Using
DRAGONFRAME 4

Welcome

Dragonframe is a stop-motion solution created by professional anima-tors—for professional animators. It's designed to complement how the pros animate. We hope this manual helps you get up to speed with Dragonframe quickly.

The chapters in this guide give you the information you need to know to get proficient with Dragonframe:

"Big Picture" on page 1 helps you get started with Dragonframe.

"User Interface" on page 13 gives a tour of Dragonframe's features.

"Camera Connections" on page 39 helps you connect cameras to Drag-onframe.

"Cinematography Tools" on page 73 and "Animation Tools" on page 107 give details on Dragonframe's main workspaces.

"Using the Timeline" on page 129 explains how to use the timeline in the Animation window to edit frames.

"Alternative Shooting Techniques (Non Stop Motion)" on page 145 explains how to use Dragonframe for time-lapse.

"Managing Your Projects and Files" on page 149 shows how to use Dragonframe to organize and manage your project.

"Working with Audio Clips" on page 159 and "Reading Dialogue Tracks" on page 171 explain how to add an audip clip and create a track reading.

"Using the X-Sheet" on page 187 explains our virtual exposure sheet.

"Automate Lighting with DMX" on page 211 describes how to use DMX to automate lights.

"Adding Input and Output Triggers" on page 241 has an overview of using Dragonframe to trigger events.

"Motion Control" on page 249 helps you integrate your rig with the Arc Motion Control workspace or helps you use other motion control rigs.

"Shooting in 3D" on page 319 explains how to connect Dragonframe to a stereo slider, set up 3D exposures, and review your 3D sequence.

"Exporting Your Take" on page 335 explains how to access your files for post-production.

"Preferences" on page 349 explains all of Dragonframe's preferences and settings.

New Features for this Version

Dragonframe 4 incorporates years of feedback from industry animators, camera technicians, directors and producers.

New Features and Improvements

Version 4.2 Changes

- Increase maximum allowed video assist size to 1920 wide. (Video assist resolution is usually limited by camera.)

- New take/exposure/frame notes stored in metadata text file for passing on to post-production.

- Reference images can now be popped out into separate window.

- New alternate composition guide layers, for framing for multiple deliveries.

- New movie record tool in Cinematography workspace makes it more clear which settings will be used when camera is set to record video.

- New motion control adjustment layer to apply bumps to moves.

- New motion control "time warp" feature to stretch or compress final move over time.

- New DMX keyframe table view.

- Support for simple arithmetic in many Arc and DMX fields.

- Support for 4K webcams and Elgato Cam Link 4K.

- Spout integration on Windows (like Syphon on macOS).

- Improvements for Auxiliary Monitor and Blackmagic Playback output.

- Open Sound Control (OSC) input and output for integration with OSC-capable software.

Version 4.1 Changes

- New "Notepad" for keeping track of scene notes.

- Up to eight "punch-in" positions of live view magnification.

- Focus check support for Sony A7III and A7RIII.

- Support for ARRI direct ARRIRAW capture.

- Support for RED DSMC2 direct R3D capture.

- Support for Pentax KP, K-1, K-1 Mark II, 645Z.

- Support for Canon EOS M50, T7/1500D/2000D and 3000D/ 4000D.

- Support for 3rd-party DMX hardware: ENTTEC DMX Pro and Art-Net protocol.

- New gamepad controller integration for programming motion control.

- New 3D mouse support for motion control.

- More virtualized axis configurations for motion control.

- Motion control capture in reverse.

Version 4.0 Changes

- New "Guide Layers" makes it easy to set up composition guides, reference layers and drawings.

- Multiple reference layers with separate opacity, chromakeying and masking.

- Integrated reference video player with animation time sync.

- Timeline pre-roll area for setting up lead-in clip.

- Multiple drawing layers with separate opacity.

- Improved live view magnification tools.

- New focus check tool within Animation workspace.

- New color palette (swatch) sampling and comparison.

- New color checking tools.

- High-resolution image comparison tools (A/B).

- Movie recording and playback for supported cameras.

- Import multiple audio clips.

- Custom DMX light profiles.

- Improved live view and test shot setup in DMX.

- Improved motion control keyframe editing.

- Import raw motion control moves from Maya.

- Support for many Sony Alpha A7 full frame mirrorless cameras.

- Support for Olympus OMD E-M1, E-M1 II and E-M5 II micro four thirds cameras.

- Support for Panasonic DMC-GH4 and GX8 micro four thirds cameras.

Table of Contents

Maps

Chapter 1: Big Picture

This chapter will help you get started using Dragonframe. It includes an overview of how Dragonframe works, gets you acquainted with its main workspaces, and helps you quickly connect cameras to your computer. Finally, it explains some important Dragonframe concepts, like the takes and exposures that enable you to do more complex effects, as well as how to use Dragonframe to work with RAW and HDR files.

This chapter includes the following sections:

See also:
Dragonframe tutorials:
https://www.dragonframe.com/tutorials/

Dragonframe camera setup troubleshooting page:
https://www.dragonframe.com/camera-support/

How Dragonframe Works

When shooting animation, Dragonframe will create two separate image sequences in tandem. The first is a series of low-res frames derived from a live video source for use in refining animation. The second is from a high-quality capture source, such as RAW files from a DSLR, for finished frames. These image sequences are kept in perfect tandem during shooting and editing within Dragonframe.

This process takes particular advantage of DSLR Live View capabilities. Dragonframe switches the DSLR from a video assist mode to a full-fledged high-quality capture mode every time you shoot a frame.

Basic Overview of DSLR Shooting

1. The animator compares the live video with stored video assist frames taken from the video source. Because the video assist is live, they can make changes and test them immediately.

2. When the animator is ready to capture the new frame, they press **SHOOT**.

3. Dragonframe grabs a video assist frame from the video source and stores it on disk and in RAM, ready for playback.

4. Immediately after capturing the video assist frame, Dragonframe switches the camera into full-quality mode and captures a high reso-lution still. Dragonframe also immediately downloads this high-quality image to disk.

Dragonframe names and numbers both the feed frames and high-qual-ity captures with the scene and take info for your shot.

- Find your feed frames within your Scene folder: in the folder called **PROJECT NAME_TAKE NAME_FEED.**

- Find your high-quality capture frames within your Scene folder: in the green frame folder.

See also:
"Finding Your Source Files" on page 335.

Other Configurations:

There are other configurations for shooting with Dragonframe, such as:

- Shooting DV or HD video only.

- Using a DSLR with a separate video feed (DSLR with no Live View).

- Using a film camera with a separate video feed source.

- Shooting with a DSLR and foregoing the live video.

By leveraging the instant feedback of live video assist and the beautiful image quality from digital still capture, Dragonframe can help you move quickly while producing feature-film-quality results.

Powerful Tools

Dragonframe brings together a powerful set of stop motion tools into one production-savvy application.

Animation Tool

Using a live video source, Dragonframe shows the animator a preview of the frame they are preparing to shoot and the frame's relationship with previously captured frames. The animator can compare this frame to the last frames by stepping one frame at a time, using full-speed playback or using the onionskin feature.

See also:
"Animation Workspace Overview" on page 14.

High-Quality Image Capture Tool

Whether you are shooting with HD video or a digital still camera, Dragonframe carefully captures the highest-quality images possible. These high-quality frames can come from a different source than the video assist. Dragonframe stores the high-quality frames on disk as soon as you shoot them.

When storing images from your camera, Dragonframe does not reprocess them. Dragonframe delivers RAW files and other formats straight from your DSLR to a folder without ever hiding them from you.

If you are shooting HD or SD video as your final capture, your images can be made from a series of averaged video frames. This process reduces noise and video artifacts.

Cinematography Tool

Our Cinematography workspace is your starting point for adjusting your camera's settings and comparing test shots. You can set up masking and broadcast-safe guides simultaneously. Dragonframe gives you histograms and a digital densitometer to evaluate image quality and consistency between scenes and takes.

See also:
"Cinematography Tools" on page 73.

Production Tool

Dragonframe is a production-savvy system with features that help you manage your production.

- Dragonframe uses the same naming hierarchy used on live-actions sets around the world.

- Each Dragonframe project folder is easy to navigate—even during shooting.

- Our frame sequences are a snap to load into compositing software.

- Multiple passes and extra exposures are organized simply for stereo (3D) shooting, clean passes and other post effects.

- Every frame shot with Dragonframe is easily searchable by scene, take and exposure name.

- Our movie export produces movies in a variety of standard video formats, including QuickTime movies, h.264/aac mp4 files, and Windows AVI and WMV.

See also:
"Exporting Your Take" on page 335.
"Available Movie Formats" on page 341.
"Finding Your Source Files" on page 335.
"Passes, Takes and Exposures Explained" on page 9.
"Creating a Movie of Your Take" on page 339.

Quick User Interface Overview

The core of Dragonframe's user interface revolves around the two key artistic practices involved in shooting stop motion: animation and cine-matography. From there our platform branches out into the DMX

workspace, audio and dialogue editing, the Arc motion control inter-
face, and the keypad.
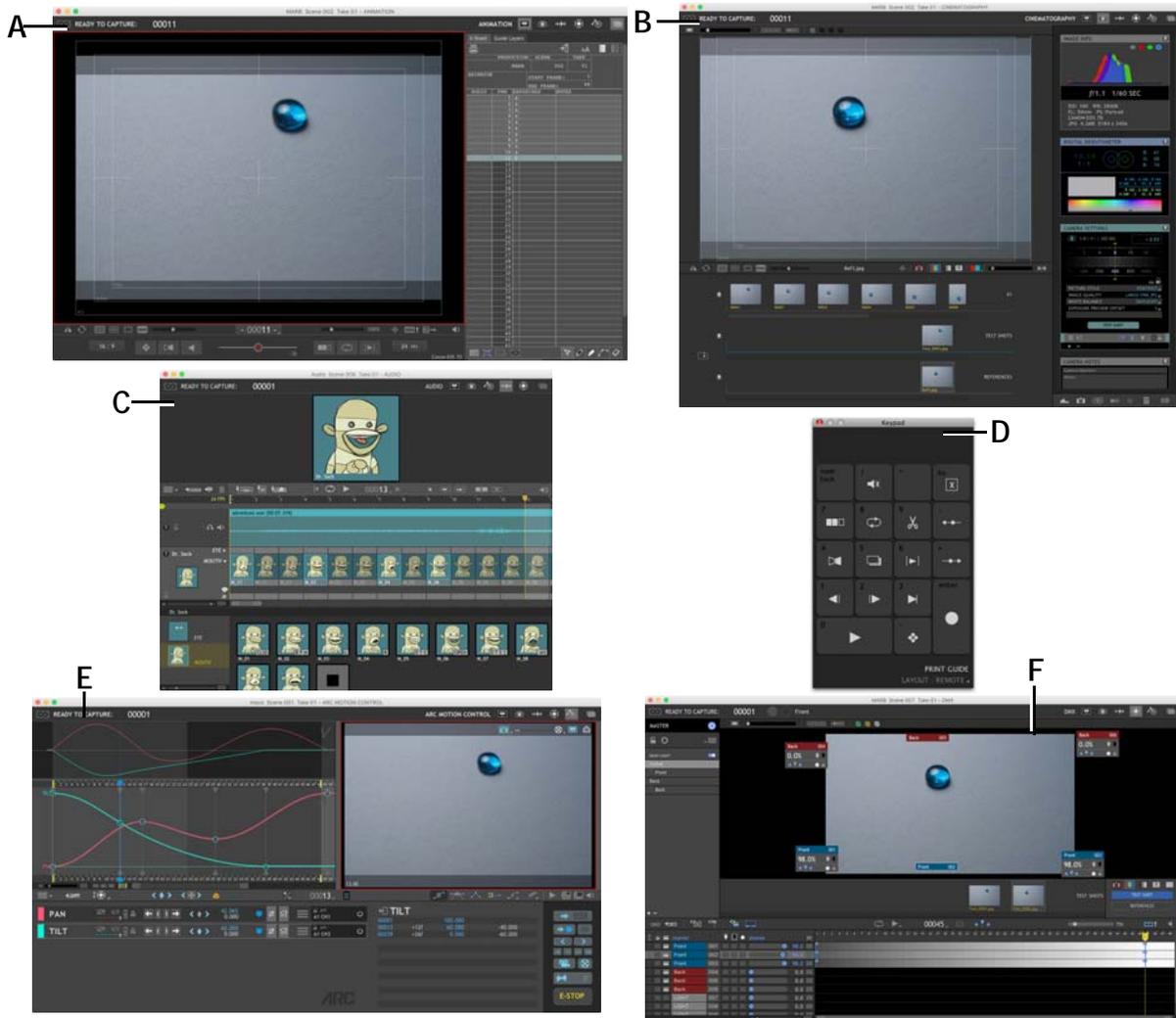
A. Animation workspace with X-Sheet. *B.* Cinematography workspace. *C.* Audio workspace.
D. Keypad. *E.* Arc Motion Control Workspace. *F.* DMX Workspace.

See also:

"Animation Workspace Overview" on page 14.

"Cinematography Workspace Overview" on page 16.

"X-Sheet Overview" on page 17.

"Dragonframe Keypad Overview" on page 21.

"Audio Workspace Overview" on page 18.

"DMX Workspace Overview" on page 19.

"Motion Control Workspace Overview" on page 20.

Dragonframe tutorials:
https://www.dragonframe.com/tutorials/

Activating Your Software

Once you download a copy of Dragonframe, you'll need to activate the copy to use it. When you start up the program for the first time, the Dragonframe Activation dialog appears. From there, you can activate a trial version, a full version, or a floating license.

Activating a Trial License

To activate the trial version:

1. Request a trial code from our site:
   https://www.dragonframe.com/downloads/

2. Look for an email from us. Make sure to check your Promotions/Junk/Spam folders.

3. Select **ACTIVATE TRIAL MODE**.

4. Copy and paste the trial code you received from our site. It should start with "**D4T00**".

5. Click **ACTIVATE**.

NOTE: You must have an Internet connection to activate a trial license.

Activating a Full License

To activate a full version of the software, or to upgrade from a previous version:

1. Enter your full serial number from the license email you received after your order was processed. If it is for Dragonframe 4, it will start with "D4R", "D4E", or "D4U", and be in this format:

   D4R01-12345-12345-12345-12345

2. Enter a name you want associated with the license in the **REGISTERED TO** field. It must be at least three characters.

3. (Optional) Enter your email address. You will be added to the Dragonframe customer database. Entering your email will:

   • Allow you to look up your serial number if you lose it (or have us look it up for you).

   • Provide DZED Systems with a way to get in touch with you if you submit a problem report.

- Notify you about critical updates and major releases to Dragonframe (maximum 1-2 emails a year).

Floating License Manager

Dragonframe can provide you with a floating license manager if you are an institution (typically a school or a large company) that holds multiple Dragonframe licenses. The floating license manager is a program that must run on a local server within your institution that can serve licenses to Dragonframe client applications.

Contact customer support to request a floating license manager.

See also:
Our contact page:
https://www.dragonframe.com/contact-us/

Transferring a License

To transfer your license to another machine:

1. Click **HELP|DEACTIVATE LICENSE…** to deactivate it on your current machine.

2. Open Dragonframe on your other machine.

3. Select **HELP|ENTER LICENSE…** Dragonframe opens the license dialog.

4. Enter your full serial number.

5. Enter a name you want associated with the license in the **REGISTERED TO** field. It must be at least three characters.

6. Click **ACTIVATE**. Dragonframe activates your license on the other machine.

NOTE: If the machine that was activated is no longer working, use our License Lookup page. It will send you an email with a list of machines that have been activated, and a link to deactivate them.
https://www.dragonframe.com/find-your-license/

Quick Set-Up Guide for Supported Video and Still Cameras

This section explains how to connect video and capture sources.

1. Configure the camera's settings to work with Dragonframe.

    Check our camera web page for a list of supported cameras and specific set-up guides:
    https://www.dragonframe.com/camera-support/

2. Connect the camera(s) to the computer according to the manufacturer's directions.

    •   Digital still cameras generally connect via USB.

    •   HDMI sources generally connect via an HDMI cable, using a video card such as the Blackmagic Intensity:
        http://www.blackmagic-design.com/products/intensity/

3. Turn off other camera software.

    Make sure no other software has detected your camera and started up. Quit any software that wants to connect to the camera.

4. Open Dragonframe and create a new scene or open an existing one.

    Dragonframe should auto-detect the camera and send a live video signal (if available) into the Animation workspace. Click **CAPTURE|VIDEO SOURCE** and **CAPTURE|CAPTURE SOURCE** to check the status of camera connections.

5. Remember the keystroke **COMMAND+R** (Mac) **/** **CTRL+R** (Win/ Linux). It resets connections to cameras.

    Or, select **CAPTURE|RESET/REFRESH CONNECTIONS**.

    If you are connecting a camera to a computer while Dragonframe is already running, press **COMMAND+R** (Mac) **/** **CTRL+R** (Win/Linux) to activate a connection to Dragonframe.

NOTE: If you run into trouble with your camera setup or operation, go to our camera setup page:
https://www.dragonframe.com/camera-support/

If you are using a DSLR, go directly to the Cinematography workspace to adjust all of your exposure-related settings, including image quality and white balance.

See also:
"Camera Connections" on page 39.
"Connecting an Unsupported Camera to Dragonframe" on page 44.

Passes, Takes and Exposures Explained

Effects shots can take many forms, such as clean passes, plate shots and matte passes. In this section, we cover how Dragonframe can make the multi-pass process simple and organized.

Dragonframe creates effects passes in two specific ways:

1. *Straight Pass:* Shooting a continuous series of frames before or after other passes are complete.

To set up a straight pass in Dragonframe, create a new take within your scene.

2. *Sub-Frame Pass:* Capturing two or more images for each frame in time. In Dragonframe, this is called an exposure. Each take may contain up to twelve exposures.

To set up a sub-frame pass in Dragonframe, create a new exposure from the Camera Settings in the Cinematography workspace.

As you read the examples of these passes that follow, keep Dragonframe's folder and frame hierarchy in mind.

- A Dragonframe project is known as a scene (gray folder). Here, the scene is named "Sample".

- A scene folder holds takes (red folders).

- Take folders hold exposures (green folders).
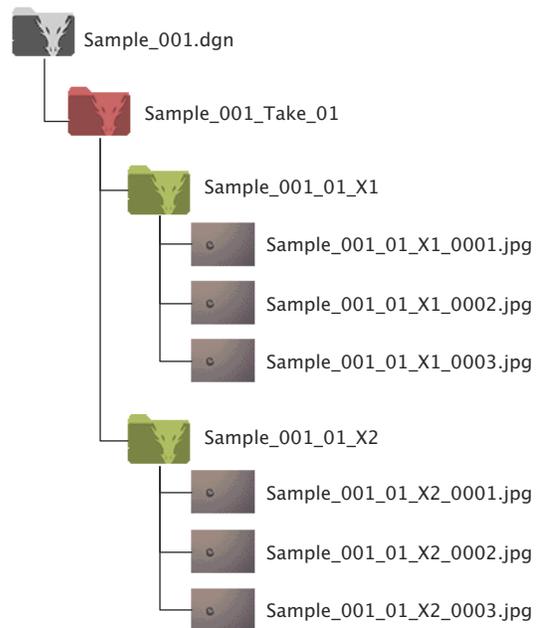
Straight Pass

A straight pass is a separate sequence that is usually the length of the main beauty pass and is shot straight through from frame 001 to the end.

A common use for a straight pass is the clean pass or clean plate. There are times when the rigging in a shot is tough to hide. You may choose to mask out the rigging in post-production. After you are done with your main take, remove the characters and objects that were animated and

shoot a new take of the set. Now you have a clean version of your shot to mask over the rigs.

Shooting your animation on green screen for a main take and shooting a separate background to composite the animation into is an example of using two straight passes.

The simplest way to create a new straight pass is to add a new take to the scene you are working in. This will keep all of the scene information from the previous take and set you to frame one. Or, create a new scene file for the extra passes. You can import scene settings from a previous scene if necessary.

Sub-Frame Pass

The sub-frame pass refers to secondary frames taken while animating. Because stop motion animation is most likely non-repeatable, some passes need to be generated on a frame-by-frame basis. Mattes, stereo pairs, and special lighting passes are all examples of sub-frame passes.

To create a sub-frame pass, add an Exposure from the Camera Settings pane within the Cinematography workspace.

A common example of a sub-frame pass is the front light/backlight pass. The front light frames are the images you see eauty pass), while the backlight frames are used to generate a matte for compositing. In the film days, this would be called a checkerboard matte because the beauty and matte pass were shot on a single strip of film. The film would look like alternating dark and light squares. The passes would be separated through the use of an optical printer. In Dragonframe, the exposures are separated and organized as you shoot.

Here is an example of a checkerboard-style matte using a green screen card instead of a backlight. By placing the card behind your subject during a second exposure, you can create a matte pass as you shoot.

1. Shoot the beauty shot: **FRAME 001, EXPOSURE 1.**

2. Place a green screen card behind your subject. Shoot the second exposure of frame 001 to create a matte frame: **FRAME 001, EXPOSURE 2**.

3. Shoot the second beauty shot: **FRAME 002, EXPOSURE 1**. When you step through your animation, you will only see the beauty pass.

4. Repeat this process until you're done with the scene.

Dragonframe automatically places the beauty and matte exposures into separate folders, ready for post-processing.

RAW File Workflow

With the development of the RAW file, digital still cameras are now rivaling the tonal fidelity and flexibility of 35mm film.

Working with RAW Files in Dragonframe

Most digital still cameras give you the choice of shooting RAW with an 8-bit file (.jpg, .tiff) or RAW only.

- If you choose to shoot RAW with .jpg or .tiff, Dragonframe will download both the RAW and the 8-bit files into the same exposure folder with matching names. The Cinematography workspace will display only the 8-bit file for evaluation and high-res playback in the Animation workspace.

