anchor Point	-1048.0	.777.0								
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Layers can be expanded to display more information. In the above example the Tracking Control point layer has been expanded to show the Transform controls for the layer. The left side of the timeline shows the names of the layers and properties, while the right side shows the position of layers in time. You can also see a number of diamond shaped icons on the Position and rotation properties, which indicate keyframes. Keyframes are used to change properties over time.

Composite shots can contain large numbers of layers, each of which contains many properties. You can use the Search box at the top of the timeline to find specific layers or properties within complex timelines.

See <u>Compositing</u> for full information about using composite shot timelines.

Switching Timelines

Looking at the top of the images above, you can see the each timeline is shown as a tab. Switching between the timelines is as simple as clicking on the relevant tab. You can do this at any time. It's just like switching tabs in your web browser.

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巴 .	T	Search in Timeline					

As you create more composite shots you will see more tabs along the top of the timeline. Composite shots are also listed in the Media panel, making it easier to manage larger projects when you might not want all your timelines open simultaneously. Clicking the X icon on any tab will close that tab. Any composite shot can be re-opened by double-clicking it in the media panel.

4.7.1. Saving Composite Shots

Composite shot timelines can be saved to your computer and then imported into other projects. This enables you to create a template involving multiple layers, export it, and then use that template in other projects in the future.

Saving a Composite Shot by Exporting

To save a composite shot outside of your HitFilm project:

- 1. Locate the composite shot in the Media panel.
- 2. Right-click on the the composite shot and choose **Save As...** from its menu.
- 3. Choose the name and location you wish to use to save the file, then click Save.
- 4. A new .hfcs file will be created at the location.

Note that saving a composite shot does not include embedded composite shots or associated media.

Composite shots can be imported into the Media panel using the Import > Composite Shot option in the menu to the right of the Import... button.

Importing Composite Shots

To import a composite shot:

- 1. In the Media panel, locate the **Import** button and click the triangle next to it.
- 2. Select **Composite Shot** from the import menu that appears. This opens a file browser window.
- 3. Navigate to and select the .hfcs file that you wish to import.
- 4. The composite shot will be imported and appear in the Media panel.

Importing a Composite Shot with Embedded Composite Shots and Associated Media

At times you may need to import a composite shot that contains other embedded composite shots, or which contains multiple media files that would be laborious to relink manually. This can be done as well, by importing the composite shot directly from its original project, without exporting first.

To import a composite shot with all embedded composite shots and media:

- 1. In the Media panel, locate the **Import** button and click the triangle next to it.
- 2. Select **Composite Shot** from the import menu that appears. This opens a file browser window.
- 3. Navigate to and select the .hfp project file that contains the composite shot you want to import.
- 4. A window will open listing all of the composite shot timelines contained in that project. Select the one(s) that you want to import using the checkboxes on the left.



5. Click **Import**, and a new folder will be created in the Media panel. All assets required for the composite shot will be imported and placed in that folder. This includes media files and other composite shots embedded in the composite shot you chose for import.

Further information is available in <u>Saving & Loading Projects</u>.

4.8. Introducing the Viewer

The Viewer is where you see the results of your editing and compositing. It's also where you'll make many of your compositing decisions, adjusting layers and masks directly instead of using the Controls panel. The Viewer is linked to your currently active timeline. The Viewer's contents and available tools will vary depending on your chosen timeline.



The image above shows the Viewer for a composite shot timeline, along with its associated tools and controls. When working on the Editor, there will be fewer tools available.

Playback Controls

Along the bottom of the Viewer are the playback controls. These are used to view the results of your timeline edits or access specific frames of your timeline.



Loop Playback: When activated, playback will loop once the playhead reaches the end of the timeline or the end of the work area.

- The work area can be defined using the **Set In Point** and **Set Out Point** buttons with the playhead at the desired frames. This can be particularly useful for looping playback around a specific cut or visual effects sequence.
- Set In Point: Sets the first frame of the work area. The work area is used when looping playback and when exporting your project. This makes it easy to export specific sections of a project, rather than entire timelines.
- Set Out Point: Sets the last frame of the work area. The work area is used when looping playback and when exporting your project. This makes it easy to export specific sections of a project, rather than entire timelines.

Playhead Control

The timeline playhead determines which frame is displayed in the viewer. The playhead can be controlled from the Viewer.

- **First Frame:** Instantly jumps the playhead to the beginning of the timeline. You can also press the **Home** key.
- **Previous Frame:** Movers the playhead backward a single frame.
- III Next Frame: Move the playhead forward a single frame.
- **Play:** Plays the timeline forwards. In some cases, realtime playback may not be possible, depending on the format of your video files and the complexity of the timeline. In these cases, realtime playback can be achieved using the RAM preview or pre-render features.
 - Playback can also be controlled using the standard keyboard shortcuts J, K and L.
 - J: plays backwards. Pressing J repeatedly will double the playback speed.
 - K: stops playback.
 - L: plays forwards. Pressing L repeatedly will double the playback speed.

RAM Preview: System memory can be used to preview a section of your timeline in realtime, even if there are complex effects. Clicking the **RAM Preview** button will begin rendering from the playhead's position and will carry on until the RAM allocation is filled or you click elsewhere in the interface to stop the previewing. You can then playback the previewed frames or scrub the playhead in realtime.

• The memory allocated for RAM previewing can be adjusted in Options.

Viewer Playhead & Duration Bar

The duration bar represents the total duration of your currently selected timeline.

00:00:00:16

- Work Area: The lighter line shows your work area, which you can change using the In and Out controls. Frames outside the work area will appear darker on the duration bar.
- **RAM Preview:** When a RAM Preview has been rendered, the area that is currently stored in RAM will be represented in blue. The light circle is the playhead position, and the light blue area to the right of the playhead indicates the current frame.
 - By dragging the circle you can move the playhead through your timeline. This is particularly useful if your timeline is currently zoomed in to a specific area, as you can watch another part of the timeline without having to move or scale your track or layer view.
- **Time Displays:** To either side of the Viewer are time displays. You can set each separately to display as a timecode (in the format Hours:Minutes:Seconds:Frames) or as a framecount by right clicking and selecting from the menu.
 - Current Time: On the left the Current Time is shown, based on the position of your playhead.
 - Total Duration: On the right the Total Duration of your current timeline is shown.

Viewer Tools (Editor)

When working in the Editor timeline, at the top-left of the Viewer are several tools.



Select: The Select tool is used for interacting with layers and effects on the Viewer. With the Select tool active you can select and transform layers and move position points.

- Sale Hand: This pans the view around the Viewer. This is useful if your content does not fit into the Viewer panel, such as when you are zoomed in or are working in HD on lower resolution monitors.
 - When the Hand tool is active you will not be able to interact with layers or effects. As an alternative to selecting the hand tool, you can click and hold the **right mouse button** while the cursor is over the viewer, then drag to reposition the view within the viewer panel.
- A **Text:** Used to create or edit text objects. You can create a new text object on the Editor at the playhead position in one of two ways:
 - **Open Text:** Select the Text tool and click on the Viewer where you want to add the text to create an open text layer.
 - **Text Box:** Select the text tool, then click and drag on the viewer to draw a text box to create paragraph text. The text will auto-wrap to a new line when it reached the edge of the box.
 - See <u>Creating Text & Titles</u> for more information.

Viewer Tools (Composite Shot)



In addition to the Editor tools discussed above, the following Viewer tools are also available if you are working in a Composite Shot timeline.

- Ellipse Mask: Creates round or elliptical masks, to remove or retain specific areas of a layer.
- • • Rectangle Mask: Creates square or rectangular masks, to remove or retain specific areas of a layer.
- **Preehand Mask:** Uses a pen tool to create masks of any shape, to remove or retain specific areas of a layer.
 - See Masking for complete details on all masking tools.
- • Orbit: When you're working in 3D the orbit tool can be used to orbit the camera or view around wherever you click or a specific selected layer. You can switch between the two orbit modes by holding down on the Orbit button to display the menu.
 - For more information see Working in 3D.

Viewer Menus and Display Options

The Viewer can be customized to display specific information.

The Viewer can be scaled using the Scale menu to the bottom-right. When the content of the Viewer is too large to fit into the interface you can pan around the view by right clicking and dragging on the view or using the Hand tool. The Scale To Fit option is most useful, as it will auto-scale the viewer to fit into whatever space you have available, allowing you to see the entire frame. The 100% view option is useful for seeing exactly what your frame will look like at actual size. You can also adjust the scale using the scroll wheel on your mouse.

There are several menus at the bottom right of the Viewer.

For information on the View and alignment menus see Working in 3D.

Channels

The channels menu switches the Viewer between different color and alpha channels.

- **RGB:** The full rendered output. This is what is exported.
- **RGB Straight:** All RGB color channels without alpha transparency. Note that fully transparent areas may be displayed with unexpected coloring.
- **Alpha:** Only the alpha (transparency) channel. White areas represent fully opaque and black areas represent fully transparent. Very useful for checking mattes during compositing.
- Red/Green/Blue: Shows only the selected color channel.

Quality

- **Antialiased:** Renders at full resolution with anti-aliasing for smooth edges. The antialiasing method can be adjusted on the project screen.
- **Full/Half/Quarter:** Renders at specific resolutions. Lower resolutions increase performance. Note that this only affects the rendering in the Viewer, and final exports will always be at maximum quality.

These quality settings also affect 3D model textures, which are automatically downsampled by the specific amount. For example, 4K textures will be downscaled to 2K when the Viewer is set to Half quality. This can be used in combination with the Options (see below) to manage performance even when working on complex shots.

Quality Menu

The Options menu turns various rendering features on and off. Note that these options do not affect the export render; they only have an impact in the Viewer. You can optimize playback of your media through the new Playback options in HitFilm Pro. Settings for playback and pause are separated, so you can select a high Quality Profile for use when the timeline is paused, then use a lower Quality Profile during playback, to ensure smooth movement. You can set up four specific Quality Profiles with your own preferences of what features are included, from the Quality Profile tab of the Options screen, and select from four Resolution options, from Antialiased to Quarter. Then you can assign Playback and Pause to use any of these four options. The specific options are detailed below.

Playback Quality

You can set up four quality profiles in HitFilm, for use with video playback and paused images in the software. These options only affect playback within the program, and will not affect exported files. Each profile can store a separate set of viewer option settings, so you can quickly switch between Final, Draft, Quick, and Fastest.

The options for each profile can be edited by opening the File menu, clicking the Options button, and then selecting the Quality Profiles tab. These profiles are used for both Playback Quality and Paused Quality. The defaults are listed below, but you can customize all four profiles however you prefer. In this tab, there are 6 options you can turn on or off for each of the four profiles. The defaults are listed below, but you can customize all four profiles. The defaults are listed below, but you can customize all four profiles.

- **2D Effects:** Toggles rendering of 2D effects on and off. By default, this option is enabled in Final, Draft, and Quick modes.
- Lights: Toggles rendering of 3D Lights on and off. By default, this option is enabled in Final and Draft modes.
- **Shadows:** Toggles rendering of 3D Shadows on and off. By default, this option is enabled in Final and Draft modes.
- **Reflections:** Toggles rendering of Reflections on and off. By default, this option is only enabled in Final mode.
- **Motion Blur:** Toggles rendering of Motion blur on and off. By default, this option is only enabled in Final mode.
- **Depth of Field:** Toggles rendering of Depth of Field on and off. By default, this option is only enabled in Final mode.

Playback Resolution

Adjusting the resolution can dramatically affect performance speed. Changing Playback Resolution will only

affect playback within the program, and will not affect exported files. The setting you choose here determines the resolution at which the source media is sampled and processed, before being displayed in the Viewer. For example, selecting Half resolution reduces both the vertical and horizontal resolution by half, and effectively reduces the processing required for each frame by 75%. This can dramatically speed up performance.

- **Antialiased:** Processes the video at full resolution and applies the antialias settings you have selected in your Project screen. This settings gives maximum quality, and the longest processing times.
- **Full:** Processes the image at full resolution, but does not apply antialiasing. Quality is still high, but some stair-stepping may be visible along diagonal lines.
- **Half:** Reduces horizontal and vertical resolution of the source media by half before it is processed, resulting in faster performance.
- **Quarter:** Reduces horizontal and vertical resolution of the source media to ¼ of its original value before it is processed, resulting in reduced visual quality and faster performance.

Paused Quality

You can assign your video to use a different quality profile when paused than it uses during playback.Typically you will waht the Paused Quality set higher, so you can view a high quality image while editing, but reduce the processing load during playback.

The options for each profile can be edited by opening the File menu, clicking the Options button, and then selecting the Quality Profiles tab. In this tab, there are 6 options you can turn on or off for each of the four profiles. These profiles are used for both Playback Quality and Paused Quality. The defaults are listed below, but you can customize all four profiles however you prefer.

- **2D Effects:** Toggles rendering of 2D effects on and off. By default, this option is enabled in Final, Draft, and Quick modes.
- Lights: Toggles rendering of 3D Lights on and off. By default, this option is enabled in Final and Draft modes.
- **Shadows:** Toggles rendering of 3D Shadows on and off. By default, this option is enabled in Final and Draft modes.
- **Reflections:** Toggles rendering of Reflections on and off. By default, this option is only enabled in Final mode.
- **Motion Blur:** Toggles rendering of Motion blur on and off. By default, this option is only enabled in Final mode.
- **Depth of Field:** Toggles rendering of Depth of Field on and off. By default, this option is only enabled in Final mode.

Paused Resolution

Adjusting the resolution can dramatically affect performance speed, but it also determines the accuracy of the rendering displayed on the Viewer. Paused Resolution only affects the image displayed within the program when the timeline is paused, and will not affect playback, or exported files. The setting you choose here determines the resolution at which the source media is sampled and processed, before being displayed in the Viewer. For example, selecting Half resolution reduces both the vertical and horizontal resolution by half, and effectively reduces the processing required for each frame by 75%. This can dramatically speed up performance. In most cases, Antialiased or Full will be preferred.

- **Antialiased:** Processes the video at full resolution and applies the antialias settings you have selected in your Project screen. This settings gives maximum quality, and the longest processing times.
- **Full:** Processes the image at full resolution, but does not apply antialiasing. Quality is still high, but some stair-stepping may be visible along diagonal lines.
- **Half:** Reduces horizontal and vertical resolution of the source media by half before it is processed, resulting in faster performance.
- **Quarter:** Reduces horizontal and vertical resolution of the source media to ¼ of its original value before it is processed, resulting in reduced visual quality and faster performance.

Color Bit Depth

The color bit depth setting here only affects the viewer. It does not alter the bit depth used by the project during export, which are set in the Project screen.

- **8-Bit Integer:** is limited to 8 bits per channel, restricting colors between 0-255 values. 8-bit integer will render more quickly than 16-bit float.
- 16-Bit Float: allows for increased dynamic range, retaining detail in highlights and shadows. 16-bit
 - float will take longer to calculate and render, but produces higher quality results. EXPRESS ADD-ON
- **32-Bit Float:** allows for very high dynamic range, retaining maximum detail in highlights and shadows. This is particularly useful during grading or when designing visually extreme effects. 32-bit float will take longer to calculate and render, but produces the highest quality results. 32-Bit Float color is only available in HitFilm Pro.

Additional Options

The remainder of the menu is primarily simple toggles to turn various options on and off.

• Floor Plane: Turns the 3D reference grid on and off. This option will only be present on Composite Shot timelines which contain a 3D camera.

- Show Motion Path: Animated layers display a line representing the movement over time. This can be turned on and off.
- **Background Color:** The Viewer usually renders a black background. This can be changed to a different color, which can be useful during compositing to ensure you do not have any 'holes' in your scenery.
- **Checkerboard Background:** in 2D views this is on by default. A checkerboard pattern is displayed in transparent areas of the frame. This pattern is not visible when you Export, but can be used in the Viewer to identify transparent areas of the frame which would otherwise be hard to spot.
- **Full Screen Preview:** Toggles the Full screen preview on and off. You must select a screen in the Set Screen menu below first, so HitFilm knows which screen to display the Full Screen Preview on.
- Set Screen: This menu shows all available displays on your system, so you can choose the one to be used for the Full Screen Preview.
- **Export Frame:** saves a high quality PNG of the current frame.

4.9. Introducing the Controls Panel

Most of your customization decisions are made in the Controls panel, which displays every detail of your currently selected layer or clip.



The contents of the Controls panel updates for your currently selected timeline item. Some items have more available controls than others.

As you add masks and effects to layers the Controls panel will expand and update to show the new information.

Each customizable entry in the Controls panel is called a property. These are organized into property groups so that you can easily find what you need. For example, the Transform property group is where you'll find the position, scale and rotation properties.

When you're working on composite shots, most properties in the Controls panel are also mirrored on the timeline, making it easy to add keyframe animation for properties. However, some effects such as Color Correction Wheels display richer controls in the Controls panel than on the timeline.

Some layers can contain large numbers of properties, particularly when the layer has many effects applied to it. You can use the Search box at the top of the Control panel to find specific properties for the layer or its

effects.

Adjusting Property Values

There are several methods used to adjust values for various properties in HitFilm. You will frequently use direct values, sliders, rotation wheels, check boxes, and combo boxes.

Direct Values

Most properties will display a numeric value which can be changed directly. Some properties offer only a direct value, while others include interface tools that can be used to change the value, which are discussed further down this page.

Values can be changed directly on any property, whether ther eare interface controls or not, in the following ways:

- Click the value, and type in a new value. Pressing **Enter** will confirm your entry and apply the value to that property. Pressing **Tab** will confirm the value and auto-select the value of the next property in the controls.
- Click and hold on the value, and drag to the left or right while keeping the mouse button depressed.
- On some properties, holding **Ctrl** (or **Cmd** on Mac) and clicking on a positive Transform value will switch it to a negative value and vice versa (eg, -500 will become 500).



Some properties will function in 2D, and have two values, such as the Position shown above. The first value controls the X axis of the property, which runs from left to right. The second value controls the Y axis, which runs from bottom to top.



Other properties, such as the Orientation shown above, will function in 3D, and have three values. In this case, the first two values are the same as the values in the 2D version. The third value controls the Z axis, which runs forward and back, controlling the distance from the audience.

Many properties can operate in either 2D or 3D, depending on the Dimension settings of the layer. Converting a 2D layer to 3D will add a third value to some properties

Sliders

Sliders allow you to change a value by dragging to the left or right.

O Opacity 100.0 %

Some properties will allow only positive values, while other properties allow positive or negative values.

Rotation Wheels

Some properties are better served by a wheel than a slider. Primarily, this applies to rotational properties, where a wheel gives a more intuitive depiction of the selected angle.



Click on the wheel and drag around its perimeter to rotate it and change the value. The white handle on the wheel indicates the current angle.

Rotating more than a complete turn is allowed, and the 0x indicator on the value represents the total number of complete rotations. The 0.0 portion indicates the angle in degrees beyond the last complete rotation, and resets to 0 after 360 degrees.

The Absolute value shows the total number of degrees represented by the number of rotations and the angle.

Checkboxes

Check boxes toggle a property on or off.



They may be on or off by default, depending on the property. A checkmark in the box indicates the property is enabled, or on.

Combo Boxes

For properties that offer a specific list of options, rather than a numeric value, a combo box is used to select the option you need.



Clicking the triangle on the right side of the property opens the menu.

	Blend	Normal
	Motion Blur	Add
	Parent	Color
	Include in Depth Map	Color Burn
che		Color Dodge
ichs		Darken
sks		Difference
ects	5	Dissolve
Insf	orm	Divide
0	Opacity	Exclusion
0	Anchor Point	Hard Light
0	Position	Hue
~	C	Lighten
0	Scale	Luminosity
0	Orientation	Multiply
0	Rotation (X)	Overlay
		Saturation
0	Rotation (Y)	Screen
		Soft Light
_	and the state of the state	Subtract

After opening the box, click any item in the list of available options to make your selection.

Certain effects such as Color Correction Wheels or Scopes include unique controls, which are explained further in the Visual Effects pages that apply to those specific effects.

For more information:

- 1. Effects and transitions
- 2. Working with layers
- 3. Animating with keyframes
- 4. Transforming layers

4.10. Exporting

Exporting creates a new video or image sequence from the contents of your timeline. HitFilm allows you to export any timeline immediately, or to create a queue of multiple tasks and export them all at once.

Export Now

You can export the current timeline at any time, from either of these locations:

- File Menu: Open the File menu and select Export...
- **Timeline:** Click the **Export Button** at the top right of the Timeline panel.

Each of those options will open a dialog where you can name the file, and select where it will be saved. The exported media can then be used and played outside of HitFilm. Exporting is handled as a background task in HitFilm, so once you begin an Export task, you can continue working on your project while the export proceeds.

Export Queue

The export queue is a list of export tasks, found in the Export panel. It allows you to add multiple export tasks to a list, and then export them all at once. Any timeline, asset, or media clip can be added to the export queue. The "Start Exporting" button, found in the Export panel, can then be used to begin exporting everything in the queue.

See the Export Panel page for full details on using the Export Queue.

Adding Export Tasks from the Timeline

The Export menu **D** at the top right of the timeline contains Add to Queue options which allow you to add the current timeline to the queue.



- Add to Queue: Select what portion of the current timeline will be added to the export queue.
 - **In-to-Out Area:** Adds the area between the In point and Out point of your timeline to the export queue.
 - Contents: Adds the entire contents of your timeline to the export queue.

Individual clips or layers on the timeline can also be added to the queue, to be exported independently.

- Editor clips: Click-drag any object on the Editor timeline, from the timeline onto the Export panel, to add it to the queue.
- **Composite Shot Layers:** Click-drag the name of any layer from the timeline to the Export panel, to add it to the queue.
- **Right-click:** Right-click any Editor object or Composite Shot layer and select the Add to Export option to add it to the queue.

Adding Export Tasks from the Media Panel

Any object in the media panel can be queued, to add its contents to the export queue.

 *Media Panel: Click-drag any object from the media panel onto the Export panel, to add it to the queue.

4.11. Introducing the Export Panel

The **Export Panel** provides further controls and information for managing your export tasks.

Viewer \Xi Layer 🚍 Export	=				=
Queue Presets					
Default Preset: YouTube 1080p	HD			▼	oorting
Name	Preset	Duration	Progress	Output	Elapse
Photon Glow/CaptainMarvel	YouTube 1080p HD	00;00;06;01	56%	/Users/axelwilkinson/Dorts/CaptainMarvel.mp4	00:01:3
Photon Glow/CaptainMarvel	YouTube 1080p HD 🛛 🔻	III 00;04;03		/Users/axelwilkinson/Dets/CaptainMarvel[2].mp4	
Prom	Task: Photon Preset: YouTube Format: .mp4 Video: H.264, 1 Audio: AAC, 48 Start: 11:51:52	Glow/CaptainMard e 1080p HD (H.264 1920 × 1080 @ 23 3000Hz, Stereo 2 [00:01:10 remaini	vel 4 compressed f .976 fps, RGB ng]	or 24/25/30fps upload to YouTube)	

- The Queue tab lists all of your current export tasks.
- The **Presets** tab shows all the Built-in export presets, as well as any user-created presets you have saved.
- The **Preview** at the bottom of the panel shows the progress of the current export while it is being rendered.

The Export Queue

The Export Queue is a list of all the timelines which are waiting to be exported. Each timeline contains export controls where you can add the timeline to the Queue. You can view the list of queued timelines here, and select the export details used by each task.

- **Name:** The name of the task to be exported. The resolution and frame rate of the timeline are also displayed here for reference.
- **Preset:** Presets contain a specified set of format and compression details which will be used to create the exported file. The presets panel on the right side of the Export screen can be used to manage your presets, and is discussed above. For each export task, you can select any preset you desire from the list in this menu.
- Duration: Indicates the total duration of the exported file. If the work area of the timeline differs from

its contents, then the icon next to the duration becomes a toggle so you can switch the task from one to the other after it is added to the queue. If the work are and contents are the same, then the button will be greyed out.

- **Progress:** Once you click the Start Exporting button, the progress of the task will be shown here, so you can see how much is completed, and how much of the render remains.
- **Output:** Here is where you can set the name and location that will be used by the exported file. Click on the Output field to enter a name to be used by your exported file, and to choose the location to which it will be saved.
- **Elapsed:** The amount of time that has been spent processing the task so far. During the export, this number will change dynamically based on how long the task has taken. Once the export is complete, this will display the total time spent on rendering the exported file.

At the top right of the Queue you find the Export Options menu, and the Start Exporting button.



- **Start Exporting:** Click this button to begin exporting all items in the queue. Once you Start Exporting, you can return to the Edit screen and resume working on your project. The export will continue in the background while you work.
 - **Suspend Exporting:** Once Exporting is in progress, this button will change to suspend Exporting, and can be used to pause the export.

Export Options Menu

The menu provides controls and options for the currently selected export task.

- Save Output As...: Edits the name applied to the exported file.
- **Reveal Output:** Opens the file on your computer containing the exported file. This option is only displayed for Finished export tasks.
- Duplicate Task(s): Creates a new copy of each selected task.
- · Force Start: Forces the currently selected task to be exported, even if it is not the first item in the

queue.

- **Remove Task(s):** Removes the selected task (or tasks) from the render queue.
- **Remove Finished Task(s):** When a render task is completed, it remains listed in the queue. You can select completed tasks and use this button to remove them when you no longer need them listed.
- Select All: Selects all items currently in the queue.
- Export Options...: Opens the Export tab of the main HitFilm Options.

Export Presets

	Pres	ets					
							🔂 New Preset 📋
Name		-	Format	Resolution	Framerate	Comment	
• 🗇 🛛	Built-	In Presets					
		YouTub0p UHD	.mp4	3840×2160	From Source	H.264 compressed for 24/25/30fps upload	to YouTube
	•	YouTub80p HD	.mp4	1920×1080	From Source	H.264 compressed for 24/25/30fps upload	to YouTube
		Vimeo 1080p HD	.mp4	1920×1080	From Source	H.264 compressed for 24/25/30fps upload	to Vimeo
		Uncompry (MOV)	.mov			Uncompressed Audio	
		PNG Seqh Alpha	Image Sequence	From Source	From Source	Lossless PNG 4:4:4 source 8-bit pixel depth	ı + Alpha
		PNG Sequence	Image Sequence	From Source	From Source	Lossless PNG 4:4:4 source 8-bit pixel depth	Lý
		OpenEXRh Alpha	Image Sequence	From Source	From Source	Lossless compressed 4:4:4 32-bit pixel dep	th + Alpha
		GoPro Ciit (MOV)	.mov	From Source	From Source	High-quality compressed 4:2:2 source 10-b	t pixel depth
		GoPro Ca (MOV)	.mov	From Source	From Source	Highest-quality visually lossless 4:4:4 source	e 12-bit pixel depth + Alpha
		Facebo20p HD	.mp4	1280×720	From Source	H.264 compressed for 24/25/30fps upload	to Facebook
		Apple Pr (Alpha)	.mov	From Source	From Source	Highest-quality visually lossless 4:4:4 source	e 10-bit pixel depth + Alpha
		Apple P22 (HQ)	.mov	From Source	From Source	High-quality visually lossless 4:2:2 source 1	0-bit pixel depth
		Apple ProRes 422	.mov	From Source	From Source	High-quality compressed codec	
		Apple Photo-JPEG	.mov	From Source	From Source	Photo-JPEG compressed movie	
		Apple iP& iPhone	.mp4	1920×1080	From Source	H.264 compressed for Apple iPad 2, iPhone	4S, Apple TV 3 (and above)
		AAC Audy (MP4)	.mp4			High-quality AAC Stereo Audio	

The Presets tab of the Export panel lists all your available export presets. Export Presets are divided into two categories.

- Built-In Presets: All of the Export Presets that ship with the software are listed here. The included
 presets provide a variety of settings suitable for most export situations, but you are not limited to only
 exporting using these settings. Depending on your platform and version of the software, your Built-in
 Presets may differ from those shown here.
- User Presets: Contains any presets you edit and save yourself. You have full control over the resolution, format, and compression settings used during export, so if you have particular settings you

want to use, you can create a preset for those settings and save it here. There is no limit to how many user presets you can save.

You can create your own presets at any time. Click the **New Preset** button above the presets list, then select the format you wish to use: MP4, Image Sequence, AVI (Windows), or MOV. Once you select a format, the options for that format will be shown, so you can select the specific settings you wish to use in your preset. Details of all available options for each export format are available in the <u>Export Formats</u> page of this manual.

The preset which will be used for each export can be selected within the Export Queue. The Default Preset, which is labeled with a check mark, will automatically be applied to each new Export Task, but you can select any of your available presets for each export task. Double-click any preset in the Export Preset list to set it as your default preset.

You can delete a preset by selecting it in the list, and then pressing the Delete key on your keyboard, or clicking the Delete Preset button at the top of the screen.

Some options when creating a preset offer a **From Source** option. This option allows the preset to adapt, and vary certain settings based on those used by the source timeline. For example, you may create a preset based on specific resolution and compression settings, but wish to use it on various timelines with different frame rates. Setting the Frame Rate to "From Source" allows you to do so.

The Preview

The Preview Panel shows the progress of the export. As HitFilm proceeds through the export task, the frame currently being rendered is displayed here. Alongside the frame, all the details of the video being rendered are displayed, including the task name, the preset being used, and the format and compression details contained within that preset, which will be used by the exported video file.

The images displayed are taken from the buffer of the actual export, so the Preview does not negatively affect export times. No additional rendering is required to display the preview.

The Timeline Export Controls

In addition to exporting immediately, timelines can be added to the Export Queue for export later. In the timeline panel, the Export controls are located at the top right corner of the timeline. The Export button is used for immediate export, while the Export menu gives access to many options.


The Export Button Export

Click the Export button to export the in/out area of the current timeline immediately. Clicking the button opens a new dialog to name the file and choose a location where it will be saved. The file created will be encoded using the current Default Export Preset.

The Export Menu 🔰

The Export menu contains three sub-menus, which give access to the main options for exporting.

	🛡 Export	>≣
00:02:5	Export Now	۲
	Add to Queue	۲
	Default Preset	۲

- Export Now: Choose the portion of the timeline to be immediately exported.
 - In-to-Out Area: Immediately exports the area between your In point and Out point, using the current Default Export Preset. Selecting this option opens a dialog where you can name the file and select the location where it will be saved.
 - Contents: Immediately exports the entire contents of your timeline, using the current Default Export Preset. Selecting this option opens a dialog where you can name the file and select the location where it will be saved.
- Add to Queue: These options add the current timeline to the export queue, so it can be exported at a later point.
 - In-to-Out Area: Adds the area between the In point and Out point of your timeline to the export queue.
 - Contents: Adds the entire contents of your timeline to the export queue.
- **Default Preset:** Select the export preset that will be used for the Export Now options and for the Export button. All export presets currently available on your system will be listed here. Presets can be edited or created in the Presets tab of the Export panel.

Exporting Multiple Media Items to Individual Clips

You can select multiple clips on the editor timeline, or multiple layers on a composite shot timeline, and then right-click on any of the items and select **Add To Export Queue**. This will add each selected item to the

Export queue as a separate task, so that you can export them individually.

This can be useful for batch converting multiple files to a new format, or for exporting the individual elements of a scene for further compositing or editing in another application. When items are added to the Queue in this way, the name of each task will indicate the source video clip and the timecode at which it is located on the source timeline.

4.11.1. Export Formats

HitFilm gives you full control over the settings used when exporting. There are a number of different formats available for export, each optimized for a specific purpose or application. Each format also includes its own options for presets which use that format.

MP4 Options

The MP4 format uses the H.264 codec, which is superb for creating final content for delivery. It creates high quality video at remarkably small sizes, so is excellent for creating videos suitable for uploading to the internet. The MP4 format is designed as a final delivery format.

General Options

- **Name:** Enter a name for your preset. This is the name that will be shown in the Presets panel of the Export screen.
- **Format:** The format used by the preset. This option is selected from the New menu at the bottom of the panel, before the preset is made, and cannot be edited here.
- **Comment:** You may add a comment to your preset, to remind you of details of the compression, or when the preset is intended to be used, or other information.

Video

- Codec: MP4 export requires the use of the H.264 codec, so this setting cannot be edited.
- Width / Height: Set the dimensions at which the timeline will be exported. By default these will be set to the dimensions of the selected timeline. You can also tick the box under "From Source" to have the preset automatically use the dimensions of the timeline being exported.
- Scale Mode: This menu lets you control how the timeline is fitted into the exported frame.
 - 1. Keep Aspect Ratio is the default, and prevents the frame from being distorted if the export resolution uses a different aspect ratio from the timeline.
 - 2. Center will center the source timeline into the export resolution, without scaling. If the source is larger than your export resolution, it will be cropped to fit. If your source is smaller than the export resolution, black edges will be added.
 - 3. Ignore Aspect Ratio will warp the source timeline to fit the size and shape of the export resolution.
 - 4. Keep Aspect Ratio by Expanding will increase the scale of the source timeline as required to fill the export resolution, which may result in some cropping of the source timeline.

- Frame Rate: This defaults to From Source, so the frame rate of whatever timeline you are exporting will be used, and should generally be left there. You can deselect the From Source option and manually select a frame rate, but keep in mind that changing the frame rate will affect the speed at which the video in the exported file plays back.
- **Aspect Ratio:** sets the aspect ratio of individual pixels in your exported file. Modern HD formats nearly always use square pixels, but if you wish to export using non-square pixels, you can set the aspect ratio here.
- **Profile:** Profiles define specific sets of capabilities in the exported file. Baseline keeps file sizes to a minimum. Main is the standard for broadcast TV, and is usually the best for standard definition content. High is the broadcast standard for HD television and Blu-Ray, and is also used for high quality digital storage.
- Level: A Level defines a specific set of constraints within the selected Profile. These might be limitations on resolution or frame rate, or maximum bitrate. Increasing the Level will increase the available resolutions, bit rates, and frame rate options.
- **Encoding:** You can select between variable or constant bitrate encoding. Bitrate refers to the rate at which the decoded data of the file is processed. Variable Bitrate is preferred in most cases. It allows a higher bitrate to be used in more complex frames of the file, and lower bitrates to be used in less complex areas where the additional data is not needed. Constant Bitrate uses the same bitrate for all frames regardless of their complexity, which can be useful for streaming content, but will tend toward quality degradation in more complex areas of the exported file.
- **Target Bitrate:** When using Variable Bitrate encoding, the software will aim to make this the average bitrate for the entire file. In general, increasing the Target Bitrate increases the quality of the exported file.
- **Max Bitrate:** When using Variable Bitrate encoding, this sets the highest bitrate that will be used for complex portions of the timeline. In general, set the Max Bitrate about 50% higher than your Target for best results.
- **Bitrate:** If you are using Constant Bitrate encoding, there will only be one Bitrate slider, which defines the constant bitrate that will be used.

Audio

- Codec: MP4 export requires the AAC audio format, so this setting cannot be edited
- Channels: HitFilm export uses stereo audio, stored in two channels (left and right).
- Sample Rate: Set the sample rate used by the exported audio. By default, HitFilm will use the same sample rate as the timeline that is being exported. However, if you wish to change it, you can deselect the "From Source" option, and choose a different sample rate from the menu. The sample rate refers to the number of audio samples per second of audio, and is similar to frame rate of a video signal. Higher sample rates don't necessarily bring a perceptible improvement in audio quality, but they can allow for more extensive editing to be done without audible damage to the signal. CD audio uses 44.1

KHz, while digital video typically uses 48 KHz.

• **Bitrate:** The audio bitrate balances the file size and the audio quality. Higher bitrates will give greater fidelity at the cost of larger file sizes. 192 kbps is a typical High Quality setting, while 256 kbps is commonly used by professional AAC audio files for maximum fidelity. In the AAC format, exceeding 256 kbps is not likely to provide perceptible quality increase, though some other audio formats which use less efficient compression methods may benefit from higher bitrate values.

Image Sequence Options

Image sequences have the benefit of exporting one frame at a time, which can save you time in the event of unexpected power loss, as you only need to resume exporting from the most recently rendered frame (with most video formats you would need to start exporting again from the start). Several common image types are provided, including PNG, JPG, BMP and OpenEXR.

Image sequences cannot include audio.

General Options

- **Name:** Enter a name for your preset. This is the name that will be shown in the Presets panel of the Export screen.
- **Format:** The format used by the preset. This option is selected from the New menu at the bottom of the panel, before the preset is made, and cannot be edited here.
- **Comment:** You may add a comment to your preset, to remind you of details of the compression, or when the preset is intended to be used, or other information.

Video

- Format: Select the image format to be used by the exported sequence. PNG and BMP offer high quality images, but larger file sizes. JPG images provide excellent compression, for much smaller files that still offer acceptable image quality. OpenEXR is not intended as a real-time playback format. It is specifically designed to be a lossless, high quality interchange format. OpenEXR is excellent for transferring video between different software. Combined with HitFilm 4 Pro's 16-bit or 32-bit render pipeline, OpenEXR is the best option for maintaining maximum quality, though filesizes are likely to be large.
- **Prefix:** You can enter a prefix that will be used in the name of each image in the sequence. By default the prefix is set to "image", but you can enter any text you wish to use.
 - 1. **Example:** The file names of the exported images will combine the prefix with the image number. This example shows what the image names will look like.

- **Dimensions:** By default the dimensions will be set to From Source, so the dimensions of whatever timeline is being exported will be used. If you wish to override this, and create a preset that will always export to fixed dimensions, you can disable the "From Source" option, and set specific dimensions at which the timeline will be exported.
- Scale Mode: This menu lets you control how the timeline is fitted into the exported frame.
 - 1. **Keep Aspect Ratio** is the default, and prevents the frame from being distorted if the export resolution uses a different aspect ratio from the timeline.
 - 2. **Center** will center the source timeline into the export resolution, without scaling. If the source is larger than your export resolution, it will be cropped to fit. If your source is smaller than the export resolution, black edges will be added.
 - 3. **Ignore Aspect Ratio** will warp the source timeline to fit the size and shape of the export resolution.
 - 4. **Keep Aspect Ratio by Expanding** will increase the scale of the source timeline as required to fill the export resolution, which may result in some cropping of the source timeline.
- **Channels:** If you are exporting to a format that supports alpha channels, such as PNG or OpenEXR, then this option allows you to select which channels are included in the export.
 - 1. **RGB** will export only the color data.
 - 2. **RGBA** includes the color data as well as an alpha channel, to store the transparency data contained in the timeline being exported. If you are exporting to JPG or BMP formats, no alpha channel option will be available, as these formats cannot support alpha channels.
- **Compression:** If you select **PNG format**, this slider will allow you to adjust the amount of compression applied to the image. PNG files are always lossless, so the quality remains the same regardless of the compression level used. However, compressing a lossless file to a smaller file size does required more processing, and will therefore slow things down. Lower values create larger files, but they will process very quickly. Higher values reduce file size, but take longer to process. The default value of 20 strikes a good balance between file size and export time. The **Use Source** checkbox tries to find the best compression value for each image, based on the source file. This can help save space, but will negatively impact export times. If you select **OpenEXR format**, a variety of compression options will be listed.
 - 1. Uncompressed: no compression.
 - 2. PLZ (lossless): This is the default compressor option. A wavelet transform is applied to the pixel data, and the result is Huffman-encoded. This scheme tends to provide the best compression ratio for the types of images that are typically processed at Industrial Light & Magic. Files are compressed and decompressed at roughly the same speed. For photographic images with film grain, the files are reduced to between 35 and 55 percent of their uncompressed size.

- 3. **RLE (lossless):** Differences between horizontally adjacent pixels are run-length encoded. This method is fast, and works well for images with large flat areas, but for photographic images, the compressed file size is usually only between 60 and 75 percent of the uncompressed size.
- 4. ZIP (lossless): Differences between horizontally adjacent pixels are compressed using the DEFLATE compression algorithm. 16 rows of pixels are accumulated and compressed together as a single block. ZIP decompression is faster than PIZ decompression, but ZIP compression is significantly slower. Photographic images tend to shrink to between 45 and 55 percent of their uncompressed size.
- 5. **ZIPS (Iossless):** Like ZIP compression, but operates on one scan line (row) at a time.
- 6. **PXR24 (lossy):** RGB pixel data is converted to luminance and chroma and then differences between horizontally adjacent pixels are compressed similar to the ZIP compressor.
- 7. B44 (lossy): RGB pixel data is converted to luminance and chroma and then split into blocks of four by four pixels. Each block is then compressed into a smaller size. The size of a compressed B44 EXR file is about 25 percent of the uncompressed image and depends on the number of pixels in the image, but not on the data in the pixels. All images with the same resolution and the same set of channels have the same size.
- 8. **B44A (lossy):** Like B44, except that blocks of four by four pixels where all pixels have the same value are compressed even further. For images with large uniform areas, B44A produces smaller files than B44 compression.
- **Quality:** If you select JPG format, this option will be available. By default it is set to **From Source**, but if you wish to customize the quality level used, you can deselect the" From Source" option and manually specify the quality level. Higher values will give better image quality and larger file sizes.
- Color Bit Depth: By default this is set to From Source, and will use the bit depth selected in your Project settings. If you want to override the project settings, so the preset always exports to a fixed bit depth, you can deselect the "From Source" option, and manually select either 16-bit Float or 32-bit Float color depth.

MOV Options

The options for .mov export differ depending on if you are using a Mac or a PC. If you're using HitFilm on a Mac you can access Apple's Quicktime format, with several codecs providing a range of compression options from H.264 to ProRes 4444. The ProRes options are particularly useful for creating high quality files suitable for further editing. On Windows, you can export to MOV using the Cineform codec to create high quality compressed files suitable for further editing outside of HitFilm.

General Options

• Name: Enter a name for your preset. This is the name that will be shown in the Presets panel of the

Export screen.

- **Format:** The format used by the preset. This option is selected from the New menu at the bottom of the panel, before the preset is made, and cannot be edited here.
- **Comment:** You may add a comment to your preset, to remind you of details of the compression, or when the preset is intended to be used, or other information.

Video

- **Codec:** Select the codec to be used for Export. The codec choices differ depending on whether you are running a Mac or a Windows machine.
 - 1. **Mac Codecs:** The **ProRes** codecs provide a range of high quality options, and are popular among professional editors. **AVC/H.264** is suitable when small file size is critical. **Photo-JPEG** is a high quality format which stores each frame of video as a JPEG image, within the .mov container. Note that if you wish to access individual image files after export, you should use the Image Sequence export option.
 - 2. **Windows Codecs:** The **CineForm** codec provides a high quality, high performance file, and it an excellent choice for creating files suitable for further editing.
- Width / Height: By default HitFilm will use the dimensions of the timeline being exported. If you wish to override this, and create a preset that will always export to fixed dimensions, you can disable the "From Source" option, and set specific dimensions at which the timeline will be exported.
- Scale Mode: This menu lets you control how the timeline is fitted into the exported frame.
 - 1. **Keep Aspect Ratio** is the default, and prevents the frame from being distorted if the export resolution uses a different aspect ratio from the timeline.
 - 2. **Center** will center the source timeline into the export resolution, without scaling. If the source is larger than your export resolution, it will be cropped to fit. If your source is smaller than the export resolution, black edges will be added.
 - 3. **Ignore Aspect Ratio** will warp the source timeline to fit the size and shape of the export resolution.
 - 4. **Keep Aspect Ratio by Expanding** will increase the scale of the source timeline as required to fill the export resolution, which may result in some cropping of the source timeline.
- Frame Rate: This defaults to From Source, so the frame rate of whatever timeline you are exporting will be used, and should generally be left there. You can deselect the From Source option and manually select a frame rate, but keep in mind that changing the frame rate will affect the speed at which the video in the exported file plays back.
- **Channels:** If you are exporting to a format that supports alpha channels, such as ProRes 444, then this option allows you to select which channels are included in the export. **RGB** will export only the color data. **RGBA** includes the color data as well as an alpha channel, to store the transparency data

contained in the timeline being exported.

- **Bitrate:** If you select the AVC/H.264 codec, this option will be available. Bitrate refers to the rate at which the decoded data of the file is processed. Higher bitrate settings will provide a higher quality file.
- **Key Frame Interval:** If you select the AVC/H.264 codec, this option will be available. The Key Frame Interval controls the frequency at which key frames will be stored when encoding the footage. Higher values create smaller files, at the expense of image quality and performance. Lower values improve performance and image quality, but also increase file sizes.
- **Quality:** If you select Photo-JPEG codec, this option will be available. It controls the quality of the JPEG compression used to encode each frame of the video. Higher values will give better image quality and larger file sizes.

Audio

- **Codec:** Select the audio codec used by the exported file. **AAC** is a high quality compressed format designed for final playback, **Apple Lossless** and **Uncompressed PCM** are full-quality formats useful for audio editing.
- Channels: HitFilm export uses stereo audio, stored in two channels (left and right).
- Sample Rate: Set the sample rate used by the exported audio. By default, HitFilm will use the same sample rate as the timeline that is being exported. However, if you wish to change it, you can deselect the "From Source" option, and choose a different sample rate from the menu. The sample rate refers to the number of audio samples per second of audio, and is similar to frame rate of a video signal. Higher sample rates don't necessarily bring a perceptible improvement in audio quality, but they can allow for more extensive editing to be done without audible damage to the signal. CD audio uses 44.1 KHz, while digital video typically uses 48 KHz.
- **Bitrate:** The audio bitrate balances the file size and the audio quality. Higher bitrates will give greater fidelity at the cost of larger file sizes. 192 kbps is a typical High Quality setting, while 256 kbps is commonly used by professional AAC audio files for maximum fidelity. In the AAC format, exceeding 256 kbps is not likely to provide perceptible quality increase, though some other audio formats which use less efficient compression methods may benefit from higher bitrate values.

AVI Options [Windows Only]

On Windows you can export to the CineForm codec to create high quality intermediate files suitable for further editing. You can also export to uncompressed AVI or legacy DV codecs.

General Options

• Name: Enter a name for your preset. This is the name that will be shown in the Presets panel of the

Export screen.

- **Format:** The format used by the preset. This option is selected from the New menu at the bottom of the panel, before the preset is made, and cannot be edited here.
- **Comment:** You may add a comment to your preset, to remind you of details of the compression, or when the preset is intended to be used, or other information.

Video

- Codec: Select the codec to be used for Export. CineForm provides a high quality, high performance file, and it an excellent choice for creating files suitable for further editing. Uncompressed provides maximum quality, but very large file sizes. DV NTSC and DV PAL are legacy standard definition formats provided for backward compatibility. NTSC is the SD video standard in America, while PAL is the SD video standard for Europe.
- **Dimensions:** Set the dimensions at which the timeline will be exported. By default these will be set to the dimensions of the selected timeline. You can also tick the box under "From Source" to have the preset automatically use the dimensions of the timeline being exported.
- Scale Mode: This menu lets you control how the timeline is fitted into the exported frame.
 - 1. **Keep Aspect Ratio** is the default, and prevents the frame from being distorted if the export resolution uses a different aspect ratio from the timeline.
 - 2. **Center** will center the source timeline into the export resolution, without scaling. If the source is larger than your export resolution, it will be cropped to fit. If your source is smaller than the export resolution, black edges will be added.
 - 3. **Ignore Aspect Ratio** will warp the source timeline to fit the size and shape of the export resolution.
 - 4. **Keep Aspect Ratio by Expanding** will increase the scale of the source timeline as required to fill the export resolution, which may result in some cropping of the source timeline.
- Frame Rate: This defaults to From Source, so the frame rate of whatever timeline you are exporting will be used, and should generally be left there. You can deselect the From Source option and manually select a frame rate, but keep in mind that changing the frame rate will affect the speed at which the video in the exported file plays back.
- Channels: If you are exporting to a format that supports alpha channels, such as CineForm or Uncompressed, then this option allows you to select which channels are included in the export. RGB will export only the color data. RGBA includes the color data as well as an alpha channel, to store the transparency data contained in the timeline being exported.
- Quality: When the CineForm codec is selected, five different quality settings are available. For most professional level projects, Film Scan 1 or High are the best options. They are suitable for acquisition, post-production, and rendering tasks. Film Scan 2 offers the highest quality, but is overkill for most projects. It might be useful, however, if you must export a file that will required

extreme post-processing. **Medium** gives a smaller file size, while still creating a file suitable for modest post-processing. **Low** should be used when small files are of primary concern, and post-processing is not required.

• Format: Cineform allows you to export using **10-bit YUV** color, or **12-bit RGB** color.

Audio

- Codec: The PCM codec is used for audio in AVI files.
- Channels: HitFilm export uses stereo audio, stored in two channels (left and right).
- Sample Rate: Set the sample rate used by the exported audio. By default, HitFilm will use the same sample rate as the timeline that is being exported. However, if you wish to change it, you can deselect the "From Source" option, and choose a different sample rate from the menu. The sample rate refers to the number of audio samples per second of audio, and is similar to frame rate of a video signal. Higher sample rates don't necessarily bring a perceptible improvement in audio quality, but they can allow for more extensive editing to be done without audible damage to the signal. CD audio uses 44.1 KHz, while digital video typically uses 48 KHz.

4.12. Introducing the Layout Panel

The Layout panel includes quick and precise tools for alignment, for positioning a single layer, or for evenly distributing multiple layers within the frame.



The specific controls which are available will vary based on the current selection.

Orientation 🗥 < 🕒 🗗

The orientation controls at the top of the layout panel enable you to instantly flip or rotate your selection in either direction

- **Mirror Vertical:** Flips the selection around a vertical axis, so the left side of the image becomes the right, and the right side becomes the left.
- **Rotate Counterclockwise:** Rotates the layer 90 degrees to the left, so the right side becomes the top, and the top becomes the left side.

Rotate Clockwise: Rotates the layer 90 degrees to the right, so the left side becomes the top, and the top becomes the right side.

Anchor Points

The top section of the panel features controls for anchor point selection and precisely positioning the layer based on the selected anchor point.



The square array of small boxes on the left of the Layout Panel is the control point selection. You can click any of these points to set that corner or side of the selection as the anchor point from which the selection will be adjusted. When you select multiple layers, there isn't a visible bounding box on the viewer surrounding them all, but the Layout controls still operate based on a bounding box that defines the overall size of the entire selection.

The values on the right show the exact position of the selection on the X and Y axis, and its current exact pixel dimensions. The primary Scale control, in the transform controls for the layer, uses a percentage of the original size. The scale controls in the layout panel use an exact size in pixels instead. The width and height are linked by default, but you can unlink them by clicking the chain icon to their right.

Alignment

The lower half of the Layout panel contains the Alignment and Distribution controls, which allow you to very quickly reposition your selection.

Align To

Align To can instantly reposition the selected layers within the selection, or within the resolution of the Timeline. If you have a single layer selected, Align To Timeline is selected automatically. You can click any of the icons to move the layer in relation to the timeline's resolution.

Align To: Timeline

- Align Left: Aligns the left edge of the selected layer with the left edge of the frame.
- 🖡 Align Horizontally: Centers the selected layer horizontally within the frame.
- Align Right: Aligns the right edge of the selected layer with the right edge of the frame.
- Align Top: Aligns the top edge of the selected layer with the top edge of the frame.
- Align Vertically: Centers the selected layer vertically within the frame.
- In Align Bottom: Aligns the bottom edge of the selected layer with the bottom edge of the frame.

When you have multiple layers selected, Align To Timeline will move all of the selected layers at once, to the alignment you choose, but you can also choose Align To Selection. The software creates an invisible bounding box based on the outermost edges of all selected layers, and you can move the layers within that bounding box.

Align To: Selection

- Align Left: Aligns the left edge of all selected layers with the left edge of the selected layer that is farthest to the left.
- **Align Horizontally:** Centers all selected layers between the left and right edges of the selection.
- Align Right: Aligns the right edge of all selected layers with the right edge of the selected layer that is farthest to the left.
- Align Top: Aligns the top edge of all selected layers with the top edge of the selection.
- Image: Align Vertically: Centers all selected layers between the top and bottom edges of the selection.
- **L** Align Bottom: Aligns the bottom edge of all selected layers with the bottom edge of the selection.

Distribute Objects

The Distribute controls allow you to evenly space multiple layers very quickly, along either a horizontal or vertical axis.

• **Distribute Top:** Spaces the selected layers evenly, based on the top pixel in each layer. The highest and lowest layers included in the selection remain in place, and all other layers will shift vertically to create even spacing.

- **Distribute Vertically:** Spaces the selected layers evenly, based on the center pixel in each layer. The highest and lowest layers included in the selection remain in place, and all other layers will shift vertically to create even spacing.
- **Distribute Bottom:** Spaces the selected layers evenly, based on the bottom pixel in each layer. The highest and lowest layers included in the selection remain in place, and all other layers will shift vertically to create even spacing.
- Distribute Left: Spaces the selected layers evenly, based on the left-most pixel in each layer. The layers farthest to the left and farthest to the right remain in place, and all other layers will shift horizontally to create even spacing.
- **Distribute Horizontally:** Spaces the selected layers evenly, based on the center pixel in each layer. The layers farthest to the left and farthest to the right remain in place, and all other layers will shift horizontally to create even spacing.
- **Distribute Right:** Spaces the selected layers evenly, based on the right-most pixel in each layer. The layers farthest to the left and farthest to the right remain in place, and all other layers will shift horizontally to create even spacing.

4.13. Introducing Scopes

Scopes allow you to precisely monitor the color of your project, to help with making color corrections and ensure that color ranges fall within specified standards. This is important to ensure that colors are accurately reproduced when the finished program is broadcast later. Scopes are important because they are always accurate, no matter what display you use. The actual colors in your video can vary based on the display they are viewed on, and how the color of that display is calibrated. But scopes will always give you accurate color info, to ensure that the colors fall within established standards regardless of the hardware used to make color adjustments.

There are four types of scopes available: a **Histogram**, an **RGB Parade**, a **Vectorscope** (which gives scopes its names), and a **Waveform** monitor.



Scopes can be accessed two different ways, through the Scopes panel, and through the Control panel of individual layers.

RAM Previews are always created using 8-bit color. If you are working in a project that uses 16-bit or 32-bit color, but have a RAM preview rendered for the current timeline, then the scopes will display data for the 8-bit color in the RAM preview, and not the full 16-bit or 32-bit range of the source.

The Scopes Panel EXPRESS ADD-ON

The Scopes panel gives you color values for the output of your timeline. The readouts of the scopes panel are based on the combined color values of all layers on the timeline at the current playhead position.

The layout of the scopes can be changed using the buttons at the top right of the panel. You can focus on a single scope, or set up any combination of two, three or four scopes.

At the top of each scope in the panel, the current scope name is shown in a menu. You can open the menu to change which type of scope is shown.

Each scope also has properties that can be accessed through the cog icon, and which vary based on the type of scope being used.

Scopes Effects EXPRESS ADD-ON

Scopes can also be applied to individual video clips or layers, to monitor the color information for that specific layer. The Scopes folder, in the Effects panel, contains all four types of scopes, which can be applied in the same fashion as any other effect. When used as effects, the scopes readout is based on the color values of the specific layer or video clip they are applied to. This can be useful to evaluate the colors of each layer before they are combined into the final readout shown in the Scopes panel.

The Four Types of Scopes

There are four types of scopes available. Each gives a different readout of of your layer, so you can evaluate it from several directions. Each type of scope also has unique properties to control what information is displayed. The cog icon at the top right of each scope gives access to the properties for that scope.

Histogram



The histogram displays a readout of the tones in your image. The tones range from pure black on the left to pure white on the right. The height of the graph indicates the relative frequency of that specific tone in the image.

The Properties for the Histogram contain the following options.

- Mode: Select the color information that is displayed in the scope.
 - 1. Luminance: Displays the luminance levels of the overall image in a greyscale graph.
 - 2. RGB: Shows the red, green, and blue channels simultaneously, as colored overlays
 - 3. **RGB Parade:** Shows the red, green, and blue channels simultaneously, as individual readouts in a vertical stack
 - 4. Red: Shows only the red channel
 - 5. Green: Shows only the green channel
 - 6. Blue: Shows only the blue channel
 - 7. Alpha: Shows the levels of the alpha channel of the image
 - 8. **CbCr:** Shows the blue chroma difference and red chroma difference channels of the YCbCr color space. The Y value is Luminance, which can be selected separately
 - 9. **CbCr Parade:** Shows the blue chroma difference and red chroma difference channels of the YCbCr color space, as individual readouts in a vertical stack
 - 10. **Cb:** Shows only the blue chroma difference channel
 - 11. Cr: Shows only the red chroma difference channel
- Analysis Downsample: Adjusts the precision of the readout. Lower sample rates are faster, but less
 accurate.

- Color Space: Select between various color standards, so you can ensure your content meets the color specifications required
 - 1. Rec. 601: The color standard for standard definition (SD) footage
 - 2. Rec. 709: The color standard for high definition (HD) footage
 - 3. Rec 2020: The color standard for ultra high definition (UHD) footage
- Analyse Using: select whether the footage is analysed using the CPU or GPU

Parade



The Parade displays a readout of the contents of each color channel in your image. Each channel is shown individually, in sequence. Whenever "parade" is used in regard to a scope, it indicates that each channel will be shown individually, one after another.

In each channel of the parade scope, the left to right axis of the graph indicates the image from left to right. So the colors present on the left side of the image will be shown on the left side of the scope. The vertical axis of the graph indicates the intensity of that color channel in that area of the image.

In the image above, notice that the red circle is on the left side of the viewer. And when you look at the red channel of the scope, a spike of high red values appears on the left side of the graph. Compare that to the blue circle, which is on the right side of the viewer. And in the blue channel of the parade, high blue values are shown on the right side of the graph.

The Properties for the Parade contain the following options.

- **Mode:** Select the color information that is displayed in the scope.
 - 1. RGB: Shows the red, green, and blue channels simultaneously, as colored overlays
 - 2. **YCbCr**: Shows the luminance (Y), blue chroma difference (Cb) and red chroma difference(Cr) channels of the YCbCr color space.

- **Direction:** By default, the parade displays values across the image from left to right. The direction control allows you to change this, so that the scope is mapped across the image in a different direction. Setting the Direction to 90 degrees, for example, will map the top of the image to the left edge of the scope, and the bottom of the image to the right edge of the scope.
- **Brightness:** Manipulates the brightness of the parade readout. Increasing or decreasing the brightness of the parade may make it easier to read in some situations.
- Analysis Downsample: Adjusts the precision of the readout. Lower sample rates are faster, but less accurate.
- **Color Space:** Select between various color standards, so you can ensure your content meets the color specifications required
 - 1. Rec. 601: The color standard for standard definition (SD) footage
 - 2. Rec. 709: The color standard for high definition (HD) footage
 - 3. Rec 2020: The color standard for ultra high definition (UHD) footage



Vectorscope

The Vectorscope provides hue and saturation data for your image. Hue is represented circularly, as a color wheel. Saturation is graphed along the radius. The more saturated a color is, the closer to the outside of the circle it will be graphed. The six color points around the perimeter of the circle represent the standard color bars used in vide, and can be used for reference. The diagonal line represents skin tones, to make it easier to color correct your footage for accurate color.

The Properties for the Vectorscope contain the following options.

- **Brightness:** Manipulates the brightness of the vectorscope readout. Increasing or decreasing the brightness of the parade may make it easier to read in some situations.
- Analysis Downsample: Adjusts the precision of the readout. Lower sample rates are faster, but less accurate
- Color Space: Select between various color standards, so you can ensure your content meets the color specifications required
 - 1. Rec. 601: The color standard for standard definition (SD) footage
 - 2. Rec. 709: The color standard for high definition (HD) footage
 - 3. Rec 2020: The color standard for ultra high definition (UHD) footage
- Skin Line: toggles the skin tone line on and off. By default the skin line is on, but you can hide it using this option, if you wish.
- Standard Color Bars: toggles the color bar indicators on and off. By default they are on, but you can hide them using this option, if you wish.



Waveform

The Waveform displays a readout of the contents of the current frame. The left to right axis of the graph indicates the image from left to right, in a similar fashion to the Parade. So the colors present on the left side of the image will be shown on the left side of the scope. The vertical axis of the graph indicates the intensity of that color channel in that area of the image.

The Properties for the Waveform contain the following options.

- Mode: Select the color information that is displayed in the scope.
 - 1. **RGB:** shows the red, green, and blue channels simultaneously, as colored overlays
 - 2. **YCbCr:** shows the luminance (Y), blue chroma difference (Cb) and red chroma difference(Cr) channels of the YCbCr color space.
- **Direction:** By default, the waveform displays values across the image from left to right. The direction control allows you to change this, so that the scope is mapped across the image in a different direction. Setting the Direction to 90 degrees, for example, will map the top of the image to the left edge of the scope, and the bottom of the image to the right edge of the scope.
- **Brightness:** Manipulates the brightness of the waveform readout. Increasing or decreasing the brightness of the waveform may make it easier to read in some situations.
- Analysis Downsample: Adjusts the precision of the readout. Lower sample rates are faster, but less accurate
- **Color Space:** Select between various color standards, so you can ensure your content meets the color specifications required
 - 1. Rec. 601: The color standard for standard definition (SD) footage
 - 2. Rec. 709: The color standard for high definition (HD) footage
 - 3. Rec 2020: The color standard for ultra high definition (UHD) footage

4.14. History & Undo/Redo

Everything you do in HitFilm is logged, so that you can always undo any changes or mistakes, even over multiple steps.

Undo & Redo ^つ C

You can undo and redo your actions using the undo/redo buttons at the top-left of the screen. This steps through your actions one at a time. You can also use the Ctrl+Z (undo) and Ctrl+Y (redo) shortcuts.

Hovering the mouse over the buttons will display the next action to be affected.

If you undo several steps and then perform a new action, you will not then be able to redo back to your project's earlier state.

History

A more powerful way to control your actions is to use the History panel.

<	CONT	ROLS	HISTORY	TEXT			
<empty></empty>							
Insert Mask							
Toggle Property Animation							
Edit Path Points							
Move KeyFrame(s)							
Edit Path Points							
Set In/Out Points							
Insert Layer							
Move Layer(s)							
้วเ	Jndo	C Red	D				

The history panel shows a chronological list of all your actions, with your most recent at the bottom. You can undo and redo one step at a time using the buttons at the bottom of the panel.

Clicking on an action in the list will revert instantly back to that state. You can continue to click in the action list to jump to different points. This is a great way to instantly compare the state of the project before and after making a series of changes.

If you jump back several steps in the action list then perform a new action, any subsequent actions in the list will be permanently lost.

You can change the number of actions that the software will log in Options.

4.15. Pre-Rendering

HitFilm uses GPU acceleration and intelligent caching to maximize performance across a wide range of hardware. However, some intensive visual effects will always be too complex to render in real time.

Pre-rendering creates a full quality version of a composite shot or video asset, providing faster performance. This is particularly useful when using embedded composite shots or using composite shots on the editor, as you can maintain fast performance regardless of the complexity of the timelines involved.

You can adjust pre-render storage and render settings in Options.

Creating Pre-renders

To create a pre-render, right-click an asset in the Media panel and choose Pre-Render > Make Pre-Render(s) from the asset's menu. You can also choose Make Pre-Render from a layer's menu on a timeline.





D This progress wheel indicates how far along the process of creating a pre-render has come.

This play icon replaces the progress wheel when the pre-render is complete, and indicates a completed pre-render is ready for use in playing back that asset.

Pre-rendering is carried out in the background, so that you can keep on working while pre-renders are created. You can keep track of pre-renders in the Processor panel, which can be turned on in the workspaces menu.

Once a pre-render is complete it will be used in place of the original on all timelines. This also enables a composite shot to display frame thumbnails on the editor timeline.

Invalidating Pre-Renders

Making any changes in a pre-rendered composite shot will cause the pre-render to be invalidated. Therefore it is best to use the pre-rendering system once you have finished work on a composite shot, or when you do not expect to be making regular changes.

Processor

The Processor panel can be used to manage your pre-renders. It shows all pre-renders currently being generated, and a progress bar for visual reference of how far along the render has progressed. It also provides controls to pause, resume, and cancel any pre-renders being processed.

4.16. Third Party Plugins

HitFilm Pro

HitFilm Pro supports a wide range of plugins offered by third party developers, in the OpenFX format, and select plugins in the After Effects format.

OpenFX

HitFilm Pro is compliant with OpenFX version 1.3, and includes OpenGL rendering support. Compatible OpenFX plugins from other developers can be used inside HitFilm Pro. When you install compatible OpenFX plugins, they will be listed in the Effects library alongside HitFilm's built-in effects.

Note that some developers of OpenFX plugins restrict them to specific host platforms. If you are not seeing your installed OpenFX plugins appearing inside HitFilm we recommend contacting the manufacturer of the plugin.

More information on OpenFX can be found at http://openeffects.org/

If you wish to develop OpenFX plugins for HitFilm please contact us at info@hitfilm.com

After Effects Plugins

Only select plugins developed for After Effects are supported by HitFilm. The supported plugins are:

- Video Copilot Element 3D
- Video Copilot Saber
- Video Copilot Orb
- Video Copilot Optical Flares
- Video Copilot Heat Distortion
- Red Giant Trapcode Particular

No other After Effects plugins are supported at this time.

Installing After Effects plugins

The easiest way to install After Effects plugins is to install After Effects first, and then install the plugins. If you don't have an After Effects license, installing the trial version will work. They will then show up in HitFilm

Pro 14 and later. If you don't have AE, and prefer not to install the demo, you can use the custom install option in the installer, and install the plugins to the appropriate path:

- Windows: C:\Program Files\Common Files\AE\Plugins
- Mac: /Library/AE/Plugins

Trapcode Particular does currently support a custom install option. So, for Trapcode Particular, you must install AE first in order to use the plugin in HitFilm Pro.

HitFilm Express

HitFilm Express does not support OpenFX plugins from third parties, with the following exceptions:

- Boris Mocha HitFilm is available in the Mocha HitFilm add-on pack.
- Boris 3D Objects is available in the Boris 3D Objects add-on pack.

No other third party plugins can be used in the Express version of HitFilm.

4.17. Ignite Pro: HitFilm Plugins

Ignite Pro is a collection of over 150 HitFilm effects which can be installed as plugins into third party video editing software. So if you wish to access HitFilm effects outside of HitFilm, Ignite Pro is available separately and will allow you to install many HitFilm effects directly into your editor of choice.

The plugins mean that you can choose how, where and when you work with HitFilm technology. If you want to use the effects inside of HitFilm, Ignite is not required, but if you have a third party editor that you are already comfortable with, Ignite allows you to access HitFilm effects directly inside of that software.

Current compatible hosts include:

- Premiere Pro CC
- After Effects CC
- Vegas Pro 16, 17
- Final Cut Pro X
- Motion 5
- DaVinci Resolve 14, 15
- Sony Catalyst Edit 2017
- EDIUS 9
- NUKE 10
- Avid Media Composer 8

The plugins are a subset of HitFilm Pro's effects and they function in very similar ways. Some host platforms have limitations compared to using the effect directly inside HitFilm Pro – for example, Premiere Pro cannot use effects which include a layer picker and only After Effects includes a 3D camera similar to HitFilm's. Due to these limitations, the exact number of Ignite effects available within each host program will vary.

Details on specific effects can be found in the Visual Effects section.

4.18. Keyboard Shortcuts

Many tools and functions in HitFilm can be selected or accessed using keyboard shortcuts. Getting familiar with the keyboard shortcuts can greatly speed up your workflow. If you prefer to use your own shortcut settings, rather than the defaults, any shortcut can be edited to suit your preferences.

The Keyboard Shortcuts editor can be accessed at **File > Options**, then clicking the **Shortcuts** tab. Additional details on keyboard shortcuts is available on the <u>Shortcuts Options</u> page of this manual.

To edit a shortcut, click on the current key combo to select it, then type in the new key combo you wish to use.

To the right of each shortcut is a Reset button, which can be used to reset that shortcut to its default setting. At the bottom of the Shortcuts tab is a Reset All Shortcuts button, which will reset all shortcuts to the defaults listed below.

General

- Undo Ctrl+Z
- Redo Ctrl*+*Y
- New Project Ctrl+N
- Open Project Ctrl+O
- Save Project Ctrl+S
- Save As Ctrl+Alt+S
- Exit Alt+F4
- Delete Del
- Rename F2
- Cut Ctrl+X
- Copy Ctrl+C
- Paste Ctrl+V
- Duplicate Ctrl+D
- Select All Ctrl+A
- Reset Ctrl+R
- Create New Composite Shot Ctrl+Shift+N
- Create New Plane Ctrl+Shift+A
- Import Media Ctrl+O
- Switch to Home Screen Ctrl+1

- Switch to Project Screen Ctrl+2
- Switch to Edit Screen Ctrl+3
- Switch to Export Screen Ctrl+4

Common Timeline

- Set In Point I
- Set Out Point O
- Set In and Out Points to Content P
- Set In and Out Points to View (no default)
- Move Playhead to Start of Timeline Home
- Move Playhead to End of Timeline End
- Jump to Time Ctrl+J (highlights current time indicator)
- Play/Pause Space
- RAM Preview Alt+L
- Previous Frame ,
- Next Frame .
- Jump Back by 10 Frames Shift+,
- Jump Forward by 10 Frames Shift+.
- Previous Edit Point Page up
- Next Edit Point Page down
- Increase Timeline Scale Ctrl+Shift+=
- Decrease Timeline Scale Ctrl+-
- Scroll to Playhead Ctrl+Home
- Previous Keyframe Alt+,
- Next Keyframe Alt+.
- Add/Remove Keyframe Alt+T
- Slice Selected Objects/Layers Ctrl+Shift+D
- Move Playhead to In Point Shift+I
- Move Playhead to Out Point Shift+O
- Remove Attributes Shift+CTRL+X
- Paste Attributes Shift+CTRL+V
- Remove Effects Option+CTRL+V
- Fit to Frame (no default)
- Fit to Frame Width (no default)
- Fit to Frame Height (no default)
- Center in Frame (no default)
- Remove All Color Labels From the Selection 0
- Apply Color Label 1 to the Selection 1

- Apply Color Label 2 to the Selection 2
- Apply Color Label 3 to the Selection 3
- Apply Color Label 4 to the Selection 4
- Apply Color Label 5 to the Selection 5
- Apply Color Label 6 to the Selection 6
- Apply Color Label 7 to the Selection 7
- Apply Color Label 8 to the Selection 8
- Apply Color Label 9 to the Selection 9

Editor Sequence Timeline

- Select Tool V
- Hand Tool H
- Snap On/Off Shift+S
- Slice Tool C
- Slip Edit Tool Y
- Slide Edit Tool U
- Ripple Edit Tool R
- Roll Edit Tool E
- Ripple Delete Alt+Delete
- Make Composite Shot Ctrl+M
- Rate Stretch Tool S
- Link Video and Audio Clips CTRL+\
- Unlink Video and Audio Clips Shift+CTRL+\

Composite Shot Timeline

- Select Tool V
- Hand Tool H
- Slice Tool C
- Snap On/Off Shift+S
- Open New Layer Menu Ctrl+Alt+N
- New Plane Layer Ctrl+Alt+A
- New Camera Layer Ctrl+Alt+C
- New Light Layer Ctrl+Alt+L
- New Grade Layer Ctrl+Alt+G
- New Text Layer Ctrl+Alt+T
- New Point Layer Ctrl+Alt+P
- Move Layer(s) to Playhead (No Default)
- Make Composite Shot Ctrl+M

• Rate Stretch Tool – S

Trimmer

- Set In Point I
- Set Out Point O
- Previous Frame ,
- Next Frame .
- Move Playhead to Start Home
- Move Playhead to End End
- Move Playhead to In Point Shift+I
- Move Playhead to Out Point Shift+O
- Play/Pause Space
- Toggle Loop Playback Ctrl+L
- Shuttle Left J
- Shuttle Right L
- Shuttle Stop K
- Insert Media on the Current Timeline B
- Overlay Media on the Current Timeline N

Viewer Panel

- Select Tool V
- Hand Tool H
- Text Tool T
- Rectangle Mask Tool R
- Ellipse Mask Tool E
- Freehand Mask Tool F
- Orbit tool B
- Set Mask Point(s) to Linear Ctrl+Alt+Shift+L
- Set Mask Point(s) to Curved Ctrl+Alt+Shift+C
- Toggle Full Screen Preview Alt+CTRL+F
- Move Position Left by 1 Pixel Left Arrow
- Move Position Right by 1 Pixel Right Arrow
- Move Position Up by 1 Pixel Up Arrow
- Move Position Down by 1 Pixel **Down Arrow**
- Move Position Left by 10 Pixels Shift+Left Arrow
- Move Position Right by 10 Pixels Shift+Right Arrow
- Move Position Up by 10 Pixels Shift+Up Arrow
- Move Position Down by 10 Pixels Shift+Down Arrow

5. Editing



HitFilm includes non-linear editing tools for constructing your short films, documentaries, music videos and features. The editor is perfectly integrated with the compositing features.

The editor timeline is track-based, with each track containing multiple clips (videos, image, audio or composite shots).

The basic editing workflow in HitFilm is as follows:

- 1. Start a new project
- 2. Import your media files
- 3. Organize and assess media
- 4. Trim media using the trimmer
- 5. Add clips to the timeline
- 6. Use the timeline tools to further refine the edit
- 7. Convert clips to composite shots for complex VFX work

- 8. Adjust audio levels
- 9. Add transitions and effects
- 10. Export the finished project

You will develop your own preferred editing workflow, if you don't already have one, as you become familiar with HitFilm.
5.1. Importing Files

In order to use media files in your project, you first need to import the files you want to use. Once imported, they become assets in the Media panel, where they can be accessed and re-used as many times as you want.

Importing media to your project does not alter or affect the original source files on your computer, as HitFilm only references the original files. Therefore removing a clip from a timeline or from the Media panel does not remove it from your computer. Similarly, duplicating a clip in a HitFilm project does not create multiple copies of the source, as they all reference the same source.

Therefore, if you wish to transfer a project to another computer you must make sure all project media is also included.

The exception to this rule is with 3D objects, which are imported and stored in the project file. For more information see **Importing 3D Models**.

Importing Files

The Media panel is where you import files into HitFilm, and where you store and organize the files which have been imported.



To import video. audio, or image files into HitFilm, do one of the following:

- **Import Button:** Click the Import button in the media panel to open a file browser window, where you can select the file(s) to import.
- **Drag and Drop:** If you already have a file browser open to the location of the files you want, you can drag and drop the files from Windows file browser into the Media Panel of HitFilm.
- **Keyboard Shortcut:** Press the keyboard shortcut **SHIFT+CTRL+O** to open a file browser window, where you can select the file(s) to import. On a Mac, the shortcut is **SHIFT+CMD+O**.

Importing Other Formats



Clicking the triangular arrow to the right of the Import button displays additional import options.



- **Media:** This is the option accessed by clicking the Import button. Used for importing videos, individual images and audio.
- **Image Sequence:** This option is used for importing sequential images stored in a single folder. Images should be numbered sequentially, in frame order. This command converts all images contained in the sequence into a single media object, which is listed in the media panel as a video file.
- **Composite Shot:** Use this option for importing HitFilm projects (.hfp) and composite shot (.hfcs) files. See <u>Saving Composite Shots</u> for more details.
- **3D Camera Tracking Data:** Allows you to import camera tracking data in the .ma format, from software including Boujou, SynthEyes, PFtrack and more. This will create a new composite shot containing the 3D camera and point cloud.
- **3D Model:** This is for importing 3D objects, which can then be manipulated on the HitFilm timeline. See <u>Importing 3D Models</u> for more information.
- **3D Model Animation:** Choose this option for importing animation files, in the .abc (Alembic) or .fbx (Filmbox) formats. These are used in combination with an associated 3D model.

Once an item is in the Media panel you can customize its properties by clicking the gear icon to its right, or choosing Properties from its menu.

Importing Templates

Templates are a special type of composite shot, which allow you to specify which elements of the composite shot can be edited. Multiple templates are installed into the software, but they remain hidden until they are imported into the software from the media panel. This way, only the templates you are using appear in the media panel.

• **Templates Button:** Click this button to view a list of the installed templates, and select specific templates for import.

For more information on creating your own templates, see Creating Templates with Composite Shots.

Syncing Video and Audio

If your video and audio are recorded in separate files, you can sync them in the HitFilm media panel. Select the video file in the media panel, then hold CTRL (CMD on Mac) and select the associated audio file. Rightclick on either of the files, and select "Merge Audio/Video." HitFilm will compare the audio in both files, synchronize them, then replace the original audio in the video with the audio file you selected. A new synchronized file will be created, and can then be edited on the timeline. For more info see <u>Audio and Video</u> <u>Sync</u>.

5.1.1. Supported Formats

Import

The following formats are supported by HitFilm for import.

Video

- AVCHD (M2T, MTS, M2TS)
- AVI (including 10-bit and 12-bit GoPro Cineform) (Windows only)
- DV & HDV
- MP4 (AVC/H264 & AAC)
- MPEG-1 & MPEG-2 (TS, PS, MPE, MPG, MPEG, M2V)
- MXF (DVCPro HD)
- MOV (including 10-bit and 12-bit Pro-Res and Cineform)
- WMV

Audio

- AAC
- MP3
- M4A
- MPA
- WAV
- WMA
- AC3

Images & Image Sequences

- BMP
- GIF
- JPG
- PNG
- TIFF
- OpenEXR (including 32-bit)

3D

• LWO

- 3DS
- OBJ
- ABC (Alembic animation)
- FBX (models and animation data)

Project

- HFP (HitFilm Project)
- HFCS (HitFilm Composite Shot)
- IMERGE (Imerge Pro 5 Project)
- VEGFX (VEGAS Effects Project)
- VEGIMG (VEGAS Image Project)

Camera Data

• MA (Maya formatted)

Export

HitFilm supports export in the following formats:

Export

- AVI (Cineform, Uncompressed, PAL DV, NTSC DV) (Windows only)
- Quicktime (Cineform) (Windows only)
- **Quicktime** (ProRes, AVC, Photo-JPEG) (Mac only)
- OpenEXR
- **MP4** (AVC/H264 & AAC)
- Image sequence (PNG, JPG, BMP)

5.1.2. Relinking Offline Files

If files become offline while you are working on a project they will be marked in the Media panel, in the Viewer, and on any timelines where they are in use.

You will also be notified of any offline files when you open a project.

If a file goes offline you won't lose anything from your project as long as you are able to relink it, even if the file has been used extensively on your timelines.

What Causes a File to Go Offline?

When you import a file to HitFilm a reference to the file is created in the form of a media asset. This reference tells HitFilm where to find the source file on your hard drive. Anything you do with the media asset in HitFilm will not affect the original source file – so you can delete, trim, cut and apply any number of effects to the media asset without altering the file on your hard drive.

HitFilm relies on being able to find the source file in its original location. If the source file is moved, deleted or renamed, HitFilm will not be able to find the file and the associated media will be marked as offline in your projects. If the file is on an external drive and the drive is unmounted, or if you change the names of folders in the file path to the file's location, this will also cause the file to be marked as offline.

In the **Media Panel**, offline files will be displayed as shown below.



If one of the files used on your timeline goes offline, you will see it indicated on the viewer by a red box, as shown below.



If a file goes offline, all references to it on the timeline will remain intact, and continue to hold the exact details of which portion of the media was used, and when during the timeline's duration it appears. There will be an [Offline] suffix added after the file's name on the timeline until the file is relinked.

Relinking

There are several ways to relink a file, depending on the reason for the file going offline.

Restoring the Source File

Often the easiest way to relink a file is to restore the source file to its original state.

- If the file has been accidentally moved, return it to its original location.
- If it has been renamed, change the name back to the original.
- If it's been accidentally deleted, restore it from the Recycle Bin.
- If the driver containing the file has been disconnected, reconnect the drive to your computer.

After a file has been restored to its original location on your computer, HitFilm will automatically detect it and

bring the media asset back online.

Relinking Individual Files

Offline files can be relinked from the Media panel from the offline asset's menu.

Clicking the **Relink** button displays a file browser which can be used to locate the file's new location.

Batch Relinking

When you open a project it will be checked for any offline files. If any are found they will be listed in the offline files dialogue.

You can start relinking the offline files in the list by double-clicking on them. This will display a standard file browser which you can use to locate the file's new location.

Each time you relink a file in the list HitFilm will check the other files to see if they can also be found at the new location. Therefore if you have deliberately moved an entire folder of video files you can relink them all by simply relinking just one.

5.1.3. Replacing Media

Assets in the Media panel can be instantly replaced with another asset. This process will ripple out through the project, replacing all instances of the original asset with the replacement asset. This can be very useful if need to use placeholder images or video to assemble a rough edit, for example, and then replace the images in the edit once the final versions are available.

To replace, on Windows hold the **Ctrl+Shift** keys or the **Alt** key and drag the replacement asset onto the original asset in the Media panel. On Mac use the **Cmd+Option** key combination while dragging.

Note that this feature supports the replacement of image, audio and video assets only.

5.1.4. Importing Project Files as Media

HitFilm can import composite shots from other HitFilm Projects, as well as project files created by certain other programs. Supported project formats include:

- HitFilm Composite Shots (.hfcs)
- Imerge Pro Project files (*.imerge)
- VEGAS Effects Project files (*.vegfx)
- VEGAS Image Project files (*.vegimg)

Importing HitFilm Composite Shots or VEGAS Effects Project Files

In structure, HitFilm composite shots and VEGAS Effects project files are essentially the same. Thus, the process of importing them into HitFilm is also the same. To import a composite shot:

- 1. In the Media panel, locate the **Import** button and click the triangle next to it.
- 2. Select **Composite Shot** from the import menu that appears. This opens a file browser window.
- 3. Navigate to and select the .hfcs or .vegfxcs file that you wish to import.
- 4. The composite shot will be imported, and appear in the Media panel.

Importing a Composite Shot with Embedded Composite Shots and Associated Media

At times you may need to import a composite shot that contains other embedded composite shots, or which contains multiple media files that would be laborious to relink manually. This can be done as well, by importing the composite shot directly from its original project, without exporting first.

To import a composite shot with all embedded composite shots and media:

- 1. In the Media panel, locate the **Import** button and click the triangle next to it.
- 2. Select **Composite Shot** from the import menu that appears. This opens a file browser window.
- 3. Navigate to and select the .hfp or .vegfx project file that contains the composite shot you want to import.
- 4. A window will open listing all of the composite shot timelines contained in that project. Select the one(s) that you want to import using the checkboxes on the left.



5. Click **Import**, and a new folder will be created in the Media panel. All assets required for the composite shot will be imported and placed in that folder. This includes media files and other composite shots embedded in the composite shot you chose for import.

Further information is available in <u>Saving & Loading Projects</u>.

Importing Project Files from Imerge Pro and VEGAS Image

Imerge Pro project files can be imported into HitFilm, where they can be used as still images. By importing the project file directly, you retain full editing capabilities over all separate components of the image. In structure, Imerge Pro project files and VEGAS Image project files are essentially the same. Thus, the process of importing them into HitFilm is the same as well.

To import an Imerge Pro or VEGAS Image project file:

- 1. In the Media panel, click the **Import** button.
- 2. Navigate to and select the .imerge or .vegimg file that you wish to import.
- 3. The project will be imported, and appear in the Media panel.

Opening project files from HitFilm into Imerge Pro or VEGAS Image

Project files imported into HitFilm behave like still images. They can be added to any timeline as a single

object, and edited using any of the tools in HitFilm. But, you can also re-access the project itself, in Imerge Pro, to edit the layers, masks, or effects used in the Imerge Pro Project.

To open an Imerge pro project from HitFilm, back into Imerge Pro:

- 1. In the HitFilm Media panel, right-click the .imerge file to access its contextual menu
- 2. Select **Open in Imerge...** from the menu.
- 3. Imerge Pro will launch, and the project will be opened.
- 4. After making any desired changes in Imerge, Save the project again, to update the saved version on your hard drive.
- 5. Close Imerge, and switch back to HitFilm. The contents of the project will be updated into HitFilm, so your changes are now visible.

5.2. Organizing Media

Organizing Assets in the Media Panel

The Media Panel features several tools for keeping your imported media organized, even in complex projects.



Listing Modes

es 📃 📕

The Project Media listing can be switched between a list view or a thumbnail view. Thumbnails can be useful for identifying videos and images at a glance, while the list view allows more items to be visible at once.

Searching Project Media

If you are looking for a specific asset and know its name, you can type it into the Search bar. As you type the list will be dynamically updated to display all matching results.

Arranging and Grouping \downarrow^{A}_{Z}

The assets in your Media panel can by arranged by name or by file type, and can be grouped by folder or media type. The order of the list can be flipped using the sort button.

- Arrange By: Choose how the files are alphabetized.
 - **Name:** Alphabetizes all project media by file name.
 - File Type: Alphabetizes the project media by file type, grouping each file type together.
- Group By: Choose how the project media will be organized.
 - **Folder:** Uses folders manually created by the user, so you can set up any organization you prefer. You can create folders using the Folder button at the bottom of the media panel.
 - Media: Uses a default folder system to organize each type of media into a separate folder.
- Sort: The Sort button toggles the list between an A-Z listing, and a Z-A listing.

Creating and Using Folders

You can create folders within the Media panel. Specific assets can then be moved into folders, allowing you to create your own organization of assets.

Note that **Group By: Folder** must be selected for your own folders to be visible.

- Folder Button: A new folder can be created by clicking the Folder button.
- **Drag and Drop:** You can also drag an asset or multiple assets onto the **New Folder** button to create a new folder and automatically move the assets inside.
- **Renaming Folders:** Folders and assets can be renamed from their right-click menu or by pressing **F2**.

Syncing Video and Audio

If your video and audio are recorded in separate files, you can sync them in the HitFilm media panel. See <u>Audio and Video Sync</u> for instructions and more information.

Organizing Media on the Timeline

Color Labels

Media on your timelines can be organized using color labels. You can apply a color label to any item on any timeline, which is a useful way to quickly identify specific classes of media at a glance. For example, you could color all point layers in a composite shot one color, or color all the clips associated with a specific scene on the Editor one color. You have full control over the color labels, so you can use them to organize your clips however you like.

Color Labels on the Editor

You can add a color label to any video clip, still image, audio clip, or other asset on the editor timeline.

- 1. Select the item or items you want to apply the color label to.
- 2. Right-click on the selection to open the contextual menu, and position the cursor on Label to open the submenu of color labels.
- 3. Click on the color you wish to use to label the selected items.

Color Labels in Composite Shots

You can add a color label to any layer in a composite shot.

- 1. Select the layer or layers you want to apply the color label to.
- 2. Right-click on the selection to open the contextual menu, and position the cursor on Label to open the submenu of color labels.
- 3. Click on the color you wish to use to label the selected items.

Editing Color Labels

There are 16 separate color labels available in HitFilm. By default, the first 9 are assigned numbered shortcuts. Select any timeline object and press a number from 1 to 9 to immediately apply the corresponding color label to that item. Pressing 0 will remove the color label from the selected item.