- If you shoot RAW only, Dragonframe will download the RAW files into the proper exposure folder. Each RAW file has an embedded .jpg file. Dragonframe will use the embedded .jpg for display in the Cinematography workspace and for high-res playback in the Animation workspace.

Final Raw Processing

Dragonframe names all of your RAW files with the specific scene, take and frame numbers from your animation. The RAW frame sequence is ready for import into your post-production pipeline.

If you need a quick way to convert your cameras native RAW files into Adobe's DNG file format, we suggest using Adobe's free DNG converter: http://www.adobe.com/products/dng/

Dragonframe doesn't reprocess RAW files. We suggest programs like Adobe's After Effects to process and resize your RAW files.

After Effects can easily recognize many RAW formats and import them as an image sequence straight from your Dragonframe exposure folder (green folder).

HDR (High Dynamic Range) Workflow

Create HDR images by combining images with different exposure levels. First, use Dragonframe's multi-exposure system to create two or more frame sequences with varying exposure levels. Then, import the

frame sequences into an HDR-creation application or batch-process them in Adobe Photoshop.

Chapter 2: User Interface

Dragonframe's workspaces, tools, and hardware have been designed with you in mind. We've not only taken our team's experience with animation, but worked with top animators for their feedback. We hope the result is a usable and beautiful interface.

Dragonframe has five workspaces:

- Animation: The main workspace, you will spend most of your time here while you are animating.

- Cinematography: Change camera settings, adjust exposure and check focus.

- Audio: Load audio clips and make basic edits. Performs dialogue track reading prior to animation.

- DMX: Set up animated lighting programs.

- Arc Motion Control: Program camera moves.

Using Workspaces

Dragonframe's main tools each appear in a workspace, a window that you can arrange easily. The main workspaces appear as tabs in the upper right corner of the program:

A. *Name of active workspace.*

B. *Workspace tabs. The Animation workspace is always the first tab of the primary window. Other tabs can be rearranged.*

C. *Opens the Guide Layers in the activate workspace.*

- To open additional tabs, right-click (Mac **CTRL**-click) the workspace tabs. Select the workspace you want to add from the drop-down menu that appears.

- To close a tab, right-click (Mac **CTRL**-click) and de-select it from the workspace menu that appears.

- To open a workspace in a new window, drag the tab away from the menu bar.

- To reattach a workspace, drag it back to the menu bar in the main window.

Animation Workspace Overview

The Animation workspace is the central location for all your animation features and tools. It opens when you open Dragonframe.

The Animation workspace:

- Displays the Live View.

- Plays back video assist frames for testing and reviewing animation.

- Controls animation aids such as onionskin and drawing tools.

- Displays the frame counter and capture counter.

- Contains the timeline for frame editing and viewing track readings.

- Contains the Nav-Line for navigation and playback.

Click ▢ (at the top of the window) to open the Animation workspace:

Animation Timeline Overview

The Animation timeline shows you thumbnails of your frames. From the timeline you can edit your frames, retrieve frames from the delete bin, or view audio information.

Click ▦↑ to open the timeline:
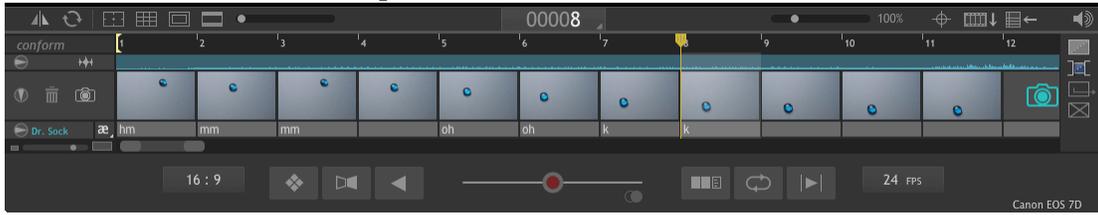
See also:

"Using the Timeline" on page 129.

"Timeline Map" on page 130.

Cinematography Workspace Overview

The Cinematography workspace provides a place to set up the composition and exposure of your scene. Use the Cinematography workspace to adjust camera settings, take test shots, preview 3D images, set up exposures with different camera settings, or test lighting.

The Cinematography workspace should be your first stop before animating. From there make sure your lighting, camera settings, and image quality are right. Once you start shooting, return to the Cinematography workspace during the shoot to check your captured frames.

Click 📷 (at the top of the window) to open the Cinematography workspace:

A. *High-resolution image review.* **B.** *High-resolution image thumbnails.* **C.** *Test and Reference shots.* **D.** *Image information.* **E.** *Camera settings (depends on camera model).*

See also:
"Cinematography Tools" on page 73.
"Reviewing 3D Images" on page 325.

X-Sheet Overview

The X-Sheet is an editable exposure sheet based on the production information for your scene.

Click ▤← in the Animation tools to open the X-Sheet (and Guide Layers) within the Animation workspace.

A. Guide Layers button. In the Animation workspace, it toggles the shared X-Sheet/Guide Layers area. *B.* X-Sheet button in Animation tools. Click to open the X-Sheet within the Animation window.

As you create your scene, Dragonframe updates the X-Sheet dynamically. Open the X-Sheet and edit it, changing the scene length, editing frames, and adding reminders for a particular frame. Draw on the X-Sheet, or view dialogue waveforms and track readings. Or, print your X-Sheet for a hard copy of your scene.

See also:
"Using the X-Sheet" on page 187.
"X-Sheet Map" on page 188.

Audio Workspace Overview

The audio workspace helps you load audio clips, edit them, and set up track readings. Use face sets to animate eyes and mouths, add dialogue cues and phonetics, and export your track reading and a preview of the face set animation.

Click ⁺⁺⁺ at the top of the Dragonframe window to open the Audio workspace:

See also:

"Audio Workspace Map" on page 160.

"Working with Audio Clips" on page 159.

"Reading Dialogue Tracks" on page 171.

"Viewing Audio Information in the X-Sheet" on page 201.

"Viewing the Track Reading in the X-Sheet or Timeline" on page 182.

"Using the Timeline" on page 129.

Dragonframe tutorials:

http://www.dragonframe/tutorials/

DMX Workspace Overview

Use the DMX workspace to set up an animated lighting program for your scene. Connecting DMX-enabled tools to Dragonframe, like the DDMX-512 or DMC-16 and a dimmer pack, allows you to automate lighting or turn off work lights automatically.

Click ⬜ at the top of the Dragonframe window to open the DMX Workspace:

See also:
"Automate Lighting with DMX" on page 211.
"DMX Workspace Map" on page 213.

Motion Control Workspace Overview

Use the Arc motion control workspace to program complex, multi-axis camera moves directly within Dragonframe. Click ⚙ at the top of the Dragonframe window to open the Arc Motion Control Workspace:
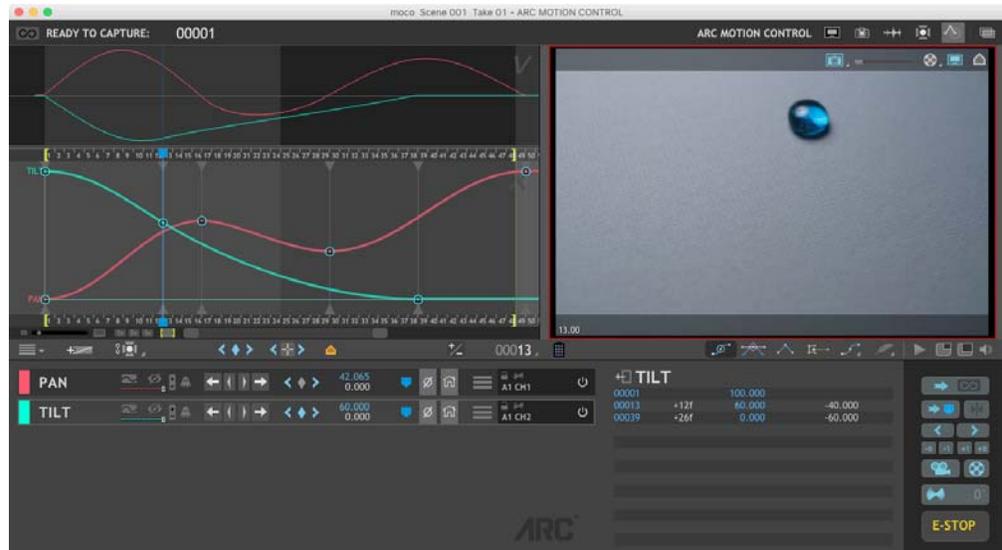
See also:

"Using the Arc Motion Control Workspace" on page 249.

"Arc Motion Control Workspace Map" on page 253.

Dragonframe tutorials:

https://www.dragonframe.com/tutorials/

Dragonframe Keypad Overview

Most copies of Dragonframe include a remote keypad, either the Dragonframe Bluetooth Keypad Controller, or the Dragonframe USB Keypad Controller. The keypad makes it easy to move away from your computer and still control Dragonframe.

NOTE: Install Dragonframe before plugging in the Dragonframe keypad. Otherwise your computer will prompt you to identify the "keyboard". If you get that prompt, close it. After you install Dragonframe, it will recognize the keypad automatically.

NOTE: The Bluetooth keypad requires a Bluetooth capable computer. If your computer does not have Bluetooth, you can buy a "Bluetooth USB Adapter" from Amazon.com.

A visual map follows showing how the Dragonframe keypad's commands relate to the Animation tools.

NOTE: The keypad on the next page is the Dragonframe keypad included with your copy of Dragonframe. If you use the keypad included on the right side of your Mac or PC keyboard, the placement of the MUTE, DELETE and ONIONSKIN keys will vary slightly, but they'll work the same way.

See also:
"Keypad Controls" on page 112.
"Keypad Window Overview" on page 23.

Dragonframe Keypad Map
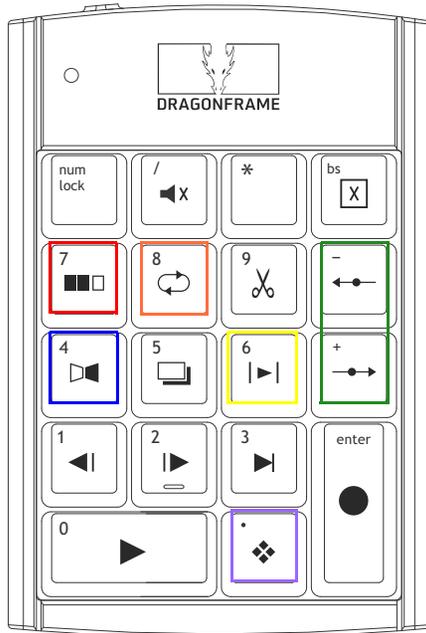
◀ˣ **MUTE** (/) .... Turns audio playback off.

☒ **DELETE** S) ....Deletes the last frame shot.

■■☐ **BLACK** (7) .... Cuts to black at the end of playback.

↻ **LOOP** (8) .... Loops the frame sequence.

✂ **CUT BACK** (9)..Eliminates a selected group of recently shot frames.

▷◀ **AUTO-TOGGLE** (4) .... Toggles the Live View at an adjustable rate.

▭ **LIVE TOGGLE** (5) ....Toggles the Live View each time you press the key.

|►| **SHORT PLAY** (6) ....Plays a selected number of previously shot frames.

•→ **ONIONSKIN** (+, -) ....Dissolves the Live View over shot frames.

◀||▶ **STEP** (1, 2) .... Steps frame-by-frame through the sequence.

▶| **LIVE** (3) .... Jumps to the Live View frame in the sequence.

▶ **PLAY** (0) ....Plays the sequence at full speed.

❖ **HIGH-RES** (.) .... Switches from video assist frames to high-res proxies.

● **SHOOT** (enter) ....Captures a frame.

The Animation tools (below) serve as a dashboard, indicating what playback modes are active, if the Onionskin slider is adjusted, and what frame you're on.

Keypad Window Overview

The keypad window is a learning aid. Keep it open when first getting acquainted with Dragonframe to help you learn the keypresses for your Dragonframe keypad, or for the keypad on your Mac or Windows keyboard.

To open the keypad window, click **WINDOW|SHOW KEYPAD**.

*Keypad Window. Click **LAYOUT** to change how the keypad looks.*

Once you open the window, you can change the layout of the keypad by clicking **LAYOUT** in the bottom right corner. Change the layout in the following ways:

Select:	To:
MAC KEYPAD	Lay out the keypad like the one on a Mac keyboard.
PC KEYPAD	Lay out the keypad like the one on a Windows keyboard.

23

Select:	To:
REMOTE KEYPAD	Lay out the keypad like the one included with Dragonframe.
DISPLAY ICONS	Show only the icons describing each keypress on the keypad window.
DISPLAY TEXT	Show the text describing each keypress on the keypad window.
TOP DISPLAY ON	Display the text and icon describing each keypress at the top of the window each time you roll over a key.
TOP DISPLAY OFF	Do not display text and icons at the top of the window.
NORMAL SIZE	Display a larger keypad.
SMALL SIZE	Display a smaller keypad.

Menu Overview

The tables that follow give more information about each of Dragon-frame's menus.

File Menu

Select this menu item:	To:	See also:
NEW TAKE…	Open the New Take dialog.	"Creating a New Take" on page 152.
NEW SCENE…	Open the New Scene dialog.	"Creating a New Scene" on page 149.
OPEN SCENE…	Open the Open Scene dialog.	"Opening a Previously-Shot Scene" on page 151.
OPEN RECENT >	Select from a list of recently opened files.	N/A
DUPLICATE SCENE…	Save the current scene as a new scene.	"Duplicating Your Scene" on page 152.
SAVE SCENE SETTINGS	Save TAKE.XML to make sure any important changes you've made to the scene will be saved.	N/A
CONFORM CURRENT TAKE	Conform edits for the take. This makes Dragonframe place frame order numbering on your source files to reflect edits such as deletes and cutbacks.	"Conforming Timeline Edits" on page 141.
CONFORM ALL TAKES	Conform edits for all takes. This makes Dragonframe place frame order numbering on your source files to reflect edits such as deletes and cutbacks.	"Conforming Timeline Edits" on page 141.
SWITCH TAKE…	Open the Choose Take dialog to view all takes and select one to switch to.	"Switching Takes" on page 152.
MANAGE TAKES…	Open the Manage Takes dialog, where you can duplicate or rename a take.	"Managing Takes" on page 153.
LOAD REFERENCE MOVIE…	Load a movie file as a reference layer.	"Loading Reference Material" on page 63.
LOAD REFERENCE IMAGE…	Load a still image as a reference layer.	"Loading Reference Material" on page 63.

Select this menu item:	To:	See also:
LOAD REFERENCE IMAGE SEQUENCE…	Load an image sequence as a reference layer.	"Loading Reference Material" on page 63.
LOAD REFERENCE SCENE	Load a Dragonframe scene as a reference layer.	"Loading Reference Material" on page 63.
IMPORT>	Import dialogue cues, camera moves, exposures, drawings from another scene, the phonetics from scrubbed audio, or X-Sheet information.	"Importing Scene Settings" on page 156. "Importing X-Sheet Data" on page 197.
EXPORT MOVIE…	Create a movie of your take.	"Creating a Movie of Your Take" on page 339.
EXPORT IMAGE SEQUENCE…	Export an image sequence with attributes you choose (instead of accessing your files directly).	"Exporting Image Sequences" on page 344.
EXPORT STEREO (3D) MOVIE…	Export stereo images for preview.	"Exporting Stereo Sequences" on page 334.
EXPORT STILL IMAGE…	Export the image you're viewing in the Cinematography workspace.	"Viewing Modes for Captured Frames" on page 79.
EXPORT X-SHEET	Export the X-Sheet to a CSV file.	"Exporting the X-Sheet as a CSV" on page 203.
PRINT…	Print a copy of the X-Sheet.	"Printing the X-Sheet" on page 201.

Edit Menu

Select this menu item:	To:	See also:
UNDO	Undo actions: capturing a frame, deleting, cutting back, or editing.	N/A
REDO	Cancel any action you undid.	N/A
CUT	Cut the selected frames.	• "Cutting, Copying or Pasting Frames with the Timeline" on page 135. • "Cutting or Copying from the X-Sheet" on page 191.
COPY	Copy the selected frames.	• "Cutting, Copying or Pasting Frames with the Timeline" on page 135. • "Cutting or Copying from the X-Sheet" on page 191.
PASTE...	Paste the selected frames.	• "Cutting, Copying or Pasting Frames with the Timeline" on page 135. • "Pasting Frames from the X-Sheet" on page 191.
DELETE	Delete the selected frames.	• "Deleting Frames from the Timeline" on page 137. • "Deleting Frames from the X-Sheet" on page 196.
SELECT ALL	In the DMX workspace, select all the keyframes if you have a keyframe selected. Otherwise, select all of the channels.	"Selecting Keyframes" on page 220.

Select this menu item:	To:	See also:
PASTE INSERT	Insert frames.	"Cutting, Copying or Pasting Frames with the Timeline" on page 135.
PASTE OVERWRITE	Replace frames.	• "Cutting, Copying or Pasting Frames with the Timeline" on page 135. • "Pasting Frames from the X-Sheet" on page 191.
PASTE REVERSE	Insert frames in reverse order.	• "Cutting, Copying or Pasting Frames with the Timeline" on page 135. • "Pasting Frames from the X-Sheet" on page 191.
PASTE REVERSE OVERWRITE	Replace frames with frames in reverse order.	• "Cutting, Copying or Pasting Frames with the Timeline" on page 135. • "Pasting Frames from the X-Sheet" on page 191.
HIDE FRAMES	Hide frames from the timeline or X-Sheet without deleting them.	• "Hiding Frames with the Timeline" on page 136. • "Hiding a Frame in the X-Sheet" on page 193.
UNHIDE FRAMES	Unhide hidden frames.	• "Un-hide Hidden Frames from the Timeline" on page 137. • "Unhide Hidden Frames from the X-Sheet" on page 195.

Select this menu item:	To:	See also:
HOLD FRAME…	Repeat a frame, as if you were to copy and paste it multiple times.	• "Holding Frames with the Timeline" on page 135. • "Holding a Frame in the X-Sheet" on page 192.
RESHOOT FRAMES	Reshoot the selected frames.	• "Reshooting Frames from the Timeline" on page 137. • "Reshooting a Frame Sequence from the X-Sheet" on page 196.
INSERT CAMERA	Move the camera to insert new frames.	• "Inserting the Camera" on page 138. • "Reshooting a Frame Sequence from the X-Sheet" on page 196.
RETURN CAMERA TO END	Move the camera back to the end of the frame sequence once you've finished adding new frames.	• "Inserting the Camera" on page 138. • "Reshooting a Frame Sequence from the X-Sheet" on page 196.
MARK IN	Set the in point for playback.	• "Cinematography Workspace Overview" on page 16. • "Play Section with the Nav-Line" on page 116.
MARK OUT	Set the out point for playback.	• "Cinematography Workspace Overview" on page 16. • "Play Section with the Nav-Line" on page 116.

Select this menu item:	To:	See also:
GO TO IN POINT	View the in point's frame in the View pane.	"Cinematography Workspace Overview" on page 16.
GO TO OUT POINT	View the out point's frame in the View pane.	"Cinematography Workspace Overview" on page 16.
SHOW DELETE BIN	Show or hide the the delete bin for the timeline.	"Restoring Frames from the Delete Bin" on page 139.

View Menu

Select this menu item:	To:	See also:
SIZE >	Select from a drop-down list of image sizes.	N/A
ORIENTATION >	Enable mirror, rotate and portrait orientations.	N/A
AUXILIARY MONITOR >	Display a full screen view of the Live View or playback on another monitor	"Using an Auxiliary Monitor" on page 125.
BLACKMAGIC OUTPUT>	Enable video output over a Blackmagic Design output device.	N/A
OUTPUT TO SYPHON (MAC ONLY)	Use the Dragonframe live view as a Syphon source.	http://syphon.v002.info/
OUTPUT TO SPOUT (WIN ONLY)	Use the Dragonframe live view as a Spout source.	http://spout.zeal.co/
FOCUS PEAKING	Focus peaking submenu (for Canon EOS R only)	N/A

Scene Menu

Select this menu item:	To:	See also:
GENERAL...	Adjust scene settings.	"Configuring Scene Settings" on page 361.
EXPOSURES...	Configure scene exposure settings.	"Adding Multiple Exposures" on page 95.
CONNECTIONS...	Connect supported hardware, like the DDMX-512 or a stereo slider, to Dragonframe.	"Connecting DMX to Dragonframe" on page 214. "Connecting to the DESC through Dragonframe's Connections Tab" on page 313. "Connecting to a 3D Slider" on page 319. "Connecting Dragonframe to Moco Hardware" on page 251.
TRIGGERS...	Work with electrical inputs or outputs.	"Adding Input and Output Triggers" on page 241.

Capture Menu

Select this menu item:	To:	See also:
SHOOT SINGLE FRAME	Shoot a frame with your capture source.	"Keypad Controls" on page 112.
SHOOT X FRAMES	Shoot two or more frames with your capture source.	"Shoot Multiple Frames" on page 117.
SHOOT MULTIPLE AS VIRTUAL HOLDS	Hold frames to create the effect of SHOOT MULTIPLE.	"Capture Options for Shooting on Twos" on page 118.
SHOOT MULTIPLE FRAMES...	Shoot more than one frame in a row.	"Shoot Multiple Frames" on page 117.
TIME-LAPSE...	Shoot a time-lapse sequence.	"Time-Lapse" on page 145.
SHOOT PREVIEW IMAGE	Capture a pseudo Live View image from a still camera.	"Shooting Without a Video Assist" on page 49.

Select this menu item:	To:	See also:
SHOOT IN REVERSE	Shoot frames in reverse order.	"Shooting in Reverse Order" on page 120.
CUT BACK…	Jump to a frame and, if you wish, delete the intervening frames.	"Cut Back Key" on page 114.
VIDEO ASSIST SOURCE >	Select your video assist source.	• "How Dragonframe Works" on page 1. • "Camera Connections" on page 39.
CAPTURE SOURCE >	Select your capture source.	• "How Dragonframe Works" on page 1. • "Camera Connections" on page 39.
CONFIGURE WIFI CAMERAS…	Open the WiFi camera setup page.	"Connecting a WiFi-Enabled Camera to Dragonframe" on page 43.
VIDEO SETTINGS…	Open the Video tab of the Settings dialog.	"Video Settings" on page 362.
PAUSE CAMERA	Pause your camera's Live View to avoid overheating.	N/A
RESET/REFRESH CONNECTIONS	Reset connections to cameras.	"Switching Video or Capture Sources" on page 50.
SHOOT MOVE MODE	Have Dragonframe move the motors to the next position right after you shoot.	"Shoot Move and Move Shoot Modes" on page 273.
MOVE SHOOT MODE	Have Dragonframe move the motors to the next position before you shoot.	"Shoot Move and Move Shoot Modes" on page 273.
BACKLASH ROLLBACK	Perform a backlash rollback with motion control.	"Adding an Axis" on page 254.
MOVIE RECORDING…	Open the Movie Recording dialog.	"Movie Recording" on page 100.

Playback Menu

Select this menu item:	To:	See also:
FPS >	Select from a drop-down list of frame rates.	"Playback Speed" on page 116.
PLAY TO BLACK	Add black frames to the end of playback.	"Black (End in Black) Key" on page 115.
LOOP	Loop playback.	"Loop Key/Ping-Pong" on page 115.
SHORT PLAY	Play back only some of the frames from a sequence.	"Short Play Key" on page 115.
REVERSE	Play the sequence backwards.	N/A
TOGGLE >	Toggle the last frame and the Live View.	"Auto-Toggle Key" on page 114.
EXPOSURES: AUTO, X1, etc.	Switch which exposure you'll view during playback. Usually, you'll view the exposure that you're ready to capture, or the AUTO option. You can switch to other exposures and view those instead.	N/A
MONO	Play back images normally.	"Playing Back Stereo Sequences in Dragonframe" on page 333.
3D ANAGLYPH COLOR	Play back frame sequence using anaglyph images, in color.	"Playing Back Stereo Sequences in Dragonframe" on page 333.
3D ANAGLYPH B/W	Play back frame sequence using anaglyph images, in black and white.	"Playing Back Stereo Sequences in Dragonframe" on page 333.
3D TRANSPARENT COLOR	Play back frame sequence using transparent 3D images, in color.	"Playing Back Stereo Sequences in Dragonframe" on page 333.
3D TRANSPARENT B/W	Play back frame sequence using transparent 3D images, in black and white.	"Playing Back Stereo Sequences in Dragonframe" on page 333.

Window Menu

Select this menu item:	To:	See also:
MINIMIZE ALL	Minimize all of Dragon-frame's workspaces.	N/A
SHOW/HIDE CINEMATOGRA-PHY	Open the Cinematography workspace, or close it if it's already open.	• "Cinematography Workspace Overview" on page 16. • "Cinematography Tools" on page 73.
SHOW/HIDE X-SHEET	Open the X-Sheet in its own window, or close it if it's already open.	• "X-Sheet Overview" on page 17. • "Using the X-Sheet" on page 187.
SHOW/HIDE DMX	Open the DMX work-space, or close it if it's already open.	• "DMX Workspace Overview" on page 19. • "Automate Lighting with DMX" on page 211.
SHOW/HIDE AUDIO	Open the Audio work-space, or close it if it's already open.	• "Working with Audio Clips" on page 159. • "Reading Dialogue Tracks" on page 171.
SHOW/HIDE ARC MOTION CON-TROL	Open the motion control workspace, or close it if it's already open.	• "Motion Control Workspace Overview" on page 20. • "Motion Control" on page 249.
SHOW/HIDE KEYPAD	Open the practice keypad, or close it if it's already open.	"Keypad Window Overview" on page 23.
SHOW/HIDE MOTION CONTROL LOG	Open the Motion Control log, or close it if it's already open.	"Using External Moco Systems with Dragonframe" on page 305.
ANIMATION [PROJECT NAME]	Open or close the Animation workspace.	• "Animation Workspace Overview" on page 14. • "Animation Tools" on page 107.

Help Menu

Select this menu item:	To:	See also:
USER GUIDE…	Open the current version of this User Guide	N/A
WEB SITE SUPPORT	Open an Internet browser and link to Dragonframe's support web site.	N/A
REPORT AN ISSUE…	Open a support ticket, notifying us of problems with Dragonframe. You'll have the option of taking screenshots of the problem and sending the **TAKE.XML** metadata file tohelp us solve the problem. The Dragonframe team addresses each ticket and posts updates on the Help Ticket site. Every ticket is assigned a number so you can track its resolution.	N/A
CAMERA TEST…	Run a test of your camera to help us assist you with connection problems.	N/A
UPDATE DMC FIRMWARE	Update the firmware for the DMC-16 or DMC+.	"Real-time Motion Control with DMC-16/DMC+/ST4" on page 286.
ACTIVATE LICENSE	Enter a license key if you've just switched from a trial version of Dragonframe to the full version.	"Transferring a License" on page 7.
DEACTIVATE LICENSE	Deactivate Dragonframe on one computer to allow you to transfer it to another one.	"Transferring a License" on page 7.

Chapter 3: Camera Connections

Dragonframe generally uses two image sources while shooting. Most of the time, the two image sources come from the same physical device.

1. A capture camera shooting high-quality images. These frames make up your final animation. For example, you might use:

   - A supported DSLR camera.
   - An HD video camera.
   - A film camera.
   - An unsupported camera.

2. A live video source, letting you step to the Live View from the captured frames, and giving you access to a variety of Dragonframe's animation tools. For example, you might use:

   - The Live View on your digital still camera.
   - A video feed from your digital still camera.
   - A digital video camera.
   - A lipstick camera or spy cam set up through your capture camera's viewfinder.
   - An analog video source connected to your computer through an AV/DV bridge.

Dragonframe doesn't have to control both sources for you to use the program. For example, you might want to use Dragonframe as a feed-only frame grabber: using a digital video camera to preview your animation, but a film camera to capture your full-res images. Or, you might work without a video source, using the still images captured from your cameras to preview frames.

This chapter reviews how to connect different camera types to Dragonframe.

Camera Options

The sections that follow give tips for different camera configurations you might use with Dragonframe. Each one also explains how that particular configuration works with Dragonframe.

Our website has the the most up-to-date list of supported cameras, along with setup instructions and troubleshooting that is specific to your camera model.

See also:
The camera page on our website:
https://www.dragonframe.com/camera-support/

DSLR with Live View

This is the optimum configuration for Dragonframe. Both the video assist for previewing animation and the high-res capture frames, which can include RAW, are pulled from the same DSLR. When you connect your camera to your computer, Dragonframe will automatically detect that you have a DSLR with Live View and set up the sources accordingly.

See also:
"Connecting DSLRs with Live View" on page 42.

Digital Movie Camera

Dragonframe supports direct capture with ARRI (ALEXA Mini, ALEXA LF, SXT and AMIRA) as well as RED DSMC2 cameras.

In both cases, Dragonframe will make a special network connection directly to the camera and trigger and download full resolution source files—ARRIRAW for ARRI and R3D for RED.

And in both cases, you will need to use a Blackmagic Design capture card/device to take the SDI output from the camera and bring it into Dragonframe for the video assist.

Visit our camera support page for more information and specific setup instructions for each model.

DSLR with a Separate Video Source

Many people set up their preview frames from a separate DV or HD camera while shooting high-res frames from a DSLR. Some people set up spy cams that look through the DSLR's viewfinder. Or, you can set up a DV camera close to your DSLR. Check your animation with the video assist; Dragonframe grabs the high-res frames from the DSLR.

Video Only

If you are shooting with video only, Dragonframe will extract a video assist and capture frames from the same video signal. When you shoot,

Dragonframe grabs a low-res preview image for frame flipping. It also generates a high quality still from the video stream and saves it in the captured frames folder.

See also:
"Connecting HD Video Cameras with HDMI" on page 43.
"Connecting HD Video Cameras with HDMI" on page 43.

Motion Picture Film and a Video Source

Dragonframe works very well for film. Set up Dragonframe with a video signal from the film camera's video assist. You will need to convert the analog signal to DV. If you do not have video assist, set up a DV camera alongside the film camera. Whether you use video assist or not, you will need to trigger the film frames from a separate control.

A WiFi Enabled Camera

Dragonframe supports some WiFi-enabled cameras, including some models of Olympus and Sony. Please check our site for an up-to-date list of supported cameras.

This functionality is experimental, and we do not recommend purchasing a camera that only supports this integration. A USB connection will always perform more reliably than a WiFi connection.

See also:
"Connecting a WiFi-Enabled Camera to Dragonframe" on page 43.

An Unsupported Camera

If Dragonframe does not currently support your camera, you can still use the software. Set up folder watching so Dragonframe can look for the frames your camera captures in the folder where they're stored.

Or, if your camera doesn't work with folder watching, you might connect your camera to Dragonframe via the DDMX-512, and use the DDMX-512's switch/relay output to trigger the camera.

NOTE: Your experience of the software, and with animating, will be best if you use a supported camera. There are many great live view DSLRs on our list that you can find used for under $200-300 USD.

Digital Camera without Live View and without Live Video

If you're unable to work with a video feed for some reason (your camera doesn't support Live View, and you don't have a digital video camera),

you can use Dragonframe to shoot "preview" frames that substitute for a Live View.

Connecting DSLRs with Live View

To connect to DSLRs with a Live View output:

1. Check our website's camera page for individual setup instructions: https://www.dragonframe.com/camera-support/
Scroll down the list of supported cameras and find your camera. Click the camera name to view setup instructions.

2. Set the camera's shooting mode to MANUAL.

3. Turn on the camera and connect it to your computer with a USB cable.

4. Open Dragonframe.

Dragonframe should connect to the camera and show the Live View in the Animation workspace.

5. Use the Camera Settings pane in the Cinematography workspace to set the camera's exposure, white balance and image size.

We have years of experience dealing with common camera issues. If you run into trouble, please review the camera setup troubleshooting FAQ on our website:
https://www.dragonframe.com/faq/#camera

Connecting DSLRs without Live View

If your DSLR does not have Live View, connect it to Dragonframe in this way:

1. Check our website's camera page for individual setup instructions: https://www.dragonframe.com/camera-support/
Scroll down the list of supported cameras and find your camera. Click the camera name to view setup instructions.

2. Set the camera's shooting mode to MANUAL.

3. Turn on the camera and connect it to your computer with a USB cable.

4. Open Dragonframe.

Dragonframe should connect to the camera.

5. Select **CAPTURE|CAPTURE SOURCE** to make sure your camera is selected.
    Or, check that your camera's name appears in the bottom right corner of the Animation workspace.

6. Use the Camera Settings pane in the Cinematography workspace to set the camera's exposure, white balance and image size.

7. Choose a video source:

    •   Use a video source for the video assist frames.

    •   Shoot with the DSLR only.

Connecting HD Video Cameras with HDMI

HDMI is an uncompressed video format for delivering high-definition video to your computer. To use HDMI video with Dragonframe, you must have an HDMI conversion card or similar device like the one from Blackmagic Design:
http://www.blackmagic-design.com/products/intensity/

CAUTION: If your computer has an HDMI port on it, you must not plug your camera into it. That port is for output only. You must use special hardware to decode HDMI signal for input into Dragonframe.

1. Install the HDMI conversion card into your computer according to the manufacturer's instructions.

2. Connect your camera to the card with an HDMI cable.

3. Open Dragonframe.

Dragonframe should connect to the HDMI source and show the Live View in the Animation workspace.

Connecting a WiFi-Enabled Camera to Dragonframe

Dragonframe has experimental support for some WiFi-enabled cameras, including models from Olympus and Sony. Support for these cameras will be limited, and we strongly recommend using a supported USB camera instead.

To connect to a supported, WiFi-enabled camera:

1. Follow the camera's instructions for enabling WiFi. For Sony cameras, you must use the "Smart Remote Control" app.

2. Join your computer to the camera's WiFi network. This is one of the downsides of WiFi-cameras—you lose your internet connection over WiFi.

3. Select **CAPTURE|CONFIGURE WIFI CAMERAS…** The WiFi Camera Setup dialog opens:

4. Select **ADD**. The Add Camera dialog opens:
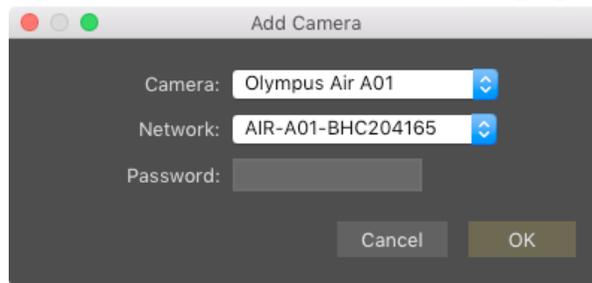
5. Select the type of **CAMERA** you have. If your exact model is not listed, you can try the closest available option.

6. Choose the **NETWORK** of your WiFi-enabled camera.

7. Close both dialogs.

Dragonframe should connect to your WiFi camera any time you connect to its network.

Connecting an Unsupported Camera to Dragonframe

Even if Dragonframe doesn't support your camera, you can still use the program. Dragonframe can detect images downloaded from your camera through folder watching. Folder watching also lets you shoot stills directly from Dragonframe, making the integration as seamless as possible. Unfortunately, folder watching cannot integrate with some Dragonframe features, such as camera settings.

NOTE: If your camera doesn't work with folder watching, you might connect your camera to Dragonframe via the DDMX-512, and use the DDMX-512's switch/relay output to trigger the camera. See "Using an External Relay Switch or a Logic Output to Automate a Bash Light" on page 245.

To set up Dragonframe's folder watching for an unsupported camera, you'll:

1. Connect your camera(s) physically to your computer.

2. Check settings in your camera's capture utility.

3. Make sure Dragonframe knows which capture utility you're using.

4. (Optional) Tell Dragonframe which keystroke your capture utility uses so Dragonframe can control your camera.

5. Tell Dragonframe where your capture utility downloads your pictures.

6. (Optional) Tell Dragonframe how many images to expect from your camera for every shot.

7. Verify your folder watching setup.

The sections that follow provide details about the steps above.

Connect Your Camera(s) to Your Computer

1. Install and open a capture utility that works with your camera, such as Olympus Studio 2.
   A capture utility controls the camera on your computer, so you can shoot stills by pressing a key on the keyboard, adjust settings on your screen, and download images from the camera onto your computer.

2. Connect your capture camera to your computer.

3. Plug your camera into its power source (or fully charge its battery).

4. Turn your camera on.

5. Set the camera to **CAPTURE** mode (not **PLAY**).

6. (Optional) Connect a video source.

Check Your Capture Utility's Settings

1. Start your camera's capture utility if it doesn't start automatically. Open up the portion of the program that remotely controls your camera.

2. Check which keypress you'd use to take a picture.
    For example, for Canon cameras working with the Canon EOS Utility, you press **SPACEBAR**.

3. Set the folder where you want your stills to download on your computer. This is the folder Dragonframe will "watch".
    Keep the default (usually your **PICTURES** folder) or set up a new folder. Make a note of the location.

Select Capture and Video Sources in Dragonframe

1. Open Dragonframe.

2. Select **CAPTURE|CAPTURE SOURCE|FOLDER WATCH**.

3. Check that your video source is connected:

    *   If you will use stills from this camera as a video source, select **CAPTURE|VIDEO ASSIST SOURCE|FOLDER WATCHING**.

    *   If you are using a supported video source, Dragonframe will automatically detect and connect to your video source.

    *   If you will work without a video source, see "Shooting Without a Video Assist" on page 49..

Check the Capture Utility Selected in Dragonframe

1. From Dragonframe, open the Cinematography workspace. The Camera Settings pane displays details about your camera's connection to Dragonframe:
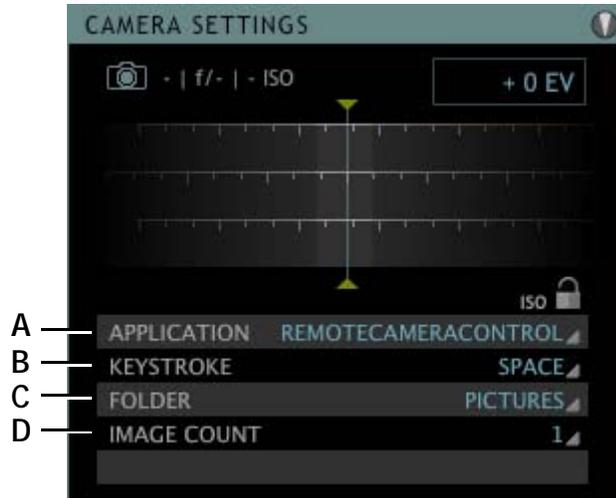
A. *Application: Shows which camera utility Dragonframe will use to communicate with your camera.*

B. *Keystroke: The key your utility uses to capture an image. Here, the key is* **SPACE***.*

C. *Folder: Shows where Dragonframe will look for pictures downloaded from your camera. This is the folder being "watched."*

D. *Image Count: How many images your camera will download for each capture. For example, if you will download both a JPEG and a RAW image, set* **IMAGE COUNT** *to* **2***.*

2. (Optional) Change the capture utility **APPLICATION** (A.) if it's incorrect.

Set Up Dragonframe's Keystroke

In the Cinematography workspace's Camera Settings pane, you can set up the **KEYSTROKE** to take pictures without having to switch back and forth between the capture utility and Dragonframe:

1. Compare the **KEYSTROKE** displayed with the one you noted in "Check Your Capture Utility's Settings" on page 46.

2. If they don't match, click the keystroke (here, **SPACE**) and select **SET…** The Keystroke dialog appears:
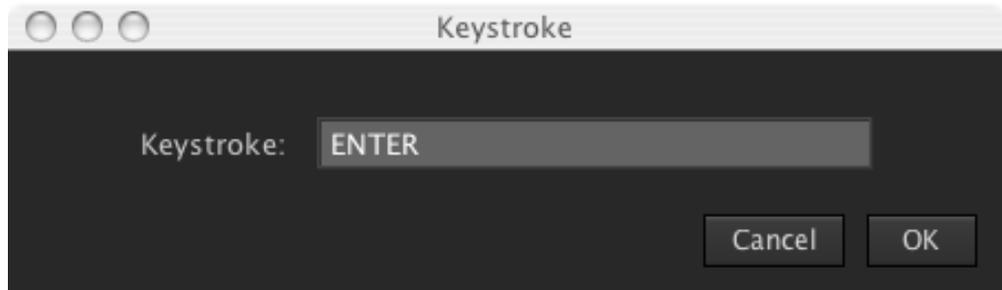
3. Press the key that your camera utility uses. Here, the keystroke is **ENTER**.

   Dragonframe displays the keypress in the dialog. Now, when you press **SHOOT**, or take a test shot, Dragonframe will have your picture utility capture a still.

NOTE: If you wish to use your camera utility to capture stills, you don't have to set up the keystroke. Dragonframe will automatically detect any stills you capture using the utility and display them.

Select Which Folder Dragonframe Will Watch

From Dragonframe's Cinematography workspace, select the **FOLDER** where your utility will download pictures.
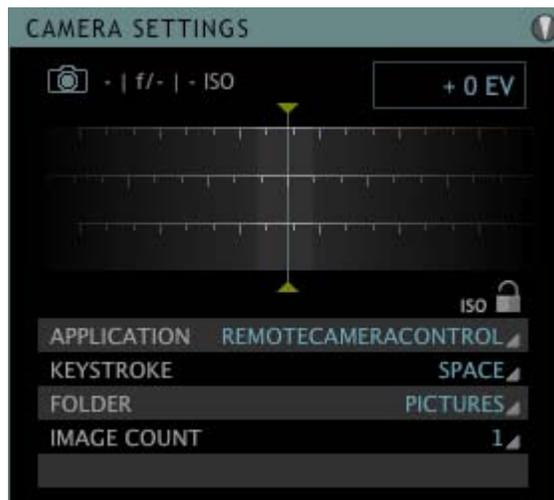
1. Click the currently selected folder (above it's called **PICTURES**) and click **BROWSE…** Dragonframe opens the Open dialog.

2. Navigate to the folder where the utility will download your stills and click **CHOOSE**. This is the folder you noted in "Check Your Capture Utility's Settings" on page 46.

Set Up the Image Count

From Dragonframe's Cinematography workspace, set the number of images to download with **IMAGE COUNT**.

- If you will only download one image from your camera, keep the **IMAGE COUNT** at **1**.

- If you will download two images, (for example, a RAW with .jpg), set it to **2**.

Test Folder Watching

To check that the integration with your camera utility is working:

- From Dragonframe's Cinematography workspace, press **TEST SHOT** to take a test shot.

- Or, if you didn't set up a **KEYSTROKE**, take a test shot in your camera utility.

Dragonframe detects the still in the folder you're watching and displays it as a thumbnail in the test shot tray at the bottom of the Cinematography workspace.

Shooting Without a Video Assist

Dragonframe will work without a video feed, using stills from your capture source as preview images. Using Dragonframe this way, however, means that you won't get automatic "updates" when you change something on your set.

To work without a video source:

1. Connect your still camera to your computer.

2. Close any associated programs that open with your camera (for example, iPhoto).

3. Open Dragonframe. Create a new scene, or open one you've already worked on.

The Animation workspace opens.