- **1 through 9:** Pressing any number from 1 to 9 while a timeline item is selected will apply the corresponding color label to the selection.
- **0**: Pressing 0 while a timeline item is selected will remove the color label from the selection.

You can customize the color used for each of the color labels in the Options panel of HitFilm. In addition to the standard process of opening the File menu to access the options, the Label options can be accessed

from the timeline as well.

- 1. Right-click any timeline object to open the Contextual menu, and position the cursor on **Label** to open the submenu of color labels.
- 2. Choose Edit Labels... from the menu.

In addition to being able to change the name or color associated with each label, you can also set defaults in the <u>Options</u>, if you wish to label media by type.

Defaults

If you want to use labels to identify specific kinds of media in your projects, you can setup defaults here, so you don't need to apply labels individually to each timeline item. There is a listing for each kind of timeline item, so you can customize each one to your own preference.

To set a default:

- 1. Locate the kind of item to which you want to apply a label.
- 2. Open the menu next to that item.
- 3. Select the color label you wish to use.
- 4. Click OK at the bottom right of the Options window to apply your changes.

Once this is done, each time you add a new item to any timeline of that kind, it will automatically receive your chosen color label.

Labels

Each of the 16 color labels has a name and a color swatch. If you want to use your own customized names or colors, you can easily do so.

- **Name:** To edit the name of a label, double-click the existing name, then type in the new name you want to use.
- **Color:** To edit the color of a label, double-click the color swatch to open the color picker. Select the new color you want to use, and click OK to close the color picker.

5.3. Audio and Video Sync

Audio Sync

If your video and audio are recorded in separate files, you can synchronize them in the Media Panel. This process creates a new merged file, making it very easy to keep the sync locked while editing. It works by comparing the audio recorded by the camera into the video file with the audio recorded separately, and synchronizing the two, then removing the camera audio so only the clean audio file remains. Therefore, it is necessary that you record audio with your camera while filming, so the sync feature has something to work from to synchronize the dedicated audio file.

HitFilm allows you to synchronize a single pair of files, or to sync multiple files at once. The process for each is explained below.

Synchronizing A Single Pair of Files

Select the video file in the Media Panel, then hold **CTRL** (**CMD** on Mac) and select the associated audio file. Right-click on either of the files, and select "Merge Audio/Video" as shown in the image below.



HitFilm will compare the audio in both files, synchronize them, then combine the video frames with the separate audio file you selected. A new synchronized file will be created, and can then be edited on the timeline. The newly created file uses the same name as the original video, and appends a (Merged) tag to the name for differentiation, as shown in the below image.



This process does not create a new media file on your drive. It creates a referenced file, referencing the video stream of one file and the audio stream of the other, which requires very little storage space on your hard drive. If you wish to create a new standalone video file containing the synced audio and video, then you can add the Merged file to the timeline and export it.

Batch Synchronizing Multiple Files

If you have multiple pairs of audio and video files that need synchronized, you don't need to select and merge them one pair at a time, you can do them all at once. Select multiple clips in the Media panel, and select Merge Audio/Video, and HitFilm will examine all the files to determine which ones belong together, and create new merged files for each video that is selected, by replacing its original audio with the audio from the matching audio file.

5.4. Media Properties

Each media asset has its own properties, which are used to control its behaviour inside your project. An asset's properties can be displayed by clicking the gear next to its name in the Project Media list. Different types of media have different settings.

Adjusting a media asset's properties will affect all instances of it on all timelines.

Media Properties 🍄

Clicking this gear icon displays key information about the video. Some properties can be edited, while others are directly linked to the source file and cannot be changed.

- **Name:** The name of the source media file. If you change the name here, it will only affect the way the media is displayed within the HitFilm Media panel. The original media file on your hard drive will remain unaffected.
- Path: Shows the file directory where the source media file is located on your system.
- Video
 - Frame Rate: By default the frame rate of the source file is used. If you wish to force a different frame rate, you can deselect the From Source option, then manually select a different frame rate. Changing the default frame rate will change the playback speed of a clip, relative to the frame rate of the timeline. For example, a 24fps clip on a 24fps timeline will play at normal speed. Reducing the asset's default frame rate will create slow motion playback and increasing it will create fast motion playback. This can be useful for creating slow motion effects, by importing a high-frame rate clip, then manually assigning it to play back at a much lower frame rate. For slow motion it is always best to shoot at a high frame rate if possible. A video shot at 48fps and then changed to 24fps will create a convincing, smooth slow motion effect.
 - Aspect Ratio: By default the pixel aspect ratio of the source file is used. If you wish to force a
 different aspect ratio, you can deselect the From Source option, then manually select a
 different aspect ratio.
 - Alpha: This option will appear only for files that contain an alpha channel By default the Alpha blend mode of the source file is used. If you wish to change the way the alpha is processed, you can deselect the From Source option, then manually select a different option. Straight is for alpha channels where all transparency data is stored in the alpha channel itself, and none in the color channels. Premultiplied is for files where a predetermined background color is blended into the transparent areas. If you import a file that contains transparency, but it is not displaying

correctly, try changing the alpha mode it uses.

- **Resolution:** Resolution is a permanent property of the source file, and cannot be edited.
- **Color:** The Color Bit Depth is a permanent property of the source file, and cannot be edited.
- **Codec:** The codec used to encode the video is a permanent property of the source file, and cannot be edited.
- Audio

The audio properties of a clip are displayed for reference, but cannot be edited directly in HitFilm.

- **Format:** Lists the format of the audio, including its bit-depth and the number of channels it contains.
- **Sample Rate:** The sample rate of the source file. It is recommended that the sample rate of your imported audio match the sample rate used in your project settings.
- **Codec:** The type of compression used to encode the audio in the source file.
- General
 - Container: Lists the container used by the source file.
 - Duration: The total duration of the source file, in Hours: Minutes: Seconds: Frames format.

You can also change a media clip's alpha channel behavior between **Straight** or **Premultiplied**. This is particularly useful when importing OpenEXR images, which do not specify the best mode.

Other Asset Types

Special assets have different properties. More information can be found about these in the <u>Compositing</u> section, in the following chapters:

- Plane Layers
- <u>Composite Shot Properties</u>
- Importing 3D Models

5.5. Trimming Assets

The Trimmer allows you to view media directly from the Media panel, regardless of whether the media has been used on any timelines within your project. This is useful for a variety of purposes.

After importing video files, you can preview the contents of each one to organize them in preparation for editing, or to identify the takes that you want to use in your edit. During editing, the Trimmer can be used to identify a specific section of a media asset before adding it to your timeline as a clip. This makes it easy to remove the start and end of a take, retaining the portion between 'action' and 'cut'.

If you have already added a clip to the timeline, and need to trim it, you can also double-click the asset on the timeline to re-open it in the Trimmer, and adjust its In and Out points. Any adjustments you make will immediately be reflected on the timeline as well.



Playback on the Trimmer functions similarly to the Viewer, using similar playback tools. However, while

playback is the primary function of the viewer, the trimmer has additional tools specifically for selecting portions of your clips and adding those portions to the timeline.

Playback Controls

Along the bottom of the Trimmer are the playback controls.

Loop Playback 🎞

When activated, playback will loop once the playhead reaches the end of the timeline or the end of the work area.

The work area can be defined using the Set In and Out point buttons with the playhead at the desired frames. This can be particularly useful for looping playback around a specific cut or visual effects sequence.

Set In and Out Points 🕩 🟓

The in and out points define the start and end of the work area. This region of the asset is used when looping playback, and to define the section of an asset that you wish to add to the timeline.

Playhead Control | | | | | | |

The timeline playhead determines which frame is displayed in the viewer. The playhead can be controlled from the Viewer.

- Move Playhead to Start: Instantly jumps the playhead to the beginning of the timeline. You can also press the Home key.
- Previous Frame and III Next Frame: Move the playhead by a single frame.
- **Play**: Plays the timeline forwards. Realtime playback may not be possible, depending on the complexity of the timeline. Realtime playback can be achieved using the RAM preview or pre-render features.

Playback can also be controlled using the standard keyboard shortcuts J, K and L.

- J plays backwards. Pressing J repeatedly will double the playback speed.
- K stops playback.
- L plays forwards. Pressing L repeatedly will double the playback speed.

The **In** and **Out** buttons in the Trimmer (explained above) are used to specify the section of the asset which you wish to use. You can also use the keyboard shortcuts I (for In) and O (for Out) while playing the asset, to set the in and out points.

Adding Assets to the Timeline

You can drag from the Trimmer directly onto the timeline, allowing you to position the new clip precisely. A green outline displays the drop location on the timeline.

Note that if you drag a clip from the Media panel the entire media asset will be used to create the clip, even if you've set up a trim section in the Trimmer. To use only the trimmed section, make sure you add the clip from the Trimmer.

If your source asset contains both audio and video elements, by default both will be included when you add the asset to the timeline. If you wish to only add one or the other, you can do so using the following tools.

- Use Video: Click on the Use Video button and drag to a video track of the timeline to add only the video from your source clip to the timeline, without the audio. You can also hold the Alt key (Option on Mac) while dragging from anywhere in the trimmer to add only the video.
 - Clicking and releasing on the Use Video button will display the video portion of the source asset in the trimmer panel.
- Use Audio: Click on the Use Audio button and drag to an audio track of the timeline to add only the audio from your source clip to the timeline, without the video. You can also hold the Alt key (Option on Mac) while dragging from anywhere in the trimmer to add only the audio.
 - Clicking and releasing on the Use Audio button will display the audio waveform of the source asset in the trimmer panel, if you wish to reference the waveform or use it to set the in or out points.

Inserting and Overlaying Clips 🖍 📩

Alternatively to dragging the clip from the viewer to the timeline, the Insert and Overlay buttons on the Trimmer can be used.

- **Insert** places the clip at the playhead's position, moving affected clips out of the way. Any existing clips on the timeline will be moved to the right to make space for the new clip. If the playhead is in the middle of an existing clip it will be automatically sliced at that position.
- **Overlay** adds the clips at the playhead's position, replacing any existing clips which are occupying the affected frames.

5.6. Adding Clips to the Timeline

There are several ways to add clips to your timeline.

If you want to preview or trim clips before adding to the timeline, see Trimming assets.

Placing Clips

Media assets can be dragged directly from the Media panel onto the timeline. A green outline will be displayed showing where the clip will be dropped. While you are positioning the clip the <u>Viewer panel</u> displays adjacent frames from any other clips on the timeline, so that you can accurately position the new clip within an existing sequence.

Adding a clip uses an **Overlay Edit**, whereby the new clip is placed at your chosen position, replacing any clips on the occupied frames.

Holding **SHIFT** while adding a clip uses an **Insert Edit**. Any clips that are already in the chosen area are sliced at the in point of the new clip and moved to the right, with the new clip being placed in the gap.

When placing a media asset which includes both audio and video content, holding **ALT** (**OPT** on Mac) will place only the video or only the audio, depending what type of track the cursor is positioned over when you release the mouse button.

Snapping Ü

The Snap button can be used to turn snapping on and off. Snapping ensures that clips connect directly with no blank frames in-between.

Clips snap to other clips and to the playhead.

You can also jump the playhead to the start or end of clips using the Page Up and Page Down keys.

- Page Up: Advances the playhead to the frame containing the next edit.
- Page Down: Moves the playhead backward to the frame containing the nearest preceding edit.

Automatically Creating New Tracks

You can automatically create a new track when placing a new clip by dropping it onto the blank area above or below the numbered video and audio tracks. This will create a new track and place the clip onto it.

For more information on working with tracks, read the <u>Using audio and video tracks</u> chapter.

5.7. Using the Editor Timeline

Editor Export O0:00:00:00 Video 2 Video 1 Pisto...iring Jo...to T0...av T0...av T0...av T0...av T019 0...LR.wav T019 ...R.wav T0...av T01 way Audio 1 -(0) And interaction and 00 LON 000-0 -(0) Audio 2 Huy...wav -(0) Audio 3 -(3) Master

There are several tools arranged around the outer edge of the editor timeline.

The Time Ruler

Along the top of the timeline is the time ruler, representing the duration of your project. Clicking on the time ruler will move the playhead, which defines the current frame, which is displayed in the Viewer.

You can also click and drag on the playhead itself.

To jump to a specific time simply type it into the time display at the top-left. The time display can be switched between time and frames using its menu.

Scaling and Panning the Timeline 🔺 🖕

The longer your project becomes, the less likely it will all fit on one screen.



The timeline can be scaled using the zoom bar, so you can either zoom out to see the timeline's entire

contents, or zoom in to focus on a specific area.

When zoomed in, you can then use the bottom scrollbar or the Hand tool to pan the timeline left and right.

Knowing how to move around the Editor timeline efficiently will make your editing much easier.

Once you've <u>placed some clips on your timeline</u> you will need to be able to scroll and zoom around the project.

Pressing Ctrl+Home will auto-scroll the timeline to the current playhead position.

Setting the Work Area

The work area is represented by the light gray bar running along the time ruler.

You can use the work area to specify a particular part of your editor sequence to export or loop play, rather than exporting the entire timeline.

To set your editor sequence work area, drag the ends of the work area, use the I key or the **O** keys on your keyboard, or use the In and Out buttons on the Viewer. When using the keys or buttons the playhead's current position will be used to set the in our out point.

Pressing the **P** key will set the work area to encompass the contents of your timeline.

Holding the **Alt** key and dragging on the work area will move it without changing its duration.

Exporting

The timeline includes two Export options, which will add your timeline to the Export queue. Both options are accessed through the **Export** button at the top right of the timeline.

- **Export Contents:** Exports the entire contents of the timeline. If your timeline extends beyond the video it contains, any empty frames on the end will not be included in the export.
- Export IN/OUT Area: Exports only the work area of your timeline. The work area is defined by the In and Out points you set. To set the work area, move the playhead to the frame where you want the

work area to begin, and press the I key (for "in") on the keyboard. Then, move the playhead to the frame where you want the work area to end, and press the O key (for "out").

Once the work area is set, choose Export In/Out Area to add the work area to the render queue.



At the top left of the timeline are the keyframe buttons.

Keyframes are used to store changes to settings on particular frames. For example, on frame 10 a video could be set to full opacity and then on frame 20 it could be set to 50% opacity. This would be stored as two keyframes, one on frame 10 and one on frame 20. Between frames 10 and 20 the video would become gradually more transparent.

The Opacity of video clips and the Volume of audio clips can be keyframed directly on the Editor. See <u>Basic</u> <u>Compositing with Clips</u> and <u>Mixing Audio</u> for more details. Other properties can be keyframed within the Controls panel.

The two arrow buttons are used to jump between keyframes for the currently selected property.

The circle button in the center is used to turn keyframes on and off on the current frame for the currently selected property. If a keyframe is present on the current frame a dot is displayed in the middle the circle.

5.8. Audio and Video Tracks

The editor timeline consists of several tracks. At first you will only have two tracks, one for video and one for audio. You can add additional tracks as needed, at any time. In the image below, there are two video tracks, and four audio tracks.



How Tracks Work

Tracks are only found on the editor timeline (composite shots use layers, which are covered in the <u>Compositing</u> section).

A track can only contain video or audio content, not both. In this context, 'video' can mean videos, images, planes or composite shots.

All video tracks are displayed in the top area of the timeline, while audio tracks are displayed in the bottom area. The amount of interface dedicated to each can be adjusted by dragging the splitter up or down.

If you have lots of tracks or are working on a small screen some of your tracks might not be visible. There are individual scroll bars at the right of the timeline to move up and down separately through the video and audio tracks.

A single track can hold as many clips as you want. Clips are placed sequentially one after the other, either end-to-end or with gaps in-between.

Linked Clips

Some media assets include both an audio and a video track. In this case the media asset is represented as two separate clips on the timeline, one on a video track and one on an audio track.

Linked clips are marked with the chain icon.

Any editing changes you make to one will also be applied to the other. Clips can be linked and unlinked by selecting them and choosing **Link** or **Unlink** from the right click menu.

The Tracks Menu

On the right end of the Tracks header bar is the Tracks Appearance menu.



It provides access to the options for track height and other appearance options. The height of video and audio tracks can be set independently, and each gives you four size options. Medium is the default size. Larger heights make the thumbnails larger, so it is easier to see the contents of the video files contained in the tracks. Note that when Small is selected, no thumbnails will be rendered for the video tracks, and no waveforms will be displayed for audio tracks.





The Preview Mode controls how the thumbnails of the video files are displayed on the timeline.

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Tracks	=	47:00		00:00:48:00
• Video 2	Video Size Audio Size) }	
	Preview Mode 🕨		Þ	None
Video 1		No. of Sec. of Sec.		Start/End
			·	Full

- **None** removes all thumbnails from the timeline, using only the clip names to identify the individual clips that are present. This can speed up performance, since the thumbnails do not need to be calculated. The following image shows medium sized tracks with the preview mode set to None.
- Start/End Shows only two thumbnails for each clip, one at the start and one at the end. This speeds
 up performance, while still providing images to help identify the clips at the edit points, where most
 adjustments are going to be made. This image shows medium sized tracks with the preview mode set
 to Start/End
- **Full** Full is the default mode, and shows thumbnails across the entire duration of each video clip. This makes it very easy to identify your clips, regardless of where you are on the timeline. This image shows medium sized tracks with the preview mode set to Full.

Creating and Deleting Tracks

You can create a new track by right clicking anywhere in the track listing and choosing **Insert Track**.

A track can be deleted by right clicking a track in the track listing and choosing **Delete Track**. If the track contains any clips you will be warned before the track is removed.

Renaming and Re-ordering Tracks

Tracks by default are called Video 1, Video 2 or Audio 1, Audio 2 etc. If you want to change these names to be more descriptive you can do so. In the image at the top of this page, one of the audio tracks has been renamed to Score, to indicate what it contains.

To rename a track:

• Right click the track name and click **Rename Track**, then enter a new name for the track.



You can drag tracks up and down in the list to re-order them. This will move the entire track's contents.

Locking Tracks 🖀 🖻

You can lock any track on the timeline, to prevent changes from being made to its contents.

• Unlocked: By default, all tracks are unlocked when created. When unlocked, the contents of the track remain fully editable. Click the lock icon to toggle the locked status.



• Locked: When locked, the contents of the track cannot be changed in any way. This is useful for preventing unwanted changes. Click the lock icon to toggle the locked status. When a track is locked, hashmarks appear over the contents of the track, to clearly identify its locked state.



Muting Tracks 👁 📣

Video and audio tracks can be turned on and off using the mute icons to the left of the track names.



Adjusting the Zoom of the Timeline

HitFilm can dynamically fit timelines of any length into the available space. At times you will need to zoom in on a specific area of time, to fine tune the timing of an edit or of effects to a finer degree of accuracy. At the bottom left of the timeline is the Zoom slider, which controls the zoom level of your timeline.



5.9. Refining Your Edit

Once you have added clips to the timeline you will want to further refine your edit using the editing tools.

HitFilm's editing tools are found on the left edge of the timeline.

Select 🕨

The **Select** tool is a multi-purpose tool that you can use for much of your basic editing, including:

- Selecting clips
- Moving clips on the timeline
- Trimming clips.

Selecting Clips

You can select single or multiple clips with the Select tool. Selected clips are highlighted in blue.

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÷				
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- Simply Click a clip to select it. Selecting a different clip will deselect the first one.
- Holding CTRL+Shift while selecting clips enables you to select multiple clips.
- You can also **drag a selection box** around multiple clips to select them all. By default the timeline will automatically scroll left and right while dragging a selection box. Holding **ALT** while dragging will also automatically scroll vertically through the video or audio tracks, depending where your mouse was positioned.

Moving Clips

You can move any clip to a new location on the timeline by dragging it with the mouse.

If you move a clip to a location which is already occupied by other clips, an **Overlay Edit** will be used by default. The existing clips are sliced according to the moved clip's in and out points and the moved clip replaces that section on the timeline. This means that the positions of other clips on your timeline are not affected.

By holding the **SHIFT** key you can instead perform an **Insert Edit**. The moved clip slices the existing clips at the in point, then moves all the affected clips to the right to make room.

Holding **CTRL** (**OPT+CMD** on Mac) while you drag a selected clip will duplicate the clip, and drop a new copy where you release the mouse button.

Trimming Clips

The Select tool is also used for simple **Trim Edits**, when you want to change a clip's in or out point.

When you move your mouse over the start or end of a clip it will change to the trim pointer. You can then drag with the mouse to change the in or out point.

As you change a clip's in or out point the surrounding clips will not be affected.

The Viewer will show a preview of the currently trimmed frame.


There needs to be enough room to make your trim edit. You can't move a clip's in or out point past the in or out point of another clip.

You can't trim a clip to be longer than its source media asset.

When working with a linked media asset which contains video and audio, both tracks will be trimmed in synchronization. You can trim only one track by holding **ALT** while performing the trim, a technique known as J and L cuts.

You can also double-click a video clip on the Editor to re-open it in the Trimmer, and adjust its in and out points there. As you do, the clip on the timeline will immediately be updated to reflect your changes.



The **Slice** tool is for cutting individual clips into multiple layers.

When using the slice tool, clicking anywhere on a clip will cut it at that point, splitting it into two clips. You can slice a clip as many times as you want.

After a clip has been sliced, both pieces exist separately on the timeline and can be adjusted individually.

Holding **ALT** when you click will slice all clips at that frame, regardless of what track they are on.

Slip 🛏

Slip Edits are useful for adjusting the in and out points of a clip without affecting its length or position on the timeline.

When the slip edit tool is selected on the editor timeline you can click and drag on any clip to perform a slip edit.

The Viewer changes to show useful information during the slip edit.



The top left and top right videos show the adjacent frames before and after the selected clip. These do not move during the slip edit, as the slip edit does not affect other clips.

The larger, lower videos show the in and out points for the selected clip. As you drag with the slip edit tool, the clip's duration and position on the timeline remain unchanged but its in and out points are shifted.

The Viewer preview can be used to easily check continuity between shots.

Timecode information shows the relative slip edit change in the center and the new in and out points relative to the source media asset.

Slide 🕀

The **Slide Edit** tool is used for quickly moving the position of a clip on the timeline relative to those before and after it.

The selected clip's duration and out point do not change. The previous clip's out point and the next clip's in point are adjusted automatically to accommodate the slid clip.

The timeline shows a preview of the slid clip's new location.

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				14181
R.wav	T019 0830 On_Cc_On_LR.wav	T019 0830 On_Cc_On_LR.wav	T019 0830 On_Cc_On_LR.wav	
04.wav	street_trafficletnam_004.wav	Huyndai Getz Openg from Inside.wav		

In the above image the bright blue clip is being slid. The light blue overlay indicates where the clip is being slid, which is three frames to the right.

The Viewer updates with useful information during a slide edit.



The top two videos represent the start and end points of the selected clip. These do not change as the duration and in and out points of the selected clip do not change during a slide edit.

The bottom two videos represent the frames or the clips adjacent to the selected clip. As you slide the clip these update to show the new frames at the edit points.

Ripple 😁

The **Ripple Edit** tool is used to trim the in or out point of a single clip, while adjusting the timeline to ensure no gaps or overlaps are created. Therefore the edit 'ripples' down through the timeline.

After a ripple edit, all clips (including the selected clip, in the case of ripple editing its in point) to the right are shifted in time automatically.

This is a good way to ensure that your timeline does not have any unwanted or accidental empty space between clips.

The Viewer updates with useful information during a ripple edit:



When adjusting the in point of a clip with the ripple edit tool, the selected clip will be shown on the right side of the Viewer. The preceding clip to the left is shown on the left side.

When adjusting the out point of a clip the videos in the Viewer are reversed, with the selected clip on the left and the subsequent clip on the right.

During a ripple edit the selected clip will update in the Viewer to show the current edit point.

Holding **SHIFT** while performing a Ripple edit will enable **Ripple Insert** mode, pushing all clips to the right of the selected clip down the timeline to make room for the edit to be inserted.

Ripple Delete

You can also ripple delete clips or gaps. When a clip or gap is ripple deleted, all affected objects to its right are moved to close the gap.

Any clip can be ripple deleted by right clicking it and selecting **Ripple delete** from its menu.

Empty spaces on the timeline between clips can also be ripple deleted.

A ripple delete might not always fully close a gap, if there are obstructions in other tracks of the timeline.

Roll

The **Roll Edit** tool is used to trim two contiguous clips at the same time. The out point of the first clip and the in point of the second clip will be trimmed simultaneously, changing the duration of both clips without moving their positions on the timeline.

When you position the mouse on the connecting line between two clips it will change the roll edit icon. Clicking and dragging with the mouse will change the out point of the first clip and the in point of the second simultaneously.Surrounding clips are unaffected.

The Viewer updates with useful information during a roll edit:



The out point of the first clip is shown on the left and the in point of the second clip is shown on the right. As you perform the roll edit both previews will update to show the new edit points.

Rate Stretch 🍾

Retiming can be used to speed up or slow down playback for specific clips. Using the **Rate Stretch** tool to change a clip's in or out point will retain the contents of the clip and change its playback speed to fit into the newly defined space on the timeline.

For example, dragging the out point of a clip so that the clip on the timeline is twice as long will cause the clip to playback at half speed.

You can also use the Speed/Duration option in any clip's menu to perform a more accurate speed adjustment. This displays the Edit speed/duration window:

EDIT SPEED/DURATION						
Speed:	100.00 <mark>%</mark>	\$	-			
Duration:	00;00;02;03	÷	<u>Q</u>			
CANCEL			ок			

The two properties, speed and duration, can be linked or separated using the chain icon at the right. The behavior is subtly different depending on the link state.

When unlinked, as in the picture above, changing the speed will retain the clip's in and out positions on the timeline while changing the playback speed of the clip's content. Changing the duration will change the out point of the clip without affecting its playback speed.

When the two properties are linked together, changing the speed will also automatically update the duration, moving the out point of the clip to accommodate the same contents at the new speed. For example, a 2 second clip on the timeline when changed to 50% speed will have a new duration of 4 seconds. Alternatively, you can change the duration and the speed will be automatically changed to fit the clip's contents perfectly into the new duration.

Snapping Ü

The Snap button can be used to turn snapping on and off. Snapping ensures that clips connect directly with no blank frames in-between.

Clips snap to other clips and to the playhead.

You can also jump the playhead to the start or end of clips using the Page Up and Page Down keys.

J and L Cuts

When working with a linked media asset which contains video and audio, both tracks will be trimmed in synchronization. You can trim only one track by holding **ALT** while performing the trim, a technique known as J and L cuts.



A J cut is when the audio begins before the cut in the video, creating a J shape, as in the selected clip above.

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An L cut is when the video begins before the cut in the audio, creating an L shape, as in the selected clip above.

5.10. Creating Text & Titles

HitFilm Pro offers a variety of tools for creating text and titles.

- **Text Tool:** The Text Tool can be used to generate text directly on the viewer. In composite shots, this text can be converted to 3D, and can interact with HitFilm's 3D lights and cameras.
- **Text Effect:** The Text Effect allows you to quickly generate text by applying the effect to a Plane or other media object.
- Boris 3D Objects: Allow you to generate complex 3D titles with a fine degree of control.
- Specific Text Effects: Several other effects such as End Credits Crawl and Pulp Sci-Fi Title Crawl are designed to simplify the creation of specific text objects.

HitFilm's own tools provide a very fast workflow for simple text, while Boris 3D Objects generates provides a greater level of control for refining the quality of animated 3D text shapes.

The Text Tool

The built-in **Text Tool** is excellent for creating custom text directly on the viewer. You can use this tool to create text on any timeline in HitFilm.

Text on the Editor

To create text on the Editor timeline:

- 1. Select the Text tool on the Viewer.
- 2. Click on the Viewer where you want the text to appear.
- 3. Enter your text.

A new Text object will be created on the timeline at the playhead location. If there is already media on the timeline at the playhead location, the text will be created on a new track and placed above the existing media.

The default duration of new Text objects can be set in the General tab of the HitFilm Options.

Text in a Composite Shot

There are several ways to create a text layer.

- New Layer: Open the New Layer menu on any composite shot timeline and select **Text**. This creates a cursor at the center of the Viewer, and you can immediately type in your text.
- Text Tool: Select the Text Tool, and click on the Viewer where you want to add your text.
- **Text Box:** For creating paragraph text. Select the **Text tool**, and click-drag on the Viewer to create a text box. As you enter text into the text box, the text will auto-wrap to a new line when it reaches the edge of the box.

Editing Text

You need to have the Text tool selected in the Viewer to edit text.

With the Text tool selected, only text layers will be highlighted in the Viewer. Drag to select the text you wish to edit, then begin typing. You can select text and move the cursor as you would in an ordinary text application.

You can continue to edit text even if it is in 3D.

When a text box is used, the text you enter will automatically wrap to the next line. when using an open text layer, line breaks must be entered manually using the Enter key.

The shape and size of a text box can be adjusted by dragging the handle on its bottom-right corner when the **Text** tool is selected. The text will automatically update as the text box is changed.

The Text panel is where you control text properties such as size and font. The text panel affects the currently selected text and any text you'll create in the future. If you want to change the attributes of existing text, make sure you have it selected in the Viewer with the Text tool.

Character

The character properties are as follows:

- Font Name: Lists all the compatible fonts available on your computer.
- Font Weight: If your selected font includes different weights (Bold, Light, Italic, etc.), you can select your desired weight here.
- Size: Sets the font size, to control the size of your text. In general, if you want to enlarge your text, it

is better to increase the font size rather than increase the layer Scale above 100%.

- Line Spacing: Defines the vertical spacing between each line of text.
- Character Spacing: Sets the horizontal spacing between each individual character.
- **Outline Size:** Sets the width of the text outline. At 0px no outline will be visible.
- Color: Allows you to select a font color.
- **Outline Color:** Lets you choose the color of the outline, which will only be visible if the Outline Size is greater than 0px.

Paragraph

The alignment of text can be adjusted using these controls. The first set of controls works for both open text layers and text boxes. For open text, each line can be aligned independently, so if you want to apply a specific alignment to multiple lines, make sure to select them all first.

- Left Alignment: Aligns the left edge of the text to the X position of the layer, for open text layers, or to the left edge of the text box, for text boxes.
- **Center Alignment:** Aligns the center of the text to the X position of the layer, for open text layers, or to the center of the text box, for text boxes.
- **Right Alignment:** Aligns the right edge of the text to the X position of the layer, for open text layers, or to the right edge of the text box, for text boxes.

For text boxes, additional justified alignment options are available.

- Left Justify Alignment: Adjusts the spacing between words in each line so that each line fills the complete width of the text box. The final line of the paragraph will be aligned to the left.
- **Center Justify Alignment:** Adjusts the spacing between words in each line so that each line fills the complete width of the text box. The final line of the paragraph will be center aligned.
- **Right Justify Alignment:** Adjusts the spacing between words in each line so that each line fills the complete width of the text box. The final line of the paragraph will be aligned to the right.
- **Justify Alignment:** Adjusts the spacing between words in each line so that each line fills the complete width of the text box. If the final line of the paragraph has only a single word, it will be aligned to the left. If there are multiple words, the final line will be justified like all other lines.
- **Top Alignment:** Aligns the top of the first line of text to the top of the text box.
- Middle Alignment: Centers the paragraph vertically within the height of the text box.
- Bottom Alignment: Aligns the bottom of the last line of text to the bottom of the text box.
- Left Indentation: Indents the text from the left side of the text box, effectively creating an empty margin on the left side.

- **Right Indentation:** Indents the text from the right side of the text box, effectively creating an empty margin on the right side.
- **First Line Indentation:** Indents only the first line of each paragraph, to define the start of paragraphs and create a standard paragraph layout. Negative values will shift the line to the left. This property is available for both open text layers and text boxes.
- **Top Indentation:** Indents the text from the top of the text box, effectively creating an empty margin above the text.
- **Bottom Indentation:** Indents the text from the bottom of the text box, effectively creating an empty margin below the text.
- **Gap Before Paragraph:** Creates a gap above the line break defining the start of the current paragraph, to separate it from the precending paragraph. This does not affect the first paragraph in the text box. This setting can be edited per paragraph, and is available for both open text layers and text boxes.
- **Gap After Paragraph:** Creates a gap below the line break defining the end of the current paragraph, to separate it from the following paragraph. This does not affect the first paragraph in the text box. This setting can be edited per paragraph, and is available for both open text layers and text boxes.

Animating Text

If you have the Viewer Select tool selected you can transform the text layer like any other layer in the viewer, with full rotation and position controls.

Note that you will not be able to transform text layers if you have the Text tool selected.

3D Text

Text layers can be converted to be 3D objects that integrate directly into HitFilm Pro's 3D compositing environment. By converting the text layer to 3D, you can make it a 3D plane that can be rotated on the X, Y, and Z axes. By adding Geometry effects and adjusting the Materials, you can transform it into an actual 3D object which can be illuminated by Lights.

• Geometry

- 1. Convert the Text layer to 3D.
- 2. Apply the Extrude Geometry effect to the text layer. (For full details on the Geometry effects, see the Geometry Effects page.)
- Materials

In the Materials you can adjust how the text layer is affected by 3D lights you add to your scene. You can also apply an Environment Map to text, so that the text can receive specular or diffuse reflections

from a specific layer on your timeline, or from the entire composite shot which contains the text.

- 1. Open the Materials controls for the Text layer, and enable **Receives Ambient Occlusion** and **Casts Ambient Occlusion**.
- 2. Open the Environment Map menu and select **Use Composite Shot**. This will apply all other layers in the composite shot as an environment map. If you have a single layer you prefer to use, you can select it instead.
- 3. Adjust the **Specular Reflectivity** and the **Diffuse Reflectivity** to control how much of an impact the Environment Map has on your layer.

The Text Effect

The Text effect lets you quickly generate text on any timeline, including the Editor. To add Text, drag the Text effect from the Effects panel onto a Plane, an image, or a video clip, to add text to that object. Open the controls for the effect in the Controls panel, and then click the A icon displayed to the right of the Text property. This will open the Edit Text dialog, where you can enter the text you wish to add to the layer. Once you are finished editing the text, click the OK button to close the Edit Text dialog and apply the changes. You can then edit the text and further customize the effect in the Controls panel, or directly on the timeline when working in a composite shot.

Full details of the Text effect controls are available on the Generate page of this manual.

Boris FX 3D Objects

This is available in the Effects library and can be applied like any other effect. You will usually want to apply the 3D Objects effect to a plane or grade layer, which can then serve as a host.

For details on using Boris FX 3D Objects, see the Boris documentation included with the plugin. To access the help, click the Help button in the plugin's main controls.

The Boris plugin features its own lighting and camera controls, which allow you to create three dimensional, illuminated text objects, even on a 2D timeline. If you are working in a 3D timeline, however, you can set Boris to use HitFilm's native lights and camera, so the Boris text is integrated into HitFilm's Unified 3D workspace. You can use either the built-in Boris lights or HitFilm's native light layers, or use both together.

Þ	RE	NDER		
		Use Comp Lights		
		Use Built-in Light		•
		Use Built-in Light 2		
		Use Built-in Light 3		
		Use Comp Camera		
		Extrusion Style	None	•

- Use Comp Lights: allows the Boris text to use HitFilm's native light layers, and is disabled by default.
- Use Built-in Light: illuminates the text with the lights included in Boris. One light is enabled by default, but you can have up to three lights in your Boris Text effect, by enabling the tickboxes for additional lights.
- Use Comp Camera: overrides the built-in Boris camera, and displays the text based on its 3D position relative to the active HitFilm camera layer. By default this option is off, and the camera built into Boris is used to display the text.

You can also find the Boris FX documentation installed on your computer here:

Windows: C:\Program Files\Boris FX, Inc\Boris Continuum Complete OFX 10.0\Documentation

Mac: Library/Application Support/BorisFX/BCC OFX 10/Documentation

End Credits & Text Crawl Effects

The end credits and text crawl effects provide a very rapid way to generate text. More details can be found in <u>Generate</u>.

Featuring

Agent Joe Gould Negotiator Joshua Davies Oracle Andrea Wake Zeus Dan Woodsen

Director & VFX Simon K Jones Producer Joshua Davies Director of photography Erin Patel

Camera team

Kirstie Tostevin Cédric Bonnier Rikki Carroll Robert Laycock

EPISODE TITLE Click the 'A' symbol to edit the text of your crawl. Text is automatically justified on the left and right.

Each line is formatted as a new paragraph, so only enter a line return if you want a paragraph break.

For authenticity we recommend using a font such as 'Star Vader' or a custom image for the Movie title.

Formatting can be further

5.10.1. The Text Panel

The Text panel is where you control text properties such as size and font. The text panel affects the currently selected text and any text you'll create in the future. If you want to change the attributes of existing text, first select it in the Viewer, using the Text tool.

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Character

The character properties modify the typeface and other specifics of the appearance of each character.

- A Font Name: Lists all the compatible fonts available on your computer.
- Font Style: If your selected font includes different styles (Bold, Light, Italic, etc.), you can select your desired style here.
- A Size: Sets the font size, to control the size of your text. In general, if you want to enlarge your text, it is better to increase the font size rather than increase the layer Scale above 100%.
- Color: Allows you to select a font color.
- A **Outline Size:** Sets the width of the text outline. At 0px no outline will be visible.
- **Outline Stroke Order:** Choose the order in which the text color and the outline color are stacked.
 - **Fill Over Stroke:** Places the fill above the outline stroke, so the fill is visible in any areas where they overlap.
 - Stroke Over Fill: Places the outline stroke above the fill, so the stroke is visible in any areas where they overlap.
- **Outline Color:** Lets you choose the color of the outline. The outline will only be visible if the Outline Size is greater than 0px.
- Al Line Spacing: Defines the vertical spacing between each line of text.
- 4 Character Spacing: Sets the horizontal spacing between each individual character.
- AI Vertical Scale: Adjusts the height of the characters, independently of their width.
- A Horizontal Scale: Adjusts the width of the characters, independently of their height.
- A^d **Baseline Shift:** Moves the position of the baseline on which the text sits. Positive values move the text upwards, and negative values move it downwards.
- TT All Caps: Forces all selected characters to use their full-size capital case.
- Lower Caps: Forces all selected characters to use their capital case, but letters which were not originally capitalized will display at a smaller size, retaining their lower case height.
- Tt Title Case: Forces the first letter of each word to use its capital case.
- ^{tt} Lower Case: Forces all characters to use their lower case.
- \perp **Underline:** Adds a horizontal line below the selected characters.
- + Strikethrough: Adds a horizontal line through the center of the selected characters.
- T¹ Superscript: The selected characters are displayed above the baseline, at a smaller size than the standard text characters.
- ¹ Subscript: The selected characters are displayed below the baseline, at a smaller size than the

standard text characters.

Paragraph

The alignment of text can be adjusted using these controls. The first set of controls works for both open text layers and text boxes. For open text, each line can be aligned independently, so if you want to apply a specific alignment to multiple lines, make sure to select them all first.

- **Left Alignment:** Aligns the left edge of the text to the X position of the layer, for open text layers, or to the left edge of the text box, for text boxes.
- **Center Alignment:** Aligns the center of the text to the X position of the layer, for open text layers, or to the center of the text box, for text boxes.
- **Right Alignment:** Aligns the right edge of the text to the X position of the layer, for open text layers, or to the right edge of the text box, for text boxes.

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- **Center Justify Alignment:** Adjusts the spacing between words in each line so that each line fills the complete width of the text box. The final line of the paragraph will be center aligned.
- **Right Justify Alignment:** Adjusts the spacing between words in each line so that each line fills the complete width of the text box. The final line of the paragraph will be aligned to the right.
- Justify Alignment: Adjusts the spacing between words in each line so that each line fills the complete width of the text box. If the final line of the paragraph has only a single word, it will be aligned to the left. If there are multiple words, the final line will be justified like all other lines.
- Top Alignment: Aligns the top of the first line of text to the top of the text box.
- 荢 Middle Alignment: Centers the paragraph vertically within the height of the text box.
- **Bottom Alignment:** Aligns the bottom of the last line of text to the bottom of the text box.
- **Left Indentation:** Indents the text from the left side of the text box, effectively creating an empty margin on the left side.
- **Right Indentation:** Indents the text from the right side of the text box, effectively creating an empty margin on the right side.
- **First Line Indentation:** Indents only the first line of each paragraph, to define the start of paragraphs and create a standard paragraph layout. Negative values will shift the line to the left. This

property is available for both open text layers and text boxes.

- **Top Indentation:** Indents the text from the top of the text box, effectively creating an empty margin above the text.
- **Bottom Indentation:** Indents the text from the bottom of the text box, effectively creating an empty margin below the text.
- **Gap Before Paragraph:** Creates a gap above the line break defining the start of the current paragraph, to separate it from the preceding paragraph. This does not affect the first paragraph in the text box. This setting can be edited per paragraph, and is available for both open text layers and text boxes.
- Gap After Paragraph: Creates a gap below the line break defining the end of the current paragraph, to separate it from the following paragraph. This does not affect the first paragraph in the text box. This setting can be edited per paragraph, and is available for both open text layers and text boxes.

5.11. Working with Audio

HitFilm's editor can have multiple audio tracks. This makes it possible to build up a soundscape of multiple audio clips, including dialogue, sound effects, music etc. For information on using tracks see <u>Audio and</u> <u>video tracks</u>.

Audio levels can be adjusted on the timeline, in the Audio Mixer, or in the Controls panel.

Adjusting Volume O o

A clip's volume can be changed over time. By adjusting the volume of multiple clips you can build up a more interesting soundtrack.

Volume can be adjusted directly on the timeline. Every audio clip on the Editor timeline has a volume bar called an **Audio Envelope** which can be dragged up and down.



By default the volume bar will change the volume of the entire clip. To change the volume over time, you can add keyframes by holding **CTRL** (**CMD** on Mac) and clicking on the volume bar.



Keyframing can also be turned on and off in the controls panel by clicking the keyframe button to the left of the Volume property.

With the audio property selected in the Controls panel you can jump between keyframes using the keyframe navigation buttons at the top of the timeline.

Audio Track Envelopes vs. Object Envelopes

One each audio track, you can either edit the levels of each individual object on the track, or edit the level of the track as a whole. The Toggle Track/Object Envelopes button located to the left of each track name allows you to toggle between them.

Editing the object envelopes is useful for balancing the objects in relation to one another. Editing the track envelopes is beneficial for final mixing, or when you need to adjust all the objects in the track at once.

Audio Mixer

The audio Mixer panel provides a traditional interface for adjusting your audio to ensure everything can be properly heard without clipping. It adjusts the Track levels. For adjusting individual object levels, use Object Envelopes, explained above.

Audio clipping, or peaking, is when the audio output is beyond the range of playback. It is indicated by red on meters, and will introduce digital distortion into the audio which should be avoided.



Audio peaks are drawn as green bars during playback or when moving the playhead. Each audio channel is displayed as a separate bar. Thin white lines are drawn separately indicating the peak volumes of each channel and the peak volume is displayed above the bars. These peak values are held momentarily so that you can easily identify unwanted clipping.

If clipping occurs, the peak volume readout turns red on the affected channel. This is a useful way to identify areas where the audio mix is too loud and may cause distortion on playback. Reducing the combined volume of the audio tracks in that area will avoid clipping. Clipped peaks will remain red until you start a new playback or move the playhead.

The peak meter is not directly equivalent to loudness or volume. Instead it represents the amplitude level. This will often correlate with loudness but other factors (such as frequency) can also have an effect on perceived loudness.

• Levels

On the left of each track's meters is a fader for adjusting the track's audio within a range from -60 to +12. The current settings is displayed immediately below the fader.

Balance

Each audio track is stereo. Below the meter, the panning slider controls the balance between the left and right channels. 0.0 is centered, perfectly balanced between the left and right. Panning the balance to the left or right will increase the signal on that side while reducing the signal on the opposite side. This can be used to position sounds in the sound stage to match their position within the frame.

Mute and Solo

The mute and solo buttons are useful for quickly controlling which tracks are audible.

- Mute: Clicking the Mute button will silence the track, until the Mute button is toggled back off.
- Solo: Soloing a track has the same result as muting all other tracks. When any Solo button is activated, only tracks that are soloed will be audible.
- **Enable Keyframing:** The circle to the right of the Solo button enables keyframing for the track level. This allows you to adjust levels for the track over time using the faders in the Audio Mixer.

Master Track

The Master Track on the right side shows the level of the overall mix, after all tracks are combined. This is the same readout shown in the Meters panel, but the Master track also provides a fader, so the master levels can be easily adjusted with a single slider.

Audio Meters

The audio meters panel shows your audio levels, so that you can adjust audio levels appropriately, ensuring your soundtrack is able to be heard while avoiding clipping.

Audio clipping, or peaking, is when the audio output is beyond the range of playback. This results in a distorted result which is best avoided.



Audio peaks are drawn as green bars during playback or when moving the playhead. Each audio channel is displayed as a separate bar. Thin white lines are drawn separately indicating the peak volumes of each channel and the peak volume is displayed above the bars. These peak values are held momentarily so that you can easily identify unwanted clipping.

If clipping occurs, the peak volume readout turns red on the affected channel. This is a useful way to identify areas where the audio mix is too loud and may cause distortion on playback. Reducing the combined volume of the audio tracks in that area will avoid clipping. Clipped peaks will remain red until you start a new playback or move the playhead.

The peak meter is not directly equivalent to loudness or volume. Instead it represents the amplitude level. This will often correlate with loudness but other factors (such as frequency) can also have an effect on perceived loudness.

Understanding the Meter Scale

The meter scale is dBFS (decibel full scale), which means that 0dBFS is the maximum possible audio level

before clipping occurs.

Peak bars are drawn using a color spectrum to make them easier to read quickly. The bars will be green when below -9dBFS, to indicate safe levels. When levels surpass -9dBFS, the color gradient shifts from green to yellow, indicating that the levels are still acceptable, but approaching the acceptable maximum. When the gradient shifts to red, the level has exceeded 0dBFS, and the signal will be clipped. Since clipping will create distortion in the audio signal, you want to adjust your audio levels to avoid red.

The scale extends to +6, which gives you an indication of how far past 0dBFS audio is peaking, so that you can make appropriate adjustments to avoid clipping. If your peak is clipping at +3, for example, then you will want to reduce the level of your audio by at least 3dB to get it into the acceptable range.

Static vs Dynamic Peaks

The audio meter's menu has an option to hold peaks. This prevents the peak indicators from ever lowering during playback, known as static peaks. Therefore by the end of playback you will have a definite readout for the maximum peak level during that section of the timeline, without needing to observe the audio meters for the duration of playback.

With the hold peaks option turned off the audio meters use dynamic peaks, which update every two seconds. After two seconds the bars will fall back down if the peaks have been lower than an earlier peak.

Waveforms

The Editor timeline, composite shot timelines, and Trimmer display waveforms for audio. This provides a visual representation of the audio over time, making it easier to position clips based on audio content.

• Options

The Options screen lets you choose between several waveform types.

- Channel List: Displays individual waveforms for each channel in the audio stream and is a common representation of audio. So you'll see one waveform for mono audio, 2 waveforms for stereo, and 6 waveforms for 5.1 surround sound. It can be useful in order to see where a particular channel has silence, for example.
- Channel Composite: This simply draws all waveforms from the audio stream over the top of each other. So you only ever see one waveform even if the source has stereo or 5.1. This view isn't particularly useful for detailed work but can be helpful if there is limited screen space and you still want to see a waveform plotted.
- **RMS Amplitude:** Similar to Channel Composite, this displays a single graph of all channels in the audio stream, but instead of plotting a waveform it shows the average levels of the audio

signal over time. Viewing an average of audio levels in this way is a better method to determine its volume than inspecting a waveform because it is a better approximation of how our ears and brains perceive loudness.

p(banner tip). Note that RMS amplitude is still only a loose correlation or rough guide. There are many factors which affect human perception of loudness which are not included in an RMS graph, such as the frequency of sounds. (Our ears are more or less sensitive to different frequencies, meaning that the same power does not always result in the same perceived loudness.)

Editor Waveforms

Waveforms will be displayed by default on all Editor audio tracks when the audio size is set to Medium, Large or Extra Large. Small tracks will not display waveforms. For more information on adjusting the Audio track Size, see <u>Audio and Video Tracks</u>.



Composite Shot Waveforms

Layers that contain audio can display waveforms in composite shot timelines. This option can be enabled on a per-layer basis, so only the waveforms you want to see are displayed.

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To enable waveforms for any layer that contains audio, open the Layer Properties in the Controls Panel, and enable the **Show Waveform** option. You can also access this option by right-clicking the layer on the timeline, and selecting Options > Show Waveform from the contextual menu.

Audio Effects

HitFilm includes an array of effects to further adjust your audio. These are found in the Effects library in the Audio folder.

To add an audio effect to an audio clip drag it from the Effects panel onto the clip. You can then customize

the effect in the Controls panel.

For information on individual audio effects, see the Audio effects chapter.

Syncing Video and Audio

If your video and audio are recorded in separate files, you can sync them in the HitFilm media panel. See <u>Audio and Video Sync</u> for instructions and more information.

5.12. Basic Compositing on the Editor

HitFilm Pro is a powerful 2D and 3D compositor. Most of your extensive compositing work is carried out using composite shots, layer-based timelines which are designed specifically for that purpose. You can find out more about <u>advanced compositing here</u>.

The editor timeline also includes simpler compositing capabilities, useful for picture-in-picture, fades, blends and static visual effects.

Using Multiple Tracks

Multiple tracks can be used to combine multiple video clips on the same frame.

Higher tracks will be rendered on top of lower tracks.

To find out more about using tracks see Audio and video tracks.

Once you have more than one track you can place clips at the same time position. If the clips are all the same resolution you will only see the top clip, which is when you use transforming, effects or blending to composite them together.

Masking

Masking is the process of drawing a shape on the viewer to define what part of a layer should be visible. You can draw any shape, then specify whether the area inside the shape or the area outside the shape is removed.

Creating Masks 💠 📰 실

To create a mask you use the mask drawing tools, which are used to draw elliptical, rectangular and freehand shapes. First select a layer on the timeline, then use one of the mask tools to begin drawing. You may want to use the Layer Viewer to make it easier to see your layer.

Mask Shapes

There are three masking tools, each designed for specific shapes.

• **Elliptical Mask:** Click and drag to create a circular or elliptical mask on the currently selected layer.

- Hold **SHIFT** while dragging to create a perfect circle.
- Hold ALT (OPTION on Mac) to center the mask at the original point you drag from. Releasing the mouse will set the shape.
- Double-click the elliptical mask icon to create an oval the exact height and width of your project.

Rectangular Mask: Click and drag to create a square or rectangular mask on the currently selected layer.

- Hold SHIFT while dragging to create a perfect square.
- Hold ALT (OPTION on Mac) to center the mask at the original point you drag from. Releasing the mouse will set the shape.
- Double-click the rectangular mask icon to create a rectangle the exact height and width of your project.

Freehand Mask: Draws a sequence of straight or curved line segments, to create any shape you desire. Clicking and dragging creates a curved line, while clicking and releasing creates a linear, straight line. The shape of curved points can be further adjusted using the extension handles.

- Click to add a new linear point to the mask path.
- Click-drag to add a curved point to the mask path. The direction and distance you drag will define the curve of the mask segment.

For complete details on creating, editing, and animating masks, see the Masking page of this user guide.

Transforming Clips

Clips can be transformed on the editor timeline, meaning you can change their position, scale and rotation. This is useful for creating simple picture-in-picture, such as during a presentation or news-style broadcast.

To transform a clip, first select it on the timeline. You can then control it in the Viewer or Controls panel.

In the Viewer you will see a transform widget:



Dragging on the arrow will move the clip on the horizontal or vertical, while dragging on the blue square will rotate it. You can also click anywhere else on the clip to move it freely.

At the 4 corners of a clip are handles which can be dragged to resize it. Holding **SHIFT** maintains the aspect ratio, while holding **ALT** (**OPT** on Mac) rotates the clip.

The Controls panel provides fine control over the clip's transform properties:



Clicking once on a property lets you type in a new value. Dragging on a value increases or decreases it.

You can also apply simple transformations using the clip's menu on the timeline. This is an easy way to resize the clip to fit the frame or be centered.



Anchor Points

Every clip has an **anchor point**. This is the clip's origin around which it rotates.

The default anchor point for clips is in the center. For most purposes this is the most useful location for the anchor point but there are some circumstances where moving the anchor point would be beneficial.

For example, if you had a simple rectangular plane and wanted to rotate it around one corner instead of its center, you would move the anchor point to that corner then use the normal rotation controls.

Blending Clips

By default clips are simply rendered on on top of the other, such that higher layers completely obscure lower layers. Blend modes are used to mix multiple clips together in more interesting ways.

You can change the blend mode of a clip by selecting it on the timeline and then viewing its Clip Properties in the Controls panel, or by using the clips timeline menu.

See <u>Blend modes</u> for details of each blend mode.

Opacity O 💿

A clip's opacity can be changed over time. This lets you create simple, manual fades or to turn a clip semitransparent.

Opacity can be adjusted in the Controls panel or directly on the timeline. Every clip has an opacity bar which can be dragged up and down.

By default, the opacity bar will change the opacity of the entire clip. If you want to change the opacity of a clip over time, you can add keyframes by holding **Ctrl** and clicking on the opacity bar. Each keyframe can contain a different opacity setting, and HitFilm will automatically ramp the frames between keyframes form one value to the next. Keyframes can be dragged vertically on the timeline to change their value, or dragged horizontally on the timeline to change their timing. Hold **Shift** while dragging to constrain movement of keyframes to the horizontal time axis.

Keyframing can also be turned on and off in the controls panel by clicking the keyframe button to the left of the Opacity property.

Keying Green Screen Clips

HitFilm includes a wide range of compositing effects, which are found in the Keying folder of the Effects library. Many of these effects work in the editor timeline as well as in composite shots.

For example, the **Color Difference Key** is a simple but effective effect for removing green screen backgrounds. To apply it to a clip simply drag it from the Effects panel onto the clip containing the green screen video. You can then refine the settings in the Controls panel.

To create a simple green screen composite, place your keyed green screen clip on the track above the background (which can be either a video or an image).

For more information on HitFilm's Keying tools, see the Keying chapter of this manual.

5.13. Effects and Transitions

Although you'll do most of your sophisticated visual effects work in <u>composite shots</u>, you can still do basic effects work in the editor.

The Effects Library

The Effects Menu, the Effects Panel, and the Insert menu each list the entire library of effects built into HitFilm. HitFilm Pro also supports third party OpenFX plugins, and if you have any OpenFX plugins installed, they will be listed along with the built-in effects. Transitions and presets are found only in the Effects Panel. For additional information on specific effects, see the <u>Visual Effects</u> chapter.

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Auto Color	\$
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🖿 New Folder 📋 Delete	600 item(s)

The effects in HitFilm are organized topically into folders. The Effects panel also lists built-in and usercreated presets, which can include multiple effects. See the <u>Presets</u> chapter for more information.

Effects marked with the ADD-ON tag will run in demo mode in HitFilm Express. You can purchase the add-on pack containing the effect at any time to remove the watermark.

Effects marked with the **[Layer only]** tag can only be used in composite shots. All other effects can be used in the editor and in composite shots.

Adding Effects

Most effects are used by adding them to an object on the timeline. There are multiple ways to do this:

- Drag and Drop: Drag an effect from the effects panel onto a timeline object, and drop it.
- **Double-click:** Double-click an effect in the effects panel to add it to the currently selected timeline object.
- Effects Menu: Open the Effects menu on the top menubar and select any effect to add it to the currently selected timeline object.
- **Insert Menu:** In the Controls panel, click the green plus icon next to Effects to open an Insert menu where you can select effects for use.
 - **Search:** The dynamic search box at the top of the insert menu will automatically update the list as you type, so you can quickly locate the effect you need.
 - **Pin:** At the top right of the insert menu is a pin, which pins the menu open. This allows you to select multiple effects, and apply them all to your layer at once.

Kinds of Effects

There are different kinds of effects available in HitFilm, each of which uses a different icon. The kind of layer or timeline object to which effects can be applied will depend on the kind of effect being used.

- **2D Effects:** These effects can be applied to any visual timeline object, on either the Editor or composite shot timelines.
- Image: Solution of the second s
- **AE Plugins:** Any After Effects plugins you install will use this icon. AE plugins are only supported by HitFilm Pro, and must be purchased separately.
- **Audio Effects:** These use the same icon as 2D effects, but can only be applied to timeline objects containing audio.
- Behavior Effects: Behavior effects can be applied to composite shot layers to control their movement.
- **Geometry Effects:** Geometry effects can be applied to text layers in composite shots, to convert the text to 3D objects.
 - **OFX Plugins:** Third party OFX plugins installed into HitFilm will use this icon. OFX plugins are

only supported in HitFilm Pro, and must be purchased separately.

You can search for effects using the Search bar. As you type the list will be instantly updated to display relevant results. You don't need to get the name exactly right – for example, searching for 'lens' will find the 'light flares' effect.

You can also filter the list to show specific types of effect using the Show All menu.

Favorite Effects

You can Favorite certain effects that you use frequently, and they will be added to the Favorites folder. Your favorites are managed in the Effects panel.

To add an effect to your favorites:

- 1. Locate the effect in the Effects panel.
- 2. Click the star icon to the right of the effect's name.
 - All effects with a slid star next to them will be included in your favorites, and automatically added to a new Favorites folder.

The favorites folder can then be found in these locations:

- Effects Panel: The Favorites folder will appear at the very top of the folder list in the effects panel.
- Effects Menu: The Favorites folder will appear above the list of category folders in the Effects menu.

Editing Effects

You can customize the settings contained in an effect in the Controls panel, or on the timeline.

To make changes to an effect, first select the relevant clip on the timeline. Its properties will be displayed in the Controls panel, with all applied effects listed in the effects section. You can expand the effects section, and individual effects, to reveal more controls and details.

Clicking once on a property lets you type in a new value. Dragging on a value increases or decreases it. For full details on adjusting properties, see <u>Introducing the Controls Panel</u>.
Transitions

The Effects library also contains transitions which can be used on the Editor timeline. Transitions provide interesting ways to blend from one clip into the next and can only be used on the editor timeline.

You can drag transitions from the Effects panel onto the timeline. Transitions need to be applied to the start or end of a clip, or between two adjacent clips. A green indicator will show where the transition will be placed.

Once you have applied a transition, it can then be selected on the timeline. The transition's properties can be adjusted in the Controls panel, and its duration can be edited by trimming the transition on the timeline.

Click here for detailed information on the different transitions.

5.13.1. Transition Details

This chapter details the transitions available in HitFilm. For information on applying transitions to your clips see <u>Effects and Transitions</u>.

Audio

Cross Fade

Lowers the audio level of the clip preceding the cut, while simultaneously raising the level of the clip following the cut, for a smooth transition.

• Fade

Adjusts the volume of your audio clip at the start or end, either fading it in from silence or fading it out to silence.

Video

Dissolve

Additive Dissolve

A dissolve that brightens the clips during the transition.

Cross Dissolve

A smooth dissolve which is commonly used in video and film.

Dither Dissolve

A pixellated dissolve.

Motion

• Push

Animates your videos on or off the screen in a particular direction.

• Slide

Animates one video over the other.

• Split

Splits your video into two halves and moves them in opposite directions.

Wipe

Clock Wipe

Traditional clock wipe, as if the moving hands of a clock were moving over the video.

• Linear Wipe

A simple directional wipe.

Radial Wipe

A curved wipe like the movement of a vehicle's windshield wiper.

Zoom

Cross Zoom

Zooms in on the first clip and out of the next.

• Zoom

Zooms the clip in or out of the screen.

Fade to color

Fades from the video to a color of your choice.

Iris

An iris shape expands or contracts to reveal your video. The iris shape can be customized:

- **Shape** choose from a variety of iris shapes.
- **Rotation** rotate the iris shape.
- **Curvature** alter the curve shape of the iris.
- **Pinch** adjust the points of the shape.
- Shift warp the shape clockwise or counter-clockwise.
- **Direction** change the direction of the transition.

5.13.2. Audio Effects

A range of audio effects are included to adjust your audio.

Audio Reverse

Plays the selected clip backwards.

Balance

Pan the audio from left to right within the stereo field of your project.

• **Balance:** Negative values pan the audio farther to the left channel, and positive values pan it to the right channel. Zero sends the audio in equal amounts to both channels.

Cathedral

Simulate the acoustics of a cathedral/large cavernous space.

• Gain: Reduces or increases the overall volume of the processed audio signal.

Channel Levels

Used to adjust the volume of each audio channel individually.

- Left: Adjusts the overall level of the Left channel, in a dB scale. 0.0 dB is the original source volume.
- **Right:** Adjusts the overall level of the Right channel, in a dB scale. 0.0 dB is the original source volume.

Doppler Shift

When combined with an animated layer, this effect introduces realistic Doppler Shift to an audio layer.

The effect should be added directly to your audio layer. In the effect's properties you can link it to a separate layer, which can then be animated. For example, if a point layer is created and animated to move towards camera, the audio will receive a Doppler Shift as if the sound is approaching camera.

A practical example would be to use a constant audio recording of a helicopter, which is then linked via the Doppler Shift effect to an animated 3D helicopter in your scene. The helicopter audio will be shifted automatically as the vehicle moves.

- **Sound Position:** Use this menu to select any layer on your timeline. The selected layer's position will be used to calculate the Doppler Shift.
- **Speed of Sound:** Defined in meters per second. Works in conjunction with the **Scene Size**, which defines how many pixels are equal to a meter within your specific scene.
- Scene Size: Defines how many pixels in the scene correspond to a real meter. This makes it possible to get accurate Doppler Shifting for a variety of scene setups.
- **Distance Falloff:** When activated, the audio will diminish in volume the farther away it is from the position set in the **Volume Distance**.
- Volume Distance is the distance from the camera at which audio will be at 100% volume. As audio gets farther away it will become quieter. At the default of 1000px, if the audio moves closer to camera it will become louder than 100%.

Echo

Generates echoes from the original audio. You can adjust the number of echoes, and how delayed they are from the original. The falloff determines how much of the echo is heard before it diminishes and becomes inaudible.

- **Delay:** The time in milliseconds between the original audio signal, and the start of the echo. When the **Number of Echoes** is set higher than one, this value is also used to set the amount of time between the start of each echo.
- **Falloff:** Defines how much the Level of each echo will be reduced from the previous instance. At the default setting of 50%, the first echo will be half the level of the original signal, the second echo will be 25% of the original level, etc.
- Number of Echoes: The number of times the original audio will be repeated in echo.

Equalizer

The equalizer is used to adjust the strength of specific frequencies in an audio clip. This can be used to selectively adjust the bass and treble, for example, depending on the intent.

The presets menu provides quick access to common equalization tasks, such as high pass, low pass and bass boost.

The Master Gain control is used to control the volume of the clip. This operates separately to the volume

property of the clip and should be used to set the base volume of an audio clip. The volume property can then be used to fine tune volume and mix clips over time.

Recorded audio will often have a low gain when imported. To set your gain to a satisfactory volume for standard playback on typical equipment, you can observe the default gain using the audio meters. Playback the clip and note the peak audio level, as displayed in the peak boxes. You can then make the appropriate adjustment to the Master Gain. For example, if you have a dialogue track which has been recorded with a peak of -18dB, making it rather quiet in the mix, you can set the Master Gain to 9.00dB in order to raise the overall gain to -9dB. This results in louder audio while still leaving headroom to adjust the volume if required.

Large Room

Simulates the ambient reverb of a large room. A longer reverb than the Medium Room effect.

• Gain: Reduces or increases the overall volume of the processed audio signal.

Medium Room

Simulates the ambient reverb of a medium sized room.

• Gain: Reduces or increases the overall volume of the processed audio signal.

Noise Reduction

This is a quick way to clean up audio which is suffering from unwanted background noise.

After applying the effect, move the playhead to a frame containing the noise you wish to remove, and no other audio. This should be a frame where there is no other interfering noises. For this reason when recording audio is is always worth recording a section of 'clean' audio before recording your actual subject. Clicking the **Capture Noise Print** button samples the audio contained in frame, so that HitFilm can recognise the noise.

• **Capture Noise Print:** Clicking this button records whatever audio is present at the current playhead location. The effect will then use this Noise Print to remove the noise from all other frames of the video.

Once you have Captured a Noise Print, some additional controls will appear. In many cases the noise will be immediately removed. The controls also allow you to fine tune how the noise removal is handled.

- · Reset Noise Print: Removes the noise print, so you can select a different frame.
- Add to Noise Print: Allows you to select additional frames of noise, and add them to the noise print.
- **Threshold Level:** On frames where the noise print overlaps with your dialog or other desired audio, removing all of the noise can sometimes create unnatural results. Reducing the Threshold Level restores a bit of the noise, can can be effective for getting a more natural result, while still retaining significant Noise Reduction.
- **Reduce By:** Defines, in dB, how much the noise print will be reduced in each frame of your video. If the results of the reduction are sounding unnatural, try lowering the Reduce By value, so the noise is not removed entirely.

Pitch

Adjusting the pitch can be useful for particular effects, or to counter the natural pitch change caused by adjusting playback speed of a clip.

• Semitone Shift: Sets, in semitones, how far the audio is shifted. Moving the slider to the left will shift the pitch lower, and moving to the right will shift the pitch higher. A semitone is equal to the pitch change between one key and the next on the piano. From C to C#, for example, is a semitone. 12 semitones is an octave.

Shortwave Radio

Simulates the sound of a shortwave radio.

• Gain: Reduces or increases the overall volume of the processed audio signal.

Small Room

Simulates the ambient reverb of a small room. A shorter reverb than the **Medium Room** effect.

• Gain: Reduces or increases the overall volume of the processed audio signal.

Telephone

Simulates the sound of telephone audio.

• Gain: Reduces or increases the overall volume of the processed audio signal.

Tone

Generates a continuous tone of a defined frequency. The **Type** you select makes a bigger difference at lower Frequencies. The higher the **Frequency**, the harder it is to distinguish between the Types.

- Type
 - **Sine:** A Sine wave gives a smooth, rounded sound.
 - Square: A Square wave gives a harsh, cutting sound
 - **Frequency:** Sets the number of waves per second, which defines the pitch of the tone that is generated.

5.14. Using Composite Shots In The Editor

While the editor is capable of <u>basic compositing</u> and <u>effects work</u>, HitFilm's true compositing power is found in composite shots.

Composite shots are layer-based timelines and you can create as many of them as you like. They support 2D and 3D compositing plus advanced effects such as the particle simulator. Composite shots are listed in the Media panel and can be added to the editor timeline like any other asset.

Full details can be found in the <u>Compositing</u> section.

Composite Shots as Clips

Composite shots on the editor timeline behave similarly to ordinary video clips. They can be trimmed, sliced and moved around. You can add effects and transitions.

Any changes you make to a composite shot clip on the timeline will not affect the actual contents of the composite shot, in the same way that trimming a video clip does not alter the duration of the source clip on your computer.

Note that composite shots on the editor timeline will not show video or audio previews unless the composite shot has been <u>pre-rendered</u>.

The Workflow Options

There are several ways to create composite shots and to integrate them into your edits. It's up to you how you structure your workflow.

Converting Clips to Composite Shots

A particularly fast workflow is to first create your basic edit, assembling clips on the timeline as normal. You can then select any clip on the timeline and convert it to a composite shot using the Make Composite Shot button at the top of the timeline.

Converting a clip to a composite shot performs the following actions:

1. A new composite shot is created based on the clip's properties (dimensions, duration, framerate).

- 2. The new composite shot is now listed in the Media panel.
- 3. The selected clip is automatically placed inside the new composite shot.
- 4. On the editor timeline the clip is replaced by the new composite shot.
- 5. The new composite shot's timeline is opened and switched to automatically.

You can switch between the composite shot and the editor at any time using the tabs at the top of the timeline. Changes made in the composite shot will be reflected on the editor timeline.

When converting a clip you will be asked a couple of questions:

MAKE COMPOSITE SHOT	×
Name: Head replacement	t VFX
Take composite shot prope	rties from:
Selected Clip	Editor Sequence
Effects and transform prop	erties:
Leave Here	Move with Clip
CANCEL	ок

- **Name:** The new composite shot needs a name. It's a good idea to have a clear naming policy to keep track of your work, especially if your project has many VFX shots.
- Take Composite Shot Properties From

The new composite shot can take its core properties from the **Selected Clip** or from the **Editor Timeline**. This is useful if you are creating a composite shot from a video or image which is a different size to your actual project.

- **Selected Clip:** Uses the Width, Height, Frame Rate and Aspect Ratio of the source clip, and applies them to the new Composite Shot.
- Editor Sequence: Uses the Width, Height, Frame Rate and Aspect Ratio selected in the Project screen, and applies them to the new Composite Shot, so that it matches the Editor Sequence settings perfectly.
- Effects and Transform Properties

If you have already applied effects to the clip or adjusted its transform properties you can choose what to do with them.

• Leave Here: applies the effects and transform settings to the new composite shot on the editor

timeline. These will therefore be applied after the composite shot itself has been rendered.

• **Move with Clip:** keeps the effects and transform settings with the original clip, which is then placed inside the new composite shot as a new layer.

Creating Composite Shots From Media Assets

Composite shots can also be created by using an asset in the Media panel as the source. Simply choose **Make Composite Shot** from an asset's menu to create the composite shot using its properties.

The new composite shot's details will be displayed so that you can check them, then the new timeline will open and the composite shot will be listed in the media panel, with the source media already in place as a layer.

Creating composite shots in the Media panel does not affect the source media asset.

Creating New Composite Shots 🗘

You can also create new composite shots without converting a specific clip. This is useful for creating titles or motion design elements which aren't connected directly to a visual effects shot.

To create a new composite shot click the New button in the Media panel and select composite shot from the menu. You can then set up your composite shot manually according to your requirements. See <u>Composite</u> <u>Shots</u> for full details.

Once a composite shot is created it is then listed in the Media panel and its timeline will open. To use the composite shot in your editor, simply switch back to your editor timeline and drag the composite shot from the Media panel onto the editor, just like you would a video asset.

6. Compositing



HitFilm's compositing tools are hugely powerful, providing 2D and 3D layer-based compositing with an advanced particle simulator, live 3D object rendering, over 800 built-in effects and presets, planar tracking with a special version of Mocha from Imagineer Systems, integrated 3D camera solving with The Foundry's Camera Tracker, and a unified 3D workspace.

The compositing tools work directly alongside the <u>Editor</u>. Switching between your main edit and a fully CG visual effects shot is as simple as clicking the timeline tab. You can also bypass the editor entirely and use HitFilm solely as a compositor.

Composite shots are built using layers. Each layer contains a single asset (video, image, particle effect, 3D model etc) and can be heavily customized by applying transformation, drawing masks, adding effects and more.

Most customizable properties can also be keyframed, creating animation over time.

6.1. Creating Composite Shots

Composite shot timelines can be created in a variety of ways, so no matter where you are in the software or in your workflow, you can readily create a new timeline when needed. Composite shots can be created from scratch, or created from existing media.

Creating New Composite Shots 🔤

There are two ways to create a new composite shot in the Media panel:

- Click the New button in the Media panel, and select Composite Shot from the menu.
- Use the keyboard shortcut **Shift+CTRL+N** to create a new composite shot.

Using either of those commands will open the Composite Shot Properties dialog shown below, where you can choose the settings to be used by your new timeline.

Composite	Shot Propert	ies				×
	Name:	Composite Shot 1				
	Template:	1080p Full HD @ 29.97 fps 🛛 👻		fps 👻	B	
	Duration:	00;00;30;00				
Standard	Advanced					
Video						
	Width:	1920		Match Timeli	ne	
	Height:	1080				
F	rame Rate:	29.97				
As	spect Ratio:	Square Pixels (1.0)			*	
Audio						
Sa	ample Rate:	48000 Hz				
Cancel					c	ж

- **Name:** Enter the name you wish to use for your composite shot. By default they are numbered sequentially, but it is recommended that you change the names to reflect the contents of each timeline. As you get more and more timelines in your project, this makes it easy to identify and locate whichever one you need.
- **Template:** If you wish to create a timeline using a standardized format, you can choose the appropriate template from this list.
 - **Save Template:** You can create your own templates by setting the Video and Audio settings to your desired values, then clicking the **Save** icon to the right of the Template menu.
- Duration: Enter your desired duration for the timeline. The default value can be set in the HitFilm

Options, but you can edit the duration of each timeline individually at any time.

Standard Tab

Video

- Width: If you wish to create a comp at a resolution that is not available as a template, you can manually enter the width, in pixels, here.
- **Height:** If you wish to create a comp at a resolution that is not available as a template, you can manually enter the width, in pixels, here.
- Frame Rate: Edit the frame rate used by your composite shot here.
- Aspect Ratio: Edit the pixel aspect ratio used by your composite shot here.

Audio

• **Sample Rate:** Enter the sample rate to be used by your composite shot here. If your comp will contain video, this should match the sample rate of the video in most cases.

Advanced Tab

The advanced tab of the composite shot properties window contains settings for fog and motion blur. Fog is used to create a fall-off in 3D scenes, while motion blur can be optionally applied to any moving item.

- More information on Fog.
- More information on Motion Blur.

Once a composite shot is created, it is then listed in the Media panel and its timeline will open.

Composite Shots From Media Assets

Composite shots can also be created by using an asset in the Media panel as the source. Simply choose Make Composites Shot from an asset's menu to create the composite shot using its properties.

The new composite shot's details will be displayed so that you can check them, then the new timeline will open and the composite shot will be listed in the media panel, with the source media already in place as a layer.

Creating composite shots in the Media panel does not affect the source media asset.

Converting Layers to Composite Shots

A layer in a composite shot can be converted into a new composite shot. This can be done from a layer's menu or by clicking the Make Composite Shot button on the timeline.

The selected layer is replaced on the timeline with the new composite shot, with the original layer moved inside the new composite shot as its first layer.

When converting a layer to a composite shot you are presented with the following options:

MAKE COMPOSITE SHOT	×
Name: Flare Composite Sh	ot
Take composite shot proper	ties from:
Selected Layer	Current Timeline
Masks, effects and transform	n properties:
Leave Here	Move with Layer
CANCEL	ОК

• **Name**: The new composite shot needs a name. It's a good idea to have a clear naming policy to keep track of your work, especially if your project has many VFX shots.

Take Composite Shot Properties From

The new composite shot can take its core properties from the Selected Clip or from the Editor Timeline. This is useful if you are creating a composite shot from a video or image which is a different size to your actual project.

- **Selected Clip**: Uses the Width, Height, Frame Rate and Aspect Ratio of the source clip, and applies them to the new Composite Shot.
- Editor Sequence: Uses the Width, Height, Frame Rate and Aspect Ratio selected in the Project screen, and applies them to the new Composite Shot, so that it matches the Editor Sequence settings perfectly.

• Effects and Transform Properties

If you have already applied effects to the clip or adjusted its transform properties you can choose what to do with them.

- Leave Here: applies the effects and transform settings to the new composite shot on the editor timeline. These will therefore be applied after the composite shot itself has been rendered.
- **Move with Clip**: keeps the effects and transform settings with the original clip, which is then placed inside the new composite shot as a new layer.

For more information about using composite shots inside other composite shots, see <u>Embedding Composite</u> <u>Shots</u>.

Converting Clips to Composite Shots on the Editor Timeline

Composite shots and the editor timeline closely interact. Any clip on the editor timeline can be converted to a composite shot. For details see <u>Using Composite Shots in the Editor</u>.

6.2. Using the Composite Shot Timeline

The composite shot timeline has several tools arranged around its outer edge. Many of these are similar to those found in the editor.



The Time Ruler

Along the top of the timeline is the time ruler, representing the duration of your project. Clicking on the time ruler will move the playhead, which defines the current frame, to the location of the click. The frame located at the playhead's new location will be displayed in the Viewer.

You can also click and drag on the playhead itself.

To jump to a specific time, simply type it into the time display at the top-left. The time display can be switched between timecode and frame count using its right-click menu.

Scaling and Panning the Timeline

The timeline can be scaled using the zoom bar, so that you can either zoom out to see the composite shot's entire contents or zoom in to focus on a specific area and perform fine frame-by-frame work.

When zoomed in you can then use the scrollbars or the Hand tool to pan the timeline left and right.

• Pressing **Home** on your keyboard will scroll the playhead to the first frame of the timeline.

• Pressing **Ctrl+Home** will auto-scroll the timeline to the current playhead position.

Searching Your Layers

Composite shots can contain large numbers of layers, each of which contains many properties. You can use the Search box at the top of the timeline to find specific layers or specific properties within complex timelines.

Setting the Work Area

The work area is represented by the light gray bar running along the time ruler. It defines a limited portion of the timeline, for two main purposes.

- Looped Playback: Specify a particular portion of your timeline for looped playback.
- Export: Define a portion of the timeline to be exported, rather than exporting the entire timeline.

The work area defaults to the timeline's entire duration, but can be adjusted using three methods.

- **Time Ruler:** Drag the ends of the work area on the time ruler to reposition them on any frame of your choice. Holding the **Alt** key and dragging on the work area will move it without changing its duration.
- Keyboard: Position the playhead on any frame, and press I to set the In Point to that frame, or press
 O to set the Out Point to that frame. * Pressing the P key will set the work area to encompass the contents of your timeline.
- Viewer Buttons: Click the Set In Point button to set the In Point to the frame where the playhead is currently located, or click the Set Out Point button to set the Out Point to the frame where the playhead is currently located.

Keyframes 🕤 💿 🕀

At the top left of the timeline are the keyframe buttons.

Keyframes are used to store changes to settings on particular frames. For example, on frame 10 a video could be set to full opacity and then on frame 20 it could be set to 50% opacity. This would be stored as two keyframes, one on frame 10 and one on frame 20. Between frames 10 and 20 the video would become gradually more transparent.

The two arrow buttons are used to jump between keyframes for the currently selected property.

The circle button in the center is used to turn keyframes on and off on the current frame for the currently

selected property. If a keyframe is present on the current frame a dot is displayed in the middle the circle.

Additional buttons control whether the timing of individual keyframes is linear, constant, or smoothed.

See Animating with Keyframes to find out more.

Exporting

You can export any timeline, in whole or in part, to create a new video file from its contents. On the top right of each timeline is the Export button. Clicking it reveals two options. Which one you click determines what portion of the timeline is added to the Export Queue.

- **IN/OUT Area:** Exports only the work area of your timeline. The work area is defined by the In and Out points you set, as detailed above.
- **Contents:** Exports the entire contents of the timeline. If your timeline extends beyond the video it contains, any empty frames on the end will not be included in the export.

The In/Out area can also be adjusted directly in the Project panel of the Export Screen. See Exporting for full details.

Adjusting Properties 🍄

You can open a composite shot's properties at any time by clicking the gear icon in the bottom-left of the panel.

6.3. Working With Layers

All objects added to composite shot timelines exist as layers. All layers, on all composite shot timelines, share some common controls.



Expanding Layers

Layers on the timeline can be expanded to reveal more details using the triangular arrow icon. Each layer contains sub-groups so that you can quickly find the details you need. Tracks, masks, effects and transform data are all grouped separately.

Some layers will have additional groups. For example, 3D layers include a Material group for adjusting their 3D lighting behavior.

Customizing Settings

A layer's settings can be adjusted on the timeline or in the Controls panel. While all layer controls can be seen simultaneously on the timeline, only the currently selected layer is displayed in the Controls panel. This allows you to focus on the controls of a specific layer, and in some cases makes room for a richer controls interface. Double-clicking a group or property in the timeline or controls panel will open it in the other area.

For more information about changing settings over time, see Animating with Keyframes.

Layer Properties

All layers have a layer properties group in the controls panel. Many of these options are also available on the timeline, using the icons shown. The specific options available will vary depending on the type of layer, but common options include:

- Lock: Toggles the editable state of the layer. When a layer is locked, it cannot be altered or edited in any way, unless it is first unlocked.
- Visible: Toggles the layer's visibility on and off. Invisible layers will not appear in the <u>viewer</u> and will not be included in any <u>exports.</u>, but can still be used as a reference for other layers and effects.
- **Mute:** If the layer contains audio, the Mute option will be displayed. Tick the box to silence all audio contained in the layer.
- Show Waveform: For layers containing audio, enabling this option displays the waveform on the timeline.
- Example 2D and 3D. Embedded composite shots, 3D models and particle simulators also have the 3D unrolled option. More information can be found in <u>The Render Pipeline</u>.
 - ^o **2D**: When set to **2D** layers behave like a flat sheet of paper, always facing the camera. When the layer is created from a 3D source, such as a 3D model or a particle simulator, the 3D contents of the layer can be edited internally, but can not interact with any other layers. For example, you can orbit a camera around a 3D object to change the angle that is visible, but the rendered result of the layer is a 2D element, and its interactions with other layers is determined solely by its position in the layer stack (Z-depth is not a factor).

3D Plane: 3D plane takes the 2D version and renders it as a 3D plane inside the 3D space. In the case of videos, images and planes this is like having a flat piece of card, which can be rotated in any direction relative to the camera. With 3D objects and particle simulations it is like looking through a window onto a 3D scene. The 3D plane exists in 3D space, so its interactions are determined by its position in 3D space. In the case of 3D objects and particle simulations note that it is the flat 3D plane which exists in 3D space, not the plane's contents.

- **3D Unrolled: 3D unrolled** renders 3D content directly into the 3D space. Multiple 3D unrolled layers will accurately interact with each other in 3D space. This is the unified 3D space and enables powerful interactions for example, you can position a green screened actor directly inside the cockpit of a 3D model helicopter, without needing any layering tricks.
- Alignment: Provides various auto-alignment options. Along Motion Path aligns the layer according to its motion (this can be effective if your layer has a define 'front', such as an arrow shape). Towards

Target Position keeps the layer aligned towards a specified point in space. **Towards Layer** keeps the layer aligned towards a specified layer.

- Blend: Changes how the layer is blended onto layer below.
- Motion Blur: Activates motion blur for the layer.
- **Parent:** Links the layer's transform to another layer. Ordinarily a layer's transform is relative to the center of the scene. Parenting changes this so that the layer's transform is relative to the selected parent layer.
- **Include in Depth Map:** Includes or excludes the layer when generating the depth map for the composite shot. This is important if the composite shot exists as a 3D Unrolled layer on another timeline.
- **Depth Source Layer:** For 3D models or 3D effects, this option selects another layer within the composite shot as the source of the depth map. The depth map acts like a mask, and the layer is only rendered where it is nearer to the camera than the information in the depth map.
- **Promote Lights:** On embedded 3D composite shots containing lights, enabling this option allows the lights to affect 3D layers in the parent composite shot.

Changing Layer Order

Once you've created more than one layer you can reorder them be dragging them up and down in the layer list (on the left side of the timeline).

You can move multiple layers at the same time by Ctrl- or Shift- clicking them.

Timeline Tools

- **The Select Tool:** The **Select** tool enables trimming and moving of layers. The icon will change based on the location of the cursor, indicating the function which will be used.
 - **Noving:** To move a layer backwards or forwards in time, drag its colored duration bar on the timeline.
 - Trimming: Dragging on the start or end of a layer will trim its duration. When a layer is trimmed you can see a dimmed representation of the layer's original duration.

The Drag Tool:* The **Drag** tool is used to move the visible portion of the timeline, without altering its contents. It serves the same function as the scroll bars at the right side and bottom of the timeline, but is often a faster option, as you can select the tool with a keyboard shortcut (H), and adjust the view from anywhere, rather than needing to move the mouse to the scroll handle.

The Slice Tool: The Slice tool is used to cut layers into two separate layers. The layer will be

sliced at the frame where you click.

The Rate Stretch Tool: Using the Rate Stretch tool to change a layer's in or out point will retain the contents of the layer and change its playback speed to fit into the newly defined space on the timeline. Retiming can be used to speed up or slow down playback for specific layers.

- For example, dragging the out point of a layer so that the layer on the timeline is twice as long will cause the layer to playback at half speed.
- You can also use the **Speed/Duration** option in any layer's right-click menu to perform a more precise speed adjustment. This displays the **Edit Speed/Duration** window:

EDIT SPEE	D/DURATION		×
Speed:	100.00 <mark>%</mark>	\$	-
Duration:	00;00;02;03	÷	0,0
CANCEL			ок

The two properties, speed and duration, can be linked or separated using the chain icon at the right. The behavior is subtly different depending on the link state. When unlinked, as in the picture above, changing the speed will retain the layer's in and out positions on the timeline while changing the playback speed of the layer's content. Changing the duration will change the out point of the layer without affecting its playback speed. When the two properties are linked together, changing the speed will also automatically update the duration, moving the out point of the layer to accommodate the same contents at the new speed. For example, a 2 second layer on the timeline when changed to 50% speed will have a new duration of 4 seconds. Alternatively, you can change the duration and the speed will be automatically changed to fit the layer's contents perfectly into the new duration.

Snapping: The Snap button can be used to turn snapping on and off. Snapping ensures that layers connect directly with no blank frames in-between. Layers snap to other clips and to the playhead.

6.4. Managing Composite Shots

Your composite shots are listed in the Media panel along with your videos and other media.

This means that you can work with composite shots in the same way you would any other media asset, including adding them to the editor timeline or even inside another composite shot's timeline.

Composite shots can also be organized in the Media panel like any other asset. See <u>Organizing Media</u> for details.

Working with Multiple Timelines

A project can contain multiple composite shot timelines, plus the editor timeline. You can have multiple timelines open at the same time, with the currently selected timeline displayed in the Viewer.

Switching between timelines is as simple as click the timeline's name tab.

You can close composite shot timelines without losing any work. Simply click the 'X' to remove.

Closed composite shots can be re-opened by double-clicking them in the Media panel. If the composite shot has been used inside another timelines (see Embedding Composite Shots) you can also double-click the layer name to open it.

6.5. Embedding Composite Shots

You can place composite shots inside other composite shots. This is called **embedding**. The embedded composite shot is often referred to as a 'child' while the composite shot containing it is known as the 'parent'.

Embedding opens up advanced compositing workflows and also provides a way to organize your layers into distinct groups. Using embedded composite shots can also provide a performance boost, when combined with <u>the pre-render system</u>.

To embed a composite shot simply add it to an existing composite shot as a layer, in the same way you would add a video or any other asset.

Masks and effects can be added to embedded composite shots just like any other media layer.

Creating Embedded Composite Shots

When you convert a layer to a composite shot you are automatically embedding that new composite shot.

You can also select multiple layers when creating a new composite shot, which is a quick way to group related layers together inside their own composite shot.

Impact on the Render Pipeline

The contents of an embedded composite shot are rendered as one, so that the embedded composite shot exists as a single layer in the current timeline's render pipeline.

Therefore you can use an embedded comp to 'bake in' all of its contents. Subsequently you can then use the embedded composite shot as a source layer for effects, knowing that they will use all of the embedded composite shot's content.