4. Select **CAPTURE|VIDEO SOURCE|[YOUR CAMERA NAME] (STILLS)**. Dragonframe configures itself to work with only a capture camera, and displays this message:

   You are working without live view.
   You may capture preview images using the LIVE key (#3 by default).

5. Click **ESC** to close the message.

6. Set up your first shot. When you're ready, press **LIVE** to shoot a pre-view image.

7. Press **SHOOT** to shoot a capture image.

NOTE: You can configure your Mac's Image Capture Preferences to not open photo software automatically when you connect a camera. Open the Image Capture application, select your camera, click on the arrow in the bottom left, and select **NO APPLICATION** to open when a camera is connected.

Switching Video or Capture Sources

If you decide to change the camera you're using to capture full-res stills, or you forgot to connect your video camera to your computer before opening Dragonframe, you can select a new source. To select a video or capture sources:

- Press **COMMAND+R** (Mac) / **CTRL+R** (Win/Linux) to reset the connections to any cameras you've connected to your computer.

- Select **CAPTURE|VIDEO ASSIST SOURCE|**your video source's name.

- Select **CAPTURE|CAPTURE SOURCE|**your camera's name.

- Or switch video sources from the Scene Settings dialog:

    a. From the Scene menu, click **SETTINGS|VIDEO**. The Camera Settings window appears.
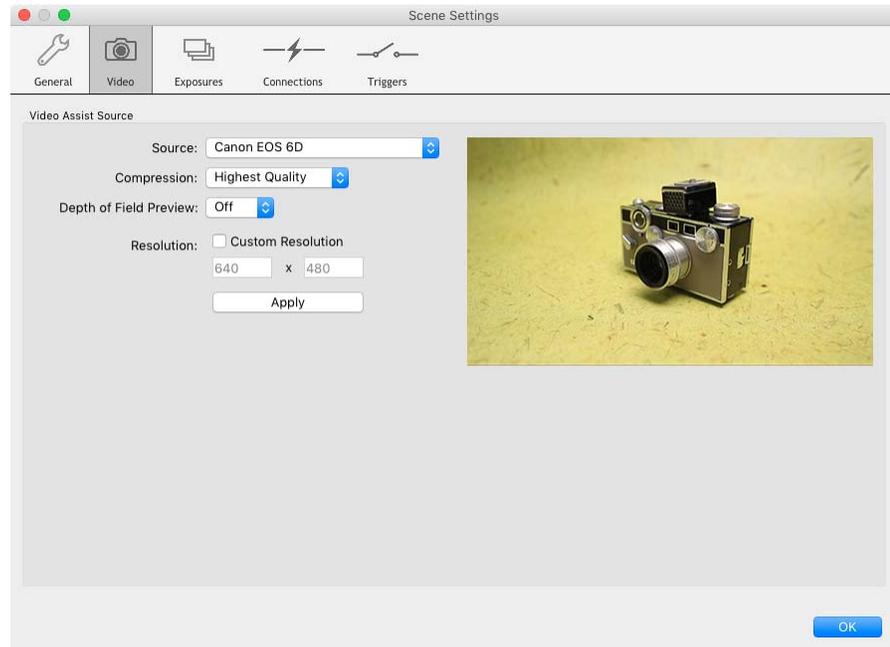
    b. Select the new video source from the **SOURCE** drop-down list. The settings for the source appear.

    c. Adjust the settings if you wish, and close video Settings.

NOTE: Dragonframe detects video sources and cameras automatically. If the source doesn't appear in the drop-down list, there is either a problem with its connection to your computer, or Dragonframe does not support it.

Chapter 4: Guide Layers

The guide layers provide quick access to your scene's composition guides, dialogue track reads, drawing layers and media layers.

They are available from within the Animation, Cinematography, DMX and Arc Motion Control workspaces.

Click the Guide Layers icon ▭ at the top right of the program window to show or hide the Guide Layers.

A. *Choose between guide layers and x-sheet. (Only in Animation Workspace.)*

B. *Lock the composition guides.*

C. *Expand or collapse the group.*

D. *Show/hide the layer.*

E. *Properties of the selected layer.*

F. *Add or remove items from the group.*

G. *Set the opacity for the layer.*
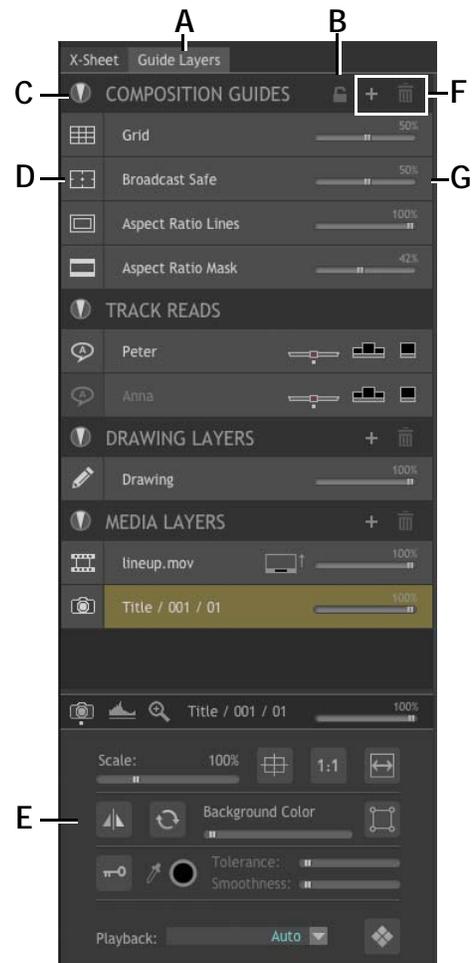
Composition Guides

Dragonframe includes various masks and overlays to aid composition.

Aspect Ratio Mask

The aspect ratio mask appears over the Live View in the Animation or Cinematography workspaces to help you see how an image might look cropped.

NOTE: The aspect ratio mask is a framing guide that does not crop your saved frames. You can choose to crop based on the aspect mask when exporting a movie or image sequence.
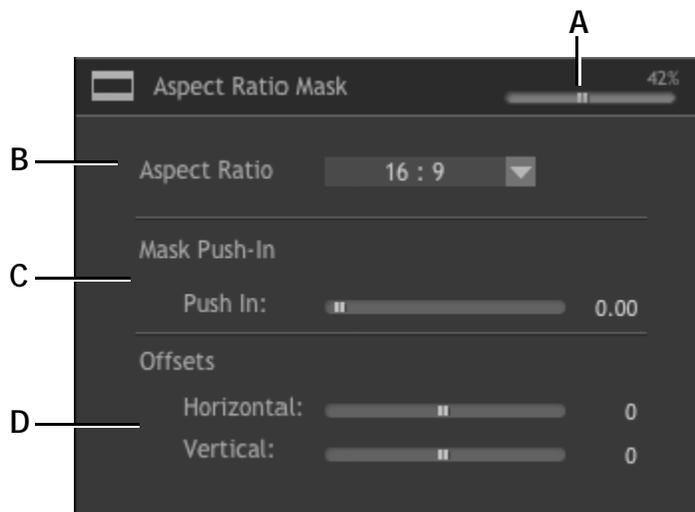
A. *Set the opacity for the mask.*

B. *Set the aspect ratio.*

C. *Choose how much to push in the mask.*

D. *Adjust how the push-in mask is aligned with the image.*

Aspect Ratio Lines

The aspect ratio lines are additional markers you can configure for your masking. You can also set up a projection-safe area, and optionally mask it.

A

Aspect Ratio Lines   100%

B — Outline   Crosshairs   Text

C — Projection Safe

Horizontal: 0.0

D —

Vertical: 0.0

E — Opacity

F — Line Color
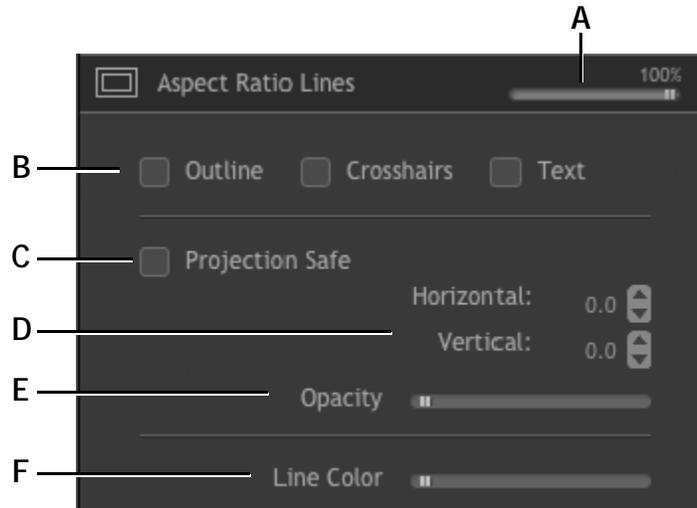
A. *Set the opacity for the lines.*

B. *Select which aspect markers show up.*

C. *Show or hide the projection-safe guide, a customizable alternative to standard broadcast-safe values.*

D. *Set the size of the projection-safe mask.*

E. *Set an opacity for masking out the entire projection-safe area.*

F. *Set the line color of the aspect lines. The slider goes from black to white. The final, rightmost position of the slider selects a full white line offset over a full black line.*

Grid

Use a grid as a composition or animation guide.

To add a grid, select **ADD GRID** from the + in the Composition Guides group header. You may have up to two grids.
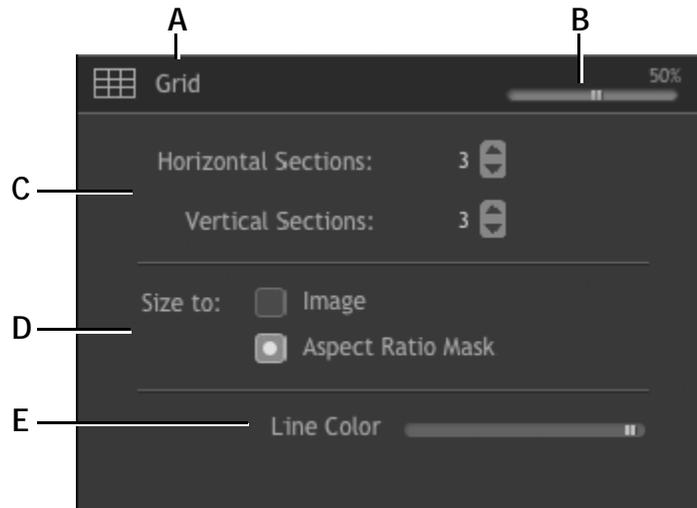
A. *The name of the grid. Double-click to edit.*

B. *Set the opacity for the grid lines.*

C. *Set the number of sections for the grid.*

D. *Size the grid to the image or aspect mask.*

E. *Set the line color of the aspect lines. The slider goes from black to white. The final, rightmost position of the slider selects a full white line offset over a full black line.*

Broadcast Safe

Use a broadcast-safe overlay as a guide for TV-safe zones. The overlays are not composited onto your final image.

To add a broadcast-safe overlay, select **ADD BROADCAST SAFE** from the + in the Composition Guides group header. You may have up to two broadcast-safe overlays.
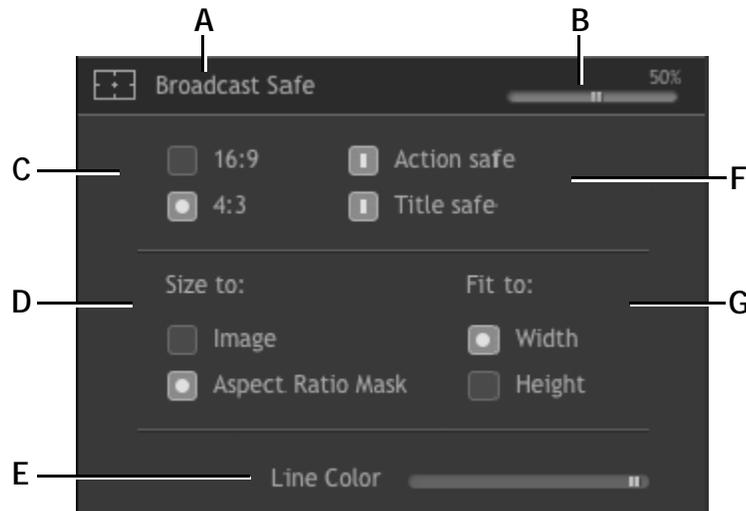
A. *The name of the broadcast safe overlay. Double-click to edit.*

B. *Set the opacity for the lines.*

C. *Select 16:9 (HD) or 4:3 (SD) masking.*

D. *Size the broadcast safe overlay to the image or aspect mask.*

E. *Set the line color of the aspect lines. The slider goes from black to white. The final, rightmost position of the slider selects a full white line offset over a full black line.*

F. *Select action safe and title safe masking lines.*

G. *Fit the mask to the width or height of the image (or aspect mask.)*

Alternate Composition Guide

Use an alternate composition guide when you have extra formats to deliver. For example, you may be creating material for both television and phone screens.

To add an alternate composition guide, select **ADD ALT. COMP GUIDE** from the + in the Composition Guides group header. You may have up to three alternate composition guides.
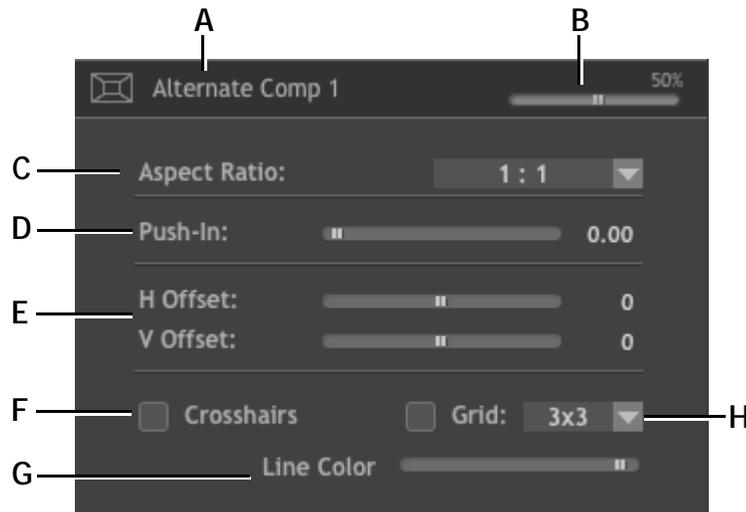
A. The name of the composition guide. Double-click to edit.

B. Set the opacity for the lines.

C. Select the aspect ratio.

D. Adjust the size of the guide.

E. Adjust horizontal and vertical offsets to move the guide around.

F. Include a crosshairs marker to indicate the center of the guide.

G. Set the line color of the aspect lines. The slider goes from black to white. The final, rightmost position of the slider selects a full white line offset over a full black line.

H. Include a grid and set the sizing.

NOTE: The alternate composition guides will be available in the movie export and image sequence export dialogs, in the aspect ratio list.

Locking Composition Guides

Click the lock icon in the Composition Guide header to lock them. This prevents a user from accidentally changing them.

Track Reads

The Track Reads group shows up if your project contains dialogue track reads. Each character in your track reading will have a corresponding layer.

The track read layer allows you to select which audio heads-up-display (HUD) type to show within the Animation View pane:

A. *Text only audio heads-up-display (HUD).*

B. *Tryptic face set plus text HUD.*

C. *Single face set plus text HUD.*

The track read properties contains additional display options:
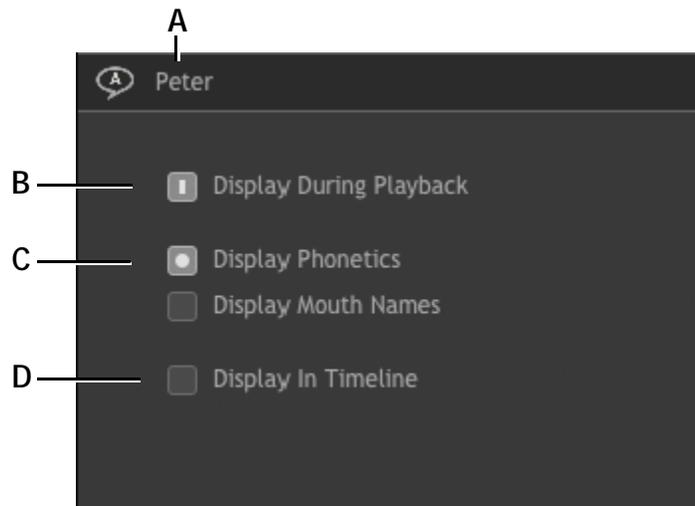
A. *The name of the character. Set in the audio work-space.*

B. *Set whether or not the track reading overlay shows during playback.*

C. *Set which items the track reading overlay displays.*

D. *Set whether the track reading should show up within the Timeline.*

Drawing Layers

Drawing layers provide a way to mark the screen to assist in animation.

To add a drawing, press the + in the Drawing Layers group header.

Drawing Layer Properties

The drawing layer properties include tools to draw freehand, lines, polylines, and shapes. It also features various hash marks, an eraser, and an increment editor that allows you to plot moves along a line.

The image below gives more information about the Drawing Layer tools.
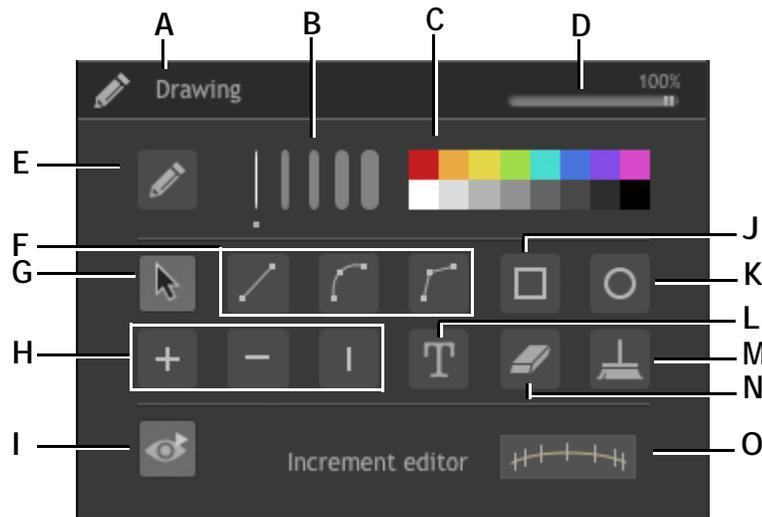
A. The name of the drawing.

B. Select the line thickness.

C. Select a line color.

D. Set the opacity for the entire drawing.

E. Draw freehand.

F. Draw a straight line, smooth polyline, or straight polyine.

G. Select an object.

H. Add a cross-hatch mark, vertical hatch mark, or horizontal hatch mark.

I. Show the drawing during playback.

J. Draw a rectangle.

K. Draw a circle.

L. Draw text.

M. Erase the entire drawing.

N. Use the eraser.

O. Open the increment editor.

NOTE: You can import any drawings you make into other scenes.

Drawing a Smooth or Straight Polyline

1. Select the smooth or straight polyline tool.

2. Click the View pane to start the polyline.

3. Move the cursor and click the View pane to add more points.

4. Double-click on the final point to end the line, or press ESC to end the line.

5. (Optional) You can add or remove points by double-clicking on the polyline.

Manipulating Objects

Once you draw a line or polygon on the View pane, you can adjust it with its handles.
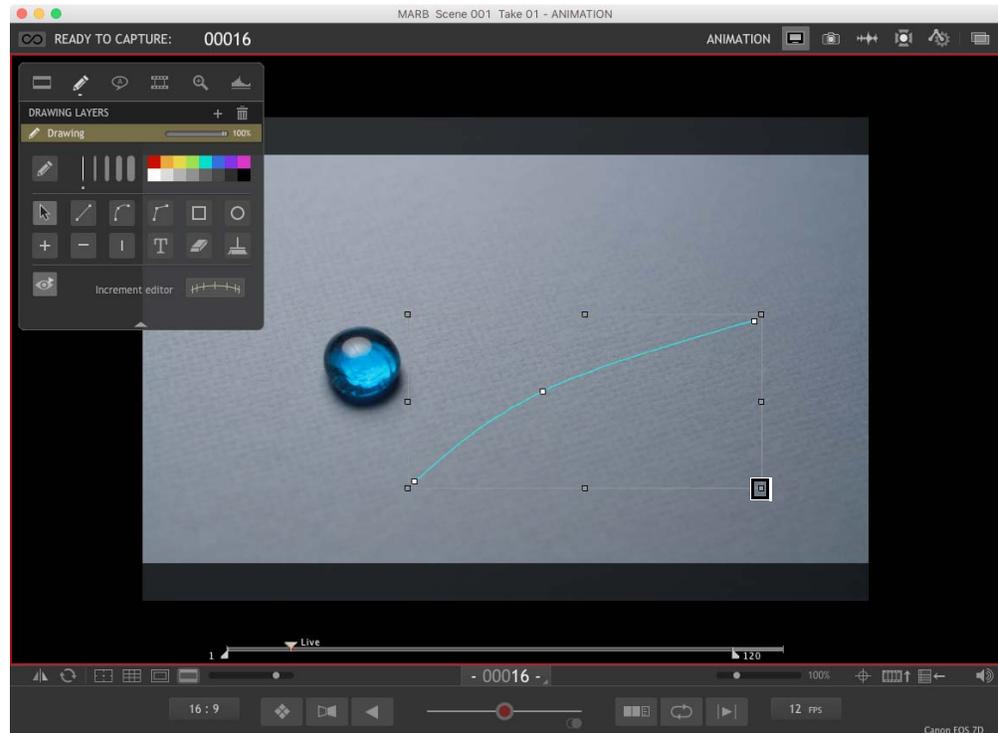
Drawing object handle.

• Move the cursor over the handle to resize the shape.

• Move the cursor close to the handle (but outside the drawing object) to rotate the shape.

Copying, Pasting and Deleting Objects

• To copy items, select one or more objects, right-click (Mac **CTRL**-click) and choose **COPY SELECTED OBJECTS**.

• To paste objects, right-click (Mac **CTRL**-click) and choose **PASTE SELECTED OBJECTS**.

• To delete objects, select one or more objects and press **DELETE**. Alternatively, you can right-click (Mac **CTRL**-click) and choose **DELETE SELECTED OBJECTS**.

Draw Tool Keyboard Shortcuts

You can draw more precisely by using some standard keyboard shortcuts.

• **ALT/OPT** constrains the drawing around a center point. Use it when drawing or resizing. For example, if you click **ALT/OPT** while draw-

ing a circle, the circle would expand from a center point, rather than from the side.

- **SHIFT** constrains the drawing to its original proportions, or constrains the drawing to standard angles. Press and hold **SHIFT** when drawing, resizing or rotating the drawing.

Using the Increment Editor

The increment editor shows movement along a path in time. It can be used to plan out simple motion paths.

To use the increment editor:

1. Draw a shape on the View pane. You can use the line, polyline, square or circle tool.

2. Select the shape.

3. Click **INCREMENT EDITOR**. The increment editor opens:

A. *Position over time graph. Double-click the line to add a handle.*

B. *Handle: Click and drag to move the graph. Double-click to remove a handle.*

C. *Increment mark selection: Choose whether the tick marks will follow the curve (default) or will always be horizontal, vertical, or diagonal.*

D. *Shape size.*

E. *Increments field: Enter the number of increments.*

F. *Reverse play.*

G. *Play.*

H. *Loop playback.*

I. *Reset: Restore position curve to original position.*

J. *Bezier curve handle: Click and drag to change the curve of the graph.*

K. *Shape selection: Choose a green circle or blue diamond to show movement.*

L. *Close: Close the dialog, saving any changes.*

4. Enter the number of one-frame increments and press **ENTER**.

The increments appear along the object.

5. (Optional) Adjust the position graph as needed.

6. (Optional) Change the type of tick mark used for the increment.

7. (Optional) Adjust the size or shape of the shape.

8. Press < or >. Dragonframe starts moving the shape along the curve.

Click **OK** when you're done viewing the movement along the curve.

Rearranging Drawing Layers

The order of the drawing layers represents the order in which they will be drawn on the screen. You can rearrange a drawing layer by clicking and dragging it to a new position.

Media Layers

The media layers represent the animation you are working on (your captured frames) and any reference videos or images that you might need while animating.

When you create a new scene, you will always have one media layer, representing the scene. It is represented by the camera icon, , and the name of your scene.

You can then import movie files, images, or other Dragonframe scenes to use as reference material while animating.

NOTE: Dragonframe does not combine your reference material with the final output of your project. It is strictly used as a guide while animating.

Loading Reference Material

Use the + in Media Layer group header to get a menu for loading reference material.

You can load the following types of reference material:

- Movie. Most standard formats including: QuickTime (mov), mp4, m4v, and Windows avi and wmv.

- Image. Most standard formats including: jpg, png, tiff, dpx.

- Image sequence.

- Dragonframe scene.

NOTE: You can also add reference layers by dragging a supported movie or image file directly into the View pane.

NOTE: You can use one of your existing frames as a reference layer by right-clicking (CTRL-clicking on Mac) it in the Timeline or Cinematography window and select **USE AS REFERENCE LAYER**.

NOTE: To move past what you've shot to play back a reference layer, move the out point on the Nav-Line to the end of the scene instead of the Live position.

The image below provides an overview of the scene properties:
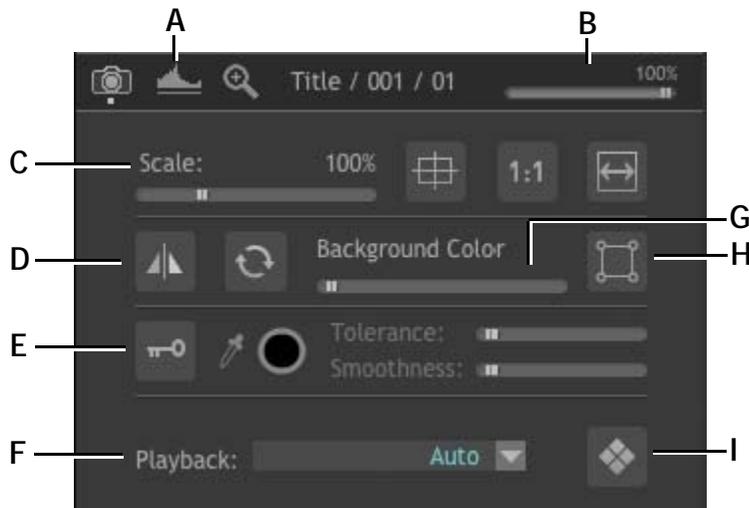
A. The scene properties has three tabs: general, video assist levels, and live view magnification.

B. Set the layer's opacity.

C. Adjust image sizing and positioning: scale, center, one-to-one and fit-to-window.

D. Adjust image orientation: flip image horizontally or vertically.

E. Chroma keying options: enable, color picker, tolerance and smoothness.

F. Set the playback exposure. Auto means whichever exposure is ready for capture.

G. Set the view pane background color: black to white.

H. Enable a garbage matte for this layer.

I. View high-res proxies or video assist images.

The image below provides an overview of the reference properties:

A   B

C

D   G

E

F
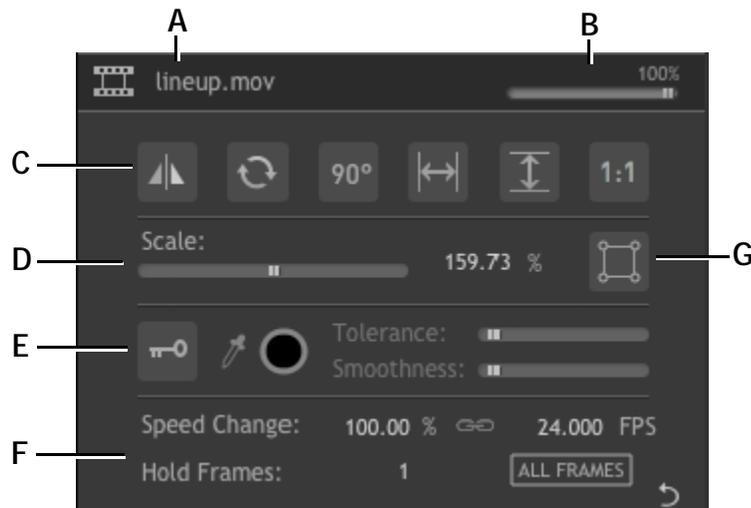
A. *Layer name. Double-click to edit.*

B. *Set the layer's opacity.*

C. *Adjust layer orientation and sizing: flip horizon-tally, flip vertically, rotate 90°, fit-to-width, fit-to-height, one-to-one.*

D. *Adjust layer size.*

E. *Chroma keying options: enable, color picker, toler-ance and smoothness.*

F. *Adjust the layer timing.*

G. *Enable a garbage matte for this layer.*

Chroma Key

Chroma keying, also referred to as "blue screen" or "green screen", is a way to mask out part of an image based on a color range.

To pull a chroma key on any media layer:

1. Select the layer in the Guide Layers.

2. In the layer properties, press ☞ to enable chroma keying.

3. Press ⚲ to active the color selection.

4. Click on the image, selecting the color you want to make disappear.

5. Adjust the Tolerance and Smoothness to specify the range of color you want to key out.

NOTE: The Chroma Key tool is only designed as an animation tool; it's not a post-production tool. Dragonframe does not export composited sequences.

Garbage Matte

The garbage matte provides a quick way to mask out part of a media layer.

To configure a garbage matte on any media layer:

1. Select the layer in the Guide Layers.

2. In the layer properties, press ⬚ to enable the garbage matte.

3. Move your mouse into the view pane and adjust the matte rectangle.

4. (Optional) Add or remove points by double-clicking on the line.

5. (Optional) Press ◩ to toggle between masking the inside or outside of the polygon.

6. (Optional) Press ↺ to reset the mask to the original size.

Reference Movie Timing

When you load a reference movie, Dragonframe must choose how to sample individual frames from it.

In the reference layer properties you will see the following timing settings:

• Speed Change

• FPS

• Hold Frames

SPEED CHANGE and **FPS** are tied together—changing one changes the other. They represent the apparent speed of your movie compared to how it was shot.

HOLD FRAMES can create a "on-twos" or "on-threes" sample of your movie based on the speed you have already set. Setting it to 2 would repeat every other frame.

By default, your movie will be set to 100% speed. This means the movie will appear to play back at the same speed it was shot.

However, if your movie was not shot at the same frame rate as your animation, some frames may be duplicated or dropped. For example, a

30fps movie will have to drop frames to render at 100% speed in a 24fps timeline.

The **ALL FRAMES** button will ensure that every frame of your source material is shown. This may result in speed change of your animation. For example, a 30fps movie would appear to play at 80% of the speed in a 24fps timeline.

Video Assist Levels

Adjust the Live View's brightness, contrast, and gamma levels with the Video Assist Levels tool in the scene properties. This basically works like the levels adjustment in Adobe Photoshop.

When working with video assist levels, keep in mind that:

- These levels only affect the video assist.
- The level changes are an effect on top of the image. The original video assist image remains unchanged.

To adjust video levels, select the scene layer, then select ⬒ from the scene properties:

A. Video histogram.

B. Set the input level range and gamma level.

C. Set the output level range.

D. Stack: Combine multiple consecutive video assist images in order to boost brightness. Useful for very

low-light situations. (Does not affect final captures).

E. Reset input/output level range and gamma.

F. Cine: Use this gamma adjustment for live view within the Cinematography workspace.

Live View Magnification

For supported cameras that have live view magnification, select up to eight "punch-in" locations to animate details more easily.

Dragonframe will capture a video assist image for each punch-in position, in addition to the full screen view. This means you will be able to step through your punched-in sequence in the same way as your normal sequence.

To set up live view magnification, select the scene layer, then select 🔍 from the scene properties:
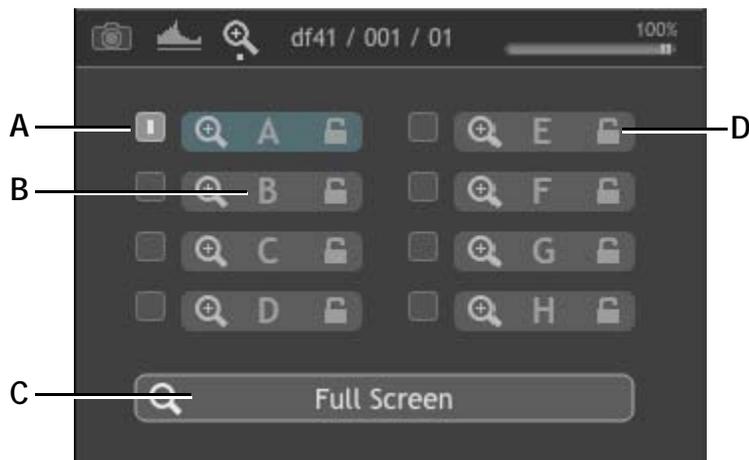
A.   *Enable live view magnification position.*   *C.*   *Switch to full screen (no magnification).*

B.   *Switch to the live view magnification position.*   *D.*   *Lock the position.*

1. Enable one or more live view magnification positions. A corresponding rectangle will appear in the View pane for each position.

2. Drag the each position to where you want to punch-in.

3. Double-click in the rectangle to preview the magnified position.

Animating With Live View Magnification

After you have set up one or more live view magnification positions, the corresponding letters A-H appear in the top left of the View pane:
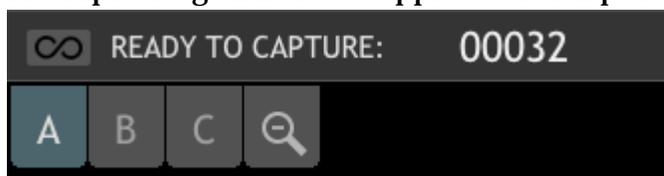
Click on the position indicator to view that magnified position.

Double-tap the **LIVE** key (**3** by default) to toggle through the live view punch-in positions and the full screen view.

NOTE: The punched-in positions are captured at the same time as the video assist image for the same frame. They are generated by the camera. Dragonframe cannot create punched-in sequences after the fact.

Reference Movie Player

When you import a movie into the Media layers, it appears as a reference (line-up) layer in your View pane, and can be blended with the scene animation.

Oftentimes, however, you may have a reference video that you do not need to blend with your animation. For example, you may have a live-action video (LAV) that you want to reference on the side while animating.

Pop out the layer into its own movie player by pressing ⬜↑ in the media layer. As soon as the layer is popped-out it no longer appears in the Timeline.

NOTE: A layer can either be popped-out into a movie player window, or used as a reference (line-up) layer in the view pane. It cannot be in both places at the same time.

The image below provides an overview of the reference movie player:

A. The reference movie.

B. Navigation line with in/out markers.

C. Timecode: movie position and length.

D. Synchronize time with animation.

E. Toggle timecode calculation between full movie and in/out markers.

F. Move to previous marker or in/out point.

G. Step backward one frame.

H. Play/pause.

I. Step forward one frame.

J. Move to next marker or in/out point.

K. Set a marker for your reference.

L. Looping.

M. Volume.

Syncing with Animation

The link icon, ⊖⊖ , syncs the reference movie with your scene's animation. By default, the first frame of your movie is synced to the first frame of your animation.

To change the synchronization point:

1. Press ⊖⊖ to unlink the movie.

2. Navigate to a target position in the movie.

3. Navigate to the corresponding frame in your animation.

4. Press ⊖⊖ again to link the movie and your animation.

When the movie is linked to the animation, the movie will keep synced when you step or play your animation.

Cropping a Reference Movie

To crop the movie, click and drag a rectangle over the area you want to keep. The movie player will shrink to show just the cropped portion.

To reset a movie to its original size, press ⟷ in the bottom-right corner of the view area of the movie.

The images below show a movie at its original size and cropped:

A. Movie at original size.	**C.** Cropped movie.
B. Cropping tool in progress.	**D.** Reset movie to original size.

Cropping a movie allows you to focus on just the area you need and save screen space for your animation.

Animation Palette

The floating tool palette in the Animation workspace provides exactly the same functionality as the Guide Layers, although in a more compact format.
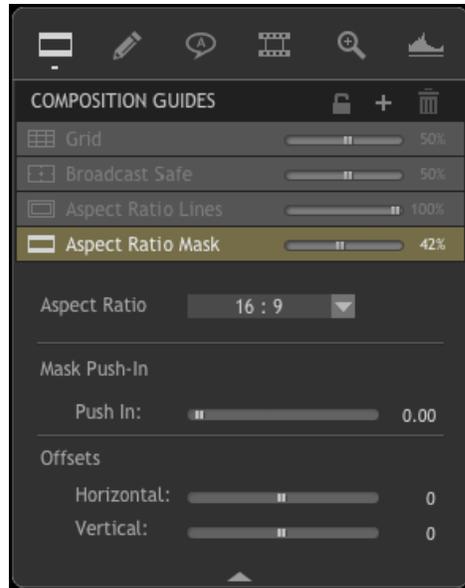
The floating tool palette will only appear if the Guide Layers are hidden *and* the mouse is in the main view pane.

Chapter 5: Cinematography Tools

Every project should begin in the Cinematography workspace, so you can ensure you have the proper composition, exposure and focus for your animation.

The Cinematography workspace gives you access to a variety of tools, from basic composition guides and exposure settings to planing multi-layered effect sequences.

NOTE: Some cameras, such as most Nikon DSLR, do not simulate the final exposure in the live view. This means your high-resolution photos may look very different from your live view. This is why it is crucial to set camera settings and take test shots before you begin animating.

Cinematography Workspace Map
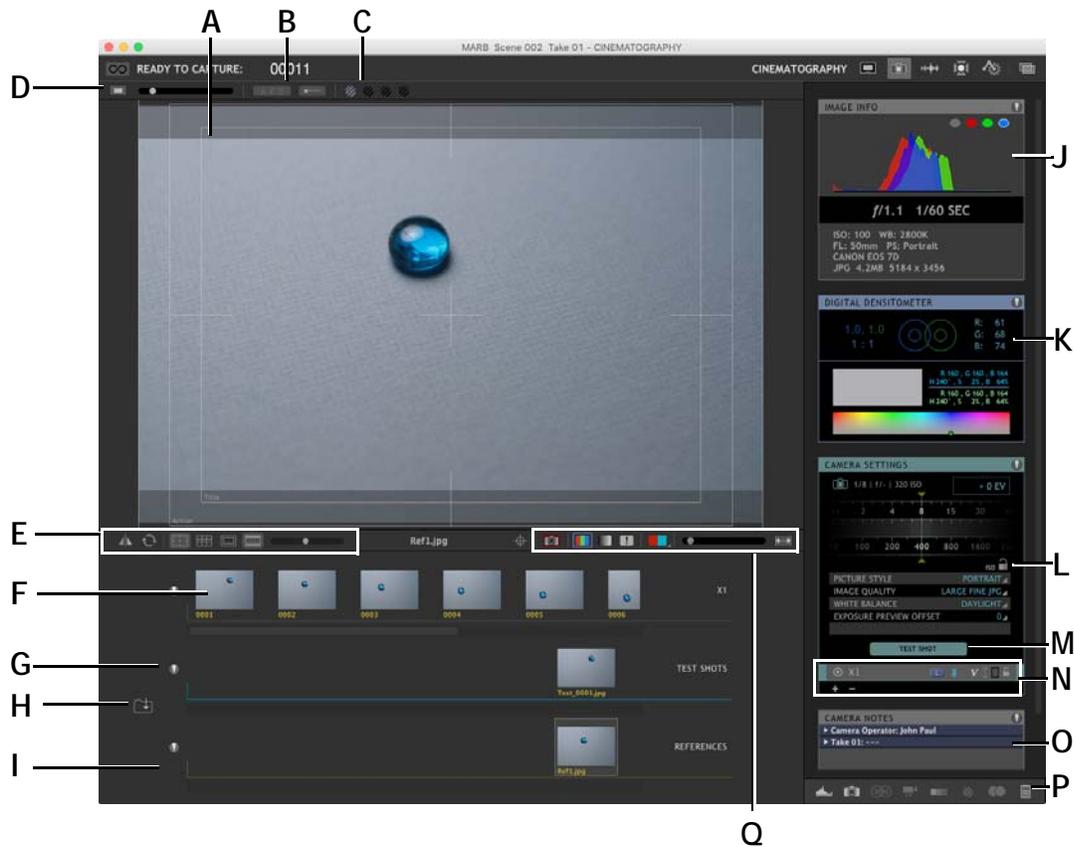
A. View Pane: View the selected frame, test shot, exposure, or the Live View.

B. A/B Image Comparison tool.

C. Color Detection tool.

D. Background Color: Adjust the background to help you see image edges.

E. Image Tools: Rotate the image and add masks or overlays to it.

F. Exposure Images Tray: View image thumbnails from the exposure, in this case, **LEFT**. Click a thumbnail to view the image in the View pane.

G. Import Test Shots: Import any image into the Test Shot Tray.

H. Test Shot Tray: View test shots. Click a thumbnail to view the image in the View pane. Or, drag and drop images from the Exposure Images tray here. 3D test shots look like stacked images.

I. Reference Shots: Import special reference shots, or save favorite Test Shots here. Drag images from Test Shots into References.

J. Image Info: View RGB values and image information.

K. Digital Densitometer: View relative light values.

L. Camera Settings: Adjust and lock camera settings.

M. Test Shot: Take mono test shots with current camera settings.

N. Exposures: Add exposures and adjust and lock camera settings for each exposure.

O. Camera Notes: Add notes about the current setup.

P. Toggle Cinematography tools: Image Info, Camera Settings, Digital Densitometer, Movie Record, Color Palettes, Color Detection, 3D Stereo Review and Camera Notes.

Q. Cinematography Viewing Modes: See the Live View, view the image in color or gray-scale, see clip info or 3D composites, and adjust image size.

Composition Guides

Dragonframe includes four different types of masks and overlays to aid composition:

- An aspect ratio mask,

- A broadcast-safe overlay,

- A grid overlay, and

- A mask push-in for the aspect ratio mask and broadcast-safe over lay.

Adjusting Composition Guides from the Guide Layers

Adjust the broadcast-safe guide, aspect ratio mask, and mask push-in all at once from the Guides Layers.

See also:

Image Controls

Working with Test Shots

As you set up the look of your shot, the Dragonframe test shot system is ideal for storing and evaluating images along the way. Here are the key features:

- Shoot and save test shots that do not interfere with your animation.

- Evaluate composition and exposure.

- Compare current images with frames from previously shot scenes or takes.

Take test shots using the **TEST SHOT** button on the bottom of the Camera Settings pane. Take 3D test shots with the **3D TEST SHOT** button in

the 3D Stereo Review pane. A thumbnail of the test shot appears in the test shot tray:

A. Test Shot Image tray. A stereo image pair appears with a stereo icon on it. *B.* References tray. *C.* Test Shot button.

References vs Test Shots

By default, any test shots you take go into the Test Shots tray. Sometimes, you may have a few special shots that you want to keep available for comparing to new shots.

The References tray is a place to put these special test shots, or other material you want to refer to while setting up your scene.

You can drag shots from Test Shots into References, or import files directly into References.

Importing Images into the Test Shot Tray

Import images into the Cinematography workspace as test shots. You might want to import images from other sources (such as .jpg or RAW), frames from other scenes, or test shots from other takes. Importing test shots gives you the ability to ensure consistency throughout your project.

To import an image into the test shots folder:

1. Click ⬇ (located on the bottom left of the Cinematography work-space). Choose **LOAD TO TEST SHOTS** or **LOAD TO REFERENCES** from the menu that appears. The Load Image dialog appears.