If an embedded composite shot is set to the 3D unrolled dimensional state, any 3D content inside it will be rendered in the unified 3D space, while still only occupying a single layer on the timeline. See <u>The Render</u> <u>Pipeline</u> for details.

Pre-Render Benefits

Embedded composite shots can be combined with the <u>pre-render system</u> to provide a major performance boost when working on complex projects.

For example, if you have completed work on a complex particle simulation which doesn't render in real time, in many cases you will be able put it into an embedded comp which you then pre-render. This will perform a background render which will generate a faster performing file, making it possible to continue working efficiently in the parent composite shot.

6.6. Creating Templates with Composite Shots

Because composite shot timelines can be embedded in other timelines, they are also useful for creating templates. You can set up one title, for example, with any animation and effects that you want applied to it, then use that as a template to quickly create multiple titles that use the exact same styling.

Templates can be created by **Publishing** specific properties in the composite shot. Inside of a composite shot, right-clicking some options will reveal a **Publish** option. When this is toggled on, a Pin icon will appear, indicating that that property is published.

When a composite shot that contains published properties is added to the Editor timeline. The published properties can be edited without opening the composite shot timeline. They will be listed in the Controls panel for the composite shot, and can be edited independently for each instance of the template that is used. So if a Text layer inside the composite shot is published, for example, then you can add multiple instances of the template on the Editor, and edit the text to be different in each one.

You can also export a template to your harddrive, then import it into any other projects you create for use there.

Installed Templates

There are a number of templates installed into the software for immediate use. They can be imported into any project.

- In the Media panel, select Import > Installed Templates
- In the window that opens, select the template or templates that you wish to import.

Installed Templates ×		
Select Tem	plates to Import	
ETHAN HUNT Prif Sector Free Conversion	Clean Box Line	
LARA CROFT	Clean Double Box	
MARTY MCFLY	Flashy	
Dominick Cobb Dears The?	L Hook	
DARTH VADER	Left Align	
Obi-Wan Kenebi se Meser	Line Wipe	
Harry Potter	Super Simple	
Jack Sparrow	Transparent Box	
Cancel	Import As Comp	Import

• Click **Import** to import the template. You also have the option of clicking **Edit** to import the composite shot in its fully editable state, instead of as a template.

The selected template will now be available for use, in the Media panel.

- Drag the template from the Media panel onto the Editor timeline.
- Open the controls panel to access the controls for the template. Specific properties of the template are listed here, and can be edited.

Each instance of a template can be edited independently. So you can drag five instances of the same template onto the editor, for example, and use different names in each instance.

Publishing Properties

Only specific properties in a composite shot can be published. These include:

- **Text Layers:** Publishing a text layer allows the contents of the text layer to be edited in the template.
- Layer Visibility: In the Layer Properties controls, the Visible property of each layer can be published.
- Layer Blend Mode: In the Layer Properties controls, the Blend Mode can be published.
- Layer Transform Properties: In the transform controls for each layer, each individual property can be published.
- **Mask Properties:** For each mask contained in the composite shot, individual properties can be published.
- Effect Properties: For each effect contained in the composite shot, individual properties can be published.

When you right-click on any property that supports publishing, you will see an option to Publish at the bottom of the contextual menu. In the following image, Opacity has been right-clicked to open its menu.



After you select the option to publish, a Pin icon is displayed next to the property, so you can easily identify which properties in the composite shot have been published.



All published properties can be edited without opening the composite shot timeline. In the Media panel, any composite shot that contains published properties will display the Template icon 🗊, as shown below.



Exporting Templates

Once one or more properties inside of a composite shot have been published, you can export it to create a template which can be shared with other users or imported into other projects.

To export a Template:

- In the Media panel, right-click on a composite shot which has the template icon
- Select **Save As...** from the menu.
- A new dialog will open, with options for creating the template:

Save Composite Shot Template	×
File Name: Credits.hfcs Thumbnail:	11 ×
Published Properties ? Opacity ? Edit New Text ? Position ? Scale ? Reveal Length ? Conceal Length ? Edit Role	
Cancel	Save

- **File Name:** Enter the name you wish to use for the template. Click the Folder icon to select a location for the exported template to be saved to. After selecting a location, click Save to save that directory and return to the template options dialog.
- Thumbnail: Click the folder icon to navigate to and select the image you want to use as a

thumbnail for the template. Click the X icon to remove the current image.

- **Published Properties:** Lists all of the properties that will be editable when the template is used.
- Cancel: Closes the dialog without saving the template.
- **Save:** Exports a template file and saves it using the name and location you have chosen.

Importing and Using Templates

To import a template:

- In the Media panel, select Import > Composite Shot.
- Navigate to the .hfcs file that you wish to import, and select it.
- Click **Open** to import the template.

The template file will now be available in the Media panel, for use in your project.

6.7. How Layers are Rendered

HitFilm renders layers in a particular order. Understanding this render order makes it easier to construct your shots.

Layer Order

HitFilm renders from the bottom layer up. Therefore higher layers in the layer stack will obscure lower layers.

The contents of any embedded composite shot layers are rendered in their entirety before higher layers are rendered.

Masks and Effects

Each layer can be heavily customized. Layer properties (eg Masks, Effects, Transform) are processed from top to bottom. Therefore masks are applied before effects.

As a practical example, if you add a circular mask to a layer, cutting out a hole, then add a glow effect, the glow will also be visible around the edges of the masked hole. This is because the hole is masked first, then the glow is applied.

Baking In/Flattening

When using a layer as a source for another effect it is important to understand that the source layer will be used before masks and effects are applied.

If you want the source to include applied effects and masks, the source layer should be made into an embedded composite shot. This will 'bake in' the effects and masks and the <u>embedded composite shot</u> can then be used as the source.

Using <u>Grade Layers</u> will also flatten all layers below, baking in any effects and masks. Using the grade layer as a source will in fact use the entire flattened render of all the layers below it.

3D Layer Modes 🔛 🖉 💬

Layers on the timeline can be set to three states: 2D, 3D plane and 3D unrolled. Which states are available for each layer will depend on the kind of layer it is. 3D Unrolled, for example, is only available for layers which contain 3D content, such as embedded composite shots and 3D models.

When set to **2D**, the content of the layer works in full 3D (for example, you can orbit a camera around a 3D object), but the rendered result of the layer is a 2D element. Therefore the 3D layer's interactions with other layers on the timeline is determined solely by its position in the layer stack (Z-depth is not a factor).

3D plane takes the 2D version and renders it as a 3D plane inside the 3D space. In the case of videos, images and planes this is like having a flat piece of card. With 3D objects and particle simulations it is like looking through a window onto a 3D scene. The 3D plane exists in 3D space, so its interactions are determined by its position in 3D space. In the case of 3D objects and particle simulations note that it is the flat **3D plane** which exists in 3D space, not the plane's contents.

3D unrolled renders 3D content directly into the 3D space. Multiple 3D unrolled layers will accurately interact with each other in 3D space. This is the unified 3D space and enables powerful interactions – for example, you can position a green screened actor directly inside the cockpit of a 3D model helicopter, without needing any layering tricks.

3D Batches

When 3D and 2D layers are combined on the same timeline it can result in render batches. If one or more 2D layers are positioned between 3D layers, it will separate those 3D layers into separate render batches.

Therefore if you need 3D layers to interact with each other properly in 3D space, make sure they are not separated by any 2D layers.

6.8. Creating Layers

After creating a <u>composite shot</u>, the first thing you need to do is add some layers to the timeline.



If you created your composite shot by converting a clip or layer, there will already be at least one layer on the new timeline.

Adding Media from the Media Panel

You can drag anything in your Media list straight into a composite shot. Simply find the <u>media asset</u> you want to use and drag it from the list onto your timeline.

When you drag media onto the timeline you need to choose where you want it to go. A blue indicator shows where the layer will be dropped.



Every item in a composite shot exists on its own layer, so each layer can only hold a single item. This means that each time you add something to the composite shot a new layer is created.

Adding 3D Effects From the Effects Panel

3D effects include the Particle Simulator and Gunfire. These are located in the Effects library but behave differently to the other effects.

While other effects can only be applied to an existing clip or layer, 3D effects create a new, dedicated layer on the timeline.

Generated Layers 😳

HitFilm can create layers internally. These allow for procedural content which does not rely on eternal media, or which can be combined with external media.

To create a generated layer use the New Layer menu in a composite shot. You can also create planes from the New menu in the Media panel.

Follow these links to find out more about each layer type:

- <u>Plane</u>: A flat, colored, rectangular shape. Planes are listed in the Media panel for easy re-use. Planes serve as excellent empty hosts for other effects. Also known as 'solids'.
- <u>Text</u>: Create text and titles which can be positioned in 3D and customized heavily using effects.
- <u>Grade</u>: These affect all layers below, making it easy to instantly apply effects to multiple layers at once. Also known as 'adjustment layers'.
- <u>Camera</u>: 3D scenes require a virtual 3D camera to define the view. 3D cameras share many similarities with real cameras, including depth of field and zoom.
- Light: Used to create more dramatic lighting in 3D scenes.
- **Point**: Invisible reference layers which can be linked to other layers. Useful for setting up animation rigs. Also known as 'nulls'.
6.9. Creating and Using Planes

Planes are flat, rectangular shapes that are created inside HitFilm. The color and opacity of a plane are specified at the time of its creation, but can be edited at any time through the plane's Properties. Editing the color or opacity of a plane in its properties will affect every instance of that plane used within your project.

Planes can be in 2D or 3D and have many uses, for example:

- Solid color backgrounds.
- Invisible layers for receiving 3D shadows.
- Reference layers for parenting.
- Creating simple 3D geometry.
- Creating 2D shapes using masks.

Creating Planes

Planes can be created from the **New** menu in the Media panel or from the **New Layer** menu in a composite shot timeline.

In both cases a new plane is created and is listed in the <u>Project Media list</u>. If you use the New Layer menu on the timeline the plane will also be automatically added to the timeline as a new layer.

Plane Properties

When creating a new plane you need to choose its initial properties. You can always update these properties later by editing the plane in the Media panel.

- Name: The plane will be listed in the Media panel and displayed on the timeline using this name.
- Width/Height: Determines the resolution of the plane. You can make it larger, smaller or the same size as your project and composite shots.
- **Aspect**: The shape of the individual pixels, which in turn affects the shape of the plane frame. Some formats use non-square pixels to create widescreen aspect ratios, so make sure you check your camera's specification if your plane looks the wrong shape.
- **Color**: Clicking the color box will display a standard color palette for choosing the plane's color. Alternatively, you can click and drag on the color pipette icon then move the mouse over any color on your screen. The Opacity of a plane can also be edited here. White, grey, black, and completely transparent swatches are also provided for quick selection.

• **Match Sequence/Composite Shot**: This button will automatically adjust the plane's settings to match those of your currently active editor sequence or composite shot.

The color of a plane is one of its core properties. Changing the color will affect all instances of the plane in your project.

6.10. Grade Layers

Grade layers are quick ways to color grade several layers at once.

The alternatives are to grade each layer individually (which gives you lots of control but can take some time!) or to put all the layers into an embedded composite shot and grade that (which can be inconvenient if you don't want to embed those layers). Using grade layers can be faster and easier.

Creating Grade Layers

You can create grade layers from the New Layer menu in composite shot timelines.

When they are first created, grade layers will be invisible and will have no effect on your project. Any 2D effects you add to the grade layer will affect all of the layers beneath it.

Grade layers are created at the same resolution as the currently open composite shot.

Grade layers **flatten** any 3D layers they are above. This means that any 3D layers above the grade layer will not be able to interact with 3D layers below.

Transforming Grade Layers

Grade layers can be transformed like any other layer, in 2D or 3D.

By transforming a grade layer you can change the area affected by it. Only layers directly behind the grade layer will be affected.

A Masks can also be used to specify which parts of a grade layer affect the layers below.

3D Transform & Layer Order

If you transform a grade layer in 3D, its position in 3D space does not directly affect which layers it grades. Even when in 3D, it is its position in the layer listing on the timeline which determines which layers are affected.

6.11. Transforming Layers

Transforming a layer means to change its position, scale or rotation.

In composite shots this can be done in 2D or 3D. The interfaces are largely the same, with 3D layers gaining the Z (depth) dimension. See " in 3D for more details.

To transform a layer, first select it on the timeline. You can then control it on the timeline, in the Viewer or in the Controls panel.

In the Viewer you will see a transform widget:



Dragging on the arrow will move the layer on the horizontal or vertical, while dragging on the blue square will rotate it. You can also click anywhere else on the layer to move it freely.

At the 4 corners of a layer are handles which can be dragged to resize it. Holding **SHIFT** maintains the aspect ratio, while holding **ALT** (**OPT** on Mac)) rotates the layer. Holding **CTRL** (**CMD** on Mac) will set the control point to the opposite corner, and resize the layer from that corner, rather than from the center.

The Controls panel provides fine control over the layer's transform properties:

Clicking once on a property lets you type in a new value. Dragging on a value increases or decreases it.

Holding **CTRL** (**CMD** on Mac) and clicking on a positive Transform value will switch it to a negative value and vice versa (eg, -500 will become 500).

Anchor Points

Every layer has an anchor point. This is the origin around which the layer rotates, and the precise coordinates which define the layer's position.

The default anchor point for layers is in the center. For most purposes this is the most useful location for the anchor point but there are some circumstances where moving the anchor point would be beneficial.

For example, if you had a simple rectangular plane and wanted to rotate it around one corner instead of its center, you would move the anchor point to that corner then use the normal rotation controls.

2D Properties

- **Opacity**: The transparency of the clip.
- Anchor Point: Sets the location of the anchor point, with 0,0 being the center of the layer.
- Position: Moves the layer along the X and Y axes.
- **Scale**: Enlarges or shrinks the layer. The X and Y scales are linked by default so that your layer retains its original shape. You can unlink them using the chain icon.
- **Rotation**: Rotates the layer around its anchor point. Rotation is presented as number of turns and degrees, making it easy to keyframe multiple rotations.

Some additional properties are available for 3D layers. These are discussed in the Working in 3D section.

6.11.1. Animation

In HitFilm, **animation** refers to anything that changes over time, not just to movement. For example, this could refer to changing a layer's transparency over time, having its color shift from blue to red over time, or increasing the number of particles created each second.

By default, changing a property will change it for the duration of the layer. Moving a layer to the right, for example, will cause it to remain in that new position for its entire duration. If you want a property to change over time – for example, having a layer move from left to right over five seconds – you do so using **keyframes**.

Your timelines are built up from multiple frames. A keyframe is a special frame which stores additional information about a change to a property value. Keyframes are turned off for all properties by default. To turn keyframing on for a property simply click the grey circle to the left of the property name. For more information on using keyframes see <u>Animating with Keyframes</u>.

Keyframes

All properties have temporal animation. This is animation which happens over time. By adjusting the temporal interpolation you can alter the speed at which animation plays out.

The default timeline view shows all your keyframes. Each property has its own row on the timeline and keyframes are displayed here as grey icons. Here's an example showing keyframes for a layer's opacity and position properties:

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Note that this view makes it easy to see how keyframes relate to each other – in this case, I can see that the opacity of the layer changes while the layer moves position. However, there's no way at a glance to see the value of each keyframe, without moving the playhead and checking the numerical display on the left, or observing the layer in the Viewer.

Value Graph

The value graph mode displays an alternate view. Here's the same setup in value graph mode:



The value graph shows the details for the currently selected property. At a glance you can see how the value changes over time, without needing to move the playhead. In the case of the position property there are two lines plotted – one for the X position (red) and one for the Y position (green).

The graph here shows that the layer is moving from left to right while also dropping lower in frame before rising back up again. This information isn't available in the default timeline view. The angle of the graph shows the speed of the value change. A steep angle shows a faster animation.

However, because the value graph can only display a single property at a time it can't be used to directly compare multiple properties. If we wanted to see the opacity keyframes, we would have to first select it in the layer list.

See <u>The Value Graph</u> for full details.

Spatial Controls

A layer's position property has an additional spatial element. This is how the property changes in space, which is separate to how it changes over time.

The animation of a layer in space is displayed using a motion path. This is draw onto the Viewer and shows the path taken by the layer over time.



Full details can be found in the chapter Spatial Animation in the Viewer.

6.11.1.1. Animating With Keyframes

Keyframes are used to log any changes you make to properties. When you change a property value which has keyframes enabled, the new value will be stored on the current frame as a keyframe. By creating multiple keyframes on different frames you can change a value over time.

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Activating Keyframing ^O O

Keyframing has to be explicitly turned on for each property you want to animate.

If keyframing is turned off, any changes you make will affect the setting for the duration of the layer. Moving to a different frame and making a further change will also make that change for the entire layer.

Once keyframing is turned on for a property, every time you make a change it is stored on that precise frame as a keyframe. You can the go to different frames and make adjustments to create multiple keyframes. HitFilm then animate the setting from one keyframe to the next.

To turn keyframing on and off click the circle to the left of the property. When activated the keyframe icon will turn blue and a new keyframe will be placed at the playhead's current position.

Creating Keyframes

Every time you change a setting in HitFilm, a keyframe is placed on the timeline at the playhead position. Keyframes contain information about the changes you make.

HitFilm automatically interpolates from one keyframe value to the next. This means that you don't need to animate every single frame.

For example: If you have a keyframe on frame 1 which positions a layer on the far left of the screen, then another keyframe on frame 24 positioning the layer on the far right, HitFilm will animate the layer moving from left to right over the course of those 24 frames.

To duplicate selected keyframes, you can hold **CTRL** (**CMD** on Mac) and drag the existing keyframes to a new location. The original keyframes will stay in position, while a new duplicate set is created at the time you drag to.

Viewing Keyframes

You can view the keyframes for any specific property by clicking the triangular arrow next to that property's name, to open its details.

You can view only the properties which contain keyframes by using the keyboard shortcut U.

- U: Press the U key on your keyboard, and all properties on the timeline which currently contain keyframes will be opened to display their keyframes.
- **UU:** Press U a second time, and all properties whose values have been edited will be displayed, even if there are no keyframes present.
- **UUU:** Press U a third time, and the timeline display reverts to its original formatting, where all properties are available, whether they have been edited or not.

Navigating by Keyframes 🕤 💿 🕀

Once you have created several keyframes it can be useful to quickly move between them on the timeline.

You can do this using the **Previous/Next Keyframe** controls at the top of the timeline, which jump your playhead between keyframes for the currently selected property.

You can also double-click on a keyframe on the timeline to jump the playhead to that position.

Adding and Removing Keyframes 💿 🔾

Sometimes you may want to add or remove a keyframe to the current frame without actually changing any settings.

This can be done by clicking the Add/Remove Keyframe button at the top of the timeline (positioned between the keyframe navigation arrows).

If there is a keyframe on the current frame already, clicking the add/remove button will remove it.

If there is not a keyframe on the current frame, a new keyframe will be created using the settings from that frame.

Editing Keyframes

Once a keyframe has been created you can make further adjustments to its position and behaviour. To edit the value of an existing keyframe you first need to move the playhead to the keyframe. If you don't do this, you will instead create a new keyframe on the current frame. The easiest way to do this is simply to doubleclick on the relevant keyframe.

Selecting Keyframes

Keyframes can be selected using the Select tool. Selected keyframes are highlighted in blue.

- Simply Click a keyframe to select it. Selecting a different keyframe will deselect the first one.
- Holding CTRL (CMD on Mac) while selecting keyframes enables you to select multiple keyframes.
- Multiple keyframes can also be selected by dragging a selection box.

Moving Keyframes

Selected keyframes can be moved around the timeline by dragging them with the mouse.

Keyframes can only be dragged horizontally on the timeline. They can't be dragged onto other properties.

If you want to transfer keyframes from one property to a similar property in another layer you can copy and paste them

Selecting three or more keyframes and holding the **ALT** (**OPT** on Mac) key while dragging on the keyframe to the extreme left or right of the selection scales the keyframe positions.

Scaling the keyframe positions may create sub-frame keyframes which don't exist on specific frames. These cannot be directly edited without first being moved to a primary frame position.

Changing Temporal Interpolation

Interpolation affects how HitFilm animates from one keyframe to the next.

You can change the temporal interpolation by right clicking selected keyframes and exploring the Interpolation menu, or using the interpolation buttons along the top of the timeline. The interpolation menu also displays options for spatial interpolation, which you can find out about in the chapter Spatial Animation in the Viewer.

- Linear: Interpolates from one keyframe to the next without any smoothing. The value changes the same amount on each frame.
- **Smooth:** As the keyframe approaches, the size of the value change per frame will get smaller, resulting in a gradual adjustment into and out of the keyframe.
- Smooth In: The smoothing only occurs on the left of the keyframe.
- Smooth Out: The smoothing only occurs on the right of the keyframe.
- **Constant:** Each keyframe value is held as a constant until the next one is reached. There is no interpolation.

Temporal interpolation is represented on the value graph as a curve. A steeper curve represents more rapid and abrupt interpolation. See <u>The Value Graph</u> for details.

The temporal interpolation of a layer's position property is also represented as dots on the motion path in the Viewer, with each dot representing a frame. Linear interpolation will show evenly spaced dots, as the value change on each frame is the same. Switching to smoothed keyframes will cause the dots to accumulate towards the keyframe, as more frames are used to create a more gradual value change. Therefore a denser cluster of dots indicate relatively slower value change, while sparser dots indicate faster change.

Here is linear temporal interpolation represented on the Viewer:



And here is the same animation with the keyframe on the right set to Smooth In:



Note how the second example has a tighter cluster of dots (frames) as the layer approaches the keyframe on the right. Also note how the layer itself (the small, grey square) is further to the right in the second example, even though both images were taken on the same frame. This is because the change of value on the left half of the animation, where more distance is covered in viewer frames (dots) is greater than on the right.

For more information see Spatial Animation in the Viewer.

6.11.1.2. The Value Graph

The value graph provides finer control over temporal interpolation between keyframes.

The graph plots the value of the most recently selected property against time, with a line representing the change in value. As you add keyframes, the graph visually represents the change in value.

Take a look at this example:



This graph is showing the Position property, which is highlighted in the layer list on the left. The position property draws two separate lines on the graph, one for the X coordinate (red) and one for the Y coordinate (green). In this particular example you can tell at a glance that the layer has been animated to move from left to right over the course of 5 seconds.

The keyframe at the left shows the X value (red) at -200, while the Y value (green) is at 0. This means the layer is positioned to the left of center by 200 pixels. The second keyframe, at 5 seconds, shows that the Y value has not changed, so the layer has not moved vertically. The X value has changed to 200, with the red line drawn between the two keyframes revealing a **linear** animation from left to right.

Here is that same animation, with the keyframe on the right changed to **Smooth In** interpolation:



Note how the smoothed keyframe is represented on the graph by a gradual curve. In the first image a straight line was drawn between the keyframes, representing a linear move. The curve in this second example shows that the speed of the value change alters over time. At the start of the animation, close to the first keyframe, the angle of the curve is steeper, meaning that the animation here is faster. As the curve becomes less steep, the animation slows down, creating a gentle shift into the value of the second keyframe.

Keyframes on the Value Graph

Keyframes function similarly on the value graph as they do in the normal timeline view. You can use the controls at the top of the timeline to jump between keyframes and to switch temporal interpolation type. See <u>Animating with Keyframes</u> for full details.

Additionally, when in a keyframe mode other than linear or constant you will be presented with bezier handles. These can be used to fine tune the shape of the curve.

Scaling the Graph 12

The scale of the graph is different for each property. With the **auto zoom** feature turned on the graph will automatically scale appropriately so as to include all keyframes within the timeline's height.

If you turn off the auto zoom, you can then scale the height of the graph manually by holding CTRL or

SHIFT and scrolling the mouse wheel. This way you can zoom in on a specific area when needed.

6.11.1.3. Spatial Animation in the Viewer

When transforming a layer's position property you can fine tune the animation using the spatial controls in the Viewer.



As you create keyframes for your animation they will be represented in the Viewer as small white squares. Selecting a keyframe on the timeline or in the Viewer highlights it in blue.

Right clicking on a keyframe displays both the temporal and spatial interpolation options. Information on temporal controls can be found in the chapter <u>Animating with Keyframes</u>.

There are three types of spatial interpolation:

- **Linear**: creates abrupt changes of direction without any curvature. The trajectory between each keyframe will be a straight line, with hard angles at keyframes.
- Auto Bezier: creates a smooth curve automatically at keyframes, so that the trajectory from the previous keyframe blends smoothly into the trajectory to the following keyframe. Bezier control handles are displayed on the keyframe, and adjusting these will automatically switch the interpolation to manual bezier.
- **Manual Bezier** allows you to define the curve of animation yourself by manipulating the bezier handles. Keyframes have two handles, which can be adjusted to change the angle of curve.
- Lock Control Points: When Lock Control Points is activated, both control points will move at the same time, ensuring that the curve going into the keyframe flows smoothly into the exit curve. If you disable Lock control points, you can then create fully arbitrary angles. In both cases, the steepness of the preceding or ensuing curve can be adjusted separately by stretching the length of each handle.

Here is an example of a locked control point keyframe:



And here is an example of an unlocked control point keyframe:



By combining spatial interpolation with the temporal controls detailed in <u>The Value Graph</u> you can create highly detailed animations.

6.12. Using Point Layers

A point is an invisible layer which does not appear in your exported videos. The point exists in the viewer and can be transformed like any other layer. It can exist in 2D or 3D.

Point layers become particularly useful when you parent other layers to them. You can use them to pivot multiple layers around a specific point in space, for example.

Creating Point Layers

Point layers can only be created using the New Layer menu on a composite shot timeline.

Controlling Point Layers

Point layers do not have any unique properties and are controlled entirely using the standard <u>Transform</u> properties.

6.13. Automatic Motion Blur

HitFilm can optionally apply automatic motion blur to layers and some effects and transitions based on their movement. This can greatly increase the realism of animations.

Motion blur needs to be turned on for each layer. This can be done by selecting the layer (or multiple layers) and clicking the Motion Blur button at the top of the timeline.

Each composite shot has its own motion blur settings. These affect the amount of blur applied to layers. To change a composite shot's motion blur open its Settings window and switch to the Advanced tab. The Settings window can be opened clicking the cog icon at the bottom left of the timeline, or clicking the same icon next to the composite shot's name in the Media panel.

Motion Blur Properties

- Enable: Turns motion blur on and off for the composite shot.
- **Shutter Angle**: A larger shutter angle will create more motion blur. The shutter angle simulates the amount of time a real camera shutter is open.
- **Shutter Phase**: Positions the blur in relation to the moving object. This can be used to offset the blur in front of or behind the object. For realistic motion blur this is best kept set to 0.
- Use Adaptive Samples: When activated, HitFilm will automatically estimate how many samples are required for good quality motion blur and will only use as many as it needs, up to the value set in the Max number of samples property. When turned off the max number of samples will always be used, even when they're not needed, which could impact on performance.
- **Max Number of Samples**: Motion blur is constructed by sampling the position of the layer over multiple frames. A higher number of samples will result in a higher quality motion blur. Fewer samples will be faster to render but may introduce visible banding in the motion blur.

6.14. Compositing With Blend Modes

HitFilm includes multiple blend modes, which are used to control how layers and effects are combined visually.

A layer's blend mode can be changed from its contextual menu on the timeline or from the Control panel. Some effects have their own blend modes, and masks also have a selection of blend modes.

Each blend mode combines pixels together in a unique manner. Before any blend mode calculations are performed, the color values are mapped from the RGB range of 0-255 to a range of 0.0-1.0, where 0.0 is pure black, and 1.0 is pure white. Blend modes fall into several categories, based on the general effect they have on the combined layers.

- Add, Color Dodge, Divide, Lighten, and Screen: All of these options brighten the image. In all of these modes, any black areas in the blended layer will disappear and have no effect.
- Darken, Color Burn, Multiply, and Subtract: All darken the image. In all of these modes, any white areas in the blended layer will disappear and have no effect.
- Hard Light, Overlay and Soft Light: These modes all increase the contrast in the image. Areas of 50% grey in the blended layer will have no effect, while areas closer to black or white will have a greater impact on the contrast of the resulting image.
- Difference and Exclusion: Both invert luminance or color values in the resulting image.
- **Color, Hue, Lightness and Saturation**: These modes all look at the blended layer in HSL color space, and then apply one or two of the three HSL components of the blend layer to the base layer.

Blend Modes

Below is a list of all available blend modes and details of how they work. Blend Layer will refer to the to layer, to which the blend mode is being applied. Base Layer refers to the layer below the blend layer, which the blend layer will be blended with.

- **Normal**: The default blend mode. Layers are not mixed at all. The Blend Layer is displayed without mixing any of the colors with the Base Layer. The Blend Layer will completely obscure the Base Layer, unless the Blend Layer contains its own masking or alpha channel.
- Add: Pixel values are added together, resulting in a brighter image. Any pixels where the sum of the addition produces a value higher than 1.0 will be clipped to 1.0 and will display as white. Useful for compositing light-based visual effects such as light flares, muzzle flashes, lightswords and stock explosions.Similar to Screen blend, but with somewhat more intense results.

- **Color**: Converts both layers to HSL color, then combines the Hue and Saturation values from the Blend Layer with the Luminance values of the Base Layer. This is often used to quickly tint images, by using the Blend Layer as a color map.
- **Color Burn**: Simulates "burning" film in a darkroom by increasing the contrast of the Base Layer, based on the color values of the Blend Layer. To do this it inverts the values of the Base Layer, divides the result by the Blend Layer, then inverts the results. Like Multiply, Color Burn darkens the image overall, but reduces highlights even more, and gives more saturated mid-tones. It is basically the opposite of Color Dodge.
- Color Dodge: Simulates the effect of "dodging" film in a darkroom by decreasing the contrast of the Base Layer based on the color values present in the Blend Layer. To do this it inverts the values of the Blend Layer, then divides the Base Layer by those inverted values. Like Screen mode, Color Dodge lightens the overall image, but tends to result in intense, saturated mid-tones and blown-out highlights. It is basically the opposite of Color Burn.
- **Darken**: For each pixel, Darken compares the color value of the Base Layer to that of the Blend Layer and displays whichever is darker. Darken can be useful for combining the black areas of multiple layers when creating or refining masks. It is the opposite of Lighten.
- **Difference**: Takes the color value for each pixel, and subtracts the Base value from the Blend value. The difference between these values is used as the new color value for the pixel. If the resulting number is negative the positive equivalent value is applied (Example: "-64" would become "64"). If the Blend color is pure white (255,255,255), the Base color will be inverted. This effect can yield dramatic and psychedelic color shifts. Difference can be very useful for comparing identical layers to ensure correct alignment. The Difference Key effect is based off this blend mode: a clean "background plate" is used, and the identical areas in the footage to be keyed go completely to black, allowing the areas isolated by the Difference blending to be enhanced and separated by means of a luma key.
- Dissolve: For each pixel, the value is randomly picked from either the Base or Blend Layer. Some pixels will use the color data of the Base, and others will use the color data from the Blend. When first applied it often appears as if the blend mode has no effect, because its results depend on adjustment to the layer opacity. At 100% opacity of the layer, all pixels will take values from the Blend Layer. At 0% opacity, all pixels use Base values. At any value in between, pixels will be randomly chosen from the Base and Blend Layers. Dissolve does not apply any kind of smoothing, blurring or anti-aliasing, so the result tends to look very grainy.
- Divide: Divides the Base value by the Blend value, resulting in a lightening of the image. Since any value divided by itself results in 0, this can be useful for removing color tints or casts from an image. By using a plane of the color you want to remove as the Blend Layer, any areas in the Base Layer containing the color of the plane will be neutralized to grey.
- **Exclusion**: Similar to Difference blending. However, in Exclusion the calculation ignores positive/ negative values, using absolute values only. This means similar values tend to get shifted to midgreys rather than black, resulting in a lower contrast image. Unlike Difference, which can be used in keying, Exclusion is pretty much only useful for surreal, solarized color effects.

- Hard Light: Increases contrast using a combination of Multiply and Screen blend modes. Hard Light applies the Screen Blend mode to areas of the Blend Layer with values greater than 50%, and applies the Multiply Blend mode to areas of the Blend Layer with values less than 50%. Hard Light is similar to Overlay and Soft Light, but more extreme than both. It is essentially the same as overlay, except that Hard Light is based on the values of the Blend Layer.
- **Hue**: Converts both layers to HSL color, then combines the Luminance and Saturation values of the Base Layer with the Hue of the Blend Layer. Used carefully, this can alter colors while retaining the tonal and saturation values of the image, which can result in accurate, subtle tonal shifts.
- **Lighten**: For each pixel, Lighten compares the color value of the Base Layer to that of the Blend Layer and displays whichever is lighter. Lighten can be useful for combining the white areas of multiple layers when creating or refining masks. It is the opposite of Darken.
- Luminosity: Converts both layers to HSL color, then combines the hue and saturation values from the Base Layer with the Luminance values of the Blend Layer. Luminosity can be particularly useful for sharpening. By blending a sharpened greyscale duplicate of a layer back onto the full color original, you can effectively sharpen the image without crating undesirable color halos or artifacting.
- Multiply: Multiplies the Base value by the Blend value, resulting in a darker image overall. Any color multiplied by black (0.0) creates black, and any color multiplied by white (1.0) remains unchanged. Thus multiply can be effective for removing white areas of the Blend Layer. It gives the opposite result of the Screen blend mode.
- **Overlay**: Increases contrast using a combination of Multiply and Screen blend modes. Overlay applies the Screen Blend mode to areas where the Base layer contains values greater than 50%, and applies the Multiply Blend mode to areas where the Base Layer contains values less than 50%. Similar to Soft Light and Hard Light in the results it produces. It is essentially the same as Hard Light, except that Overlay is based on the values of the Base Layer.
- **Saturation**: Converts both layers to HSL color, then combines the Luminance and Hue values of the Base Layer and the Saturation values of the Blend Layer. This can be used for artistic effects, or for selectively de-saturating parts of an image.
- Screen: The pixel values of both layers are inverted, multiplied, then inverted again, resulting in a brighter picture. Effective for compositing transparent stock elements such as smoke and glows. It is similar to Add in its results, but tends to be more subtle. It gives the opposite result of the Multiply blend mode.
- **Soft Light**: Increases overall contrast and vibrance of an image, in a manner similar to Hard Light and Overlay. Soft Light applies a half-strength Screen Blend mode to areas of the Blend Layer with values greater than 50%, and applies the half-strength Multiply Blend mode to areas of the Blend Layer with values less than 50%. The results are more subtle than Hard Light and Overlay.
- **Subtract**: Subtracts the Blend Layer value from the Base Layer value, resulting in a darkening of the overall image. Negative values are clipped to 0 (black).

6.15. The Layer Viewer

The Layer tab of the Viewer panel displays a non-transformed, pre-effects version of your currently selected layer. This is used for accurate masking and during 2D Tracking.

Accessing the Layer Panel

The Layer panel is always linked to the Viewer. You can display either the Viewer or the Layer panel, but you can't see them both at the same time.

To use the Layer panel, simply switch to it using the tab next to the Viewer, then select a layer on the timeline.

You can switch between the Viewer and the Layer panel at any time when in a composite shot timeline.

Masking

The Layer panel shows your selected layer before any transformation or effects are applied. This can be very useful when compositing: even if you've animated your layer so that it is difficult to work on directly in the Viewer, you can switch to the Layer panel to get an undistorted view.

Check out the Masking section for more details.

Tracking

The Layer panel is used for positioning 2D tracking points. For details on HitFilm's 2D tracking head over to the <u>Tracking</u> section.

6.16. Masking

Masking is used to manually define which parts of a layer are visible.

Practically, this means that masks are used to cut holes in your layers.



You can draw masks manually inside HitFilm or use mocha's planar tracking to automatically track shapes for you. See <u>Planar Tracking with mocha HitFilm</u> for details.

Creating Masks 💠 📰 실

To create a mask you use the mask drawing tools, which are used to draw elliptical, rectangular and freehand shapes. Select the mask tool you need, then select a layer on the timeline. Then, use begin drawing to add a mask to the selected layer. You may want to use the Layer panel to make it easier to see your layer. When multiple masks are created, each mask will be assigned a unique color, so you can easily identify which mask is which.

Mask Shapes

There are three masking tools, each designed for specific shapes.

• **Elliptical Mask:** Click and drag to create a circular or elliptical mask on the currently selected layer.

- Hold **SHIFT** while dragging to create a perfect circle.
- Hold ALT (OPTION on Mac) to center the mask at the original point you drag from. Releasing the mouse will set the shape.
- Double-click the elliptical mask icon to create an oval the exact height and width of your project.

••• **Rectangular Mask:** Click and drag to create a square or rectangular mask on the currently selected layer.

- Hold **SHIFT** while dragging to create a perfect square.
- Hold ALT (OPTION on Mac) to center the mask at the original point you drag from. Releasing the mouse will set the shape.
- Double-click the rectangular mask icon to create a rectangle the exact height and width of your project.

Freehand Mask: Draws a sequence of straight or curved line segments, to create any shape you desire. Clicking and dragging creates a curved line, while clicking and releasing creates a linear, straight line. The shape of curved points can be further adjusted using the extension handles.

- Click to add a new linear point to the mask path.
- Click-drag to add a curved point to the mask path. The direction and distance you drag will define the curve of the mask segment.

To deform the shapes see **Editing masks**, below.

Freehand Mask 실

The ellipse and rectangular mask tools are quite straightforward, and create specific, basic shapes. For all mask shapes other than basic rectangles or ellipses, you will use the Freehand Mask tool. Freehand masks can be used for creating even very complex mask shapes.

With the Freehand Mask tool selected you can click on the Viewer to draw points. Clicking and dragging creates a curved line, while clicking and releasing creates a linear, straight line.

The shape of curved points can be further adjusted using the extension handles.

You can change the type of any point by right clicking on it and choosing the desired type from the menu:

- **Make Curved Locked:** Both extension handles work in tandem. Adjusting one will adjust the other simultaneously. This is useful for maintaining smooth curves.
- Make Curved Unlocked: The extension handles can be adjusted separately. This is useful for

creating sharp corners while retaining a curved line.

• Make Linear: The point forms an angled corner and the line either side is straight.

To activate a freehand mask you must close it. To do this simply click again on the first point you created, having created at least 3 points. The mask will close and activate.

Editing Masks 🞍

Once a mask has been created it can be edited and customized. There are two primary ways to edit a mask.

- Using the Freehand Shape tool, you can edit or animate the individual points of the mask, individually
 or in groups.
- Using the Selection tool, you can edit or animate the mask as a whole, using the Position, Scale, and Rotation properties.

Editing the Shape

If you want to make adjustments to the mask shape use the freehand shape tool. This will display all of the available mask shape points of the currently selected mask. Masks can be selected on the timeline or in the Controls panel.

Individual points can be clicked and dragged to change the shape. Curved points have additional bezier controls for changing the curvature. Clicking on a connecting line will add a new linear point. Clicking and dragging on a connecting line will add a new curved point.

To edit multiple points at once, you can drag a marquee around the points to select them. A bounding box will appear, enclosing the selected points.

- Dragging any corner will uniformly scale the selected points from the center of the bounding box.
- Holding SHIFT will override the aspect ratio lock, and allow freeform scaling from the center of the bounding box.
- Holding CTRL (CMND on Mac) will uniformly scale the selected points from the opposite corner of the bounding box.
- Holding SHIFT+ CTRL (SHIFT + CMND on Mac) will allow freeform scaling from the opposite corner of the bounding box.
- Holding ALT (OPT on Mac) and dragging any corner will rotate the selected points around the center of the bounding box.

Double-click any selected point to select all points in the mask.

Right-clicking on a selected point opens a menu with several additional options.

- Select All can be used to select all points in the mask.
- Invert Selection will select all unselected points, and deselect the currently selected points.
- Reset will restore the mask to its original shape.

Transforming the Shape

Using the Select tool in the Viewer you can transform the mask shape in the same way you would the layer itself. The currently selected mask on the timeline or in the Controls panel will also be selected in the Viewer, with a bounding box around the shape. This can be used to scale and position the shape without changing the shape.Click within the mask and drag to reposition it. Hold SHIFT and drag to reposition the anchor point from the center of the layer.

• Dragging any corner will uniformly scale the selected points from the anchor point of the mask.

- Holding SHIFT will override the aspect ratio lock, and allow freeform scaling from the anchor point of the mask.
- Dragging any edge point will scale the mask on that specific axis.
- Holding CTRL (CMND on Mac) will uniformly scale the selected points from the opposite corner of the bounding box.
- Holding SHIFT+ CTRL (SHIFT + CMND on Mac) will allow freeform scaling from the opposite corner of the bounding box.
- Holding ALT (OPT on Mac) and dragging on an edge point will rotate the shape.

Animating Masks

To animate the mask over time you must have the Path property's keyframes enabled. See <u>Animating with</u> <u>Keyframes</u> for details.

The mask's entire shape is stored in the Path property. You cannot keyframe individual mask points.

Mask Properties

A mask's properties can be customized in the Controls panel or on the timeline.

- **Mask Color:** Select the color used for the mask shape. Each mask uses a different color when created, but you can click the swatch to open a color picker and choose any color you prefer.
- Inverted: Toggles whether the mask selection area is inside or outside of your specified shape.
- Blend: Multiple mask shapes can be blended together in various ways for different results.
- Shape
 - **Expansion:** This can be used to contract or expand the mask without needing to change its shape or position.
 - **Feather:** There are three types of feathering; working from Inside the mask shape, Outside, or Both. Which you use will depend on the specifics of your shot.
 - **Feather Strength:** A stronger feather creates a softer edge to the mask.
 - Roundness: This is a useful way to change a linear shape into a curved shape without needing to alter the points.
- Transform
 - **Path:** If keyframing is turned on for this property the mask shape can then be animated over time.

p(banner tip). You cannot add or remove mask points using keyframing. A mask shape will have the same number of points for its entire duration.

- Opacity: Adjusts the transparency of the mask.
- **Anchor Point:** Sets the location of the mask's anchor point, with 0,0 being the center of the mask.
- **Position:** Moves the mask along the X and Y axes. This is useful for quickly moving the mask without changing its shape.
- **Scale:** Enlarges or shrinks the mask. The X and Y scales are linked by default so that your layer retains its original shape. You can unlink them using the chain icon.
- **Rotation:** Rotates the mask around its anchor point. Rotation is presented as number of turns and degrees, making it easy to keyframe multiple rotations.
- **Extra Transform:** This property is used by mocha HitFilm. It is not necessary for standard masks. See <u>Planar Tracking with Mocha HitFilm</u> for details on using Mocha HitFilm.

6.17. Tracking

HitFilm includes multiple options for tracking:

- **2D Feature Tracking:** Optical flow and template match tracking for fast feature tracking and stabilization inside HitFilm, described below.
- Planar tracking for advanced roto and camera solving with mocha HitFilm from Imagineer Systems.
- Importing 3D camera tracking data from third party applications including Boujou, SynthEyes, PFtrack and more.

2D Feature Tracking

HitFilm's 2D tracker is designed for quickly tracking moving features in your videos.

The Track panel is where you control all of your 2D tracking inside HitFilm. The Track panel only displays information if you have a tracker selected on the timeline.

TRACK							
A002C002_1408285T.mov > A002C002_1408285T.mov > Tracker							
STEP 1 : TRACK	STEP 1 : TRACK YOUR POINTS						
Туре:							
Method:	Optical Flow 🔫	Options					
Track Controls:	! < ► !!						
STEP 2 : APPLY	TO LAYER						
Purpose:	Transform						
	None						
	☑ X-position ☑ Y-position						
	Rotation Scale						
	Apply						

Tracking is split into two steps. First you track parts of a video layer, then you apply that tracking data to a layer either to stabilize or transform it.

Y Tracking can only be performed on video layers.

When you track a layer the information is stored in a Tracker on the timeline, under the Track section. A tracker can then contain one or two tracking points, which store the actual animation keyframes.

Creating A Tracker 🗘

A new tracker can be added to any video layer by clicking the + button on the timeline, found to the right of the Tracks section.

This will add a new tracker to the layer, containing a single tracking point, and will automatically switch to the Layer viewer.

You can rename your trackers to give them more descriptive names. Especially when you have multiple trackers on a layer, this is useful for organization.

Tracking Point Properties

Tracking points contain several properties which can be edited manually from the Controls panel or timeline. However, these properties will most commonly be populated using the Track panel.

Step 1: Track Your Points

The first step is to track points on your video layer. The Track and Layer panels must be visible. They are displayed automatically when a new Track is created, but if they are not currently visible when you want to start tracking, they will need to be selected so they are visible.

Tracking points are only displayed on the Layer panel. For more information see <u>The Layer</u> <u>viewer</u>.

Tracking Setup

There are several properties that can be adjusted in the Track panel prior to tracking your points.

- **Type:** You can choose between tracking a single point or two points. If you want to track rotation or scale transformation you will need to use the double point option. For simpler position tracking you only need a single point.
- **Method:** HitFilm has two types of tracking, Optical Flow and Template Match. Choosing a specific tracking method can affect the quality of your results. Both methods should provide high quality tracks but you may find that certain situations better suit one or the other.
 - Optical Flow observes all movement within the search area, determining the flow of brightness to track the object. This is useful if the tracked feature is repeated several times inside the search area, or if the shape of the tracked feature changes slightly over time. Optical flow can also sometimes continue to track a feature even if it is obscured for a few frames, by continuing to track the overall flow of movement. This method can also have unpredictable results in some circumstances, particularly when tracking small features that are moving rapidly across textured surfaces.
 - Template Match looks for an exact copy of the feature within the search area so can sometimes provide more predictable results. It can also search using the RGB channels as well as the luminance channel.

The **Options** button displays advanced technical settings which affect the tracking systems:

- Error Tolerance: This setting determines when HitFilm will automatically stop the tracking if the accuracy drops below a certain point. A high tolerance setting will cause tracking to continue even when the system is unsure of the results. A low tolerance will cause HitFilm to stop tracking if it is uncertain. The default setting offers a good balance.
- **Iterations:** More iterations will provide more accurate optical flow tracking but will take longer to process.
- Channels: The template match method can examine the Luminance or RGB channels when tracking.
- **Comparison Method:** Template match can use varying methods to identify and track the feature within the search area.

Positioning the Tracking Point

The Layer panel displays your selected layer. The currently selected tracker is also displayed.



Tracking points consist of three elements:

- **Feature Offset:** This central point is used to create the actual transform data that will then be applied to other layers. This enables you to track one area while creating relative keyframes in a different location. The feature offset can be moved outside of the feature and search areas.
- Feature Area: This red box should be placed around the element you wish to track.
- Search Area: On each frame the green search area will be used to locate the feature area's new position. It is therefore important that the search area is big enough to cover the movement in the video from frame to frame.

Positioning the tracking point elements correctly is key to a successful track.

If you are working with two points, note that it is the primary point that determines the position of the track. The secondary point is is used for reference to determine scale and rotation.

Once you have positioned your tracking points you are then ready to begin tracking.

Track Controls

The four track controls are used to track forwards and backwards through the video. You can track frame by frame, or use the play forwards/backwards buttons to track the entire video in the chosen direction.

As HitFilm tracks the video keyframes will be added to tracking points on the timeline. You can stop the track at any time by clicking anywhere in the interface.



Repositioning the Feature Area

During tracking, if the feature you are tracking leaves the frame or becomes untrackable for some other reason, you can reposition the Feature Area without moving the Feature Offset. If this becomes necessary, hold **ALT** (**OPT** on Mac), and drag the Feature Area to a new feature that is in frame, or better suited to tracking.

Step 2: Apply to layer

Once you have created tracking data in step 1, you then need to choose what to do with it. This is also done using the Track panel.

- Purpose: Choose between Stabilize or Transform.
- Layer: If you select Transform as your Purpose, you also need to choose a layer to apply the Transform data to.
- **Property Checkboxes:** You can choose which aspects of the track you wish to apply to the layer using the checkboxes. If you want to use Rotation and Scale tracking you need to select double points in step 1.

Stabilize

You can stabilize your tracked shot using HitFilm. When the stabilize option is selected, the tracking data will be applied to the source layer. This will transform the layer so that the tracked point remains in the same position in the frame.

You can stabilize based on any point in the frame. If you apply stabilize after tracking a person walking along, the shot will be altered to keep the person perfectly centered in the frame. If you track an immobile background element, the stabilize will eliminate any handheld wobble.

Anchor point keyframes are added to the selected layer, replacing any existing keyframes.

Stabilizing a shot will transform it within the composite shot. This is likely to reveal the edge of the layer as it moves around. To counter this you should increase the scale of the shot so that it fills the frame at all times.

Transform

Selecting transform from the Purpose menu enables you to then select a different layer. The tracking data

will then be applied to that layer.

This is useful if you want a layer to track to a particular part of your video. Perhaps you want to replace a sign, or to track a light flare onto a street lamp. You can apply the tracking data to any layer, including point layers, which can open up exciting visual effects possibilities.

Position keyframes are applied to the chosen layer, replacing any existing keyframes.

Applying tracked transform data to a new Point Layer provides many benefits. For example, you can then link multiple items (a 3D light, a light flare effect, a light rays effect etc) to that one point layer and move them as one.
6.17.1. Planar Tracking with Mocha HitFilm

HitFilm Pro includes a special version of Mocha from Imagineer Systems. Using Academy Award-winning planar tracking technology, Mocha provides advanced tracking solutions for multiple situations.

Three main processes are covered by Mocha's features:

- **Shape tracking:** Rapidly track moving shapes in your shot and export the data to a mask inside HitFilm. Incredibly powerful for compositing and grading.
- **3D camera solving:** Track multiple planes to create a 3D camera solve. This can be exported to HitFilm as a 3D scene complete with camera and reference points.
- **Corner pinning:** Track a rectangular shape within the footage and export exact positioning for each of the corner points into HitFilm. A new graphic can then be pinned over the original, by placing the four corners of the new graphic at the tracked point locations.

Launching Mocha 🗘

In HitFilm Pro Mocha functions as a plugin. It can be added to any clip from the Effects panel. After Mocha is added to your video, open the controls and click the "Launch Mocha UI" button to open Mocha and begin tracking.



Using Mocha

Mocha is a sophisticated program. Imagineer have a series of learning resources available on their website.

A series of tutorials focused on using Mocha's camera solving features alongside HitFilm can be found here.

Transferring Mocha Data to HitFilm

Once you have completed your work inside Mocha you need to transfer it back to HitFilm. Mocha creates

composite shot files which can be imported into HitFilm.

For shape tracking, use the **Export Shape Data**... option in Mocha's Track module.

For 3D camera solving, use the **Export Camera Data**... option in the Camera Solve module.

For corner pinning data, use the **Export Tracking Data**... option in the Track module.

Exported composite shot files can then be imported to an existing HitFilm project using the Import menu. See <u>Saving & loading projects</u> details.

Upgrading to Mocha Pro

HitFilm users can upgrade to the full version of Mocha Pro for a discounted rate. <u>See Imagineer's</u> website for details.

6.17.2. Importing 3D Camera Tracking Data

HitFilm supports the .ma format for importing 3D camera data from other tracking products, such as Boujou and SynthEyes.

Importing 3D Camera Tracking Data

Use the 3D camera tracking data option from the Import menu in the Media panel to select your .ma file.

- 1. In the Media panel, click the triangle next to the Import button.
- 2. Select **3D Camera Tracking Data** from the menu.
- 3. In the File Explorer window that opens, select the .ma file that you wish to import.

HitFilm will analyze the camera data and open an options window:

CAMERA TRACKING IMPORT					
Name: Camera trac	k				
FILE INFORMATION					
Frame Rate:	24	-			
Number of Points:	11	÷			
	🗌 Import Video				
	No video path found				
CANCEL		CREATE			

- **Name:** A new composite shot will be created to contain the imported tracking data. Enter a name for the new composite shot here.
- Frame Rate: Specify the frame rate to be used by the composite shot that will contain the tracking data.

- **Number of Points:** 3D tracking data uses a point cloud to represent the scene. You can choose to import a specified number of points, which will be represented as 3D point layers inside HitFilm.
- **Import Video:** If the .ma file includes details for the video file which was tracked, you can also import this video into the composite shot by enabling this checkbox.
 - **File Path:** When Import Video is enabled, the file path to the selected video will be displayed here.

After you click **Create**, a new composite shot will be created using the specified name and frame rate, and containing the tracked 3D camera and a cloud of 3D points representing the position of various objects in the scene.

6.18. Working in 3D

3D compositing adds depth to your scenes. In addition to the X (horizontal) and Y (vertical) coordinates, you also have a Z coordinate, representing distance from the virtual camera.

Switching to 3D

To change a composite shot into 3D you need to add a camera.

- 1. Open the New Layer menu at the top of the timeline.
- 2. Select Camera from the menu.

A default camera will be added and the scene will automatically switch into 3D. For more information on cameras see <u>Virtual Cameras</u>.

If you add a 3D layer to a timeline a camera will be automatically added.

Once you have a 3D camera, you will need some 3D content otherwise the camera will not have anything with which to interact. See <u>Working with Layers</u> for information on creating 3D layers.

Customizing the 3D Viewer

To aid navigation and placement in the 3D space you can change the Viewer to display multiple views from different angles.

You can display up to 4 views simultaneously from different angles. The View menu in the Viewer is used to add additional 3D views.



The c urrent view mode is displayed at the top left of each view. Clicking on this displays all the available modes:

Active Camera View

The active camera view shows what will be rendered when you export. This is what will appear in your rendered videos. If you have multiple camera layers on your timeline, the active camera is defined as being the top-most active camera layer on the current frame.

Changing the position and orientation when in active camera view will change your camera's transform properties.

For more information on cameras see Virtual Cameras.

Perspective View

The perspective view is a free-roaming way to explore your scene without affecting the position of your camera.

Orthographic Views

The orthographic views provide flat, 2D views of your 3D scene. The orthographic views do not show

perspective or depth.

You can choose from front, back, left, right, top and bottom views.

As they are presented in a 2D 'blueprint' form, the orthographic views are very useful for precise positioning of layers in the 3D space.

The orthographic views are controlled in a similar way to the Viewer when it is in 2D mode.

Zoom and pan controls in the corner of the Viewer can be clicked and dragged for quick movements.

Resetting the Views

You can reset a view using the **Reset Current View** option, in the View menu.

Navigating 3D Space

Navigating in a 3D composite shot is different than in a 2D composite shot as you also have to take the Z-axis (depth) into consideration.

Orbit Tool 🔊

The quickest and easiest way to move around the 3D space is using the orbit tool. This has two modes: **Orbit Around Selected Layers** and **Orbit Around Clicked Point**. You can switch between these two modes by clicking and holding on the Orbit tool button.

When the orbit tool is selected, you will not see the wireframe outlines of your layers and you will not be able to use the Viewer transform controls. Change back to the Select tool to return to the normal mode.

Orbit Around Selected Layers uses your current layer selection for orbiting. This can be a single layer or multiple layers. This way you can be certain of what you are going to orbit around, even in complex scenes.

Orbit Around Clicked Point tries to determine where you want to orbit around based on where you click in the Viewer.

- If you click on a layer the view will orbit around that specific point on the layer.
- If you click on an empty space it will orbit around that point on the 3D grid.



3D Move Controls

To the right of the 3D Viewer are the move controls. These will vary depending on your current view and are operated by clicking and dragging on them with the mouse.

- Dolly/Track Z: Moves the camera or view forwards and backwards along its own Z axis.
- Pan/Track XY: Moves the camera or view horizontally and vertically along its own X and Y axes.
- Zoom: adjusts the camera's field of view, zooming in and out.
- Rotate/Tumble: Rotates the camera or view without moving its position.

Keyboard Shortcuts

Using keyboard shortcuts makes navigating in HitFilm's 3D space much faster. The shortcuts are as follows:

- Orbit: ALT+Left mouse
- **Dolly:** ALT+Right mouse
- Zoom: CTRL/CMD+Right mouse
- Rotate: Middle mouse
- **Pan:** Right mouse (perspective & orthographic views only), *ALT*+Middle mouse or *CTRL*/*CMD*+Left mouse
- Canvas Pan: Right mouse (active camera view only)
- Select Object: Left mouse

Render Options

At the bottom-left of the 3D Viewer is a button for turning render options on and off.

Clicking the button will turn ALL render options on and off, which is a quick way to switch between a fast performing Viewer and a high quality render.

Holding the mouse button down on the button opens a menu where you can choose specific items to turn on and off:

- Lights: Turns rendering of lights on and off.
- · Shadows: Turns rendering of shadows and ambient occlusion on and off.
- Reflections: Turns dynamic reflections on and off.
- Motion Blur: Turns motion blur on and off.

- Depth of Field: Turns depth of field on and off.
- Toggle All Render Options: turns everything on and off.

These settings only affect the Viewer. They do not affect your final export, which is always rendered with all elements activated.

You can also change these settings from the Viewer's Options menu.

6.18.1. Transforming Layers in 3D

Your 3D layers can be transformed along X, Y and Z axes.

 Even if you have changed your composite shot to 3D by adding a camera or a 3D effect, your 2D layers will still be 2D. You can change 2D layers into 3D using the timeline toggle. See Working with Layers for more information.

3D layers have additional Viewer controls for transforming in 3D.



- A third, blue position arrow controls the Z axis (depth).
- Rotation is split into three separate wheels for the X, Y and Z axes.

Aside from these additional controls, transforming layers in 3D is functionally identical to <u>transforming layers</u> in 2D.

3D Properties

3D layers have a additional transform properties, which are available in the Controls panel and on the timeline.

- Opacity: The transparency of the clip.
- Anchor Point: Sets the location of the anchor point, with 0,0,0 being the center of the layer.
- **Position:** Moves the layer along the X, Y and Z axes.
- Scale: Enlarges and shrinks the layer. The X, Y and Z scales are linked by default so that your layer retains its original shape. You can unlink them using the chain icon.
- **Orientation:** Sets the starting orientation for the layer. This works separately to the rotation properties.
- Rotation: Rotates the layer around its anchor point. When in 3D the rotation properties are split into separate properties for X, Y an Z axes.

Alignment of Transform Controls

The alignment of the Viewer controls can be adjusted using the **Align** menu at the top of the Viewer. The controls can be aligned to **Local**, **World** or **View**.

This is useful if, for example, you have already rotated a layer to an arbitrary angle but wish to move it horizontally according to the floor plane, or according to the camera view.

6.18.2. Lighting a 3D Scene

Light layers are used for creating a custom lighting setup for your 3D scenes.

If you don't have any light layers, your 3D layers will not use the lighting system. Your layers will receive a default, flat, non-directional lighting.

Lights only affect 3D layers. You can add lights to a composite shot containing only 2D layers but they will not have any effect.

Creating Lights

Lights can only be created from the New Layer menu on composite shot timelines.

You can create as many lights as you want in a composite shot and they will all work together, just like using real lights on a set.

Achieving Realistic Results

The 3D lights can be positioned and set up just like real lights on a set. You will often want to use multiple lights to create your scene, especially when working with 3D models. This way you can create classic setups such as 3-point lighting with key, back and fill lights.

When working with 3D models, for best results 3D lights should be combined with reflective materials. See <u>Setting Up Materials</u> for details.

Additional post-processing can be applied using effects, such as lens flares, film grain, specular highlights, anamorphic streaks and so on. See <u>Grade Layers</u> and <u>Visual Effects</u> for details.

Shadows

Point, spot and directional lights can all cast shadows. These shadows will automatically update as lights and layers move around in 3D space.

To enable shadows you need to do the following:

- 1. Turn on **Cast Shadows** in the Light properties of any light layers which you want to be casting shadows.
- 2. Turn on **Casts Shadows** in the Material properties of any layers which you want to cast shadows. You need to have at least one layer casting shadows.
- 3. Turn on **Receives Shadows** in the Material properties of any layers on which you want to see shadows. You need to have at least one layer receiving shadows.

Layers do not need to be illuminated to receive shadows.

Spot and directional lights provide faster performance when casting shadows than point lights.

Customizing Lights

The Light properties change depending on the light type. There are 4 types of light, each with very different behaviour. The light type can be set in the light's layer properties.

Ambient

An ambient light floods the entire composite shot with light from all sides. It is a non-directional light and does not have a source.

Ambient lights cannot cast shadows and do not have any falloff, so objects will be equally lit regardless of their position and orientation.

This makes it the least 'realistic' of the lights but it can be very useful to use as a fill light.

- **Color:** Changes the color of the light.
- Intensity: The higher the intensity, the brighter the light.

Point

A point light emanates from a single source point in all directions, behaving in a similar way to the sun, or to a flare.

Depending on your settings, layers farther away from the light will be less illuminated.

- Color: Changes the color of the light.
- Intensity: The higher the intensity, the brighter the light.
- Cast Shadows: Turns shadows on and off for the selected light layer.
- Falloff: Sets whether the light decreases over distance in a realistic manner.
 - **None:** The light affects all illuminated layers equally, regardless of distance.
 - **Linear:** The strength of the light is directly equivalent to the distance from the light to the object it is illuminating. At a distance of 0, the full value of the lights intensity is used. The intensity falls off until it reaches 0 intensity at the Reach distance, set below.
 - Curve: The strength of the light falls off according to the inverse square law, replicating the behavior of lights in the real world. In practice, this means the light falls off more quickly than linear falloff
- **Reach:** If Falloff is set to Linear or Curve, this defines the maximum distance at which the light will have any effect.
- Shadow Opacity: If Cast Shadows is on, this adjusts the visibility of the shadows.
- Shadow Diffusion: If Cast Shadows is on, this changes the softness of the shadow edge.
- Shadow Color: Changes the color of the shadow.

Spot

Spot lights emit light in a single direction, emitting in a cone shape from a single source point, just like a real spotlight.

Depending on your settings, layers towards the edge of the light cone will be less illuminated.

- Color: Changes the color of the light.
- Intensity: The higher the intensity, the brighter the light.
- Cast Shadows: Turns shadows on and off for the selected light layer.
- Falloff: Sets whether the light decreases over distance in a realistic manner.
 - **None:** The light affects all illuminated layers equally, regardless of distance.
 - **Linear:** The strength of the light is directly equivalent to the distance from the light to the object it is illuminating. At a distance of 0, the full value of the lights intensity is used. The intensity falls off until it reaches 0 intensity at the Reach distance, set below.
 - Curve: The strength of the light falls off according to the inverse square law, replicating the behavior of lights in the real world. In practice, this means the light falls off more quickly than linear falloff
- **Reach:** If Falloff is set to Linear or Curve, this defines the maximum distance at which the light will have any effect.
- Cone Angle: Widens and narrows the size of the spot light cone.
- Feather: Changes the softness of the edge of the spot light cone.

- Shadow Opacity: If Cast Shadows is on, this adjusts the visibility of the shadows.
- Shadow Diffusion: If Cast Shadows is on, this changes the softness of the shadow edge.
- Shadow Color: Changes the color of the shadow.

Directional

Directional lights emit light in a single direction. Unlike spot and point lights, directional lights are emitted from an infinitely large source plane, with all the light rays moving parallel to each other.

This results in all objects in the chosen direction being lit equally from that angle.

A directional light requires the layer's **Alignment** property to be set to **Towards Target Position**.

- Color: Changes the color of the light.
- Intensity: The higher the intensity, the brighter the light.
- Cast Shadows: Turns shadows on and off for the selected light layer.
- Falloff: Sets whether the light decreases over distance in a realistic manner.
 - None: The light affects all illuminated layers equally, regardless of distance.
 - **Linear:** The strength of the light is directly equivalent to the distance from the light to the object it is illuminating. At a distance of 0, the full value of the lights intensity is used. The intensity falls off until it reaches 0 intensity at the Reach distance, set below.
 - Curve: The strength of the light falls off according to the inverse square law, replicating the behavior of lights in the real world. In practice, this means the light falls off more quickly than linear falloff
- **Reach:** If Falloff is set to Linear or Curve, this defines the maximum distance at which the light will have any effect.
- Shadow Opacity: If Cast Shadows is on, this adjusts the visibility of the shadows.
- Shadow Diffusion: If Cast Shadows is on, this changes the softness of the shadow edge.
- Shadow Color: Changes the color of the shadow.

The target direction is set using the standard <u>Transform</u> **Target** property.

Promoting Lights from Embedded Composite Shots

Embedded composite shots have an additional option in their Layer materials called Promote Lights.

When Promote lights is activated, any lights inside the embedded composite shot will also affect layers in the parent composite shot.

6.18.3. Layer Materials

Layers can be switched between 2D and 3D. See <u>Working with Layers</u> for details about switching dimensions. Once a layer is switched to 3D it gains the Materials group, which defines how the layer interacts with 3D lights and other 3D layers.

See Lighting a 3D Scene for more details on lighting a 3D scene.

3D model layers have additional material properties. See Importing 3D Objects for more information.

Material Options

A 3D layer has multiple options for adjusting its material.

Illumination and Shadows

- **Illuminated:** Controls whether a 3D layer is affected by 3D lights. Exact behavior of the layer under different light types can be customized.
- Ambient: Determines how much the layer is illuminated by ambient lights.
- **Diffuse:** Determines how much the layer is illuminated by point, directional and spot lights.
- **Specular:** Adjusts the strength of specular highlights when illuminated by point, directional and spot lights. A low specular value will create a more matte surface.
- **Shininess:** Adjusts the size of the specular highlight. A low shininess creates a large, diffuse highlight while a high value creates a smaller, defined highlight.
- **Emissive:** Causes the layer to emit a visible color even when not under direct lighting. Therefore the layer will still be visible in darkness, acting like a light-emitting source (eg neon).

A layer can be set to receive shadows. These shadows will only be cast from layers which have **Cast shadows** activated.

You can also set a layer to cast shadows even when the layer's visibility is turned off. This makes it easier to create a shadow pass, in which you can cast shadows onto a white background for further compositing purposes, such as blending the shadow pass into live action footage.

Note that shadows are only cast if a 3D light source is activated which also has Cast shadows enabled. See Lighting a 3D Scene for more information.

Reflections

Only 3D model layers can receive reflections, but all 3D layers can cast reflections. A 3D model will only reflect layers which have **Cast Reflections** activated.

As with shadows, you can also cast reflections even when the layer itself is not visible. This is very useful for creating 'bounce boards', similar to using a reflector on set to provide fill light. In HitFilm you can create solid color planes, set to be invisible, which cast reflected light onto your 3D models. By having the casting layer be invisible you can position the 'bounce board' anywhere you like without it being visible in shot.

Ambient Occlusion

Layers can shade each other based on proximity. This replicates the absence of light that occurs where surfaces meet in the real world (this can be observed by the naked eye in the corners of rooms).

This example is of a 3D model but the same principles apply to other 3D layers. Compare this image without ambient occlusion:



With this image showing ambient occlusion on the vehicle:



The ambient occlusion in the second image highlights detail by shading areas where different surfaces are in close proximity. There is also subtle ambient occlusion being cast onto the white floor around the wheels. Ambient occlusion can then be combined with illumination and shadows cast from actual 3D lights.

Layers can be set to receive and cast ambient occlusion separately.

Once ambient occlusion is activated, additional options are displayed for customizing the appearance of the occlusion.

The **Depth Scale** can be used to adjust the appearance of ambient occlusion for different scale models.

If you experience visual glitching with some models, try increasing the **Blur Radius** or **Samples**.

Note that 3D layers cannot cast ambient occlusion onto 3D models. However, 3D models can cast ambient occlusion onto all other 3D layer types, and 3D layers can cast ambient occlusion onto each other (eg a plane in proximity to another plane, or an image in proximity to a video).

6.18.4. Virtual Cameras

Cameras are used in 3D composite shots. If you have any 3D layers you must have a camera for them to be visible.

If you only have 2D layers in your composite shot, a camera will not have any effect.

When you add 3D effects to your timeline or switch 2D layers to 3D a camera will be created automatically.

Creating Cameras

Cameras can be created manually from the **New Layer** menu on any composite shot timeline. The camera will be added to the timeline as a new layer.

Multiple Cameras

You can create multiple cameras in the same composite shot. Each camera can be positioned separately, enabling multiple views of the same 3D scene.

Only one camera can be used at a time. HitFilm uses three methods to determine which camera is the active camera:

- 1. **Camera Layer Duration:** The duration of the layer on the timeline determines whether a camera can be active or not. If the camera layer does not cover the current frame, the camera will not be used as an active camera.
- 2. **Camera layer visibility:** Only cameras that are visible can be active cameras. If multiple camera layers are present on the current frame, then any camera layer whose visibility is disabled will be ignored.
- 3. **Timeline Layer Order:** If multiple camera layers are present and visible on the current frame, the camera on the highest layer is used as the active camera.

Customizing Cameras

Camera layers have a number of unique properties.

Layer Properties

- **Depth Of Field:** Turns depth of field for this camera on or off. This default to off, ensuring that all 3D layers will be in focus.
- Focus Distance Layer: Locks the focus to a specific layer. The focus will then automatically track that layer as the camera and selected layer move in relation to one another.

Lens

- **Aperture:** Size of the camera's virtual aperture in pixels. The larger the number, the larger the aperture, and the shallower the depth of field. Note that this is different to real camera apertures, whereby a smaller number represents a larger aperture. Only has an effect if Depth of field is turned on.
- Zoom: Adjusts the camera between wide angle and telephoto.
- **Focus Distance:** Moves the focal point closer to or further away from the camera. This setting will only have an effect if Depth of Field is turned on.
- **Blur:** Changes the amount of blur applied to out of focus areas. Only has an effect if Depth of Field is turned on.

Camera Properties

Unlike Layer properties and Lens, Camera properties are found by choosing **Properties** from the camera layer's menu on the timeline.

- Name: The name of the camera on the timeline.
- Near Clip Distance: The closest point at which layers are rendered.
- Far Clip Distance: The farthest point at which layers are rendered.

6.18.5. Distance-Based Fog

When working in 3D, the layers on your timeline exist in a 3D space. Fog can be added to the scene, to fill the space between the layers.

With fog turned off, all layers are rendered the same regardless of their distance from the camera. A layer in the far distance will be just as bright as a close-up layer. If you turn fog on, layers will gradually fade to the fog color over a given distance, simulating atmospheric haze.

The Fog properties can be adjusted for each composite shot timeline, and are accessed in the Properties for each timeline

Fog Properties

The fog properties can be accessed from the Media panel or the Timeline.

Media Panel

- 1. Click the cog icon to the right of any composite shot's name, to open the properties for that timeline.
- 2. Click the Advanced tab to access the fog properties.

Timeline

- 1. Click the cog icon at the lower left corner of the timeline to open the properties for the current timeline.
- 2. Click the **Advanced** tab to access the fog properties.
- Enable: Turns the fog on and off.
- Near Distance: The distance at which layers begin to fade into the fog.
- Far Distance: The distance at which layers will be completely fogged.
- **Density:** When using exponential fall offs, this increases the rate at which the fog thickens.
- Fall Off: Change between a linear fall off and various exponential fall offs. Exponential fall offs are more natural but can be more difficult to predict.
- Color: Change the color and brightness of the fog.

6.18.6. Working with Depth Maps

In addition to 2D and 3D compositing, HitFilm allows you to overlap or combine the two using depth maps. Working with models or effects in 3D Unrolled makes it very easy to arrange them interactively within HitFilm's Unified 3D workspace. But working in 2D provides the advantage of being able to apply effects directly to models or particle systems. Using depth maps, your layers can remain in 2D, so effects can easily be applied, but they can still be rendered accurately into the depth of the 3D scene.

Depth maps are greyscale images that represent the distance from the camera to each object in the scene. Once generated, the depth map can be used as a matte, and applied to to other layers to control their visibility.

When a 3D model or particle simulator layer is set to 2D, the Layer Properties will include a **Depth Source Layer** menu. You can use this menu to select any other 2D layer on the timeline, so that the layers will be rendered as if they were 3D, using the depth map.

6.19. Importing 3D Objects

To import a 3D model, click the drop-down arrow on the Import button in the Media panel and choose Import 3D model.

HitFilm supports the .lwo, .3ds, .abc, .fbx and .obj formats.

The 3D model properties window will appear with information about your selected model. The information displayed will vary depending on the way the model has been designed.

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CANC	EL				ок

There are three sections for customizing the model during import – <u>Groups</u>, <u>Materials</u> and <u>Advanced</u>. You can return to adjust Materials and Advanced at any time during your project, but Groups can only be

changed during import.

For details on each section see the following chapters:

- Animation Groups
- <u>Setting Up Materials</u>
- Advanced Properties

Note that static 3D model geometry is saved within the HitFilm project file, so you will experience larger project file sizes when working with 3D models.

Preview

A preview of the 3D model is rendered in the window on the left. You can move the camera around using the tools in the top right corner, **tracking** forwards, backwards, left, right, up and down.

Left clicking and dragging in the window will **orbit** the camera around the model.

Importing

Once you have finished adjusting the 3D model's properties, click OK to add it to your Media library. It can then be used like any other media asset. See <u>3D Objects on the Timeline</u> for details.

6.19.1. Animation Groups

3D models can be animated using two methods in HitFilm.

If a model is set up with animation groups these can be used to animate individual parts of the model using HitFilm's standard animation tools – for example, spinning the rotors on a helicopter or opening a car door.

For more advanced animation you can import Alembic of FBX animation files creates in 3D animation software. See <u>Alembic Animation</u> for details.

Setting Up Groups

Some 3D models are built using groups. These are pre-defined parts within the main model. During import you can select groups you want to animate inside HitFilm using the **Groups** panel.

Selecting a group in the list will highlight it in the preview. Checking the box will create transform controls on the timeline for each group.

You can also rename a group by right-clicking and choosing the **Rename** option from the menu.

After importing the model and adding it to the timeline, you can then animate the specified groups from the layer's Models section. Each group selected during import will have its own listing and can be animated individually.

Setting up groups can only be done during import. Make sure you define your groups at this stage as they cannot be edited later without re-importing the model.

Sroups cannot be created inside HitFilm, they must be part of the original model's design.

6.19.2. Setting Up Materials

A model's textures are listed in the **Materials** panel. This is <u>displayed during import</u> and can be accessed again at any time after import by clicking the cog icon next to the 3D model in the Media panel, or right-clicking the model and choosing **Properties** from its menu.

The appearance of a 3D model in your scene can be drastically altered using the materials options. Models will often have multiple materials, representing different parts of the model. The glass in a car's windows will be a separate material to the metal on the doors, for example. For realistic results we recommend setting up each material.

Conce you've got a model perfectly set up, you can always save it out to a project file which can be used as a template in the future, saving time.

Selecting a material in the list will highlight it with a red mesh in the preview, so that you can see precisely which part of the model you are adjusting. Each material will have the following controls. More detailed explanations of these controls and their functions can be found below, on this page.

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• **Diffuse Map:** A Diffuse Map defines the primary texture on your model. The image is mapped onto the model's surface, so the details in the map appear to be painted onto the model's surface. Click the

folder icon to open a browser and select a diffuse map image. Click the X to remove the image.
Specular Map: A Specular Map defines how shiny different areas within the material will be. With no

map, the entire material will be consistently shiny. Click the folder icon to open a browser and select a diffuse map image. Click the X to remove the image.

- Normal Map: Normal Maps are used to increase visual detail of a model without negatively impacting performance. They must be generated by 3D modeling software. Click the folder icon to open a browser and select a diffuse map image. Click the X to remove the image.
- **Bump Map:** Bump Maps perform a similar function to Normal Maps, but in a simplified way, using greyscale to indicate bump height. Click the folder icon to open a browser and select a diffuse map image. Click the X to remove the image.
- Max Bump Depth: Bump maps are greyscale, with pure black areas being the lowest, and pure white areas being the highest. This setting defines the height of the white areas, then all gray values are mapped into the difference between the black height (the model's actual surface) and the white height.

- **Diffuse Color:** Alters the base color of the material under a point, spot or direction light. The luminance of this color determines the brightness of the diffuse texture map. Click the swatch to open a color picker and chose any color. You can also use the eyedropper to select a color from the Preview, or manually enter the RGB values for your desired color.
- **Specular Color:** Determines the color used for the material's specular highlights. Specular highlights are only visible if there is a 3D light source in the scene. Click the swatch to open a color picker and chose any color. You can also use the eyedropper to select a color from the Preview, or manually enter the RGB values for your desired color.
- **Ambient Color:** Defines the color of the material under an ambient light source. Click the swatch to open a color picker and chose any color. You can also use the eyedropper to select a color from the Preview, or manually enter the RGB values for your desired color.
- Emissive Color: The color of the material regardless of the lighting setup. Even when the model is unlit or shadowed, it will still emit this color. This is useful for simulating light sources, such as neon objects or lights on a vehicle. Click the swatch to open a color picker and chose any color. You can also use the eyedropper to select a color from the Preview, or manually enter the RGB values for your desired color.
- Illumination Model: There are two illumination models available, to better simulate different physical materials.
 - **Phong:** Phong is effective for very smooth surfaces with a single specular highlight, such as plastics or paint.
 - Shininess: Adjusts how glossy the material is, and the size of the specular highlight.
 - **Cook-Torrance:** Cook-Torrance is a Physically Based Renderer more suitable for metals, with a rougher surface that distributes the light less evenly.
 - **Fresnel:** Adjusts reflectivity based on the angle of the surface relative to the viewer. The more perpendicular the viewing angle, the more reflective the surface. The values here determine the range of reflectivity, for each of the color channels. The Menu of metal types offers convenient presets for different common metals.
 - **Roughness:** Adjusts how rough the surface of the metal is, and thus how much of the light is reflected in a diffuse fashion, rather than being reflected specularly.
- **Diffuse Reflectivity:** Diffuse reflectivity refers to light being reflected in all directions. It does not produce a direct reflection, but causes the object to be illuminated by surrounding objects.
- **Specular Reflectivity:** Specular reflectivity is what we normally think of when we talk about reflections seeing a visible reflection of an object on the surface of another object. Increasing specular reflectivity allows the material to reflect nearly objects in the 3D space.
- **Reflection Mode:** Select the mode used to calculate the reflectivity.
 - Spherical: Uses a spherical reflection.
 - **Planar:** Uses planar reflections.
- Index of Refraction: Refraction occurs when light is deflected while passing through a semitransparent object, causing a vertically inverted version of the scene to be reflected onto the surface

of the material. The Index of Refraction sets the amount of refraction, which differs depending on the density of the material the light is passing through. Water has a refraction index of 1.7 while glass typically starts about 1.55, for example.

• **Refraction Amount:** This value defines the visibility of the refraction.

Texture Maps

At the top of the controls for each material are four texture map slots, for Diffuse, Specular, Normal and Bump maps. These are used to add detail and color to the 3D geometry.

Compare the difference between an untextured model in the first image, and the same model with textures and materials set up, in the second image:





Most 3D models have been designed with textures. HitFilm will attempt to import textures automatically during import, if they are located in the same folder as the 3D file. If textures are not found automatically or if you want to change a texture, you can locate a new one using the folder icon. You can remove a texture from a slot using the X button.

Diffuse Map

The diffuse map is used to add surface detail and color to the model. Here is an example of a helicopter, with the diffuse map providing dirt detail on the hull as well as lettering:

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				Ref	raction Amount	•				0.0%

The image file for the diffuse map looks like this:



Textures are not made inside HitFilm. Instead, they are produced when the 3D model is designed and created. However, you can customize textures using any normal image editor, and changes made can be then re-applied in HitFilm.

Specular Map

Specular highlights are created by your lighting setup. By default all surfaces on the model are equally likely to receive specular highlights. Sometimes, however, you may want to restrict specularity based on the material – for example, if you have a normally shiny surface (such as polished metal) covered in dirt and scratches, you will want to restrict the specularity only to the clean areas. This can be achieved using a specular map.

Observe the helicopter in the first image, without a specular map, and compare it to the second image, with a specular map applied:



In the above example the specular highlight has been made blue and more extreme, so as to illustrate the point. Ordinarily you would opt for a subtler appearance. In the first image, where no specular map is used, note how the specular highlight is bright along the entire length of the helicopter, including over the UNITED STATES ARMY text. In the second image, note how the specularity has been restricted. Dirtier areas of the

helicopter are less reflective. The UNITED STATES ARMY text is now visible and is not creating highlights – as if the black paint of the text is preventing it. Using a specular map can drastically improve the realism of your 3D models.

3D models are usually provided with a specular map, but they can also be created by hand. They are greyscale images, with black areas representing non-specular areas and white areas representing high specularity. The specular map for this helicopter is very simple:



The specular map slot also restricts the behavior of the reflectivity options, detailed below.

Normal Maps & Bump Maps

Normal Maps are hugely powerful textures which can be used to add the appearance of additional 3D detail to a model, without actually increasing its polycount. Normal maps are used to create detailed models without negatively impacting performance.

The smooth 3D sphere in the first image has no surface detail at all. By applying a normal map, we get the second image:




The sphere model now appears to have substantial surface detail. However, it is still the same smooth sphere. The illusion of surface detail is being created entirely by the normal map. The huge benefit is that the model is still very simple, which keeps rendering times low.

There are restrictions to how normal maps function. If you move your camera very close it will become apparent that the detail is texture-based. Similarly, viewing the model from an oblique angle can reveal that the surface detail is only an illusion. And while the normal mapped surface reacts to the position of 3D lights for illumination and shading, normal maps won't cast actual 3D shadows. Normal maps are therefore best used for subtle, fine surface detail, while major features are represented by actual geometry.

Bump Maps perform a similar task to normal maps but using a different, less sophisticated technique. Bump maps can be created by hand much like a specular map, as they are greyscale images with white representing maximum height and black representing minimum height. Normal maps have to be generated from by 3D modeling software and the textures include information for X, Y and Z vectors.

A common workflow would be to produce a high poly model first, then generate a normal map which can be applied to a low poly version. This retains the illusion of fine detail while keeping fast performance.

Because bump maps are inherently relative, with no actual defined height, you can adjust the scale of bump mapping using the Max Bump Depth property. This does not affect normal maps.

Lighting Colors

The various color properties are used to set up the default colors for the material. These combine with the texture maps and your lighting setup.

- **Diffuse Color:** Alters the base color of the material under a point, spot or direction light. The luminance of this color determines the brightness of the diffuse texture map.
- **Specular Color:** Determines the color used for the material's specular highlights. Specular highlights are only visible if there is a 3D light source in the scene.
- Ambient Color: Defines the color of the material under an ambient light source.
- Emissive Color: The color of the material regardless of the lighting setup. Even when the model is unlit or shadowed, it will still emit this color. This is useful for simulating light sources, such as neon objects or lights on a vehicle.

Illumination Model

There are two illumination models available for materials: Phong and Cook-Torrance. In general, Phong is more suitable for plastics with a single specular highlight, while Cook-Torrance is more suitable for metals with a rougher surface that distributes the light less evenly.

Note that the specular highlight for both illumination models is determined by the specular color, described above. A specular map can also be used to restrict the specular highlights of a material.

Phong

Phong generates a defined highlight similar to plastic materials. Light bounces off the surface evenly. This model has less control than Cook-Torrance.

The color of the highlight is determined by the specular color.

A small **Shininess** will generate a large highlight, as seen here:

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A larger shininess value will generate a smaller, sharper highlight:

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Cook-Torrance

This illumination model provides greater control and is more suitable for metal surfaces. Bounced light is scattered across the surface, as if reflecting off multiple 'microfacets', rather than a focused, singular bounce as with Phong.

The **Fresnel** determines the scattering of light. Several metal presets are provided to make it easier to choose a suitable material.

Roughness determines the spread of the specular highlight. A low roughness creates a defined, sharp highlight, while a high roughness diffuses the specular highlight across the surface, moving towards a more matte material.

Specular Reflectance adjusts the intensity of the specular highlight.

In this example a copper fresnel is being used to generate a more realistic metallic appearance, compared to the Phong images above:

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Here is the same setup in a more natural lighting scenario:



Reflectivity

There are two types of reflectivity. Specular reflectivity is what we normally think of when we talk about reflections – seeing a visible reflection of an object in the surface of another. Diffuse reflectivity doesn't produce a direct reflection but causes the object to be illuminated by surrounding objects.

Here is an example image with a single light source and no reflectivity:



The overall lighting in the above image is unconvincing, because the skull is not being illuminated by it surroundings. While the blue wall and grey floor are not directly emitting light, they should nevertheless be bouncing light.

Here is the same shot with diffuse reflectivity turned on, and no other changes:



This time the skull sits far more naturally in the scene. It is brighter and is receiving diffuse blue light from the back wall. This still only uses a single light source, but the overall lighting impression is far more realistic. The diffuse reflectivity technique is subtle and hugely powerful – for very little effort you can achieve much more convincing lighting.

Here is the same scene using specular reflectivity instead of diffuse:



The result is very different. The reflections are very sharp and defined, as if the skull were a shiny chrome material.

Here is a more extreme example, using the same settings but a different background wall:



And the same background again, but with a diffuse reflectivity setup:



You can, of course, combine the two, which is what you will normally want. That's how the copper skull was created, using a mixture of diffuse and specular reflectivity:



The amount of diffuse and specular reflectivity can be adjusted per material.

You can also use an environment map image for reflectivity, in addition to the actual 3D scene. An environment map is usually a panoramic, wrap-around image representing a particular location. While this is not as accurate as reflecting the actual 3D scene, it is often more convenient. For example, if you are compositing an object into a live action plate, you are more likely to have a panoramic image of the location than a full 3D recreation.

A 3D layer can be assigned a single environment map. This is set in the material properties of the layer on the timeline. See <u>3D Objects on the Timeline</u> for more information.

Refraction

Refraction occurs when light is deflected while passing through a semi-transprent object. In HitFilm refraction causes a vertically inverted version of the scene to be visible on the surface of the material.

As with reflectivity, refraction can also use the 3D model layer's environment map. See 3D Objects on the Timeline for more information.

The Index of Refraction sets the amount of refraction, which differs depending on the density of the material

the light is passing through. Water has a refraction index of 1.7 while glass typically starts about 1.55, for example.

The Refraction Amount determines the visibility of the refraction.

Here is an example of the skull object set up to look more like crystal:



6.19.3. Advanced Properties

The advanced panel contains additional controls for defining how the model behaves in VEGAS Effects.

After adjusting the advanced settings the **Update Preview** button must be clicked to see the changes in the preview.

Coordinate System

- Flip YZ Axis: Alters the default orientation of the model. This is useful if the model has been built in software that uses a different coordinate system to VEGAS Effects.
- **Center Anchor Point:** Ensures the anchor point is at the center of the model. This can be useful if the model is offset in 3D space.

The coordinate system can only be adjusted during import.

3D Model Units/Scale

The scale of an imported model has to be adapted to the VEGAS Effects 3D scene.

- **Auto Normalize** will scale the model automatically to fit within a cube 500 units on a side. This will ensure the model fits neatly within the frame of a default VEGAS Effects camera.
- **Single Unit Scale:** If you are working with multiple models or multi-file models that have been created to a specific scale you should uncheck auto normalize and set the Single Unit Scale. This will ensure all models use the same scale.
- Unit: The unit scale can be set using the drop-down menu and the value set with the slider.