2. Navigate to the image you want to import and click **LOAD IMAGE INTO TEST SHOTS FOLDER.**

The new image appears as a thumbnail in the test shots tray (or references tray). Click the thumbnail to view it full-size in the View pane.

NOTE: You can import .jpg, .jpeg, .tif, .png, .gif, and any RAW format, such as .cr2, .crw, .nef, .nrw, .orf, or .dng.

Dragging and Dropping Exposures into the Test Shot Image Tray

To bring a frame from your take folder into the test shot folder, drag and drop it from the exposure tray into the test shot tray. This will make a duplicate.

Renaming or Deleting Test Shots

- To rename a test shot, right-click (Mac **CTRL**-click) on the image and select **RENAME…** The Rename Test Shot window appears. Enter the new name, then click **OK**.

- To delete a test shot, right-click (Mac **CTRL**-click) on the image and select **DELETE**. Dragonframe deletes the image.

Changing Test Shot Image Orientation

Rotate or mirror test shot images right from the image tray. Right-click (Mac **CTRL**-click) the image and select **ROTATE 180** or **MIRROR**.

Finding Test Shot Source Files

To find out where a test shot is saved, right-click (Mac **CTRL**-click) on the image, and select **REVEAL IN EXPLORER** (Mac **FINDER**). Dragonframe opens the folder where the image is saved.

Opening Test Shot Files in Another Application

You may want to work with a test shot in a graphics program in tandem with Dragonframe. Once you choose which application to use for your images, you can open them up directly from the Cinematography work-space.

To open files in another application for the first time, you must set up Preferences:

1. Click **DRAGONFRAME|PREFERENCES…** (Mac) or **FILE|PREFER-ENCES…** (Win/Linux), then click **ADVANCED**. Dragonframe opens Advanced Preferences.

2. Choose the program you want to use for each image type.
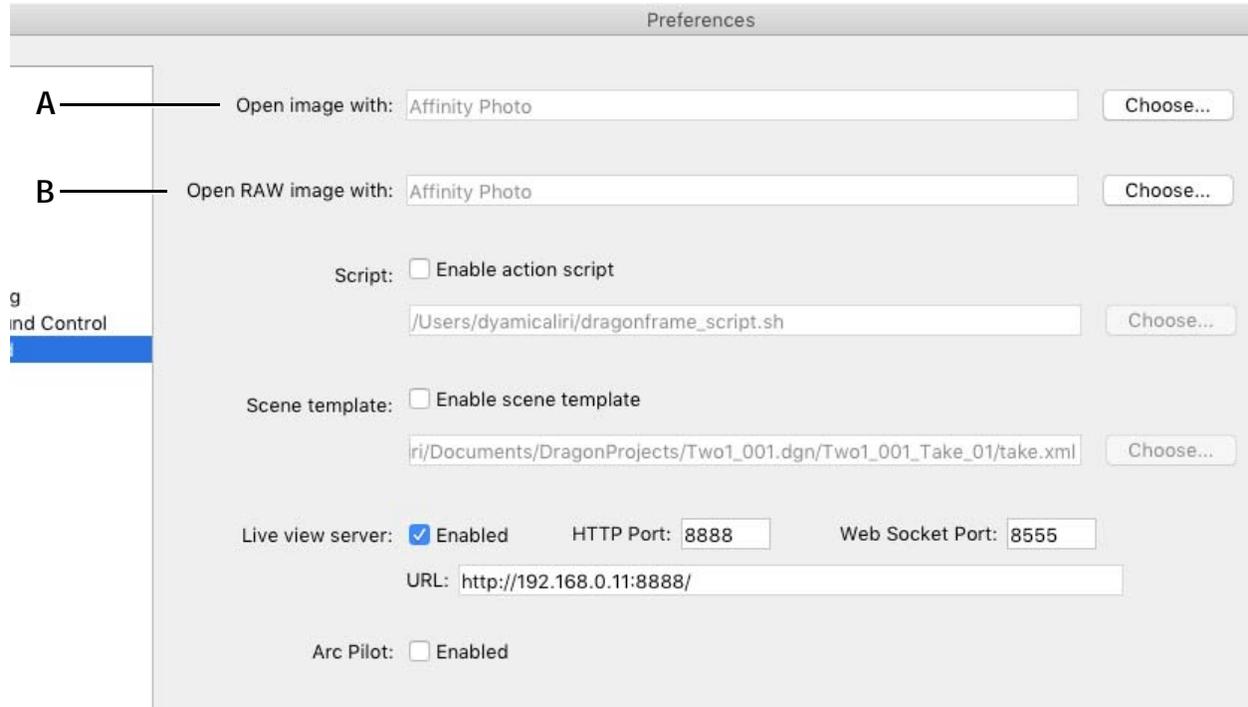
A. Click to select an application to use for all images. B. Click to select an application to use for RAW images.

3. Close Preferences to save changes.

To open an image in another application once Preferences are set:

1. Open the Cinematography workspace.

2. Select an image:

   • Double-click the image you want to work with.

   • Or, right-click (Mac **CTRL**-click) the image, and select **OPEN IN APPLICATION**.

Dragonframe opens the image in the application you set.

Viewing Modes for Captured Frames

Use the Viewing Modes in the Cinematography workspace to evaluate your images, and adjust camera settings. The table that follows gives more information about each mode.

Use this mode:	To:
	See the Live View in the View pane of the Cinematography workspace. The Live View will appear in the View pane until you: • Shoot a new frame or test shot. • Select an existing test shot or exposure thumbnail. • Activate the Animation workspace.
	View the current image in color.
	View the current image in gray-scale.
	View where you will lose (clip) color information because it exceeds the limits of the RGB color space.
	View the current image in 3D. • Click to view a color anaglyph. • Click the arrow to select the type of anaglyph or transparency to view.
	Resize the captured frame or Live View. Slide to the right for a one-to-one pixel ratio with your screen (capture frames only).
	Fit the image in the View pane.

Cinematography Image Presentation Modes

Press F to toggle through the image presentation modes. The default mode shows all of the cinematography tools.

- Press F once to hide most of the tools and increase the image viewing area.

- Press F again to remove the remaining tools and increase the image viewing area even more.

- Press **F** once more to return to the default mode.

This helps you view large images and present test shots.

Focus Check During Live View

On supported Canon, Nikon and Olympus DSLRs with Live View, Dragonframe's Cinematography workspace provides Live View magnification for focus check.

Your Live View image will have a white rectangle on it, representing the focus area. It will also have focus check buttons below the image:
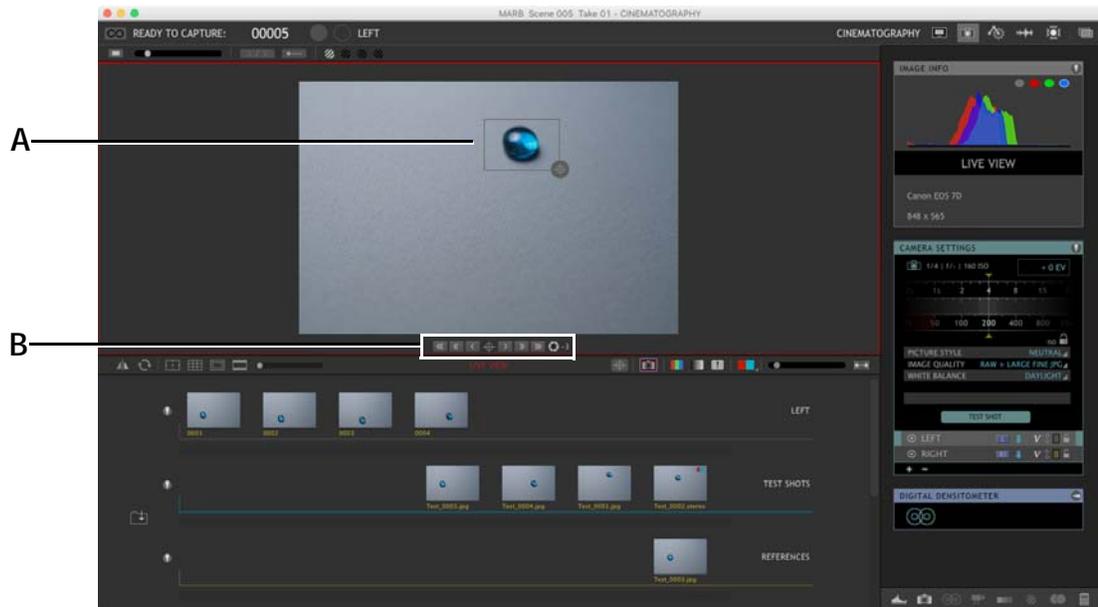
A. *Focus area.* **B.** *Focus tools.*

To work with the focus area:

1. Click and drag the focus area (A.) to any part of the image.

2. Magnify the focus area:

   - Click within the rectangle to magnify that portion of the Live View. Click anywhere within the image to revert to the full image view. Or,

   - Select and de-select ⊕ to move in or out of the magnified view.

3. If you have a digital lens, or a motorized axis configured for focus, control focus with the focus arrows.

Focus Check Exposure Offset

When focusing, it is common to open up your camera's aperture all the way. The problem is that then your exposure will get brighter (assuming your camera has live view exposure simulation.)

To offset the brightness during focus check, activate the focus exposure offset by pressing ⬤ .

Right-click (Mac **CTRL**-click) the focus exposure offset button set adjust the amount of compensation, in stops. You can choose between -**1**, -**2** or -**3** stops.

Adjusting and Locking Camera Settings

Adjust the camera settings from the Camera Settings pane in the Cine-matography workspace. Camera Settings is a visual interface that directly controls your digital still camera.
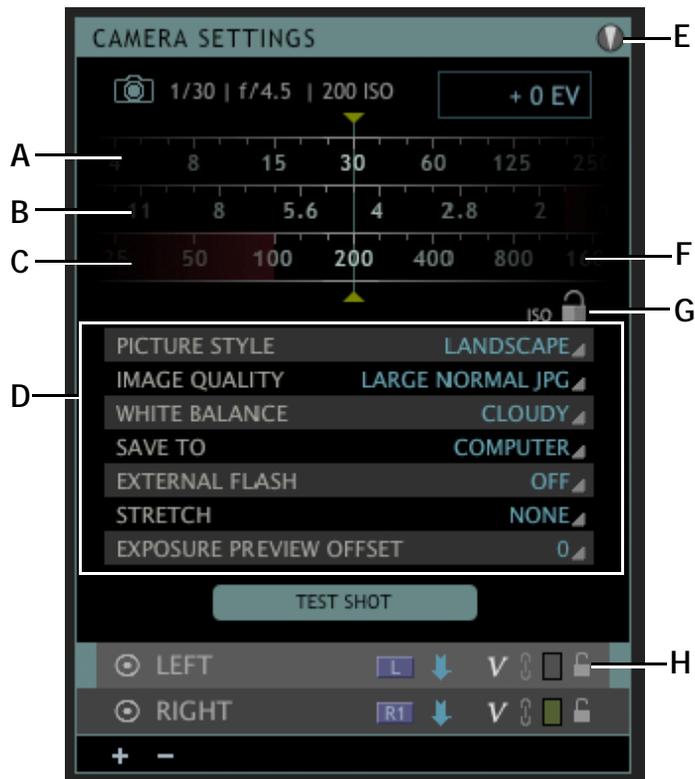
A.	*Adjust the shutter speed.*	**E.** *Minimize the Camera Settings pane.*
B.	*Adjust the aperture.*	**F.** *Adjust the ISO.*
C.	*Red, un-selectable areas indicate settings not supported by your camera.*	**G.** *Lock only the ISO setting. This applies only to the current exposure.*
D.	*Adjust other camera settings. The settings here are specific to your camera.*	**H.** *Lock all settings for the exposure.*

81

Depth of Field Slider

An additional feature of the Camera Settings pane, the DF (depth of field) slider, is available for digital lenses only. Use the DF slider to adjust depth of field while keeping the same exposure value. When you move the two rings with the slider, their values move in opposition. In other words, the shutter speed increases while the aperture decreases, and vice-versa. That way, the DF slider keeps the exposure value steady while depth of field changes.

Click the line between the aperture and shutter speed to activate the DF slider. The line changes to green circles to indicate that the two settings are moving together:
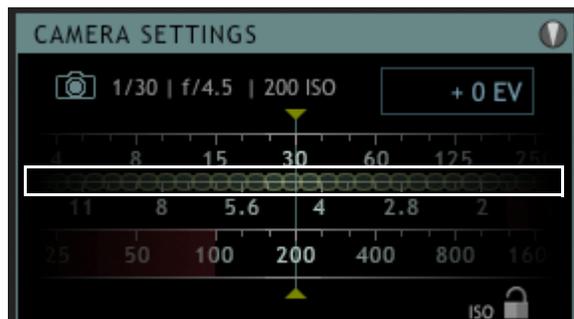
DF Slider.

Adjusting Exposure Preview Offset

Exposure preview offset is available only for Canon DSLR and Sony A7 cameras. Adjust the Live View shutter speed relative to the high-resolution capture shutter speed. It's helpful for manual aperture lenses.

Viewing Image Information

The Image Info pane in the Cinematography workspace contains a histogram of the selected image or Live View. The histogram looks at 8-bit data. For RAW files, the histogram views an 8-bit proxy.
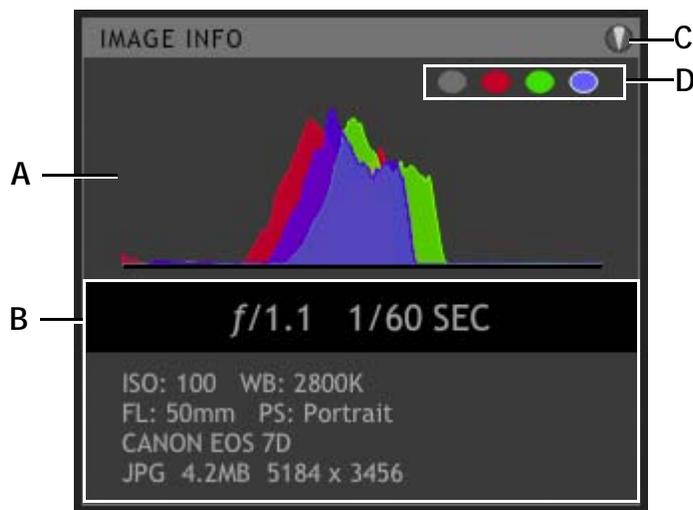
A. Histogram of the image or Live View. B. Picture Metadata: Info about the image. C. Minimize or maximize the Image Info pane. D. Channel Selection: Choose all, red, green, or blue.

Reading Pixel Values with the Digital Densitometer

You can compare the values of light and dark areas in any image using the digital densitometer. The densitometer shows you an approximate exposure value based on Standard Picture Style of several Canon EOS cameras).

The scale we use is reminiscent of the Ansel Adams zone system, but is only approximate. A change of +1 represents a 1 stop longer exposure. The densitometer also gives you a ratio of the two areas.

To compare two sample areas using the densitometer:

1. Select an image to use with the densitometer.

2. Click the Digital Densitometer to activate it:
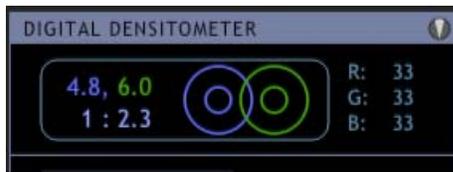
In the View pane, two sample circles appear, along with a scale of gray values.
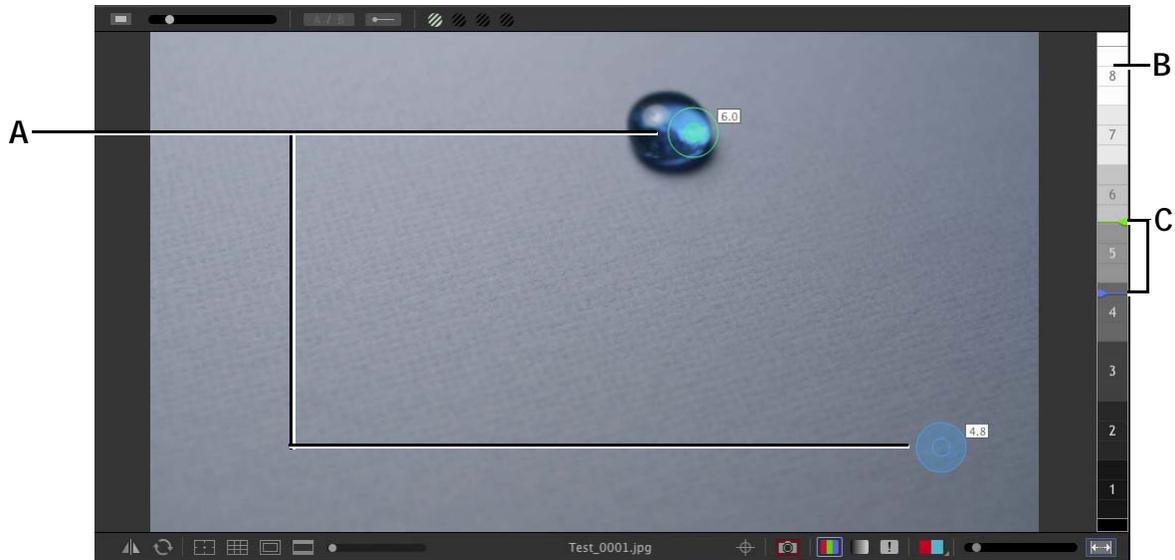
A. *Move the blue and green circles into two different areas on the test shot to compare the pixel values. Click the center of the circle to sample only the values in the center.*

B. *Densitometer exposure scale.*

C. *Two indicators appear on the scale alongside the image. The green indicator corresponds with the light value for the green circle, and the blue indicator for the blue circle.*

As you move and adjust the sampling circles, the information in the Densitometer changes:
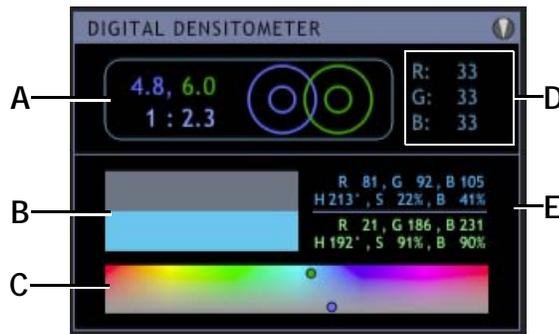
A. *Displays the ratio of the darker light value to the lighter light value.*

B. *Comparison of average color of sample circles.*

C. *Hue and Saturation comparison of sample circles.*

D. *Shows RGB values of the pixel currently at the cursor position when you place it over the image.*

E. *RGB and HSB averages for the sample circles.*

3. Adjust your lighting and camera settings as needed.

Comparing Images with the A/B Tool

Compare any two hi-res images within the Cinematography workspace using the A/B tool.

Enable the A/B tool by pressing ▭ at the top of the workspace:
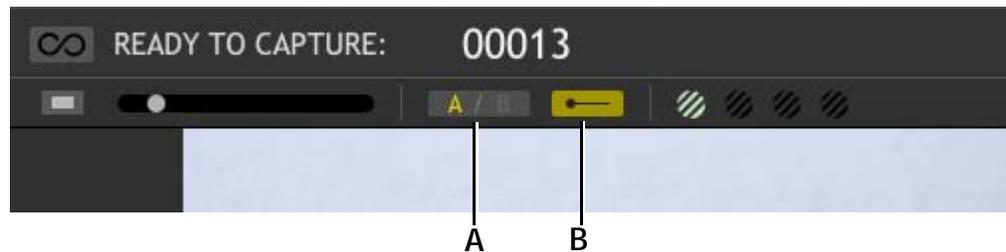
A. *Select if image in thumbnails will be next A or B .* **B.** *Enabled the A/B comparison tool.*

Once the A/B tool is enabled, it appears within the Cinematography view pane:

A. *The A/B tool. You can drag it and rotate it.* **B.** *The images that are currently A and B in the comparison.*

Compare different images by selecting them in the thumbnails area:

- If **A** is selected at the top, the next image you select will become the A (yellow) image in the comparison.

- If **B** is selected at the top, the next image you select will become the B (orange) image in the comparison.

You can grab the circle of the A/B tool and drag it to a different position.

You can adjust the angle of the comparison line by grabbing the end of the line on the tool, and rotating it:
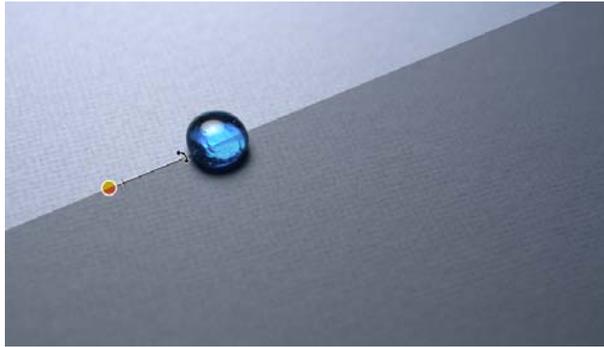
Comparison tool rotated about 40 degrees from straight.

You can add parallel strips of varying thickness by grabbing the cross-bar on the line and dragging it:
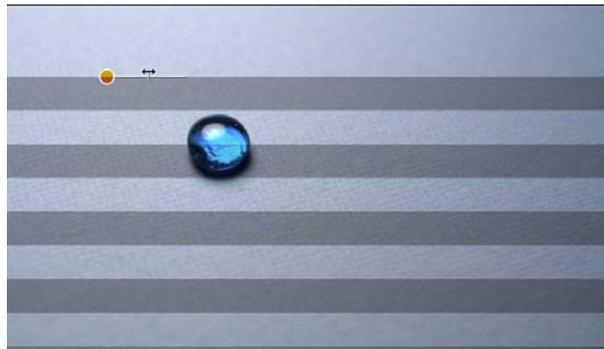
Parallel comparison strips are useful for judging 3D offsets.

Working with Color Palettes

The Color Palettes tool lets you create color swatches by sampling colors from your high-resolution images. You can also compare previous swatches to a new image.

Swatches are stored in Adobe Swatch Exchange format (.ase), so you easily use them in other programs.

Enable the color palette sampling tool:
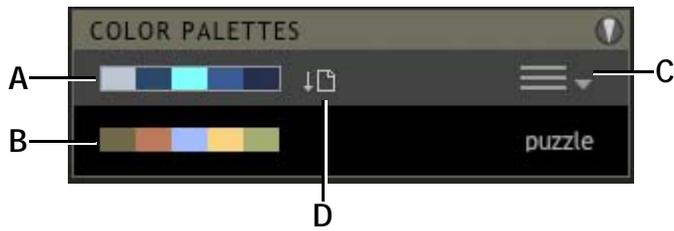
A. Activate the color sampling toolbar in the view pane.

B. Saved swatch. You may have multiple swatches saved.

C. Menu with import/export/rename/delete swatches.

D. Saves current samples to a swatch file.

Activating the color sampling toolbar opens it in the view pane:
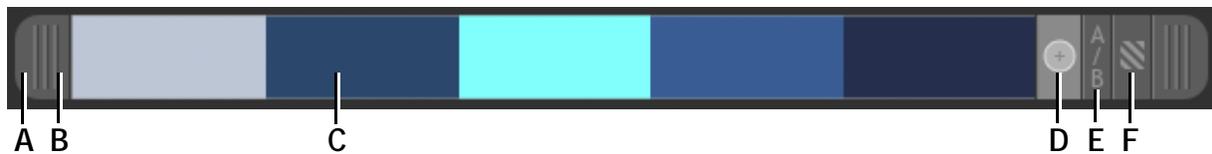
A. Resize grip for the toolbar.

B. Move grip for the toolbar.

C. Color sample. There are five color samples in a palette.

D. Activate color sample circles.

E. Enable A/B comparison of swatches.

F. Enable transparency stripes in the swatch samples, for comparing to other colors.

Once you have the color sampling toolbar in the view pane, activate the sample circles and move them to find the colors you want to sample:
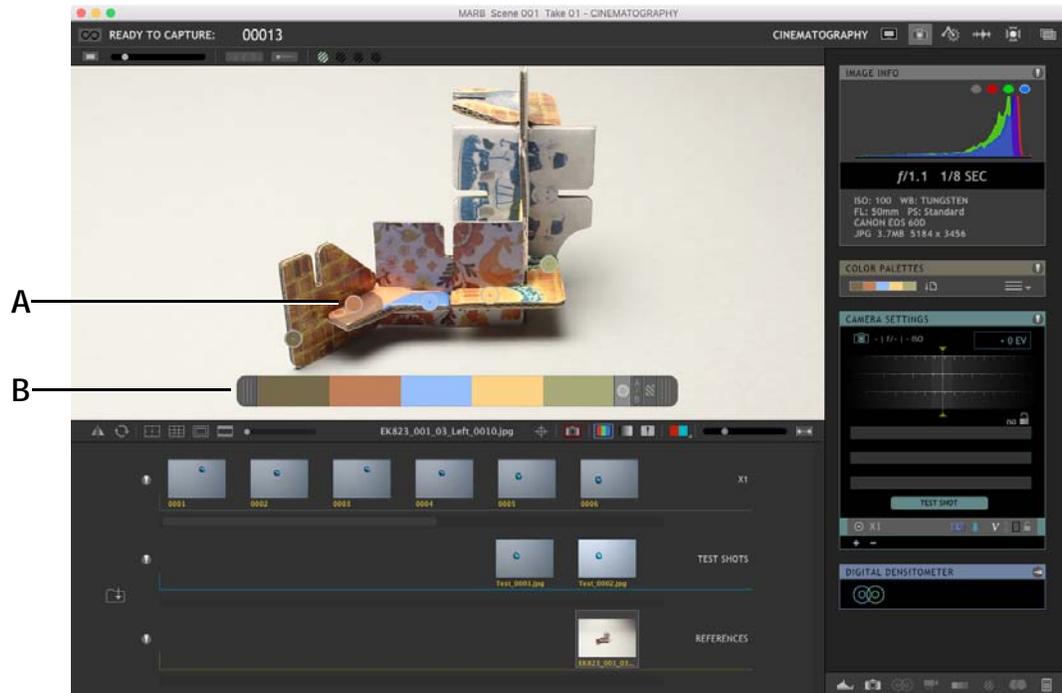
A. *Color sample circles.*   **B.** *Color sample toolbar with sample circles activated.*

Press ⤓ in the Color Palettes tool to save the swatch. You will be asked for a swatch name, and the swatch will appear within the tool.

Working with Saved Swatches

Swatches are saved with a ".ase" extension, which is the Adobe Swatch Exchange format. This means you can load swatches into Photoshop or other Adobe products.

All of the swatches for your scene are stored in a "Swatches" folder within the .dgn folder.

Use the menu in the Color Palettes tool to:

- **IMPORT SWATCH**: Load a swatch file from another Dragonframe project or other source.

- **EXPORT SWATCH**: Save the current swatch to an external location.

- **RENAME SWATCH**: Rename the current swatch.

- **DELETE SWATCH**: Delete the current swatch.

Importing Swatches from External Sources

Use the **IMPORT SWATCH** option of the Color Palettes tool to import swatches from other sources.

- **PNG IMAGES**: Many programs and websites can generate a PNG of your color palette.

- **COOLORS SCSS**: The website coolors.co generates five-color palettes. Choose **EXPORT | SCSS** and import the resulting file.

- **PALETTON SCSS**: The website paletton.com generates many palette types. Choose **TABLES / EXPORT** and select **AS CSS** or **AS SASS**. You will then need to copy the text output into a corresponding css or sass file.

Comparing Colors between Shots

The Color Detection tool is useful for comparing tone ranges between shots, to check for consistency. It can also be used to judge matte lighting for green or bluescreen effects.
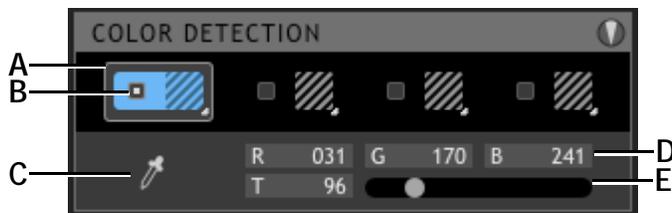
A. One of four colors you can set.	**C.** Activate the color picker.
B. Color active checkbox. Click to make the color detection show for that color.	**D.** RGB values of the selected color.
	E. Tolerance value and slider for selected color.

To choose a color:

1. Select one of the four color slots in the Color Detection tool.

2. Click on the color picker icon.

3. Click and drag over a portion of the image:
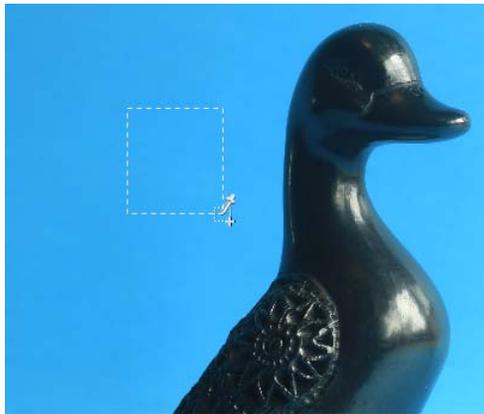
4. The image will show angled stripes over the area with matching color:
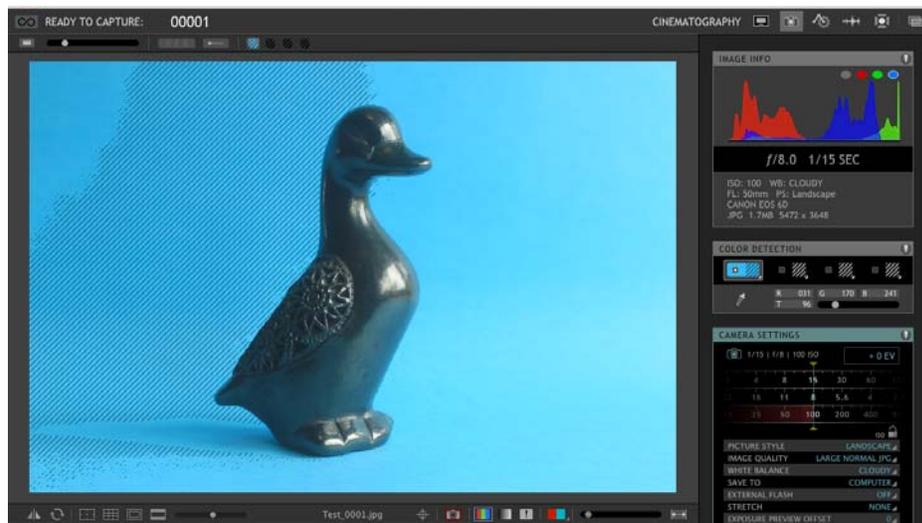
5. (Optional) Adjust the tolerance until it selects the full range of color your are hoping for:
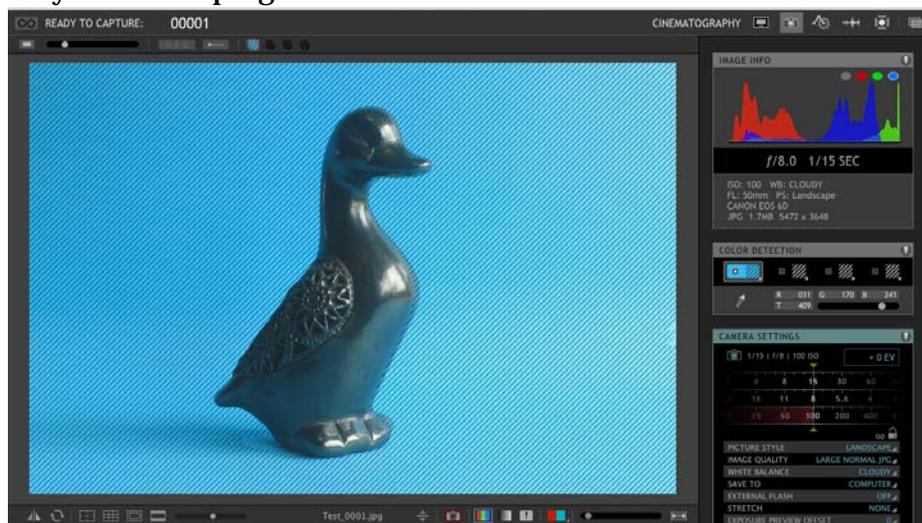
Once you have one or more colors set up, the color dots at the top of the
Cinematography workspace allow you to quickly turn on and off the
detection stripes for those colors:

Cinematography header with color detection dots highlighted.

Viewing Stereo Images

Take 3D test shots, review stereo images and refine interocular settings
from the 3D Stereo Review pane. By default, this pane is minimized;
click the arrow in the lower right corner to maximize it.

For more information, see "Reviewing 3D Images" on page 325.

Adding Camera Notes

Record important information about the scene's cinematography, for
each take and exposure. Review information from previous takes within
the same scene.
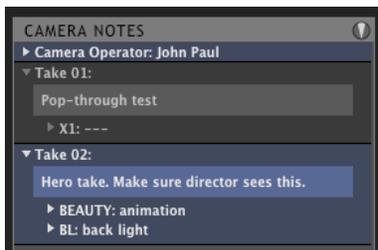
- Click the toggle button to the left of the take name to view all of the
  notes for it and its exposures.

- Click the take or exposure description (when expanded) to edit it in place. Enter any relevant notes for the take or exposure, then click in another area of the program.

Dragonframe saves all of the take and exposure descriptions, along with some other information, in the scene metadata file. This is a file you can pass on to post-production.

See "

Portrait versus Landscape Orientation

You can change the orientation of your scene to portrait from landscape. This may be useful for still photography.

Select **VIEW|ORIENTATION|PORTRAIT** to change orientation. All of the frames in your scene will change to portrait orientation.

Exporting the Cinematography View

Export the image you're looking at in the Cinematography workspace to save the specific view of the image, such as cropping, a mask push-in, or an anaglyph.

To export an image:

1. Open the Cinematography workspace.

2. Find the image you want to export in the Test Shot image tray or the Exposure Image Tray, and select it. The image appears in the View pane.

3. (Optional) Edit the image as needed, for example cropping it, viewing it as an anaglyph, or viewing clip information.

4. Right-click (Mac **CTRL**-click) on the View pane and select **EXPORT STILL IMAGE…** The Export Still Image dialog opens.
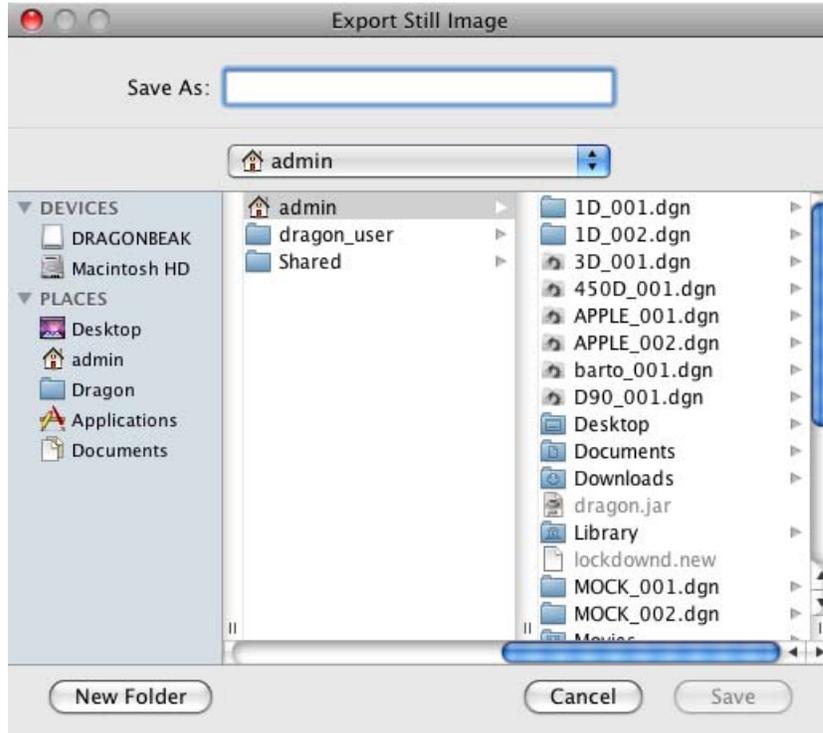
5. Name the file, select where to save it, and click **SAVE**. Dragonframe exports the image.

Multiple Passes and Exposures

Add or edit multiple passes, called "exposures" in Dragonframe, from the Camera Settings pane in the Cinematography workspace. Here, you can associate camera settings with each exposure.

If you're filming multiple passes for your scene (for example, one pass with a front light and the other with a backlight), you can have camera settings associated with each pass. For example, if you want to have the first exposure with a higher shutter speed than the second, set the desired shutter speed for each pass. Then, as you're filming, Dragonframe will automatically adjust the shutter speed as it takes each exposure.

Once you create your exposure, you can view it in the X-Sheet. There you can see how the exposures relate to the other elements of your scene, such as phonetic symbols or waveforms.

NOTE: If you want to create a second pass of an entire sequence of frames, (for example, a clean pass to create mattes) create a new take.

Adding Multiple Exposures

To create multiple exposures with customized camera settings:

1. Set up your first exposure and lock it from the Camera Settings pane.

2. (Optional) Lock the ISO settings. Doing so locks ISO for the exposure. That way, you can adjust other settings without worrying about accidentally changing ISO.

3. Click **+ (ADD EXPOSURE)**.

Add exposure (+) button.

Dragonframe adds a new exposure. By default, it will be named **x2**:

A. *Enable or disable the exposure.*	**E.** *Enable or disable the video assist capture.*
B. *Exposure name. Double-click to edit.*	**F.** *Link the exposure to other exposures.*
C. *3D slider position. Toggle through 3D slider positions for the exposure.*	**G.** *Change the color associated with the exposure.*
	H. *Lock or unlock all settings for the exposure.*
D. *Auto-capture arrow. Enable or disable auto-capture.*	**I.** *Add an exposure.*
	J. *Delete the selected exposure.*

4. Adjust any camera settings for the new exposure that you want to differ from the default exposure.

5. (Optional) Click 🔓 (H.) to lock the camera settings for the new exposure.

6. (Optional) Click the 3D slider icon (C.) to toggle through available slider positions for the exposure.

7. (Optional) De-select the blue auto-capture arrow (D.) for Dragonframe to stop capturing the exposure automatically, without you having to press **SHOOT**.

8. (Optional) Click the link (F.) to link the exposure to other exposures. When you change settings in one exposure, the settings for all exposures linked to it will change, too.

9. (Optional) Click **v** (E.) to have Dragonframe save the video assist frames from that exposure.

10. (Optional) Click the rectangle (G.) to change the exposure's cue color. The color will appear at the top of the Animation workspace when it's time to capture the exposure.

11. (Optional) Create any additional exposures (I.), adjusting the settings for each one.

NOTE: When you create multiple exposures, Dragonframe copies each new exposure's settings from the currently selected exposure.

Once you create multiple exposures, you will need to adjust the size of the View pane to see all exposure image trays in the Cinematography workspace:
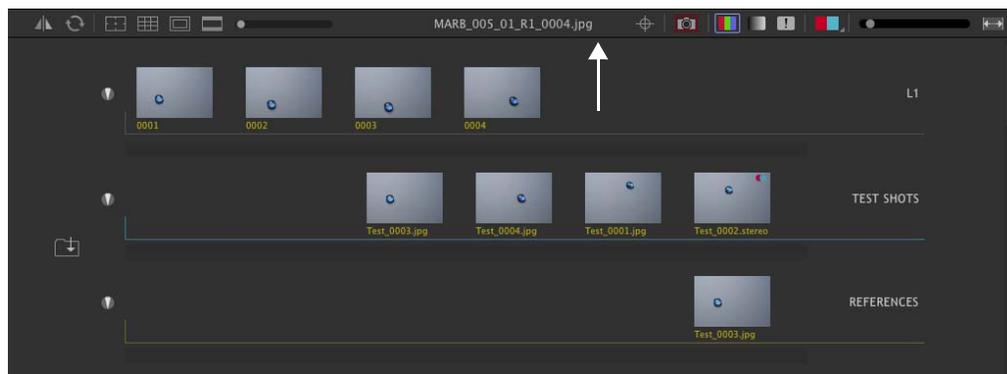
Dragging the edge of the Exposure Image tray to view multiple exposures.

Linking Exposures

You can group exposures, or "link" them. If you change the settings in one exposure, the settings for any exposures linked to it will change too. For example, when setting up stereo pairs, you could easily keep the settings the same for the left and right exposures.

To link exposures together:

1. Create the exposures you need:
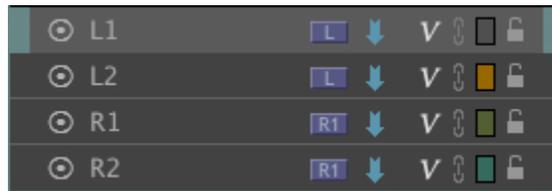
2. Click ⬆ next to the exposure you want to link. A drop-down menu appears:
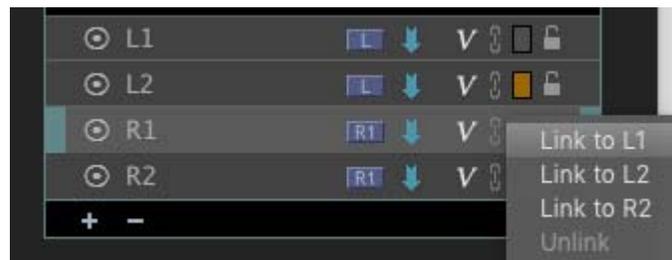
3. Select the exposure to link to. Dragonframe links them, and turns the link icon blue:
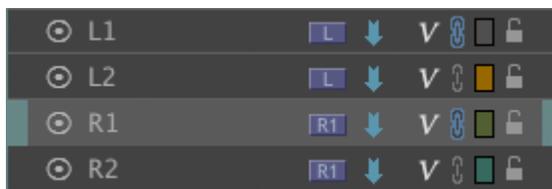
Any other linked groups you make will have a unique link color, so it's easy to tell different groups apart.

4. Adjust camera settings for one of the exposures you linked. Dragonframe will automatically adjust the settings in the exposures linked to it.

NOTE: Dragonframe will only copy *camera settings*—those settings found on your camera (such as aperture, shutter speed, white balance, etc). It will not copy exposure settings, such 3D slider positions or auto-capture settings.

Manual vs. Automatic Captures

When you create multiple exposures, Dragonframe will capture each one automatically by default. In other words, you'll press **SHOOT** only once to capture both your exposures. Dragonframe will capture the first

exposure, adjust camera settings, then capture the second exposure without you having to press any more keys.

This also makes it possible for you to create multiple exposures for time-lapse, or when shooting left and right views for 3D stereo.

There are other ways to set auto-capture for your shoot:

- Keep the second exposure's capture manual, so that you have time to animate in between exposures.

- Add a capture delay before capturing a second exposure to give you a few seconds to change lighting, for example.

Automatic capture is controlled by the blue arrows in the Camera Settings pane:

Auto-capture arrows.

By default, all exposures have auto-capture turned on. Click the arrow to turn auto-capture off.

When choosing between a manual or an automatic capture, keep these points in mind:

- De-selecting auto-capture for the default exposure (here, **x1**) won't change the way single shots work. However, if you deselect auto-capture, you will not be able to shoot a time-lapse sequence or shoot multiple frames with one keystroke.