The scale of a model directly affects the behaviour of ambient occlusion. Small scales will produce deeper ambient occlusion, creating the impression of a smaller model.

The model scale can only be adjusted during import.

Normals

Normals are used to determine how light interacts with a surface. The Normal of each polygon is the angle which the polygon faces.

In most cases the Normals properties should not be changed. Only alter them if the model is rendering incorrectly.

- Flip Normals: In the event of lighting seeming inaccurate, with areas appearing dark when they should be light, activate the Flip Normals property.
- **Unify Normals**: This option calculates the normals for all faces so they are facing away from the center of the model. If you have a model which is so broken that some polygons are not visible, or the order of the polygons is inconsistent, this option may help to repair the model and make it usable.

Generate Method

The Generation **Method** can be used to create normals for models that do not have them, or to alter the existing normals. This gives you several options for how the normals are handled, to modify their appearance.

- From File: Reads the normals from the file, without any modification
- Generate Faced + Auto Smoothing: Generates normals for each face, and then smooths all normals within the specified angle tolerance
- Generate Faceted: Generates normals for each face of the model
- From File + Auto Smoothing: Reads the normals from the file, then smooths all normals within the specified angle tolerance

UV Mapping

• Flip UV Coordinates: UV mapping determines how textures are applied to a surface. If textures are appearing inverted or upside-down, make sure you activate the Flip UV Coordinates property.

6.19.4. 3D Objects on the Timeline

After <u>Importing 3D models</u> they will be available in the Media panel. These can then be added to composite shot timelines like any other media asset.

Using Multiple 3D Models

3D models can exist on their own individual layers, or within a single 3D model layer. When dragging a new model to the timeline from the Media panel, you can choose to drop it onto the timeline as a new layer, or on top of an existing 3D model layer. If a 3D model layer contains multiple models, they are listed individually inside the Models group.

See <u>Working With Layers</u> for information on more generic model layers.

World Transform

These transform controls move the entire 3D scene contained within the 3D layer. All 3D models inside the 3D layer will be affected.

Material

Fine control is provided over how the 3D model layer is affected by lighting. These settings affect the entire layer. If you want to adjust individual materials within the model, see <u>Setting Up Materials</u>.

- **Illuminated:** Controls whether the 3D model layer is affected by 3D lights. The way a model reacts to lights can be adjusted when <u>Setting up Materials</u>.
- **Receive Shadows:** A model can be set to receive shadows. These shadows will only be cast from layers which have **Cast Shadows** activated. This includes the selected model, which will only self-shadow and cast shadows with both options enabled.
- Cast Shadows: Enable this option to allow the layer to cast shadows into other layers.
- **Cast Shadows If Visibility Is Off:** Allows the layer to cast shadows even when the layer's visibility is turned off. This makes it easier to create a shadow pass, in which you can cast shadows onto a white background for further compositing purposes, such as blending the shadow pass into live action footage.
- Self Shadow Bias: Used to restrict how much of the model casts shadows onto itself. Some models produce shadows where there should be none, and this helps to remove unwanted glitches. Raising it too high will cause unrealistic results.

- Note that shadows are only cast if a 3D light source is activated which also has Cast Shadows enabled. See <u>Lighting a 3D Scene</u> for more information.
- **Receives Reflections:** Allows the model to receive reflections from any other 3D layers set to cast reflections.
- Cast Reflections: Allows the model layer to cast reflections onto other 3D model layers.
- **Cast Reflections If Visibility Is Off:** Allows the layer to cast reflections, even when the layer's visibility is turned off.
 - Note that reflections will only be visible if other layers have been set to cast reflections, and if the 3D model has materials set up to show diffuse or specular reflectivity.
- Environment Map: Choose the source which will be used as an Environment Map. An environment map can be used for reflections and refraction. This is a single layer, usually a wraparound panoramic image of a location which is representative of the desired reflections. An environment map can be used on its own, or in combination with the real-time reflections.
 - **None:** No environment map will be used.
 - **Use Composite Shot:** A flattened version of the entire contents of the current composite shot will be used to generate an environment map.
 - **Use Layer:** Allows you to choose a single layer from the current timeline, which will be used as the environment map.
 - **Layer:** When Use Layer is selected, a new property will appear, where you can select the layer you wish to use from a menu of all layers in the current composite shot.
 - Note that the effects of an environment map will only be visible if other layers have been set to cast reflections, and if the 3D model has materials set up to show diffuse or specular reflectivity.
- **Receives Ambient Occlusion:** Enabling this option allows the model to receive ambient occlusion from itself or other nearby layers.
- **Casts Ambient Occlusion:** Enabling this option allows the model to cast ambient occlusion into itself or other nearby layers. Once ambient occlusion is activated, additional options are displayed for customizing the appearance of the occlusion.
 - **Samples:** Adjusts the quality of the ambient occlusion. Increasing this setting can eliminate visual errors, if any appear, and improve the accuracy of the occlusion, but may increase processing times.
 - **Sample Radius:** Adjusts the size of the area included when factoring the ambient occlusion.
 - Intensity: Changes the overall visibility of the ambient occlusion.
 - **Depth Scale:** Adjust this value to change the appearance of ambient occlusion for different scale models.
 - Bias: Shifts the relative intensity of the occlusion, based on the size of the model's details.
 - **Blur Radius:** Softens the falloff of the shadowed areas. If you see visual flaws in the occlusion, try increasing this value.
 - **Depth Falloff:** Adjusts how much sharp detail is retained within the shadow areas.

 **Include Semi-Transparent Triangles:* Enable this option to apply ambient occlusion to materials containing transparency, or using 32-bit textures.

Models

Each model in a layer will be listed in this property group, and can be controlled individually using the following control groups.

Transform

If animation groups were selected during importing the model these will be listed as sub-models within the relevant model, each with their own transform properties. Most of the controls are identical to the transform controls found elsewhere in the software.

• Anchor Point Orientation: This property determines the orientation of the model group's coordinate system. This is useful for setting up correct rotation of particular animation groups, such as the rotor blades on a helicopter.

Animations

The Animations section can be used to apply Alembic (.abc) or Filmbox (.fbx) animation data. See <u>Alembic</u> <u>Animation</u> for details.

Override Materials

HitFilm allows you to override the materials settings stored in the model, and apply your own textures. This allows you to use video files, or composite images created within HitFilm, as textures on your models. See <u>Override Materials</u> for complete details.

6.19.5. Alembic Animation

Alembic .ABC files can be used to drive a 3D model's animation. Alembic files can store complex animation data with full IK rigging. This means that you can import pre-animated models into HitFilm, including advanced character animation, which wouldn't be possible to animate directly inside HitFilm.

You still retain complete control over 3D camera angles and lighting when using animation files. Alembic animation can therefore be considered as 3D stock footage, just as you might use 2D stock in your projects.

For example, here we can see a human character performing a complex cartwheel animation which would be impossible to animate inside HitFilm:



More information on the Alembic format can be found here: http://www.alembic.io/

Note that Alembic files do not have to contain animation data. If your Alembic file is not an animation, it can be imported using the normal <u>3D Model Import Process</u>.

To import an Alembic animation file, choose the **3D Model Animation** option from the Import Menu.

Applying Alembic Animation to a 3D Model

Alembic animations must be applied to corresponding 3D geometry. The animation file needs to have been created alongside a specific model, which should be imported separately. Applying animation created for one model to a different model will create unpredictable results.

Alembic files are listed in the <u>Media Panel</u>. You first need to add the associated 3D model to the timeline, to create the 3D model layer.

Once you have your 3D model layer, expand its property groups to find the **Models** group. This is where your specific models are listed, with each model having an **Animations** slot.

You can now drag the related Alembic animation file onto the Animations slot to add it to the layer.

Note that you can add multiple Alembic animations to a single model. These animations can be set up to work sequentially or simultaneously.

Controlling Alembic Animation

It should be noted that you cannot change the specifics of the animation inside HitFilm. The animation itself can only be altered in 3D modeling and animation products.

Using the animation's controls you can change the playback rate of the animation, including reversing playback, or play a specific section.

The **Strength** property adjusts the intensity of the animation on the model. For character animation you will normally want this at 100%. If the animation is being used to warp or distort a model, this can be used to adjust its effect.

By default the animation will playback as intended by the animator. Enabling Custom Playback gives you more direct control over the playback, enabling you to choose a specific part of the animation or keyframing the animation's progress. For example, if you have an animation which lasts 5 seconds by default, you can use **Custom Playback** to play it in slow motion by setting its 0% and 100% **Playback** keyframes 10 seconds apart.

When Custom Playback is deactivated you can optionally turn on Loop, which will repeat the animation indefinitely.

6.19.6. Override Materials

Overriding the materials used by a 3D model allows you to use textures contained in your HitFilm project. This is useful for applying video textures to your models, or for using composite images created in HitFilm, which can then be dynamically edited and immediately update onto the model.

To Enable Material Override:

- 1. Right-click the model whose textures you want to edit, and select **Properties**. The 3D Model Properties dialog for that model will open.
- 2. In the Materials tab of the Properties dialog, locate the texture you want to override.
- 3. To the left of the material's name, click the Override Material icon:
- 4. Click OK to close the 3D Model Properties dialog.

Now the material you selected will be listed in the Override Materials controls, on the timeline and in the controls panel, and can be edited there.

Override Materials Controls

Once any material in your model has been overridden, the override controls will be displayed on the timeline, and in the controls panel.

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				•	Diffuse Map Source	From File		•
				•	Specular Map Source	From File		•
				•	Normal Map Source	From File		•
				•	Bump Map Source	From File		•

Each material which is overridden will be listed separately, with the following controls available for each.

- Diffuse Map Source: Select the source to be used to generate the visual texture for the material.
 - **None:** No texture is used, and the material is colored using the diffuse color assigned to the model.
 - **From File:** Uses the image assigned in the material controls of the model itself. This option matches the appearance shown if the Override Material option was not enabled.
 - **Use Layer:** Allows you to select any video, image, or plane layer present on the timeline, and use its contents as the texture.
- Specular Map Source: Select the source used to calculate how shiny different areas of the material will be.
 - None: No map is used, and the specularity is consistent in all areas of the material.
 - **From File:** Uses the map assigned in the material controls of the model itself. This option matches the appearance shown if the Override Material option was not enabled.
 - **Use Layer:** Allows you to select any video, image, or plane layer present on the timeline, and use its contents as the specular map.
- Normal Map Source: Select the source to be used as a normal map for the model.
 - None: No normal map is used, and the unaffected polygons of the model are displayed.
 - **From File:** Uses the normal map selected in the material controls of the model itself. This option matches the appearance shown if the Override Material option was not enabled.
 - **Use Layer:** Allows you to select any video, image, or plane layer present on the timeline, and use its contents as the normal map.

- Bump Map Source: Select the source used as a bump map for your material.
 - **None:** No bump map is used, and the unaffected polygons of the model are displayed.
 - **From File:** Uses the bump map selected in the material controls of the model itself. This option matches the appearance shown if the Override Material option was not enabled.
 - **Use Layer:** Allows you to select any video, image, or plane layer present on the timeline, and use its contents as the bump map.

7. Visual Effects

HitFilm includes a huge library of built-in effects. Each individual effect is explained in greater detail in this section of the user guide. In HitFilm Pro, you can also install compatible OpenFX plugins from other developers. All of the available effects can be accessed through the Effects panel, the Effects menu, or the insert menu, each of which is shown here:



	Search in Effects 👎
	Recents
	Favorites
•	360° Video
۲	Animation
Þ	Audio
Þ	Blurs
Þ	Boris Continuum Complete
Þ	Boris FX Mocha
Þ	Channel
۲	Color Correction
•	Color Grading
	Depth

The effects in HitFilm are organized topically into folders. The Effects panel also lists your created presets. See the <u>Presets</u> chapter for more information.

Effects marked with the [Layer only] tag can only be used in composite shots. All other effects can also be used in the editor.

Adding Effects

Most effects are used by adding them to an object on the timeline. There are multiple ways to do this:

- Drag and Drop: Drag an effect from the effects panel onto a timeline object, and drop it.
- **Double-click:** Double-click an effect in the effects panel to add it to the currently selected timeline object.
- Effects Menu: Open the Effects menu on the top menubar and select any effect to add it to the currently selected timeline object.
- **Insert Menu:** In the Controls panel, click the green plus icon next to Effects to open an Insert menu where you can select effects for use.
 - **Search:** The dynamic search box at the top of the insert menu will automatically update the list as you type, so you can quickly locate the effect you need.
 - **Pin:** At the top right of the insert menu is a pin, which pins the menu open. This allows you to select multiple effects, and apply them all to your layer at once.

Searching for Effects

If you are looking for a specific effect and know its name, you can type it into the Search bar. As you type the list will be instantly updated to display relevant results.

You can also filter the list to show specific types of effect using the Show All menu.

Controlling Effects

Effects are added to clips and layers by dragging them from the Effects panel onto the chosen clip.

You can then customize the effect in the Controls panel, or directly on the timeline when working in a composite shot.

To make changes to an effect, first select the relevant clip or layer on the timeline. Its properties will be displayed in the Controls panel, with all applied effects listed in the effects section.

You can expand the effects section and individual effects to reveal more controls and details.

Clicking once on a property lets you type in a new value. Dragging on a value increases or decreases it.

Presets

HitFilm contains two types of presets.

Plugin Presets

Plugin presets are built into individual effects, and can be accessed through the Preset menu in the controls for most effects. They only impact the effect they are contained in.



Not all effects have a preset menu, and the number of presets available will vary from one effect to the next. Select any preset from the menu to apply it to the effect. You can quickly try different presets to find the one best suited to your project.



Presets

Standard Presets can be created for 3D effects and combinations of 2D effects.

Presets store your chosen settings so that you can quickly recreate them elsewhere in your project or even in completely different projects. To learn more about creating and using presets, see the <u>Presets</u> page.

Transitions

The Effects library also contains Transitions. Transitions provide interesting ways to blend from one clip into the next and can only be used on the editor timeline.

You can drag transitions from the Effects panel onto the timeline. Transitions need to be applied to the start or end of a clip, or between two adjacent clips. A green indicator will show where the transition will be placed.

Once you have applied a transition it can then be selected on the timeline. The selected transition's properties can be adjusted in the Controls panel.

See the <u>Transitions page</u> for detailed information on the different transitions.

7.1. 360° Video

The 360° Video category contains the following tools designed specifically for working with 360° video. Each effect has its own page with full details of the effect and its controls.

- <u>360° Animated Lasers [Layer Only]</u>
 EXPRESS ADD-ON
 EXPRESS ADD-ON
- <u>360° Blur</u>
 EXPRESS ADD-ON
- 360° Bulge EXPRESS ADD-ON
- 360° Channel Blur
 EXPRESS ADD-ON
- <u>360° Fisheye Converter</u>
 EXPRESS ADD-ON
- 360° Fractal Noise EXPRESS ADD-ON
- 360° Glow EXPRESS ADD-ON
- 360° Glow Darks
 EXPRESS ADD-ON
- <u>360° Lightsword (2-Point Auto) [Layer Only]</u>
 EXPRESS ADD-ON
- 360° Lightsword (4-Point Manual) [Layer Only]
 EXPRESS ADD-ON
- <u>360° Lightsword (Glow Only) [Layer Only]</u>
 EXPRESS ADD-ON
- 360° Magnify
 EXPRESS ADD-ON
- 360° Neon Path [Layer Only]
 EXPRESS ADD-ON
- <u>360° Text [Layer Only]</u>
 EXPRESS ADD-ON
- 360° Twirl EXPRESS ADD-ON
- <u>360° Unsharpen</u> EXPRESS ADD-ON
- 360° Video Transform
- 360° Viewer [Layer Only]

7.1.1. 360° Animated Lasers

EXPRESS ADD-ON 360° Animated Lasers is available in the 360°: Neon Lights Pack.

A customized version of the Animated Lasers effect optimized for use with 360° video. If this effect is applied to normal video, it will look distorted and incorrect.

Designed to create laser bolts which travel from one point to another. The lasers can be constructed from multiple lines, which can be further manipulated into spirals, expanding the effect to also be useful in motion graphics animation.



The laser has two position **points** which define the path along which the laser will travel. These interact with the **Laser Length** and **Location** properties, which define the laser bolt's location between the two points.

- Start Point: Sets the origin point of the path along which the laser will travel.
 - **Use Layer:** Select any other layer on the timeline to use its position as the origin of the laser path. A common example is to select a point layer which contains the tracking data for the muzzle of a prop. When a layer is selected, the Position property below functions as an offset from the selected layer's position.
 - **Position:** Defines the location of the point from which the laser originates, on the X axis (horizontal) and Y axis (vertical). When the **Use Layer** option (above) is used, this position

value serves as an offset from the position of the selected layer.

- **Depth:** Adjusts the perspective of the effect along its path. Reduce the depth to make the origin of the laser path appear to be farther away from the camera. Increase the depth to make the origin appear to be closer to the camera.
- End Point: Sets the target point toward which the laser will travel.
 - **Use Layer:** Select any other layer on the timeline to use its position as the target of the laser path. When a layer is selected, the Position property below functions as an offset from the selected layer's position.
 - Position: Defines the location of the point from which the laser originates, on the X axis (horizontal) and Y axis (vertical). When the Use Layer option (above) is used, this position value serves as an offset from the position of the selected layer.
 - **Depth:** Adjusts the perspective of the effect along its path. Reduce the depth to make the target position of the laser path appear to be farther away from the camera. Increase the depth to make the target position appear to be closer to the camera.
- Laser Length: Defines the length of the laster bolt, in pixels.
- Location: Adjusts the position of the laser bolt, along the path from the start point to the end point. Lower values move it closer to the start point, while higher values move it closer to the end point. Keyframing the Location value allows you to animate the laser's movement along the path.
- **Number of Beams:** The effect includes one beam by default, but you can add up to 10 unique beams to build more complex effects. Each beam will have a section of numbered Beam controls below.

Beam 1 (duplicate controls will be listed for each beam number)

- **Core Color:** Choose a color for the laser core. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Glow Color:** Choose a color for the laser glow which surrounds the core. Usually the glow should be a richer, more saturated color than the core, but you can choose any color you need. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Brightness: Allows you to reduce the brightness of the beam.
- Width: Defines the width of the beam, in pixels.
- Length: Defines the length of the beam, as a percentage of the Laser Length value. When working with multiple beams, adjusting the relative length of each beam provides a massive amount of control for building complex effects.
- Position Shift: Adjusts the position of the beam relative to the Location value.
- **Tail Scale:** Sets the width of the tail of the beam, as a percentage of the **Width** value above.
- Edge Size: Adjusts the size of the feather applied to the edges.

- **Color Shift:** Adjusts the balance between the core and glow colors. Decreasing the value makes the core color more prominent, while increasing the value introduces more of the glow color.
- **Tail Color Shift:** Adjusts the balance between the core and glow colors in the tail portion of the beam. Decreasing the value makes the core color more prominent, while increasing the value introduces more of the glow color.
- **Brightness Noise:** Breaks up the beam by introducing a noise texture, which makes small random bits of the beam less visible. This can help make it feel more organic.
- **Color Mix Noise:** Breaks up the beam and allows the glow color to show through the core, based on a randomized noise pattern. The **Noise Scale** property in the General controls adjusts the size of the noise used.
- **Beam Blend:** Choose the blend mode used to combine the beam with the underlying layer. The **Noise Scale** property in the General controls adjusts the size of the noise used.
- **Spiral:** Each beam has associated Spiral properties. These are used to twist the beam's straight line into curving spirals.
 - Radius: Sets the radius around which the beam is spiraled.
 - **Radius Shrink:** Tapers the radius from the start point to the end point.
 - **Path Angle:** Increasing this value increases the number of rotations present in the beam.
 - Rotation: Adjusts the specific rotation of the beam around the path.
 - Rotation Speed: Animates rotation into the beam, at the speed you choose.

Global Controls

- Brightness: Adjusts the overall brightness of the entire effect, including all beams that are present.
- **Rotation:** Rotates the entire effect, made up of the combination of all beams.
- Rotation Speed: Animates rotation into the entire combined effect, at the speed you choose.
- Noise Scale: Modifies the size of the noise used to break up any beams that include Brightness Noise or Color Mix Noise settings.

7.1.2. 360° Blur

EXPRESS ADD-ON 360° Blur is available in the 360°: Toolkit Pack.

A standard, fast blur, optimized for use with 360° video.

- **Radius:** Sets the intensity of the blur. The radius, in pixels, defines the area that will be calculated into the blur of each pixel.
- **Iterations:** The number of times the blur is calculated. More iterations give a smoother result, and a larger blur.
- **Dimension:** The blur can be applied Horizontally, Vertically, or Both.
- **Clamp To Edge:** Enabling this feature prevents the blur from expanding outside the edges of the layer it is applied to. Disabling it will allow the blur to expand outside the layer edges.

7.1.3. 360° Bulge

EXPRESS ADD-ON 360° Bulge is available in the 360°: VFX Pack.

A modified version of the bulge effect, optimized for working with 360° video. Bulge creates the illusion of a bulging shape pushing through the layer.

You can choose from multiple shapes and adjust the size and shape of the bulge.

- Center: By default the bulge is centered in the frame, but you can reposition the center if you wish.
 - Position: Sets the exact location of the vignette center, using X and Y values.
 - **Use Layer:** Select any other layer on the timeline to use it's position as the center of the vignette. When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- **Bulge:** Adjusts the height of the bulge. Negative values invert the bulge and create a recessed pinch effect.
- Radius: Set the overall size of the bulge.
- **Plateau:** You can create a flat area in the center of the bulge. This value sets the radius of that flat area.
- Wrap: When the edges of the frame are distorted, especially using negative values, this determines how the blank space created is handled.
 - **None:** The blank areas remain unaffected.
 - **Tile:** An exact copy of the layer is used to fill the blank area.
 - **Reflect:** A mirrored copy of the layer is used to fill the blank area. The mirroring helps hide any seam at the layer's edge.
- **Shape:** The bulge can be created in a variety of geometric shapes.
 - Choose from Circle, Triangle, Square, Pentagon, Hexagon, Heptagon, Octagon, Nonagon, or Decagon.
- Scale: Independently adjust the width and height of the bulge.
 - **X:** Adjusts the width of the bulge.
 - **Y:** Adjusts the height of the bulge.

7.1.4. 360° Channel Blur

EXPRESS ADD-ON 360° Channel Blur is available in the 360°: Toolkit Pack.

Blurs color channels individually. Useful for creating the impression of chromatic aberration.





Radius

- Radius Red: Sets the radius of the blur on the red channel. A higher radius creates a bigger blur.
- Radius Green: Sets the radius of the blur on the green channel. A higher radius creates a bigger blur.
- Radius Blue: Sets the radius of the blur on the blue channel. A higher radius creates a bigger blur.
- **Radius Alpha:** Sets the radius of the blur on the alpha channel, which determines the transparency of the image. A higher radius creates a bigger blur.

Dimension

- Dimension Red: Select whether the red channel blur is Horizontal, Vertical, or both Horizontal and Vertical.
- Dimension Green: Select whether the green channel blur is Horizontal, Vertical, or both Horizontal and Vertical.
- Dimension Blue: Select whether the blue channel blur is Horizontal, Vertical, or both Horizontal and Vertical.
- Dimension Alpha: Select whether the alpha channel blur is Horizontal, Vertical, or both Horizontal and Vertical.

7.1.5. 360° Fisheye Converter

EXPRESS ADD-ON 360° Fisheye Converter is available in the 360°: Toolkit Pack.

When working with video captured with two opposing 180° lenses, such as video from the Samsung Gear 360, the 360° Fisheye effect allows you to convert the video into a standard equirectangular format for editing.

7.1.6. 360° Fractal Noise

EXPRESS ADD-ON 360° Fractal Noise is available in the 360°: VFX Pack.

Generates a range of textures optimized for use with 360° video, using procedural methods.



Each fractal method includes a range of properties for customizing the appearance of the effect.

- **Preset:** Choose from a variety of built-in presets.
- **Seed:** Randomizes the pattern within the style created by the other settings. The seed value can also be keyframed to create movement within the pattern.
- **Type:** Each type uses a different fractal, to give a different appearance to the pattern.
 - Blob: Creates a pattern of solid blobs with defined edges.
 - Clouds: Creates a pattern of gradual transitions with dithered edges, reminiscent of clouds.
 - Colored Clouds: Similar to clouds, but using the entire spectrum of colors.
 - **Emboss:** Uses a pattern similar to clouds, but then applies a height map, creating a stone-like texture.
 - **Marble:** A pattern of randomized fluid lines, giving the appearance of marble.
 - **Swirl:** A variation of clouds where each tone has a linear aspect, so the colors swirl softly together.
 - Whisp: Stringy, high contrast pattern.

- Wood: A strong linear pattern reminiscent of wood grain.
- *Energy: * A pattern of thin, energetic strings.
- Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
- **Smoke:** Soft, billowing shapes like the texture of smoke.
- Interpolation: Choose the method used to build the texture from the fractal geometry.
 - **Block:** Creates a square, pixelated appearance.
 - Linear: Applies more gradual transitions from one block to the next.
 - **Cubic:** More dramatic gradients completely obscure the block pattern to create organic shapes.

Transform

- **Position:** Moves the origin point of the fractal pattern, thereby shifting the entire pattern by the value selected.
- **Use Layer:** Allows you to select another timeline layer, to parent the fractal noise to its position data. When a layer is selected, the Position values above function as an offset from the parent layer.
- Rotation: Rotates the pattern around the origin point.
- Scale: Adjusts the size of the fractal pattern.
- Axis Scale: Allows you to scale the pattern on a single axis.
 - X: Scales the width of the pattern without affecting the height.
 - **Y:** Scales the height of the pattern, without affecting the width.

Sub Settings

The sub settings affect the additional iterations of the fractal which are used to break up the primary fractal and create the finer details.

- Sub Levels: Sets the number of sub levels which will be applied.
- Influence: Adjusts the balance of the original fractal and the sub levels. Values below 50% favor the original, and values above 50% favor the sub levels.
- Scale: Adjusts the size of the sub levels, without altering the original.
- Rotation: Rotates the sub levels, without rotating the original.
- **Offset:** Adjusts the position of the sub levels without altering the original.
- **Center Subscale:** Enabling this option precisely aligns the noise used for each sub scale with the primary fractal. Disabling it randomly positions each subscale noise, for more random results.

Appearance

- **Color 1:** Controls for the first color used to generate the fractal pattern.
 - **Color:** You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color

values for the red, green, and blue channels.

- **Opacity:** Adjusts the transparency of areas of the fractal pattern filled with the first color.
- Color 2: Controls for the second color used to generate the fractal pattern.
 - Color: You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
 - **Opacity:** Adjusts the transparency of areas of the fractal pattern filled with the second color.
- **Exposure:** Adjusts the exposure of the fractal effect. The intensity of the results correspond directly to the to the brightness of the original colors, so bright areas are affected more strongly than dark areas. Positive values brighten the effect, and negative values darken it.
- **Offset:** Shifts the entire range of tonal values up or down. Values shifted beyond pure black or pure white will be clipped.
- Blend: Controls how the effect is combined with the contents of the layer it is applied to.
7.1.7. 360° Glow

EXPRESS ADD-ON 360° Glow is available in the 360°: VFX Pack.

Adds a glowing aura to bright areas of the layer, optimized for use with 360° video.

Per Channel Intensity properties enable you to shift the glow color.

Advanced options provide further customization of the glow's appearance, including creating a specific color gradient.



7.1.8. 360° Glow Darks

EXPRESS ADD-ON 360° Glow Darks is available in the 360°: VFX Pack.

Adds a diffuse, glowing aura to dark areas of the layer, optimized for use with 360° video.

Size and intensity of the blur can be edited with the included controls. Per Channel Intensity properties enable you to shift the glow color.

7.1.9. 360° Lightswords (2-Point Auto) [Layer Only]

EXPRESS ADD-ON 360° Lightsword (2-Point Auto) is available in the <u>360° Neon Lights Pack</u>.

A 2-Point Lightsword effect optimized for use with 360° video. If this effect is applied to normal video, it will look distorted and incorrect.

The effect requires the placing of two points in the frame, one at the hilt and one at the tip of the prop blade. Once these points are rotoscoped to the movement of the lightsword blade, HitFilm will automatically calculate the appropriate motion blur based on the speed at which the blade is moving, and the path interpolation settings you choose.

Hilt

- **Position Menu:** The hilt position can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position:** The hilt position can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the hilt. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Tip

- **Position Menu:** The tip position can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position:** The tip position can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the tip. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Extension

• **Extension:** Sets the length of the blade, as a percentage of the distance from the hilt to the tip. The lightsword extension can be keyframed to create the 'ignition' animation, whereby the lightsword blade extends out of the hilt, or contracts back in.

Core

The core is the central part of the effect which directly covers the prop blade.

- Width: The Width of the core can be adjusted, as a percentage of the width values set in the Tip and Hilt controls above. This control allows you to adjust the overall width with a single control, while retaining any taper created by the separate width values used in the hilt and tip controls.
- **Color:** Choose a color for the core. The core Color should generally be set sightly off white, in the direction of the color that will be used for the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Feather: Adjusts the softness of the core's edges.
- **Stability:** Lowering the Stability causes the core shape to fluctuate in size, making the blade appear unstable.
- Mask: Control whether masks applied to the layer affect the glow.
 - **Disable:** Allows the glow to naturally wrap around the mask edges, for a softer result. This option is best when the object being masked is very near the lightsword blade
 - **Enable:** Cuts the glow off exactly at the edge of the mask. Masks should generally be enabled when there is a significant distance between the object being masked and the lightsword blade.
 - Invert: Reveals the glow outside the mask, while removing it inside.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Stability:** Lowering the stability causes the inner glow to fluctuate in size, making the blade appear unstable.
- Flicker: Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.

Path interpolation

During rapid movement motion blur should cause the hilt and tip to fan out, creating a motion trail. Path interpolation is used to create a natural curve along the hilt and tip ends.

- Scale: Reducing the scale to zero will remove all path interpolation, resulting in straight lines drawn at the hilt and tip ends of the blade. Increasing the scale will create path interpolation and curve the ends.
- **Hilt:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- **Tip:** When the blade is swinging toward or away from the camera, you can adjust the Tip angle to correspond to the movement of the prop's tip, and get accurate motion simulation.
- Motion Persistence: HitFilm automatically attempts to create a natural trail shape based on the movement of the hilt and tip points, based on the expected behavior of a blade in motion. The duration of the trail is determined by the motion persistence. Increasing the value will cause the trail to remain visible for more frames, thus creating a larger trail. Reducing the value will create a smaller trail.
 - Note that motion persistence is restricted by the Auto Scale Persistence properties, if Auto Scale is activated (see below).
- **Persistence Shift:** Shifts the position of the motion blur in relation to the exact hilt and tip locations. This adjusts the trail to be either in front (1.0), behind (0.0) or in the middle (0.5) of the control point positions. At the default of 0.0 this means that on frames containing fast moving blades you should position the control points on the leading edges of the blade.

Auto Scale Persistence

Auto Scale provides additional control over the generation of the persistence trail, determining when the trail is generated. These settings can be used to match the trail to the natural motion blur found in your footage, which may vary depending on your camera settings.

- Auto Scale: Choose how the scale persistence is calculated.
 - **Enable:** Uses the thresholds below to calculate the motion persistence.
 - Disable: Uses only the Motion Persistence property. Therefore the trail will always be generated even during small movements. A high Motion Persistence value combined with Auto Scale turned off will create a long, unnatural trail. Increasing the motion persistence over 180 can create extreme streaking. This isn't suitable for lightsabers but can be an interesting effect in its own right.
- **Speed Threshold:** Used to restrict the activation of motion persistence. Below the specified threshold, the lightsword shape will be drawn without any trail. This ensures that the blade does not look indistinct when it is moving slowly. As soon as the speed threshold is exceeded, the trail will be generated according to the motion persistence setting.
- Swing Threshold: Used to restrict the activation of motion persistence. Below the specified threshold, the lightsword shape will be drawn without any trail. This ensures that the blade does not look indistinct when it is moving slowly. As soon as the swing threshold is exceeded, the trail will be generated according to the motion persistence setting.
- **Minimum Persistence:** Determines how much motion trail is generated on frames where the speed and swing thresholds are not met. Setting this to 0.0 ensures the blade shape is defined solely by the core, hilt and tip properties. Raising the value will generate a blur trail even during minor movements.

Distortion

Distortion not only alters the edges of the core, to make them more irregular, but distorts the background layer where it is visible through the glow. If Distortion is reduced to 0 the edge will be regular and smooth.

- **Distortion:** Determine how irregular the edge of the core is. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- Blend: Choose the blend mode that is used to composite the effect onto the underlying layers.

7.1.10. 360° Lightsword (4-Point Manual) [Layer Only]

EXPRESS ADD-ON 360° Lightsword (4-Point Manual) is available in the 360°: Neon Lights Pack.

A 4-Point Lightsword effect optimized for use with 360° video. If this effect is applied to normal video, it will look distorted and incorrect.

The effect provides precise control over the lightsword shape by using four control points, two at the hilt and two at the tip of the prop blade. This allows you to precisely match the shape to the motion blur of the prop blade created by the camera. Both ends of the effect will be curved based on their motion and the Path Interpolation settings you have selected, to create a natural shape for the moving blade.

Hilt

- **Position 1 Menu:** The left hilt corner. Hilt position 1 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 1:** The left hilt corner. Hilt position 1 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- **Position 2 Menu:** The right hilt corner. Hilt position 2 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 2:** The right hilt corner. Hilt position 2 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the hilt. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Tip

• **Position 1 Menu:** The left tip corner. Tip position 1 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the

selected layer's position.

- **Position 1:** The left tip corner. Tip position 1 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- **Position 2 Menu:** The right tip corner. Tip position 2 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 2:** The right tip corner. Tip position 2 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the tip. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Extension

• **Extension:** Sets the length of the blade, as a percentage of the distance from the hilt to the tip. The lightsword extension can be keyframed to create the 'ignition' animation, whereby the lightsword blade extends out of the hilt, or contracts back in.

Core

The core is the central part of the effect which directly covers the prop blade. Normally it is the brightest component of the effect.

- Width: The Width of the core can be adjusted, as a percentage of the width values set in the Tip and Hilt controls above. This control allows you to adjust the overall width with a single control, while retaining any taper created by the separate width values used in the hilt and tip controls.
- **Color:** Choose a color for the core. The core Color should generally be set slightly off white, in the direction of the color that will be used for the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Feather: Adjusts the softness of the core's edges.
- **Stability:** Lowering the Stability causes the core shape to fluctuate in size, making the blade appear unstable.
- Mask: Control whether masks applied to the layer affect the glow.
 - **Disable:** Allows the glow to naturally wrap around the mask edges, for a softer result. This option is best when the object being masked is very near the lightsword blade
 - **Enable:** Cuts the glow off exactly at the edge of the mask. Masks should generally be enabled when there is a significant distance between the object being masked and the lightsword blade.

• **Invert:** Reveals the glow outside the mask, while removing it inside.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Stability:** Lowering the stability causes the inner glow to fluctuate in size, making the blade appear unstable.
- **Flicker:** Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.

Path interpolation

During rapid movement motion blur should cause the hilt and tip to fan out, creating a motion trail. Path interpolation is used to create a natural curve along the hilt and tip ends.

• Scale: Reducing the scale to zero will remove all path interpolation, resulting in straight lines drawn at the hilt and tip ends of the blade. Increasing the scale will create path interpolation and curve the

ends.

- **Hilt 1:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- **Hilt 2:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- **Tip 1:** When the blade is swinging toward or away from the camera, you can adjust the Tip angle to correspond to the movement of the prop's tip, and get accurate motion simulation.
- **Tip 2:** When the blade is swinging toward or away from the camera, you can adjust the Tip angle to correspond to the movement of the prop's tip, and get accurate motion simulation.

Distortion

Distortion not only alters the edges of the core, to make them more irregular, but distorts the background layer where it is visible through the glow. If Distortion is reduced to 0 the edge will be regular and smooth.

- **Distortion:** Determine how irregular the edge of the core is. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- Blend: Choose the blend mode that is used to composite the effect onto the underlying layers.

7.1.11. 360° Lightswords (Glow Only) [Layer Only]

EXPRESS ADD-ON 360° Lightsword (Glow Only) is available in the <u>360°: Neon Lights Pack</u>.

A version of the Lightsword Glow effect optimized for use with 360° video. If this effect is applied to normal video, it will look distorted and incorrect.

The effect allows you to create an external glow to any layer's shape. You can use masks to define or animate a layer's shape, then add a glow around the outside of that shape. This technique is commonly used to create the lightsword core using a masked plane, then multiple Lightsword (Glow Only) effects can be added to create a rich, complex glow.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Stability:** Lowering the stability causes the inner glow to fluctuate in size, making the blade appear unstable.
- Flicker: Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

• Width: Adjusts the overall width of the inner glow, in pixels.

- **Color:** Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.

Distortion

Distortion not only alters the edges of the core, to make them more irregular, but distorts the background layer where it is visible through the glow. If Distortion is reduced to 0 the edge will be regular and smooth.

- **Distortion:** Determine how irregular the edge of the core is. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- Blend: Choose the blend mode that is used to composite the effect onto the underlying layers.

7.1.12. 360° Magnify

EXPRESS ADD-ON 360° Magnify is available in the 360°: VFX Pack.

A Magnify effect optimized for use with 360° video. If this effect is applied to normal video, it will look distorted and incorrect.

Zooms in on a specific area of the layer. The shape, size and position of the magnification can all be changed.



- **Center:** By default the magnification is centered in the frame, but you can reposition the center if you wish.
 - **Position:** Sets the exact location of the magnification center, using X and Y values.
 - Use Layer: Select any other layer on the timeline to use it's position as the center of the magnification. When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- Radius: Sets the radius, in pixels, of the magnified area.
- **Magnification:** Adjusts the amount of magnification applied within the radius.
- **Bulge:** Controls the amount of bulge distortion applied within the radius. Higher bulge values reduce the distortion at the edges of the magnified area.
- Wrap: When the edges of the frame are distorted, wrap determines how the blank space created is handled.

- **No:** The blank areas remain unaffected.
- **Tile:** An exact copy of the layer is used to fill the blank area.
- **Reflect:** A mirrored copy of the layer is used to fill the blank area.
- Shape: Select the shape to be used for the bulge.
 - Choose between Circle, Triangle, Square, Pentagon, Hexagon, Heptagon, Octagon, Nonagon, or Decagon.
- **Blend:** Choose the blend mode used to apply the effect to the underlying layer.

Shape

When a shape other than Circle is selected in the Shape menu, additional controls will be displayed to provide further control over the shape.

- Rotation: Turn the knob to rotate the magnified shape.
- **Curvature:** Adds a curve to each edge of the shape. Negative values curve inward, and positive values curve outward.
- **Pinch:** Adjusts the weighting of the curvature.
- Shift: Rotates the curvature without moving the shape itself, to shift how the edges are curved.

7.1.13. 360° Neon Path [Layer Only]

EXPRESS ADD-ON 360° Neon Path is available in the 360°: Neon Lights Pack.

A useful tool for creating animated Neon Path effects. You can use a Text Layer or a Mask to define the shape of the effect, and then control the position and movement of the Neon line on the selected path.

7.1.14. 360° Text [Layer Only]

EXPRESS ADD-ON 360° Text is available in the 360°: Toolkit Pack.

Creates text with unwrapped spherical distortion, for use with 360° video.

The Text effect lets you quickly generate text on any timeline. To add Text, drag the Text effect from the Effects panel onto a Plane, an image, or a video clip, to add text to that object. Open the controls for the effect in the Controls panel, and then click the A icon displayed to the right of the Text property. This will open the Edit Text dialog, where you can enter the text you wish to add to the layer. Once you are finished editing the text, click the OK button to close the Edit Text dialog and apply the changes. You can then edit the text and further customize the effect in the Controls panel, or directly on the timeline when working in a composite shot.

• **Text:** This is where you edit the contents of the Text effect. Click the "A" icon to open the Edit Text window. You can then enter whatever text you wish the effect to display.

EDIT TEXT	×
Enter whatever text you wish to display	
CANCEL	ок

- Cancel: discards any changes you have entered and closes the Edit Text window.
- **OK:** Confirms the text you have entered and closes the Edit Text window. Once the window closes, the text will be updated on the viewer.

Transform

You can control the alignment and positioning of the Text effect through these controls.

- Offset From: Select the position from which the layer movement will be measured. By default the text is Centered, but you can also place it in the Bottom Left, Bottom, Bottom Right, Left, Right, Top Left, Top, or Top Right.
- **Position Offset:** Sets the distance, in pixels, which the layer is moved from the default position selected in the Offset From menu.
- Rotation: Sets the rotation of the layer, in degrees.

Format

The Format controls allow you to set the details of the text style for the effect.

- Font: Select the font to be used, from a list of all fonts installed on your computer.
- **Style:** If your selected font includes different styles (Bold, Light, Italic, etc.), you can select your desired style here.
- Alignment: The text alignment can be adjusted here. You can align the text to Left, Center, or Right, or Justify the text to keep both sides aligned
- Color: Allows you to select a font color.
- **Opacity:** Sets the transparency of the Text, from completely invisible at 0.00 to completely opaque at 1.00.
- Font Size: Sets the size of your text. In general, if you want to enlarge your text, it is better to increase the font size rather than increase the layer Scale above 100%.
- Line Spacing: Defines the vertical spacing between each line of text.
- Enable Word Wrap: Toggles word wrap on and off. Enabling word wrap means that as soon as the text gets too long to fit in a single line, a line break will be created automatically, and a new line is started automatically.
- Word Wrap Width: Defines the width at which word wrap will be implemented. You can create margins in your text layer by setting the Word Wrap Width to a smaller value than the width of the layer the text effect is applied to. For example, if your text is applied to a Full HD layer that is 1920 pixels wide, and you set the Word Wrap Width to 1800, the 120 pixels that remain will be split to create a 60 pixel wide margin on each side of the layer.
- **Blend:** Determines how the Text is blended with the layer it is applied to. None will prevent the layer from being displayed at all, so only the text is visible. Normal displays the text over the top of the layer, so both are visible. Details on all the other Blend Mode options can be found on the page about Compositing With Blend Modes.
- Motion Blur: Sets the amount of motion blur applied to the layer when its position is animated.

7.1.15. 360° Twirl

EXPRESS ADD-ON 360° Twirl is available in the <u>360°: VFX Pack</u>.

A customized Twirl effect designed for use with 360° video. If this effect is applied to standard video, it will look distorted and incorrect.

Twists the layer around the effect's center point. The center point stays in place, while the pixels at the edge of the radius are distorted by the angle you choose.



- Angle: Sets the number of degrees by which the area inside the radius will be rotated.
- Center: By default the twirl is centered in the frame, but you can reposition the center if you wish.
 - **Position:** Sets the exact location of the effect center, using X and Y values.
 - Use Layer: Select any other layer on the timeline to use its position as the center of the effect.
 When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- Radius: Determines the distance from the center point to which the distortion will extend.
- Wrap: Controls how the distortion will be wrapped when it reaches the edge of the frame.
 - **No:** No wrapping is applied.
 - **Tiled:** A second identical copy of the image is used alongside the original to fill the wrapped area.
 - **Reflection:** A mirrored copy is used alongside the original to fill the wrapped area.

7.1.16. 360° Unsharpen

EXPRESS ADD-ON 360° Unsharpen is available in the 360°: Toolkit Pack.

A tool for bringing out or improving fine detail in a 360° video layer.

7.1.17. 360° Video Transform

On 360° video, this can be applied to adjust the position of the video layer without losing its wraparound appearance. It can also be used effectively on wraparound environment maps.

Applying this to an ordinary layer will create distorted, unusual results.

This effect was called Environment Map Transform in previous versions of HitFilm.

7.1.18. 360° Viewer [Layer Only]

Apply this effect to a 360° video layer to wrap the layer onto a spherical shape for viewing. This wraps the selected layer onto a spherical shape.

When placed as the bottom layer in a 3D composite shot, this creates a convincing, wrap-around background for 3D shots. Examples would be a sky background for a cityscape or plane shot, or a space nebula for a spaceship fly-by.

The 360° viewer will automatically update as the camera is panned in all directions.

This effect was called Environment Map Viewer in previous versions of HitFilm.

7.2. Audio

The following audio effects are available in HitFilm to adjust your audio. Each effect has its own page with full details of the effect and its controls.

- Audio Reverse
- Balance
- <u>Cathedral</u>
- <u>Channel Levels</u>
- Compressor
 EXPRESS ADD-ON
- Doppler Shift [Layer Only]
 EXPRESS ADD-ON
- Echo
- Equalizer
 EXPRESS ADD-ON
- Large Room
- Medium Room
- Noise Reduction
 EXPRESS ADD-ON
- <u>Pitch</u>
- Shortwave Radio
- Small Room
- <u>Telephone</u>
- <u>Tone</u>

7.2.1. Audio Reverse

Plays the selected clip backwards. There are no controls, the effect simply reverses the audio on the clip when it is applied.

7.2.2. Balance

Pan the audio from left to right within the stereo field of your project.

• **Balance:** Negative values pan the audio farther to the left channel, and positive values pan it to the right channel. Zero sends the audio in equal amounts to both channels.

7.2.3. Cathedral

Simulate the acoustic reverb of a large cavernous space, such as a cathedral.

• Gain: Reduces or increases the overall volume of the processed audio signal.

7.2.4. Channel Levels

Used to adjust the volume of each audio channel individually. For stereo source files, this will adjust the relative volume of each channel fo the source. For mono sources, this will adjust the relative volume of the source in each of the stereo output channels.

- Left: Adjusts the overall level of the Left channel, in a dB scale. 0.0 dB is the original source volume.
- **Right**: Adjusts the overall level of the Right channel, in a dB scale. 0.0 dB is the original source volume.

7.2.5. Compressor

EXPRESS ADD-ON Compressor is available in the Audio: Toolkit Pack.

Compression reduces the total range in volume between the loudest and quietest points in the audio. This allows you to either reduce the audio peaks without making the quiet bits too quiet, or increase the level of the quiet moments, without pushing the peaks too high and causing them to clip.

- Input Gain: Adjusts the gain of the source audio being fed into the Compressor effect.
- **Threshold:** The Threshold is the level above which the audio will be compressed, and below which the audio will remain unaffected.
- Limiter: Sets a fixed level which the audio peaks will not be allowed to exceed. Limiting should be used judiciously, because excessive clipping can cause unwanted distortion.
- Ratio (x:1): The ratio at which audio levels will be attenuated once they exceed the Threshold.
- **Knee:** Low values will result in a hard knee, or a severe transition at the threshold, while higher values will create a soft knee, and a more gentle transition from uncompressed to compressed audio.
- Attack Time: Defines how quickly, in milliseconds, the audio will be compressed once it exceeds the Threshold. Faster attack times are good for ensuring that extreme peaks in the audio are caught and reduced right away.
- **Release Time:** Defines how quickly, in milliseconds, the compressor will stop reducing the audio level, once the source level falls below the threshold.
- **Output Gain:** Sets the overall level of the audio after the compression has been applied.

7.2.6. Doppler Shift [Layer Only]

EXPRESS ADD-ON Doppler Shift is available in the Audio: Toolkit Pack.

When combined with an animated layer, this effect introduces realistic Doppler Shift to an audio layer.

The effect should be added directly to your audio layer. In the effect's properties you can link it to a separate layer, which can then be animated. For example, if a point layer is created and animated to move towards camera, the audio will receive a Doppler Shift as if the sound is approaching camera.

A practical example would be to use a constant audio recording of a helicopter, which is then linked via the Doppler Shift effect to an animated 3D helicopter in your scene. The helicopter audio will be shifted automatically as the vehicle moves.

- **Sound Position**: Use this menu to select any layer on your timeline. The selected layer's position will be used to calculate the Doppler Shift.
- **Speed of Sound**: Defined in meters per second. Works in conjunction with the Scene Size, which defines how many pixels are equal to a meter within your specific scene.
- Scene Size: Defines how many pixels in the scene correspond to a real meter. This makes it possible to get accurate Doppler Shifting for a variety of scene setups.
- **Distance Falloff**: When activated, the audio will diminish in volume the farther away it is from the position set in the Volume Distance.
- Volume Distance: The distance from the camera at which audio will be at 100% volume. As audio gets farther away it will become quieter. If the audio moves closer to the camera than the chosen value, it will become louder than 100%.

7.2.7. Echo

Generates echoes from the original audio. You can adjust the number of echoes, and how delayed they are from the original. The falloff determines how much of the echo is heard before it diminishes and becomes inaudible.

- **Delay:** The time in milliseconds between the original audio signal, and the start of the echo. When the **Number of Echoes** is set higher than one, this value is also used to set the amount of time between the start of each echo.
- **Falloff:** Defines how much the Level of each echo will be reduced from the previous instance. At the default setting of 50%, the first echo will be half the level of the original signal, the second echo will be 25% of the original level, etc.
- Number of Echoes: The number of times the original audio will be repeated in echo.

7.2.8. Equalizer

EXPRESS ADD-ON Equalizer is available in the Audio: Toolkit Pack.

The equalizer is used to adjust the strength of specific frequencies in an audio clip. This can be used to selectively adjust the bass and treble, for example, depending on the intent.

The presets menu provides quick access to common equalization tasks, such as high pass, low pass and bass boost.

The Master Gain control is used to control the volume of the clip. This operates separately to the volume property of the clip and should be used to set the base volume of an audio clip. The volume property can then be used to fine tune volume and mix clips over time.

Recorded audio will often have a low gain when imported. To set your gain to a satisfactory volume for standard playback on typical equipment, you can observe the default gain using the audio meters. Playback the clip and note the peak audio level, as displayed in the peak boxes. You can then make the appropriate adjustment to the Master Gain. For example, if you have a dialogue track which has been recorded with a peak of -18dB, making it rather quiet in the mix, you can set the Master Gain to 9.00dB in order to raise the overall gain to -9dB. This results in louder audio while still leaving headroom to adjust the volume if required.

7.2.9. Large Room

Simulates the ambient reverb of a large room. A longer reverb than the **Medium Room** effect, but shorter than the **Cathedral** effect.

• Gain: Reduces or increases the overall volume of the processed audio signal.

7.2.10. Medium Room

Simulates the ambient reverb of a medium sized room.

• Gain: Reduces or increases the overall volume of the processed audio signal.

7.2.11. Noise Reduction

EXPRESS ADD-ON Noise Reduction is available in the Audio: Toolkit Pack.

Noise Reduction is a quick way to clean up audio which is suffering from unwanted background noise.

After applying the effect, move the playhead to a frame containing the noise you wish to remove, and no other audio. This should be a frame where there is no other interfering noises. For this reason when recording audio it is always worth recording a section of 'clean' audio before recording your actual subject. Clicking the **Capture Noise Print** button samples the audio contained in frame, so that HitFilm can recognize the noise.

• **Capture Noise Print:** Clicking this button records whatever audio is present at the current playhead location. The effect will then use this Noise Print to remove the noise from all other frames of the video.

Once you have Captured a Noise Print, some additional controls will appear. In many cases the noise will be immediately removed. The controls also allow you to fine tune how the noise removal is handled.

- Reset Noise Print: Removes the noise print, so you can select a different frame.
- Add to Noise Print: Allows you to select additional frames of noise, and add them to the noise print.
- **Threshold Level:** On frames where the noise print overlaps with your dialog or other desired audio, removing all of the noise can sometimes create unnatural results. Reducing the Threshold Level restores a bit of the noise, and can be effective for getting a more natural result, while still retaining significant Noise Reduction.
- **Reduce By:** Defines, in dB, how much the noise print will be reduced in each frame of your video. If the results of the reduction are sounding unnatural, try lowering the Reduce By value, so the noise is not removed entirely.

7.2.12. Pitch

Adjusting the pitch can be useful as an effect in itself, or to counter the natural pitch change caused by adjusting playback speed of a clip.

• Semitone Shift: Sets, in semitones, how far the audio is shifted. Moving the slider to the left will shift the pitch lower, and moving to the right will shift the pitch higher. A semitone is equal to the pitch change between one key and the next on the piano. From C to C#, for example, is a semitone. 12 semitones is an octave.

7.2.13. Shortwave Radio

Adjusts the frequency response of the source and adds distortions to simulate the sound of a shortwave radio.

• Gain: Reduces or increases the overall volume of the processed audio signal.
7.2.14. Small Room

Simulates the ambient reverb of a small room. A shorter reverb than the Medium Room effect.

• Gain: Reduces or increases the overall volume of the processed audio signal.

7.2.15. Telephone

Modifies the frequency response of the source audio, and adds distortion calculated to simulate the sound of telephone audio.

• Gain: Reduces or increases the overall volume of the processed audio signal.

7.2.16. Tone

Generates a continuous tone of a defined frequency.

- **Type:** Choose the type of waveform used to generate the tone. The higher the Frequency, the harder it is to distinguish between the Types.
 - Sine: A Sine wave gives a smooth, rounded sound.
 - Square: A Square wave gives a harsh, cutting sound
- **Frequency:** Sets the number of waves per second, which defines the pitch of the tone that is generated.

7.3. Animation

PRO EXCLUSIVE All Animation effects are exclusively available in HitFilm Pro.

Animation effects can be added to layers to apply preset animation in various styles. The Animation effects fall into two categories, **Behaviors** and **Effects**. The process of applying them is always the same, regardless of the category. The controls for behavior animations will be found in the Behavior controls for the layer to which they are applied.

Each animation has its own page, with full details of the effect and its controls.

- <u>Center Wipe</u>
- <u>Central Spiral [Text]</u>
- <u>Cinema Style [Text]</u>
- Doomo Designs [Text]
- Down Dir Insert [Text]
- Down Insert [Layer Only]
- Down Roll [Layer Only]
- Drop [Layer Only]
- Drop In By Character [Text]
- Evaporate
- Expansion [Layer Only]
- Fade [Layer Only]
- Fly In
- Fly In and Fade Out [Layer Only]
- Fly In and Fly Out [Layer Only]
- Fly To Zoom In [Layer Only]
- Left Dir Insert [Text]
- Left Roll [Layer Only]
- Linear Wipe
- <u>Pinwheel</u>
- Push [Text]
- Radial Reveal
- Randomized Insert [Text]
- Randomized Reveal [Text]
- Rich Tick [Text]
- Right Dir Insert [Text]

- Right Roll [Layer Only]
- Shuffle In [Text]
- String Fade [Text]
- Tiny Zoom [Layer Only]
- Twirl [Layer Only]
- Typewriter [Text]
- Up Dir Insert [Text]
- Up Insert [Layer Only]
- Up Roll [Layer Only]
- Wavy Style [Text]
- Zoom In [Layer Only]
- Zoom Out [Layer Only]

7.3.1. Center Wipe

The Center Wipe gradually reveals the timeline object from the center, wiping outward in both directions.



- **Reveal Length:** The percentage of the total object duration which will be used to complete the reveal of the object at the start of its duration.
- **Conceal Length:** The percentage of the total object duration that will be used to conceal the object, at the end of its duration.
- **Gradient Size:** The width, in a percentage of the total object width, of the gradient at the edges of the wipe.
- **Direction:** The angle at which the wipe will travel. The visible portion of the object will appear as a line perpendicular to this angle.
- **Position:** The origin point of the wipe. By default it is at the center of the object, but you can offset it using this property to place it anywhere you wish.

7.3.2. Central Spiral [Text]

Central Spiral starts with the individual characters shifted out of place in a spiral pattern, then moves and rotates them back into their correct position.



* Central Spiral is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.3. Cinema Style [Text]

Cinema Style gradually reveals the text layer, one character at a time. Starting in the center of the layer, each character simultaneously fades in, and grows in width until it reaches 100%. Additional characters are revealed moving both directions from the center, until the entire text layer is visible.



* Cinema Style is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.4. Doomo Designs [Text]

Doomo Designs reveals your text layer one character at a time, in random order. Each character starts out stretched vertically, and gradually shrinks to its intended size as it fades in.



A Doomo Designs is a **Behavior** which can be used on Text layers in composite shots.

- Seed: Change the seed to alter the randomized order in which the text characters appear.
- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.5. Down Dir Insert [Text]

Down Dir Insert slides the text layer from the top downward, until it comes fully into view.



A Down Dir Insert is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.6. Down Insert [Layer Only]

Down Insert starts with the layer moved out of view to the top of the viewer, and slides the layer downward, until it reaches the layer's original position.

Down Insert is a **Behavior** which can be used on any layer in a composite shot.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.7. Down Roll [Layer Only]

Down Roll smoothly and evenly moves the layer from above the viewer to below the viewer, like rolling credits. It positions the layer above the viewer, just out of view, at the first frame of the layer, and moves it to below the viewer, just out of view, on the final frame.

A Down Roll is a **Behavior** which can be used on any layer in a composite shot.

There are no controls for the Down Roll behavior. The speed of the animation is determined by the size and duration of the layer. To speed up the movement, shorten the layer duration. To slow down the movement, extend the layer duration.

7.3.8. Drop [Layer Only]

The Drop behavior, moves your layer up and to the left, then drops it into frame at an angle. The layer bounces a few times and settles into place.

Prop is a **Behavior** which can be used on any layer in a composite shot.

• **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.

7.3.9. Drop In By Character [Text]

Drop In By Character moves all characters of your text layer to above the viewer at the start of the layer. The characters are then dropped sequentially and fall into their intended locations, one after another, starting with the characters on the left and ending on the right.



Down Dir Insert is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.10. Evaporate

Evaporate reveals the timeline object in small pieces, based on a randomized fractal noise pattern.



- **Reveal Length:** The percentage of the total object duration which will be used to complete the reveal of the object at the start of its duration.
- **Conceal Length:** The percentage of the total object duration that will be used to conceal the object, at the end of its duration.
- Seed: Change the seed to alter the fractal pattern which defines the shape and position of the pieces used to reveal the object.

7.3.11. Expansion [Layer Only]

Expansion shifts the position of the layer horizontally, and the height of the layer vertically. The layer slides into view from offscreen left, at 20% of its actual height. Once it reaches its final position, the vertical scale expands until the layer reaches its full height.



- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.12. Fade [Layer Only]

Fade applies a basic Opacity fade to your layer, so it starts out transparent and gradually reaches full opacity.

Fade is a Behavior which can be used on any layer in a composite shot.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.13. Fly In [Layer Only]

Fly In animates the text approaching from the distance, following a curve which eventually brings it to its intended position.

• **Reveal Length:** The percentage of the total layer duration which will be used to complete the animation of the layer at the start of its duration.

7.3.14. Fly In and Fade Out [Layer Only]

Fly In and Fade Out applies two separate animations to your layer, one at the start and one at the end. At the start of the layer's duration, it flies down and toward the camera, until it reaches the layer's intended position. At the end of the layer's duration, the layer is compressed vertically, expanded horizontally, and reduced in opacity until it is no longer visible.

Fly In and Fade Out is a **Behavior** which can be used on any layer in a composite shot.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.15. Fly In and Fly Out [Layer Only]

Fly In and Fly Out applies two separate animations to your layer, one at the start and one at the end. The layer starts up and to the left, and flies down, right, and toward the camera, until it reaches the layer's intended position. At the end of the layer's duration, the layer flies down, left, and away from the camera until it is out of sight.

Fly In and Fly Out is a **Behavior** which can be used on any layer in a composite shot.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.16. Fly To Zoom In [Layer Only]

Fly To Zoom In Rotates your layer into place, while at the same time zooming in on the center of the layer.



Fly To Zoom In is a **Behavior** which can be used on any layer in a composite shot.

• **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.

7.3.17. Left Dir Insert [Text]

Left Dir Insert begins with the text offscreen right, and it slides to the left until it comes fully into view.



Left Dir Insert is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.18. Left Roll [Layer Only]

Left Roll smoothly and evenly moves the layer from offscreen right to offscreen left, like side-scrolling credits. It positions the layer right of the viewer, just out of view, at the first frame of the layer, and moves it to left of the viewer, just out of view, on the final frame.

Left Roll is a **Behavior** which can be used on any layer in a composite shot.

There are no controls for the Left Roll behavior. The speed of the animation is determined by the size and duration of the layer. To speed up the movement, shorten the layer duration. To slow down the movement, extend the layer duration.

7.3.19. Linear Wipe

The Linear Wipe gradually reveals the timeline object through a linear change in opacity. The wipe is linear, moving directly across the viewer in the chosen direction.



- **Reveal Length:** The percentage of the total object duration which will be used to complete the reveal of the object at the start of its duration.
- **Conceal Length:** The percentage of the total object duration that will be used to conceal the object, at the end of its duration.
- Gradient Size: The width, in a percentage of the total object width, of the gradient at the edge of the wipe.
- **Direction:** The angle at which the wipe will travel. The visible portion of the object will appear as a line perpendicular to this angle.

7.3.20. Pinwheel

Pinwheel divides the timeline object it is applied to into four quadrants. Each quadrant is then revealed by a radial wipe, centered on the Position values.



- **Reveal Length:** The percentage of the total object duration which will be used to complete the reveal of the object at the start of its duration.
- **Conceal Length:** The percentage of the total object duration that will be used to conceal the object, at the end of its duration.
- **Gradient Size:** The width, in a percentage of the total object width, of the gradient at the edge of the wipe.
- **Direction:** The angle at which the wipe will travel. The visible portion of the object will appear as a line perpendicular to this angle.

7.3.21. Push [Text]

Push starts by positioning the text offscreen left, then slides it to the right until the entire layer is in view.



Left Dir Insert is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.22. Radial Reveal

Radial Reveal gradually reveals the timeline object from the center, with a radial wipe. A small circle is revealed in the center, then grows in all directions until the entire object is revealed.



- **Reveal Length:** The percentage of the total object duration which will be used to complete the reveal of the object at the start of its duration.
- **Conceal Length:** The percentage of the total object duration that will be used to conceal the object, at the end of its duration.
- Gradient Size: The width, in a percentage of the total object width, of the gradient at the edge of the wipe.
- **Direction:** The angle at which the wipe will travel. The visible portion of the object will appear as a line perpendicular to this angle.

7.3.23. Randomized Insert [Text]

Randomized Insert inserts the characters in your text layer one at a time, in random order. Each character slides into frame from offscreen above or offscreen below, and fades in to full opacity as it is inserted.



Randomized Insert is a **Behavior** which can be used on Text layers in composite shots.

- Seed: Change the seed to alter the randomized order in which the text characters appear.
- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.24. Randomized Reveal [Text]

Randomized Reveal reveals the characters in your text layer one at a time, in random order. Each character fades in from completely transparent to completely opaque.



Randomized Reveal is a **Behavior** which can be used on Text layers in composite shots.

- Seed: Change the seed to alter the randomized order in which the text characters appear.
- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.25. Rich Tick [Text]

Rich Tick inserts the characters in your text layer one at a time, in sequential order. Some characters will briefly glitch in different locations before they appear permanently in their final location.



Rich Tick is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.26. Right Dir Insert [Text]

Right Dir Insert begins with the text offscreen left, and it slides to the right until it comes fully into view.



Right Dir Insert is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.27. Right Roll [Layer Only]

Right Roll smoothly and evenly moves the layer from offscreen left to offscreen right, like side-scrolling credits. It positions the layer left of the viewer, just out of view, at the first frame of the layer, and moves it to right of the viewer, just out of view, on the final frame.

Right Roll is a **Behavior** which can be used on any layer in a composite shot.

There are no controls for the Right Roll behavior. The speed of the animation is determined by the size and duration of the layer. To speed up the movement, shorten the layer duration. To slow down the movement, extend the layer duration.

7.3.28. Shuffle In [Text]

Shuffle In inserts the characters in your text layer one at a time, in sequential order. each character begins offscreen left, and slides to the right to its intended position.



Shuffle In is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.29. String Fade [Text]

String Fade reveals the contents of your text layer one word at a time, in sequential order. The characters in each word will start larger and transparent, then gradually shift to their intended size and full opacity.



String Fade In is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.30. Tiny Zoom [Layer Only]

Tiny Zoom adds a slight zoom in, then zoom out, to the center of your layer duration. The layer starts and ends at its normal size, with quickly bumps to a larger size in the middle, as an accent.



Tiny Zoom is a **Behavior** which can be used on any layer in a composite shot.

• Length: The percentage of the total layer duration which will be used to perform the zoom, positioned in the center of the layer's duration.

7.3.31. Twirl [Layer Only]

Twirl rotates the entire layer into its intended position.

Tiny Zoom is a **Behavior** which can be used on any layer in a composite shot.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.
7.3.32. Typewriter [Text]

Typewriter reveals each character in your text layer sequentially, as if they were being typed onto the screen with a typewriter.



String Fade In is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.33. Up Dir Insert [Text]

Up Dir Insert begins with the text below the text box, and it slides upward until it comes fully into view.



Y Up Dir Insert is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.34. Up Insert [Layer Only]

Up Insert starts with the layer moved out of view to the bottom of the viewer, and slides the layer upward, until it reaches the layer's original position.

Y Up Insert is a **Behavior** which can be used on any layer in a composite shot.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.35. Up Roll [Layer Only]

Up Roll smoothly and evenly moves the layer from offscreen below ot offascreen above, like scrolling credits. It positions the layer below the viewer, just out of view, at the first frame of the layer, and moves it to above the viewer, just out of view, on the final frame.

Y Up Roll is a **Behavior** which can be used on any layer in a composite shot.

There are no controls for the Up Roll behavior. The speed of the animation is determined by the size and duration of the layer. To speed up the movement, shorten the layer duration. To slow down the movement, extend the layer duration.

7.3.36. Wavy Style [Text]

Wavy Style adds a bouncing movement to each word as they are sequentially revealed. Each word starts out semitransparent and squashed vertically, then stretches upward as the opacity rises, and finally shrinks back to its intended size.



Y Up Dir Insert is a **Behavior** which can be used on Text layers in composite shots.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.37. Zoom In [Layer Only]

Zoom In starts with the layer reduced in size, so it appears far away. The size of the layer then increases until it reaches its intended size.



Zoom In is a **Behavior** which can be used on any layer in a composite shot.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.3.38. Zoom Out [Layer Only]

Zoom Out starts with the layer increased in size, so it appears very near the camera. The size of the layer then decreases until it reaches its intended size.



Zoom Out is a **Behavior** which can be used on any layer in a composite shot.

- **Reveal Length:** The percentage of the total layer duration which will be used to complete the reveal of the layer at the start of its duration.
- **Conceal Length:** The percentage of the total layer duration that will be used to conceal the layer, at the end of its duration.

7.4. Behaviors

Behaviors are a separate category of Effects, which control a layer's movement using physics equations or values taken from another layer.

Behaviors can only be used on layers within composite shot timelines, and are not available in the Editor.

Each behavior has its own page, where you can find full details of the effect and its controls.

- Acceleration [Layer Only]
- Attract To [Layer Only]
 EXPRESS ADD-ON
- Drag [Layer Only]
 EXPRESS ADD-ON
- Follow [Layer Only]
 EXPRESS ADD-ON
- Gravity [Layer Only]
- Mix Parent Position [Layer Only]
 EXPRESS ADD-ON
- Repel From [Layer Only]
 EXPRESS ADD-ON
- Rotate By Layer [Layer Only]
 EXPRESS ADD-ON
- Throw [Layer Only]

7.4.1. Acceleration [Layer Only]

Causes the layer to accelerate in a user-specified direction.

- Acceleration: Sets the speed at which acceleration will occur. The distance the layer travels per second will be increase by the specified number of pixels for each second of travel. So if Acceleration is set to 100, for example, the layer will travel 100 pixels in the first second, 200 pixels in the second second, and 300 pixels in the third second, for a total of 600 pixels traveled in three seconds.
- Orientation: Sets the direction, in degrees in which travel will occur. The X Axis, Y Axis, and Z Axis are all represented, so you can move the layer in any direction you wish.

7.4.2. Attract To [Layer Only]

EXPRESS ADD-ON Attract To is available in the Behaviors: Starter Pack.

This behavior allows you to move the layer it has been applied to toward the specific location of another layer. This is sometimes simpler that determining the exact angles in which a layer needs to move. For example, you can set up a Point layer at the exact destination you want to use, then select that point layer as a Target in the Attract To controls.

- **Target:** The layer containing the Attract To behavior will move toward the position of the layer you select in this menu.
- Acceleration: Sets the speed at which acceleration will occur. The distance the layer travels per second will be increase by the specified number of pixels for each second of travel. So if Acceleration is set to 100, for example, the layer will travel 100 pixels toward the Target in the first second, 200 pixels in the second second, and 300 pixels in the third second, for a total of 600 pixels traveled in three seconds.
- **Distance:** Defines the distance, in pixels at which the specified acceleration will be in effect. Acceleration will fall off when the object is at a greater distance than the value specified, and acceleration will increase as the object moves closer than the specified value.
- Falloff: Choose between Linear and Quadratic Falloff
- **Target Radius:** Defines the size of the target object, from which the attraction originates. As the object being attracted enters the target radius, the force of the attraction will be reduced.

7.4.3. Drag [Layer Only]

EXPRESS ADD-ON Drag is available in the Behaviors: Starter Pack.

When drag is applied to a layer, any movement of the layer will be slowed down based on the amount of drag applied. The higher the Drag value, the slower the layer will move, and the less distance it will cover.

• Drag: Specifies the amount of drag applied to the layer's motion.

7.4.4. Follow [Layer Only]

EXPRESS ADD-ON Follow is available in the **Behaviors: Starter Pack**.

The Follow behavior allows you to move the layer it has been applied to based on the movement of another layer.

- **Target:** The layer containing the Follow effect will follow the movement of the layer you select in this menu.
- Attraction: Defines the strength of the attraction between the two layers.
- **Distance:** Sets the closest distance the two layers will get to one another. Once the layer the Follow effects is applied to reaches this distance from the Target layer, it will stop.

7.4.5. Gravity [Layer Only]

The Gravity behavior drags your layer downward at a progressively accelerating rate, like actual gravity.

• Acceleration: Sets the speed at which acceleration will occur. The distance the layer travels per second will be increase by the specified number of pixels for each second of travel. So if Acceleration is set to 100, for example, the layer will travel 100 pixels toward the Target in the first second, 200 pixels in the second second, and 300 pixels in the third second, for a total of 600 pixels traveled in three seconds.

7.4.6. Mix Parent Position [Layer Only]

EXPRESS ADD-ON Mix Parent Position is available in the Behaviors: Starter Pack.

This behavior allows you to adjust the intensity of the parenting between layers. While standard parenting is absolute, and always affects the child layer at 100% of the parent layer's position values, you can use Mix Parent Position to reduce the impact that parenting has on the child.

- Source Layer: This menu is used to select the Layer whose position you wish to use as a source.
- **Mix:** Sets the percentage of the source layer's movement that will be applied to this layer. If the Mix is set to 70%, for example, and the Source layer moves 100 pixels down and 200 pixels to the left, the layer the Mix Parent Position behavior is applied to will move 70 pixels down and 140 pixels to the left.

7.4.7. Repel From [Layer Only]

EXPRESS ADD-ON Repel From is available in the Behaviors: Starter Pack.

This behavior moves the layer it has been applied to away from the specific location of another layer. This allows you to push one layer around using a second layer, and keep a minimum distance between them.

- **Target:** The layer containing the Repel From behavior will move away from the position of the layer you select in this menu.
- Acceleration: Sets the speed at which repulsion will be accelerated. The distance the layer travels per second will be increase by the specified number of pixels for each second of travel. So if Acceleration is set to 100, for example, the layer will travel 100 pixels toward the Target in the first second, 200 pixels in the second second, and 300 pixels in the third second, for a total of 600 pixels traveled in three seconds.
- **Distance:** The minimum separation between this layer and the Target Layer. Once the tow layers reach this distance from one another, this layer will begin moving away from the target layer.
- Falloff: Choose between Linear and Quadratic Falloff

7.4.8. Rotate By Layer [Layer Only]

EXPRESS ADD-ON Rotate By Layer is available in the Behaviors: Starter Pack.

This behavior allows you to adjust the intensity of the parenting between layers. While standard parenting is absolute, and always affects the child layer at 100% of the parent layer's rotation values, you can use Mix Parent Position to reduce the impact that parenting has on the child. Each axis is separated, so they can be controlled independently

- Rotate By Layer: This menu is used to select the Layer whose rotation values you wish to use as a source.
- Rotation X Amount: Sets the percentage of the source layer's X rotation that will be applied to this layer. If the Mix is set to 50%, for example, and the Source layer rotates 180 degrees on the X axis, the layer the Mix Parent Position behavior is applied to will rotate 90 degrees on the X axis.
- Rotation Y Amount: Sets the percentage of the source layer's Y rotation that will be applied to this layer. If the Mix is set to 50%, for example, and the Source layer rotates 180 degrees on the Y axis, the layer the Mix Parent Position behavior is applied to will rotate 90 degrees on the Y axis.
- Rotation Z Amount: Sets the percentage of the source layer's Z rotation that will be applied to this layer. If the Mix is set to 50%, for example, and the Source layer rotates 180 degrees on the Z axis, the layer the Mix Parent Position behavior is applied to will rotate 90 degrees on the Z axis.

7.4.9. Throw [Layer Only]

Causes the layer to travel in a user-specified direction. The Throw behavior is similar to the Accelerate behavior, except the object travels at a consistent speed

- Speed: Sets the speed at which movement will occur, in pixels per second.
- Accelerate Time: The amount of time, in seconds, which the layer will take to accelerate from a stationary position to full speed. After the Accelerate time, the layer will continue to move at a fixed rate of Speed, in the direction you have chosen.
- Orientation: Sets the direction, in degrees in which travel will occur. The X Axis, Y Axis, and Z Axis are all represented, so you can move the layer in any direction you wish.

7.5. Blurs

The Blurs folder contains the following blur-related effects. Each effect has its own page where you can find full details of the effect and its controls.

- Angle Blur
- Bilateral Blur
- <u>Blur</u>
- Diffuse
- Lens Blur [Layer Only]
- Motion Blur
- Radial Blur
- Zoom Blur

Some blurs include a **Clamp to Edge** property, which ensures that the effect extends to the edge of the frame.

See Motion Blur for information on the automatic motion blur feature.

7.5.1. Angle Blur

Blurs the layer in a specific direction. Can be useful for an impression of fast movement.



- Angle: Rotating the Angle wheel controls the direction of the blur
- Length: Sets the strength of the blur, defined in number of pixels
- Clamp To Edge: Enabling this feature prevents the blur from expanding outside the edges of the

layer to which it is applied. Disabling it will allow the blur to expand outside the layer edges.

7.5.2. Bilateral Blur

EXPRESS ADD-ON Bilateral Blur is available in the Edit: Beautify Pack Effects-express#edit-beautify.

Smooths images for a softer, untextured appearance, while retaining fine edge detail.



- **Radius:** Sets the intensity of the blur. The radius, in pixels, defines the area that will be calculated into the blur of each pixel.
- **Threshold:** Sets the amount of edge contrast that must be present for an edge to be retained. Higher values will result in fewer edges being held out from the blur.
- **Dimension:** The blur can be applied Horizontally, Vertically, or Both.

7.5.3. Blur

A standard, fast blur.



- **Radius:** Sets the intensity of the blur. The radius, in pixels, defines the area that will be calculated into the blur of each pixel.
- **Iterations:** The number of times the blur is calculated. More iterations give a smoother result, and a larger blur.
- **Dimension:** The blur can be applied Horizontally, Vertically, or Both.
- **Clamp To Edge:** Enabling this feature prevents the blur from expanding outside the edges of the layer it is applied to. Disabling it will allow the blur to expand outside the layer edges.

7.5.4. Diffuse

Creates a soft focus appearance by duplicating the footage, blurring the copy, and then blending the duplicate back onto the original footage.



- **Radius:** Sets the intensity of the blur. The radius, in pixels, defines the area that will be calculated into the blur of each pixel.
- **Opacity:** Controls the opacity of the duplicate blurred footage. Lower opacity levels will give a more subtle result.

7.5.5. Lens Blur [Layer Only]

The lens blur is designed to more closely mimic the depth of field bokeh effects created by real lenses. It can be used in conjunction with a depth map to selectively blur different areas of the frame to different degrees.

Here's an example of lens blur in action, followed by the original frame without blur:





Note how the face remains in sharp focus while the rest of the image becomes progressively more blurred. This is based upon a simple depth map created by hand inside HitFilm using some planes and masks:



The circle at the top keeps the face in focus, while the left-to-right gradient oval causes her arm to become progressively more blurred. The rest of the image, being black, is fully blurred.

Lens blur can be heavily customized.

- Source Layer: can be optionally used to apply a depth map, as shown in the example above.
- **Source Channel:** You can use various channels from the source layer as the depth map, such as luminance and alpha.
- Radius: adjusts the strength of the blur.
- Focal Distance: is used to rack focus based on the depth map, adjusting which point on the map is in focus. This is analogous to changing focus on your camera.
- Focal Range: defines the depth of field. A larger focal range will cause more of the frame to remain in focus, while a small focal range will cause a shallower area to remain in focus.
- **Specular Threshold:** Sets the luminance level above which highlights will be blown out to white, rendering as specular highlights based on the Iris settings below.
- **Specular Brightness:** Sets the brightness of the specular highlights. Lower threshold and higher brightness will make the bokeh more obvious. The bokeh shape can be further customized in the Iris section.
- **Quality:** Defines the visual quality of the blur. If you are trying to match your footage to other footage shot with a lower quality lens, reducing the quality may help. Reducing quality also allows the effect to render more quickly.
- Iris: The iris section can be used to switch between multiple primitive shapes. These can then be rotated and warped using the curvature, pinch and shift options to create custom shapes. The View Iris option can be useful for dialing in the shape of the iris.
 - **Shape:** Select a shape based on the number of blades you wish to be used for the iris. More blades tend to give a smoother blur and higher quality results.
 - **Rotation:** Sets the rotation of the shape selected above.
 - **Curvature:** Sets the curvature of each blade of the iris. A value of 0.0 creates a straight side. Negative values will curve the sides inward, while positive values curve it outward.
 - **Pinch:** Limits the area affected by the curvature. Higher pinch levels will reduce the width of the curve, so it is pinched close to the vertices of the iris shape.
 - Shift: Offsets the center of the curvature.
 - Opacity Curve: Feathers the edges of the iris shape, from the outer edge and the center.
 - **Highlight Location:** Sets the distance of the circular highlight from the center of the iris.
 - **View Iris:** Enabling this option shows the iris shape in white, so you can see exactly how the adjustments above affect the shape that will be used to render the specular highlights.

7.5.6. Motion Blur

Motion Blur uses optical flow techniques to identify movement in the contents of a layer and apply artificial motion blur based on the distance specific features travel from one frame to the next. This can be very useful for animation or for adding exaggerated motion blur to a live action shot. If you have animated the position of a layer, and wish to apply motion blur to that movement, the <u>Automatic Motion Blur</u> should be used.



- Mode: Choose the method used to calculate the blur.
 - Off:* disables the blur entirely.
 - Comp Settings:* Uses the same settings used by the composite shot, which are found in the Advanced tab of the composite shot Properties. This allows the motion blur to exactly match any 3D motion blur created by animation within the composite shot.
 - **Custom:** Allows you to manually specify the settings used for the effect. If you select Custom, the following settings will become available.

- **Shutter Angle:** A larger shutter angle will create more motion blur. The shutter angle simulates the amount of time a real camera shutter is open.
- **Shutter Phase:** Positions the blur in relation to the moving object. This can be used to offset the blur in front or behind the object. For realistic motion blur this is best kept to half the value of the shutter angle.
- Samples: Motion blur is constructed by sampling the position of the layer over multiple frames.
 A higher number of samples will result in a higher quality motion blur. Fewer samples will be faster to render but may introduce visible banding in the motion blur.

Optical Flow

Motion blur is calculated by tracking the movement of every pixel in the image using optical flow techniques. The amount of blur applied to each pixel is based on the speed at which it is moving. These advanced settings let you adjust how the movement in the frame is tracked.

- Window Size: The number of pixels surrounding the current pixel that is scanned to calculate the motion of the current pixel.
- **Sigma:** A value in the algorithm used for tracking, that alters the way it tracks. Changing the Sigma can affect the result. If the blur is calculated incorrectly, trial and error can be used to see if changing sigma improves results.
- **Iterations:** The number of times the tracking algorithm is performed. The results of all iterations are averaged, so more iterations will give a more accurate result, but will also take longer to calculate.
- **Downsamples:** Optical Flow can only track movement smaller than one pixel, so before the tracking algorithm runs, the image must be downsampled. You can create multiple levels of downsampling, and the algorithm will be calculated for each downsample level. More downsamples can improve the results, but will take longer to calculate.
- **Start Downsample:** By default the tracking algorithm starts with the first downsample, skipping the full resolution image, which makes it less susceptible to being misled by noise in the image. Increasing the Start Downsample can speed up the results, but reduces the resolution of the tracking results, which may negatively impact accuracy.

7.5.7. Radial Blur

Creates a circular shaped blur. The center of the blur can also be moved using the control point in the Viewer.



- **Center Position:** The center point from which the blur is calculated can be positioned anywhere you like. You can either manually type in a value, or select the Position property, then drag the Center Point shown in the Viewer to a new location.
- **Use Layer:** If you wish to link the center of the blur to the position of a different layer, you can use this property to select any layer on your timeline.
- **Angle:** Controls the amount of blur applied. Since radial blur has a greater effect on the image the farther you get from the center point, the amount of blur is defined in degrees, rather than pixels.

7.5.8. Zoom Blur

A blur emanating out from a central point. The center of the blur can also be moved using the control point in the Viewer.



- **Quality:** Affects the smoothness of the blurred results. Increasing the quality will smooth the results, but may take longer to calculate.
- Strength: The distance, in pixels, that each pixel will be blurred.
- **Center Position:** The center point from which the blur is calculated can be positioned anywhere you like. You can either manually type in a value, or select the Position property, then drag the Center Point shown in the Viewer to a new location.
- **Use Layer:** If you wish to link the center of the blur to the position of a different layer, you can use this property to select any layer on your timeline. When a layer is selected here, the Center Position property above serves as an offset from the position of the selected layer.

7.6. Channel

Channel effects are used to manipulate the channels in a layer, such as RGB or luminance. Each effect has its own page where you can find full details of the effect and its controls.

- <u>Channel Blur</u>
 EXPRESS ADD-ON
- <u>Channel Mixer</u>
 EXPRESS ADD-ON
- Channel Swapper
 EXPRESS ADD-ON
- <u>Channel Time Shift</u>
 EXPRESS ADD-ON
- <u>Chromatic Aberration</u>
- <u>Color Space Converter</u>

7.6.1. Channel Blur

EXPRESS ADD-ON Channel Blur is available in the Color: Looks Pack.

Blurs the color channels of the image individually. This can be useful for creating the impression of chromatic aberration.





Radius

- Radius Red: Sets the radius of the blur on the red channel. A higher radius creates a heavier blur.
- **Radius Green:** Sets the radius of the blur on the green channel. A higher radius creates a heavier blur.
- Radius Blue: Sets the radius of the blur on the blue channel. A higher radius creates a heavier blur.
- **Radius Alpha:** Sets the radius of the blur on the alpha channel, which determines the transparency of the image. A higher radius creates a heavier blur.

Dimension

- Dimension Red: Select whether the red channel blur is Horizontal, Vertical, or both Horizontal and Vertical.
- Dimension Green: Select whether the green channel blur is Horizontal, Vertical, or both Horizontal and Vertical.
- Dimension Blue: Select whether the blue channel blur is Horizontal, Vertical, or both Horizontal and Vertical.
- Dimension Alpha: Select whether the alpha channel blur is Horizontal, Vertical, or both Horizontal and Vertical.

7.6.2. Channel Mixer

EXPRESS ADD-ON Channel Mixer is available in the Color: Looks Pack.

Used to mix the color channels together. The red channel can have some of the blue channel introduced to it, for example. This can be useful for adjusting the color balance in a natural way, since the adjustments are based on another color channel from the source image.





The channel mixer is an effective option for creating a black and white image with extensive control over the contrast. Setting all values to zero, and then increasing the Red value in each color channel to 1.0, for example, will give you a black & white image of only the red channel. The same technique can be used with the green or blue channels as well.

Red

- **Red:** Sets the amount of the source red channel that is used to create the red output of your image. The default value of 1.0 delivers the red channel in its original state.
- **Green:** Sets the amount of the source green channel that is used to create the red output. This is set to 0.0 by default. Decreasing this value will darken the red output, based on the contrast contained in the green channel. Increasing the value will brighten the red output, based on the contrast of the green channel.
- **Blue:** Sets the amount of the source blue channel that is used to create the red output. This is set to 0.0 by default. Decreasing this value will darken the red output, based on the contrast contained in the blue channel. Increasing the value will brighten the red output, based on the contrast of the blue channel.
- **Constant:** Controls the base value of the red channel. This value is calculated after the three channels above are mixed, and increases or decreases the total output of the red channel, based on the sum of the three channels above.

Green

- **Red:** Sets the amount of the source red channel that is used to create the green output of your image. This is set to 0.0 by default. Decreasing this value will darken the green output, based on the contrast contained in the red channel. Increasing the value will brighten the green output, based on the contrast of the red channel.
- **Green:** Sets the amount of the source green channel that is used to create the green output of your image. The default value of 1.0 delivers the green channel in its original state.
- **Blue:** Sets the amount of the source blue channel that is used to create the green output. This is set to 0.0 by default. Decreasing this value will darken the green output, based on the contrast contained in the blue channel. Increasing the value will brighten the green output, based on the contrast of the blue channel.
- **Constant:** Controls the base value of the green channel. This value is calculated after the three channels above are mixed, and increases or decreases the total output of the red channel, based on the sum of the three channels above.

Blue

• Red: Sets the amount of the source red channel that is used to create the blue output of your image.
This is set to 0.0 by default. Decreasing this value will darken the blue output, based on the contrast contained in the red channel. Increasing the value will brighten the blue output, based on the contrast of the red channel.

- **Green:** Sets the amount of the source green channel that is used to create the blue output. This is set to 0.0 by default. Decreasing this value will darken the blue output, based on the contrast contained in the green channel. Increasing the value will brighten the blue output, based on the contrast of the green channel.
- **Blue:** Sets the amount of the source blue channel that is used to create the blue output of your image. The default value of 1.0 delivers the blue channel in its original state.
- **Constant:** Controls the base value of the blue channel. This value is calculated after the three channels above are mixed, and increases or decreases the total output of the blue channel, based on the sum of the three channels above.

7.6.3. Channel Swapper

EXPRESS ADD-ON Channel Swapper is available in the Color: Looks Pack.

Replaces channels with other channels. For example, you can have a layer's alpha (transparency) set to correspond to its red values, or its saturation. This is useful for both color grading and compositing. Channel swapping is also frequently used in Infrared (IR) photography.





- Take Red From: Select the source channel that will be used to generate the red output.
- Take Green From: Select the source channel that will be used to generate the green output.
- **Take Blue From:** Select the source channel that will be used to generate the blue output.
- Take Alpha From: Select the source channel that will be used to generate the alpha output.

7.6.4. Channel Time Shift

EXPRESS ADD-ON Channel Time Shift is available in the Color: Looks Pack.

Moves red, green and blue channels backwards or forwards in time individually. This creates a trailing effect on moving objects, or can create a chromatic aberration style distortion.



- **Red Shift:** Sets the number of frames by which the red channel is shifted from the current frame number. Positive values will take frames from later in the clip, while negative values will take frames from earlier in the clip.
- **Green Shift:** Sets the number of frames by which the green channel is shifted from the current frame number. Positive values will take frames from later in the clip, while negative values will take frames from earlier in the clip.
- **Blue Shift:** Sets the number of frames by which the blue channel is shifted from the current frame number. Positive values will take frames from later in the clip, while negative values will take frames from earlier in the clip.
- Alpha: Selects the frame that will be used for the alpha channel. By default it uses the Current Frame. Average will calculate the average of the values of all three color channels, and use that frame. Red Shift, Green Shift and Blue Shift will take the value from the selected channel, and use that frame as the alpha. The alpha setting applies when you are working with a layer that included

alpha transparency. On standard video, the alpha setting will have no effect, since the entire frame is completely opaque.

7.6.5. Chromatic Aberration

Chromatic Aberration splits the individual color channels of the image, and offsets them slightly to create imperfect color alignment. This is effective for replicating the prismatic effect often created by light sources on camera, or for creating colorful distortion or grunge.



- **Distance:** Adjusts the distance between the original location and the aberration. Positive values move the aberration in the direction of the Angle specified below. Negative values move the aberration in the opposite direction.
- **Strength:** Controls the intensity of the aberration. At 100% the full value of the aberrant channel is used. At lower values, the effect is reduced.
- **Use Lens:** Enabling this option reveals a circular control on the Viewer. Drag the radius of the circle to adjust the aberration.
- Angle: Sets the direction in which the aberration is offset.
- **Channels:** Select which channels are offset. The unlisted channel remains in its original position.
 - Red and Blue: Offsets the red and blue channels, in opposite directions.
 - **Red and Green:** Offsets the red and green channels, in opposite directions.
 - Green and Blue: Offsets the green and blue channels, in opposite directions.

Radius

Each channel can be blurred independently. These controls define the radius of the blur applied to each channel.

- **Red:** Specify the radius of the blur applied to the red channel.
- Green: Specify the radius of the blur applied to the green channel.
- **Blue:** Specify the radius of the blur applied to the blue channel.
- Alpha: Specify the radius of the blur applied to the alpha channel.

Dimension

Select the dimension in which the blur is applied. The dimension can be adjusted per channel, or for all channels at once.

- **Toggle All Dimensions:** Synchronizes all channels to the same setting, then changes the setting applied to all channels together, to keep them synchronized.
- Red: Adjusts the dimension of the blur on the red channel.
- Green: Adjusts the dimension of the blur on the green channel.
- Blue: Adjusts the dimension of the blur on the blue channel.
- Alpha: Adjusts the dimension of the blur on the alpha channel.
 - **Horizontal and Vertical:** Selecting this option for any channel blurs the channel in both dimensions.
 - **Horizontal:** Selecting this option for any channel blurs the channel from left to right, along the X axis.
 - Vertical: Selecting this option for any channel blurs the channel from top to bottom, along the Y axis.

7.6.6. Color Space Converter

Changes the color space of the layer to a different color space. Useful for color grading and compositing.



- From: Select the source channel or color space from which the conversion will be calculated.
- To: Select the destination color space to which the source channel or color space will be converted.
- **Invert:** Toggling this option will invert the results of the conversion.
- Alpha: Controls how the alpha channel is handled. Normal will give the typical result based on the

conversion options you have selected. Solid will override the conversion settings and create a solid alpha, so the layer remains entirely opaque.

7.7. Color Correction

Color correction effects are designed to enhance the visual quality of layers by adjusting their colors. Color correction is intended for the initial color manipulation and for fixing problems occurring in your source media. Each effect has its own page where full details of the effect and its controls can be found.

- Auto Color
- Auto Contrast
- Auto Levels
- Brightness & Contrast
- <u>Color Balance</u>
- <u>Color Correction Wheels</u>
 EXPRESS ADD-ON
- <u>Color Temperature</u>
- Crush Blacks & Whites
- <u>Curves</u>
- Custom Gray
 EXPRESS ADD-ON
- Dehaze PRO EXCLUSIVE
- Exposure
 EXPRESS ADD-ON
- Exposure Pro
 PRO EXCLUSIVE
- <u>Gamma</u>
- Hotspots
- Hue, Saturation & Lightness
- Levels Histogram
- Pro Skin Retouch
 EXPRESS ADD-ON
- <u>Tone Coloring</u>
- White Balance
- YUV Color Correction
 EXPRESS ADD-ON
- YUV Color Transform
 EXPRESS ADD-ON

Also see Color Grading to find more tools for making color adjustments.

7.7.1. Auto Color

HitFilm includes three Auto grading effects to adjust the layer's color, contrast or levels.

Compare the following image in each of these three effects to see the different results they give.



- Threshold: Sets the threshold below which colors will remain unaffected.
- **Blend With Original:** The effect of the Auto Color can be softened by increasing this setting. Higher values retain more of the original color.
- Select Frame: By default the auto grading effects update on each frame, which can cause fluctuations in the layer's appearance as the contents of the frame change. By activating the Select frame property you can manually choose a frame to use as the source for the automatic adjustment, which will be used for the duration of the layer.

7.7.2. Auto Contrast

HitFilm includes three Auto grading effects to adjust the layer's color, contrast or levels.

Compare the following image in each of these three effects to see the different results they give.



- Threshold: Sets the threshold below which colors will remain unaffected.
- **Blend With Original:** The effect of the Auto Contrast can be softened by increasing this setting. Higher values retain more of the original color.
- Select Frame: By default the auto grading effects update on each frame, which can cause fluctuations in the layer's appearance as the contents of the frame change. By activating the Select frame property you can manually choose a frame to use as the source for the automatic adjustment, which will be used for the duration of the layer.

7.7.3. Auto Levels

HitFilm includes three Auto grading effects to adjust the layer's color, contrast or levels.

Compare the following image in each of these three effects to see the different results they give.



- Threshold: Sets the threshold below which colors will remain unaffected.
- **Blend With Original:** The effect of the Auto Levels can be softened by increasing this setting. Higher values retain more of the original color.
- Select Frame: By default the auto grading effects update on each frame, which can cause fluctuations in the layer's appearance as the contents of the frame change. By activating the Select frame property you can manually choose a frame to use as the source for the automatic adjustment, which will be used for the duration of the layer.

7.7.4. Brightness & Contrast

Quick adjustment of the layer's brightness and contrast.

- Brightness: Adjust to the left to decrease brightness, or to the right to increase brightness.
- Contrast: Adjust to the left to decrease contrast, or to the right to increase contrast.

7.7.5. Color Balance

Individually adjust the balance of red, green and blue in the layer's shadows, midtones and highlights.



The **Preserve luminosity** property retains the layer's original brightness when altering the colors.

Shadows

- **Red Balance:** Adjust to the left to reduce red tones in the shadow areas, or to the right to increase red tones in the shadow areas.
- **Green Balance:** Adjust to the left to reduce green tones in the shadow areas, or to the right to increase green tones in the shadow areas.
- Blue Balance: Adjust to the left to reduce blue tones in the shadow areas, or to the right to increase blue tones in the shadow areas.

Midtones

- **Red Balance:** Adjust to the left to reduce red tones in the midtones, or to the right to increase red tones in the midtones.
- **Green Balance:** Adjust to the left to reduce green tones in the midtones, or to the right to increase green tones in the midtones.
- Blue Balance: Adjust to the left to reduce blue tones in the midtones, or to the right to increase blue tones in the midtones.

Highlights

- **Red Balance:** Adjust to the left to reduce red tones in the highlights, or to the right to increase red tones in the highlights.
- **Green Balance:** Adjust to the left to reduce green tones in the highlights, or to the right to increase green tones in the highlights.
- **Blue Balance:** Adjust to the left to reduce blue tones in the highlights, or to the right to increase blue tones in the highlights.

7.7.6. Color Correction Wheels

EXPRESS ADD-ON Color Correction Wheels is available in the Color: Correction Pack.

This effect provides a visual way to quickly adjust the tone and color of the highlights, midtones and shadows of your layer. Here you can see the difference the color wheels effect can make to a layer, with the original shown first and the color corrected version below it:



You can drag on the color wheels to adjust the color balance of highlights (top wheel), midtones (middle wheel) and shadows (bottom wheel). The further out from the center of the color wheel you drag the point, the more saturated the colors will become.

The sliders can be used to adjust the strength and lightness of the adjustment, and the rotator on the wheels changes the hue.

Master Controls

The Master Controls are applied to the entire tonal range of the image, from the brightest highlights to the darkest shadows. Everything is affected.

- **Saturation:** Adjusts the master saturation of the entire layer. Positive Values add saturation, and negative values reduce saturation.
- **Exposure:** Positive values brighten the image, and negative values darken the image.
- White Balance: Sets the neutral value on which color adjustments are based. In most cases, you will want to use the pipette tool to select an area in your image which should be neutral grey, but you can also manually specify an RGB value.

Highlights

- **Strength:** The amount of color adjustment applied. This slider directly translates to the distance of the control point from the center of the top color wheel.
- **Hue:** The hue toward which the colors are adjusted. This radial dial is directly equivalent to the top color wheel, and represents the angle at which the control point sits within the wheel.
- **Saturation:** The saturation of the selected hue. This slider is the same control as the Saturation slider beside the top color wheel.
- Lightness: The Lightness of the selected hue. This slider is the same control as the Lightness slider beside the top color wheel.

Midtones

- **Strength:** The amount of color adjustment applied. This slider directly translates to the distance of the control point from the center of the middle color wheel.
- **Hue:** The hue toward which the colors are adjusted. This radial dial is directly equivalent to the middle color wheel, and represents the angle at which the control point sits within the wheel.
- **Saturation:** The saturation of the selected hue. This slider is the same control as the Saturation slider beside the middle color wheel.
- **Lightness:** The Lightness of the selected hue. This slider is the same control as the Lightness slider beside the middle color wheel.

Shadows

- **Strength:** The amount of color adjustment applied. This slider directly translates to the distance of the control point from the center of the bottom color wheel.
- **Hue:** The hue toward which the colors are adjusted. This radial dial is directly equivalent to the bottom color wheel, and represents the angle at which the control point sits within the wheel.
- **Saturation:** The saturation of the selected hue. This slider is the same control as the Saturation slider beside the bottom color wheel.
- **Lightness:** The Lightness of the selected hue. This slider is the same control as the Lightness slider beside the bottom color wheel.

7.7.7. Color Temperature

Use to warm or cool the colors in your layer. Color temperature is measured in Kelvin.

• **Temperature:** Adjusting to the left reduces color temperature, introducing more orange and red into the image. Adjusting to the right increases the color temperature, shifting it towards blue.

7.7.8. Crush Blacks & Whites

An alternative to simply altering the contrast, this enables you to change the black and white points separately for finer control.

- **Black:** Increasing this slider will raise the threshold below which shadow areas will be pushed into pure black.
- White: Decreasing this slider lowers the threshold above which highlights will be pushed into pure white.

7.7.9. Curves

Curves is a powerful color correction and grading tool, based on an editable graph. Here's an example of the curves graph as shown in the Controls panel:



The horizontal axis on the graph represents the input, which is the original image. The vertical axis represents the output, which is the graded result. Therefore if you follow a line vertically up from any point on the graph until you hit the curves, then track to the left, you can see how the input is being changed.

Therefore with the default curves graph you can see that the input values are identical to the output values:



Two easy presets are provided, one of which resets the graph to the default straight line and another which creates an s-curve:



Where the graph becomes steeper you will see increased contrast, whereas a shallower incline will reduce contrast. In the case of an s-curve, the center of the graph is steeper, which increases contrast in the mid-tones, at the expense of detail in the shadows and highlights.

Given that the focus of a frame is often in the mid-tones (such as actor's faces), an s-curve is often an

effective way to add perceived detail and contrast to a shot.

Curves can be used to adjust the RGB channels combined or each channel individually. Adjusting individual channels can be useful for correcting white balance and lighting issues.

7.7.10. Custom Gray

EXPRESS ADD-ON Shadows & Highlights is available in the Color: Starter Pack.

Custom Gray creates a grayscale image while providing finer control over how that image is generated. This is useful for creating specific black and white looks, as each RGB channel can be emphasized to a lesser or greater degree when creating the result, providing fine control over contrast.



- **Red:** Positive values increase the lightness of the red channel, negative values decrease the lightness of the red channel. Increasing the red level can help lighten skin tones, to bring the viewer's focus onto human subjects.
- **Green:** Positive values increase the lightness of the green channel, negative values decrease the lightness of the green channel.
- **Blue:** Positive values increase the lightness of the blue channel, negative values decrease the lightness of the blue channel.

The sum of the values of the Red, Green, and Blue channels should equal 1.00 to maintain the overall luminosity of the original image. Total values above 1.00 will brighten the image overall, and total values below 1.00 will darken it.

- **Offset:** Raises or lowers the luminosity of the entire image equally, affecting all tones in the image equally
- **Exposure:** Raises or lowers the exposure of the image. This adjustment primarily affects the Highlights and Midtones, while the Shadow areas remain unaffected. Thus, reducing Exposure lowers the overall contrast of the image, while increasing Exposure increases the contrast between the brightest and darkest areas.

7.7.11. Dehaze

PRO EXCLUSIVE The Dehaze effect is a HitFilm Pro exclusive.

This tool restores detail to areas where haze obscured or reduced the detail when the image or video was captured. This is particularly useful in wide shots and distant landscapes, where fog or other haze in the air obscures the more distant details. You can also introduce haze into shotsIt can also be a useful tool for adding detail to black and white footage.

- **Amount:** The primary control, which adjusts the amount of haze in the shot. Negative values reduce the haze and add detail. Positive values introduce haze, softening the detail.
- **Offset:** Adjusting the amount of haze frequently alters the brightness of the shot. Use offset to compensate for this alteration. Positive values increase brightness of the highlights, while negative values reduce brightness in the highlights.

7.7.12. Exposure

EXPRESS ADD-ON Exposure is available in the Color: Starter Pack.

Simulates the effect of changing the amount of light allowed into the camera lens. The end result is a brightening or darkening of the footage, but in a more natural, dynamic way than a direct Brightness adjustment. In addition to changing brightness, reducing exposure lowers the overall contrast of the image, while increasing exposure increases the contrast between the brightest and darkest areas. The available controls give you access to the three main tonal ranges of the image, allowing you to fine-tune the Highlights, Midtones, and Shadows separately.





- **Exposure:** Primarily brightens or darkens the highlights of the image, with minimal effects on the shadows.
- **Offset:** Brightens or darkens the shadow areas of the image, with minimal effects on the Highlights. Start with minor adjustments, as excessive changes here can create unnatural results.
- Gamma: Shifts the midtones of the image.

7.7.13. Exposure Pro

PRO EXCLUSIVE The Exposure Pro effect is a HitFilm Pro exclusive.

A more powerful, more comprehensive control over the exposure of your image than the basic Exposure effect allows.



- **Exposure:** Positive values brighten the image, and negative values darken the image. The value is measured in EV, (Exposure Value) exactly as it is on a camera, so it is easy to make adjustments that directly correspond to adjustments in the camera settings.
- **Contrast:** Reducing contrast holds the midtones in place and brings the highlight and shadow values closer to the midtones. Increasing contrast pushes everything brighter than mid-gray closer to white, and everything darker than mid-gray closer to black.
- **Shadows:** Adjusts the shadow areas of the image, which can be brightened to reveal more detail, or darkened to make the shadows heavier.
- **Midtones:** Adjusts the midtones of the image, while keeping changes to the highlights and shadows to a minimum.
- **Highlights:** Adjusts the highlight areas of the image, which can be brightened to increase contrast, or darkened to reveal more detail and color.
- Whites: Sets the white point of the image.
- Blacks: Sets the black point of the image.
- **Vibrance:** Changes the saturation of the image, but affects colors with low saturation more than colors that are already saturated, to avoid over-saturation.
- **Saturation:** Shifts the saturation of all colors in the image. Increasing the value makes colors more intense, while reducing the value makes the colors more subdued.

7.7.14. Gamma

Individually alter the gamma of red, green and blue channels. Gamma is weighted toward the midtones of the image, and will change the midtones the most, with a more minimal impact on the highlights and shadows.



- Red: Raises or lowers the red levels in the image, especially in the midtones.
- Green: Raises or lowers the green levels in the image, especially in the midtones.

• Blue: Raises or lowers the blue levels in the image, especially in the midtones.

7.7.15. Hot Spots

A quick and easy way to isolate and alter the bright areas of your layer. Hotspots allow you to select and modify the brightest areas of your image, based on a user-defined brightness threshold.



- **Threshold:** Sets the brightness threshold on which the effect is based. Only areas above your Threshold setting will retain detail.
- Threshold Add Color: All areas of the image below the threshold level will be filled with the color you

select here. By default the color is black, which can be useful for isolating the hot spots in your image for compositing purposes. For example, you could duplicate your footage, apply Hot Spots to the top copy, then set the blend mode of the top copy to Screen to blend the results of the Hot Spots effect onto the original copy of the footage below it.

- Saturation: Adjusts the intensity of the colors in any areas brighter than the Threshold.
- Brightness: Alters the brightness of all areas in your footage which are brighter than the Threshold.
- **Smooth Source:** Applies a blur to the source image before calculating the threshold, which is useful for smoothing the transition areas around the threshold and removing graininess in the result.

7.7.16. Hue, Saturation & Lightness

Control over the hue, saturation and lightness of your image. The Master controls affect the entire image, while the individual color controls (Red, Yellow, Green, Cyan, Blue, Magenta) allow you to limit adjustments to a specific color family.



• **Hue Shift:** Shifts the colors by rotating them the specified number of degrees around the color wheel. The colors are oriented around the color wheel in the sequence they are listed in the effect (red, yellow, green, cyan, blue, magenta), and the distance between each color family is 60 degrees. The Master control will affect the entire image, while the lower controls will only affect a range of colors within the specific color family you adjust.

- **Saturation:** Increases or decreases the saturation, or color intensity. The Master control will affect the entire image, or you can select a specific color family and adjust it separately from all other colors in the image.
- Lightness: Lightens or darkens the image. The Master control will affect the entire image, or you can select a specific color family and adjust it separately from all other colors in the image. Increasing the Lightness can result in a perceived decrease in saturation, so in many cases it may be useful to adjust Lightness and Saturation in combination to get the result you desire.

The Master controls in the Hue, Saturation & Lightness effect are a quick way to adjust the overall Saturation and Lightness of your image.

7.7.17. Levels Histogram

Levels gives you detailed information about the channel composition of the layer through the use of a Histogram Display. This allows you to make manual adjustments to the tonality of the layer to improve its appearance. A Histogram is a graph which allows you to quickly see at a glance the exact range of tonal values in your image. Histograms are also available in the scopes panel, and more information about histograms is available in Introducing Scopes. The histogram is a more accurate way to assess colors than by eye.

The histogram displays a readout of the tones in your image. The tones range from pure black on the left to pure white on the right. The height of the graph at any point indicates the relative frequency of that specific tone in the image. Information for different channels of your image can be viewed, based on your selection in the Channels menu.

Channels Menu

- **RBG:** Displays three separate histograms at once, one for each color channel of your image. Each histogram is colored to match the channel it represents.
- **RGB Combined:** Averages the values of all three channels, and displays a single histogram that represents the overall tonal values of the image.
- Red: Displays the tonal values of the Red channel of the image.
- Green: Displays the tonal values of the Green channel of the image.
- Blue: Displays the tonal values of the Blue channel of the image.
- Alpha: Displays the tonal values of the Alpha channel of the image.

The Histogram

The primary method for viewing the levels in your image is the Histogram. The image below is represented by the histogram shown to its right.


The histogram contains a **Graph** and a **Gradient**. Beneath the graph are three triangles, representing the **Input Black** (black triangle), the **Gamma** (grey triangle) and the **Input White** (white triangle). Looking at this histogram, notice that the graph does not begin at the Input Black, it ends before the Input White, and nearly all the image data is positioned below the mid-point Gamma control. By default, pure black is set to 0.0, and pure white is set to 1.0. Shifting the white or black input values evenly redistributes the tonal range of the image between black and white. However, adjusting them too far can result in clipping of the image, and loss of detail in the shadow or highlight areas.

By adjusting these controls we can optimize the dynamic range of tones in our image. Slide the Input Black control to the right control until it touches the edge of the visible graph. Then, slide the White Input to the left, until it touches the edge of the visible graph. Shifting the Gamma will then redistribute the midtones between the white and black points. The image below shows how this basic adjustment can improve the image by darkening the blacks to true black, raising the highlights to pure white, and brightening the overall image with a Gamma shift.





There are also two triangle controls below the gradient, representing the **Output Black** (black triangle) and **Output White** (white triangle). Shifting these will reduce the contrast in the image, by reducing the intensity of the black point or white point of the image. This can be useful for creating a flat image in preparation for applying final grading adjustments. The image below shows how adjusting the Output Black and Output white affects our result.





Controls

- **Input Black:** Sets pure black in the image to the selected value. Any tones below the selected value will be clipped to pure black. Linked to the black triangle below the graph.
- **Input White:** Sets pure white in the image to the selected value. Any tones above the selected value will be clipped to pure white. Linked to the white triangle below the graph.
- **Gamma:** Redistributes the midtones between the defined input black and input white. Adjusting Gamma to the left will brighten the midtones, and adjusting it right will darken the midtones. Linked to the grey triangle below the graph.
- **Output Black:** Offsets the black point from 0.0 to the selected value. This is useful for lightening shadow areas of the image. Linked to the black triangle below the gradient.
- **Output White:** Offsets the white point of the image from 1.0 to the selected value. This can be beneficial for reducing the brightness of the highlights in your image. Linked to the white triangle below the gradient.

7.7.18. Pro Skin Retouch

EXPRESS ADD-ON Pro Skin Retouch is available in the Edit: Beautify Pack.

Apply realistic and subtle post-production make-up to your actors, with fine control over skin color, detection thresholds, skin treatment and highlight glow.

Skin retouching has three distinct sections. **Skin Detection** is used to define the area to be processed. This area is called the skin matte. **Skin Treatment** contains the main controls for adjusting the amount of processing applied to the skin matte. **Glow** is used to add a subtle glow to the skin area, to soften it.

Skin Detection

HitFilm will automatically try to select common skin tones. Adjusting the settings below will allow you to ensure that all skin tones are selected, regardless of what color shifts or lighting is present in your footage.

- **Skin Color:** Sets the base color for skin detection. This should be adjusted based on the subject's skin color, by dragging the eyedropper onto a typical portion of the subject's skin in the viewer.
- **Brightness Threshold:** Limits the skin detection based on brightness. Higher values will include a wider range of highlights and shadows in the selection. This can be useful for selecting skin in shots with uneven lighting, but higher values also make it easier for unwanted areas of the frame to be included in the skin matte.
- **Chroma Threshold:** The skin detection is performed in the YUV color space. The chroma threshold defines the distance around the selected color used to create the detection circle. Increasing this setting includes a wider chromatic range in the selection, which can also easily begin to select unwanted areas of the frame. This setting shuld be kept at the lowest value that is acceptable for your footage.
- **Softness:** Applies a feather to the edge of the skin matte, to more naturally blend it with the rest of the frame.
- Elliptical Deformation: Adjusts the shape of the YUV detection circle into an ellipse, which is a more optimized shape for skin detection.
- Blur Selection: Blurs the resulting skin matte.

Skin Treatment

These controls define how the area inside the skin matte is modified.

• Smooth: Smoothes the skin by applying a blur within the area of the skin matte.

- Edge Threshold: The skin treatment attempts to retain edge detail while smoothing the skin. The edge threshold determines how much detail is retained.
- **Saturation:** Adjusts the color intensity of the skin. A subtle saturation boost often creates a healthy appearance.
- **Exposure:** Adjusts the exposure within the skin matte. Since human faces are the most common subject of video shots, this allows you to easily brighten skin, and draw the viewer's eyes to your subject.

Glow

- **Brightness:** Adjusts the strength of the glow. Subtle use is recommended for average shots, but higher values can also be useful for creating elf-glow effects.
- **Threshold:** Applies a threshold to the skin. Higher thresholds reduce the amount of skin used to generate the glow.
- Radius: Higher radius values will increase the size of the glow, creating a softer, more diffuse result.
- **Colorize:** The glow can be tinted towards a specific color using the color picker. If you want to tint the glow away from normal skin color, to give it a sickly green tinge or an ethereal blue tint, for example, you could select those colors here.

View

Switching between these view modes makes it easier to adjust the skin detection settings.

- **Final Result:** This option shows the processed skin composited back onto your source layer, so you can see the exact results of the effect.
- Skin Matte: Shows a greyscale representation of the skin matte, so you can see exactly what areas are selected. White indicates selected areas, black indicates unselected areas, and grey indicates areas of partial selection. The darker a grey area is, the less effect the Skin Treatment settings will have in that area.
- Skin: Isolates the selected area and hides all parts of the layer that are outside of the skin matte.

7.7.19. Tone Coloring

Tone coloring applies hue shifts to specific tonal ranges of your layer.



• Editing the curve: The tone coloring curve has four control points. Each controls a different tonal range. The points correspond to the controls listed below the spectrum. Drag a point left or right to determine the color that is edited within its tonal range. Drag the point upward to add more of the selected color, or drag it downward to remove the selected color.



- **Global Hue:** Affects the entire tonal range of the layer. Edit the value to change the hue that is selected. As the slider is moved, the corresponding control point on the spectrum will move accordingly.
- Global Adjustment: Increase the percentage to add more of the selected hue, or lower the

percentage to a negative value to reduce the selected hue.

- **Shadows Hue:** Affects only the darker, shadow tones if the layer. Edit the value to change the hue that is selected. As the slider is moved, the corresponding control point on the spectrum will move accordingly.
- **Shadows Adjustment:** Increase the percentage to add more of the selected hue, or lower the percentage to a negative value to reduce the selected hue.
- **Midtones Hue:** Affects the middle tones of the layer, while leaving the shadows and highlights unaffected. Edit the value to change the hue that is selected. As the slider is moved, the corresponding control point on the spectrum will move accordingly.
- **Midtones Adjustment:** Increase the percentage to add more of the selected hue, or lower the percentage to a negative value to reduce the selected hue.
- **Highlights Hue:** Affects only the bright highlight tones of the layer. Edit the value to change the hue that is selected. As the slider is moved, the corresponding control point on the spectrum will move accordingly.
- **Highlights Adjustment:** Increase the percentage to add more of the selected hue, or lower the percentage to a negative value to reduce the selected hue.

7.7.20. White Balance

If your video was shot with incorrect white balance, or has an undesirable color shift, this effect can help to correct the problem. Use the color pipette to select a part of the video that should be white (or neutral grey) and the layer will be corrected.

In the example below, the white balance has been set to the frames of the sunglasses. The first image is the original, with an overly warm, yellowish appearance, while the second image shows the corrected white balance.





- **Color:** Specify the current color value of an area that should be neutral white. HitFilm will then apply a color adjustment to counteract the current tint of that value, and bring it back to a neutral value.
 - **Pipette:** In most cases, the best results will be achieved by clicking the pipette, dragging the cursor to an area of your frame that should be white, and releasing the mouse button there.
 - **Numerical Values:** You can also manually enter values for the red, green and blue channels.
 - Color Picker: Click the color swatch to select a color using a traditional color picker.

7.7.21. YUV Color Correction

EXPRESS ADD-ON YUV Color Correction is available in the Color: Correction Pack.

YUV Color Correction is similar to the standard Color Correction Wheels, but operates within the YUV color space rather than in RGB color space. So the footage is converted to YUV, the adjustments you make are applied, and then the results are converted back to RGB for display. YUV separates the brightness of the image from the color data. The Y channel is the brightness data. The U channel stores chrominance data on a vertical axis through the center of the color wheel, and the V channel stores chrominance data on a horizontal axis through the center of the color wheel.

Highlights

- **Brightness:** Adjust the Y value of the highlights, altering their brightness without affecting the chrominance values. This slider is the same as the slider to the left of the top color wheel.
- **UV Shift Amount:** The strength of color adjustment applied. This slider directly translates to the distance of the control point from the center of the top color wheel.
- **UV Shift Direction:** The hue toward which the colors are adjusted. This radial dial is directly equivalent to the top color wheel, and represents the angle at which the control point sits within the wheel.
- **Hue Shift:** Adjusts the highlight colors of the image by rotating them around the color wheel. The outer wheel's relationship to the main wheel reflects the amount of this adjustment.
- **Saturation:** The saturation of the selected hue. This slider is the same control as the Saturation slider to the right of the top color wheel.

Midtones

- **Brightness:** Adjust the Y value of the midtones, altering their brightness without affecting the chrominance values. This slider is the same as the slider to the right of the middle color wheel.
- **UV Shift Amount:** The strength of color adjustment applied. This slider directly translates to the distance of the control point from the center of the middle color wheel.
- **UV Shift Direction:** The hue toward which the colors are adjusted. This radial dial is directly equivalent to the middle color wheel, and represents the angle at which the control point sits within the wheel.
- **Hue Shift:** Adjusts the midtone colors in the image by rotating them around the color wheel. The outer wheel's relationship to the main wheel reflects the amount of this adjustment.
- **Saturation:** The saturation of the selected hue. This slider is the same control as the Saturation slider to the left of the top color wheel.

Shadows

- **Brightness:** Adjust the Y value of the shadows, altering their brightness without affecting the chrominance values. This slider is the same as the slider to the left of the bottom color wheel.
- **UV Shift Amount:** The strength of color adjustment applied. This slider directly translates to the distance of the control point from the center of the bottom color wheel.
- **UV Shift Direction:** The hue toward which the colors are adjusted. This radial dial is directly equivalent to the bottom color wheel, and represents the angle at which the control point sits within the wheel.
- **Hue Shift:** Adjusts the shadow colors in the image by rotating them around the color wheel. The outer wheel's relationship to the main wheel reflects the amount of this adjustment.
- **Saturation:** The saturation of the selected hue. This slider is the same control as the Saturation slider to the right of the bottom color wheel.

7.7.22. YUV Color Transform

EXPRESS ADD-ON YUV Color Transform is available in the Color: Correction Pack.

Transforms your media from RGB to YUV color space, so you can apply color adjustments using YUV controls.

- **Brightness:** Modifies the brightness of the layer by altering the Y (luminance) channel. In the graphic interface of the effect, the slider to the left of the color wheel controls Brightness.
- **Contrast:** Increases or reduces the contrast of the layer by altering the Y (luminance) channel. In the graphic interface of the effect, the slider above the color wheel controls Contrast.
- UV Shift Amount:* Shifts the color of the layer toward a specific hue. In the graphic interface of the effect, the distance of the handle from the center of the color wheel determines the UV Shift Amount.
- **UV Shift Direction:** Shifts the color of the layer toward a specific hue. In the graphic interface of the effect, the position of the handle within the color wheel determines the hue which the image is shifted toward.
- **Hue Shift:** Shifts all colors in the image an equal distance around the color wheel. In the graphic interface of the effect, the colored ring surrounding the color wheel controls the Hue Shift. Each hue in the color wheel will be shifted to the color directly next to it in the Hue Shift ring.
- **Saturation:** Increases the color intensity of the U and V channels. In the graphic interface of the effect, the slider to the right of the color wheel controls Saturation.
- Color Space: Select the color space used for the conversion. Rec. 601, Rec. 709 and Rec. 2020 are available.

7.8. Color Grading

Color grading effects are ideal for modifying the final look of a project, for artistic or stylistic purposes. **Color grading** was originally a photo lab term for the process of changing the color appearance during the process of duplicating source film to create a release print. These effects allow you to achieve similar results digitally, with a fine degree of control. Each effect has its own page, where full details of the effect and its controls are available.



See also Color Correction.

7.8.1. Bleach Bypass

EXPRESS ADD-ON Bleach Bypass is available in the Color: Looks Pack.

Bleach Bypass simulates the harsh, high contrast look of bleach bypass film processing. Often used for war movies. Bleach bypass takes its name from a technique used to develop color film stock. By skipping the bleaching step in the development process, the silver in the film emulsion is retained, resulting in a black-and-white image laid over the color image. The final image has reduced saturation, and increased contrast and graininess.



- Amount: The intensity of the Bleach Bypass effect applied to your source video.
- **Brightness:** Adjusts the brightness of the video. Actual film is typically shot 1 stop underexposed to prepare for bleach bypass processing, to compensate for the brightening that occurs during the process. This slider allows you to compensate for the brightness of your source video to get the result you want.
- Silver Source: You can change the source used to create the Silver map used by the bleach bypass here. Choose the Intensity of the image, the Luminosity of the image, or the Lightness of the image. This is a case where its best to just try the options, and see which one gives the most pleasing result.

7.8.2. Cine Style

EXPRESS ADD-ON Cine Style is available in the Color: Cine Pack.

Using an s-curve shift, cine style creates a cinematic, Hollywood-style look. It is a fast method for achieving a professional, high quality finish. While it offers rapid results, it still provides controls for fine tuning the appearance. Cine style includes built-in Grain, Vignette and Letterboxing features. These can be turned on or off independently, to create your desired final look.





- **S-Curve:** Adjusts the contrast of the image, by applying an s-curve based on the Curves effect.
- **Color Adjustment:** Controls the color shift applied to the image, which boosts contrasting colors, By default, it pushed toward the teal and orange palette popular in Hollywood blockbusters, but this can be changed using the Color Adjustment Settings below.

Color Adjustment Settings

- Shift: Adjusts the midpoint of the map used to apply the colors to the image.
- Hue: The primary hue toward which the color will be shifted.
- **Exposure:** Adjust the exposure of the image. Use this control and the S-Curve control to find the balance of contrast and brightness that you need.
- Saturation: Increases the color intensity within the image.

2.35:1 Letterbox

Cinematic films often use a wider aspect ratio than standard 16:9 video cameras. You can add a letterbox to your video to give it a more cinematic look.

- Enabled: Toggles the letterbox on and off.
- **Offset:** Adjusts the vertical position of the video, so you can ensure the most important elements of the frame are visible within the letterbox.

Grain

The film stock which was used traditionally on Hollywood films, and from which films take their designation, often has a characteristic grain which is often lacking in video. Adding subtle grain can help your video have a more filmic appearance.

- Enabled: Toggles the Grain on and off
- Amount: The intensity of the Grain effect.
- **Size:** The size of the grain. Grain is generally of a similar size, but its size relative to the frame will vary based on the size of the film. So grain in 8mm film will appear larger than grain in 35mm film. Adjust the size here to get the look you are after.
- Monochrome: Toggles between full color grain and grain that is black and gray only.
- Seed: Each seed gives a different random pattern to the grain.

Vignette

Some camera lenses cause a vignette distortion which darkens the corners of the frame. These controls can be used to simulate that look, or simply to bring more focus to the center of the frame by darkening the edges.

- Enabled: Toggles the Vignette on and off.
- Center: Controls the positioning of the vignette over the frame.
 - **Position:** By default the vignette is centered on the frame, but you can reposition the center anywhere within the frame
 - **Use Layer:** This menu allows you to select any other layer on the timeline, and use its position coordinates as the center of the vignette.
- Horizontal Stretch: Adjusts the width of the vignette.
- Vertical Stretch: Adjusts the height of the vignette.
- **Softness:** Controls the width of the feather applied to the edges of the vignette.
- Curvature: Changes the radius used in the corners of the vignette effect
- Opacity: Adjusts the transparency of the image within the vignette
- **Background:** These settings control the generation of the vignette itself.
 - **Opacity:** Adjusts the opacity of the vignette color applied to the image.
 - **Color:** Select the color which will be used by the vignette. Black is the default.

7.8.3. Classic Cine Style

EXPRESS ADD-ON Classic Cine Style is available in the Color: Cine Pack.

This effect is all about recreating retro film looks. It includes several presets and can also be fully customized. Here's an example of a preset recreating the look from 1950 film Gentlemen Prefer Blondes:



Controls

- Preset: The built-in presets give you a variety of starting points, based on the look of classic films.
 - 2-Strip The Gulf Between (1917)
 - 2-Strip The Toll of the Sea (1922)
 - 2-Strip Kodak (1928)
 - 3-Strip On With The Show (1929)
 - 3-Strip Gentlemen Prefer Blondes (1950)
 - 2-Strip Aviator
 - 3-Strip Aviator
- **S-Curve:** Alters the contrast of the layer, based on a s-curve which alters the shadows and highlights more than mid-tones, while limiting clipping in the extreme values.
- **Exposure:** Allows you to brighten or darken the exposure of the layer.
- Saturation: Increase or decrease the color intensity of the layer.

- **Black:** The black point of the resulting image can be set using the color picker, or by manual selection.
- White: The white point of the resulting image can be set using the color picker, or by manual selection.
- **Defocus Blur:** Blurs the image in a manner that replicates the look of a lens being out of focus. Subtle applications of defocus can help replicate the look of very old film.

Grain

Adds grain to the image to replicate film stock. Choose a preset as a starting place, then adjust the controls to fine tune its appearance.

- Film Size: The smaller the film, the larger the grain will appear in the image.
 - 8mm
 - **16mm**
 - 32mm
- Grain Strength: Increase the strength to make the grain more obvious. In most cases, relatively low settings are best.
- Seed: Change the Seed value to randomize the grain pattern.

Red, Green, Blue

Each channel can be adjusted individually using the following controls.

- **Density:** Increases the intensity of the relevant color channel.
- Hue: Shifts the hue of the relevant color channel around the color wheel.
- Hue Range: Increases or decreases the range of hues affected by the adjustment.
- Exposure: Brightens or darkens the relevant color channel.
- Gamma: Changes the luminosity of the relevant color channel using a nonlinear algorithm.
- **Negative:** Shifts the colors of the areas outside of the relevant color channel. By default the values here are the opposite of the color channel being edited, but you can change the color values to add color into those areas.
- **Output Strength:** Sets the overall strength of the relevant color channel, after all adjustments are applied.

Output Gamma

- **Red:** Adjusts the balance between the three color channels in the layer. Values above 1.0 shift the image toward red.
- Green: Adjusts the balance between the three color channels in the layer. Values above 1.0 shift the

image toward green.

• **Blue:** Adjusts the balance between the three color channels in the layer. Values above 1.0 shift the image toward blue.

Letterbox

- Enabled: Toggles the letterbox on or off.
- **Ratio:** Sets the size of the image inside of the letterbox. The value is the width, applied as a ratio to a height of 1.
- **Offset:** Shifts the visible image inside of the letterbox. If the ratio creates a pillarbox, with black bars on the left and right, then the image will be offset horizontally. If the ratio creates a letterbox with black bars at the top and bottom, the video will be offset vertically.

Vignette

- Enabled: Toggles the vignette on or off.
- Center: Sets the location of the vignette's center.
 - **Position:** Define the position of the center on the X ands Y axes.
 - **Use Layer:** Select another layer from the timeline to use its position as the center. When a layer is selected here, the Position property above functions as an offset, based on the position of the selected layer.
- Horizontal Stretch: Adjusts the width of the vignette.
- Vertical Stretch: Adjusts the height of the vignette.
- Softness: Defines the distance from the center to the start of the feather.
- **Curvature:** Shifts the distance from the center to the mid-point of the feather. Lower values give a mire subtle effect.
- **Opacity:** Determines how opaque or transparent the layer itself is.
- Background: Defines the color fo the vignette
 - **Opacity:** Determines how opaque or transparent the vignette areas are.
 - Color: Choose the color of the vignette. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

7.8.4. Color Cycle

Color Cycle loops the color palette. Adjusting the **phase shift** will cause the colors to cycle. Each color can be adjusted individually, including adjusting its alpha transparency. This can therefore be used to generate mattes based on specific color ranges. It includes numerous Cycle Presets for quickly generating specific looks, such as this hue cycle:



Input Phase

- Phase From: Select which channel from the source is used to map through the color cycle.
- Add Phase: An additional phase shift can be added, based on a second layer on the timeline.
 - Layer: Choose the layer to be used as a source for the added phase shift.
 - **Phase From:** Select which channel from the selected layer is used to map through the color cycle.
 - **Mode:** Choose the mode used to combine the Add Phase with the primary Input Phase.
- **Phase Shift:** Adjusting the phase shift will cause the colors to cycle.

Cycle

- Cycle Preset: Choose from a number of predefined presets that create specific looks.
- Number of Colors: Choose the number of colors used in the cycle. The default is 4. There will be

controls displayed below for as many colors as you set in this property.

- **Color 1:** The number of colors you see controls for will correspond to the value in the Number of Colors property above. The controls for each will be the same.
 - **Phase:** Set the number of degrees by which the colors will be shifted around the color wheel.
 - Color: Choose the color to be used as the basis for this stage of the cycle
 - Alpha: Set the opacity of the color. Lower values make the color more transparent.
- **Cycle Repetitions:** Set the number of times the defined color cycle will be applied to the selected channel.
- Interpolate Palette: When enabled, this property allows for gradual transitions between colors. When disabled, there will be a harder transition from one color to the next.

Output

- **Channels:** Select the channel or channels that will be displayed in the output. Only one option from the menu can be selected at a time, but some options include multiple channels.
- Alpha: Select how the original alpha of the image will be combined with the alpha generated by the effect.
- **Composite Over Layer:** Enabling this option places the results of the Color Cycle above the source layer before calculating the final values.
- Blend With Original: Adjusts the intensity of the final effect.

Masking

- **Masking Mode:** Select the option used to define how the results will be masked onto the original source layer.
 - **Pixel Distance:** Allows masking based on the colors present within the image. Selecting this option opens the Pixel Distance controls below.
 - **Layer:** Allows masking based on another layer on the timeline. Selecting this option opens the Layer Selection controls below.
 - **Both:** Combines Pixel Distance and layer masking. Selecting this option opens both the Pixel Distance and Layer Selection controls below.
- **Pixel Distance:** When the mode is set to Pixel Distance, the following controls will appear.
 - **Color:** Select a color to which the color cycle will be applied.
 - **Tolerance:** Higher tolerance values will include a greater range of colors surrounding the selected Color value.
 - Softness: Higher values soften the edges of the selected range, so the transitions are softer.
 - Mode: Choose between RGB or Hue modes for different results.
- Layer Selection
 - Layer: Choose another layer on the timeline to be used as the source.

• **Channel:** Select which channel from the selected layer is used to map through the color cycle.

7.8.5. Color Map [Layer Only]

The color map effect can be used to apply a color range from one layer to another layer. This is most commonly used with a color gradient. In the following example we will use this image, and color gradient:



The images below show the result of mapping the color gradient onto the image.

The left image shows the full effect of the color map, with the original colors mapped to the new blue gradient. The right image shows the color mapped version blended back onto the original to create an appealing color grade. This was done by applying the Color Map to a grade layer, and reducing the transparency of the grade layer.





The X axis and Y axis property groups define how the color map source is mapped onto the layer. The X axis controls take the colors found in the selected layer from left to right and map them onto the target image. The Y axis controls take the layers found in the selected layer from top to bottom and map them onto the target image.

• Color Map: Choose the layer whose contents will be used to generate the color map.

X Axis

- **Coordinates From:** Choose the channel whose values will be used to map the color source onto the target image.
- Clip Black: Increasing the Clip Black value darkens the shadow areas of the image.
- Clip White: Reducing the Clip White value brightens the highlights of the image.
- Target Black: Increasing the Target Black value lightens the shadow areas of the image.
- Target White: Reducing the Target White value darkens the highlight areas of the image.

Y Axis

- **Coordinates From:** Choose the channel whose values will be used to map the color source onto the target image.
- Clip Black: Increasing the Clip Black value darkens the shadow areas of the image.
- Clip White: Reducing the Clip White value brightens the highlights of the image.
- Target Black: Increasing the Target Black value lightens the shadow areas of the image.
- Target White: Reducing the Target White value darkens the highlight areas of the image.

7.8.6. Color Phase

EXPRESS ADD-ON Color Phase is available in the Color: Starter Pack.

Each color channel can be phased, shifting it to a different color range. The controls rotate the phase around the color wheel, based on the angle value you specify.

- Red Phase: Shifts the hue of the red channel, without affecting the green or blue channels.
- Green Phase: Shifts the hue of the green channel, without affecting the red or blue channels.
- Blue Phase: Shifts the hue of the blue channel, without affecting the red or green channels.
- **Overflow:** Defines how out of range colors are handled.
 - **Wrap:** The color spectrum functions as a circle, and when the end is reached, it wraps back to the beginning.
 - Solarize: Out of range values are inverted.

7.8.7. Color Vibrance

EXPRESS ADD-ON Color Vibrance is available in the Color: Looks Pack.

This effect is ideal for adding color to greyscale procedural effects such as particles and textures. Here is a grayscale fiery planet created using a combination of fractal noise and sphere effects inside HitFilm:



Here's the same shot with color vibrance applied:



Color vibrance is particularly effective at retaining detail in bright areas without creating excessive bloom. The strength of the vibrancy and the luminance preservation can be adjusted, as can the color and phasing of the effect.

- Preset: Several presets are provided which can be used as starting points for your adjustments.
- Color: Select the base color which will be applied to the layer.
- Vibrance: Sets the intensity of the colorization.
- **Phase:** Shifts the hue of the colorization.
- **Preserve Luminance:** Defines how much the total luminance of each pixel is affected by the colorization. Higher values retain more of the original luminance, while lower values allow the added color to alter the luminance value if necessary.
- **Exposure:** Brightens or darkens primarily the highlights of the image, with minimal effects on the shadows.
- **Offset:** Brightens or darkens the shadow areas of the image, with minimal effects on the Highlights. Start with minor adjustments, as excessive changes here can create unnatural results.
- Gamma: Brightens or darkens the midtones of the image.
- Invert: Inverts the color values of the colorized image.
- Generate Matte: Creates a matte based on the colorization.

7.8.8. Day For Night

A quick way to convert a shot filmed in the day to having the appearance of being filmed at night. Day for Night applies a gradient based on the Horizon property, with separate controls for the near and far areas.



- **Horizon:** Sets the position of the horizon line, dividing the Near colorization and Far colorization of the image.
- **Near:** The Near controls are used to set the appearance of your subject and foreground; the area below the horizon line, which will often have a blue cast for a night scene.
 - **Red Gamma:** Defines the amount of red in your foreground.
 - Blue Gamma: Defines the amount of blue in your foreground.
 - Brightness: Increases or decreases the brightness of your foreground.
 - Saturation: Adjusts the intensity of the color in the affected image.
- **Far:** The Far controls alter the area above the horizon, which should usually be quite dark for a convincing night scene.
 - Gamma: Adjusts the darker areas of the background.
 - Brightness: Adjusts mainly the brighter areas of the background.
 - Hue: Selects the hue toward which the background will be tinted.

7.8.9. Duo Tone

EXPRESS ADD-ON Duo Tone is available in the Color: Looks Pack.

Creates a two tone look, based on two specified colors. A gradient from one color to the other is mapped onto the tonal range of the image.



- **Preset:** Choose from a variety of preset color combinations.
- **Color 1:** Choose the color to be mapped onto the highlights of the image. Click the swatch to open a color picker and chose any color. You can also use the eyedropper to select a color from the Viewer, or manually enter the RGB values for your desired color.
- **Color 2:** Choose the color to be mapped onto the shadows of the image. Click the swatch to open a color picker and chose any color. You can also use the eyedropper to select a color from the Viewer, or manually enter the RGB values for your desired color.
- **Invert:** Inverts Color 1 and Color 2. If you realize you need to swap the colors, you can do so easily with this toggle.
- **Threshold:** Shifts the mid-point of the gradient, to adjust the location of the color split in the image's brightness range.
- Softness: Adjusts the overall contrast of the altered image.
- **Blend With Original:** Combines the duo tone effect with the original colors of the image. The percentage indicates how much of the original image is included.

• **Brightness Used:** Select the channel that will be used to determine the brightness and map the Duo Tone onto the original image. Choose between **Intensity**, **Lightness**, or **Luminosity**.

7.8.10. Grading Transfer [Layer Only]

EXPRESS ADD-ON Grading Transfer is available in the Color: LUT Pack.

Matches the look of one layer to another layer. This is a quick way to grade based on an existing source. The transferred grade can then be further customized, either globally or within specific tonal ranges.

Global Transform

Adjusts the entire layer as a whole, affecting all tonal ranges equally.

- Brightness Shift: Controls how much of the selected layer's brightness is transferred.
- Chrominance Shift: Controls how much of the selected layer's color data is transferred.

Shadow Transform

Adjusts the darkest values of the layer, without altering the mid-tones or highlights.

- Brightness: Controls how much of the selected layer's brightness is transferred in the shadow areas.
- **Chrominance:** Controls how much of the selected layer's color data is transferred in the shadow areas.

Midtones Transform

Adjusts the middle tonal values of the layer, without altering the shadows or highlights.

- **Brightness:** Controls how much of the selected layer's brightness is transferred in the mid-tone areas.
- **Chrominance:** Controls how much of the selected layer's color data is transferred in the mid-tone areas.

Highlights Transform

Adjusts the brightest values of the layer, without altering the shadows or mid-tones.

- **Brightness:** Controls how much of the selected layer's brightness is transferred in the highlight areas.
- **Chrominance:** Controls how much of the selected layer's color data is transferred in the highlight areas.

7.8.11. Hue Colorize

Applies a single user-selected hue to the layer. The tonal value of each pixel is retained, and only the hue is adjusted.



- **Preset:** Choose from a variety of hue presets as a starting point.
- Hue: Select any hue on the color wheel, by shifting the angle of the wheel.
- Hue Strength: Adjust how far the original color is shifted toward the selected hue.
- **Saturation:** Changes the color intensity of the colorized image.
- Lightness: Changes the lightness of the colorized image.

7.8.12. Hue Shift

Hue Shift moves the entire color spectrum of the layer through different hues.



- **Preset:** Choose from a variety of hue presets as a starting point.
- Hue Shift: Adjust how far the original colors are shifted around the color wheel.
- Saturation: Changes the color intensity of the colorized image.
- Lightness: Changes the lightness of the colorized image.

7.8.13. Invert

Inverts the colors in the layer, by inverting the tonal values of each color channel in the image. There are no controls; just toggle the effect on or off to control the inversion.



7.8.14. LUT

EXPRESS ADD-ON LUT is available in the Color: LUT Pack.

LUT files are used to transform color values, which helps to ensure accurate color correction across multiple software and hardware setups. LUT also provides a powerful way to provide a one-click grade, simulating specific film stocks and processing techniques. Applying a LUT to flat footage can produce high quality results very quickly.

The LUT effect can import .cube LUT files.

Take a look at this comparison:



On the left is the original footage, which was purposely shot to be 'flat', providing a neutral starting point for the grade.

The middle image is using a LUT designed to mimic the look of KODACHROME film. The only additional alteration that has been made is to slightly reduce the saturation. In about 10 seconds you can got from a
basic flat look to a highly dramatic and filmic grade." Find out more about KODACHROME and grab the LUT here.":https://frankglencairn.wordpress.com/2014/01/15/everything-looks-better-on-kodachrome-k-tone-lut/

The image on the right is using a Kodak 2393 emulation LUT, Again, you can achieve a good film look with literally a couple of clicks, and note how different this look is to the KODACHROME. <u>You can download</u> several film emulation LUTs and find some great behind-the-scenes info here.

- File Path: Click the folder icon to select the .cube file you wish to apply to your layer.
- Strength: Adjusts the intensity of the selected LUT's effect on your layer, to provide finer control.

Using LUTs

- 1. Add the LUT effect to your layer, from the Effects panel.
- 2. In the controls for the LUT effect, click the **Folder** icon **b** to the right of the LUT File property.
- 3. In the File browser that opens, navigate to the .cube file that you wish to use, and select it.

The LUT will be applied to your layer, and the path to its location will be shown in the effect controls.

7.8.15. Shadows & Highlights

EXPRESS ADD-ON Shadows & Highlights is available in the Color: Starter Pack.

Provides fine control over the visible detail in the extremes of the layer's tonal range.



- **Shadow Amount:** Raises the tonal value of the shadow areas, to reveal detail that is hidden in the shadows.
- Highlight Amount: Lowers the tonal value of the highlight areas, to reveal detail that is blown out.

Shadow

- **Tonal Width:** Determines the range of tones that will be included in shadow adjustments. Higher values will include more midtones and brighter areas.
- Radius: Defines how many surrounding pixels will be averaged in when adjusting shadow areas.
- Black Clip: Pushes all areas at or below the selected tonal value to pure black.

Highlight

- **Tonal Width:** Determines the range of tones that will be included in highlight adjustments. Higher values will include more midtones and darker areas.
- Radius: Defines how many surrounding pixels will be averaged in when adjusting highlight areas.
- Black Clip: Pushes all areas at or above the selected tonal value to pure white.

- **Color Correction:** In areas where colors are pushed to high levels of saturation by the adjustments, this brings the colors down toward more natural values.
- Midtone Correction: Shifts the midtones of the image to make them brighter (right) or darker (left).
- **Blend With Original:** Combines the adjustments with the original colors of the image. The percentage indicates how much of the original image is included.

7.8.16. Three Strip Color

Simulates the three strip Technicolor film process commonly used in the early days of color film, resulting in richer, deeper colors.



- **Preset:** Use the menu to choose from several preset starting points.
- Red Strength: Adjusts the intensity of the Red channel of the image.
- Green Strength: Adjusts the intensity of the Green channel of the image.
- Blue Strength: Adjusts the intensity of the Blue channel of the image.

7.8.17. Two Strip Color

Simulates the two strip Technicolor film process. More information on the process can be found in this article on <u>Wikipedia</u>

In the original process, a black and white negative was used, and a prism beam-splitter behind the camera lens exposed two consecutive frames simultaneously, one behind a red filter, the other behind a green filter.

After development, each print was dyed to a complimentary color of the filter used: red for the green-filtered images, cyan for the red-filtered ones. The highlights would remain clear, dark areas would be strongly colored, and intermediate tones were colored proportionally. The two prints, made on film stock half the thickness of regular film, were then cemented together back to back to create a projection print. This process is simulated in HitFilm's Two Strip color effect.

- Preset: Several presets are included as starting points.
- Red Filter: Choose the color of the red prism.
- Green/Blue Filter: Choose the color of the green prism.
- **Red Dye:** Choose the color of the dye applied to the image created by the green prism, which should be complimentary and is Red by default.
- **Cyan Dye:** Choose the color of the dye applied to the image created by the red prism, which should be complimentary and is Cyan by default.
- Brightness: Adjusts the overall brightness of the modified image.
- Saturation: Adjusts the color intensity of the modified image.
- Offset Darks: Slide left to intensify shadows, or shift right to lessen the shadow intensity.

7.8.18. Vibrance

EXPRESS ADD-ON Vibrance is available in the Color: Starter Pack.

Adds pop to your image, emphasizing edge detail by increasing local contrast. To generate the result, the effect first generates a temporary copy of your image with inverted colors. Then, this inverted image is blurred and mixed with the original. The result of that mixing is then applied to the original image using a 'soft light' blend mode.



- Radius: Sets the radius of the blur applied to the inverted copy.
- Intensity: Adjusts the mix ratio of the original image and the inverted copy. Higher values use more of the inverted copy, lower values use more of the original image.
- Iterations: The number of times the effect is applied. Higher values intensify the results.

7.8.19. Vignette

Adds a colored overlay to the edges of the layer. You can customize the color, shape and softness of the vignette.



- **Preset:** Several presets are available as starting points of varying intensity.
- Vignette Center: By default the vignette is centered in the frame, but you can reposition the center if you wish.
 - **Position:** Sets the exact location of the vignette center, using X and Y values.
 - Use Layer: Select any other layer on the timeline to use it's position as the center of the vignette. When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- Width: The width of the vignette's bright center, in pixels.
- Height: The height of the vignette's bright enter, in pixels.
- Horizontal Stretch: Adjusts the width of the vignette.
- Vertical Stretch: Adjusts the height of the vignette.
- **Softness:** Defines the distance from the center to the start of the feather.
- **Curvature:** Shifts the distance from the center to the mid-point of the feather. Lower values give a more subtle effect.
- Strength: Sets the intensity of the vignette.
- Color: Choose the color used for the surrounding area that creates the vignette.
 - Alpha: Adjusts the opacity of the vignette color.

 Color: Choose the color to be used for the vignette. Click the swatch to open a color picker and chose any color. You can also use the eyedropper to select a color from the Viewer, or manually enter the RGB values for your desired color.

7.8.20. Vignette Exposure

This alternate vignette effect adjusts the exposure of the edges of the frame, instead of applying an overlay. This can produce a subtler and more natural vignetting result. The vignette can also be pushed brighter, which creates a halo effect or can be used to counteract unwanted vignetting in the source footage.

- **Amount:** Sets the exposure of the vignette. Positive values brighten the exposure, and negative values darken the exposure.
- Mid-point: Sets the distance from the center of the effect to the mid-point of the gradient.
- Center: By default the vignette is centered in the frame, but you can reposition the center if you wish.
 - Position: Sets the exact location of the vignette center, using X and Y values.
 - **Use Layer:** Select any other layer on the timeline to use it's position as the center of the vignette. When a layer is selected, the Position property above functions as an offset from the selected layer's position.

Stretch

- **Global:** Adjusts the overall size of the gradient.
- Horizontal: Adjusts the width of the vignette.
- Vertical: Adjusts the height of the vignette.
- Rotation: Rotates the vignette from its default angle.

7.9. Depth

PRO EXCLUSIVE Depth effects are exclusive to HitFilm Pro.

The depth effects can aid in creating the illusion of depth when blending 2D layers with 3D models or 3D effects. HitFilm also supports genuine 3D compositing, which allows you to place 3D layers precisely in all three dimensions. For situations where it is necessary to blend 2D and 3D layers, however, the depth effects can be quite useful. Each effect has its own page where you can find full details fo the effect and its controls.

- Depth Mask [Layer Only]
 PRO EXCLUSIVE
- Depth Matte [Layer Only]
 PRO EXCLUSIVE

7.9.1. Depth Mask [Layer Only]

PRO EXCLUSIVE Depth Mask is exclusively available in HitFilm Pro.

Depth Mask can be applied to a 2D layer to mask the layer based on the depth of another layer on the same timeline. For example, you may want a video layer to intersect with a 3D model that you have imported. Normally this would require that the model be set to 3D unrolled, which prevents you from applying effects to the model. But if you apply a Depth Mask to the video, then select the 3D model as the depth layer, they can intersect while still retaining their 2D qualities.

- **Depth Layer:** Select the layer to be used as the depth source. If a video or image is chosen, the color data will be used as a depth map. If a 3D model or particle layer is selected, the Z-depth data of the layer will be used.
- Invert: Inverts the depth map.
- **Softness:** Feathers the depth map. This will be particularly noticeable where the layers appear to intersect.
- **Depth Shift:** Adjusts the apparent depth of the depth layer, in relation to the layer the effect is applied to. Positive values will move it closer to the camera, and negative values will move it farther away. Note that the actual position of the Depth Layer is unaffected.

7.9.2. Depth Matte [Layer Only]

PRO EXCLUSIVE Depth Matte is exclusively available in HitFilm Pro.

Depth Matte creates a greyscale depth map, based on the depth of another layer on the same timeline. For example, you could apply Depth Matte to a grade layer, then select a 3D model layer as the Depth Layer to generate a greyscale depth map of the 3D layer's contents.

- **Depth Layer:** Select the layer to be used as the depth source. If a video or image is chosen, the color data will be used as a depth map. If a 3D model or particle layer is selected, the Z-depth data of the layer will be used.
- Invert: Inverts the depth map.
- **Softness:** Feathers the depth map. This defines the total distance between the foreground (black and background (white) of the map.
- **Depth Shift:** Adjusts the apparent depth of the depth layer, in relation to the layer the effect is applied to. Positive values will move it closer to the camera, and negative values will move it farther away. Note that the actual position of the Depth Layer is unaffected.

7.10. Distort

The Distort effects are used to bend, shift, or otherwise alter the details contained within a layer. Each effect has its own page where you can find full details of the effect and its controls.

- Block Displacement
- Bulge
- Chromenator [Layer Only]
- Derez (VGHS) [Layer Only]
- Displacement [Layer Only]
- Energy Distortion
 EXPRESS ADD-ON
- Fluid Distortion
 EXPRESS ADD-ON
- Heat Distortion
- Insect Vision
- <u>Magnify</u>
- <u>Mosaic</u>
- Puppet
 EXPRESS ADD-ON
- Smoke Distortion EXPRESS ADD-ON
- <u>Twirl</u>
- Waves [Layer Only]
- <u>Witness Protection</u>

7.10.1. Block Displacement

Block displacement divides the contents of the layer into blocks, then randomly scatters the blocks to break up the layer



- Size: Sets the size, in pixels, of the blocks.
- **Displacement:** The distance, in pixels, which the blocks will be displaced from their original position.

Block Settings

- Seed: Randomizes the pattern of blocks the layer is divided into.
- Coverage: The percentage of the source layer that will be visible.
- **Displaced Blocks:** The percentage of the visible blocks that will be displaced from their original position. By keyframing the Coverage and Displaced Blocks values, you can make the blocks of a layer gradually appear, or gradually assume their correct position to build the layer.
- Aspect Ratio: Adjusts the aspect ratio of the area into which the blocks can be displaced.

Position

- **Position:** Shifts the position of the blocks without moving the displaced layer.
- **Use Layer:** Use this menu to select another layer on the timeline and use its position to control the block position. When a Layer is selected here, the Position property above reflects the offset of the blocks from the parent layer's location.

Displacement Settings

- Seed: Randomizes the direction in which each block is displaced.
- **Rotation:** Rotates the portion of the layer that is visible within each block
- Sub-Block Displacement: Adds a secondary layer of displacement, to distort the layer even further.
- **Displacement Axis:** Select the axis on which the blocks will be displaced:
 - **Horizontal:** Blocks are only displaced left and right, along the horizontal axis.
 - Vertical: Blocks are only displaced upward and downward, along the vertical axis.
 - Both: Blocks are displaced in all directions.
- Wrap: Controls how the displacement will be wrapped when it reaches the edge of the frame.
 - **No:** No wrapping is applied.
 - **Tiled:** A second identical copy of the image is used alongside the original to fill the wrapped area.
 - **Reflection:** A mirrored copy is used alongside the original to fill the wrapped area.

Image Position

- Position: Shifts the position of the source layer without moving the displaced blocks.
- Use Layer: Use this menu to select another layer on the timeline and use its position to control the image position. When a Layer is selected here, the Position property above reflects the offset of the block's contents from the parent layer's location.

7.10.2. Bulge

Creates the illusion of a bulging shape pushing through the layer. You can choose from multiple shapes and adjust the size and shape of the bulge.



- Center: By default the bulge is centered in the frame, but you can reposition the center if you wish.
 - **Position:** Sets the exact location of the vignette center, using X and Y values.
 - Use Layer: Select any other layer on the timeline to use it's position as the center of the vignette. When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- **Bulge:** Adjusts the height of the bulge. Negative values invert the bulge and create a recessed pinch effect.
- Radius: Set the overall size of the bulge.
- **Plateau:** You can create a flat area in the center of the bulge. This value sets the radius of that flat area.
- Wrap: When the edges of the frame are distorted, especially using negative values, this determines how the blank space created is handled.
 - **None:** The blank areas remain unaffected.
 - **Tile:** An exact copy of the layer is used to fill the blank area.
 - **Reflect:** A mirrored copy of the layer is used to fill the blank area. The mirroring helps hide any seam at the layer's edge.
- **Shape:** The bulge can be created in a variety of geometric shapes.

- Choose from Circle, Triangle, Square, Pentagon, Hexagon, Heptagon, Octagon, Nonagon, or Decagon.
- Scale: Independently adjust the width and height of the bulge.
 - **X:** Adjusts the width of the bulge.
 - **Y:** Adjusts the height of the bulge.

7.10.3. Chromenator [Layer Only]

Creates the appearance of liquid metal.



- **Preset:** Chose from preset configurations of settings.
- **Source Layer:** The Chromenator effect creates a reflective surface. Select another layer to be reflected into the chrome surface created.
- **Channel:** Select a channel of the layer the effect is applied to. The selected channel will be used to create the depth map on which the Chromenator effect is based.
- Detail Scale: Sets the minimum size of details that will be included in generating the depth map.
- Reflection Distance: Changes the distance between the surface and the reflection.
- Wrap: When the edges of the frame are distorted, wrap determines how the blank space created is handled.
 - **None:** The blank areas remain unaffected.
 - **Tile:** An exact copy of the layer is used to fill the blank area.
 - **Reflect:** A mirrored copy of the layer is used to fill the blank area.

7.10.4. Derez (VGHS) [Layer Only]

Custom-built for Freddie Wong's Video Game High School web series. Creates a digital glitching appearance which was used for characters disappearing out of the game after being shot.



- View: Select the component of the effect you wish to see.
 - **Result:** Shows the final result, with all components of the effect enabled.
 - Pixelation: Shows only the pixelation component of the effect, with its associated controls.
 - Wavy Lines: Shows only the wavy lines component of the effect, with its associated controls.
 - **Horizontal Lines:** Shows only the horizontal lines component of the effect, with its associated controls.
- **Mask:** Select another layer from the timeline to be used as a mask for the effect. The results of the effect will only be visible within the area of the selected layer.

Pixelation

- Strength: Higher values make the pixelation more obvious.
- Source Frame Shift: The pixelation can be based on a different frame of the layer the effect is applied to, to create a temporal glitching. Select the amount of frame shift used with this control.
- **Mask Erode/Expand:** When a Mask is selected, this control adjusts the exact size of the mask area. Negative values contract the mask, and positive values expand the mask.

- Horizontal Blocks: Sets the number of horizontal blocks in the effect. Lower values create larger blocks.
- Vertical Blocks: Sets the number of vertical blocks in the effect. Lower values create larger blocks.

Wavy Lines

- Strength: Higher values make the wavy lines more obvious.
- **Source Frame Shift:** The distortion of the wavy lines can be based on a different frame of the layer the effect is applied to, to create a temporal glitching. Select the amount of frame shift used with this control.

Lines

- Frequency: Controls the number of wavy lines. Higher values create more lines.
- **Sharpness:** Defines how separate and distinct the lines are. Higher values blur the lines together more.
- **Angle:** Rotate the knob to set the angle of the wavy lines. The angle sets the direction of frequency, and is perpendicular to the lines themselves.
- **Smooth Source:** The wavy lines are distorted based on a depth map created form the underlying layer. Increasing this value applies a blur to the layer before calculating the depth map, to smooth the distortion.

Color

• This effect has a built-in version of the Color Correction Wheels effect that modifies the wavy lines specifically. For full details on these controls, see the <u>Color Correction</u> page of this manual.

Displacement

- **Smooth Source:** The wavy lines are displaced based on selected channels of the underlying layer. Increasing this value applies a blur to the selected channels before calculating the displacement, to smooth the distortion.
- Horizontal Displacement: Sets the distance, in pixels, of the horizontal displacement.
- Vertical Displacement: Sets the distance, in pixels, of the vertical displacement.
- Horizontal Displacement Channel: Select the channel of the underlying layer that will be used to calculate the horizontal displacement.
- Vertical Displacement Channel: Select the channel of the underlying layer that will be used to calculate the vertical displacement.

Horizontal Lines

• Strength: Higher values make the horizontal lines more obvious.

• **Source Frame Shift:** The distortion of the horizontal lines can be based on a different frame of the layer the effect is applied to, to create a temporal glitching. Select the amount of frame shift used with this control.

Inverted Lines

- Frequency: Controls the number of horizontal lines. Higher values create more lines.
- **Sharpness:** Defines how separate and distinct the lines are. Higher values blur the lines together more.
- **Angle:** By default these lines are horizontal, as the name implies, but you can rotate the knob to set the angle of the horizontal lines.
- Brightness: Sets the brightness of the inverted lines. Lower values create brighter lines.
- Offset: Controls the overall brightness of the layer. Higher values create a darker image.
- **Smooth Source:** Increasing this value applies a blur to the layer before calculating the depth map, to smooth the distortion. Lower values make the shapes in the underlying layer more apparent.

Brightness Contrast

- Brightness: Adjusts the brightness of the final, altered image.
- Contrast: Adjusts the contrast of the final, altered image.

7.10.5. Displacement [Layer Only]

Shifts the pixels in particular directions according to the displacement source. This can create excellent invisibility and other distortion effects. You can select the source layer and source channels, plus adjust the strength of the displacement.



- Source Layer: Select another layer on the timeline to be used as the displacement source.
- Horizontal Displacement: Select the channel of the source layer that will be used to calculate the horizontal displacement.
- **Max Horizontal Displacement:** Displacement is based on the value of each pixel, with middle gray pixels remaining in place, darker pixels shifting right, and lighter pixels shifting left. This value sets the maximum distance, in pixels, of the horizontal displacement. Using a negative value inverts the direction in which brighter and darker pixels are shifted.
- Vertical Displacement: Select the channel of the source layer that will be used to calculate the vertical displacement.
- **Max Vertical Displacement:** Displacement is based on the value of each pixel, with middle gray pixels remaining in place, darker pixels shifting right, and lighter pixels shifting left. This value sets the maximum distance, in pixels, of the vertical displacement. Using a negative value inverts the direction in which brighter and darker pixels are shifted.
- Wrap Pixels: When the edges of the frame are distorted, this setting determines how the blank space created is handled.

- **None:** The blank areas remain unaffected.
- **Tile:** An exact copy of the layer is used to fill the blank area.
- **Reflect:** A mirrored copy of the layer is used to fill the blank area. The mirroring makes the edges of the frame less apparent, helping to hide any visible seams.

7.10.6. Energy Distortion

Express ADD-ON Energy Distortion is available in the VFX: Distortion Pack.

Distorts your footage based on a procedurally generated fractal pattern. You can adjust the appearance of the distortion using the controls.



- **Distortion:** Adjusts the intensity of the distortion applied to the layer.
- Scale: Sets the scale of the distortion
- **Diffusion Bias:** Set the amount of the image that is affected by diffusion blurring. Increasing the setting will make the blur more prevalent.
- **Diffusion Strength:** Sets the strength of the blur in the areas affected by diffusion.
- **Distortion Rotation:** Sets the angle in which the distortion is applied.
- **Distort Single Axis:** Enabling this option applies the distortion in a single direction. The specific angle used can be set with the Distortion Rotation setting above.

Animation

By default the Energy Distortion is animated. You can set the details of the movement within the effect here.

- Wind Direction: Sets the direction of the movement
- **Wind Speed:** Sets the speed of the movement along the axis determined in the Wind Direction, by altering the position of the noise. Higher values will create more movement in the distortion.
- **Noise Speed:** Sets the speed of the movement of the fractal noise the distortion is based on. This speed alters the shape of the noise, while the Wind Speed property affects its position.

Noise

- **Seed:** Acts as a randomizer for the shape of the noise. Each seed value sets a unique starting shape for the procedurally generated noise.
- Interpolation: Provides options for how the noise is interpolated. Linear Interpolation uses the simplest path to connect points in the rectilinear grid the effect is based on. Cubic interpolation uses smoother paths to interpolate the grid. Neither option is better than the other, they just provide different options for the effect.

Transform

Multiple layers of fractal noise are combined to create the final noise that the distortion is based on. The Transform controls adjust the primary noise, while the Sub Settings alter the sub levels of noise that add detail to the distortion.

- **Position:** Sets the position of the primary fractal noise the distortion is based on.
- Use Layer: You can select another layer on your timeline, to parent the position of the distortion to that layer
- Rotation: Sets the rotation of the primary fractal noise
- Axis Scale X: Alters the aspect ratio of the primary fractal noise by changing its scale along the X axis. Higher values will stretch the distortion horizontally.
- Axis Scale Y: Alters the aspect ratio of the primary fractal noise by changing its scale along the Y axis. Higher values will stretch the distortion vertically.

Sub Settings

- **Sub Levels:** Sets the number of sub levels that are used to calculate the distortion. Higher levels create greater detail in the distortion.
- Influence: Controls the intensity with which the sub levels alter the primary noise.
- Scale: Sets the scale of the sub levels, thus impacting the size of the detail added by the additional

sub levels.

- **Rotation:** Alters the angle of the sub levels which are laid over the primary noise.
- Offset: Sets the position of the sub levels in relation to the primary noise position.
- **Center Subscale:** Enabling this option links the center of all subscale layers, so they stay aligned when offset using the above control.

7.10.7. Fluid Distortion

EXPRESS ADD-ON Fluid Distortion is available in the VFX: Distortion Pack.

Distorts your footage based on a procedurally generated fractal pattern. You can adjust the appearance of the distortion using the controls.



- Distortion: Adjusts the intensity of the distortion applied to the layer.
- Scale: Sets the scale of the distortion
- **Diffusion Bias:** Set the amount of the image that is affected by diffusion blurring. Increasing the setting will make the blur more prevalent.
- Diffusion Strength: Sets the strength of the blur in the areas affected by diffusion
- **Distortion Rotation:** Sets the angle in which the distortion is applied.
- **Distort Single Axis:** Enabling this option applies the distortion in a single direction. The specific angle used can be set with the Distortion Rotation setting above.

Animation

By default the Fluid Distortion is animated. You can set the details of the movement within the effect here.

• Wind Direction: Sets the direction of the movement

- **Wind Speed:** Sets the speed of the movement along the axis determined in the Wind Direction, by altering the position of the noise. Higher values will create more movement in the distortion.
- **Noise Speed:** Sets the speed of the movement of the fractal noise the distortion is based on. This speed alters the shape of the noise, while the Wind Speed property affects its position.

Noise

- **Seed:** Acts as a randomizer for the shape of the noise. Each seed value sets a unique starting shape for the procedurally generated noise.
- Interpolation: Provides options for how the noise is interpolated. Linear Interpolation uses the simplest path to connect points in the rectilinear grid the effect is based on. Cubic interpolation uses smoother paths to interpolate the grid. Neither option is better than the other, they just provide different options for the effect.

Transform

Multiple layers of fractal noise are combined to create the final noise that the distortion is based on. The Transform controls adjust the primary noise, while the Sub Settings alter the sub levels of noise that add detail to the distortion.

- Position: Sets the position of the primary fractal noise the distortion is based on.
- Use Layer: You can select another layer on your timeline, to parent the position of the distortion to that layer
- Rotation: Sets the rotation of the primary fractal noise
- Axis Scale X: Alters the aspect ratio of the primary fractal noise by changing its scale along the X axis. Higher values will stretch the distortion horizontally.
- Axis Scale Y: Alters the aspect ratio of the primary fractal noise by changing its scale along the Y axis. Higher values will stretch the distortion vertically.

Sub Settings

- **Sub Levels:** Sets the number of sub levels that are used to calculate the distortion. Higher levels create greater detail in the distortion.
- Influence: Controls the intensity with which the sub levels alter the primary noise.
- Scale: Sets the scale of the sub levels, thus impacting the size of the detail added by the additional sub levels.
- Rotation: Alters the angle of the sub levels which are laid over the primary noise.
- Offset: Sets the position of the sub levels in relation to the primary noise position.
- **Center Subscale:** Enabling this option links the center of all subscale layers, so they stay aligned when offset using the above control.

7.10.8. Heat Distortion

Applies automatic heat distortion with built-in displacement and diffusion. The behavior can be adjusted for faster or slower movement.



- Scale: Sets the scale of the distortion
- Distortion: Adjusts the intensity of the distortion applied to the layer.
- **Diffusion Bias:** Set the amount of the image that is affected by diffusion blurring. Increasing the setting will make the blur more prevalent.
- Diffusion Strength: Sets the strength of the blur in the areas affected by diffusion
- **Distortion Rotation:** Sets the angle in which the distortion is applied.
- **Distort Single Axis:** Enabling this option applies the distortion in a single direction. The specific angle used can be set with the Distortion Rotation setting above.

Animation

By default the Energy Distortion is animated. You can set the details of the movement within the effect here.

- Wind Direction: Sets the direction of the movement
- Wind Speed: Sets the speed of the movement along the axis determined in the Wind Direction, by altering the position of the noise. Higher values will create more movement in the distortion.

• **Noise Speed:** Sets the speed of the movement of the fractal noise the distortion is based on. This speed alters the shape of the noise, while the Wind Speed property affects its position.

Noise

- **Seed:** Acts as a randomizer for the shape of the noise. Each seed value sets a unique starting shape for the procedurally generated noise.
- Interpolation: Provides options for how the noise is interpolated. Linear Interpolation uses the simplest path to connect points in the rectilinear grid the effect is based on. Cubic interpolation uses smoother paths to interpolate the grid. Neither option is better than the other, they just provide different options for the effect.

Transform

Multiple layers of fractal noise are combined to create the final noise that the distortion is based on. The Transform controls adjust the primary noise, while the Sub Settings alter the sub levels of noise that add detail to the distortion.

- **Position:** Sets the position of the primary fractal noise the distortion is based on.
- Use Layer: You can select another layer on your timeline, to parent the position of the distortion to that layer
- Rotation: Sets the rotation of the primary fractal noise
- Axis Scale X: Alters the aspect ratio of the primary fractal noise by changing its scale along the X axis. Higher values will stretch the distortion horizontally.
- Axis Scale Y: Alters the aspect ratio of the primary fractal noise by changing its scale along the Y axis. Higher values will stretch the distortion vertically.

Sub Settings

- **Sub Levels:** Sets the number of sub levels that are used to calculate the distortion. Higher levels create greater detail in the distortion.
- Influence: Controls the intensity with which the sub levels alter the primary noise.
- Scale: Sets the scale of the sub levels, thus impacting the size of the detail added by the additional sub levels.
- Rotation: Alters the angle of the sub levels which are laid over the primary noise.
- Offset: Sets the position of the sub levels in relation to the primary noise position.
- **Center Subscale:** Enabling this option links the center of all subscale layers, so they stay aligned when offset using the above control.

7.10.9. Insect Vision

Distorts the layer through a hexagon pattern of tiles, to create the appearance of a multi-faceted insect eye.



- Preset: Choose a preset configuration of settings as a starting point.
- Center: By default the effect is centered in the frame, but you can reposition the center if you wish.
 - Position: Sets the exact location of the effect center, using X and Y values.
 - Use Layer: Select any other layer on the timeline to use it's position as the center of the effect.
 When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- Rotation: Rotates the hex pattern around the central tile.
- Lens Size: Determines the width, in pixels, of each hex tile in the pattern.
- **Zoom:** Controls how much of the underlying image is visible through each hex tile, or lens. Lower values tend to give the effect of multiple copies of the image typically associated with this effect.
- Iris Bulge: Distorts each lens as if it was bulged, creating a fisheye distortion within each lens.
- **Wrap:** At low Zoom levels, the edges of the frame may become visible within each lens. This control determines how the blank space created is handled.
 - No: The blank areas remain unaffected.
 - Tile: An exact copy of the layer is used to fill the blank area.
 - Reflect: A mirrored copy of the layer is used to fill the blank area.

7.10.10. Magnify

Zooms in on a specific area of the layer. The shape, size and position of the magnification can all be changed.



- **Center:** By default the magnification is centered in the frame, but you can reposition the center if you wish.
 - **Position:** Sets the exact location of the magnification center, using X and Y values.
 - Use Layer: Select any other layer on the timeline to use its position as the center of the magnification. When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- Radius: Sets the radius, in pixels, of the magnified area.
- **Magnification:** Adjusts the amount of magnification applied within the radius.
- **Bulge:** Controls the amount of bulge distortion applied within the radius. Higher bulge values reduce the distortion at the edges of the magnified area.
- Wrap: When the edges of the frame are distorted, wrap determines how the blank space created is handled.
 - No: The blank areas remain unaffected.
 - **Tile:** An exact copy of the layer is used to fill the blank area.
 - **Reflect:** A mirrored copy of the layer is used to fill the blank area.
- Shape: Select the shape to be used for the bulge.
 - Choose between Circle, Triangle, Square, Pentagon, Hexagon, Heptagon, Octagon,

Nonagon, or Decagon.

• **Blend:** Choose the blend mode used to apply the effect to the underlying layer.

Shape

When a shape other than Circle is selected in the Shape menu, additional controls will be displayed to provide further control over the shape.

- Rotation: Turn the knob to rotate the magnified shape.
- **Curvature:** Adds a curve to each edge of the shape. Negative values curve inward, and positive values curve outward.
- **Pinch:** Adjusts the weighting of the curvature.
- Shift: Rotates the curvature without moving the shape itself, to shift how the edges are curved.

7.10.11. Mosaic

Creates a tiled, mosaic appearance by reducing the number of distinct pixels in the layer. The color values of all pixels within each block are averaged to determine the color value used for that block.



- Preset: Choose from a variety of predetermined configurations of the effect.
- Horizontal Blocks: Determines the number of horizontal blocks. Lower numbers create larger, more obvious blocks.
- Vertical Blocks: Determines the number of vertical blocks. Lower numbers create larger, more obvious blocks.

7.10.12. Puppet

EXPRESS ADD-ON Puppet is available in the Motion: Puppet Pack.

The Puppet tool allows you to set up specific control points within your layer, then animate the position of each point to move or distort the layer's contents.





Using the Puppet tool

- 1. Add the puppet effect to your layer.
- 2. **Click** in the Viewer to add new control points. A new control point will be added at each location you click.
- 3. Drag any existing point to a new location to distort the image beneath it.
- 4. If you wish to reposition a point without distorting the image, hold **Shift** while you **drag** the point. While shift is held, the mesh that is used to generate the distortion will be visible, and points can be repositioned without altering the distortion.

Controls

- **Mode:** The Mode changes automatically as you edit the effect in the Viewer. If you want to manually force a specific mode, you can do so here.
 - **Animate:** In Animate Mode the control points are pined to the layer, and moving any control point will distort the layer accordingly. Note that keyframing must still be enabled for individual control point properties in order to change the values over time.
 - **Edit:** In Edit mode you can add points and change the position of existing points without affecting the source layer. The mesh is overlaid onto your image when Edit mode is active.

When Edit mode is selected, some additional controls appear, which allow you to fine tune the mesh used to distort the image.
- **Expansion:** Expands the boundaries of the mesh beyond the borders of the layer. If you get unwanted creasing along the edges of your layer when it is distorted, try increasing the expansion to smooth out the edges.
- **Tessellation:** Controls the size of the triangles that make up the mesh. Increasing tessellation creates more faces, for smoother curves in the distortion. Increased tessellation may also increase processing time.
- **Rigidity Map:** You can use a map to add rigidity to certain areas of the layer, and further control how it is distorted.

Control Points

You can create as many control points as necessary within the Puppet tool. Control points are numbered in the order in which they are created, and each control point will have two controls:

- **Position:** Identifies the exact position of the control point at the current frame, on the X and Y axes.
- **Z-Order:** Controls the depth order of the points. If your points are moved so that parts of the layer overlap, the Z order determines which point is in front. In overlapping areas, point with higher Z-order values will be rendered in front of points with lower values.

7.10.13. Smoke Distortion

EXPRESS ADD-ON Smoke Distortion is available in the VFX: Distortion Pack.

Distorts your footage based on a procedurally generated fractal pattern. You can adjust the appearance of the distortion using the controls.



- Distortion: Adjusts the intensity of the distortion applied to the layer.
- Scale: Sets the scale of the distortion
- **Diffusion Bias:** Set the amount of the image that is affected by diffusion blurring. Increasing the setting will make the blur more prevalent.
- Diffusion Strength: Sets the strength of the blur in the areas affected by diffusion
- **Distortion Rotation:** Sets the angle in which the distortion is applied.
- **Distort Single Axis:** Enabling this option applies the distortion in a single direction. The specific angle used can be set with the Distortion Rotation setting above.

Animation

By default the Energy Distortion is animated. You can set the details of the movement within the effect here.

• Wind Direction: Sets the direction of the movement

- **Wind Speed:** Sets the speed of the movement along the axis determined in the Wind Direction, by altering the position of the noise. Higher values will create more movement in the distortion.
- **Noise Speed:** Sets the speed of the movement of the fractal noise the distortion is based on. This speed alters the shape of the noise, while the Wind Speed property affects its position.

Noise

- **Seed:** Acts as a randomizer for the shape of the noise. Each seed value sets a unique starting shape for the procedurally generated noise.
- Interpolation: Provides options for how the noise is interpolated. Linear Interpolation uses the simplest path to connect points in the rectilinear grid the effect is based on. Cubic interpolation uses smoother paths to interpolate the grid. Neither option is better than the other, they just provide different options for the effect.

Transform

Multiple layers of fractal noise are combined to create the final noise that the distortion is based on. The Transform controls adjust the primary noise, while the Sub Settings alter the sub levels of noise that add detail to the distortion.

- Position: Sets the position of the primary fractal noise the distortion is based on.
- Use Layer: You can select another layer on your timeline, to parent the position of the distortion to that layer
- Rotation: Sets the rotation of the primary fractal noise
- Axis Scale X: Alters the aspect ratio of the primary fractal noise by changing its scale along the X axis. Higher values will stretch the distortion horizontally.
- Axis Scale Y: Alters the aspect ratio of the primary fractal noise by changing its scale along the Y axis. Higher values will stretch the distortion vertically.

Sub Settings

- **Sub Levels:** Sets the number of sub levels that are used to calculate the distortion. Higher levels create greater detail in the distortion.
- Influence: Controls the intensity with which the sub levels alter the primary noise.
- Scale: Sets the scale of the sub levels, thus impacting the size of the detail added by the additional sub levels.
- Rotation: Alters the angle of the sub levels which are laid over the primary noise.
- Offset: Sets the position of the sub levels in relation to the primary noise position.
- **Center Subscale:** Enabling this option links the center of all subscale layers, so they stay aligned when offset using the above control.

7.10.14. Twirl

Twists the layer around the effect's center point. The center point stays in place, while the pixels at the edge of the radius are distorted by the angle you choose.



- Angle: Sets the number of degrees by which the area inside the radius will be rotated.
- Center: By default the twirl is centered in the frame, but you can reposition the center if you wish.
 - **Position:** Sets the exact location of the effect center, using X and Y values.
 - Use Layer: Select any other layer on the timeline to use it's position as the center of the effect.
 When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- Radius: Determines the distance from the center point to which the distortion will extend.
- Wrap: Controls how the distortion will be wrapped when it reaches the edge of the frame.
 - **No:** No wrapping is applied.
 - **Tiled:** A second identical copy of the image is used alongside the original to fill the wrapped area.
 - **Reflection:** A mirrored copy is used alongside the original to fill the wrapped area.

7.10.15. Waves [Layer Only]

Creates a corrugated effect. You can also choose another layer as the displacement source and alter the lighting on the bright and dark sides of the wave.



- Amplitude: Sets the height from the peak of the waves to the bottom of the valley between waves.
- Frequency: Sets the distance from one peak to the next.
- **Angle:** Rotate the dial to define the angle, in degrees, at which the angle travels, from one peak to the next.
- **Displace Angle:** Distorts the position of the underlying image shown within the waves.
- Center: By default the effect is centered in the frame, but you can reposition the center if you wish.
 - **Position:** Sets the exact location of the effect center, using X and Y values.
 - **Use Layer:** Select any other layer on the timeline to use it's position as the center of the effect. When a layer is selected, the Position property above functions as an offset from the selected layer's position.
- **Phase Speed:** Adds movement to the waves in the direction of the Angle wheel above. Set the speed of the movement here.
- **Distance To Image:** The distance from the waves to the underlying image affects how the image is refracted through the waves. Higher value make the image more distant, and therefore smaller.
- Wrap X: Controls how the blank areas at the left and right edges of the frame will be handled, when the Distance To Image is increased.
 - **No:** No wrapping is applied, and the area is left blank.

- **Tiled:** A second identical copy of the image is used alongside the original to fill the wrapped area.
- **Reflect:** A mirrored copy is used alongside the original to fill the wrapped area.
- Wrap Y: Controls how the blank areas at the top and bottom edges of the frame will be handled, when the Distance To Image is increased.
 - **No:** No wrapping is applied, and the area is left blank.
 - **Tiled:** A second identical copy of the image is used above or below the original to fill the wrapped area.
 - **Reflect:** A mirrored copy is used above or below the original to fill the wrapped area.
- Illumination: Gives the waves themselves a 3D appearance by shadowing the valleys between the waves.

Distortion Map

The waves effect can be limited to a specific area of the frame by using another layer as a distortion map

- Source Layer: Choose any other layer on the timeline to be used as a source for the distortion.
- Blur: Softens the detail of the distortion generated from the source layer.
- **Channel:** Choose the channel of the source layer which will be used as a map to generate the distortion.
- Invert: Reverses the values in the selected channel to invert the distortion.

7.10.16. Witness Protection

This is a quick way to obscure an item within a shot, such as a face, number plate or product logo. You can choose between blur or pixelate styles.



- Preset: Choose from a variety of presets that give you different looks for the effect.
- Size: Sets the diameter of the area that will be distorted.
- Edge Softness: Feathers the edges so they blend softly into the rest of the frame.

Shape

- Scale X: Adjusts the width of the distortion area.
- Scale Y: Adjusts the height of the distortion area.
- Rotation: Rotates the area by the number of degrees to which the dial is moved.

Position

By default the effect is centered in the frame, but you can reposition the center if you wish.

- Center: Sets the exact location of the effect center, using X and Y values.
- **Use Layer:** Select any other layer on the timeline to use it's position as the center of the effect. When a layer is selected, the Center property above functions as an offset from the selected layer's position.

- Method: Choose how the detail within the distortion area is obscured.
 - **Pixelate:** Creates a pixelated mosaic of the area, by dividing it into large blocks and filling each block with the average color of all pixels it contains. Selecting this option reveals the Pixelate controls below.
 - Blur: Applies a blur within the distortion area. Selecting this option reveals the Blur controls below.

Pixelate

- Block Size: Sets the size, in pixels, of each block within the pixelation.
- Randomize Source: Scrambles the position of the blocks to further obscure their contents.

Blur

· Radius: Sets the radius of the blur. Larger numbers hide the details to a greater extent.

7.11. Generate

The Generate effects are used to create new visual elements. These can be applied to layers like any other effect, but rather than modifying the contents of the layer, they create entirely new contents, which can then be used on their own or combined with the original contents.

- <u>3D Extrusion [Layer Only]</u>
- Animated Lasers [Layer Only]
- Audio Spectrum [Layer Only]
- Audio Waveform [Layer Only]
- Auto Volumetrics
- Caustics [Layer Only]
- <u>Clone</u>
- <u>Clouds</u>
- Dimension Rift [Layer Only]
- Distance Field
- Drop Shadow
- End Credits Crawl
- Fractal Noise
- Grid
- <u>Hyperdrive</u>
- <u>Letterbox</u>
- Lightsword (2-Point Auto) [Layer Only]
- Lightsword (4-Point Manual) [Layer Only]
- Lightsword (Glow Only) [Layer Only]
- Lightsword Ultra (2-Point Auto) [Layer Only]
- Lightsword Ultra (4-Point Manual) [Layer Only]
- Lightsword Ultra (Glow Only) [Layer Only]
- Neon Path [Layer Only]
- <u>PiP</u>
- Pond Ripple
- Pulp Sci-fi Title Crawl
- Radio Waves
- <u>Reflection</u>
- Sphere [Layer Only]
- Split Screen Masking [Layer Only]
- <u>Text</u>

- <u>Tile</u>
- <u>Timecode</u>
- <u>Vertical Video</u>
- Wireframe

7.11.1. 3D Extrusion [Layer Only]

EXPRESS ADD-ON 3D Extrusion is available in the VFX: Starter Kit Pack.

Extruding creates the appearance of 3D depth in a flat 2D layer. This is often used to enhance titles but can be used on any layer.



3D extrusion can use the 3D lights in your scene. The material behavior of the extrusion can be adjusted in the Illumination property group. Another layer can be used as an environment map for extruded text. This is effective for creating reflective text or for inheriting some of the lighting in a background plate.



For 3D extrusion to cast shadows the layer must also be set to 3D.

Position

Extrusion is a 2D effect, and can be positioned directly within 2D space. By selecting a 3D layer in the **Transform From** control, however, you can simulate the appearance of a 3D extrusion, and position the layer as if it were 3D.

- **Transform From:** Use this menu to select another layer on the timeline and use its position to control the extrusion's position. When a 3D layer is selected, all three axes of the parent layer's position are factored into positioning the extrusion.
- **Position:** Sets the position of the effect, if there is no layer selected above. When a Layer is selected in the Transform From property, Position reflects the offset of the extrusion from the parent layer's location.
- **Z Shift:** Simulates shifting the effect away from or toward the virtual camera.

Rotation

- Rotation X: Rotates the extrusion around an axis running left to right.
- Rotation Y: Rotates the extrusion around an axis running top to bottom.
- Rotation Z: Rotates the extrusion around an axis running from front to back.

- **Depth:** Defines the depth of the extrusion. Higher values create a wider extruded edge on the layer.
- Quality: Set the quality used to render the extrusion.
 - **Normal:** This option renders the fastest, at the expense of some finer detail. It is useful for keeping performance fast while setting things up
 - **Multisampled:** This option provides a balance between normal and supersampled.
 - **Supersampled:** This option gives the highest quality, but may take slightly longer to render. It is the best option for final rendering.

Depth of Field

- **Enable:** Turns on depth of field rendering, so you can control the distance from the camera at which the extrusion will be in focus
- **DoF Settings:** Choose what camera data will be used to calculate the depth of field.
 - **Active Camera:** uses the active camera in your composite shot, so the depth of field applied to the extrusion matches the depth of field of all other layers in the scene. If you already have a camera on your timeline, this is often the best option to choose.
 - Custom: Allows you to define the specific camera values used to render the depth of field on the extrusion effect. This option is especially useful if you don't have a 3D camera on your timeline. Choosing custom opens the following three properties.
- Aperture: Defines the size of the virtual camera's aperture. Higher values reduce the depth of field.
- Focus Distance: Sets the exact distance, in pixels, from the camera position to perfect focus.
- Blur: Controls the amount of blur applied to the areas outside the field of focus.

Illumination

- **Type:** Select the lighting option that will be used to illuminate the extrusion.
 - **Comp Lights:** Uses all Light layers present in the composite shot timeline.
 - **Selected Lights:** Allows you to specify which lights will illuminate the extrusion. When this option is selected, four menus will appear that allow you to select up to four specific light layers from the timeline.

Material

- Ambient: Determines how much the surface of the extrusion is illuminated by ambient lights.
- **Diffuse:** Determines how much the surface of the extrusion is illuminated by point, directional and spot lights.
- **Specular:** Adjusts the strength of specular highlights when illuminated by point, directional and spot lights. A low specular value will create a more matte surface.
- **Shininess:** Adjusts the size of the specular highlight. A low shininess creates a large, diffuse highlight while a high value creates a smaller, defined highlight.

Environment Map

- Layer: Choose any layer from the timeline to be used as the source of the environment map. The surface of the extrusion will be illuminated and display reflections as if it was surrounded by the selected layer.
- **Pre-blur:** Set the amount of blur applied to the layer before the reflections are calculated. Softening the reflections with blur tends to give more realistic results in many cases.
- Amount: Controls the overall strength of the environment map on the surface of the extrusion.
- **Angle Dependency:** Modifies the angle at which the environment map is reflected. Lower values use more fo the color from the environment map, while higher values tend to brighten the reflection using lighter colors.
- **Texture Scale:** Adjusts the size of the reflected image on the extruded surface.
- **Texture Ratio:** Controls the X ratio of the reflection. Values lower than 1 compress the reflected image from left to right. Values higher than 1 stretch the image from left to right.

Transform

- **X Rotation:** Rotates the reflected environment map image around the X axis, without affecting the rotation of the actual extrusion.
- **Y Rotation:** Rotates the reflected environment map image around the Y axis, without affecting the rotation of the actual extrusion.
- **Z Rotation:** Rotates the reflected environment map image around the Z axis, without affecting the rotation of the actual extrusion.

7.11.2. Animated Lasers [Layer Only]

EXPRESS ADD-ON Animated Lasers is available in the VFX: Starter Kit Pack.

Designed to create laser bolts which travel from one point to another. The lasers can be constructed from multiple lines, which can be further manipulated into spirals, expanding the effect to also be useful in motion graphics animation.



The laser has two position **points** which define the path along which the laser will travel. These interact with the **Laser Length** and **Location** properties, which define the laser bolt's location between the two points.

- Start Point: Sets the origin point of the path along which the laser will travel.
 - Use Layer: Select any other layer on the timeline to use its position as the origin of the laser path. A common example is to select a point layer which contains the tracking data for the muzzle of a prop. When a layer is selected, the Position property below functions as an offset from the selected layer's position.
 - Position: Defines the location of the point from which the laser originates, on the X axis (horizontal) and Y axis (vertical). When the Use Layer option (above) is used, this position value serves as an offset from the position of the selected layer.
 - **Depth:** Adjusts the perspective of the effect along its path. Reduce the depth to make the origin of the laser path appear to be farther away from the camera. Increase the depth to make the

origin appear to be closer to the camera.

- End Point: Sets the target point toward which the laser will travel.
 - **Use Layer:** Select any other layer on the timeline to use its position as the target of the laser path. When a layer is selected, the Position property below functions as an offset from the selected layer's position.
 - Position: Defines the location of the point from which the laser originates, on the X axis (horizontal) and Y axis (vertical). When the Use Layer option (above) is used, this position value serves as an offset from the position of the selected layer.
 - **Depth:** Adjusts the perspective of the effect along its path. Reduce the depth to make the target position of the laser path appear to be farther away from the camera. Increase the depth to make the target position appear to be closer to the camera.
- Laser Length: Defines the length of the laster bolt, in pixels.
- Location: Adjusts the position of the laser bolt, along the path from the start point to the end point. Lower values move it closer to the start point, while higher values move it closer to the end point. Keyframing the Location value allows you to animate the laser's movement along the path.
- **Number of Beams:** The effect includes one beam by default, but you can add up to 10 unique beams to build more complex effects. Each beam will have a section of numbered Beam controls below.

Beam 1 (duplicate controls will be listed for each beam number)

- **Core Color:** Choose a color for the laser core. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Glow Color:** Choose a color for the laser glow which surrounds the core. Usually the glow should be a richer, more saturated color than the core, but you can choose any color you need. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Brightness: Allows you to reduce the brightness of the beam.
- Width: Defines the width of the beam, in pixels.
- Length: Defines the length of the beam, as a percentage of the Laser Length value. When working with multiple beams, adjusting the relative length of each beam provides a massive amount of control for building complex effects.
- Position Shift: Adjusts the position of the beam relative to the Location value.
- Tail Scale: Sets the width of the tail of the beam, as a percentage of the Width value above.
- Edge Size: Adjusts the feather applied to the edges.
- **Color Shift:** Adjusts the balance between the core and glow colors. Decreasing the value makes the core color more prominent, while increasing the value introduces more of the glow color.
- Tail Color Shift: Adjusts the balance between the core and glow colors in the tail portion of the beam.

Decreasing the value makes the core color more prominent, while increasing the value introduces more of the glow color.

- **Brightness Noise:** Breaks up the beam by introducing a noise texture, which makes small random bits of the beam less visible. This can help make it feel more organic.
- **Color Mix Noise:** Breaks up the beam and allows the glow color to show through the core, based on a randomized noise pattern. The **Noise Scale** property in the General controls adjusts the size of the noise used.
- **Beam Blend:** Choose the blend mode used to combine the beam with the underlying layer. The **Noise Scale** property in the General controls adjusts the size of the noise used.
- **Spiral:** Each beam has associated Spiral properties. These are used to twist the beam's straight line into curving spirals.
 - **Radius:** Sets the radius around which the beam is spiraled.
 - **Radius Shrink:** Tapers the radius from the start point to the end point.
 - **Path Angle:** Increasing this value increases the number of rotations present in the beam.
 - Rotation: Adjusts the specific rotation of the beam around the path.
 - Rotation Speed: Animates rotation into the beam, at the speed you choose.

Global Controls

- Brightness: Adjusts the overall brightness of the entire effect, including all beams that are present.
- **Rotation:** Rotates the entire effect, made up of the combination of all beams.
- Rotation Speed: Animates rotation into the entire combined effect, at the speed you choose.
- Noise Scale: Modifies the size of the noise used to break up any beams that include Brightness Noise or Color Mix Noise settings.

7.11.3. Audio Spectrum [Layer Only]

EXPRESS ADD-ON Audio Spectrum is available in the Motion: Audio Visual Pack.

The audio spectrum effect generates spectrum patterns based on a chosen audio layer. The effect is akin to the readout on a graphic equalizer. Extensive controls allow you to fully customize the appearance of the spectrum.



This effect requires a layer containing audio to function correctly.

Audio Input

- Audio Layer: Choose any layer containing audio, to use its audio as the source for generating the spectrum. The effect examines the audio frequencies present in the selected layer, and generates a spectrum that displays those frequencies.
- Channel: Select the audio channel from the source layer that will be used to generate the spectrum.
 - Left: Uses the left audio channel from the layer.
 - **Right:** Uses the right audio channel from the layer.
 - **Average:** Combines the values from the left and right channels then divides by two, and uses that average value.
- Start Frequency: Sets the lowest frequency that will be factored into the effect.
- End Frequency: Sets the highest frequency that will be factored into the effect.
- Duration: Sets the duration for which each sample will be displayed before it is updated from the

source audio.

- Offset: Allows you to shift the visuals through time in relation to the source audio. Negative values will cause the visuals to appear after their corresponding audio. Positive values will cause the visuals to appear before their corresponding audio.
- Sampling: Controls the number of samples displayed in the visual spectrum.
 - **Adaptive:** Evaluates the audio track, and determines how many samples to use based on the contents of the audio.
 - **Custom:** Allows you to specify the exact number of samples used, using the **Number of Samples** slider that appears when this option is selected.

Audio Start

- **Position:** Defines the origin point of the spectrum effect, on the low end of the spectrum.
- **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the start position of the spectrum. When a layer is selected, the Position property above functions as an offset from the parent layer's position.

Audio End

- **Position:** Defines the origin point of the spectrum effect, on the high end of the spectrum.
- **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the end position of the spectrum. When a layer is selected, the Position property above functions as an offset from the parent layer's position.

Colors

- **Preset:** Choose from one of many built-in presets. Presets can be used as-is, or serve as a starting point for further adjustment of settings.
- Interpolation: Controls how the colors are mapped onto the effect. The following three examples all use the same gradient from green to yellow to red, so you can see the difference in each interpolation method.
 - **Distance:** Maps the color gradient vertically onto the total height of each sample of the spectrum. As the height of each sample changes, the length of the gradient will shift to match the height.



 Time: Maps the color gradient horizontally across the entire spectrum effect, starting at the start point, and ending at the end point.



• **Amplitude:** Maps the color gradient vertically onto the total height of the spectrum effect, so the position of each color in the gradient is fixed, and the samples move through them as their height changes.



- **Number of Colors:** Sets the number of different colors used to create the gradient. Separate numbered color controls will be displayed below for as many colors as you select here.
- Color Controls (Numbered)
 - **Radius:** Controls the position of the color's center along the total length of the gradient. A value of 0.00 places it all the way at the start position, and a value of 1.00 placed it all the way at the end position.
 - Color: Choose a color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

- Alpha: Sets the transparency of the color. 0.00 is completely transparent, and 1.00 is completely opaque.
- Height: Defines the overall height of the spectrum, in pixels.
- **Thickness:** Defines the thickness of each visual sample. Lower values give a finer degree of detail, while higher values will use fewer points to generate the visual spectrum.
- **Render Mode:** Choose how the spectrum is drawn. Each of the following examples uses the exact same audio input, so you can see how each option differs from the others.
 - Points: Only the point marking the top of each sample is drawn.



• Lines: A solid line is drawn, connecting each sample to the samples on either side of it.



• **Fill:** A baseline is combined with a solid line connecting all sample points, and filled to create a solid shape.



• Bar Graph: Each sample is drawn as an individual vertical line.



- Amplitude Transform:
 - None: The default option. Increasing audio levels move upward from the baseline.



• **Flip:** Flips the effect upside down, so increasing audio levels move downward from the baseline.



• **Mirror:** Combines the original and flipped effects, so increasing audio levels move both upward and downward from the baseline, creating a symmetrical effect.



• Blend: Controls how the effect is combined with the contents of the layer it is applied to.

7.11.4. Audio Waveform [Layer Only]

EXPRESS ADD-ON Audio Waveform is available in the Motion: Audio Visual Pack.

Generate waveform patterns based on an audio layer. The waveform scrolls along a line, whose position is determined using end points, and its color and appearance is fully customizable.



Requires a layer containing audio to function correctly.

Audio Input

- Audio Layer: Choose any layer containing audio, to use its audio as the source for generating the waveform. The effect examines the audio levels and frequencies present in the selected layer, and generates a waveform that displays that data.
- Channel: Select the audio channel from the source layer that will be used to generate the waveform.
 - Left: Uses the left audio channel from the layer.
 - Right: Uses the right audio channel from the layer.
 - **Average:** Combines the values from the left and right channels then divides by two, and uses that average value.
- **Duration:** Sets the duration of the source file which will be visible at any given time. This will also affect the speed at which the waveform scrolls, with lower values creating faster movement. At very low values, you will see more frantic movement, rather than a recognizable waveform. In this example, the Duration is set to 10 ms.



- Offset: Allows you to shift the visuals through time in relation to the source audio. Negative values
 will cause the visuals to appear after their corresponding audio. Positive values will cause the visuals
 to appear before their corresponding audio.
- Sampling: Controls the number of samples displayed in the visual spectrum.
 - **Adaptive:** Evaluates the audio track, and determines how many samples to use based on the contents of the audio.
 - Custom: Allows you to specify the exact number of samples used, using the Number of Samples slider that appears when this option is selected.

Audio Start

- Position: Defines the origin point of the waveform effect toward which the waveform will scroll.
- **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the start position of the waveform. When a layer is selected, the Position property above functions as an offset from the parent layer's position.

Audio End

- **Position:** Defines the origin point of the spectrum effect from which the waveform will scroll.
- **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the end position of the waveform. When a layer is selected, the Position property above functions as an offset from the parent layer's position.

Colors

- **Preset:** Choose from one of many built-in presets. Presets can be used as-is, or serve as a starting point for further adjustment of settings.
- Interpolation: Controls how the colors are mapped onto the effect. The following three examples all

use the same gradient from white to teal, so you can see the difference in each interpolation method.

• **Distance:** Maps the color gradient vertically onto the total height of each sample of the spectrum. As the height of each sample changes, the length of the gradient will shift to match the height.



• **Time:** Maps the color gradient horizontally across the entire spectrum effect, starting at the start point, and ending at the end point.



• **Amplitude:** Maps the color gradient vertically onto the total height of the spectrum effect, so the position of each color in the gradient is fixed, and the samples move through them as their height changes.



• **Number of Colors:** Sets the number of different colors used to create the gradient. Separate numbered color controls will be displayed below for as many colors as you select here.

- Color Controls (Numbered)
 - **Radius:** Controls the position of the color's center along the total length of the gradient. A value of 0.00 places it all the way at the start position, and a value of 1.00 placed it all the way at the end position.
 - Color: Choose a color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
 - **Alpha:** Sets the transparency of the color. 0.00 is completely transparent, and 1.00 is completely opaque.
- Height: Defines the overall height of the spectrum, in pixels.
- **Thickness:** Defines the thickness of each visual sample. Lower values give a finer degree of detail, while higher values will use fewer points to generate the visual spectrum.
- **Render Mode:** Choose how the spectrum is drawn. Each of the following examples uses the exact same audio input, so you can see how each option differs from the others.
 - Points: Only the point marking the top of each sample is drawn.



· Lines: A solid line is drawn, connecting each sample to the samples on either side of it.



• **Fill:** A baseline is combined with a solid line connecting all sample points, and filled to create a solid shape.



• **Bar Graph:** Each sample is drawn as an individual vertical line.



- Amplitude Transform: Controls how the color gradient is mapped onto the effect.
 - **None:** The default option. The color radius is mapped from 0.00 at the center line, to 1.00 at the lowest point of the waveform.



• **Flip:** Flips the effect upside down, so radius values of 1.00 are mapped to the highest point in the waveform.



 Mirror: Combines the original and flipped versions, so radius values of 1.00 are mapped to both the top and bottom of the waveform, with the center line remaining at 0.00, creating a symmetrical effect.



• Blend: Controls how the effect is combined with the contents of the layer it is applied to.

7.11.5. Auto Volumetrics

EXPRESS ADD-ON Auto Volumetrics is available in the VFX: Lighting Pack.

Generates volumetric lighting effects which can be positioned in 3D. The volumetric rays are based on a source layer.



Here is the original frame:



Often the most effective way to apply auto volumetrics is to a simple plane layer. You can then specify a separate source layer in the Light source properties. Applying the effect to a separate plane provides greater flexibility when moving a 3D camera, as the rays can emanate away from the layer boundaries of the source itself.

The light position determines the angle of the rays. You can also link the light position to another layer, such as a light or point layer.

Light Shafts

- Light Position: Use these controls to specify the central point from which the volumetric rays will emanate.
 - **Use Layer:** Select another layer on the timeline to use that layer's position to control the auto volumetrics.
 - **XY Position:** Change the center position on the X (horizontal) and Y (vertical) axes.
 - **Z Position:** Adjusts the depth of the origin point, on the axis running toward and away from the virtual camera lens.
- Light Falloff: Adjusts the radius of the glow applied to bright areas of the image, which will serve as the source of the rays.
- **Distance Scalar:** Adjusts the length of the rays themselves.

Light Source

- Use Layer: Select the layer whose contents will be used to generate the volumetric rays. By default, the contents of the layer to which the effect is applied will be used, unless a different layer is selected here.
- Use Layer As: Choose how the selected layer is used. It can be used as the Source, as a Mask, or as a Multiplier for the light rays.
- **Threshold:** Defines the level of brightness below which no volumetric rays will be generated. Only the brightest parts of the image, above the assigned threshold value, will be used to calculate the effect.
- **Exposure:** Adjusts the exposure of the source layer before applying the threshold value. This will not alter the selected layer itself, but only how the contents of that layer are processed to calculate where the volumetrics will be applied.

Render

- **Exposure:** Adjusts the exposure of the rendered volumetric rays themselves.
- Saturation: Adjusts the color intensity of the rendered volumetric rays themselves.
- **Colorize:** Allows you to introduce a specific color to the rays, independently of what colors appear in the source layer.
 - **Amount:** How much of the selected color will be blended with the default color of the rays.
 - **Color:** Choose a color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Blend: Controls how the effect is combined with the contents of the layer it is applied to.

7.11.6. Caustics [Layer Only]

Simulates the distortion created when looking through the surface of a volume of water. In this example, the water's surface is entirely generated using Caustics.



This effect can also be used to simulate the natural movement of a liquid surface. The **Bottom Texture** allows you to select another layer whose contents will be used as the floor beneath the water. The **Height Map** controls the shape and movement of the waves on the water's surface. The **Environment Map** handles the reflections on the water's surface.

- **Depth:** Sets the depth of the water simulation. Greater depth values increase the distortion created by the effect.
- **Refractive Index:** Controls how light is refracted through the volume of he water simulation. 1.33 is the refractive index for water. If you wish to simulate other materials, you can change the refractive index used.

Bottom Texture

• Layer: Choose a layer that will be used as the image of the floor below the water volume. This can be an image, a video, or a composite shot.

Height Map

The height map is used to create the water's surface. Luminance values are translated into a height map,

with black areas being highest, and white areas being lowest.

- Layer: Choose any layer on the timeline to use its contents as the height map.
- Wave Height: Sets the range between the highest and lowest points.
- Invert Map: Inverts the values, so white areas are highest, and black areas are lowest.

Surface Texture

• Layer: Chose any layer on the timeline to be used as the surface of the caustics effect.

Illumination

- Type: Select what lights will be used to illuminate the caustics effect.
 - **Comp Lights:** The caustics will be illuminated by entire lighting setup that is present on the timeline.
 - Selected Lights: Allows you to choose specific lights which will be applied to the caustics, while unselected lights will have no effect.
- Material: Control how the caustics will respond to lights.
 - Ambient: Sets the intensity to which any Ambient light layers will affect the caustics.
 - **Diffuse:** Sets the intensity to which any Point, Directional, or Spot light layers will affect the caustics.
 - **Specular:** Adjusts the strength of specular highlights when illuminated by point, directional and spot lights. A low specular value will create a more matte surface.
 - **Shininess:** Adjusts the size of the specular highlight. A low shininess creates a large, diffuse highlight while a high value creates a smaller, defined highlight.

Environment Map

Setting up an environment map to control the reflections on the water's surface is a key part of the caustics effect. The selected layer will be mapped onto a spherical surface which surrounds the caustics effect, and reflections will be created based on that. The sphere itself is not visible, it is only used internally to generate the reflections.

- Layer: Choose the layer whose contents will be reflected onto the caustics surface.
- **Pre-blur:** Blurs the detail of the selected layer within the created reflections. It is often useful to turn off the pre-blur while setting the position of the reflection, then adjust the amount of pre-blur after the position is correct.
- Amount: Sets the overall intensity of the environment map reflections.
- Angle Dependency: Controls the balance of the reflection colors and the illumination color in specular areas of the caustic surface.
- Texture Scale: Adjusts the scale of the reflected image.
- **Texture Ratio:** Adjusts the height of the reflected image without affecting its width, to control the aspect ratio of the reflections.
- **Transform:** Sets the position of the reflected image within the frame.
 - **X Rotation:** Rotates the spherical map on the X axis.
 - Y Rotation: Rotates the spherical map on the Y axis.
 - **Z Rotation:** Rotates the spherical map on the Z axis.

7.11.7. Clone

EXPRESS ADD-ON Clone is available in the Composite: Toolkit Pack.

Quickly create duplicates of your layer and arrange them in grid patterns.



- Number of Clones: Sets the number of copies of the layer which will be created.
- **Position Offset:** Define the X and Y distance from the center of the original to the center of the first clone. The same distance will be used to offset any additional clones. The default value is the width of the source layer, so by default there is no space between the clones.
- **Rotation:** Rotates the original and all clones by a selected number of degrees.
- **Rotation Offset:** Does not affect the original, but increases the rotation of each clone over the one preceding it by the selected value. So at a value of 15°, for example, the original will be rotated 0°, the first clone would be rotated 15°, and the second clone would be rotated 30°, the third clone 45°, etc.
- Scale Offset: Does not affect the original, but adjusts the scale of each clone to the selected percentage, based on the size of the preceding clone.
- Scale Position Offset: Enabling this option reduces the offset of each clone by a percentage corresponding to the Scale Offset.
- **Time Offset:** For layers containing movement, the playback of each clone is offset by the number of frames selected here.
- Clone Mode: Select how the clones are positioned in relation to the original.
 - **Normal:** A single copy of clones is created, traveling in the direction defined by the Position Offset values.
 - Dual: Clones are created in two opposite directions, in the direction defined by the Position Offset values, and by the inverted offset values.
 - **Mirror:** Uses the same positioning as Dual, but the clones positioned using inverted values are also mirrored from the original.
- Frame Loop: Controls playback of the source layer in each clone.
 - **No:** Each instance of the source is played through once, then ends.
 - **Repeat:** Each clone plays repeatedly through the selected loop range, for the duration of the layer the effect is applied to. After reaching the final frame, playback begins again from the first

frame.

- **Oscillate:** Each clone plays repeatedly through the selected loop range, for the duration of the layer the effect is applied to. The frames play back first forward, then in reverse order, then forward, etc.
- Loop Range: When The Frame Loop option is set to **Repeat** or **Oscillate**, Frame Loop controls will be displayed.
 - Start Time: Select the frame of the source layer at which playback will start.
 - End Time: Select the frame of the source material at which play back will stop.
- Blend Mode: Controls how the effect is combined with the contents of the layer it is applied to.

7.11.8. Clouds

A simplified fractal generator which creates a moving, randomly generated cloud texture using a fractal pattern. For more complex fractals requiring a finer degree of control, the Fractal Noise effect should be used.



• **Preset:** Choose from a variety of built-in presets, each of which gives you a predefined set of values for the effect controls. These can be used as-is, or as a starting point for further adjustments.

Center

- Position: Sets the overall position of the effect, using X (horizontal) and Y (vertical) values.
- **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the position of the clouds. When a layer is selected, the Position property above functions as an offset from the parent layer's position.

Shape

- **Frequency:** Sets the frequency of the fractal waveform on which the effect is based, thus adjusting the scale of the clouds. Higher values reduce the size of the individual cloud components.
- Frequency Relative X: Adjusts the frequency only on the X axis, thereby altering the aspect ratio of the cloud pattern.

- **Iterations:** Controls the amount of detail in the cloud effect, by adjusting how many iterations of fractal noise are used to generate the pattern.
- Seed: Each value randomizes the fractal pattern.

Speed

- X: Sets the speed, in pixels per second, at which the pattern will move on its horizontal axis. Positive values create movement to the right, negative values create movement to the left.
- Y: Sets the speed, in pixels per second, at which the pattern will move on its vertical axis. Positive values create upward movement, negative values create downward movement.

Appearance

- Blend: Sets the blend mode used to apply the cloud effect onto the underlying layer.
- Cloud Brightness: Adjusts the brightness of the cloud effect.
- **Offset:** Shifts the entire range of brightness up or down. Positive values will clip the whites, and negative values will clip the blacks.
- **Cloud Color:** Choose a color for the cloud pattern. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Background Color:** Choose a background color, over which the cloud pattern will be created. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

7.11.9. Dimension Rift [Layer Only]

Instantly create a portal, a circular rift in space leading to another location!



The Dimension Rift effect has several built-in features for easily creating authentic portals:

- Automatically displace the background video as the portal opens.
- A layer can be selected to be visible through the portal.
- · Pre-animated expanding, contracting and connection of portals with controllable animation speed.
- Adjust the 3D wave surface with a fine degree of control.
- Create custom shapes.

Applying the Rift

The Dimension Rift effect can be applied directly onto a video or image layer. This will enable it to displace and warp the background as the portal opens, but you will not be able to rotate and position it in 3D, because it is locked to the host layer.

For more flexibility it is recommended that the effect is added to a separate plane layer (see <u>Creating and</u> <u>using planes</u>). This plane layer can then be transformed in 3D (see <u>Transforming layers in 3D</u>), which will also transform the dimension rift. Even when applied to a separate plane layer, the effect can still warp the

desired source layer. See the Wall Image property, detailed below.

Individual elements of the effect can be enabled or disabled in the Optional Layers section of the controls.

Controls

- Preset: Choose from one of the built-in presets as a starting point for setting up the effect.
- Wall Image: As described in Applying the Rift above, you may want the effect to warp a different layer to the host. The Wall Image property is used to define the layer which should be warped. For example, consider a composite shot containing two layers: a live action video clip and a 3D plane. The Dimension Rift is applied to the 3D plane, which is then positioned in 3D space so that the portal aligns with a wall in the video. The Wall Image property is set to the video layer, so that as the portal opens it warps the video.

Shape

The Dimension Rift defaults to a classic oval shape. This can be customized in the Shape group.

- From Mask: Use the shape of a selected layer, such as an image or embedded composite shot containing an alpha channel, to define the shape of the rift. This makes it easy to create your own custom shapes.
- Position: Adjusts the position of the rift within the layer it is applied to, without moving the layer itself.
- Scale: Adjusts the overall scale of the entire rift effect, including all components which are enabled.
- Rotation: Spins the entire rift effect, including all enabled components.
- Anchor Point: Shifts the anchor point from which the position and rotation of the effect are calculated, relative to the effect.
- **Portal Roundness:** Setting this value to 1.00 creates a perfect circle. Values below 1.00 create an oval that is taller than it is wide. Values above 1.00 create an oval that is wider than it is tall.

View

This controls relate to what is seen through the portal, when it is open.

- **Image:** Choose another layer on the timeline to have that layer be visible through the dimension rift when the rift is open. When **None** is selected, the view through the portal is simply a hole cut through the host layer.
 - Note that the selected *Image will only be visible if the Connection property (found below) is set to a value above 0.00.*
- Position: Shift the visible area of the selected layer on the X (horizontal) axis or the Y (vertical) axis.

- **Z**: Determines the depth, or distance between the rift and the image seen through it. Increasing the Z depth will create a greater sense of parallax movement when the portal moves in 3D.
- Scale: Change the size of the selected layer within the rift.
- Rotation: Spin the selected layer, as seen through the rift.

Appearance

These settings are used to adjust the outline of the rift, and the appearance of the interior elements and texture.

- Noise Scale: Changes the size of the noise that fills the rift shape.
- **Edge Width:** Sets the width, in pixels, of the feathered edge that surrounds the rift. The color of the Edge is determined by the Primary Color property found further down the controls.
- **Outline Width:** Sets the width, in pixels, of the solid line which marks the outside boundary of the rift. The color of the Outline is determined by the Primary Color property found further down the controls.
- **Depth:** Changes the apparent Z depth of the rift.
- **Brightness Direction:** Rotates the highlight applied to the effect. As a general rule, the highlight should be applied to the edge nearest the camera, but you can position it however you want.

Animation

These properties control the animation of the texture which fills the rift while it is closed, and the edge which surrounds the open rift.

- Noise Motion Direction: Select the direction in which the noise pattern will travel.
- Noise Motion Speed: Set the speed at which the noise's position will change, in the direction chosen above.
- Noise Change Speed: Set the speed at which the pattern of noise will be modified.
- **Sparks:** Specify the number of sparks which are emitted as the rift is opened or closed using the connection property, or when the Expansion property is animated.
 - **NOTE:** The color of the sparks displayed during **Expansion** is determined by the Primary Color property found further down the controls.
 - **NOTE:** The color of the sparks displayed during **Connection** is determined by the Secondary Color property found further down the controls.

Optional Layers

Specific elements of the effect can be enabled or disabled, providing finer control over exactly what is included in the effect.

- **Wall:** Enable or disable the interaction with the selected Wall Image layer. Disabling this option removes the Wall Image property from the controls.
- Floating Edge: Enable or disable the solid line which marks the outside boundary of the rift.
- Sparks: Enable or disable the sparks that appear when the rift is expanded or contracted.
- Secondary Portal: When enabled, the inner edge of the opened rift will display the secondary color. Disable this option to remove the secondary color from within the rift.
- Secondary Sparks: Enable or disable the sparks that appear when the rift is connected or disconnected.

The final controls adjust the colors of the dimension rift, and allow you to keyframe its activity.

- **Primary Color:** The primary color is used on the side of the dimension rift closest to camera.
- Secondary Color: The Secondary color can be glimpsed through the portal when it is open, and represents the portal on the 'other side', or the destination of the rift. This can be set to be a different color.
- **Expansion:** Keyframing the Expansion property animates the portal appearing or disappearing on a wall or surface. This includes displacement warping as it expands, as long as you have selected a Wall Image. It also includes Sparks in the primary color.
- **Connection:** Keyframing the Connection property links, or connects, the portal to the destination, thereby opening the portal. With Connection set to 0.00, the portal will be closed, with a rippling, water-like surface. Increasing the Connection will dissolve the rippling surface to reveal the **View**, as set in the View properties.

7.11.10. Distance Field

Creates a grayscale gradient, coloring each pixel based on its distance from the edge of the layer. Distance fields are primarily useful as an intermediary step to creating various other effects, rather than being used on their own as an end result.

ORIGINAL TEXT

DISTANCE FIELD



- Mode: Select the mode that will be used to generate the gradient
 - **Inner Distance:** The edge of the layer is black, and the gradient extends into the layer, to the width of the radius.
 - **Outer Distance:** The edge of the layer is black, and the gradient extends outward from the layer, to the width of the radius.
 - **Edge Distance:** The edge of the layer is black, and the gradient extends in both directions, to the width of the radius.
 - **Signed Distance:** The edge of the layer is mid-gray, and the gradient extends to white inside the layer, and to black outside the layer.
- **Radius:** Defines the width of the gradient in pixels. Everything farther from the edge than the selected radius will be pure white (or pure black, if the effect is inverted)
- Invert: Swaps the black and white ends of the gradient, to invert the grayscale map.

7.11.11. Drop Shadow

Adds a drop shadow to the layer. You can change the scale, distance and appearance of the shadow, or choose to render the shadow without the layer.



- Preset: Choose from one of the built-in shadow configurations.
- Angle: Sets the angle at which the shadow will be offset from the layer's center
- Distance: Choose the distance, in pixels, of the shadow's offset from the layer position.
- **Shadow Color:** Choose a color for the shadow. You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Opacity:** Adjust how transparent the shadow is. 0.00 is completely transparent, and 1.00 is completely opaque.
- Scale: Adjusts the size of the shadow, as a percentage of the source layer's size. Values below 1.00 will be smaller than the source layer, values above 1.00 will be larger than the source layer.
- Scale Pivot: Offsets the origin point from which the shadow is scaled.
- Penumbra: Adjusts the width, in pixels, of the feathered edge of the shadow.
- Shadow Only: Enabling this option hides the layer, and renders only the shadow.

7.11.12. End Credits Crawl

Creates scrolling end credits with automatic formatting and animation, designed to mimic classic feature film credits.



The effect is split into multiple design elements and automatically reflows text and adjusts the layout depending on the copy you provide. Formatting and layout for element titles, role descriptions and names can be adjusted independently, giving you a lot of flexibility within the core framework.

If you omit either titles or roles, the layout will be automatically updated to still make sense. For example, removing roles will reflow the names into a multi-column layout by default, which is useful for crediting a large stunt or VFX team who all share the same role.

Text Format

This section contains the text controls for adjusting the appearance of each of the components of the effect.

• **Color:** Choose a color for the end credits. The entire end credits effect will use a single color. You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

- Title: Edits the appearance of the Title component of each element.
 - **Font:** Choose from any of the fonts installed on your system.
 - **Style:** Select the style of the selected font to be used. **Regular**, **Bold**, **Italic** and **Bold Italic** are available.
 - **Font Size:** Set the size of the text.
 - **Force Uppercase:** Enabling this option overrides the case sensitivity of the text, and uses uppercase letters exclusively.
- **Roles:** Edits the appearance of the Roles component of each element.
 - **Font:** Choose from any of the fonts installed on your system.
 - Style: Select the style of the selected font to be used. Regular, Bold, Italic and Bold Italic are available.
 - Font Size: Set the size of the text.
 - **Force Uppercase:** Enabling this option overrides the case sensitivity of the text, and uses uppercase letters exclusively.
- Names: Edits the appearance of the Names component of each element.
 - **Font:** Choose from any of the fonts installed on your system.
 - **Style:** Select the style of the selected font to be used. **Regular**, **Bold**, **Italic** and **Bold Italic** are available.
 - Font Size: Set the size of the text.
 - **Force Uppercase:** Enabling this option overrides the case sensitivity of the text, and uses uppercase letters exclusively.

Layout

Adjust the layout and positioning of the End Credits effect.

- Width: Sets the maximum overall width of the end credits.
- Horizontal Positioning: Adjusts the position of the end credits, from left to right.
- Vertical Spacing: Adjusts the gaps between the components of the effect.
 - **Element:** Changes the gap between one element and the next.
 - Sub-element: Changes the spacing between the individual components within an element.
 - **Line:** Changes the spacing between the lines in any component of an element that contains multiple lines.
- Horizontal Spacing: Adjusts the horizontal spacing between components of the effect.
 - Column Gap: Adjusts the gap between the Roles column and the Names column.
 - Columned Names Width: For components containing multiple names divided into columns, this adjusts the gap between the columns.
- Speed: Determines the speed at which the credits will crawl.
- · Number of Elements: Set the number of separate elements contained in the complete end credits

crawl.

Numbered Element Controls

A separate set of numbered Element controls (Element 1, Element 2, etc.) will be displayed for each element.

- Title: Enter the title of the element, e.g. Cast, Director, Visual Effects Supervisor, etc.
- **Roles:** For cast elements, enter the character names here.
- Names: Enter the names of the cast or crew members here.

7.11.13. Fractal Noise

Procedurally generates a variety of patterns based on multiple iterations of fractal geometry.



Each fractal method includes a range of properties for customizing the appearance of the effect.

- Preset: Choose from a variety of built-in presets.
- **Seed:** Randomizes the pattern within the style created by the other settings. The seed value can also be keyframed to create movement within the pattern.
 - **Type:** Each type uses a different fractal, to give a different appearance to the pattern.
 - **Blob:** Creates a pattern of solid blobs with defined edges.
 - · Clouds: Creates a pattern of gradual transitions with dithered edges, reminiscent of clouds.
 - Colored Clouds: Similar to clouds, but using the entire spectrum of colors.
 - **Emboss:** Uses a pattern similar to clouds, but then applies a height map, creating a stone-like texture.
 - Marble: A pattern of randomized fluid lines, giving the appearance of marble.
 - **Swirl:** A variation of clouds where each tone has a linear aspect, so the colors swirl softly together.
 - Whisp: Stringy, high contrast pattern.
 - Wood: A strong linear pattern reminiscent of wood grain.
 - Energy: A pattern of thin, energetic strings.

- Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
- **Smoke:** Soft, billowing shapes like the texture of smoke.
- Interpolation: Choose the method used to build the texture from the fractal geometry.
 - Block: Creates a square, pixelated appearance.
 - Linear: Applies more gradual transitions from one block to the next.
 - **Cubic:** More dramatic gradients completely obscure the block pattern to create organic shapes.

Transform

- **Position:** Moves the origin point of the fractal pattern, thereby shifting the entire pattern by the value selected.
- **Use Layer:** Allows you to select another timeline layer, to parent the fractal noise to its position data. When a layer is selected, the Position values above function as an offset from the parent layer.
- Rotation: Rotates the pattern around the origin point.
- Scale: Adjusts the size of the fractal pattern.
- Axis Scale: Allows you to scale the pattern on a single axis.
 - **X:** Scales the width of the pattern without affecting the height.
 - **Y:** Scales the height of the pattern, without affecting the width.

Sub Settings

The sub settings affect the additional iterations of the fractal which are used to break up the primary fractal and create the finer details.

- Sub Levels: Sets the number of sub levels which will be applied.
- **Influence:** Adjusts the balance of the original fractal and the sub levels. Values below 50% favor the original, and values above 50% favor the sub levels.
- Scale: Adjusts the size of the sub levels, without altering the original.
- Rotation: Rotates the sub levels, without rotating the original.
- Offset: Adjusts the position of the sub levels without altering the original.
- **Center Subscale:** Enabling this option precisely aligns the noise used for each sub scale with the primary fractal. Disabling it randomly positions each subscale noise, for more random results.

Appearance

- **Color 1:** Controls for the first color used to generate the fractal pattern.
 - **Color:** You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
 - **Opacity:** Adjusts the transparency of areas of the fractal pattern filled with the first color.

- Color 2: Controls for the second color used to generate the fractal pattern.
 - **Color:** You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
 - **Opacity:** Adjusts the transparency of areas of the fractal pattern filled with the second color.
- **Exposure:** Adjusts the exposure of the fractal effect. The intensity of the results correspond directly to the to the brightness of the original colors, so bright areas are affected more strongly than dark areas. Positive values brighten the effect, and negative values darken it.
- **Offset:** Shifts the entire range of tonal values up or down. Values shifted beyond pure black or pure white will be clipped.
- Blend: Controls how the effect is combined with the contents of the layer it is applied to.

7.11.14. Grid

Creates a grid pattern. The size of each square of the grid is determined by the position of two points, which mark opposite corners of the central square. You can adjust the spacing and size of the grid lines.



- Preset: Choose from one of the built-in grid presets.
- Point 1: The top left corner of the square.
 - Position: Sets the location on the canvas of the top left corner of the central grid square
 - **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the position of point 1. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- Point 2: The top left corner of the square.
 - **Position:** Sets the location on the canvas of the top left corner of the central grid square
 - **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the position of point 2. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- Border Radius: Sets the thickness, in pixels, of the grid lines.
- Feather: Adjust the softness of the edges of the grid lines.
 - **Feather X:** Applies a blur on the X axis (left to right), which adjusts the edge softness of the vertical lines.
 - Feather Y: Applies a blur on the y axis (top to bottom), which adjusts the edge softness of the

horizontal lines.

- **Color:** Choose a color for the grid lines. You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Invert:** Enabling this option inverts the effect, creating a grid of visible squares with transparent lines between them.
- Blend: Controls how the effect is combined with the contents of the layer it is applied to.

7.11.15. Hyperdrive

Jumping to lightspeed is as easy as dusting crops with this effect, which generates a spray of streaking stars, complete with built-in animation and customization.



- **Progress:** Controls the overall animation of the effect. At 0% the stars have not yet appeared, and at 100% they have completed their animation past camera. Keyframing the progress creates the animation of the effect.
- **Temperature:** Sets the base color temperature (in Kelvin) of the stars and star lines. Higher temperatures shift the color toward blue. Lower temperatures shift the color toward Orange and red. Daylight white is around 6500 K.
- **Temperature Variation:** Add some variation to the star colors by increasing this value. Colors will vary from the base temperature in both directions, by the amount you select.
- Number of Stars: Determines the number of stars within the frame.
- **Seed:** Each seed value provides a different layout of the star placement, effectively randomizing their positions.
- **Star Blend:** Choose the Blend mode which is used to combine star trails where they overlap. Add is often the best option, which creates a pleasing brightness in overlapping areas.
- Blend With Source: Choose the blend mode used to combine the stars and star trails with the contents of the layer to which the effect is applied. None makes the underlying layer transparent, so only the Hyperdrive effect is visible, and makes it easy to composite the effect onto underlying

timeline layers. On Top lays the stars and star trails over the contents of the layer to which the effect is applied.

7.11.16. Letterbox

The fastest and easiest way to add letterboxing to your movie. Presets enable you to quickly pick from standard film aspect ratios.



- Preset: Choose from a selection of common aspect ratios.
- **Color:** Choose a color for the letterbox areas. You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Aspect Ratio: Choose an aspect ratio to use. The Custom options allow you to specify any ratio you wish.
 - **Custom (ratio)** is used to define the ratio of the width as a percentage of the height (example, 2.35:1).
 - Custom (w:h) allows you to specify the ratio as multiple of a smaller value (example, 16:9).

7.11.17. LightSword (2-Point Auto) [Layer Only]

HitFilm provides the most efficient and high quality tools for creating lightsword effects, reducing the rotoscoping requirements and automating key visual elements such as the motion blur trails.



Lightsword (2-Point Auto) provides a rapid method requiring the placing of two points in the frame, one at the hilt and one at the tip of the prop blade. Once these points are rotoscoped to the movement of the lightsword blade, HitFilm will automatically calculate the appropriate motion blur based on the speed at which the blade is moving, and the path interpolation settings you choose.

Hilt

- **Position Menu:** The hilt position can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position:** The hilt position can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the hilt. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Tip

- **Position Menu:** The tip position can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position:** The tip position can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the tip. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Extension

• **Extension:** Sets the length of the blade, as a percentage of the distance from the hilt to the tip. The lightsword extension can be keyframed to create the 'ignition' animation, whereby the lightsword blade extends out of the hilt, or contracts back in.

Core

The core is the central part of the effect which directly covers the prop blade.

- Width: The Width of the core can be adjusted, as a percentage of the width values set in the Tip and Hilt controls above. This control allows you to adjust the overall width with a single control, while retaining any taper created by the separate width values used in the hilt and tip controls.
- **Color:** Choose a color for the core. The core Color should generally be set sightly off white, in the direction of the color that will be used for the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Feather: Adjusts the softness of the core's edges.
- **Stability:** Lowering the Stability causes the core shape to fluctuate in size, making the blade appear unstable.
- Mask: Control whether masks applied to the layer affect the glow.
 - **Disable:** Allows the glow to naturally wrap around the mask edges, for a softer result. This option is best when the object being masked is very near the lightsword blade
 - **Enable:** Cuts the glow off exactly at the edge of the mask. Masks should generally be enabled when there is a significant distance between the object being masked and the lightsword blade.
 - Invert: Reveals the glow outside the mask, while removing it inside.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the

glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Stability:** Lowering the stability causes the inner glow to fluctuate in size, making the blade appear unstable.
- Flicker: Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.

Path interpolation

During rapid movement motion blur should cause the hilt and tip to fan out, creating a motion trail. Path interpolation is used to create a natural curve along the hilt and tip ends.

- Scale: Reducing the scale to zero will remove all path interpolation, resulting in straight lines drawn at the hilt and tip ends of the blade. Increasing the scale will create path interpolation and curve the ends.
- **Hilt:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- Tip: When the blade is swinging toward or away from the camera, you can adjust the Tip angle to

correspond to the movement of the prop's tip, and get accurate motion simulation.

- **Motion Persistence:** HitFilm automatically attempts to create a natural trail shape based on the movement of the hilt and tip points, based on the expected behavior of a blade in motion. The duration of the trail is determined by the motion persistence. Increasing the value will cause the trail to remain visible for more frames, thus creating a larger trail. Reducing the value will create a smaller trail.
 - Note that motion persistence is restricted by the Auto Scale Persistence properties, if Auto Scale is activated (see below).
- **Persistence Shift:** Shifts the position of the motion blur in relation to the exact hilt and tip locations. This adjusts the trail to be either in front (1.0), behind (0.0) or in the middle (0.5) of the control point positions. At the default of 0.0 this means that on frames containing fast moving blades you should position the control points on the leading edges of the blade.

Auto Scale Persistence

Auto Scale provides additional control over the generation of the persistence trail, determining when the trail is generated. These settings can be used to match the trail to the natural motion blur found in your footage, which may vary depending on your camera settings.

- Auto Scale: Choose how the scale persistence is calculated.
 - **Enable:** Uses the thresholds below to calculate the motion persistence.
 - Disable: Uses only the Motion Persistence property. Therefore the trail will always be generated even during small movements. A high Motion Persistence value combined with Auto Scale turned off will create a long, unnatural trail. Increasing the motion persistence over 180 can create extreme streaking. This isn't suitable for lightsabers but can be an interesting effect in its own right.
- **Speed Threshold:** Used to restrict the activation of motion persistence. Below the specified threshold, the lightsword shape will be drawn without any trail. This ensures that the blade does not look indistinct when it is moving slowly. As soon as the speed threshold is exceeded, the trail will be generated according to the motion persistence setting.
- **Swing Threshold:** Used to restrict the activation of motion persistence. Below the specified threshold, the lightsword shape will be drawn without any trail. This ensures that the blade does not look indistinct when it is moving slowly. As soon as the swing threshold is exceeded, the trail will be generated according to the motion persistence setting.
- **Minimum Persistence:** Determines how much motion trail is generated on frames where the speed and swing thresholds are not met. Setting this to 0.0 ensures the blade shape is defined solely by the core, hilt and tip properties. Raising the value will generate a blur trail even during minor movements.

Distortion

Distortion not only alters the edges of the core, to make them more irregular, but distorts the background layer where it is visible through the glow. If Distortion is reduced to 0 the edge will be regular and smooth.

- **Distortion:** Determine how irregular the edge of the core is. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- Blend: Choose the blend mode that is used to composite the effect onto the underlying layers.

7.11.18. Lightsword (4-Point Manual) [Layer Only]

HitFilm provides the most efficient and high quality tools for creating lightsword effects, reducing the rotoscoping requirements and automating key visual elements such as the motion blur trails.



Lightsword (4-Point Manual) provides precise control over the lightsword shape by using four control points, two at the hilt and two at the tip of the prop blade. This allows you to precisely match the shape to the motion blur of the prop blade created by the camera. Both ends of the effect will be curved based on their motion and the Path Interpolation settings you have selected, to create a natural shape for the moving blade.

Hilt

- **Position 1 Menu:** The left hilt corner. Hilt position 1 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 1:** The left hilt corner. Hilt position 1 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Position 2 Menu: The right hilt corner. Hilt position 2 can be linked to another layer via the Position

menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.

- **Position 2:** The right hilt corner. Hilt position 2 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the hilt. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Tip

- **Position 1 Menu:** The left tip corner. Tip position 1 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 1:** The left tip corner. Tip position 1 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- **Position 2 Menu:** The right tip corner. Tip position 2 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 2:** The right tip corner. Tip position 2 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the tip. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Extension

• Extension: Sets the length of the blade, as a percentage of the distance from the hilt to the tip. The lightsword extension can be keyframed to create the 'ignition' animation, whereby the lightsword blade extends out of the hilt, or contracts back in.

Core

The core is the central part of the effect which directly covers the prop blade. Normally it is the brightest component of the effect.

• Width: The Width of the core can be adjusted, as a percentage of the width values set in the Tip and

Hilt controls above. This control allows you to adjust the overall width with a single control, while retaining any taper created by the separate width values used in the hilt and tip controls.

- **Color:** Choose a color for the core. The core Color should generally be set slightly off white, in the direction of the color that will be used for the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Feather: Adjusts the softness of the core's edges.
- **Stability:** Lowering the Stability causes the core shape to fluctuate in size, making the blade appear unstable.
- Mask: Control whether masks applied to the layer affect the glow.
 - **Disable:** Allows the glow to naturally wrap around the mask edges, for a softer result. This option is best when the object being masked is very near the lightsword blade
 - **Enable:** Cuts the glow off exactly at the edge of the mask. Masks should generally be enabled when there is a significant distance between the object being masked and the lightsword blade.
 - Invert: Reveals the glow outside the mask, while removing it inside.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Stability:** Lowering the stability causes the inner glow to fluctuate in size, making the blade appear unstable.
- Flicker: Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.

Path interpolation

During rapid movement motion blur should cause the hilt and tip to fan out, creating a motion trail. Path interpolation is used to create a natural curve along the hilt and tip ends.

- Scale: Reducing the scale to zero will remove all path interpolation, resulting in straight lines drawn at the hilt and tip ends of the blade. Increasing the scale will create path interpolation and curve the ends.
- **Hilt 1:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- **Hilt 2:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- **Tip 1:** When the blade is swinging toward or away from the camera, you can adjust the Tip angle to correspond to the movement of the prop's tip, and get accurate motion simulation.
- **Tip 2:** When the blade is swinging toward or away from the camera, you can adjust the Tip angle to correspond to the movement of the prop's tip, and get accurate motion simulation.

Distortion

Distortion not only alters the edges of the core, to make them more irregular, but distorts the background layer where it is visible through the glow. If Distortion is reduced to 0 the edge will be regular and smooth.

- **Distortion:** Determine how irregular the edge of the core is. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- Blend: Choose the blend mode that is used to composite the effect onto the underlying layers.

7.11.19. Lightsword (Glow Only) [Layer Only]

HitFilm provides the most efficient and high quality tools for creating lightsword effects, reducing the rotoscoping requirements and automating key visual elements such as the motion blur trails.



Lightsword (Glow Only) allows you to create an external glow to any layer's shape. You can use masks to define or animate a layer's shape, then add a glow around the outside of that shape. This technique is commonly used to create the lightsword core using a masked plane, then multiple Lightsword (Glow Only) effects can be added to create a rich, complex glow.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- Stability: Lowering the stability causes the inner glow to fluctuate in size, making the blade appear

unstable.

• Flicker: Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

- Width: Adjusts the overall width of the inner glow, in pixels.
- Color: Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.

Distortion

Distortion not only alters the edges of the core, to make them more irregular, but distorts the background layer where it is visible through the glow. If Distortion is reduced to 0 the edge will be regular and smooth.

- **Distortion:** Determine how irregular the edge of the core is. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- Blend: Choose the blend mode that is used to composite the effect onto the underlying layers.

7.11.20. Lightsword Ultra (2-Point Auto) [Layer Only]

EXPRESS ADD-ON Lightsword Ultra (2-Point Auto) is available in the VFX: Neon Lights Pack.

HitFilm provides the most efficient and high quality tools for creating lightsword effects, reducing the rotoscoping requirements and automating key visual elements such as the motion blur trails.



Lightsword Ultra (2-Point Auto) provides a customizable and fast method for creating lightswords. By placing two points in the frame, one at the hilt and one at the tip of the prop blade, the effect is quickly positioned. Extensive built-in distortion effects allow you to customize the shape of the blade for a variety of different results. Once the position is rotoscoped to the movement of the lightsword blade, HitFilm will automatically calculate the appropriate motion blur based on the speed at which the blade is moving, and the path interpolation settings you choose.

• **Preset Menu:** Choose from one of the built-in presets as a starting point for the effect. Presets should be chosen before you begin animating the effect's position.

Hilt

• **Position Menu:** The hilt position can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When

a layer is selected, the Position values below serve as an offset from the selected layer's position.

- **Position:** The hilt position can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the hilt. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Tip

- **Position Menu:** The tip position can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position:** The tip position can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the tip. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Extension

• Extension: Sets the length of the blade, as a percentage of the distance from the hilt to the tip. The lightsword extension can be keyframed to create the 'ignition' animation, whereby the lightsword blade extends out of the hilt, or contracts back in.

Core

The core is the central part of the effect which directly covers the prop blade.

- Width: The Width of the core can be adjusted, as a percentage of the width values set in the Tip and Hilt controls above. This control allows you to adjust the overall width with a single control, while retaining any taper created by the separate width values used in the hilt and tip controls.
- **Color:** Choose a color for the core. The core Color should generally be set slightly off white, in the direction of the color that will be used for the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Feather: Adjusts the softness of the core's edges.
- Mask: Control whether masks applied to the layer affect the core.
 - **Disable:** Allows the glow to naturally wrap around the mask edges, for a softer result. This option is best when the object being masked is very near the lightsword blade
 - **Enable:** Cuts the glow off exactly at the edge of the mask. Masks should generally be enabled when there is a significant distance between the object being masked and the lightsword blade.
 - Invert: Reveals the glow outside the mask, while removing it inside.

• **Stability:** Lowering the Stability causes the core shape to fluctuate in size, making the blade appear unstable.

Distortion

Core Distortion changes the form of the effect's core.

- Distortion: Adjusts the amount of distortion applied to the core.
- **Type:** Distortion is based on fractal patterns. Choose the fractal pattern used to generate the distortion.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - Heat: Wavering distortion replicating a natural heat haze.
 - Smoke: Soft, billowing shapes like the texture of smoke.
- Noise: Adjust the settings used to control the distortion pattern.
 - Noise Scale: Changes the size of the details contained in the distortion.
 - **Bias:** Adjusts the balance between the initial fractal pattern and the sub-fractals that create finer levels of detail.
 - Complexity: Increasing complexity adds more sub-levels of noise, breaking up the distortion into finer details.
 - Invert: Reverses the fractal patterns for an alternate result.
 - Seed: Each seed value creates a unique pattern, to add variety to the effect.
- Animation: Adjust the motion behavior applied to the distortion.
 - Wind Direction: Rotate the wheel to select the angle of motion applied to the effect.
 - Wind Speed: Adjusts the intensity of the movement.
 - Noise Speed: Adjusts the speed of the sub-fractals, independently from the speed of the initial fractal pattern.
 - Motion Blur: Adds an angle blur aligned with the Wind Direction. Increasing the value adds more blur.
- Blend On Top: Enabling this option renders both the original lightsword effect and the distortion. Disabling it renders only the distorted results.
- Use In Glow: Enabling this option creates the glow based on the shape of the distorted core. Disabling generates the glow based on the original undistorted shape.

Flicker

Adding flicker to the effect can make it more exciting, interesting, and less refined.

- Amount: Adjusts the scale of the flickering, to control its intensity.
- Probability: Adjusts how often the flicker affects the blade. Set the percentage of frames which will
be randomly altered by the flicker.

- Frequency: Adjusts how many frames in sequence make up the flicker.
- Seed: Each seed value gives a unique pattern to the flicker.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Stability:** Lowering the stability causes the inner glow to fluctuate in size, making the blade appear unstable.
- Flicker: Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.
- **Falloff:** Shifts the weight of the glow's gradient, to control how quickly it fades out as it gets farther from the core.
- Mask: Control whether masks applied to the layer affect the glow.
 - **Disable:** Allows the glow to naturally wrap around the mask edges, for a softer result. This option is best when the object being masked is very near the lightsword blade
 - **Enable:** Cuts the glow off exactly at the edge of the mask. Masks should generally be enabled when there is a significant distance between the object being masked and the lightsword blade.
 - Invert: Reveals the glow outside the mask, while removing it inside.

Distortion

Inner Glow Distortion changes the form of the effect's inner glow.

- Distortion: Adjusts the amount of distortion applied to the inner glow.
- **Type:** Distortion is based on fractal patterns. Choose the fractal pattern used to generate the distortion.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - Heat: Wavering distortion replicating a natural heat haze.
 - **Smoke:** Soft, billowing shapes like the texture of smoke.

- Noise: Adjust the settings used to control the distortion pattern.
 - **Noise Scale:** Changes the size of the details contained in the distortion.
 - **Bias:** Adjusts the balance between the initial fractal pattern and the sub-fractals that create finer levels of detail.
 - **Complexity:** Increasing complexity adds more sub-levels of noise, breaking up the distortion into finer details.
 - Invert: Reverses the fractal patterns for an alternate result.
 - Seed: Each seed value creates a unique pattern, to add variety to the effect.
- Animation: Adjust the motion behavior applied to the distortion.
 - Wind Direction: Rotate the wheel to select the angle of motion applied to the effect.
 - Wind Speed: Adjusts the intensity of the movement.
 - Noise Speed: Adjusts the speed of the sub-fractals, independently from the speed of the initial fractal pattern.
 - Motion Blur: Adds an angle blur aligned with the Wind Direction. Increasing the value adds more blur.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

- Width: Adjusts the overall width of the inner glow, in pixels.
- Color: Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Falloff:** Shifts the weight of the glow's gradient, to control how quickly it fades out as it gets farther from the core.
- Mask: Control whether masks applied to the layer affect the outer glow.
 - **Disable:** Allows the glow to naturally wrap around the mask edges, for a softer result. This option is best when the object being masked is very near the lightsword blade
 - **Enable:** Cuts the glow off exactly at the edge of the mask. Masks should generally be enabled when there is a significant distance between the object being masked and the lightsword blade.
 - Invert: Reveals the glow outside the mask, while removing it inside.

Distortion

Outer Glow Distortion changes the form of the effect's outer glow.

- **Distortion:** Adjusts the amount of distortion applied to the inner glow.
- **Type:** Distortion is based on fractal patterns. Choose the fractal pattern used to generate the distortion.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - Heat: Wavering distortion replicating a natural heat haze.
 - **Smoke:** Soft, billowing shapes like the texture of smoke.
- Noise: Adjust the settings used to control the distortion pattern.
 - Noise Scale: Changes the size of the details contained in the distortion.
 - **Bias:** Adjusts the balance between the initial fractal pattern and the sub-fractals that create finer levels of detail.
 - Complexity: Increasing complexity adds more sub-levels of noise, breaking up the distortion into finer details.
 - Invert: Reverses the fractal patterns for an alternate result.
 - Seed: Each seed value creates a unique pattern, to add variety to the effect.
- Animation: Adjust the motion behavior applied to the distortion.
 - Wind Direction: Rotate the wheel to select the angle of motion applied to the effect.
 - Wind Speed: Adjusts the intensity of the movement.
 - **Noise Speed:** Adjusts the speed of the sub-fractals, independently from the speed of the initial fractal pattern.
 - **Motion Blur:** Adds an angle blur aligned with the Wind Direction. Increasing the value adds more blur.

Mask

- From: Choose a layer whose shape will be used to mask the
- Use Source:

Path Interpolation

During rapid movement motion blur should cause the hilt and tip to fan out, creating a motion trail. Path interpolation is used to create a natural curve along the hilt and tip ends.

• Scale: Reducing the scale to zero will remove all path interpolation, resulting in straight lines drawn at the hilt and tip ends of the blade. Increasing the scale will create path interpolation and curve the ends.

- **Hilt:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- **Tip:** When the blade is swinging toward or away from the camera, you can adjust the Tip angle to correspond to the movement of the prop's tip, and get accurate motion simulation.
- **Motion Persistence:** HitFilm automatically attempts to create a natural trail shape based on the movement of the hilt and tip points, based on the expected behavior of a blade in motion. The duration of the trail is determined by the motion persistence. Increasing the value will cause the trail to remain visible for more frames, thus creating a larger trail. Reducing the value will create a smaller trail.
 - Note that motion persistence is restricted by the Auto Scale Persistence properties, if Auto Scale is activated (see below).
- **Persistence Shift:** Shifts the position of the motion blur in relation to the exact hilt and tip locations. This adjusts the trail to be either in front (1.0), behind (0.0) or in the middle (0.5) of the control point positions. At the default of 0.0 this means that on frames containing fast moving blades you should position the control points on the leading edges of the blade.

Auto Scale Persistence

Auto Scale provides additional control over the generation of the persistence trail, determining when the trail is generated. These settings can be used to match the trail to the natural motion blur found in your footage, which may vary depending on your camera settings.

- Auto Scale: Choose how the scale persistence is calculated.
 - Enable: Uses the thresholds below to calculate the motion persistence.
 - Disable: Uses only the Motion Persistence property. Therefore the trail will always be generated even during small movements. A high Motion Persistence value combined with Auto Scale turned off will create a long, unnatural trail. Increasing the motion persistence over 180 can create extreme streaking. This isn't suitable for lightsabers but can be an interesting effect in its own right.
- **Speed Threshold:** Used to restrict the activation of motion persistence. Below the specified threshold, the lightsword shape will be drawn without any trail. This ensures that the blade does not look indistinct when it is moving slowly. As soon as the speed threshold is exceeded, the trail will be generated according to the motion persistence setting.
- Swing Threshold: Used to restrict the activation of motion persistence. Below the specified threshold, the lightsword shape will be drawn without any trail. This ensures that the blade does not look indistinct when it is moving slowly. As soon as the swing threshold is exceeded, the trail will be generated according to the motion persistence setting.
- **Minimum Persistence:** Determines how much motion trail is generated on frames where the speed and swing thresholds are not met. Setting this to 0.0 ensures the blade shape is defined solely by the

core, hilt and tip properties. Raising the value will generate a blur trail even during minor movements.

Background Distortion

Background Distortion warps the background layer where it is visible through the glow of the lightsword effect.

- **Distortion:** Sets the intensity of the distortion applied to the background within the glow. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- **Type:** Distortion is based on fractal patterns. Choose the fractal pattern used to generate the distortion.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - **Heat:** Wavering distortion replicating a natural heat haze.
 - **Smoke:** Soft, billowing shapes like the texture of smoke.
- Noise: Adjust the settings used to control the distortion pattern.
 - Noise Scale: Changes the size of the details contained in the distortion.
 - **Bias:** Adjusts the balance between the initial fractal pattern and the sub-fractals that create finer levels of detail.
 - **Complexity:** Increasing complexity adds more sub-levels of noise, breaking up the distortion into finer details.
 - Invert: Reverses the fractal patterns for an alternate result.
 - Seed: Each seed value creates a unique pattern, to add variety to the effect.
- Animation: Adjust the motion behavior applied to the distortion.
 - Wind Direction: Rotate the wheel to select the angle of motion applied to the effect.
 - Wind Speed: Adjusts the intensity of the movement.
 - **Noise Speed:** Adjusts the speed of the sub-fractals, independently from the speed of the initial fractal pattern.
 - Motion Blur: Adds an angle blur aligned with the Wind Direction. Increasing the value adds more blur.
- Blend: Choose the blend mode that is used to composite the effect onto the underlying layers.

7.11.21. Lightsword Ultra (4-Point Manual) [Layer Only]

EXPRESS ADD-ON Lightsword Ultra (4-Point Manual) is available in the VFX: Neon Lights Pack.

HitFilm provides the most efficient and high quality tools for creating lightsword effects, reducing the rotoscoping requirements and automating key visual elements such as the motion blur trails.



Lightsword Ultra (4-Point Manual) provides precise control over the lightsword shape by using four control points, two at the hilt and two at the tip of the prop blade. This allows you to precisely match the shape to the motion blur of the prop blade created by the camera. Both ends of the effect will be curved based on their motion and the Path Interpolation settings you have selected, to create a natural shape for the moving blade. Extensive built-in distortion effects allow you to customize the details of the blade for a variety of different results.

Hilt

- **Position 1 Menu:** The left hilt corner. Hilt position 1 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- Position 1: The left hilt corner. Hilt position 1 can be manually specified, using X (horizontal) and Y

(vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.

- **Position 2 Menu:** The right hilt corner. Hilt position 2 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 2:** The right hilt corner. Hilt position 2 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the hilt. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Tip

- **Position 1 Menu:** The left tip corner. Tip position 1 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 1:** The left tip corner. Tip position 1 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- **Position 2 Menu:** The right tip corner. Tip position 2 can be linked to another layer via the Position menu. Use the menu to select any other layer on your timeline, to apply the selected layer's position to the Hilt point. When a layer is selected, the Position values below serve as an offset from the selected layer's position.
- **Position 2:** The right tip corner. Tip position 2 can be manually specified, using X (horizontal) and Y (vertical) values. When a layer is selected, these Position values serve as an offset from the selected layer's position.
- Width: Sets the width of the lightsaber core at the tip. The width of the hilt and tip can be set separately, which is useful for creating perspective on the blade or creating tapered shapes.

Extension

• **Extension:** Sets the length of the blade, as a percentage of the distance from the hilt to the tip. The lightsword extension can be keyframed to create the 'ignition' animation, whereby the lightsword blade extends out of the hilt, or contracts back in.

Core

The core is the central part of the effect which directly covers the prop blade.

- Width: The Width of the core can be adjusted, as a percentage of the width values set in the Tip and Hilt controls above. This control allows you to adjust the overall width with a single control, while retaining any taper created by the separate width values used in the hilt and tip controls.
- **Color:** Choose a color for the core. The core Color should generally be set slightly off white, in the direction of the color that will be used for the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Feather: Adjusts the softness of the core's edges.
- **Stability:** Lowering the Stability causes the core shape to fluctuate in size, making the blade appear unstable.
- Mask: Control whether masks applied to the layer affect the glow.
 - **Disable:** Allows the glow to naturally wrap around the mask edges, for a softer result. This option is best when the object being masked is very near the lightsword blade
 - **Enable:** Cuts the glow off exactly at the edge of the mask. Masks should generally be enabled when there is a significant distance between the object being masked and the lightsword blade.
 - Invert: Reveals the glow outside the mask, while removing it inside.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Stability:** Lowering the stability causes the inner glow to fluctuate in size, making the blade appear unstable.
- Flicker: Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.

Path interpolation

During rapid movement motion blur should cause the hilt and tip to fan out, creating a motion trail. Path interpolation is used to create a natural curve along the hilt and tip ends.

- Scale: Reducing the scale to zero will remove all path interpolation, resulting in straight lines drawn at the hilt and tip ends of the blade. Increasing the scale will create path interpolation and curve the ends.
- **Hilt 1:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- **Hilt 2:** When the blade is swinging toward or away from the camera, you can adjust the Hilt angle to correspond to the movement of the prop's hilt, and get accurate motion simulation.
- **Tip 1:** When the blade is swinging toward or away from the camera, you can adjust the Tip angle to correspond to the movement of the prop's tip, and get accurate motion simulation.
- **Tip 2:** When the blade is swinging toward or away from the camera, you can adjust the Tip angle to correspond to the movement of the prop's tip, and get accurate motion simulation.

Distortion

Distortion not only alters the edges of the core, to make them more irregular, but distorts the background layer where it is visible through the glow. If Distortion is reduced to 0 the edge will be regular and smooth.

- **Distortion:** Determine how irregular the edge of the core is. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- Blend: Choose the blend mode that is used to composite the effect onto the underlying layers.

7.11.22. Lightsword Ultra (Glow Only) [Layer Only]

EXPRESS ADD-ON Lightsword Ultra (Glow Only) is available in the VFX: Neon Lights Pack.

HitFilm provides the most efficient and high quality tools for creating lightsword effects, reducing the rotoscoping requirements and automating key visual elements such as the motion blur trails.



Lightsword Ultra (Glow Only) allows you to create an external glow to any layer's shape. You can use masks to define or animate a layer's shape, then add a glow around the outside of that shape. This technique is commonly used to create the lightsword core using a masked plane, then multiple Lightsword (Glow Only) effects can be added to create a rich, complex glow. Extensive built-in distortion effects allow you to customize the shape of the glow for a variety of different results.

- **Preset Menu:** Choose from one of the built-in presets as a starting point for the effect. Presets should be chosen before you begin animating the effect's position.
- Source: Choose any layer on the timeline to create a glow based on its shape.

Flicker

Adding flicker to the effect can make it more exciting, interesting, and less refined.

- Amount: Adjusts the scale of the flickering, to control its intensity.
- **Probability:** Adjusts how often the flicker affects the blade. Set the percentage of frames which will be randomly altered by the flicker.
- **Frequency:** Adjusts how many frames in sequence make up the flicker.
- Seed: Each seed value gives a unique pattern to the flicker.

Inner Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The inner glow is controlled here, and the outer glow controls are found below.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The inner glow color should generally be set to a bright, highly saturated color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.
- **Stability:** Lowering the stability causes the inner glow to fluctuate in size, making the blade appear unstable.
- Flicker: Sets the intensity of the flicker applied to the glow's brightness. This does not alter the shape of the glow.

Distortion

Inner Glow Distortion changes the form of the effect's inner glow.

- **Distortion:** Adjusts the amount of distortion applied to the inner glow.
- **Type:** Distortion is based on fractal patterns. Choose the fractal pattern used to generate the distortion.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - **Heat:** Wavering distortion replicating a natural heat haze.
 - **Smoke:** Soft, billowing shapes like the texture of smoke.
- Noise: Adjust the settings used to control the distortion pattern.
 - **Noise Scale:** Changes the size of the details contained in the distortion.
 - **Bias:** Adjusts the balance between the initial fractal pattern and the sub-fractals that create finer levels of detail.
 - **Complexity:** Increasing complexity adds more sub-levels of noise, breaking up the distortion into finer details.

- Invert: Reverses the fractal patterns for an alternate result.
- Seed: Each seed value creates a unique pattern, to add variety to the effect.
- Animation: Adjust the motion behavior applied to the distortion.
 - Wind Direction: Rotate the wheel to select the angle of motion applied to the effect.
 - Wind Speed: Adjusts the intensity of the movement.
 - **Noise Speed:** Adjusts the speed of the sub-fractals, independently from the speed of the initial fractal pattern.
 - **Motion Blur:** Adds an angle blur aligned with the Wind Direction. Increasing the value adds more blur.

Outer Glow

Two glows are built-in to the effect. Varying the width of the inner and outer glows allows you to layer the glow and create a more natural falloff around the edges of the effect. The outer glow is controlled here, and the inner glow controls are found above.

- Width: Adjusts the overall width of the inner glow, in pixels.
- **Color:** Choose a color for the inner glow. The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Alpha: Adjusts the opacity of the inner glow.

Distortion

Outer Glow Distortion changes the form of the effect's outer glow.

- **Distortion:** Adjusts the amount of distortion applied to the outer glow.
- **Type:** Distortion is based on fractal patterns. Choose the fractal pattern used to generate the distortion.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - **Heat:** Wavering distortion replicating a natural heat haze.
 - **Smoke:** Soft, billowing shapes like the texture of smoke.
- **Noise:** Adjust the settings used to control the distortion pattern.
 - Noise Scale: Changes the size of the details contained in the distortion.
 - **Bias:** Adjusts the balance between the initial fractal pattern and the sub-fractals that create finer levels of detail.
 - Complexity: Increasing complexity adds more sub-levels of noise, breaking up the distortion

into finer details.

- Invert: Reverses the fractal patterns for an alternate result.
- **Seed:** Each seed value creates a unique pattern, to add variety to the effect.
- Animation: Adjust the motion behavior applied to the distortion.
 - Wind Direction: Rotate the wheel to select the angle of motion applied to the effect.
 - Wind Speed: Adjusts the intensity of the movement.
 - Noise Speed: Adjusts the speed of the sub-fractals, independently from the speed of the initial fractal pattern.
 - **Motion Blur:** Adds an angle blur aligned with the Wind Direction. Increasing the value adds more blur.

Mask

- From: Choose a layer whose shape will be used to mask the
- Use Source:

Background Distortion

Background Distortion warps the background layer where it is visible through the glow of the lightsword effect.

- **Distortion:** Sets the intensity of the distortion applied to the background within the glow. Lower values give a smoother, more refined effect. Higher values will make the edge irregular, and increasingly distort the background behind the glow of the effect. This can help to make the effect feel more convincing, as part of the scene.
- **Type:** Distortion is based on fractal patterns. Choose the fractal pattern used to generate the distortion.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - **Heat:** Wavering distortion replicating a natural heat haze.
 - **Smoke:** Soft, billowing shapes like the texture of smoke.
- Noise: Adjust the settings used to control the distortion pattern.
 - Noise Scale: Changes the size of the details contained in the distortion.
 - **Bias:** Adjusts the balance between the initial fractal pattern and the sub-fractals that create finer levels of detail.
 - Complexity: Increasing complexity adds more sub-levels of noise, breaking up the distortion into finer details.
 - Invert: Reverses the fractal patterns for an alternate result.
 - Seed: Each seed value creates a unique pattern, to add variety to the effect.
- Animation: Adjust the motion behavior applied to the distortion.

- Wind Direction: Rotate the wheel to select the angle of motion applied to the effect.
- Wind Speed: Adjusts the intensity of the movement.
- **Noise Speed:** Adjusts the speed of the sub-fractals, independently from the speed of the initial fractal pattern.
- Motion Blur: Adds an angle blur aligned with the Wind Direction. Increasing the value adds more blur.
- **Blend:** Choose the blend mode that is used to composite the effect onto the underlying layers.

7.11.23. Neon Path [Layer Only]

EXPRESS ADD-ON Neon Path is available in the VFX: Neon Lights Pack.

A useful tool for creating animated Neon Path effects. You can use a Text Layer or a Mask to define the shape of the effect, and then control the position and movement of the Neon line on the selected path.

- **Preset:** Use this menu to choose from one of the built-in presets.
- Path From: Neon path effects take their shape from another layer. Choose the kind of source to be used.
 - Mask: Allows you to sue the Masks from a different layer on the timeline.
 - **Text:** Allows you to use the shape of a text layer as the path source.
- Layer: Choose another layer from the timeline, to be used as the path source.

Path

- Start Width: Set the width of the path, in pixels, at its starting point.
- End Width: Set the width of the path, in pixels, at its ending point.
- Start Alpha: Sets the opacity of the path at its start point.
- End Alpha: Sets the opacity of the path at its end point.
- **Falloff:** Shifts the transition between the Start Width and End Width. Positive values increase the influence of the Start Width. Negative Values increase the influence of the End Width.
- Evolution: Shifts the position of the effect along the source path.
- **Extension:** Adjusts the length of the neon path effect, as a percentage of the total length of the source path.

Core

The core is the central part of the effect, which is typically the brightest.

- Width: The Width of the core can be adjusted, as a percentage of the width values set in the Path controls above.
- **Color:** The core Color should generally be set sightly off white, in the direction of the color that will be used for the glow. You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Feather: The edges of the core can be softened with the Feather control.
- Mask Mode: Enable, Disable, or Invert Mask mode using this menu.

• **Stability:** Lowering the Stability causes the core shape to fluctuate in size.

Distortion

The Core Distortion controls allow you to procedurally alter the shape of the core to create a variety of animated results.

- **Distortion:** Controls the strength of distortion that is applied to the core.
- **Type:** There are four types of distortion available, each of which gives a different result.
 - Energy: A pattern of thin, energetic strings.
 - **Fluid:** Replicates a pattern similar to the caustics created by looking through a volume of water.
 - Heat: Replicates the haze and diffusion created by heat waves.
 - Smoke: Soft, billowing distortion, like the texture of smoke.
- **Noise:** The noise that defines the shape of the distortion can be modified using these properties. They correspond to the controls in the standalone Distortion effects.
- **Animation:** The movement of the noise that defines the shape of the distortion can be modified using these properties. They correspond to the controls in the standalone Distortion effects.
- **Blend on Top:** Enabling this option will apply the glow above the core, potentially altering the core's color.
- Use in Glow: Enabling this option will adaptively shift the shape of the glow of the effect to match the distortion of the core shape.

Flicker

The Flicker controls will affect the movement of the overall effect.

- Amount: Controls the amount of flicker applied to the effect.
- **Probability:** Adjusts how regular the flicker is. Higher probability settings will make a more regular flicker.
- **Frequency:** Adjusts the timing between the flickering, Higher values will increase the speed of the flicker.
- **Mode:** Choose how the flicker will be generated.
 - Per Path: The entire effect flickers as a whole.
 - Per Character: Each character flickers independently.
- Seed: Changing the seed will randomize the pattern of the flicker.

Inner Glow

Two glows are built-in to the effect. This makes it possible to create an intense inner glow, with a low width so that it is close to the core, and a wider, diffuse, less bright outer glow.

- Width: The width of the inner glow can be adjusted, in pixels.
- **Color:** The inner glow color should generally be set to a bright, vibrant color.
- Alpha: Adjusts the transparency of the inner glow layer.
- **Stability:** Lowering the stability causes the glow shape to fluctuate in size.
- Flicker: Sets the intensity of brightness flicker applied to the glow. This does not alter the shape of the glow.
- **Falloff:** Alters the range over which the glow edges are feathered. Lower numbers will create a harder edge to the glow.
- **Mask:** Controls whether masks applied to the layer affect the glow.
 - **Disable** will allow the glow to naturally wrap around the mask edges, for a softer result.
 - Enable will cut the glow off exactly at the edge of the mask.
 - Invert will reveal the glow outside the mask, while removing it inside.

Distortion

The Inner Glow Distortion controls allow you to procedurally alter the shape of the inner glow to create a variety of animated results.

- **Distortion:** Controls the strength of distortion that is applied to the inner glow.
- **Type:** There are four types of distortion available, each of which gives a different result.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - Heat: Replicates the haze and diffusion created by heat waves.
 - **Smoke:** Soft, billowing distortion, like the texture of smoke.
- **Noise:** The noise that defines the shape of the distortion can be modified using these properties. They correspond to the controls in the standalone Distortion effects.
- **Animation:** The movement of the noise that defines the shape of the distortion can be modified using these properties. They correspond to the controls in the standalone Distortion effects.

Outer Glow

Two glows are built-in to the effect. This makes it possible to create an intense inner glow, with a low width so that it is close to the core, and a wider, diffuse, less bright outer glow.

- Width: The width of the outer glow can be adjusted, in pixels.
- **Color:** The outer glow color can be set to a similar color to the inner glow color, for a traditional look, or to an entirely different color to create a gradient in the glow.
- Alpha: Adjusts the transparency of the inner glow layer.
- Stability: Lowering the stability causes the core shape to fluctuate in size.
- Flicker: Sets the intensity of brightness flicker applied to the glow. This does not alter the shape of

the glow.

- **Falloff:** Alters the range over which the glow edges are feathered. Lower numbers will create a harder edge to the glow.
- **Mask:** Controls whether masks applied to the layer affect the glow.
 - **Disable** will allow the glow to naturally wrap around the mask edges, for a softer result.
 - Enable will cut the glow off exactly at the edge of the mask.
 - **Invert** will reveal the glow outside the mask, while removing it inside.

Distortion

The Outer Glow Distortion controls allow you to procedurally alter the shape of the outer glow to create a variety of animated results.

- **Distortion:** Controls the strength of distortion that is applied to the outer glow.
- **Type:** There are four types of distortion available, each of which gives a different result.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.
 - Heat: Replicates the haze and diffusion created by heat waves.
 - **Smoke:** Soft, billowing distortion, like the texture of smoke.
- **Noise:** The noise that defines the shape of the distortion can be modified using these properties. They correspond to the controls in the standalone Distortion effects.
- Animation: The movement of the noise that defines the shape of the distortion can be modified using these properties. They correspond to the controls in the standalone Distortion effects.

Mask

- From: Choose the layer which will be used to mask the Neon Path Effect.
- Use Source: Enable or disable masking from the selected source.
- Use Text Alpha: When the **Path From** property is set to a text layer, this Property will appear, so you can enable or disable masking based on the Text alpha.

Background Distortion

The Background Distortion controls allow you to procedurally distort the image behind the Neon Path, to improve the realism of the effect's integration into the scene.

- **Distortion:** Controls the strength of distortion that is applied to the background.
- Type: There are four types of distortion available, each of which gives a different result.
 - Energy: A pattern of thin, energetic strings.
 - Fluid: Replicates a pattern similar to the caustics created by looking through a volume of water.

- Heat: Replicates the haze and diffusion created by heat waves.
- **Smoke:** Soft, billowing distortion, like the texture of smoke.
- **Noise:** The noise that defines the shape of the distortion can be modified using these properties. They correspond to the controls in the standalone Distortion effects.
- **Animation:** The movement of the noise that defines the shape of the distortion can be modified using these properties. They correspond to the controls in the standalone Distortion effects.
- **Blend:** Choose how the effect is combined with the layer to which it is applied.

7.11.24. PiP (Picture in Picture)

EXPRESS ADD-ON PiP is available in the Edit: Starter Pack.

Quickly create a picture-in-picture effect using any layer in your timeline, and adjust the size and position of the PiP effect.

- **Position:** Choose the location within the frame where the Picture-in-Picture image is placed.
- **Scale:** Sets the size of the image, as a percentage of the frame width.
- **Margin:** Sets the width, in pixels, of the space between the picture-in picture and the edge of the frame.

7.11.25. Pond Ripple

Creates randomly placed ripples which expand and distort the layer, simulating the effect of rainfall on a pond. The size and behavior of the ripples can be adjusted.



- Seed: Changing the seed randomizes the placement of the individual ripples.
- Droplets Per Second: Sets the number of new ripples that will begin per second.

Droplet Shape

- Size: Sets the width of the rings of the droplets. Higher values softens the ring detail.
- Number of Ripples: The total number of rings per droplet.
- **Viscosity:** Adjusting the viscosity alters the speed of the ripple movement, and the degree to which they alter the liquid surface.
- **Displacement:** Adjusts the amount of displacement applied to the image below the ripples.

Droplet Animation

- **Speed:** Sets the speed at which the ripples will move away from the center point where they originate.
- Lifetime: Sets the total duration of each ripple before it disappears entirely.

7.11.26. Pulp Sci-Fi Title Crawl

EXPRESS ADD-ON Pulp Sci-fi title Crawl is available in the VFX: Retro Pack.

An instant way to get perfect Star Wars and Flash Gordon-style openings, complete with separate sections for the teaser, main title and the crawl itself.



The text is entered into the Teaser, Movie Title, Episode Number, Episode Title and Text Crawl properties. Clicking the font 'A' symbol opens a new window for editing the Movie Title and Text Crawl text.

The formatting and animation of the teaser, movie title and text crawl can be adjusted in separate property groups, with the text reflowing automatically to suit the classic pulp look.



The Pulp Sci-Fi Title Crawl creates a series of elements which are displayed sequentially. On the left is the Teaser, followed by the Movie Title, and then the main Text Crawl, which includes the Episode Number, Episode Title, and Story.

The Movie Title can also be switched to use an image instead of text. This can be useful for creating a more authentic appearance when recreating movie logos, or for creating titles that incorporate graphic elements.

- **Teaser:** A stationary title, which is the first element shown. Think, "A long time ago, in a galaxy far, far away..."Enter the text you wish to use directly into the text box to the right of the property name.
- **Movie Title:** The title of your film. Click the A icon to open the text box where you can enter your movie title. The separate text box allows you to easily enter line breaks and see what each line will contain.
- **Episode Number:** The first line of the text crawl, typically used to display the episode number. Leave the text field blank to remove this element. Enter the text you wish to use directly into the text box to the right of the property name.
- **Episode Title:** The second line of the text crawl, typically use4d to display the specific name of this episode. Leave the text field blank to remove this element. Enter the text you wish to use directly into the text box to the right of the property name.
- **Text Crawl:** The main body of the text crawl. Click the A icon to open the text box where you can enter your text crawl. The separate text box allows you to easily enter line breaks and separate paragraphs, and preview the text layout while editing its contents.

Teaser



Use these controls to adjust the appearance and timing of the Teaser element.

Appearance:

• Color: Select a color for the Teaser element. You can use the eyedropper to choose a color from the

layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

- Font: Choose a font for the Teaser element. All fonts currently installed on your system, will be available in this menu.
- **Style:** Select a style for the currently selected font. Some options may not work, depending on what styles are installed for the current font.
- Font Size: Adjust the size of the font.
- Word-wrap Width: Set the width at which text will be wrapped to a new line, as a percentage of the total frame width.
- Line Spacing: Adjusts the distance between lines, when text is wrapped to a new line. This setting has no effect if the text fits on a single line.

Animation

- **Duration:** Sets the overall duration of the Teaser element, in seconds.
- **Fade In:** At the start of the effect, the Teaser fades in. Use this control to adjust the timing of the fade in, as a percentage of the total duration.
- **Fade Out:** At the end of the teaser duration, the Teaser fades out. Use this control to adjust the timing of the fade out, as a percentage of the total duration.
- End Time Gap: Set the gap between the Teaser and the Movie Title. This gap occurs after the Duration set above.

Movie Title



Use these controls to adjust the appearance and timing of the Movie Title element.

- Use: Choose whether the Movie Title element will use text or a layer.
 - Text: When this option is selected, the Movie Title property above will be used to define the

contents fo this element.

• **Layer:** When this option is selected, you can choose any other layer on the timeline to use its contents as the Movie Title element.

Appearance:

- **Color:** Select a color for the Movie Title element. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Font: Choose a font for the Movie Title element. All fonts currently installed on your system, will be available in this menu.
- **Style:** Select a style for the currently selected font. Some options may not work, depending on what styles are installed for the current font.
- Font Size: Adjust the size of the font.
- Line Spacing: Adjusts the distance between lines, when text is wrapped to a new line. This setting has no effect if the text fits on a single line.
- **Outline:** Creates an outline of the text, which allows you to use fonts that are not an outline already. When this property is set to 0.0%, the original font will be displayed. When the value is increased, the font is filled with black, and an outline is created using the color chosen above.

Animation

- Duration: Sets the overall duration of the Movie Title element, in seconds.
- **Start Distance:** Adjusts the distance from the camera to the Movie Title element when it first appears. Lower values make it appear closer to the camera.
- End Distance: Adjusts the distance from the camera to the Movie Title element when it disappears. Lower values make it appear closer to the camera.
- **Fade Out:** As the Movie Title recedes into the distance, it fades out at the end of its duration. Use this control to adjust the timing of the fade out, as a percentage of the total duration.
- **Text Crawl Overlap:** Adjust the overlap between the Movie Title and the Text Crawl elements. Higher values increase the amount of time for which both elements are visible simultaneously.

Text Crawl



Use these controls to adjust the appearance and timing of the Text Crawl elements. There are three elements which combine to make the crawl: the **Episode Number**, the **Episode Title**, and the **Story**. The Appearance controls affect all three elements, to retain consistent styling among them. Additional controls are available for each element, to customize its appearance further.

Appearance:

- **Color:** Select a color for the Teaser element. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Font: Choose a font for the Teaser element. All fonts currently installed on your system, will be available in this menu.
- **Style:** Select a style for the currently selected font. Some options may not work, depending on what styles are installed for the current font.
- Font Size: Adjust the size of the font.
- Angle: Adjusts the angle at which the text appears to recede from the camera.
- Word-wrap Width: Set the width at which text will be wrapped to a new line, as a percentage of the total frame width.
- Episode Number: Fine tune the layout of the Episode Number element.
 - **Stretch:** Changes the height of the Episode Number element, without altering its width. Values above 100% increase the height.
 - Line Spacing: Changes the size of the gap between the Episode Number and the Episode Title below it.
- Episode Title: Fine tune the layout of the Episode Title element.
 - Font Scale: Adjusts the size of the Episode Title text.
 - Stretch: Changes the height of the Episode Title element, without altering its width. Values

above 100% increase the height.

- Line Spacing: Changes the size of the gap between the Episode Title and the Story below it.
- Story: Fine tune the layout of the Story element which makes up the bulk of the Text Crawl.
 - **Stretch:** Changes the height of the Story element, without altering its width. Values above 100% increase the height.
 - Line Spacing: Changes the size of the gap between lines of text within the Story element.
 - **Paragraph Spacing:** Defines the amount of space created between paragraphs, when there is a line break in the text.
 - Character/Word Justification: Controls whether justification is applied to individual characters, to words, or to both. At 0.0%, each character is repositioned to justify each line. At 100.0%, the spacing within each word remains unchanged, and entire words are repositioned to create the justification.
 - Justify Last Story Line: When enabled, the final line of the story will be justified to fill the word-wrap width. When disabled, the final line will not be justified, but will display as a partial line.

Animation

- **Speed:** Sets the rate at which the Text Crawl scrolls past the camera. The speed selected here and the duration of the layer to which the Pulp Sci-fi Title Crawl is applied can both be adjusted to ensure the entire effect is visible.
- Fade Start: Select the point in the total duration of the Text Crawl at which it will start to fade out.
- Fade End: Select the point in the total duration of the Text Crawl at which its fade out will be completed.

7.11.27. Radio Waves

Creates geometric shapes that can be warped and animated. The shape of the waves can be heavily customized.



If the playhead is on the first frame of the layer, then the Radio Waves effect will not yet be visible when it is applied to the layer. Scrub the playhead forward to see the emitted waves.

• Preset: A variety of shapes are available in this menu.

Position

- **Center:** Sets the point from which the waves will originate, using X (horizontal) and Y (vertical) values.
- **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the center of the Waves effect. When a layer is selected, the Position property above functions as an offset from the parent layer's position.

Shape

- **Shape:** Select the basic geometric shape of the waves. Round waves can be created using the Circle option, or choose any polygonal shape with from 3 to 10 faces.
- Rotation: Rotates polygonal wave shapes around the Center point.
- **Curvature:** When a polygon shape is selected, this property curves each face, while the angles where the faces meet remain in place.
- **Pinch:** Shifts the weight of the curvature toward the corners, so higher values create a flat area in the center of each face.
- **Shift:** Moves each face of the polygonal shape sideways, or perpendicular to their direction of travel. Any portion of the wave which is shifted beyond its corner will be cropped.

Appearance

- **Color:** Choose a color for the waves. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Opacity:** Defines how opaque the waves are. At 0.00 the waves will be completely transparent, and at 1.00 they will be completely opaque.
- Wave Start: Sets the time, measured from the start of the layer, at which waves will begin to be emitted.
- **Fade In:** Sets the point in the total duration of each wave, at which its fade in ends, defined as a percentage of the total duration of the wave. Setting this value to 0% removes the fade in.
- **Fade Out:** Sets the point in the total duration of each wave, at which its fade out begins, defined as a percentage of the total duration of the wave. Setting this value to 100% removes the fade out.
- Wave End: Defines the duration, in seconds of each individual wave.
- Start Width: The line width of each wave, in pixels, at the point when it is emitted.
- End Width: The line width of each wave, in pixels, at the point when its duration ends.
- Line Blend: Select the blend mode used to combine the lines in any areas where they overlap. In many cases, the lines will not overlap, in which case this setting can be ignored.

Motion

- Frequency: Sets the amount of time, in seconds, between one wave and the next.
- Expansion: The speed at which the wave expands outward from the center point.
- **Spin:** Rotates the center point by the angle you specify, per second. The result is that the angles of each wave are offset from the preceding and subsequent waves.
- · Blend: Choose the blend mode used to blend the Radio Waves effect onto the contents of the layer to

which it is applied.

7.11.28. Reflection

A quick and easy way to create a reflection of the layer.



- **Preset:** Chose one of a variety of preconfigured reflection layouts.
- **Center:** Use these controls to define the location of the reflection, in relation to the source layer.
 - Position: Sets the point which marks the edge of the reflection, using X (horizontal) and Y (vertical) values. The boundary separating the original image and the reflected image will travel though this point, at the angle selected below.
 - **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position as the position of the Reflection effect. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- **Angle:** Select the angle at which the original image and the reflection will be divided. If you imaging the reflection as a mirror, one edge of which is placed against your image, this is the angle of the mirror's edge.

7.11.29. Sphere [Layer Only]

Creates a sphere that reflects its surroundings.



The sphere can be heavily customized with separate layers for the optional surface texture and environment map.

- **Preset:** Choose from one of the preconfigured options in this menu to automatically apply its settings to the effect.
- Radius: Sets the radius of the sphere, in pixels.
- Use Source As: Choose how the contents of the layer to which the sphere effect is applied will be used within the effect.
 - **Surface Texture:** Wraps the source layer onto the sphere, as the sphere's main texture. When this option is selected, the Layer property in the Surface Texture controls will not be displayed.
 - Environment Map: Reflects the source layer onto the surface of the sphere, as an environment map. When this option is selected, the Layer property in the Environment Map controls will not be displayed.
 - **Environment Layer:** The source layer is distorted and wrapped behind the sphere, as if it were being viewed through a sphere of glass. When this option is selected, the Environment Layer

controls will not be displayed.

• **None:** The source layer's contents are ignored.

Position

- **Transform From:** Select another layer from the timeline using this menu, to use the selected layer's position to control the center of the Sphere. When a layer is selected, the Position property below functions as an offset from the parent layer's position.
- Position: Sets the center point of the sphere, using X (horizontal) and Y (vertical) values.
- **Depth:** Adjusts the apparent distance of the sphere from the camera, without moving the environment map or environment layer.

Scale

- X: Adjusts the horizontal diameter of the sphere independently from the Y axis and Z axis.
- Y: Adjusts the vertical diameter of the sphere independently from the X axis and Z axis.
- **Z**: Adjusts the front to back diameter of the sphere independently from the X axis and Y axis.

Surface Texture

The Surface Texture is the image used as the surface of the sphere itself, not factoring in any reflections or refractions.

- Layer: Choose any layer on the timeline to be used as the surface texture.
- Scale: Adjusts the size of the texture image applied to the sphere.
- Scale Ratio: Adjusts the width of the image independently from the height. A Scale Ratio of 1.00 uses the original aspect ratio of the source image.
- Wrap X: Select how the image will be wrapped from left to right, when necessary. Generally this setting is only relevant when the Scale (above) is set below 100%.
 - No: If the image is too small to fill the sphere, the areas beyond the image are filled with black.
 - Tile: An exact copy of the layer is used to fill the blank areas to the left and right of the original.
 - **Reflect:** A mirrored copy of the layer is used to fill the blank areas to the left and right of the original.
- Wrap Y: Select how the image will be wrapped from top to bottom, when necessary. Generally this setting is only relevant when the Scale (above) is set below 100%.
 - No: If the image is too small to fill the sphere, the areas beyond the image are filled with black.
 - **Tile:** An exact copy of the layer is used to fill the blank areas above and below the original.
 - **Reflect:** A mirrored copy of the layer is used to fill the blank areas above and below the original.

Environment Map

The Environment Map is the image used as the surrounding of your sphere, which is reflected onto its surface. The selected image is mapped onto an invisible virtual sphere, which surrounds the actual Sphere created by the effect. This allows the environment map to be realistically reflected onto the sphere from all sides. The Reflection controls below adjust how reflective the sphere's surface is, and thus how visible the environment map is.

- Layer: Choose any layer on the timeline to be used as the environment map.
- Scale: Adjusts the size of the environment map image that is reflected onto the sphere.
- Scale Ratio: Adjusts the width of the image independently from the height. A Scale Ratio of 1.00 uses the original aspect ratio of the source image.
- Wrap X: Select how the image will be wrapped from left to right, when necessary. Generally this setting is only relevant when the Scale (above) is set below 100%.
 - No: If the image is too small to fill the sphere, the areas beyond the image are filled with black.
 - Tile: An exact copy of the layer is used to fill the blank areas to the left and right of the original.
 - **Reflect:** A mirrored copy of the layer is used to fill the blank areas to the left and right of the original.
- Wrap Y: Select how the image will be wrapped from top to bottom, when necessary. Generally this setting is only relevant when the Scale (above) is set below 100%.
 - No: If the image is too small to fill the sphere, the areas beyond the image are filled with black.
 - **Tile:** An exact copy of the layer is used to fill the blank areas above and below the original.
 - **Reflect:** A mirrored copy of the layer is used to fill the blank areas above and below the original.

Environment Layer

The Environment Layer is the image used as a background, refracted through the sphere. The Refraction controls below define how transparent and refractive the sphere material is.

• Layer: Choose any layer on the timeline to be used as the Environment Layer.

Reflection

The reflection controls define how reflective the surface of the sphere is. This, in turn, affects how the environment map is reflected onto the sphere's surface.

• Amount: Adjusts how reflective the surface is.

- **Angle Dependency:** Modifies the shininess of the surface. Higher values create more glare on the surface, which washes out the contrast of the reflections.
- Reflection Region: Choose where on the sphere's surface the reflections will appear.
 - All: The entire surface of the sphere will reflect the environment map.
 - **Textured Area:** Only areas where a Surface Texture is present will be reflective.
 - Untextured Area: Only areas where no surface texture is present will be reflective.
 - **Text Mult Color:** Only areas where a Surface Texture is present will be reflective, but it also multiplies the color of the texture. So for example, a black texture will not reflect light, or a red texture will only reflect red light.

Refraction

Refraction controls how light passes through the volume of the sphere. In practical terms, it controls how the Environment Layer image which can be selected above, appears through the sphere. The Refractive Index property can be used to accurately simulate refraction from real world materials.

• **Refractive Index:** Select the refractive index of the sphere. <u>A list of common refractive indices can be</u> <u>found on Wikipedia.</u>

Illumination

- **Type:** Choose the lights that will be used to illuminate the sphere.
 - **None:** Any lights present on the timeline are ignored, and the default illumination model is used.
 - Comp Lights: All lights present on the timeline are used to illuminate the sphere.
 - Selected Lights: Only the specific lights you select will be used to illuminate the sphere.

7.11.30. Split Screen Masking [Layer Only]

EXPRESS ADD-ON Split Screen Masking is available in the Edit: Starter Pack.

Provides a quick way to set up various split screen layouts. Numerous screen layout presets are included which can then be further customized.



• **Preset:** More than 25 split screen layouts are provided as presets. Choose any preset from this menu to apply it to your timeline as a starting point, and you can then link your images or videos to each region of the split screen.

Cuts

Cuts are the lines which split your screen into separate regions or images.
- Cut Type: Select how the frame will be divided
 - **Local:** The cut divides the entire frame, passing through the Position point in a straight line.
 - **Radial:** The Position Point is used as a hub, and all cuts radiate outward from that point.
- **Number of Cuts:** Defines how many cuts are present in the frame. Each cut will have its own controls below to fine tune its exact position.
- View Cut Regions: Enabling this option adjusts the brightness of each region, based on the order they are created in, to make it easier to see each region separately.
- **Cut #:** A numeric listing will be added for each Cut contained in the effect. For example, if **Number of Cuts** is set to 3, then there will be three sets of Cut controls, for controlling the positioning of each cut.
 - Position: Sets the origin point of the cut. The cut will pass through this line at the angle selected in the Direction property below. If the Cut Type is set to Radial, this property is not displayed.
 - **Direction:** Select an angle at which the cut will pass through the Position point.

Input Layers/Frames

Here is where you select the specific layer or media which will be displayed within each region created by the split screen. A separate set of Input controls will be listed for each region created by the effect, so the total number of inputs will be one greater than the number of cuts.

- Layer: Choose any timeline layer to display its contents within the region.
- Frame Shift: You can adjust the timing of the source layer. At 0, the source frame shown matches the timecode of the split screen layer. Negative values pull the source frame from earlier on the timeline, by the number of frames you choose. Positive values pull the source from later on the timeline, by the number of frames you choose.
- **Translate:** Shifts the position of the source layer within the region, on the X axis (horizontal) and Y axis (vertical).
- Scale: Adjusts the size of the source image within the region, to control what area of the source is visible.
- Rotation: Spins the source image within the region.

Border

These controls alter the appearance of the lines which divide one region from another.

- Width: Sets the width of the dividing line, in pixels. Set this value to 0.0 to remove the dividing lines entirely.
- Color: Choose a color for the borders. You can use the eyedropper to choose a color from the layer,

or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

• **Alpha:** Defines how opaque the dividing lines are. At 0.00 the waves will be completely transparent, and at 1.00 they will be completely opaque.

7.11.31. Text

EXPRESS ADD-ON Text is available in the Edit: Starter Pack.

The Text effect lets you quickly generate text on any timeline. To add Text, drag the Text effect from the Effects panel onto a Plane, an image, or a video clip, to add text to that object. Open the controls for the effect in the Controls panel, and then click the A icon displayed to the right of the Text property. This will open the Edit Text dialog, where you can enter the text you wish to add to the layer. Once you are finished editing the text, click the OK button to close the Edit Text dialog and apply the changes. You can then edit the text and further customize the effect in the Controls panel, or directly on the timeline when working in a composite shot.

• **Text:** This is where you edit the contents of the Text effect. Click the "A" icon to open the Edit Text window. You can then enter whatever text you wish the effect to display.

EDIT TEXT	X
Enter whatever text you wish to display	
CANCEL	ок

- Cancel: discards any changes you have entered and closes the Edit Text window.
- **OK:** Confirms the text you have entered and closes the Edit Text window. Once the window closes, the text will be updated on the viewer.

Transform

You can control the alignment and positioning of the Text effect through these controls.

- Offset From: Select the position from which the layer movement will be measured. By default the text is Centered, but you can also place it in the Bottom Left, Bottom, Bottom Right, Left, Right, Top Left, Top, or Top Right.
- **Position Offset:** Sets the distance, in pixels, which the layer is moved from the default position selected in the Offset From menu.
- Rotation: Sets the rotation of the layer, in degrees.

Format

The Format controls allow you to set the details of the text style for the effect.

- Font: Select the font to be used, from a list of all fonts installed on your computer.
- **Style:** If your selected font includes different styles (Bold, Light, Italic, etc.), you can select your desired style here.
- Alignment: The text alignment can be adjusted here. You can align the text to Left, Center, or Right, or Justify the text to keep both sides aligned
- Color: Allows you to select a font color.
- **Opacity:** Sets the transparency of the Text, from completely invisible at 0.00 to completely opaque at 1.00.
- Font Size: Sets the size of your text. In general, if you want to enlarge your text, it is better to increase the font size rather than increase the layer Scale above 100%.
- Line Spacing: Defines the vertical spacing between each line of text.
- Enable Word Wrap: Toggles word wrap on and off. Enabling word wrap means that as soon as the text gets too long to fit in a single line, a line break will be created automatically, and a new line is started automatically.
- Word Wrap Width: Defines the width at which word wrap will be implemented. You can create margins in your text layer by setting the Word Wrap Width to a smaller value than the width of the layer the text effect is applied to. For example, if your text is applied to a Full HD layer that is 1920 pixels wide, and you set the Word Wrap Width to 1800, the 120 pixels that remain will be split to create a 60 pixel wide margin on each side of the layer.
- **Blend:** Determines how the Text is blended with the layer it is applied to. None will prevent the layer from being displayed at all, so only the text is visible. Normal displays the text over the top of the layer, so both are visible. Details on all the other Blend Mode options can be found on the page about Compositing With Blend Modes.
- Motion Blur: Sets the amount of motion blur applied to the layer when its position is animated.

7.11.32. Tile

A quick and easy way to tile the layer without needing to create duplicates. The effect duplicates the source as many times as necessary in order to fill the frame. The Scale property controls how many duplicate tiles are visible.



- Preset: Choose from several predefined tile layouts.
- Scale: Changes the size fo each tile, thereby controlling how many tiles are visible within the frame.
- Center: Controls for the positioning of the tiles.
 - **Position:** Sets the center point for the tile effect, using X (horizontal) and Y (vertical) values.
 - **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the center of the Tiles effect. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- **Blend:** Adjusts the balance of the source image and the tiles. At 0.0% only the tiles are visible. At 100.0% only the source is visible.

7.11.33. Timecode

Generates a counter showing the current position in time of the layer or timeline.



- Time From: Choose the source of the timecode that is displayed.
 - Layer: The timecode starts from 0 at the first frame of the layer to which the effect is applied.
 - **Timeline:** The timecode starts from 0 at the first frame of the entire timeline, regardless of where on the timeline the layer itself starts.
- **Format:** Choose the format in which the timer counts. The example images show the timecode fo the exact same frame, in each format.
 - Frames: Displays as a simple frame count, showing exactly how many frames exist in the range from the start of the source to the current playhead position.
 - **SMPTE:** Uses the format established for film by the Society of Motion Picture and Television Engineers, which displays Hours : Minutes : Seconds : Frames

 Milliseconds: Counts in common time format, displaying displays Hours : Minutes : Seconds : Milliseconds.



• Center: Use these controls to adjust the positioning of the timecode.

- **Position:** Sets the center point for the timecode effect, using X (horizontal) and Y (vertical) values.
- **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the center of the timecode effect. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- Scale: Adjusts the size of the timecode.
- Text: Modify the appearance of the numbers using these controls.
 - **Color:** Choose a color for the numbers. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
 - **Opacity:** Defines how opaque the numbers are. At 0.00 the numbers will be completely transparent, and at 1.00 they will be completely opaque.
- **Background:** Modify the appearance of the box which sits beneath the numbers, using these controls.
 - **Color:** Choose a color for the background. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
 - **Opacity:** Defines how opaque the background is. At 0.00 the background will be completely transparent, and at 1.00 they will be completely opaque.

7.11.34. Vertical Video

EXPRESS ADD-ON Vertical Video is available in the Edit: Starter Pack.

Quickly integrate vertical video into a standard video frame, by auto-filling the area surrounding the vertical video. Using a blurred version of the vertical video ensure the frame matches the video, and maintains a level of interest to the audience without being distracting.



- Mode: Choose the method used to fill the areas outside of the video.
 - **Fill:** The source video is scaled up until it fills the width of the frame, and used to create a background.
 - Clone: Duplicates of the source video are placed on either side of the original, to create a background.
- **Blur:** Adjusts the amount of blur applied to the fill area. Blurring the fill leads the viewer's focus to the actual video content. The amount of blur required to accomplish this will depend on the resolution, the content of the video, and personal preference.
- **Exposure:** Modifies the exposure of the fill area. The viewer's eye is drawn toward the brightest areas of the frame, so in most cases, reducing the exposure to darken the fill works best.
- **Saturation:** Adjusts the color intensity within the fill area. Reducing saturation is another way to keep the viewer's focus on the main video.

- **Offset:** Shifts the duplicate video within the fill area up or down. A value of 0.50 matches the original video. Lower values move the fill downward, and higher values move it upward.
- Scale: Adjusts the size of the duplicate video used in the fill area.
- **Shift:** Shifts the duplicate video within the fill area left or right. If the Shift has no effect, increase the Scale property, so there is room for the video to be shifted.
- Mirror: Flips the video within the fill area around the Y axis, as if it were viewed in a mirror.

7.11.35. Wireframe

EXPRESS ADD-ON Wireframe is available in the <u>3D: Model Render Pack</u>.

Renders a line-based representation of a layer. This is particularly effective when applied to 3D models, to create wireframe views that can be highly customized.



Туре

There are two main types of wireframe:

- Mesh: Renders the lines around the triangles that make up the 3D model.
- **Grid:** Renders a 3D grid of lines, on the surface of the 3D model. The grid can be further customized to adjust the pattern.

Render Mode

- All Triangles: Renders the lines for all triangles within the model.
- Front Facing: Renders lines only for surfaces that are facing towards the camera.
- Nearest Triangles: Renders lines only for the parts of the model that are visible to camera.

Material

- Solid Color: Creates solid lines of the chosen color.
- Model Material: Uses the color from the model's material.

• Model Material: Color* multiplies the color of the model's material by the chosen color.

Illumination

Wireframe can use 3D lights for illumination. You can choose to use all lights in the composite shot or specific lights.

7.12. Geometry

Geometry effects can be applied to Text layers to modify the text in 3D space. These effects interact directly with HitFilm's 3D lights and cameras, and allow you to create genuine 3D text natively in HitFilm. Geometry effects can be used individually, or in combination.

- Bend
 EXPRESS ADD-ON
- Bevel
 EXPRESS ADD-ON
- Extrude EXPRESS ADD-ON
- Rotate
 EXPRESS ADD-ON

7.12.1. Bend [Text Layer Only]

EXPRESS ADD-ON Bend is available in the <u>3D: Generate Pack</u>.

The Bend effect adds a curve to your text. It can only be applied to Text layers.

- Center: Positions the center of the invisible sphere around which the text is bent.
- Angle: Controls how far the text is bent.
- Orientation: Changes the direction of the bend in 3D space
- **Curve Length:** Adjusts the width of the curve. Areas of text outside the curve will remain straight, but will be repositioned based on the bend.

7.12.2. Bevel [Text Layer Only]

EXPRESS ADD-ON Bevel is available in the <u>3D: Generate Pack</u>.

The Bevel effect cuts the edges of a text layer at an angle in relation to the surface of the text. The size and depth of the angle can be adjusted using the controls.

- Depth: Sets the depth of the bevel, in pixels
- **Expansion:** Defines the width of the bevel, and thus how much of the text face will be affected by it.
- Face: Choose between Back, Front, or Front & Back to determine the direction in which the bevel will be generated.
- Internal Edges: This toggle determines whether internal edges of the layer will be affected by the bevel or not.

7.12.3. Extrude [Text Layer Only]

EXPRESS ADD-ON Extrude is available in the <u>3D: Generate Pack</u>.

The Extrude effect uses the shape of your Text layer as a source, and stretches it on the Z axis to create a 3D object.

- Depth: Sets the depth of the Extrusion, in pixels
- Face: Choose between Back, Front, or Front & Back to determine the direction in which the Extrusion will be generated.
- Internal Edges: This toggle determines whether internal edges of the layer will be affected by the extrusion or not.

7.12.4. Rotate [Text Layer Only]

EXPRESS ADD-ON Rotate is available in the <u>3D: Generate Pack</u>.

The Rotate effect allows you to adjust or animate the rotation of the characters in the Text layer. The settings you choose will be applied to each character individually, so rather than rotating the entire layer, each letter or character will be turned on its own axes.

- X: Rotates the characters on the X axis, which runs from left to right. Imagine running a skewer through each character from left to right. Adjusting this value is equivalent to turning that skewer by a specified number of degrees.
- Y: Rotates the characters on the Y axis, which runs from top to bottom. Imagine running a skewer through each character from top to bottom. Adjusting this value is equivalent to turning that skewer by a specified number of degrees.
- **Z**: Rotates the characters on the Z axis, which runs from front to back. Imagine running a skewer through each character from front to back. Adjusting this value is equivalent to turning that skewer by a specified number of degrees.

7.13. Gradients & Fills

A range of gradients and fills are provided. These can be extremely useful when used in conjunction with other effects, such as color map or shatter. Each effect has its own page, where details of the effect and its controls can be found.

- <u>4-Point Color Gradient</u>
- <u>Color Gradient</u>
- Fill Color
- Radial Gradient

7.13.1. 4-Point Color Gradient

Generates a 4-color gradient. The colors and mixing of the colors can be changed, as can the position of the gradient points.



- **Preset:** Several predefined configurations are provided in this menu for your use.
- Point 1 (four numbered copies of these controls are present, for the four control points)
 - **Position:** Sets the location for the selected point, using X (horizontal) and Y (vertical) values.
 - **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the position of the selected gradient point. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
 - **Color:** Choose a color for the selected point. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Color Blend:** Adjusts the area affected by each color point. at 1.0, all four colors are blended across the entire frame, resulting in the frame being colored with an average of all four color values. At 25.0, each color extends from its center point, half of the distance to the nearest point in any direction.
- **Ramp Scatter:** Adds subtle noise into the gradient areas between colors, which can help to improve naturalness.
- **Opacity:** Changes the overall visibility of the gradient effect. 0.0% is completely transparent, and 100.0% is completely opaque.

• **Blend:** Select the blend mode used to combine the gradient with the contents of the layer to which it is applied.

7.13.2. Color Gradient

Creates a 2-point linear or radial gradient of color.



- Preset: Several predefined configurations are provided in this menu for your use.
- Start Point: Use these controls to define the location of the start point of the gradient.
 - **Position:** Sets the location for the start point, using X (horizontal) and Y (vertical) values.
 - **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the position of the start point. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- End Point: Use these controls to define the location of the end point of the gradient.
 - Position: Sets the location for the end point, using X (horizontal) and Y (vertical) values.
 - **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the position of the end point. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- **Start Color:** Choose a start color for the gradient. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- End Color: Choose an end color for the gradient. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

- **Radial:** Enable this option to switch from a linear gradient to a radial gradient.
- **Ramp Scatter:** Adds subtle noise into the gradient areas between colors, which can help to improve naturalness.
- **Opacity:** Changes the overall visibility of the gradient effect. 0.0% is completely transparent, and 100.0% is completely opaque.
- **Blend:** Select the blend mode used to combine the gradient with the contents of the layer to which it is applied.

7.13.3. Fill Color

Simply fills the layer with the selected color. You can choose to blend the color with the original layer to varying amounts.



- **Color:** Choose the color which will fill the layer. You can use the eyedropper to choose a color from the viewer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Blend Amount:** Adjusts the balance between the fill color and the layer's original content. At 0.0% only the original layer will be visible. At 100.0% only the fill color will be visible.

7.13.4. Radial Gradient

Creates a circular color gradient. The size, position and shape of the gradient can all be tweaked.



- **Preset:** Several predefined configurations are provided in this menu for your use.
- Center: Use these controls to define the center point of the gradient.
 - Position: Sets the location for the center point, using X (horizontal) and Y (vertical) values.
 - **Use Layer:** Select another layer from the timeline using this menu, to use the selected layer's position to control the position of the center point. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- · Inner Radius: Controls for the inner radius of the effect
 - **Radius:** Sets the distance, in pixels, to which the core color of the gradient will extend before it begins transitioning to another color.
 - Color: Choose a color for the core of the gradient. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
 - **Opacity:** Changes the overall visibility of the gradient's core. 0.0% is completely transparent, and 100.0% is completely opaque.
- Outer Radius: Controls for the outer radius of the effect
 - **Radius:** Sets the distance from the center point, in pixels, at which the gradient will complete its transition from one color to another.

- Color: Choose a color for the outer edge of the gradient. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Opacity:** Changes the overall visibility of the gradient's outer edge. 0.0% is completely transparent, and 100.0% is completely opaque.
- **Smooth:** Modifies the transition of the gradient between the two radii. Higher values weight the transition more toward the center.
- **Gradient Scatter:** Adds subtle noise into the gradient area between colors, which can help to improve naturalness.
- Elliptical Deformation: Deforms the gradient from circular to elliptical in shape. Positive values create a horizontal ellipse, and negative values create a vertical ellipse.
- **Rotation:** Spins the axis of the gradient. Adjusting the rotation is only noticeable if **Elliptical Deformation** (above) is set to a value other than 0.00.
- **Blend:** Select the blend mode used to combine the gradient with the contents of the layer to which it is applied.

7.14. Grunge

The grunge effects are a set of effects for creating the appearance of old or damaged video. Each effect has its own page, where details of the effect and its controls can be found.

- Dot Matrix
- Film Damage EXPRESS ADD-ON
- Film Grain
 EXPRESS ADD-ON
- Flicker EXPRESS ADD-ON
- Grain
- Half Tone
- Half Tone Color EXPRESS ADD-ON
- <u>Jitter</u>
- Lens Dirt
- Noise
- <u>Pixel Sort</u>
- Scan Lines
 EXPRESS ADD-ON
- Shake
- <u>Stutter</u>
- TV Damage [Layer Only]
 EXPRESS ADD-ON

7.14.1. Dot Matrix

Breaks the surface of our layer up into in a two dimensional patterned array of dots. The results are similar to a half-tone effect, but the dots are consistent in size, and are laid out in a fixed grid of horizontal and vertical lines.



- **Seed:** Randomizes the placement of the variations included in the dot matrix pattern. If the Variation controls are all set to 0, this property will have no effect.
- **Size:** Changes the size of each dot, and therefore the number of dots that are present within the frame.
- **Coverage:** Controls how much of the source image is visible within the dot matrix. This is achieved by controlling how the dots are affected by the variation properties. At 0% coverage, all dots will be given the lowest value within the range set for each variation property. At 100% coverage, all dots will be given the highest value within the range set for each variation property. So if you have Scale Shape set to 100% in the Variation controls, each dot has a range from 0% scale to 100% scale available. Keyframing the Coverage from 0 to 100% in that case will cause each dot to gradually increase in scale from 0 to 100%, but in a randomized pattern.
- **Gradient:** Adjusts the number of dots within the matrix which will be affected by Variation settings.

Position

- **Position:** Sets the location for the center of the dot matrix, using X (horizontal) and Y (vertical) values.
- Use Layer: Select another layer from the timeline using this menu, to use the selected layer's position as the center of the dot matrix. When a layer is selected, the Position property above functions as an offset from the parent layer's position.

Dot Appearance

- **Shape:** Select the shape of each dot within the matrix.
 - Square: Each dot uses a square or rectangular shape.
 - Circle: Each dot uses a circular or elliptical shape.
- **Size:** Adjusts the size of each dot, as a percentage of its available space within the matrix. At 100%, each dot will touch its neighboring dots on each side.
- Gradient Type: Select the type of gradient used to fill each dot.
 - Radial: The color of each dot is strongest in the center, and fades out radially toward the edges.
 - Pyramid: The color of each dot is strongest in an X pattern, and fades out between the arms of the X.
 - Cross: The color of each dot is strongest in a cross pattern, and fades out between the arms of the cross.
- Gradient: Controls how much gradient is present on each dot.
- **Gradient Alpha:** Modifies the transparency of the gradient on each dot. At 0.0, the color within each dot will fade to black. At 100%, the color within each dot will fade to transparent.
- Aspect Ratio: Stretches the shape of each dot horizontally.

• **Dot Texture:** Select the layer that will be used to map color onto the dots. **None** uses the contents of the layer to which the effect is applied.

Matte

- Enable: When enabled, this option allows you to matte the shape of the dot matrix pattern using a second layer.
- Layer: Choose any layer from the timeline to use its contents as a matte source.
- Matte Channel: Select the channel of the selected layer which will be used to crate the matte.
 Luminance is most commonly used. If you select a layer containing an alpha channel, then Alpha will allow you to apply that transparency data to the dot matrix.
- Variation Mix Mode: Select how the matte is combined with the original contents of the dot matrix.
 - **Add:** Adds the selected matte, increasing the visible area.
 - Mix: Mixes the matte with the effect.
 - Mult: Multiplies the selected matte, reducing the visible effect outside of the matte area.

Variation

- **Noise:** Increasing noise randomly removes individual dots from the matrix. Changing the **Seed** above will alter which dots are removed.
- Scale Shape: Adjusts the range of size variations that will be used.
- Scale Gradient: Adjusts the range of gradient variations that will be used.
- Scale Color: Adjusts the range of color variations that will be used.
- Scale Alpha: Adjusts the range of alpha variations that will be used.
- **Distortion:** Warps the matrix, thereby modifying the shape of each dot.

7.14.2. Film Damage

EXPRESS ADD-ON Film Damage is available in the VFX: Damage Pack.

Simulates the flaws and problems seen in aged or poorly projected film stock, including grain, stains, dust and scratches, frame shake and flickering. You can control each of the elements individually to get the exact look you want.



• **Seed:** Randomizes the specific frames which are affected by the various elements of the Film Damage effect.

Grain

Grain is an inherent characteristic of traditional film. It is an optical texture of the film stock, created by tiny particles of silver halide on each frame of film being exposed to photons of light. It is similar to digital noise, but film grain tends to have a more organic appearance. The prominence of the grain will vary based on the film stock used, the exposure settings, and the physical size of the frame. In most cases, it should be applied subtly, so it doesn't draw attention to itself. Here we see the grain from our example clip, isolated onto a white background:



- Enabled: Toggles the grain component on or off.
- Amount: Sets the amount of grain present in the frame.
- Size: Adjusts the size of the individual grain particles.
- **Monochrome:** When enabled, this option makes all of the grain grayscale. When disabled, random colors are assigned to each particle of grain.

Stains

Stains are generated per frame. They replicate the flaws which may be present on old film that was poorly maintained, and allowed to be splattered with liquid, or dripped on. Here we see the stains from our example clip, isolated onto a white background:

- Enabled: Toggles the stains component on or off.
- Quantity: Sets the number of stains present per frame.
- **Quantity Variation:** Higher values increase the variation in the number of stains from one frame to the next.
- Size: Sets the average size, in pixels, of each stain.
- Size Variation: Higher values increase the variation in the size of each individual stain.
- **Opacity:** Defines how visible each stain is. Higher values make the stains more opaque, lower values make them more transparent.
- **Color:** Choose a color for the stains. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

Dust

This element replicates the appearance of dust on the projector lens, creating blurry, out of focus spots on the frame. At very low Size settings, it can also effectively serve to replicate dust on the film itself. Here we see the dust from our example clip, isolated onto a white background:

- · Enabled: Toggles the dust component on or off.
- Quantity: Sets the amount of dust present per frame.
- Quantity Variation: Higher values increase the variation in the amount of dust from one frame to the next.
- Size: Sets the average size, in pixels, of each dust spot.
- Size Variation: Higher values increase the variation in the size of each individual dust spot.
- Opacity: Defines how visible each dust spot is. Higher values make the dust more opaque, lower

values make it more transparent.

• **Color:** Choose a color for the dust. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

Scratches

Simulates the appearance of scratches on film that has not been well cared for, and has been abraded or scuffed. Here we see the scratches from our example clip, isolated onto a white background:

- Enabled: Toggles the scratches component on or off.
- Quantity: Sets the number of scratches present per frame.
- Length: Adjusts the length of the individual scratches.
- Width: Defines the width of the scratches.
- **Taper:** Tapers the ends of the scratches, so they fade out rather than stopping abruptly.
- **Color:** Choose a color for the scratches. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Opacity:** Defines how visible the scratches are. Higher values make the scratches more opaque, lower values make them more transparent.

Shake

The Shake component simulates the behavior of film that is improperly registered in the projector, or which is slipping off the projector's drive sprockets and periodically getting out of alignment. Here we see the

shake from our example clip, isolated onto a white background:

- Enabled: Toggles the shake component on or off.
- Frequency: Adjusts the frequency of frames being mis-aligned.
- Amplitude: Sets the range of how far off the alignment will be.
- **Regularity:** Changes how consistently the shake occurs.
- **Gap:** Adjusts the width of the space between one frame and the next, when the division between frames is visible.
- Blur: Adjust the amount of blur present on frames where the alignment is shifting.

Vignette

This component makes the edges of the frame darker than the center. Some projectors may create this effect, when the projector bulb doesn't illuminate the frame evenly. Here we see the vignette from our example clip, isolated onto a white background:



- Enabled: Toggles the vignette component on or off.
- Center: Controls the placement of the vignette.
 - **Position:** Sets the location for the center of the vignette, using X (horizontal) and Y (vertical) values.
 - Use Layer: Select another layer from the timeline using, to use the selected layer's position to control the position of the vignette. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- Horizontal Stretch: Adjusts the width of the vignette, relative to the width of the frame.
- Vertical Stretch: Adjusts the height of the vignette, relative to the height of the frame.
- **Softness:** Adjusts the transition from full brightness to darkened vignette, around the vignette's edges.
- **Curvature:** Shifts the weighting of the transition, between the center of frame and the edge of the vignette.
- **Opacity:** Adjusts the opacity of the layer to which the vignette is applied, for some reason.
- Background: These controls adjust the appearance of the vignette itself.
 - **Opacity:** Defines how visible the vignette is. Higher values make the vignette more opaque, lower values make it more transparent.
 - Color: Choose a color for the vignette. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

Flicker

The Flicker component varies the brightness of each frame, simulating the effects of a slightly mis-aligned or sloppy shutter in a film projector, which does not allow a consistent amount of light through the lens. Here

we see the flicker from our example clip, isolated onto a white background:



- Enabled: Toggles the flicker component on or off.
- Frequency: Controls how often the frame flickers.
- Amplitude: Defines the range of brightness within which the adjustments will be applied.
- Randomness: Controls how regularly or randomly the flicker is applied.
- Brightness: Modifies the default brightness of the layer.
- **Red:** You can modify the flicker of each color channel individually. These controls affect the red channel.
 - Amplitude: Controls how far the red channel flickers toward the selected phase.
 - Phase: Choose the color phase toward which the red channel will be shifted.
- **Green:** You can modify the flicker of each color channel individually. These controls affect the green channel.
 - **Amplitude:** Controls how far the green channel flickers toward the selected phase.
 - Phase: Choose the color phase toward which the green channel will be shifted.
- **Blue:** You can modify the flicker of each color channel individually. These controls affect the blue channel.
 - **Amplitude:** Controls how far the blue channel flickers toward the selected phase.
 - Phase: Choose the color phase toward which the blue channel will be shifted.

Defocus

Defocuses the image subtly, on a per-frame basis, as if the filmstock has shifted slightly out of the focal plane while traveling through the projector. Here we see our example footage with only the defocus component applied:



- Enabled: Toggles the defocus component on or off.
- Frequency: Controls how often the focus is softened.
- Amplitude: Adjusts how much blur is applied when the defocus occurs
- **Randomness:** Modifies how much the range of blur varies, within the range set by the Amplitude property.
7.14.3. Film Grain

EXPRESS ADD-ON Film Grain is available in the VFX: Damage Pack.

Generates a realistic grain based on 8mm, 16mm or 32mm film stock. The individual grains that make up Film Grain tend to be similar in size, but their apparent size changes based on the size of each from of the film being used. An 8mm frame will fit far fewer grains than a 35mm frame, and therefore the grain appears larger in the 8mm frame. This example shows 16mm film grain with no underlying image, so you can see exactly what the grain looks like:



- Preset: Choose from various presets for common film stocks.
- Film Size: Select the size of the film you wish to emulate.
 - 8mm: 8mm film has the largest grain
 - **16mm:** 16mm film has a moderately sized grain
 - **35mm:** 35mm film has a finer grain.
- Grain Strength: Modifies the intensity of the grain. Higher values make the grain darker, and more obvious.
- Seed: Each seed number randomizes the position of the individual grains.
- **Monochrome:** When enabled, this option makes all of the grain grayscale. When disabled, random colors are assigned to each particle of grain.

7.14.4. Flicker

EXPRESS ADD-ON Flicker is available in the VFX: Lighting Pack.

Introduces a random flickering to the layer. The behavior of the flicker can be finely customized.



- Seed: Each seed value randomizes the pattern of the flicker, altering which frames are affected and what values they are assigned, within the range specified by your settings below.
- Frequency: Controls how often the frame flickers.
- Amplitude: Defines the range of brightness within which the adjustments will be applied.
- Randomness: Controls how regularly or randomly the flicker is applied.
- Brightness: Modifies the default brightness of the layer.
- **Red:** You can modify the flicker of each color channel individually. These controls affect the red channel.
 - **Amplitude:** Controls how far the red channel flickers toward the selected phase.
 - **Phase:** Choose the color phase toward which the red channel will be shifted.
- **Green:** You can modify the flicker of each color channel individually. These controls affect the green channel.
 - **Amplitude:** Controls how far the green channel flickers toward the selected phase.
 - Phase: Choose the color phase toward which the green channel will be shifted.
- **Blue:** You can modify the flicker of each color channel individually. These controls affect the blue channel.
 - **Amplitude:** Controls how far the blue channel flickers toward the selected phase.
 - **Phase:** Choose the color phase toward which the blue channel will be shifted.

7.14.5. Grain

This effect provides fine control over the size of the grain.



- Amount: Sets the amount of grain present in the frame.
- Size: Adjusts the size of the individual grain particles.
- **Monochrome:** When enabled, this option makes all of the grain grayscale. When disabled, random colors are assigned to each particle of grain.
- Seed: Each seed number randomizes the position of the individual grains.

7.14.6. Half Tone

Turns the layer into a half tone image, as used in traditional black and white newspaper print. Halftone uses a grid of dots to reproduce the image, varying the size or spacing of the dots to depict tonal changes.

You can adjust the composition of the half tone dots.



- Preset: Choose from one of the built-in presets to immediately replicate a specific half tone look.
- **Resolution:** Defines the number of dots which will be used to represent the image, horizontally.
- Angle: Sets the angle of each vertical line of dots.
- **Dot Color:** Choose a color for the dots. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Background Color:** Choose a color for the spaces between the dots. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- Shift X: Shifts the grid of dots along the horizontal axis. Positive values move the dots right, negative values move them left.
- **Shift Y:** Shifts the grid of dots along the vertical axis. Positive values move the dots up, negative values move them down.
- **Offset:** Shifts the overall brightness of the entire image. Positive values brighten, negative values darken.

• **Smooth Source:** Applies a pre-blur of the layer before converting it to half-tone, thereby softening the details.

7.14.7. Half Tone Color

EXPRESS ADD-ON Half Tone Color is available in the VFX: Retro Pack.

A color variation of the Half tone effect. Halftone uses a grid of dots to reproduce the image, varying the size or spacing of the dots to depict tonal changes. Color Half tone renders each color channel into a half tone grid, then blends them to create the color image.



- Preset: Choose from one of the built-in presets to immediately replicate a specific half tone look.
- **Type:** Select the color channels used to generate the half tone.
 - **RGB:** Uses the red, green, and blue channels which make up most digital images.
 - **CMY:** Uses the Cyan, Magenta, and Yellow channels used in printing, for a more accurate replication of printed imagery.
- **Resolution:** Defines the number of dots which will be used to represent the image, horizontally.
- Angle: Sets the angle of each vertical line of dots.
- **Offset:** Shifts the overall brightness of the entire image. Positive values brighten, negative values darken.
- **Smooth Source:** Applies a pre-blur of the layer before converting it to half-tone, thereby softening the details.
- **Red/Cyan:** Repositions the red or cyan channel, depending on the selected type. Individual color channels can be offset in this way to replicate the slight alignment errors common in old color half

tone images.

- **Shift X:** Shifts the red or cyan channel along the horizontal axis. Positive values move the dots right, negative values move them left.
- **Shift Y:** Shifts the red or cyan channel along the vertical axis. Positive values move the dots up, negative values move them down.
- **Green/Magenta:** Repositions the green or magenta channel, depending on the selected type. Individual color channels can be offset in this way to replicate the slight alignment errors common in old color half tone images.
 - **Shift X:** Shifts the green or magenta channel along the horizontal axis. Positive values move the dots right, negative values move them left.
 - **Shift Y:** Shifts the green or magenta channel along the vertical axis. Positive values move the dots up, negative values move them down.
- **Blue/Yellow:** Repositions the blue or yellow channel, depending on the selected type. Individual color channels can be offset in this way to replicate the slight alignment errors common in old color half tone images.
 - **Shift X:** Shifts the blue or yellow channel along the horizontal axis. Positive values move the dots right, negative values move them left.
 - **Shift Y:** Shifts the blue or yellow channel along the vertical axis. Positive values move the dots up, negative values move them down.

7.14.8. Jitter

Creates glitches in video playback order, shuffling the order of frames. Compare the original shot here with the second shot, where jitter is applied:



The amount and frequency of the jitter can be extensively modified.

- **Frame Group Size:** Select how many frames are played in the correct sequence, before the litter effect jumps to a new frame in the source file. This has the result of altering the speed of the jitter.
- **Jitter Amount:** Controls the maximum range of how far each jump in the jitter effect can extend, as a percentage of the entire layer length.

• Seed: Each value randomizes the pattern of skipping through the frames.

7.14.9. Lens Dirt

Simulates dirt on the camera lens and in-lens reflection. Subtle use of this effect can often be helpful in adding realism to CGI shots or elements, and making them feel less perfect or artificially precise.



The dirt element can be procedurally generated from various seed values, or you can use another layer as the dirt source. The in-lens reflection flaring can be generated from the applied layer or from another source.

- **Preset:** Choose any of the built-in presets for immediate results, or as a starting point for further adjustments.
- Light Layer: Choose the layer whose luminance will be used to illuminate the lens dirt. When **None** is selected, the contents of the layer to which the effect is applied will be used. Select any other layer on the timeline to use its contents instead.
- **Dirt Layer:** Choose the layer whose contents will be used to generate the lens dirt. When **None** is selected, the dirt generated by the Lens Dirt effect will be used. Select any other layer on the timeline to use its contents instead.
- **Threshold:** Set the minimum luminance level at which the contents of the Dirt layer or dirt map will be visible. Higher values restrict the effect to brighter areas of the frame, thereby making the effect more subtle.
- Intensity: Adjusts the brightness of the dirt. Higher values make the effect more obvious.
- **Blur:** Blurs the light layer which illuminates the dirt, without altering the detail if the dirt itself. For realistic results this value should be kept relatively high.
- **Pivot Angle:** Modifies the angle at which the light layer enters the virtual lens. For realistic results this value should be kept relatively high.
- **Blend:** Choose the blend mode used to composite the effect onto the underlying layer.
- Dirt Map: When no Dirt Layer is selected, the Lens Dirt effect will generate its own dirt map.
 - **Seed:** Each seed value contains a unique procedurally generated dirt map. Change the seed if you want to use a different dirt map.

7.14.10. Noise

The basic noise effect provides a fixed-size noise.



- Amount: Sets the amount of noise present in the frame.
- **Monochrome:** When enabled, this option makes all of the noise grayscale. When disabled, random colors are assigned to each particle of noise.
- Seed: Each seed number randomizes the position of the individual noise particles.

7.14.11. Pixel Sort

Sorts lines of pixels based on color or tone, and creates a linear smearing effect. The Min Brightness and Max Brightness settings allow you to define a specific range of values to be included in the sorting. In each line of pixels, all pixels within the specified value range will be grouped, then sorted by value.



- Sort Order From: Choose the layer whose contents will be used to calculate the sort order. Select **None** to use the contents of the layer to which the Pixel Sort effect is applied. Choose any other layer on the timeline to calculate sort order based on its contents.
- Sort Order Channel: Select the channel of the chosen layer whose data will be used for sorting the pixels. This can dramatically affect the results. Sorting pixels based on saturation values will give much different results than sorting them by Luminance values, for example.
- **Grouping From:** Choose the layer whose contents will be used to calculate the pixel grouping. Select **None** to use the contents of the layer to which the Pixel Sort effect is applied. Choose any other layer on the timeline to calculate pixel grouping based on its contents.
- **Grouping Channel:** Select the channel of the chosen layer whose data will be used for generating the pixel groups. This can dramatically affect the results. Grouping pixels based on saturation values will give much different results than grouping them by Luminance values, for example.
- **Min Brightness:** Specify the lowest value that will be included in the sorting. Pixels with values below the specified brightness will remain unaffected.
- **Max Brightness:** Specify the highest value that will be included in the sorting. Pixels with values above the specified brightness will remain unaffected.
- Edge Threshold: Increasing the Edge Threshold value preserves edge details in the image, preventing the sorting from crossing the edges.

- Direction: Specify the angle of the sorting.
- **Sort Transparent:** Enable this option to include transparent pixels in the sorting. For layers with masks or alpha transparency, disabling this option keeps the sorted pixels within the limits of the matte. Enabling it allows the pixel sorting to extend beyond the matte borders.
- **Reveal Mode:** The Reveal controls can be keyframed to gradually apply the pixel sorting. Select the mode used to reveal the effect.
 - **Re-Order:** Linearly moves the pixels to their final sort locations.
 - **Flow (Dark):** Pixels are sorted progressively, with the darkest pixels being sorted first, working through to lightest pixels last.
 - Flow Over (Dark): Pixels are sorted progressively, from dark to light, and blended over the original image.
 - **Flow (Bright):** Pixels are sorted progressively, with the brightest pixels being sorted first, working through to darkest pixels last.
 - **Flow Over (Bright):** Pixels are sorted progressively, from light to dark, and blended over the original image.
- **Reveal:** Sets the percentage of the selected brightness range that is currently applied. 0% shows the original, unaffected image. 100% shows the fully pixel sorted image. The **Reveal Mode** setting above controls what method is used to reveal the pixels at all other values.
- **Reveal Noise:** Controls the granularity of the effect. Lower values smooth out the reveal, while higher values increase fine detail in the sorting results.

7.14.12. Scan Lines

EXPRESS ADD-ON Scan Lines is available in the VFX: Retro Pack.

Creates scan lines, as seen on some CRT displays when filmed.



- **Preset:** Choose any one of the built-in presets. The presets can be used as-is, or further customized to create the exact look you require.
- Frequency: Defines how many lines appear within the frame height.
- **Sharpness:** Adjusts how sharp the edges of each line are. Higher values soften the edges by blurring the scan lines.
- Angle: Sets the angle perpendicular to the scan lines.
- **Shift:** Adjusts the position of the scan lines, along the angle specified above. Negative values move the lines upward, positive values move the lines downward.
- Channel Shift: Each color channel can be shifted independently of the others.
 - **Red:** Adjusts the position of the red channel, along the angle specified above. Negative values move the channel upward, positive values move the channel downward.
 - **Green:** Adjusts the position of the green channel, along the angle specified above. Negative values move the channel upward, positive values move the channel downward.
 - **Blue:** Adjusts the position of the blue channel, along the angle specified above. Negative values move the channel upward, positive values move the channel downward.

- **Color:** Specify the two alternating colors used to create the scan lines. The effect is multiplied onto the underlying layer, so White becomes invisible, while Black remains completely visible.
 - Color 1: Choose a color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
 - **Color 2:** Choose a color. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Brightness:** Modifies the brightness of the underlying layer, beneath the scan lines. The darkest and brightest tonal values remain unchanged, while all values in between are shifted.
- **Offset:** Moves the entire tonal range of the underlying layer. Unlike the brightness control above, all tonal values get shifted equally.
- Gamma: Changes the gamma of the underlying layer.
- Saturation: Alters the intensity of the colors contained in the underlying layer, beneath the scan lines.
- Smooth Source: Blurs the contents fo the underlying layer, beneath the scan lines.

7.14.13. Shake

Adds artificial camera shake to the layer. This can be useful for adding shake to explosive effects, or for adding a sense of a handheld camera to a tripod shot.



- Amount: Controls the maximum distance which the frame can be moved to create the shaking.
- Speed: Controls the maximum speed at which the frame can move to create the shaking.
- Seed: Each seed number randomizes the timing, speed, and direction of the shake, within the maximums defined above.
- Smooth: Applies a radius to any sharp angles in the shaking movement.
- Scale: Changes the size of the layer contents, to prevent edges from becoming visible when the

frame moves.

Individual Controls

- **X Shake:** Shakes the frame left to right, moving it along the X (horizontal) axis.
- **Y Shake:** Shakes the frame up and down, moving it along the Y (vertical) axis. * **Tilt Shake:** Shakes the frame rotationally, randomly changing the angle.

Fractal

- Levels: Increasing the fractal levels adds smaller jitters on top of the larger shake movement.
- Amount Scalar: Alters the distance which the frame will be moved by the shake.
- **Speed Scalar:** Alters the speed at which the frame will be moved by the shake.
- **Temporal Shift:** Shifts the timing of the shake pattern. When more extreme shake is applied, this can help to ensure that critical components of the scene remain visible.

Motion Blur

- Mode: Choose how motion blur is calculated, for the motion of the shaking frame.
 - Off: No motion blur is applied.
 - Comp Settings: The motion blur settings defined in the timeline properties are used.
 - **Custom:** Allows you to define custom settings specifically for the shake effect. Selecting this option reveals two additional controls, Scale and Samples.
- Scale: Specifies the amount of blur to be applied.
- **Samples:** Defines how many duplicates of the frame should be used to fill in the blur distance. Higher values tend to look better, but are slower to process.

Wrap

- X: As the frame position is moved by the shake, the edges of the frame may become visible within each lens. This control determines how the blank space on the left or right side of the frame is handled.
 - No: The blank areas remain unaffected.
 - **Tile:** An exact copy of the layer is used to fill the blank area.
 - Reflect: A mirrored copy of the layer is used to fill the blank area.
- Y: As the frame position is moved by the shake, the edges of the frame may become visible within each lens. This control determines how the blank space on the top or bottom of the frame is handled.
 - **No:** The blank areas remain unaffected.
 - **Tile:** An exact copy of the layer is used to fill the blank area.

• **Reflect:** A mirrored copy of the layer is used to fill the blank area.

7.14.14. Stutter

Reduces the number of frames used during playback of the layer, creating the impression of the video momentarily freezing.



- Freeze Frames: Specify the duration, in frames, for which each frozen image will be held.
- **Frame Start:** The freeze frames can be offset within the layer's duration. Choose the frame on which the stuttering results should begin.

7.14.15. TV Damage [Layer Only]

EXPRESS ADD-ON TV Damage is available in the VFX: Damage Pack.

TV Damage simulates the appearance of a badly tuned television signal. It combines multiple elements to create the final effect, and each element can be customized individually to create the exact look you want.



• Seed: Randomizes the specific frames which are affected by the various elements of the TV Damage effect.

Ghosting

Ghosting is a duplication of the image, with the duplicate(s) being offset from the original. The most common cause is a television signal reaching the antenna from several different paths, with slightly different timing, so multiple frames are displayed simultaneously. Here is the sample footage with only the ghosting component applied.



- Enabled: Toggles the ghosting component on or off.
- Number of Ghosts: Defines the number of duplicate images which will be generated.
- Separation: Sets the distance, in pixels, between each ghost, or duplicate.
- **Falloff:** Increasing the falloff moves the ghosts back to the correct position. At 0.00, the ghosts will be separated by the Separation value defined above. At 1.00, they will be perfectly aligned with the original. Keyframing this value allows you to naturally animate the appearance or disappearance of the ghosting component.

Co-Channel Interference

Co-Channel interference, also known as crosstalk, occurs when two channels are being received at the same time. It blends a second image onto your primary image. Here is the co-channel interference from the sample footage, isolated from the main footage:



- Enabled: Toggles the co-channel interference component on or off.
- **Source:** Choose another timeline layer to be the source of the interference.
- **Intensity:** Adjusts the balance between the primary image, and the interference image. 0.00 shows only the original image, and 1.00 shown only the interference image.

Offset

Use these controls to change the positioning of the interference image.

- **Position:** Sets the location for the center of the interference image, using X (horizontal) and Y (vertical) values.
- **Use Layer:** Select another layer from the timeline using, to use the selected layer's position to control the position of the interference image. When a layer is selected, the Position property above functions as an offset from the parent layer's position.

Movement

The movement controls apply automated animation to the position of the interference image.

- X: Set the distance, in pixels, which the interference image will move horizontally per second.
- Y: Set the distance, in pixels, which the interference image will move vertically per second.

Gap

controls the size of the gap between duplicates of the interference image, when the Offset or Movement properties are set to values which reveal the edges of the image.

- X: Set the width, in pixels, of the gap between each horizontal copy of the interference image.
- Y: Set the height, in pixels, of the gap between each vertical copy of the interference image.

Radio Interference

This component simulates the negative impact on your image quality of a radio signal which is overlapping the frequency of the television signal. Generally the affect presents as squiggly lines which break up the image. Here is the radio interference component from our sample footage:



- Enabled: Toggles the radio interference component on or off.
- Intensity: Controls how visible the interference lines are.
- Angle: The angle selected here will be perpendicular to the squiggly lines.
- Scale: Adjust the overall size of the lines which make up the interference.
- **Frequency:** Sets the width of each wave, or squiggle. Higher values increase the number of squiggles in each line.
- **Amplitude:** Sets the height of each squiggle. Lower values result in relatively straight lines, while higher values increase the distortion of the lines.
- Sharpness: Adjusts how crisp the edges of each line are.

Motion

- Angle: Select the direction in which the radio interference lines will move.
- **Speed:** Set the speed, in pixels per second, at which the radio interference lines will move.

Vertical Hold

Analog television signals sometimes needed to be manually adjusted for accurate alignment. When vertical hold lost synchronization, the image would consistently or intermittently scroll upwards or downwards. Here is the sample footage with only the vertical hold component applied:



- Enabled: Toggles the vertical hold component on or off.
- Frequency: Adjusts how often the vertical hold is lost, causing the image to shift vertically.
- **Regularity:** Controls how consistently the vertical position of the image is shifted. Lower values give more random results.
- **Gap:** Determines the size of the gap between each copy of the image.
- Blur: Applies motion blur to the image, based on how quickly it is moving on each frame.

Horizontal Hold

When horizontal hold lost synchronization on an analog television signal, each line of resolution could become shifted sideways, causing vertical edges within the image to become ragged. Here is the sample footage with only the horizontal hold component applied:



- Enabled: Toggles the horizontal hold component on or off.
- Frequency: Adjusts how often the horizontal hold is lost.
- Amplitude: Controls how far the lines may be shifted sideways.
- **Regularity:** Controls how consistently the horizontal position of the image is shifted. Lower values give more random results.

Electrical Interference

Electrical interference can be caused by any electromagnetic source near the television receiver. It presents as horizontal lines of noise over the image. Here is the electrical interference component from our sample footage, isolated over a black background:



- Enabled: Toggles the electrical interference component on or off.
- Quantity: Determines the number of lines which are present.
- Width: Controls the thickness of the individual lines.
- **Color:** Choose a color for the lines. White is the default, and most common. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

Placement

Use these controls to alter the positioning of the electrical interference lines.

- **Center:** Sets the location for the center of the electrical interference, using X (horizontal) and Y (vertical) values.
- **Use Layer:** Select another layer from the timeline using, to use the selected layer's position to control the position of the electrical interference. When a layer is selected, the Position property above functions as an offset from the parent layer's position.
- Area Width: Defines the percentage of the frame height which will be filled by the electrical interference.

Gaps

The horizontal lines will be broken up by gaps. Use these controls to define how the gaps will appear.

- Amount: Adjusts the ratio of lines to gaps. Higher values increase the amount of gaps.
- Frequency: Changes the overall number of lines and gaps within the frame width.

Vignette

Darkens the corners and edges of the frame. Here is the vignette from our sample footage, on its own:



- Enabled: Toggles the vignette component on or off.
- Horizontal Stretch: Adjusts the width of the vignette, relative to the width of the frame.
- Vertical Stretch: Adjusts the height of the vignette, relative to the height of the frame.
- **Softness:** Adjusts the transition from full brightness to darkened vignette, around the vignette's edges.
- **Curvature:** Shifts the weighting of the transition, between the center of frame and the edge of the vignette.
- **Opacity:** Adjusts the opacity of the layer to which the vignette is applied, for some reason.

Background

These controls adjust the appearance of the vignette itself.

- **Opacity:** Defines how visible the vignette is. Higher values make the vignette more opaque, lower values make it more transparent.
- **Color:** Choose a color for the vignette. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

Monitor

The monitor component divides the image into a grid of squares, pixelating the image based on a resolution of your choice. This component was not used in our sample footage, but here is an example applied to the same source:



- Enabled: Toggles the Monitor component on or off.
- **Resolution:** Controls the number of vertical pixels used to represent the frame. the number of horizontal pixels will be calculated based on the aspect ratio of the frame.

Pixel Component

- Width: Sets the width of each pixel, as a percentage of its available width. At 1.00, each pixel will touch the pixels bordering it on the left and right. At lower values, a gap will be created between the pixels.
- **Height:** Sets the height of each pixel, as a percentage of its available height. At 1.00, each pixel will touch the pixels bordering it on the top and bottom. At lower values, a gap will be created between the pixels.
- **Shift:** Each pixel contains red, green, and blue values (RGB) You can offset the color values using these controls.
 - **Red:** Shifts the red value of the pixel. Negative values shift it right, and positive values shift it left.
 - **Green:** Shifts the green value of the pixel. Negative values shift it right, and positive values shift it left.
 - **Blue:** Shifts the blue value of the pixel. Negative values shift it right, and positive values shift it left.

7.15. Keying

Keying is the term used for automatically removing parts of an image or video, usually by identifying a specific color. HitFilm includes several effects for keying your layers. Each effect has its own page, where you can find full details of the effect and its controls.

- <u>Matte Enhancement</u>
- Chroma Key [Layer Only]
 EXPRESS ADD-ON
- <u>Chroma UV Blur</u>
- <u>Color Difference Key</u>
- Demult
- Difference Key [Layer only]
- Hue & RGB Key
- Luminance Key
- <u>Remove Stock Background</u>

7.15.1. Matte Enhancement

After keying a layer you may need to perform further adjustments to achieve high quality results. The matte enhancement effects are designed for this purpose. Each effect has its own page where you can find full details fo the effect and its controls.

- Alpha Brightness & Contrast
- <u>Crush Blacks & Whites Alpha</u>
- Erode White
- Invert Alpha
- Light Wrap [Layer Only]
- <u>Matte Cleaner</u>
- <u>Remove Color Matting</u>
- Set Matte [Layer Only]
- <u>Spill Removal</u>

7.15.1.1. Alpha Brightness & Contrast

The brightness and contrast of a layer's alpha channel can be adjusted to tweak the edges of a composite.

- **Brightness:** Adjust to the left to decrease brightness, or to the right to increase brightness of the alpha channel. Remember that in the alpha channel, black is completely transparent, and white is completely opaque, so the visible results in the viewer alter what parts of the layer are visible, rather than the actual tonal values of the image.
- **Contrast:** Adjust to the left to decrease contrast, or to the right to increase contrast of he alpha channel. Remember that in the alpha channel, black is completely transparent, and white is completely opaque, so the visible results in the viewer alter what parts of the layer are visible, rather than the actual tonal values of the image.

7.15.1.2. Crush Blacks & Whites Alpha

Similar to the normal Crush Blacks & Whites effect, but only affects the alpha channel. Crushing the blacks can remove lingering areas of your keyed area, while clamping the white can help to fill transparent areas in your subject.

- **Black:** Increasing this slider will raise the threshold below which shadow areas will be pushed into pure black, ensuring they are completely transparent.
- White: Decreasing this slider lowers the threshold above which highlights will be pushed into pure white, ensuring they are completely opaque.

7.15.1.3. Erode White

The erode effect shifts the edge of a layer's alpha channel inward, reducing the white area of the matte.

- Choke: Sets the distance, in pixels, by which the edge of the white area will be moved inward.
- **View Matte:** Enable this option to view the transparency matte as a greyscale image. Disable it to view the original image with the transparency applied.

7.15.1.4. Invert Alpha

Inverts the layer's alpha channel. There are no controls for this effect.

7.15.1.5. Light Wrap [Layer Only]

Light wrap allows the brightness of a selected layer to brighten the edges of the keyed layer. You can often improve composites using light wrap, which enables light from another layer to bleed onto the keyed layer. This helps to realistically embed the keyed subject into the surrounding scene, since the edges of the keyed layer are modified based on the specific brightness/color of the pixels behind them.

If you have transformed or added effects to the light wrap source layer, you will need to convert it to an embedded composite shot for the light wrap to take those changes into account.

- Source Layer: Choose the layer used to generate the light wrap.
- **Radius:** Defines the distance, in pixels, to which the light rap will reach into the keyed layer. The effect is feathered within this distance, so the effect will be strongest at the edge of the keyed layer, and fade as it reaches farther into the layer.
- **Opacity:** Adjust the overall intensity of the light wrap. 1.00 gives the strongest results, while 0.00 makes the effect completely transparent.
- **Blend:** Select the blend mode used to apply the light wrap onto the keyed layer. The most commonly used settings are:
 - **Lighten:** The default setting, which works best in the majority of cases. Only areas where the background layer is lighter than the keyed layer will have any effect.
 - **Screen:** For very bright backgrounds, using screen can be helpful for transferring that brightness onto the edges of the keyed layer.
 - **Soft Light:** When working with very dark backgrounds, this option can help to softly darken the edges of the keyed layer, and create a more convincing composite.
7.15.1.6. Matte Cleaner

You can use the matte cleaner to refine the results of a keying effect. The matte, which defines the transparent areas created by the key, can be modified with these controls to improve the results.

- **Smooth:** Makes the edge of the matte smoother. Any corners or abrupt changes in direction of the matte edge are rounded, using the radius (in pixels) which you specify.
- **Feather:** Makes the edge of the key softer. A gradient of transparency is applied to the edge of the matte, to a width (in pixels), which you specify.
- **Choke:** Shrinks the edge of the key. This value sets the distance, in pixels, by which the edge of the white area will be moved inward, reducing the white area of the matte.
- View Matte: Enable this option to view the transparency matte as a greyscale image. Disable it to view the original image with the transparency applied.

7.15.1.7. Remove Color Matting

When using stock footage, this effect can be used to reduce dark areas in the composited element. This tool is most effective when used after stock has been composited using the <u>channel swapper</u>.

• **Background Color:** Choose the color of the background contained in the stock The selected color will be removed from the layer. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

7.15.1.8. Set Matte [Layer Only]

A Matte is a greyscale image which serves as a transparency map, with white areas being opaque and black areas being transparent. The Set Matte effect enables you to use channels from another layer as a matte, to define the transparency of the current layer. This can be particularly useful if you want to use the alpha channel from another layer.

- Source Layer: Choose the layer from which the matte will be obtained.
- **Matte Source:** Select the channel of the source layer, to use the contents of that channel to generate the matte.
 - **Red:** Uses the red color channel of the source image to define transparency. The higher the red value in each pixel, the more opaque that pixel will be.
 - **Green:** Uses the green color channel of the source image to define transparency. The higher the green value in each pixel, the more opaque that pixel will be.
 - **Blue:** Uses the blue color channel of the source image to define transparency. The higher the blue value in each pixel, the more opaque that pixel will be.
 - **Alpha:** Apples the alpha channel of the source layer directly to the current layer. The current layer will only be visible where the source layer is visible.
 - **Luminance:** Uses the luminance values of the source layer to define transparency. The higher the luminance value for each pixel, the more opaque that pixel will be.
 - Hue:
 - **Lightness:** Uses the lightness values of the source layer to define transparency. The lighter a pixel is, the more opaque that pixel will be.
 - **Saturation:** Uses the saturation values of the source layer to define transparency. The more saturated a pixel is, the more opaque that pixel will be.
 - Full:
 - **Off:** Disables the effect, turning off the matte. This is primarily useful for toggling the set matte effect on and off over the course of the current layer's duration.
- Blend: Select how the matte from the source layer is blended with the current layer.
 - **Add:** The source matte is added to the current layer's matte. All visible areas of the current layer will remain visible, and visible areas of the source matte will also be visible.
 - Subtract: The source matte is subtracted from the current layer's matte. All transparent areas
 of the current layer will remain transparent, and transparent areas of the source matte will also
 become transparent.
 - **Replace:** The current layer's matte will be disregarded, and the source layer's matte will be used in its place.
- Invert: Reverses the matte, so transparent areas become opaque, and opaque areas become

transparent.

7.15.1.9. Spill Removal

When working with green screen and blue screen you can sometimes find slight color fringing around the edge of a key after the colored background has been removed. This is called color spill, and is caused by the background color blending with the subject color. Where this occurs, the pixels are not green enough to be included in the key. The Spill Removal effect removes or reduces this color fringing, by identifying areas with relatively high green values (or blue values when working with blue screen), and removing the green (or blue) in those areas.

- Screen Color: Select the color of the background used in the source video. Red, Green, or Blue can be selected.
- Strength: Adjusts the intensity of the effect. Higher values remove more of the selected color.
- **Suppression Type:** Choose the type of suppression used to remove the color. The main difference is how the hues near the selected color are affected.
 - Standard: Removes a smaller range of colors, which can help to retain accurate color in your image in some cases. Particularly if you are green screening a subject which contains bright yellows, this option is useful.
 - **Extended:** The default option, which affects the largest range of colors. This gives the best results in most cases, but if you find that the colors of your subject are being altered, try switching to Standard to see if it gives better color accuracy.

7.15.2. Chroma Key [Layer Only]

This effect provides professional quality removal of any color from a source with precision control over edge detail, edge color correction and advanced spill replacement.

EXPRESS ADD-ON Chroma Key is available in the Composite: Pro Keying Pack.

- View: Select how the chroma key will be displayed on the Viewer.
 - **Source:** Shows the original, unkeyed layer.
 - Status: Shows a black and white matte. This makes it easy to see at a glance which areas are not fully opaque. This mode does not show gradients of transparency. White areas are opaque, black areas are transparent, and all semi-transparent areas are dispalyed as a single tone of middle gray.
 - Matte: Shows a greyscale matte. This provides an accurate view of opaque and transparent areas.
 - **Despill Mask:** Displays the despill mask, if one is being used.
 - Despill Map: Shows the area being spill suppressed. White areas indicate where spill suppression will be applied.
 - **Result:** Shows the final composited result.

Note that the View menu will affect final output.

- Adaptive Color: This method is particularly effective when working with uneven green screens. Even slight changes in tone or brightness across your green screen can cause keying complications. Adaptive color aims to improve results in such cases and can be particularly effective with fine detail areas such as lace and hair.
 - Note that when adaptive color is activated the Gain setting will have a minimal effect. Key
 adjustments should be made primarily using the Clip Foreground and Clip Background settings.
- **Color:** Defines the color to be keyed.
- **Gain:** Gain is the base sensitivity of the chroma key. This is best used for the initial background removal. It should be adjusted until the subject is isolated, though you don't want to push the gain too far as you will start to lose edge detail.
- Balance & Hue Balance: These two settings adjust the emphasis of the chroma key, affecting the range of colors that are affected. In practical use, it is usually best to try them at the minimum and maximum values to see which best suits your image.
- **Pre-Blur:** Applies a blur to the footage prior to keying. This can help with lower resolution footage.

Matte

- **Clip Background:** Crushes the black point of the matte, so that more parts of the image are removed. If parts of your green screen are still visible this should be used to remove them.
- **Clip Foreground:** Clips the white point of the matte, returning detail to the foreground. If parts of your subject are semi-transparent, you should reduce the clip foreground to make it fully opaque.
- **Clip Rollback:** After adjusting the clip foreground you may want to return some of the semitransparency to the outer edges of your foreground. This helps to create a softer edge, although increasing this setting too much will cause an undesirable band of semi-transparency around the edge.
- **Gamma:** Adjusts the strength of the key. This can be useful for adjusting the fine detail at the edges of the key, particularly around hair and semi-transparent areas.
- **Erode/Expand:** This works in a similar way to the standalone Erode White filter and can be used to expand or erode the alpha matte. If you need to add or remove pixels from the edge of the key this can be very useful.
- **Despot Foreground/Background:** Aims to remove holes in the background or foreground. Used subtly this can improve overall keying quality without affecting edge detail.
- **Softness:** Blurs the alpha, creating a softer edge to the key.
- **Bias:** Performs a white balance using the selected color, prior to applying the key.

Edge Color

- Subtract Background Color: Increasing the subtract setting removes the background color (for example, green if you're using a green screen) from the semi-transparent areas of the image. **This can be very effective for reclaiming the correct color in semi-transparent areas, such as glass.
- **Recover Edge Color:** A thin dark line can sometimes be seen on the keyed edges of white clothing or pale skin. The recover setting can counter this problem by adjusting the colors of the outer pixels. Rather than using their actual color, instead they will take on the color of the pixels further inside the foreground. Best used subtly.

Expansion Region Color

• **Method:** If Erode/Expand is set to a positive value, this determines the content of the expansion region. The default **Despilled Source** usually provides best results.

Retain/Remove Mask

• Separate layers can be specified as additional masks to aid with the overall keying. Retain masks identify areas the key should ignore, while remove masks identify areas that should definitely be removed.

Spill Suppression

The chroma key effect also includes built-in spill suppression. Even a perfectly shot clip can still suffer from color spill. This is when the green or blue of the screen is reflected on the subject. While this is often difficult to see in the original image, once it has been composited it becomes extremely obvious, resulting in unwanted color fringing around edges.

- Amount: Varies the strength of the spill suppression.
- *Hue Range/Balance/Hue Balance: Expands or contracts the spill suppression area. Best adjusted while in the Despill Map view mode.

Spill Replacement

Spill replacement aims to replace the unwanted spill with a new spill color.

- Luminance Change: Varies the luminance adjustment based on the replacement color.
- **Source Layer:** A specific layer can be selected for spill replacement. This then updates the replacement color as the selected layer changes.
- Color: A color can be selected manually for spill replacement.
- Blur: When using a source layer for spill replacement, the layer can be blurred for a subtler effect.

Despill Mask

A specific layer can be used to manually define areas to be spill suppressed.

- From: Selects the Despill Mask layer.
- Color Dist Max: Adjusts the range of color to be suppressed.
- Softness: Blurs the Despill Mask.

Color Correction

Color correction is integrated into the chroma key effect, enabling you to color correct the foreground, background and edge of your key.

- Enable: Turns the color correction features on and off. The remaining controls will only be visible once Color Correction is Enabled.
- Edge Resize: The edge area can be blurred and enlarged.
- Foreground/Edge/Background: Each area's strength, hue, saturation and lightness can be individually adjusted.

7.15.3. Chroma UV Blur

The UV blur can be essential depending on the way your video camera stores its data.

After keying some video you may notice a pixellated 'stepping' around the edge of the key. If this occurs, add a chroma UV blur before the key itself. This will help to smooth out the edge. YUV color separates the luminance of each pixel (Y) from the chroma data (UV) Blurring only the chrominance data smooths the edges without losing the contrast detail which defines the edge location.

- Radius: Controls the amount of blur, defined as a radius in pixels.
- **Direction:** Select how the blur is applied.
 - **Horizontal & Vertical:** The blur is applied in all directions. This is the usual method used for blurs.
 - Horizontal: The blur is only applied horizontally.
 - Vertical: The blur is only applied vertically.

7.15.4. Color Difference Key

This is a simpler keying tool than the chroma key effect, and is used for removing green screen and blue screen backgrounds from video and images.

- Screen Color: Choose the color to be removed from your video.
 - **Red:** Red screens are sometimes used for keying non-human subjects, such as mechanical models containing a lot of gray.
 - **Green:** Green screen is the most common background for keying, because most video cameras record more data in the green channel than in the other color channels. It is also effective for human subjects, and provides for good separation from skin tones.
 - Blue: Blue was the most common color for keying with film, due to the processed used for analog keying, and because it is most distinct from skin tones. It is still an effective option for video keying of human subjects, but is less common than green.
- Min: Increase the Min setting to remove a larger range of tones centered on the selected color.
- **Max:** Reduce the Max setting to restore edge areas to the matte. If the Max value is set below the Min value, the key will be inverted, and all colors except the selected color will be removed.
- **Gamma:** Shifts the gamma of the matte, which is an adjustment of the luminance which affects shadow tones more than highlight tones. In practice, increasing Gamma reduces the area removed by the key, and reducing the gamma increases what is removed.
- View Matte: Toggling this option displays the matte on the viewer, as a grayscale image where White is completely retained, and black is completely removed. This can be useful for identifying problem areas which may need further adjustment.

7.15.5. Demult

Quickly key out the background from stock footage shot on black and generate an embedded alpha channel. Very useful for compositing smoke, explosions and similar.

- Alpha From: Select the values which will be used to generate the alpha channel.
 - Max RGB: Compares the red, green, and blue values, and uses the highest value for each pixel. These values are then converted to luminance, to generate a grayscale image which is used as an alpha channel for the image.
 - Luminance: The luminance channel of the image is directly converted to an alpha channel.
 - **Average RGB:** The red, green, and blue values are added, then divided by three to get an average value for each pixel. These values are then converted to luminance, to generate a grayscale image which is used as an alpha channel for the image.

7.15.6. Difference Key [Layer Only]

Removes areas of a layer based on differences with another layer. This works best with stationary shots, where you film a clean plate of the background, keep the camera locked off, and then film your subject. The Difference Key then compares each pixel of the two shots, and any pixels that remain the same are removed by the key. The background, which is the same in both shots, is thus removed, and only the subject remains.

- **Source Layer:** Choose any layer from the timeline. The selected layer will be compared to the current layer to generate the key.
- **Blurred Comparison:** Applies an invisible blur to each layer before calculating the key. Used judiciously, this can help to overcome difficulties like grain or noise in the footage.
- Threshold: Defines how different each pixel must be in order to be removed.
- **Softness:** Feathers the edge of the key to create a softer edge.

7.15.7. Hue & RGB Key

This effect keys the layer based on a color of your choice. You can use the hue or RGB values to generate the key.

- **Color:** Choose a color to be removed from the layer. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.
- **Tolerance:** Controls the range of hues surrounding the exact color you have chosen, which will also be removed.
- Edge Softness: Applies a blur to the matte generated by the key, to soften its edges.
- Match Colors By: Select whether colors are matched based on hue, or RGB values.
- **Invert:** Reverses the results of the key, so only the selected color remains, and all other colors are removed.
- View Matte: Toggling this option displays the matte on the viewer, as a grayscale image where White is completely retained, and black is completely removed. This can be useful for identifying problem areas which may need further adjustment.

7.15.8. Luminance Key

This effect keys the layer based on its brightness. This is commonly used to remove black or white backgrounds, and can also be particularly useful for sky replacement.

- **Key Type:** Luminance Key can remove either end of the luminance range. Select the type which will be used.
 - Key Out Brighter: Removes the brightest tones, leaving the darker areas.
 - Key Out Darker: Removes the darkest tones, leaving the brighter areas.
- **Threshold:** Sets the tonal value which marks the limit of the key. Tonal values on one side of the threshold are retained, and values on the other side are removed.
- **Tolerance:** Softens the transition surrounding the threshold. Higher values create a more gradual transition between the areas which are removed and the areas which are retained.
- View Matte: Toggling this option displays the matte on the viewer, as a grayscale image where White is completely retained, and black is completely removed. This can be useful for identifying problem areas which may need further adjustment.
- Brightness Used: Select the channel that will be used to determine the luminance values which the effect will process. Choose between Intensity, Lightness, or Luminosity.

7.15.9. Remove Stock Background

For stock footage shot on a black or white background, this tool makes it easy to remove those backgrounds. In this example image, a clip of smoke filmed in front of black is being composited onto another media clip. Remove Stock Background has been applied to the left side of the clip, to remove the black, leaving only the smoke.



- Background: Choose whether Black or White is removed from the layer.
- Channel: Choose the channel used to determine what area is removed.
 - Max RGB: Uses the highest value among the RGB channels to calculate removal.
 - Luminance: Calculates the removal based on the luminance channel.
 - **Average RGB:** Averages the red, green and blue values, and uses the result to calculate the removal.
- **Balance:** Adjusts how much of the tonal range is removed.
- View Matte: Reveals, on the Viewer, the matte created by the removal calculations.

7.16. Lights & Flares

These effects focus on creating light-based effects and enhancements, such as lens flares, glows and light rays. Each effect has its own page where you can find full details of the effect and its controls.

- Anamorphic Lens Flare
 EXPRESS ADD-ON
- Auto Light Flares
- Gleam
 EXPRESS ADD-ON
- <u>Glow</u>
- Inner Glow
 PRO EXCLUSIVE
- Light Flares
- Light Leak
 EXPRESS ADD-ON
- Light Rays
 EXPRESS ADD-ON
- Light Streaks [Layer Only]
 EXPRESS ADD-ON
- Neon Glow
- Outer Glow PRO EXCLUSIVE

7.16.1. Anamorphic Lens Flare

EXPRESS ADD-ON Anamorphic Lens Flare is available in the VFX: Lighting Pack.

Simulates the use of an anamorphic lens, creating broad flares based on the source layer.



The **threshold** determines how much of the source layer produces flaring. The resultant effect can be adjusted with the **intensity** property. The **blur flare** property creates a less distinct flare, which can often look more realistic.

- Threshold: Specifies the brightness level above which the source layer will produce flaring.
- Intensity: Controls the overall brightness of the generated flares affecting all streaks
- Blur Flare: Blurs the linear streaks created by the flare. Fairly low blur settings tend to give the most realistic results
- **Blend:** Select the blend mode used to composite the flares onto the layer.
- **Number of Streaks:** Specify the number of streaks which will be present. The effect includes one streak by default, but you can add up to 10 unique streaks to build more complex effects. Each streak will have a section of numbered Streak controls below.

Streak 1 (duplicate controls will be listed for each streak

number)

- Length: Adjusts the length of the streak.
- Intensity: Controls the overall brightness of the streak.
- **Offset:** Adjusts the brightness of the flares independently of saturation. Reducing the offset and increasing the Intensity allows you to create more colorful flares.
- Orientation: Select the direction of the streaks.
 - Horizontal: The streaks will run horizontally.
 - Vertical: The streaks will run vertically.
- **Alignment:** Specify the position of the streaks within the frame. The options displayed will vary based on the selected Orientation.
 - **Top:** The flares will originate from the top of the frame, and extend into the frame based on the Length setting.
 - Center: The flares will be centered on the bright spots in the frame and extend in both directions. If the orientation is set to Vertical, they will extend up and down. If the Orientation is set to Horizontal, they will extend left and right.
 - **Bottom:** The flares will originate from the bottom of the frame, and extend into the frame based on the Length setting.
 - **Left:** The flares will originate from the left side of the frame, and extend into the frame based on the Length setting.
 - **Right:** The flares will originate from the right side of the frame, and extend into the frame based on the Length setting.
- Horizontal Pivot: Flips the streaks from left to right.
- Vertical Pivot: Flips the streaks from top to bottom.

Colorize

By default the streaks will take their color from the layer to which they are applied. You can also introduce a specific color of your choice into the streaks.

- **Amount:** Adjusts the balance of the original color with the new color. 0.00 shows only the original color and 1.00 shows only the selected Colorize color.
- **Color:** Choose a color to be applied to the flare. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

7.16.2. Auto Light Flares

The **Auto Light Flares** effect shares many properties with the <u>Light Flares</u> effect. The primary difference is that auto light flares identifies bright areas in the layer and applies light flares automatically, adjusting intensity and scale based on the source.



The **Hotspot** property group is different in auto light flares, providing control over where the light flares appear.

- **Threshold:** Sets how bright a pixel has to be for a light flare to be drawn. At high thresholds, flares will only appear on the brightest parts of the layer. Lowering the threshold will produce more light flares on less bright areas.
- Max flares: Determines how many flares can be drawn.

Flare appearance can be adjusted as with the standard light flares effect.

7.16.3. Gleam

EXPRESS ADD-ON Gleam is available in the VFX: Lighting Pack.

Creates the impression of rays of light shining out from a central point. The general appearance of the rays is determined by the effect properties, rather than by its interaction with the layer itself. In this respect it differs from the Light rays effect. The appearance of the rays can be heavily customized.



- Ray Length: Adjust the length of the rays created by the effect.
- Intensity: Modifies the overall brightness of the rays.
- **Minimum Value:** Specifies the lowest luminance value which will generate rays. Any tones darker than the chosen value will be ignored by the effect.
- **Maximum Value:** Specifies the highest luminance value which will generate rays. Any tones brighter than the chosen value will be ignored by the effect.
- **Quality:** Adjusts the balance of speed and image quality. Higher values will create superior results, but will take longer to process.
- **Blend:** Select the blend mode used to composite the gleam effect onto the original contents of the layer.

Position

- **Center:** Defines the location of the point from which the rays originate, on the X axis (horizontal) and Y axis (vertical). When the Use Layer option (below) is used, this position value serves as an offset from the position of the selected layer.
- **Use Layer:** Select any other layer on the timeline to use its position as the origin of the gleam rays. When a layer is selected, the Position property below functions as an offset from the selected layer's position.

Colorize

By default the rays will take their color from the layer to which they are applied. You can also introduce a specific color of your choice into the effect.

- **Enable:** Enabling this option overrides the layer color and creates the rays using the color you choose.
- **Color:** Choose a color to be applied to the rays. You can use the eyedropper to choose a color from the layer, or click the swatch to open a color picker and choose any color you prefer. You can also manually enter the color values for the red, green, and blue channels.

7.16.4. Glow

Adds a glowing aura to bright areas of the layer.

Per Channel Intensity properties enable you to shift the glow color.

Advanced options provide further customization of the glow's appearance, including creating a specific color gradient.



7.16.5. Inner Glow

Creates a soft glow effects around the inside of your layer, with full control over the size and color of the glow effect. The glow is a gradient that transitions from its most opaque at the edge of the layer, to complete transparency inside the layer, at the distance set by the width control.

- Color: Select the color you want to apply to the glow.
 - Values: You can enter new RGB values for a specific color.
 - **Pipette:** Use the pipette to select a color from within your frame. Click on the pipette, hold the mouse button down, and drag to the color you wish to select. Release the mouse button to select the color.
 - **Color Swatch:** Click the color swatch to open a color picker and choose any color you wish.
- **Opacity:** Defines the amount of the glow, from completely transparent at 0.00 to fully opaque at 1.00.
- Size: Adjusts the width of the glow, in pixels.
- **Spread:** Shifts the mid-point of the gradient, to make it more solid or more subtle. Increasing the value shifts the mid point closer to the center of the layer, giving the glow more body.
- Offset: By default the glow is centered on the layer. Use offset to shift it on the X (horizontal) or Y (vertical) axis.

7.16.6. Light Flares

Generates a wide variety of realistic lens flares and lights. Each flare type can be heavily customized to create a limitless variety of alternatives.

Flares are made up of a hotspot, rays and unique tertiary elements. Each part can be adjusted individually.

The positioning of a flare is determined by its **hotspot** and its **pivot**. The pivot point is used for automatically animating the rays and additional elements, while the hotspot is used for the position of the main flare itself.

Below are two examples of light flares, both created starting with the **chromatic halo** type to show the level of possible customization:





7.16.7. Light Leak

EXPRESS ADD-ON Light Leak is available in the VFX: Lighting Pack 2.

Generates an evolving pattern of color gradients, simulating unwanted light leaking into the camera during shooting.

7.16.8. Light Rays

EXPRESS ADD-ON Light Rays is available in the VFX: Lighting Pack 2.

Though similar in immediate appearance to Gleam, **Light Rays** generates a more realistic illusion of light emitting from a central point.



Used in conjunction with a 3D point, light rays can be used to create realistic volumetric lighting effects as in this 3D model shot:



7.16.9. Light Streaks [Layer Only]

EXPRESS ADD-ON Light Streaks is available in the VFX: Lighting Pack 2.

Creates a range of light streaks based on the source layer. Ideal for creating the kind of lens aberrations caused by anamorphic lenses.



7.16.10. Neon Glow

Creates a glowing edge around a layer's alpha channel. This is particularly useful for effects such as lasers and lightsabers.



7.16.11. Outer Glow

Creates a soft glow effects around the outside of your layer, with full control over the size and color of the glow effect. The glow is a gradient that transitions from its most opaque at the edge of the layer, to complete transparency farther outside the layer, at the distance set by the width control.

- Color: Select the color you want to apply to the glow.
 - Values: You can enter new RGB values for a specific color.
 - **Pipette:** Use the pipette to select a color from within your frame. Click on the pipette, hold the mouse button down, and drag to the color you wish to select. Release the mouse button to select the color.
 - **Color Swatch:** Click the color swatch to open a color picker and choose any color you wish.
- **Opacity:** Defines the amount of the glow, from completely transparent at 0.00 to fully opaque at 1.00.
- Size: Adjusts the width of the glow, in pixels.
- **Spread:** Shifts the mid-point of the gradient, to make it more solid or more subtle. Increasing the value shifts the mid point farther outside of the layer, giving the glow more body.
- Offset: By default the glow is centered on the layer. Use offset to shift it on the X (horizontal) or Y (vertical) axis.

7.17. Particles & Simulation

Each effect in this category has its own page, where you can find complete details of the effect and its controls.

- Atomic Particles [Layer Only] 3D, array-based particle system with audio integration.
 EXPRESS ADD-ON
- Blood Spray Splatter simulation.
 EXPRESS ADD-ON
- Fire [Layer Only] Realistic flame simulation. EXPRESS ADD-ON
- <u>Gunfire</u> 3D muzzle flash generator.
 EXPRESS ADD-ON
- Lightning & Electricity Realistic electrical animation.
- <u>Particle Simulator</u> Hugely powerful, 3D particle simulator.
- Rain On Glass Realistically simulate raindrops moving across a pane of glass.
- Shatter [Layer Only] Break a layer into 3D chunks.
 EXPRESS ADD-ON

7.17.1. Atomic Particles [Layer Only]

Atomic Particles are array-based, which means they use regimented grids of particles. This is very different to the <u>Particle Simulator</u> which is a physics-based, free-emitter particle system.

EXPRESS ADD-ON Atomic Particles is available in the Motion: Audio Visual Pack.

Although applied as a 2D effect, atomic particles are simulated in 3D and can be rotated around using a 3D camera. They also interact with HitFilm's 3D lighting system.

Examples of atomic particles

There are countless uses for atomic particles effects. Below are a few simple examples, all created very quickly and easily:









Particle placement

This property group determines the initial positioning and layout of the particle grid that forms the foundation of any atomic particle effect.

3D model render mode

If atomic is applied to a 3D model layer this option becomes available.

Screen space applies atomic to the 3D model as if it were a 2D layer, simply atomizing the rendered, flattened frame.

Project texture atomizes the 3D model according to its 3D geometry. This mode 'bakes in' lighting into the atomized version.

Model textures atomizes the 3D model according to its 3D geometry. It uses the 3D model's source textures, prior to the model being illuminated in the scene.

Position & rotation

The position properties determine the location in 3D space of the particle grid.

For greater control the particle grid can be linked to another layer in the composite shot, including a 3D
point layer.

Atomic and 3D cameras

Atomic particles is a 2D effect, although it generates 3D rendered content. It can be adjusted to exist in 3D space using this technique:

- 1. Create a new point layer.
- 2. Set the point layer's **dimension** to 3D.
- Apply the Atomic particles effect to a layer and explore the Particle placement -> Position property group.
- 4. Set the **Transform From** option to link to the point layer created in step 1.

The atomic particles will inherit 3D position data from the point layer. 3D cameras can then be moved in and around the atomic particle cloud in 3D.

Number of particles

The particle grid can be adjusted to have more or less individual particles. The particle grid is made up of multiple layers (Z) of horizontal (X) and vertical particles (Y).

When first using atomic particles it can be easier to understand the system by reducing the X and Y values so that you can easily make out the individual particles.

This is a particle grid of 10×10×1:



Increasing the number of Z layers to 5 gives depth to the particle grid:



The spread of particles can be adjusted using the **scale** properties, to make particles closer together or farther apart:



The **twist** property spins each vertical column of particles, creating a corkscrew appearance:



Depth sort changes the accuracy of the particle rendering. Turned off the rendering is fastest, but particles may not be represented accurately in 3D space.

Here is an example effect without depth sorting:



Here is the same effect with depth sorting **on**:



The second example shows a much more accurate representation of the particles in 3D space. Note the crossover point of the two strands at the top-left of the image and the peak of the curve at the top right, both of which are more accurately rendered with depth sorting on.

Turning depth sort to on can slow down rendering times.

Particle appearance

The appearance properties determine the size, shape and opacity of the particles.

The **shape** menu can be used to change the particle shape to that of another layer, which is defined in the **source** menu.

This can be used to create a grid of particles using a product logo, for example:



Embedded composite shots can also be used as particle shapes, enabling the use of animated shapes.

Disperse

Dispersing particles randomizes the position of the particles.

Here is a particle grid with no dispersal:

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Here is the same effect with an increase dispersal amount:



This can have interesting effects when applied to video or image layers:



Layer

By default the dispersal happens uniformly across the layer.

The **layer** option can be used to alter the strength of the dispersal by location.

Applying this gradient layer:



Results in the dispersal being most prominent towards the bright side of the gradient:



Fractal

Warping the atomic grid using the fractal controls creates organic shapes and introduces animation.



Displace alters the atomic grid to produce a folded result, best imagined as undulating cloth:

Disperse and **size** work similarly to the standard dispersal and size properties but also create fractal animation, retaining the sense of a connected grid.

The **wavelength** and **iterations** properties determine the strength of the overall fractal warp. A higher **wavelength** will result in a more uniform, less detailed transformation. Low **iterations** will create smoother patterns, with higher iterations creating noisier results.

The **speed** of the fractal animation can be adjusted.

Flow

Adjusting the flow will give the impression that the particles are moving in a particular direction. This is most evident with larger numbers of particles:



Layer

The fractal settings can also be driven by a separate layer, in the same way to dispersal. A layer such as a color gradient can then be used to adjust the intensity of the fractal warping.

In the example below, a simple gradient has been used to alter the fractal shape, resulting in less fractal warping at the right side of the frame and more at the left:



Displacement

The position of individual particles in the grid can be affected by another layer. In the example below a video layer of a car has been used to displace the atomic particles, revealing the layer's shape:



Size

The size of particles can also be linked to another layer. In this example the size of the particles is affected by the car layer, with darker areas creating smaller particles;



Spherical warp

The particle grid can be warped by a sphere force, either attracting or detracting the particles. This can be used to wrap the particle grid into a spherical shape:



Audio interaction

Atomic particles animation can be driven by an audio layer.

The **audio layer** must first be chosen. This can be any layer on the timeline that includes audio.

Before the audio affects the particle animation it must first be mapped to particular properties.

There are four mapping slots and you can use as many as you want.

Mapping slots

The **Map to** property determines which property the audio interacts with.

Frequency, range and threshold adjusts how the audio interacts with the particles.

Audio interaction works on top of the other atomic particles properties, so you will also need to adjust the corresponding property group to enable audio interaction. For example, if you choose **Fractal** as your map to option, you will also need to adjust some of the **fractal** properties.

Illumination

By default an atomic particles grid is lit only by its own specified color. The illumination properties can be used to enable full 3D lighting.

To illustrate the difference, here is an example with the **Illumination Type** set to **none**:



While the spherical shape is evident, there is no distinction between strands that are closer to the camera and those that are further away.

Here is the same shot with the **Illumination Type** set to **Comp lights**, with a single point light (with falloff) in the center of the shape:



By using the 3D light for illumination, it is possible to perceive depth in the atomic shape.

Comp lights will use all available lights in a scene.

Selected lights can be used to choose specific lights.

The material property group provides the same properties as found in standard 3D layers.

Motion blur

Motion blur can be turned on or off. Using the **Comp settings** option will match the motion blur found in the rest of the composite shot.

7.17.2. Blood Spray

Creates a spray of blood that jets out from the center point. The effect can also simulate the blood impacting on a surface.

EXPRESS ADD-ON

Blood Spray is available in the VFX: Starter Kit Pack.



Particle generation

These properties determine when the spray begins, its duration and its total density.

A longer duration will result in a thinner spray unless the number of particles is also increased.

Particle birth properties

The angle, speed and size of the spray are set using these properties.

Simulation

By default the spray is pulled down by gravity. The strength of this gravity can be adjusted.

The collision plane can be used to simulate the effect of the spray hitting a flat surface.

Appearance

The color of the spray is set here. The spray has two colors, which are used to create the illusion of depth.

Illumination

The illusion of depth can be adjusted using the illumination properties.

Motion blur

The blood spray effect can receive automatic motion blur.

7.17.3. Fire [Layer Only]

The Fire effect creates procedurally generated flames. There are numerous settings to control the behaviour and appearance of the fire.

EXPRESS ADD-ON Fire is available in the VFX: Starter Kit Pack.



Fire regions

There are three definable regions for the fire: **flammable region**, **blocking region** and **burn direction**. If you leave these blank the fire will use the entire layer as its source (excluding transparent areas).

If you select a layer and channel for any of the regions or the direction the fire will be influenced by those elements. This way you can use layers such as gradients to further control the fire's behaviour.

Simulation

- Seed creates a different random variety of fire.
- · Iterations more iterations will create a more realistic simulation of the fire's movement.
- Pre-start by default the fire starts on the first frame of the layer. This enables you to start the fire

before the first frame.

- **Flammable end** determines when the fire is no longer visible.
- Source scale changes the size of the fire source elements.
- **Source variation** adjusts how often the fire changes formation. Low variation will create a smoother, less volatile fire.
- Source fill changes the density of the fire.
- Movement changes the length of the flames.
- Source noise adjusts the random density of the flammable region.
- **Source intensity** adjusts the density of the flammable region.
- **Reload maps** activating this property creates a more realistic simulation when the flammable region is animated.
- **Source position** moves the entire fire simulation. When combined with 2D tracking this can create more realistic composites into videos with moving cameras.

Wind

Wind can be applied to the fire to push the flames in a particular direction.

Appearance

The **color** and **blend** method of the fire can be altered here.

The **temperature** settings change the intensity of the fire. A lower low temperature will reveal more detail in the flame.

7.17.4. Gunfire

HitFilm's gunfire effect uses a highly customized version of the particle simulator and is the best tool available for creating CG muzzle flashes.

EXPRESS ADD-ON

Gunfire is available in the <u>3D: Gunfire Pack</u>.

There are many benefits to creating your muzzle flashes in HitFilm:

- No need to use dangerous and expensive blank-firing weapons.
- You can shoot silently in areas that might not normally allow gunfire.
- Complete artistic control over the look and behaviour of your weapons.
- You are no longer limited to re-using the same muzzle flash stock footage.

Important: Even if you're not using blank-firing weapons during shooting, always make sure you have notified the police and informed local residents prior to filming. Don't assume that the presence of a camera is enough to let people know you're making a movie.

Gunfire can be moved using the standard Transform properties. For realistic positioning, the gunfire origin should be positioned at the end of the gun barrel.

Appearance

- Textures see the Particle textures chapter for details.
- **Preview** toggles between textures and preview particles.
- Blend changes how the textures blend together. Add will usually give the best results.
- Colorize this overrides the texture's original colors with the Color property.
- Color changes the gunfire's color when you have Colorize deactivated.
- Color variation introduces random variation to the chosen color when you have Colorize deactivated.
- Active turns the entire muzzle flash on and off.
- Rate of fire percentage chance of the muzzle flash appearing on the current frame. 100 ensures the muzzle flash is always visible. Lower values are useful for creating the appearance of automatic weapons fire, without needing to manually keyframe the Active property.
- **Seed** this is used to generate random variations of the muzzle flash shape. Keyframing the seed will ensure that your muzzle flash is different each time it appears, while retaining its basic shape.

• Blur strength – changes the amount of blur applied when motion blur is turned on.

Core flare

The core flare is the central part of the muzzle flash and is projected directly out of the front of the barrel.

- Active turns the core flare on and off.
- Scale the size of the particles that form the core flare.
- **Barrel gap** the distance between the core flare and the barrel.
- Length the length of the core flare.
- Length taper changes the weighting of the length of the core flare.
- Radius the radius of the core flare.
- Radius taper changes the weighting of the radius of the core flare.
- Jitter creates a more dispersed and randomized appearance.
- Intensity creates a brighter core flare.
- Primary number the number of particles that make up the main part of the core flare.
- Secondary number the number of particles that make up the jitter part of the core flare.

Side flares

- · Active turns the side flares on and off.
- Scale the size of the particles that form the side flares.
- Number of flares adjusts how many side flares are visible.
- Barrel gap the distance between the side flares and the barrel.
- Barrel angle the angle of the side flares in relation to the barrel.
- Barrel rotation all side flares can be rotated around the gun barrel.
- Length the length of the side flares.
- Length taper changes the weighting of the length of the side flares.
- Radius the radius of the side flares.
- Radius taper changes the weighting of the radius of the side flares.
- Jitter creates a more dispersed and randomized appearance.
- Intensity creates brighter side flares.
- Primary number the number of particles that make up the main part of the side flares.
- Secondary number the number of particles that make up the jitter part of the side flares.

7.17.5. Lightning & Electricity



HitFilm's lightning generator can create a limitless variety of electrical effects.

Lightning consists of several main elements:

- The core is the solid color center of the effect, most commonly white.
- The **glow** is the softer color around the edge of the effect.
- Trunks are the primary lines used to draw the lightning.
- Branches are created along trunks, adding detail to the effect.
- **Twigs** are created along branches, adding fine detail to the effect.

You can adjust the number of trunks, branches and twigs in the effect using the relevant property groups. Changing these will drastically alter the appearance of the effect.

Wave & twitch

The wave and twitch properties determine the shape of the lightning.

- Wave creates a more undulating, curved line.
- Twitch increases the number of twists and turns in the line.

Start & end

The start and end groups control the overall dimensions and animation of the lightning.

The **Growth** property is used to give the appearance of a lighting strike, causing the lightning to extend and travel down its length.

Animation

- **Speed** the speed of the lightning's movement.
- Jitter how often the lightning regenerates to a completely new position.
- Scale how much the lightning moves from its central position.

7.17.6. Particle Simulator

HitFilm's 3D Particle Simulator is an advanced, physics-driven system capable of an infinite variety of effects.

EXPRESS ADD-ON Particle Simulator is available in the <u>3D: Particles Pack</u>.

Particle structure

A particle simulation contains a hierarchy of elements. Understanding how these work is key to designing and creating your own particle effects.

Particle simulator layer

The top level is the particle simulator layer on your timeline. This is a 3D layer that contains your simulation. You can of course have multiple particle simulators on your timeline.

Particle simulator effects can only be created and adjusted in composite shots.

The particle simulator has the standard **Layer** and **Material** properties, plus high level access to **general** properties, **deflectors** and **forces**.

It also provides access to your Emitters.

Emitters

The Emitters group can contain multiple emitters. You can add additional emitters using the + icon. The currently selected emitter can be renamed by pressing F2.

An emitter is where all particle effects begin, specifying where the particles appear and affecting their initial trajectory.

A benefit of having multiple emitters in a single particle simulator layer (rather than using multiple particle simulators) is that they can all share the same deflectors and forces. If you decide to move a deflector, all of the emitters will update accordingly.

Click here for details on Emitter properties.

Due to the rendering pipeline in HitFilm, organizing your emitters under a single particle simulator can also result in a performance boost.

Emitters can be various shapes, including being based on another layer.

Each emitter contains its own particle systems, which are detailed below.

Particle systems

An emitter can contain multiple particle systems. A particle system is the visible part of the particle effect.

The currently selected particle system can be renamed by pressing F2.

The properties of a particle system will determine the visual appearance and behaviour of each individual particle at its birth. Once a particle is born, its behaviour can be affected by multiple external factors such as deflectors and forces.

Click here for details on Particle systems.

Lifetime panel

You can also control how particles behave during their lifetime, using the Lifetime panel.

The Lifetime settings affect every particle within a particle simulator from its birth to its death. This can be useful if you want to have particles fade out gradually, or increase in speed over time.

For more information take a look at the Lifetime panel section.

Mobile emitters

Emitters can also contain mobile emitters. These are special types of emitter that are spawned in the same way as particle systems, but which can then go on to spawn their own particle systems.

See <u>Mobile emitters</u> for details.

Deflectors & Forces

If you want your particles to interact in more interesting ways, deflectors and forces are what you need.

The currently selected deflector or force can be renamed by pressing F2.

Deflectors are collision areas for particles and can be shapes generated inside the particle simulator or other layers on your timeline. This is a great way to simulate particles colliding with real world objects in your live action footage.

Forces can be used to affect particles once they have been birthed. Forces occupy specific areas in 3D space and when a particle enters that area it will be affected accordingly.

Click here for details on Deflectors.

Click here for details on Forces.

7.17.6.1. Particle Textures

HitFilm's texture system provides a hugely powerful method for assigning textures to the <u>Gunfire</u> and <u>Particle simulator</u> effects.

The texture properties can be found in the **Appearance** property groups.

Texture sources

There are three possible texture sources:

- None this will use a default circle shape.
- Layer any layer can be assigned as the texture source, including embedded composite shots and 3D models.
- Built-in a selection of default textures are provided for quick access.

Using layers as textures

After selecting to use a layer as the texture source you will need to specify the source layer.

Large resolution and animated textures may have an impact on performance.

There are three Frame options when using a source layer:

- **Single** uses a single frame of the source layer as the texture. The frame can be specified using the **Frame number** property
- **Random** randomly selects a frame for each particle. The random selection can be changed using the **Seed** property.
- Animated enables the use of sequential frames from the source layer as the texture. The start frame and the number of frames to use can be set. The loop option will cause the texture to return to the start frame after the specified number of frames have been used.

Keyframing the start frame property will cause each particle to have a different start frame.

Working with multiple textures

If you want to use several individual textures on the same particle system, each texture should be placed into an embedded composite shot.

Inside the embedded composite shot, each texture layer should be offset by one frame, so that each frame displays a new texture. With the **Frame option** set to **Random**, all of the textures inside the composite shot will be used at random.

An embedded composite shot containing textures can be set to invisible on the timeline and still be used. In this case it is best to place the embedded composite shot on the lowest layer on the timeline.

7.17.6.2. Lifetime Panel

The Lifetime panel is directly related to the particle simulator.

The Lifetime panel controls how particles behave over their lifetime. The currently selected particle system is displayed in lifetime.

A single particle simulator effect can contain multiple particle systems, so it is important to make sure you have selected the correct one.

About particle lifetime

The term lifetime refers to the period between a particle's birth and death.

As particles can be spawned at any time and be of varying duration (depending on your emitter and particle system properties), the lifetime properties do not refer to specific frames on your timeline.

The total lifetime of a particle is determined by the **Life** property in the Movement section of the particle system.

Using the Lifetime panel

The Lifetime panel shows the lifetime properties for the currently selected particle system.

At the top of the panel are the various lifetime properties. Clicking a property will display its information below the list.

There are two types of lifetime property: graph and gradient.

Graph properties

Most of the lifetime properties take the form of a graph.

The left side of the graph is the particle's birth and the right side is the particle's death.

Keyframes are represented on the graph as small, white squares. These can be moved around the graph.

Additional keyframes can be added by clicking on an empty area of the graph. Clicking and dragging will create a curved keyframe.

Below the graph the position in time (**Life**) and value of the property are displayed. These update as you move the keyframes, or you can click on them to enter numerical values directly.

Above the graph are a selection of preset shapes to help you draw common curves or reset the graph. Clicking any of these will update the graph accordingly.

Multiple properties can be displayed on the lifetime graph simultaneously. To do this, select the properties using the checkboxes to the right of the property list. Each property will be displayed in the relevant color.

When displaying multiple properties on the graph, only the currently selected property can be edited.

Gradient properties

The Alpha and Color lifetime properties use a different interface based on a gradient.

The **Type** menu has three options:

- Off the selected lifetime property has no effect.
- Gradient particles will cycle from left to right through your gradient.
- Random particles will be born with a random property taken from your gradient.

Keyframes can be added to the gradient by clicking anywhere below the gradient bar.

You can then move keyframes left and right on the gradient by clicking and dragging on them. A keyframe's position can also be set by entering a value into the **Life** property.

The color or alpha value is changed using the property below and to the left of the gradient bar.

Type: Gradient

With the Type menu set to Gradient additional options are available:

Mix with appearance – this includes the Color or Alpha property from the particle simulator's
 Appearance section as part of the gradient. You can choose the Appearance property to work as the
 first or last keyframe of the gradient.

 Loop number – by default the gradient represents from left to right a particle's lifetime from birth to death. Increasing the loop number will make the gradient cycle multiple times during the particle's lifetime.

Type: Random

With the Type menu set to Random an additional option is available:

• Use Keyframes only – with this selected only the actual keyframe values will be applied to particles. If this option is not selected the entire range of values available in the gradient will be used.

7.17.6.3. Emitters

An emitter is where all particle effects begin, specifying where the particles appear and affecting their initial trajectory.

A default emitter is added automatically to a new particle simulator, but this can be deleted if you wish.

See also <u>Mobile emitters</u>.

Shape

Emitters can be several shapes. You can choose the emitter shape using the **Shape** menu. Clicking on any shape properties will display a wireframe outline of the shape in the Viewer.

- Each shape has its own properties to define its size and position.
- Shapes can be **attached** to another layer in the same composite shot, such as a point layer. The emitter will then animate to stay in the same relative position to the parent layer.
- The **Boundary** option forces particles to only be birthed around the edge of the shape, rather than inside the shape.

Grid

Activating the Grid option restricts particle birth to specific grid positions. This is useful for creating more regimented patterns, for motion graphics purposes or even controlled clusters of 3D textures (eg buildings arranged into city blocks).

The grid will always fill the specified emitter shape. The number of available grid positions can be defined in all three dimensions, which will then be evenly distributed within the emitter shape.

The **Avoid previous positions** option will force particles to spawn on a previously unused grid position until all available positions have been occupied.

Shape layers

If you set your emitter shape to a layer you access additional settings.

Use Layer Color uses the source to color the particles. This is a highly effective way to create a range of color within a particle effect and can be used to blend particles in with the source.

Use Layer Alpha uses the alpha channel in the source to define where the particles are born. The Threshold is then used to adjust the minimal alpha value required for particle birth. This makes it possible to confine an emitter to a specific shape, such as a green screen actor or a custom gradient.

Trajectory

When particles are birthed they need an initial trajectory, to determine which direction they move in.

Some shapes do not support all trajectory types.

- Cone emit in a funnel shape.
- Explode emit in a direction away from the center of the shape.
- Implode emit in a direction towards the center of the shape.
- **Disc** emit in a flattened disc shape.
- Random emit in random directions.
- Target emit particles towards a specified 3D point.

Expanding the Trajectory group will give you access to the controls for your selected trajectory.

General

The General group contains a single **Active** property. This turns the emitter on and off and is used for controlling the visibility of all existing particles.

7.17.6.4. Particle Systems

An emitter can contain multiple particle systems. A particle system is the visible part of the particle effect.

A default particle system is created inside the default emitter when a new particle simulator is added to the timeline, though you can delete this if you wish.

Properties for particle systems are split into several groups. Most settings only affect particles' initial birth state, after which they are unaffected by keyframed properties.

The **Appearance** and **Movement** groups also have variation properties in separate **Variation** groups. The variation properties increase the range of possible values. For example, if you set **Scale** to 100% and **Scale variation** to 10%, the actual scale of particles will vary randomly between 90% and 110%.

General

- Active turns the particle system emission on and off. This does not affect the visibility of particle that have already been born.
- Affected by Deflectors whether the particle system reacts to deflectors.
- Affected by Forces whether the particle system reacts to forces.
- **Seed** a random number used to generate the particle. Adjust this to vary the distribution of particles without changing the overall appearance.
- **Particles per second** the number of particles birthed per second. For example, 25pps in a 25 frame per second timeline will result in 1 particle birthed every frame.
- Emitter attachment by default once a particle is birthed, it behaves independently of the emitter. So even if the emitter is animated, the particle will continue according to its own behaviour. By increasing the emitter attachment the already emitted particles will move relative to the emitter movement.
- Velocity from emitter as particles are birthed they will inherit initial velocity from the emitter's movement.

Appearance

- Texture sources see the particle textures chapter for details.
- **Billboard** billboarding particles forces them to always face the camera, regardless of their movement. Disabling billboarding enables particles to be displayed at any angle.
- Align to motion orients the particle based on its direction. This can be useful for having an arrow

texture follow a path, for example. Billboarding must be turned off for this to work correctly.

- Intersect layers when disabled, individual particles can only be behind or in front of another 3D layer. When enabled particles will be positioned more accurately when moving through other 3D layers, but this does take longer to render. Note that particles always intersect with 3D models.
- Soften intersections this makes the interaction of particles intersecting with a 3D model far subtler. This is particularly useful if you need to position a 3D model amongst a particle cloud. Without softening, the individual textures will become visible as they are cropped by the surface of the 3D model.
- **Soften glancing angle** as a non-billboarded texture is viewed side-on it can become progressively less opaque, according to this property. Note that this only applies to non-billboarded textures.
- Texture angle rotates the texture on the particle.
- **Texture angle per second** causes the texture to rotate continuously.
- **Blend** blend method for the particles. Add is useful for gas and light-based effects.
- **Color source texture color** takes the particle's color from its texture. **Birth color** uses the color from each particle's birth frame. **Current color** adjusts all particles to the current color, which is useful for changing the color of all particles simultaneously.
- Alpha source these settings work in the same way as the color source options above.
- Alpha boost when using motion blur particles can become semi-transparent. The alpha boost can be used to return these to full solidity.
- Color sets the color of particles. See also color source above.
- Alpha sets the alpha (transparency) of particles. See also alpha source above.

Movement

- Life the duration of particles in seconds.
- Scale the size of particles.
- Speed the speed of particles.
- Acceleration applies constant acceleration to particles in the given direction.
- Center of mass offsets the texture itself from the origin of the particle.
- Rotation (X, Y, Z) rotates the particle.
- Rotation per second (X, Y, Z) adds constant rotation over time.
- Mass adjusts how forces affect the particles. More mass will result in less impact from forces.
- Bounce the bounce of particles when they collide with a deflector.
- **Friction** higher friction will cause particles to stop faster, while lower friction will let them continue moving along a deflector surface.

7.17.6.5. Mobile Emitters

Mobile emitters share many properties with standard <u>Emitters</u>. The core difference is that mobile emitters are themselves particles.

After being spawned by standard Emitters, mobile emitters behave like ordinary particle systems but are also capable of spawning their own particle systems.

The properties for mobile emitters are a mixture of those for standard <u>Emitters</u> and <u>Particle systems</u>. Refer to those chapters for more information.

Creating mobile emitters

New mobile emitters can be created by clicking the + icon next to their property group in the Controls panel.

If you are creating a mobile emitter-based effect, you may want to first delete the default particle system that is found in the default Emitter. This will ensure that you are only seeing the mobile emitter.

A default particle system is automatically created inside a new mobile emitter. This can be deleted if you wish.

Mobile emitters by default are a different color to particle systems, making it easier to identify them.

Activation events

Mobile emitters can change behaviour based on specific conditions. These are called **activation events**, which are found in the mobile emitter's **general** properties.

Activation events determine when mobile emitters are able to emit particle systems.

The type of activation event can be set using the Activation event menu.

The deactivate after event property will prevent further emission of particle systems after the event has
occurred.

Birth

The mobile emitter will begin emitting particles as soon as it is spawned.

Death

The mobile emitter will not emit particles until the moment of its death.

Turning on the deactivate after event property will have no effect when using the Death activation event.

Force

The mobile emitter will emit particles when it is affected by a force.

Deflector

The mobile emitter will emit particles when it comes into contact with a deflector surface.

7.17.6.6. Deflectors

Deflectors are a hugely powerful part of the particle simulator. With deflectors you can have particles impact on shapes and surfaces and even simulate particles colliding with objects in a live action shot.

A particle simulation can include multiple deflectors, allowing for very complex setups.

Deflectors can be added from the timeline or from the Controls panel using the icon to the right of the Deflectors group.

The Bounce and Friction settings in the **Particle system** -> **Movement properties** directly affect how particles interact with deflectors.

General

- Active turns the deflector on and off.
- Front face whether a particle can collide with the front face of a deflector.
- Back face whether a particle can collide with the back face of a deflector.
- Kill particles kills particles when they come into contact with the deflector.
- Kill mobile emitters kill mobile emitters when they come into contact with the deflector.

Shape

Deflectors can be cuboid shapes generated inside the simulator or you can use another layer on the current timeline. Therefore if you've already got a plane set up as your 'floor', you can use that same layer as a particle deflector.

Cuboid

The cuboid properties enable you to change the shape of the cube and transform it in 3D space.

The **Mask** option also uses the Deflector as a 3D mask for the particles. Any particles that are behind or inside the deflector from the point of view of the camera will not be visible.

Layer

When using a layer as a deflector you need to select the source layer from the deflector's properties.

The **infinite plane** option extends the deflector along the axis of the plane in all directions. This can be considerably easier than having to enlarge the layer itself to cover the entire 3D scene.

If particles are passing through your deflector layer, check the **Front face** and **Back face** properties as described above.

7.17.6.7. Forces

Forces are used to apply additional behaviour to particles based on realistic physics. They can be applied globally to a scene, or only affect a specific cuboid region.

Multiple forces can be added to a single particle simulator. Forces can be added to a particle simulator using the icon to the right of the Forces group on the timeline or in the Controls panel.

All forces are affected by the particle **mass** property in **Particle system** -> **Movement**. Particles with greater mass will be less affected by forces.

General

- Active turns the force on and off.
- Kill particles particles will die when entering the force region.
- Kill mobile emitters mobile emitters will die when entering the force region.

Shape

- **Global** affects the entire scene. All particles will be affected regardless of position.
- **Cuboid** force only acts within a specified volume, defined by the cuboid. You can change the dimensions and transform the cuboid. The **Mask** option uses the cuboid as a mask, hiding any particles that pass inside the volume or behind it from the camera's point of view.

Туре

There are several types of force.

Direction

Direction forces particles in a specific direction.

The **strength** and **direction** of this force can be adjusted and keyframed. By combining multiple direction forces you can simulate both gravity and wind in a single particle simulator.

Attraction

Attraction forces draw particles towards a point in 3D space. When using a **global** force, this is the value of the force's **center** property. With **cuboids** it is the center of the shape.

The **strength** of attraction forces can be adjusted.

Detraction

Detraction forces propel particles away from a point in 3D space. When using a **global** force, this is the value of the force's **center** property. With cuboids it is the center of the shape.

The **strength** of detraction forces can be adjusted.

Turbulence

Turbulence causes particles to randomly change direction.

- Smooth smoother movement causes particles to change direction in a gentler manner.
- Seed changes the random composition of the turbulence field.
- Strength adjusts the strength of turbulence.

7.17.6.8. Material

Particle simulators have two properties in addition to the standard Layer materials.

- **Billboarded lights** lights a 3D particle effect as if the individual particles are all facing towards the light. This can be useful if you want an evenly lit particle effect.
- **Billboarded shadows** shadows are cast from a 3D particle effect as if the individual particles are all facing towards the light. This can be useful if you want shadows to appear more solid.

7.17.7. Rain On Glass

The Rain On Glass effect allows you to quickly simulate the appearance of looking through a window covered with raindrops.

Simulation

Use the simulation controls to set the size and quantity of raindrops.

- **Drops Per Second:** Adjusts the number of new drops that hit the frame each second, to control how hard it is raining.
- Rain Drop Size: Changes the size of the rain drops.
- Seed: Randomly changes the pattern of the raindrops.

Rendering

The appearance of looking through glass involves subtly distorting the original image. The Rendering settings control how this is handled.

- Layer Tiling: Choose how the area around the image will be filled, when it is scaled smaller than the frame.
 - **Off:** Doesn't fill around the image. the original layer will be visible around the effect.
 - **Tile:** Creates rows and columns of the image, to fill the edges.
 - **Mirror:** Applies a mirrored version of the image to each edge. This is the default method, and usually gives the best result.
- Layer Scale: Adjusts the scale of the source image within the effect.
- **Glass Thickness:** changes the glass distortion applied to the image. Thicker Glass will create more glare on the image.
- Layer Distance: Adjusts the distance of the image outside of the glass.

Environment Map

Raindrops will contain micro reflections of their surroundings. The environment Map settings define what is contained in those reflections. By default, the layer the effect is applied to is used as the Environment Map.

- Use Environment Map: Toggles Environment Map on and off.
- Source: Select the source layer you want to use as your environment map.
- Amount: The intensity of the environment map reflections

- **Scale:** Changes the size of the image within the reflections, to simulate the distance between the raindrops and the environment.
- Scale Ratio: Adjust the width to height ratio. Environment mapping wraps your selected image into a sphere, which sometimes results in a distorted image. You can compensate for that distortion here.
- Transform: Rotates the environment map around the X, Y and Z axes.

7.17.8. Shatter [Layer Only]

The Shatter effect is used to break a layer into 3D chunks.

EXPRESS ADD-ON Shatter is available in the VFX: Starter Kit Pack.

Here is the HitFilm logo being shattered:



Although applied as a 2D effect, shatter can be explored in 3D.

Position

The effect's position in 3D space is determined by these properties. The effect can also be parented to another layer using the **Transform From** property.

Shatter in 3D

Shatter is added to a layer as a 2D effect. It can be adjusted to exist in 3D space using this technique;

- 1. Create a new point layer.
- 2. Set the point layer's **dimension** to 3D.

- 3. Apply the shatter effect to a layer and explore the **Position** property group.
- Set the Transform From option to link to the point layer created in step 1. The shatter effect will inherit 3D position data from the point layer. 3D cameras can then be moved in and around the shatter pieces in 3D.

Pattern

Determines the shape of the shatter pieces.

The **Type** can be set to the preset **brick** and **hex** shapes, or to a **custom** shape.

The **Size** property alters the size and number of individual **brick** or **hex** pieces.

The custom shape by default will use the layer itself as the shape. This will break a layer into its component pieces, with shapes and sizes defined by the layer's composition.

Custom maps

You can also select another layer on the timeline as a **custom map**. This will then use that layer to define the breaking points and shapes.

The fixed color property specifies a color in the custom map which will remain unshattered.

The Threshold property adjusts the detail of the shatter. Lower thresholds will result in finer shatter pieces.



Extrusion adjusts the depth of shatter pieces.

Physics

The physics property group defines the behaviour of the shatter.

Forces

The force defines the point at which the shatter takes place. The force can be small or large, as defined by the **Radius** property.

The Strength of shatter impact can be adjusted.

The force's **Position** can be altered or linked to another layer on the timeline.

Gravity

After the shatter pieces are created by the Force they are then affected by gravity, which pulls the pieces in a direction as defined by the **XY Direction** and **Z Direction** properties.

The Shatter effect can also include a simulated floor for the shatter pieces to land on. The relative height of this floor is defined by the Floor Distance property.

Simulation

The behaviour of the shatter pieces is defined by the **Simulation** properties.

Timing

The timing properties are used to alter the beginning and end of the shatter effect within the applied layer.

Appearance

The front, back and sides of the shatter pieces can be colored and textured individually using the Appearance properties.

Render

The **Render** properties can be used to alter what is rendered during a shatter effect and the overall quality.

Depth of field for the Shatter effect can also be activated here.

Motion blur

Motion blur can be applied to the Shatter effect, using the **Comp settings** or the effect's own setup.

Illumination

The shatter pieces can be illuminated by 3D lights in the composite shot. You can choose to use either all lights with the **Comp lights** option, or select specific lights.

7.18. Quick 3D

HitFilm's Quick 3D effects are simple effects that provide immediate, specific results. They are described in the following pages.

If you want full control over your particle effects, make sure you use the hugely powerful Particle Simulator.

- Bonfire
- Falling Debris
- Fire Explosion
- Fluffy Cloud
- <u>Missile Smoke</u>
- <u>Rain</u>
- <u>Sci-Fi Shockwave</u>
- <u>Smoke</u>
- Sparks
- <u>Storm Cloud</u>

7.18.1. Bonfire

Creates a realistic bonfire.

General

- Preview toggles between textures and preview particles.
- **Target** the point towards which the fire and smoke moves. Changing the target position can create a convincing illusion of the fire being influenced by wind.
- Height alters the height of the flame relative to the target position.

Fire

- Active each individual element of the bonfire can be turned on and off.
- Spread adjusts the fire between a small, intense base or a broad base.
- Ferocity changes the textures used by the fire.
- Intensity creates a stronger, brighter fire.
- Size adjusts the size of the individual fire particles.
- **Color** changes the color of the fire, which in turn affects the lighting on the smoke.

Smoke

- Active each individual element of the bonfire can be turned on and off.
- Spread adjusts the smoke between a thin or broad column.
- Thickness changes the textures used by the smoke.
- **Density** moves between thin, wispy smoke and dense, thick smoke.
- Size adjusts the size of the individual smoke particles.
- Color from fire determines how much of the smoke is illuminated by the fire.
- **Color** changes the color of the smoke when it isn't being affected by the fire.

Embers

- Active each individual element of the bonfire can be turned on and off.
- Spread adjusts whether the embers are generated over a small or large area.
- Variation changes the textures used by the embers.
- Amount alters the number of embers visible at any one time.
- **Turbulence** increasing turbulence will cause the embers to move more erratically.

- Size adjusts the size of the individual ember particles.
- Color changes the color of the embers, without affecting the smoke and fire colors.

7.18.2. Falling Debris

Creates tumbling debris and dust, as if from an explosion or disintegration.

General

- Preview toggles between textures and preview particles.
- Fall duration how long the debris continues to be created.
- Scale fall area size of the area the debris falls from.
- Floor plane layer a layer can be selected to use as the floor. Debris that hits the floor plane will collide with it.
- Infinite floor plane this will extend the selected floor plane layer beyond the bounds of the actual layer.
- Gravity strength speed at which the debris falls.
- **Color** color of the debris. Often best when matched to the live action source of the debris.

Debris

- · Active turns the debris element on and off.
- Life duration how long the debris lasts for on-screen.
- Type choose between brick, concrete and rock.
- Amount how much debris do you want?
- Minimum size debris will be no smaller than this.
- Maximum size debris will be no larger than this.

Dust

- Active turns the dust element on and off.
- Life duration how long the dust should linger for.
- Density adjusts the density of the dust.

7.18.3. Fire Explosion

Creates a fire explosion that rapidly spreads and grows in size.

General

- Preview toggles between textures and preview particles.
- **Duration** how long the explosion lasts.

Fire explosion

- Seed each seed number creates a unique explosion.
- **Ferocity** how rapidly the explosion generates new sub-explosions.
- **Growth** how much the explosion expands.
- Dirtyness creates a dirtier explosion.
- Color alters the color of the explosion.

7.18.4. Fluffy Cloud

Creates a slow moving clump of cloud. The size and position of the cloud can be adjusted using the standard **Transform properties**.

Cloud

- **Preview** toggles between textures and preview particles.
- **Density** the cloud can be thin or thick.
- **Color** changes the color of the cloud.

7.18.5. Missile Smoke

The missile smoke effect is a great way to create quick smoke trails.

Animating a smoke trail

By default the smoke trail sits in the center of the screen, creating a smoke ball.

There are two ways of animating the smoke trail, each of which will create very different results.

- If you use the layer's **Transform** properties the entire effect will be moved. This will not create a smoke trail.
- If you want to create a smoke trail, you should use the **Position** property in the layer's General section.

General

- **Preview** toggles between preview and textured particles.
- Active turns the entire effect on and off.
- Attach to layer the smoke's position can be linked to another layer.
- Position the position of the smoke emitter.

Smoke

- **Density** higher density creates thicker smoke.
- Linger changes how long the smoke remains visible.
- Linger variation increasing variation introduces a random variable to the linger.
- Size adjusts the size of the smoke particles.
- Size variation increasing variation introduces a random variable to the size.
- Speed adjusts the speed of the individual smoke particles.
- Speed variation increasing variation introduces a random variable to the speed.
- Color the base color of the smoke.

7.18.6. Rain

HitFilm's rain creates realistic rainfall. The rain exists in a 3D rain box which can be moved around your scene – you can even move your camera through the rain.

Rain

- Preview toggles between textures and preview particles.
- Direction the rain can be angled to fall in a particular direction.
- **Spread** a low spread will result in rain moving in the same direction. Higher spread values will cause the rain to fall at more varied angles.
- Amount changes the density of the rain.
- Color adjusts the color of the rain.
- **Billboard** force rain to face the camera regardless of its movement.

7.18.7. Sci-Fi Shockwave

Creates a dramatic shockwave, as seen in sci-fi movies when planets and space stations explode (that's no moon!).

General

- Preview toggles between textures and preview particles.
- Duration sets how long the shockwave lasts before fading away.
- Type choose between a variety of different shockwave designs.
- Width adjusts the density of the shockwave along its radius.
- Height choose between a thin sliver of a shockwave or a giant wall of plasma.
- **Speed** speed at which the shockwave expands.
- Size size of the individual shockwave particles.

Band

- Color sets the color of the main band.
- Color variation more variation creates more random coloring.

Trail

- **Amount** the trail is a separate element and its visibility can be adjusted here.
- **Color** the trail color can be set separately to the band.
- Color variation more variation creates more random coloring.

7.18.8. Smoke

The smoke effect is great for creating slowly drifting or falling smoke.

General

- **Preview** toggles between preview and textured particles.
- Active turns the entire effect on and off.
- **Position** the position of the smoke emitter.

Smoke

- Thickness adjusts the thickness by changing the texture set.
- **Density** creates thin or thick smoke.
- **Gravity** strength strong gravity will pull the smoke either up or down.
- Linger adjusts how long the smoke lasts before fading away.
- Linger variation introduces a random variable to the linger.
- Size adjusts the size of the individual smoke particles.
- Speed alters the speed of the smoke's movement.
- Speed variation introduces a random variable to the speed.
- Turbulence higher turbulence values will create a less smooth smoke animation.
- Color change the base color of the smoke.

7.18.9. Sparks

The sparks effect is designed for sudden bursts of sparks, such as when a bullet hits a metal surface. It can be rotated using the standard Transform properties to point in any direction.

General

- Preview toggles between textures and preview particles.
- Duration how long the sparks last before disappearing.

Sparks

- Spread the sparks can be emitted in a tight, focused beam or a wide dispersal.
- Amount adjusts the number of sparks.
- Star ratio adjusts how many stars are created in relation to sparks.
- **Color** changes the color of the entire effect.

7.18.10. Storm Cloud

Creates a dark, ominous storm cloud.

Cloud

- **Preview** toggles between textures and preview particles.
- **Density** the cloud can be thin or thick.
- Color changes the color of the cloud.

7.19. Scene

The scene effects are designed to enhance the 3D compositing environment. Each effect has its own page, where you can find full details of the effect and its controls.

- Parallax [Layer Only]
- Projector [Layer Only]
 EXPRESS ADD-ON
- Surface Studio [Layer Only]
 PRO EXCLUSIVE

7.19.1. Parallax

The parallax effect creates the illusion of 3D depth in a 2D layer.

In this example parallax has been used to apply a cracked concrete texture to some text:



The height map is used to determine the depth effect.

When set to **None** the host layer's own texture will be used for the parallax effect. You can also choose a different layer to use as the height map.

The **Blur Height Map** property can be used to create a softer, smoother parallax effect.

The parallax effect is most effective when combined with HitFilm's 3D lights.

7.19.2. Projector

EXPRESS ADD-ON Projector is available in the Composite: Toolkit Pack.

Camera projection can be used to project a camera's view onto a layer. This can be used for object removal, converting still images into 3D scenes and projecting 2D effects onto 3D angles.

- **Projection From** The source layer to be projected to the current layer.
- **Camera** The camera that is used for the projection.
- Layer Opacity Opacity multiplier for the projected image.
- Blend The blend mode used to composite the projected layer onto the current layer

7.19.3. Surface Studio

Surface Studio is a powerful tool for generating smooth or roughly textured metallic and vitreous surfaces on any text or layer. It uses a ray tracing algorithm, together with height maps, to render 3D geometry based on 2D layers.

The default height map is created based on the values present in the layer the Surface Studio effect is applied to.



- **Height:** Sets the overall height of the height maps. Height maps use greyscale values to define the height of each pixel, with black pixels being the lowest and white pixels being the highest. This value defines the range between the highest and lowest points.
- **Environment:** Select a layer to be used as an environment map. If the materials used for the surface are reflective, then the environment map will be reflected as if it surrounded the layer in 3D.
- **Background:** Select a layer to be a background, behind all surfaces. Especially when transparent surfaces are being used, having a background is important for getting accurate refractions.

Background Layer

These settings affect the background layer selected above.

• Visible: Toggles whether the background layer should be visible outside of the raytraced surfaces.

- Depth: Defines how far behind the height maps the background layer sits.
- Wrap: Toggles whether wrapping should be applied to the background layer

Material

- Ambient: Determines how much the layer is illuminated by ambient lights.
- **Diffuse:** Determines how much the layer is illuminated by point, directional and spot lights.
- **Specular:** Adjusts the strength of specular highlights when illuminated by point, directional and spot lights. A low specular value will create a more matte surface.
- **Shininess:** Adjusts the size of the specular highlight. A low shininess creates a large, diffuse highlight while a high value creates a smaller, defined highlight.

Surfaces 1-4

Surface Studio allows you to layer up to 4 different surfaces within the effect, each using its own height map. Using multiple surfaces allows you to build up a material made of multiple layers.

For example, you could use one surface to represent the bricks of a wall, then another to represent the plaster over the bricks, and a final layer on top to represent the paint or wallpaper over it. Then, by animating the height maps for the different surfaces, you could make the wall age, and start to crumble, to reveal the layers beneath.



Surface 1 is the top level, primary surface. The other surfaces are positioned underneath it in sequence, with surface 4 being the lowest. Surfaces 2-4 have a Mode property, which determines how they interact with or are affected by the surface above. Each surface has its own set of the following controls.

- **Height:** Sets the depth of the height map for the current surface. Height maps use greyscale values to define the height of each pixel, with black pixels being the lowest and white pixels being the highest. this value defines the range between the highest and lowest points.
- **Mode:** The mode determines how the current surface interacts with or is affected by the surface above it. This menu is only available for surfaces 2-4.
 - Clamped: Clips any areas where the current surface reaches higher than the surface above it. Thus the current surface is only ever seen through the surface above. Useful if Surface 1 is set to be glassy or watery.
 - Overlap: Allows the entire height map of the current surface to be used. In areas where the current surface reaches higher than the surface above, it will be rendered accordingly. In areas where the height map of the current surface is below the height map of the surface above, it will be rendered behind it.
 - **Overlay:** Only areas where the height map of the current layer reaches higher than the surface above it will be rendered. The current surface is thus added to the top of the the original top surface. Useful for adding moss or other surface detail to the top of Surface 1.
- Color: Sets the color of the surface.
- Surface Alpha: Adjusts the transparency of the surface.

Height Map

- Height Map: Select the image you wish to use as a height map for the current surface.
- **Depth Blend:** Select how the user defined height map is blended with the default height map based on the contents of the layer the Surface Studio effect is applied to.
 - **Add:** For each pixel, the value of that pixel in the default depth map, and the value of that pixel in the height map selected for the current surface are added together, to determine the value its height will be based on.
 - Max: Compares the value in the two maps, and for each pixel selects whichever is higher.
 - Min: Compares the values in the two maps, and for each pixel selects whichever value is lower.
 - **Mult:** For each pixel, the value in each of the two maps are multiplied to create the new value on which the pixel's height will be based.
 - **Subtract:** For each pixel, the value of the current surface's depth map is subtracted from the value of the default height map.
- Generate: Toggles the height map for the current surface on and off.

Bevel

These settings modify the height map that is generated for the current surface.

- Height: Adjust the overall height distance between the white and black areas of the map.
- Size: Changes the size of the height map.
- Edge Offset: Shifts the edges of the surface outward from the actual edges of the layer

External Material Properties

These settings determine how the raytracing interacts with the outer skin of the current surface.

- Reflectivity: Determines how reflective the external surface of the current surface is.
- **Fresnel:** Adjusts how the reflection changes based on the viewing angle.
- Ambient: Determines how much the layer is illuminated by ambient lights.
- **Diffuse:** Determines how much the layer is illuminated by point, directional and spot lights.
- **Specular:** Adjusts the strength of specular highlights when illuminated by point, directional and spot lights. A low specular value will create a more matte surface.
- **Shininess:** Adjusts the size of the specular highlight. A low shininess creates a large, diffuse highlight while a high value creates a smaller, defined highlight.

Internal Material Properties

These settings determine how the raytracing behaves while traveling through the volume of the current surface's height map.

- **Refractive Index:** Defines how the raytracing behaves as it travels through the volume of the current surface's height map.
- **Translucence:** Defines how cloudy or how transparent the surface is. Increasing the value means that the raytracing will be impacted more by the color of the surface as the ray travels through it.
- Illumination: Select the illumination options that will be used to render the layer
 - **Default Lights:** Renders using the illumination built into the Surface Studio effect. If there are no lights on the timeline, this still allows you to see the 3D aspects of the effect.
 - **Comp Lights:** Uses all of the lights that are present on the timeline.
 - **Selected Lights:** Allows you to select specific lights that are present on the timeline, if you don't wan tall lights to be factored into the render.
- Antialiasing: Determines the number of rays cast to trace each pixel by the raytracing engine. Higher values take longer to render, but may give more accurate, realistic results.

7.20. Scopes

Scopes allow you to precisely monitor the color of your project, to help with making color corrections and ensure that color ranges fall within specified standards. This is important to ensure that colors are accurately reproduced when the finished program is broadcast later. The actual colors in your video can vary based on the display they are viewed on, and how the color of that display is calibrated. But scopes will always give you accurate color info, to ensure that the colors fall within established standards regardless of the hardware used to make color adjustments.

For full details of the primary built-in scopes in HitFilm Pro, see the Introducing Scopes page of this manual.

In addition to the scopes built into HitFilm Pro, which always display data based on the image in the viewer, scopes are also provided as effects. Any scope can be added into the effects stack for a layer at any point, to accurately evaluate the color data at that point in the effects stack.

There are four types of scopes available. Each is explained in detail on its own page.

- Histogram
- RGB Parade
- Vectorscope
- Waveform

7.20.1. Histogram

The histogram displays a readout of the tones in your image. The tones range from pure black on the left to pure white on the right. The height of the graph indicates the relative frequency of that specific tone in the image.



- Mode: Select the color information that is displayed in the scope.
 - 1. Luminance: Displays the luminance levels of the overall image in a greyscale graph.
 - 2. **RGB:** Shows the red, green, and blue channels simultaneously, as colored overlays.
 - 3. **RGB Parade:** Shows the red, green, and blue channels simultaneously, as individual readouts in a vertical stack
 - 4. Red: Shows only the red channel.
 - 5. Green: Shows only the green channel.
 - 6. Blue: Shows only the blue channel.
 - 7. Alpha: Shows the levels of the alpha channel of the image.
 - 8. **CbCr:** Shows the blue chroma difference and red chroma difference channels of the YCbCr color space. The Y value is Luminance, which can be selected separately.
 - 9. **CbCr Parade:** Shows the blue chroma difference and red chroma difference channels of the YCbCr color space, as individual readouts in a vertical stack.
 - 10. **Cb:** Shows only the blue chroma difference channel.
 - 11. Cr: Shows only the red chroma difference channel.
- Analysis Downsample: Adjusts the precision of the readout. Lower sample rates are faster, but less
 accurate.

- **Color Space:** Select between various color standards, so you can ensure your content meets the color specifications required.
 - 1. **Rec. 601:** The color standard for standard definition (SD) footage.
 - 2. **Rec. 709:** The color standard for high definition (HD) footage.
 - 3. **Rec. 2020:** The color standard for ultra high definition (UHD) footage.
- Analyze Using: Select whether the footage is analyzed using the CPU or GPU.

7.20.2. Parade

The Parade displays a readout of the contents of each color channel in your image. Each channel is shown individually, in sequence. Whenever "parade" is used in regard to a scope, it indicates that each channel will be shown individually, one after another.



In each channel of the parade scope, the left to right axis of the graph indicates the image from left to right. So the colors present on the left side of the image will be shown on the left side of the scope. The vertical axis of the graph indicates the intensity of that color channel in that area of the image.

In the image above, notice that the red circle is on the left side of the viewer. And when you look at the red channel of the scope, a spike of high red values appears on the left side of the graph. Compare that to the blue circle, which is on the right side of the viewer. And in the blue channel of the parade, high blue values are shown on the right side of the graph.

- Mode: Select the color information that is displayed in the scope.
 - 1. **RGB:** Shows the red, green, and blue channels simultaneously, as colored overlays.
 - 2. **YCbCr**: Shows the luminance (Y), blue chroma difference (Cb) and red chroma difference(Cr) channels of the YCbCr color space.
- **Direction:** By default, the parade displays values across the image from left to right. The direction control allows you to change this, so that the scope is mapped across the image in a different direction. Setting the Direction to 90 degrees, for example, will map the top of the image to the left edge of the scope, and the bottom of the image to the right edge of the scope.
- **Brightness:** Manipulates the brightness of the parade readout. Increasing or decreasing the brightness of the parade may make it easier to read in some situations.

- Analysis Downsample: Adjusts the precision of the readout. Lower sample rates are faster, but less accurate.
- **Color Space:** Select between various color standards, so you can ensure your content meets the color specifications required.
 - 1. **Rec. 601:** The color standard for standard definition (SD) footage.
 - 2. Rec. 709: The color standard for high definition (HD) footage.
 - 3. **Rec. 2020:** The color standard for ultra high definition (UHD) footage.

7.20.3. Vectorscope

The Vectorscope provides hue and saturation data for your image. Hue is represented circularly, as a color wheel. Saturation is graphed along the radius. The more saturated a color is, the closer to the outside of the circle it will be graphed. The six color points around the perimeter of the circle represent the standard color bars used in vide, and can be used for reference. The diagonal line represents skin tones, to make it easier to color correct your footage for accurate color.



- **Brightness:** Manipulates the brightness of the vectorscope readout. Increasing or decreasing the brightness of the parade may make it easier to read in some situations.
- Analysis Downsample: Adjusts the precision of the readout. Lower sample rates are faster, but less accurate.
- **Color Space:** Select between various color standards, so you can ensure your content meets the color specifications required.
 - 1. **Rec. 601:** The color standard for standard definition (SD) footage.
 - 2. Rec. 709: The color standard for high definition (HD) footage.
 - 3. Rec. 2020: The color standard for ultra high definition (UHD) footage.
- Skin Line: Toggles the skin tone line on and off. By default the skin line is on, but you can hide it using this option, if you wish.
- Standard Color Bars: Toggles the color bar indicators on and off. By default they are on, but you can
hide them using this option, if you wish.

7.20.4. Waveform

The Waveform displays a readout of the contents of the current frame. The left to right axis of the graph indicates the image from left to right, in a similar fashion to the Parade. So the colors present on the left side of the image will be shown on the left side of the scope. The vertical axis of the graph indicates the intensity of that color channel in that area of the image.



- Mode: Select the color information that is displayed in the scope.
 - 1. **RGB:** Shows the red, green, and blue channels simultaneously, as colored overlays.
 - 2. **YCbCr:** Shows the luminance (Y), blue chroma difference (Cb) and red chroma difference(Cr) channels of the YCbCr color space.
- **Direction:** By default, the waveform displays values across the image from left to right. The direction control allows you to change this, so that the scope is mapped across the image in a different direction. Setting the Direction to 90 degrees, for example, will map the top of the image to the left edge of the scope, and the bottom of the image to the right edge of the scope.
- **Brightness:** Manipulates the brightness of the waveform readout. Increasing or decreasing the brightness of the waveform may make it easier to read in some situations.
- Analysis Downsample: Adjusts the precision of the readout. Lower sample rates are faster, but less accurate.
- **Color Space:** Select between various color standards, so you can ensure your content meets the color specifications required.

- 1. Rec. 601: The color standard for standard definition (SD) footage.
- 2. **Rec. 709:** The color standard for high definition (HD) footage.
- 3. **Rec 2020:** The color standard for ultra high definition (UHD) footage.

7.21. Sharpen

The sharpen folder contains standard tools for sharpening images.

- Highpass Sharpen
- <u>Sharpen</u>
- Unsharpen

7.21.1. Highpass Sharpen

Sharpening is a common application for highpass filtering. To create the sharpening, a duplicate of the layer is created, a highpass filter is applied to the duplicate, and the result is then blended back onto the original. All of this is handled internally by the Highpass Sharpening effect, greatly simplifying the process.

- Radius: Sets the radius, in pixels, which will be evaluated to identify contrast.
- Amount: Adjusts the intensity of the sharpening.
- Blend Method: Choose the blend method used to create the sharpening
 - Linear Light: Creates a stronger, more intense sharpening.
 - Hard Light: A mid-range option, similar to Overlay in intensity.
 - **Soft Light:** Soft Light method gives the most subtle results.
 - **Overlay:** Overlay is the traditional blend mode used for highpass sharpening, and is good for general use.
- View Highpass: Enabling this option shows the highpass filter used for the sharpening, in the viewer. Useful for viewing how large of an area around the edges is being affected.

7.21.2. Sharpen

Brings out fine detail in the image.



7.21.3. Unsharpen

Alternative method for highlighting detail.



7.22. Stylize

The stylize effects offer more extreme color grading options. They often combine multiple techniques into a single effect.

- <u>Cartoon</u>
- Emboss
- Find Edges
- Glow Darks
- Leave Color
 EXPRESS ADD-ON
- Oil Painting
- Photorama
- Posterize
- Solarize
- Threshold
- <u>Tint</u>

7.22.1. Cartoon

Creates the appearance of a cartoon drawing, with smoothed colors and lines drawn over edges.

You can heavily customize the appearance of the edge lines and the fill.



7.22.2. Emboss

Creates the illusion of a ridged image, based on the source layer, similar to clay imprint.



7.22.3. Find Edges

Reduces the layer to only showing edge areas.



7.22.4. Glow Darks

Functions in a similar way to a standard glow but affects dark areas rather than light areas.

7.22.5. Leave Color

EXPRESS ADD-ON Leave Color is available in the Color: Looks Pack.

Desaturates the layer except for a specified color range.



7.22.6. Oil Painting

Creates the look of an oil painting.



7.22.7. Photorama

A selection of generated photo-style distortions.

7.22.8. Posterize

Reduces the color detail in the layer to create blocks of color.



7.22.9. Solarize

Creates the appearance of a film negative that has been exposed to light during development.



7.22.10. Threshold

Reduces the layer to just two colors. You can specify the colors and the threshold changes the emphasis of the effect.



7.22.11. Tint

Tints the layer, shifting dark and light areas towards your specified colors.

The Amount to Tint property can be used to create subtle or extreme effects.



7.23. Temporal

Temporal effects alter layers based on time.

- Echo
- Motion Trails
- <u>Speed</u>
- Time Displacement [Layer Only]
- <u>Time Reverse</u>

7.23.1. Echo

Creates repeated versions of the layer, offset in time, which are blended onto the current frame.

- Echo Time the time difference between each echo.
- **Decay** each subsequent echo will be less visible.



7.23.2. Motion Trails

Adds a fake motion blur based on the movement of the layer.



7.23.3. Speed

Changes the playback speed of the layer.

- The speed effect does not change the duration of the layer on the timeline. If you reduce the speed of the layer you will not be able to see any frames which are not played before the end of the layer.
- * Basic speed changes are better handled using the Rate Stretch tool or the Speed/Duration option on the timeline. See <u>Refining Your Edit</u> for more details.

7.23.4. Time Displacement [Layer Only]

Displaces the layer based on time. You can displace using the layer itself or another layer.

The Black Time Shift and White Time Shift values specify where in time the displacement source is from.



7.23.5. Time Reverse

Plays the layer in reverse frame order.

7.24. The Foundry

The Foundry's Camera Tracker for HitFilm allows anyone to easily and quickly composite effects or other elements into video footage that was filmed with a moving camera. While making the basic process incredibly simple, Camera Tracker also includes powerful features that ensure high quality results even with difficult to track files.

Using Camera Tracker

This video walks you through the basics of using the camera tracker:



Full details on all features of Camera Tracker are available on its dedicated page.

• Camera Tracker [Layer Only]

7.24.1. Camera Tracker [Layer Only]

The Foundry's Camera Tracker for HitFilm allows anyone to easily and quickly composite effects or other elements into video footage that was filmed with a moving camera. While making the basic process incredibly simple, Camera Tracker also includes powerful features that ensure high quality results even with difficult to track files.



Camera tracking, also called matchmoving, is usually among the first steps in the post-production process, because compositing elements into a scene convincingly relies on the camera tracking data. The basic workflow can be broken into three main steps:

- 1. **Tracking Features** Identifying unique points of detail in the scene, then locating those features in each frame to determine how they move through the frame.
- 2. **Solving** Analyzing the tracked features and comparing their relative movement to determine where the camera was positioned in relation to each of the tracked features. By triangulating the movement of multiple points, the camera position can be solved with great accuracy.
- 3. Creating a Scene Using the solve data to generate a scene, comprised of a moving 3D camera, the

relative positions of each feature that was tracked, and the original video clip which is being tracked.

Using Camera Tracker

The basic process of using Camera Tracker to create a 3D camera solve is shown in this video, or you can follow the steps detailed below.



- 1. Add the CameraTracker effect to the layer that needs tracked.
- 2. Double-click the effect on the timeline to open its controls in the Controls panel.
- 3. Click the Track Features button. This may take some time, while the software auto-selects features and tracks them through the video.
- 4. Click the Solve Camera button. Camera tracker will evaluate the movement of each feature to determine where the camera was when the scene was filmed.
- 5. Click the Create Scene button. A new point will be created, with its position animated to match the camera movement. A new camera will be created and parented to the animated point.
- 6. The final step, which is not essential, but is useful in most cases, is to set the ground plane. Select two or more points that are positioned on the ground.
- In the bottom left corner of the Viewer, open the Camera tracker menu. Select Ground Plane > Set To Selected.

This simple process creates a scene containing your video and a matchmoved camera, ready to add new elements.

Advanced Features

For many situations, the basic steps above are all that will be required. But frequently the tracking results can be improved by customizing the settings used to track the scene. By getting familiar with these features and settings, you can get the best results possible for any scene you are working on.

- Matte Source:
 - None: No matte is applied.
 - Src Alpha: Uses the alpha of the source layer.
 - Src Inverted Alpha: Uses the inverted alpha of the source layer.
 - Matte Layer Luminance: Uses the luminance of the matte layer.

- Matte Layer Inverted Luminance: Uses the inverted luminance of the matte layer.
- Matte Layer Alpha: Uses the alpha of the matte layer.
- Matte Layer Inverted Alpha: Uses the inverted alpha of the matte layer.
- Analysis Range: Select the range of frames within the source layer that will be tracked.
 - Source Clip Range: Tracks the entire duration of the source layer
 - **Specified Range:** Allows you to specify a limited range within the layer, and only tracks the selected frames. When this option is selected, two new controls will appear below.
 - Analysis Start: Select the frame where tracking will begin.
 - Analysis Stop: Select the frame where tracking will end.
- **Display:** Choose what information the Viewer displays about the tracked features.
 - Tracks: Shows only the tracks, without any additional information. All tracks are shown as orange before solving. After solving, solved tracks are colored green, unsolved tracks are orange, and rejected tracks are red.
 - **Track Quality:** The reliability of the tracks is indicated through color coding. Reliable tracks are green, questionable tracks are yellow, and unreliable tracks are red.
 - **Point Quality:** The quality of the 3D points generated by the solve are displayed through color coding. Tracks with the lowest probability of error are green. Tracks with the highest probability of error are red. This option is only available after the camera is solved.
- Allow Line Selection: Enabling this checkbox makes it easier to select multiple points in the viewer. When disabled, you must click on the track X to select it. When enabled, you can click the line of the track path to select it.
- Preview Features: Enabling this option allows you to view the features before tracking has begun.
- View Keyframed Points Only: Select this checkbox to view only keyframed points. Keyframed points are the core of the tracking data, and are used to fill in data for the other tracks
- Track Features: Click this button to begin the tracking process.
- **Solve Camera:** After tracking is completed, click this button to solve the camera's position and movement, based on the tracking data.
- **Create Scene:** After the camera is solved, clicking this button generates a 3D scene, with a moving 3D camera and your source video layer.
- **Toggle Render Mode:** This control toggles between showing the features placed over the source video, and showing the 3D point cloud created by the tracker.

Tracking

- Number of Features: Set the number of features used to track the movement int he scene. More features can improve accuracy of the solve, but will extend the processing time needed to track and solve the scene. As a rule, most layers should use a minimum of 100 features to ensure a reliable solve.
- Detection Threshold: Lowering the detection threshold selects more prominent points within the

layer, while increasing detection threshold spreads the features more evenly across the layer.

- (marker-blue) TIP: If your layer contains large areas that are relatively featureless, use a low detection threshold to improve the results.
- Feature Separation: Controls the distribution of features across the layer. Higher values space features more evenly, while lower values allow features to group together near areas of more prominent contrast.
 - TIP: Increase feature separation when using a low number of features. When you raise the number of features, reduce the feature separation.
- **Track Threshold:** Adjusts the tolerance to change within the video. Lowering the threshold can generate longer tracks, but they may potentially be less accurate. Use the preview features to check the accuracy of tracks when lowering the threshold, to ensure they are still accurate.
- **Track Smoothness:** When working with more complex scenes, increase the track smoothness value to discard tracks that error over time.
- **Track Consistency:** Sets the acceptable level of consistency before a track is discarded and replaced with a new feature in a different location. Higher values allow less inconsistency, but may take longer to process.
- **Track Validation:** Select the type of camera motion that Camera Tracker should expect while tracking the scene.
 - **None:** Do not validate tracks base don any particular camera movement.
 - Free Camera: Compensates for both translational and rotational movement in the camera.
 - Rotating Camera: Compensates for a camera that is rotating only, if your scene was shot from a tripod.

Using Mattes

Mattes block specific areas of the video from being used in tracking. This helps reduce processing time, and prevent unusable tracking data. By keyframing mattes to cover areas of the frame containing moving objects, you allow Camera Tracker to ignore those areas, so it can focus on tracking stable objects that will give superior results.

Mattes must be created on a separate layer. In most cases a plane works best, but other layer types can work as well. Use the following steps to create a basic matte.

- 1. On the timeline, open the **New** menu and create a new **Plane** layer.
- 2. Open the transform controls for the plane, and reduce its **Opacity** to 30%. This allows you to see through the plane and observe the details of the video layer.
- 3. On the Viewer, select the Freehand Mask tool. Then, on the timeline, select the plane.
- 4. Draw a mask loosely around the moving object in your video. It does not need to be precise, but try to keep the space outside of the object to a minimum.
- 5. Keyframe the mask's path, position, rotation, or scale as needed, to follow the movement of the

object.

- If necessary, repeat steps 3-5 for any additional moving objects in the frame.
- Right-click the plane on the timeline, and select Make Composite Shot. In the dialog that
 opens, rename the composite shot to "Matte", and select Move With Layer to move the masks
 with the layer into the new comp. This step bakes the masks into the layer, so they are
 calculated into the layer's shape.
- Switch back to the main composite shot timeline, where the tracking is being performed, and open the Camera Track controls.
- For the Matte Source property, select Matte Alpha.
- For the Matte Layer property, select the "Matte" layer that contains the masks.

You can now proceed with the tracking, and the areas inside the matte will be ignored.

Solving the Camera

Creating a Scene

7.25. Video Clean-up

These effects provide useful tools for improving the quality of your video footage and fixing common issues.

- Clone Stamp [Layer Only]
- Deinterlace
- Denoise EXPRESS ADD-ON
- Grain Removal
 EXPRESS ADD-ON
- Rolling Shutter
 EXPRESS ADD-ON
- Wire Removal
 EXPRESS ADD-ON

7.25.1. Clone Stamp [Layer Only]

The clone stamp is useful for duplicating or removing specific parts of a layer. Combined with HitFilm's feature tracking this is a very powerful feature.



A separate layer can be used as a **clone mask**, defining the area to clone. Using a simple plane is usually the easiest way to do this, as the plane can be easily resized and positioned if necessary.

The clone source can be from the applied layer or from another layer, as defined by the **Clone From** property.

The **Source** and **Target** positions can then be specified, or linked to other layers. This enables the cloning to be linked to points containing tracking data.

7.25.2. Crop

7.25.3. Deinterlace

HitFilm is designed to create progressive projects and output. If you are using interlaced footage in a project we recommend deinterlacing it with this effect to avoid visible interlace 'combing'.

There are two options:

- **Field separation** discards one of the fields. This results in a half-resolution image. You can also separate the fields while retaining both, which results in an increased framerate. The composite shot containing the footage should have its framerate set to twice that of the footage to retain normal playback.
- **Field displacement** uses optical flow techniques to analyze movement within the fields and attempts to create a new, full resolution frame which merges the two fields together. This generates a full resolution frame but artefacts may be visible if the merge is not fully successful.
7.25.4. Denoise

EXPRESS ADD-ON Denoise is available in the Edit: Repair Pack.

Professional noise reduction is possible with the denoise effect.

Core workflow

After the effect is applied to a noisy layer a highlight box will be displayed in the Viewer. This can be adjusted using the two control points.

This box should be positioned over a noisy area of the frame. This will provide the effect with input to analyze the video. Ideally select a flat region with mid-level brightness.

Click the Analyze button to analyze the selected area.

Some noise will be removed immediately.

To further refine, change the View setting to Analysis Box.

Move the control points so that the analysis box is over darker noisy area.

Click the Analyze Brightness button in the Analyze control group.

This will analyze the difference in the noise levels, between the brightness of the original analysis and the brightness of the new analysis region.

This will refine the noise removal.

The process can be further improved by increasing the number of frames used during the analysis. The more frames it uses, the more time it will take to render, but usually with superior results.

Controls

- **Analyze button** Only visible when image has not yet been analysed. Uses the selected analysis area, to analyse the noise of the image.
- Frames The number of frames used to remove the noise. It should be kept at '1' if applied to an

image.

View modes

- Result shows the result of the noise reduction
- Analysis Box shows the region that will be used for analysis if one of the analysis button is pressed
- Frequency Y shows how much the brightness changes at the selected frequency level
- Frequency U shows how much the u color changes at the selected frequency level
- Frequency V shows how much the v color changes at the selected frequency level

Frequency View Options Group

Only visible if the selected View is one of the frequency options.

- Level The frequency level to be viewed.
- **Contrast** Allows you to change the contrast of the displayed frequency. Sometimes the changes in frequency are too subtle to see. This control allows you to increase the contrast, to help you to see it.

Analyse Brightness

Used when noise amount varies depending on the brightness.

Updates the threshold values in the 'Threshold – Brightness' control group.

Re-Analyse

Discards the original analysis that was performed and re-analyzes with the currently selected analysis area.

Threshold

The controls under this group help the plugin to identify what is and isn't noise, by manually adjusting the threshold values.

- **Brightness** The controls under this group, allow you to change the threshold values dependent on the brightness of the image. If, for example, not enough noise is being removed from dark areas, just increase the threshold of the '0' slider. If the problem is in the white areas, adjust the '100' slider. The sliders act like a graph, adjusting one will cause the nearby sliders to also be adjusted.
- **Channel** These controls allow you to change the noise threshold depending on the YUV channel.
- **Frequency** This allows you to change the noise threshold depending on the frequency of the data. It is easier to edit these slider if viewing the correct frequency: simply change the view to one of the

frequencies; then change the frequency options level to correspond with the frequency slider.

• **Keep Edges** – This slider sometimes helps to bring more of the edges back. But as the value is increased, more of the noise might be brought back as well.

Removal Amount

These controls allow you to adjust how much of the noise is removed.

- Y controls how much noise is removed from variations in brightness, of the image. By default it is set at 80%, as removing all of the noise from the brightness tends to not look as good.
- U/V controls how much noise is removed from variations in colour.
- Frequency controls how much noise is removed dependent on the frequency of the data.

7.25.5. Grain Removal

EXPRESS ADD-ON Grain Removal is available in the Edit: Repair Pack.

Basic grain removal. Also see <u>Denoise</u> for advanced noise removal.

7.25.6. Rolling Shutter

EXPRESS ADD-ON Rolling Shutter is available in the Edit: Repair Pack.

Some capture methods used by video cameras produce an effect called rolling shutter. This is particularly common with DSLR cameras. Rolling shutter can be identified by a wobbling, jelly-like instability in the frame during rapid movement.

The rolling shutter effect is designed to counteract rolling shutter, correcting the video and minimizing the effects of rolling shutter.

Shutter direction is used to define whether the camera uses a vertical or horizontal shutter. Consult your camera's specifications for more information.

Correction

The **correction** property is used to specify the amount of time it takes for the camera's shutter to travel across the frame.

In the case of cameras using a vertical shutter, this is defined as the time it takes in frames to capture from the top row of the image to the bottom row.

Positive values indicates the vertical shutter is travelling from top to bottom, while negative values are for bottom to top. You should consult the specifications of your camera to find the **correction** value to use.

Shutter sync

This property determines which part of the rolling shutter frame should be used to fix the image.

- -0.5 will use the frame at the beginning of the vertical shutter capture, as defined by the correction property.
- 0.0 will use the frame halfway through the vertical shutter capture. This is usually best as it will result in the minimum amount of distortion.
- 0.5 will use the frame at the end of the vertical shutter capture, as defined by the **correction** property.

Optical flow

Rolling shutter works by tracking the movement of every pixel in the frame using optical flow techniques.

The **View** menu can be used to observe the accuracy of the optical flow track.

Different videos may require adjustments to the optical flow properties. Adjusting the **Window size** and **Sigma** properties tend to yield the best results.

7.25.7. Wire Removal

EXPRESS ADD-ON Wire Removal is available in the Composite: Toolkit Pack.

Easily remove wires from your shot using this tool to paint them out

- **Start Position:** Sets the location of the start point. You can either move the Position point on the Viewer, or change the values manually.
- **Use Layer:** Allows you to use the position of another layer by selecting it. Useful if you have tracked the ends of the wire, and want to use the position of Point layers that contain the tracking data.
- End Position: Sets the location of the end point. You can either move the Position point on the Viewer, or change the values manually.
- **Use Layer:** Allows you to use the position of another layer by selecting it. Useful if you have tracked the ends of the wire, and want to use the position of Point layers that contain the tracking data.
- Width: The Wire Removal effect draws a line over the wire, between the start and end points, and repaints that line using background info from the video. This slider sets the width of the line. Adjust it so it covers the entire wire that needs removed.
- **Gradient:** Softens the edges of the repainted line to blend it into the background. Try to raise this setting only as much as the scene requires. Setting it too high may create a ripple as the wire moves.
- **Reflection:** Increasing this setting adds a reflection at the center of the line, which may help to blend the line into the scene better.

7.26. Warp

These effects stretch and push your layers into new shapes.

- Action Cam Crop
 EXPRESS ADD-ON
- <u>Action Cam Lens Distort</u>
- Bezier Warp
- Lens Distort
 EXPRESS ADD-ON
- Perspective Warp
- Polar Warp
- Quad Warp
- <u>Spherical Warp</u>
- Vortex Displacement Warp [Layer Only]

7.26.1. Action Cam Crop

EXPRESS ADD-ON Action Cam Crop is available in the VFX: Lighting Pack.

Quickly adjusts your GoPro footage to crop to different framing.

7.26.2. Action Cam Lens Distort

Adds or removes fisheye lens distortion. Several presets are provided specifically for use with GoPro cameras, making it simple to composite layers naturally into GoPro footage or to adjust GoPro footage to match traditional lenses.

Here is a grid representing the natural curvature of a GoPro HERO4:



Here is the exact same image with the curvature removed using the fisheye warp:

The effect can also be used applied to other layers, so that they can be composited realistically into fisheye footage:



The FOV property adjusts the amount of distortion and Center adjusts the distortion's center – ordinarily you will want to leave the Center at 0,0.

Scale anchor

When the layer is adjusted this controls how it is scaled.

Corner maintains the corners of the image, scaling from the sides so that all the image is retained but some black areas are introduced:



Height scales the image so that the frame is filled vertically while some areas are cropped:

Width scales the image so the frame is filled horizontally, while some black areas are introduced at the top and bottom:



Layer resize

When the warp is applied some parts of the original frame are likely to be cropped outside of the frame. This

is a natural and expected side effect of removing fisheye distortion.

If you are removing the distortion so that you can then apply other elements before re-distorting back to the original look this can lead to potential problems. For example, rewarping the unwarped grid results in lost areas around the edge due to the cropping:

Original:



Fisheye removed:

Fisheye reapplied using a reverse fisheye warp effect:



This can be countered using the Layer Resize options.

Take a look at this expanded view, with the Layer Resize set to None:



You can see that the undistorted grid is kept within the layer's boundaries.





Grow lets the layer expand beyond its boundaries, meaning that none of the original frame is lost. When this version is then redistorted using a second fisheye warp set to Reverse, the entire contents of the original

are recovered.

Wrap

The various wrap options determine what happens if the effect produces empty areas of frame. Tile, Reflect and Blur Reflect fill in the empty areas using various techniques.

7.26.3. Bezier Warp

Provides the ability to distort the layer and fold it into new shapes.

It is generally easier to use the Viewer controls.



7.26.4. Lens Distort

EXPRESS ADD-ON Lens distort is available in the VFX: Distortion.

Can be used to simulate lens distortion or remove unwanted distortion (such as from fisheye camera lenses).

7.26.5. Perspective Warp

Simulates rotating the layer in 3D.



7.26.6. Polar Warp

Wraps the layer into a circular shape.



7.26.7. Quad Warp

Adds quad controls to the layer so that you can change its shape by moving its corners.



7.26.8. Spherical Warp

Creates the appearance of a spherical lens, as if wrapping the layer around a concave or convex surface.



7.26.9. Vortex Displacement Warp [Layer Only]

Similar to the Twirl distort effect but with additional displacement and vortex controls for pinching and stretching the affected area.



7.27. Presets

Making use of presets can massively speed up your workflow in HitFilm. Presets can be created for 3D effects and combinations of 2D effects.

Presets store your chosen settings so that you can quickly recreate them elsewhere in your project or even in completely different projects.

Using Presets

The presets are organized into multiple folders in the Effects panel.

3D Presets

All the default 3D effects presets are kept in the 3D Effects folder.

When dragged to the timeline, 3D presets create new 3D effect layers. The layer will be automatically set up according to the settings in the preset.

2D Presets

2D effects presets need to be dragged to a layer or clip. They can store the settings for multiple 2D effects, providing a quick way to re-use specific combinations. This is especially useful for different film looks.

Some 2D effects presets can only be used on composite shot timelines. These are marked automatically by [Layer Only] in the Effects panel.

Preset Management

You can arrange presets into folders for easy access.

New folders can be created by clicking the **New Folder** button at the bottom of the Effects panel.

Presets can be **imported** and **exported** by right clicking in the Effects window and using the relevant menu options.

You can drag presets between folders inside the Effects panel to change how they are categorized.

Folders and presets can be deleted by selecting them then clicking the **Delete** button.

Deleting presets cannot be undone. However, if you accidentally delete the wrong preset you can retrieve it from your computer's Recycle Bin.

Creating Presets

You can create your own presets. When creating a preset you will be asked to select a folder in which to store it. See above for information on creating folders.

3D Presets

To create a new 3D preset, simply right click the 3D effect in your layer list on your timeline and choose **Create 3D Preset**.

You can then choose a name for your new preset and specify which folder to store it in.

The **Include Layer Properties** option will also include any Transform, Material or Clip Window keyframes and values, as well as the width, height and dimensions of the layer. This can be useful if you want to recreate the exact effect within the same project.

Presets cannot store texture information for particle effects using a layer as the texture source. To store the settings for complex particle effects we recommend saving the effect as its own project file. This can then be imported and used in future projects.

2D Presets

To create a 2D effects preset you first need to choose which effects to store in the preset.

Effects can be selected on the timeline by holding shift or ctrl and clicking on the effects you want.

Once you have selected your effects, right click them and choose **Create Preset**.

8. Licensing Details

Licensing Details

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