- If auto-capture is off for additional exposures (here, **x2**), you must press **SHOOT** again to capture the exposure. You may want to do this if you need to animate between exposure 1 and exposure 2. However, if you keep auto-capture off for additional exposures, you will not be able to shoot a time-lapse sequence or shoot multiple frames with one keystroke.

Besides choosing to automate captures, you can also add a capture delay of up to one minute before Dragonframe auto-captures an exposure. To add a capture delay:

1. Right-click (Mac **CTRL**-click) on the arrow of the desired exposure. A drop-down list appears.

2. Select a delay. Dragonframe displays it in the Camera Settings pane:
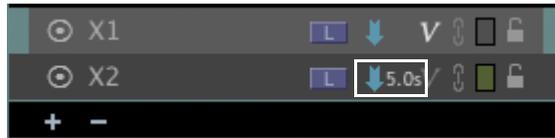
Exposure with a delay of five seconds.

Deleting Multiple Exposures

To delete an exposure:

1. Select the exposure you want to delete.

2. Click - (delete). Dragonframe deletes the selected exposure.

NOTE: The exposure you select cannot have any frames in it. If it has frames in it, you must disable it to stop shooting the exposure.

Disabling an Exposure

To disable an exposure, de-select the radio buttons in the Camera Settings pane:

Both exposures enabled.

NOTE: You can't disable the default exposure for the scene.

Viewing Multiple Exposures in the X-Sheet

Any exposures you create appear in the X-Sheet, alongside all the information about your scene:

*X-Sheet. Each exposure gets its own column. **x** marks already-captured frames. **c** marks the exposure to be captured next.*

Movie Recording

Dragonframe can capture movies on some supported cameras. This includes most supported Canon EOS, Nikon DSLR, Olympus (USB) and Sony Alpha (USB) cameras.

NOTE: The video you record will not become a frame sequence within your project.

Open the Movie Recording tool with the icon in the bottom right of the Cinematography workspace:

A — MOVIE RECORD
B — Canon EOS 6D
C — SHUTTER SPEED   1/30
ISO   100
PICTURE STYLE   STANDARD
WHITE BALANCE   DAYLIGHT
FORMAT   640X480 @ 29.97 IPB
RECORD TO   COMPUTER + CARD
AUDIO   OFF
D —
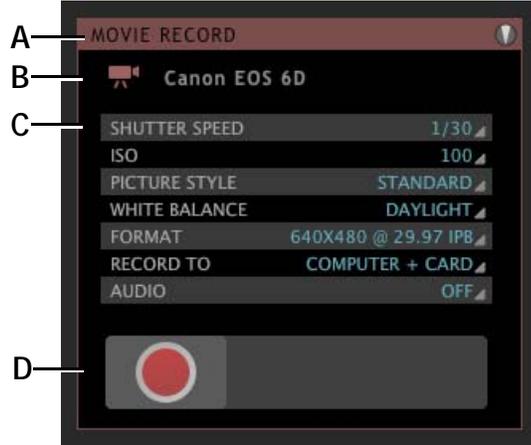
A. *Movie record tool header.*

B. *Camera name.*

C. *Camera settings for movie record.*

D. *Start/stop recording.*

Press ⬤ to start and stop recording. After the movie finishes recording, it will download into the Tests Shots tray (if you chose to download it).

Note that when the Movie Record tool is active, the Camera Settings tool is disabled. This is because the program stores different camera settings just for movie mode on the camera.

Playing Movies from Test Shots Tray

Click the movie to open it within the Cinematography view pane. The movie controls appear at the bottom of the view pane:

00043   A   B   C D E F G

A. *Frame counter.*

B. *Timeline. Drag the yellow bar to scrub through the movie.*

C. *Step backward one frame. (Keyboard: <)*

D. *Play/stop. (Keyboard: SPACEBAR)*

E. *Step forward one frame. (Keyboard: >)*

F. *Loop playback.*

G. *Adjust movie volume.*

Alternatively, you can open the movie the default system movie player by double-clicking it.

TIP: Use the contextual menu to use the video as a reference layer.

Tricks of the Trade

A few tricks can help you light your shot perfectly, while still letting you to use a work light or have your computer screen close to your set.

Black-Out Mode

If the light from your computer screen is affecting the lighting for your shot, you can have Dragonframe black out the screen during a capture. To black out the screen:

1. Press **DRAGONFRAME|PREFERENCES** (Mac) or **FILE|PREFERENCES** (Win/Linux) to open Preferences.

2. Click **CAPTURE**.

Check the box labeled **BLACK OUT SCREEN DURING CAPTURE**. When the box is checked, the screen will momentarily go black when you capture a frame.

Adding a Capture Delay

The capture delay gives you time before your shot to turn off a bash light. It adds a delay between the video assist capture and the high-res capture. That way, the work light can illuminate your video assist frame without interfering with the high-res capture.

1. Click **DRAGONFRAME|PREFERENCES** (Mac) or **FILE|PREFERENCES** (Win/Linux) to open Preferences.

2. Click **CAPTURE**.

3. Select the number of seconds you want to delay each high-res shot when you press **ENTER**.

NOTE: Automate a bash light with the DDMX-512 and a dimmer pack, or using the DDMX-512's output terminals. See "Automating a Bash Light" on page 229. or "Using an External Relay Switch or a Logic Output to Automate a Bash Light" on page 245.

NOTE: If you want to add a capture delay before *both* the video assist and high-res captures, add a capture delay to your exposure. For example, you might use this if you want to quickly change lighting in between two exposures, but you don't want to press **SHOOT** for each exposure. See "Manual vs. Automatic Captures" on page 97.

Keyboard Shortcuts and Contextual Menus for the Cinematography Workspace

Use the keyboard shortcuts and contextual menus in this section to access many of the workspace's tools.

Keyboard Shortcuts for the Cinematography Workspace

Press:	To	See this section for more information:
F	Toggle the view of the workspace between normal, expanded, and full.	"Cinematography Image Presentation Modes" on page 79.
UP	Move up one exposure.	n/a
DOWN	Move down one exposure.	n/a
Step keys	Step through the frames.	n/a
CTRL + Step keys	Step back or forward 12 frames.	n/a
' (single quote)	Shoot test shot.	"Working with Test Shots" on page 75.
3	Switch to the Live View in the Cinematography workspace.	"X-Sheet Overview" on page 17.

Cinematography View Pane Contextual Menus

Select:	To:	See this section for more information:
EXPORT STILL IMAGE	Export the image you're looking at in the Cinematography workspace.	"Viewing Modes for Captured Frames" on page 79.

Exposure and Test Shot Image Tray Contextual Menus

Select:	To:	See this section for more information:
OPEN RAW IN APPLICATION	Open the RAW image in the photo-editing software you chose in Advanced Preferences.	"Advanced Preferences" on page 360.
OPEN IN APPLICATION	Open the image in the photo-editing software you chose in Advanced Preferences.	"Advanced Preferences" on page 360.

Select:	To:	See this section for more information:
REVEAL IN FINDER	Show where the image is stored on your hard drive.	"Finding Your Source Files" on page 335.
USE AS REFERENCE LAYER	Use the selected image as a reference layer.	"Loading Reference Material" on page 63.

Chapter 6: Animation Tools

The Animation workspace is the primary interface of Dragonframe. It is where you will animate your scene.

This section describes the Animation workspace and many of the useful tools Dragonframe provides to assist with your animation.

NOTE: Although you animate in the Animation workspace, you must make sure your high-res exposures are correct in the Cinematography workspace before you begin. Otherwise you run the risk of capturing a scene that is over or under-exposed.

Animation Workspace Map
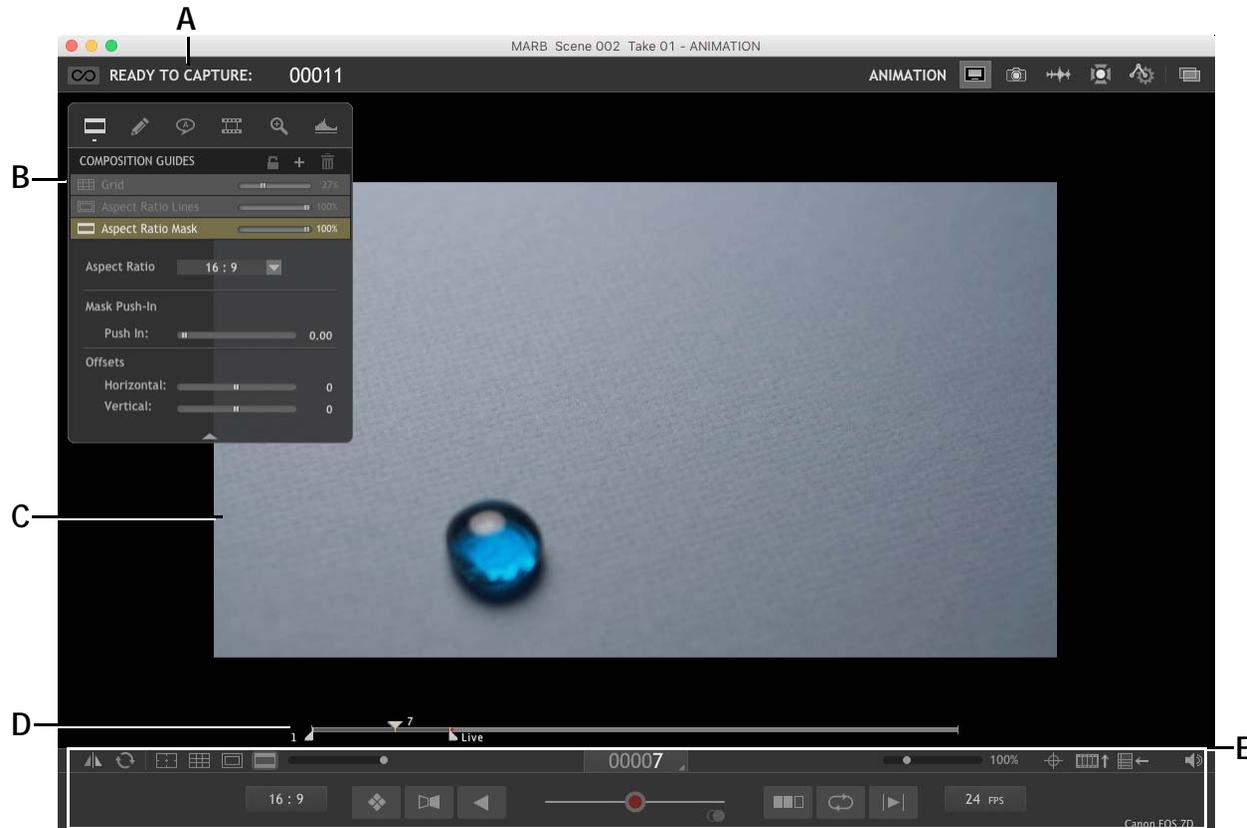
A. *Capture Counter: Shows which full-res frame you're ready to capture.*

B. *Animation Palette: Shows tools, including Composition Guides, Drawings, Track Reads and Media Layers.*

C. *View Pane: Shows a video assist or a high-res preview still. A red line around the frame (shown) indicates that you're looking at the Live View. A blue line means Live View has stopped.*

D. *Nav-Line: See a visual representation of your frame sequence. Use it to select frames for playback, to edit frames, or work with very large scenes.*

E. *Animation Tools: Work with the View pane image and playback.*

Frame Counters Overview

- The capture counter tells you which high-res frame you're about to capture.
- The frame counter tells you which frame you're currently viewing in the Animation workspace.

A

B
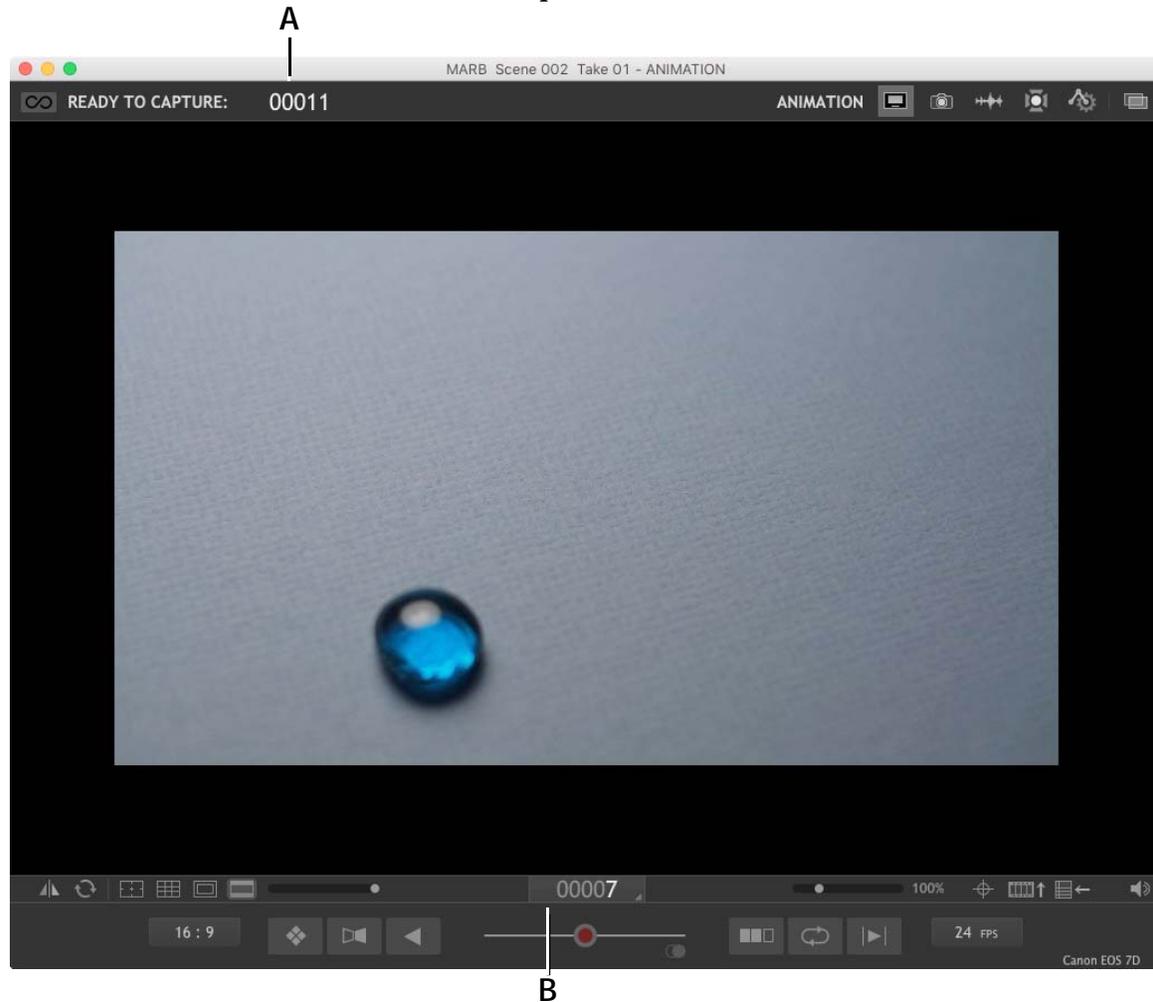
A. The capture counter: Tells you which high-res frame you're about to capture.
B. The frame counter: Tells you which frame you're currently viewing in the Animation work-space.

As you use Dragonframe, other features will correspond to either the capture source or the video assist source. Keeping the two straight will help you use Dragonframe.

The Capture Counter

The counter at the top of the workspace is the capture counter (A.). It shows the frame you are about to capture. The frame in this counter will match the information in the X-Sheet. For example, if the X-Sheet

shows that you've captured 20 full-res stills, the capture counter will read 21.

The Frame Counter

The frame counter (B.) displays the frame number for the image currently in the Animation workspace. As you step though or play your animation, this counter tracks with the corresponding images.

When you step forward onto the Live View frame, the frame counter will display the frame number for this yet-to-be-captured image. At that point, the frame counter's number will match the number in the capture counter.

When you're viewing the Live View, white dashes appear on either side of the frame number.

When you're viewing a frame you've already captured, the number is white.

When you've moved past the Live View, the number is gray. The options for stepping past the Live View are in Preferences.

Click the frame counter to open its drop-down menu:

From there change how Dragonframe displays the frame numbers.

Animation Tools Overview

The tools at the bottom of the Animation workspace help you animate, control your image, and manage playback.

NOTE: Many of the most frequently used Animation tools (such as loop, onion-skin, and end in black) are keys on the Dragonframe Controller that came with your software.

The map that follows gives a visual overview of all the tools.

Animation Tools Map
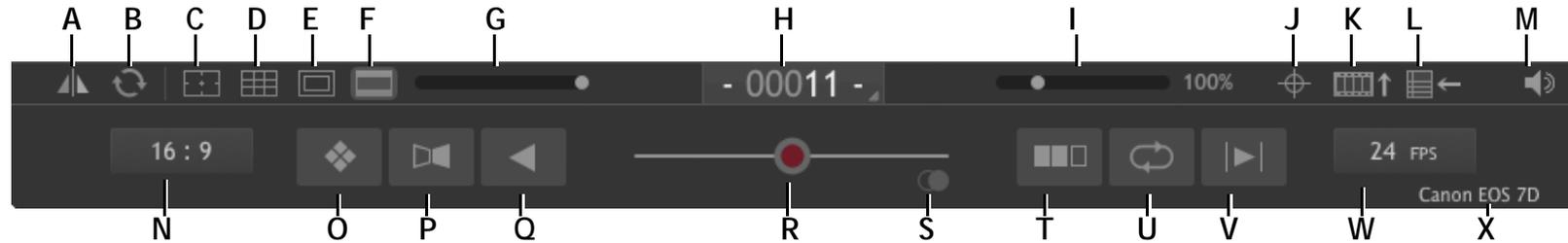
A. Mirror: Mirrors image.

B. Rotate: Flips image 180 degrees.

C. Broadcast-safe: Toggles a TV-safe overlay.

D. Grid: Overlays a grid on the View pane.

E. Aspect Ratio Lines: Toggles the aspect ratio lines on/off.

F. Aspect Ratio Mask: Toggles the aspect ratio mask on/off.

G. Aspect Ratio Mask Opacity: Adjust the opacity of the aspect ratio mask.

H. Frame Counter: Shows the live feed (dashes) or a previous frame (number only).

I. View Scale: Adjusts the animation view scale.

J. Focus Check: Enable the focus check tool (supported cameras).

K. Timeline: Open the timeline for frame editing.

L. X-Sheet Button: Opens the X-Sheet and Guide Layers alongside the Animation workspace.

M. Volume: Adjusts audio track volume while animating.

N. Aspect Ratio: Sets the aspect ratio mask.

O. High-Res Preview: Use high-res stills for preview.

P. Auto-Toggle: Continuously toggles the Live View with the selected frame.

Q. Reverse: Reverses play.

R. Onionskin Opacity Slider: Adjusts onionskin opacity.
Center: Clean Live View.
Right: Live View with last frame.
Left: Live View with any frame.

S. Onionskin Settings: Open additional onionskin settings.

T. Black: Adds black frames to the end of playback.

U. Loop: Loops playback. Press ALT LOOP to turn on ping-pong playback, moving forward, then reversing through the frame sequence.

V. Short Play: Includes only the last twelve frames for playback, or the number you choose.

W. Playback Speed.

X. Camera: Names the connected camera.

Animation Palette Overview

The Animation palette (or "Floating Tool Palette") appears any time you move the mouse over the View pane, and disappears again when you move it over the rest of your computer screen.

NOTE: If the Guide Layers are visible in the Animation workspace, the floating tool palette will not display. You can only view one of those at a time.

The animation palette contains these tools:

- Composition Guides,
- Track Reads,
- Drawing Layers,
- Media Layers,
- Video Assist Levels.

Click and drag the title bar to move the Animation palette anywhere in the View pane.

See also:
"Guide Layers" on page 53.
"Animation Palette" on page 72.

Keypad Controls

The keypad controls on the Dragonframe keypad keep the most important animation tools at your fingertips.

If you do not have the Dragonframe keypad, you can set up keyboard shortcuts in Preferences to suit your needs.

Step, Play and Shoot Keys

With only the **STEP**, **PLAY** and **SHOOT** keys, you could animate a scene.
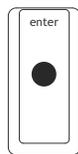
Press **SHOOT** to capture a frame.

Use the **STEP** keys to move through your frames.

Press **PLAY** to play back the frames you've shot.

Stepping with Holds

If some of your frames are "holds", you can vary how you step through frames.

If shoot multiple as virtual holds is not checked:

To:	Press:
Step through each frame including holds,	The **STEP** keys.
Step through frames without including holds,	**COMMAND+STEP** (Mac). **CTRL+STEP** (Win/Linux).

If shoot multiple as virtual holds is checked:

To:	Press:
Step through frames without including holds,	The **STEP** keys.
Step through each frame including holds,	**COMMAND+STEP** (Mac). **CTRL+STEP** (Win/Linux).

Live Key

Press **LIVE** to go to the Live View frame.

Live Toggle Key

Press **LIVE TOGGLE** to toggle between live and captured frames; release the button to move back.

Auto-Toggle Key

[key: 4 ▷◁] Press **AUTO-TOGGLE** to turn auto-toggle on and off.

To:	Press:
Change the toggling speed,	• **AUTO-TOGGLE**, then the **STEP** keys. • Click **PLAYBACK|TOGGLE [SPEED]**
Auto-toggle between the last frame shot and the Live View,	Press **LIVE**, then **AUTO-TOGGLE**.
Auto-toggle between a frame you choose and the Live View,	Step to the desired frame and press **AUTO-TOGGLE.**

Delete Key

[key: bs ⊠] To delete the frame (with all exposures in the frame), double-press **DELETE** on the Dragonframe keypad.

NOTE: To replace just one exposure in a frame, you can reshoot it from the X-Sheet.

Cut Back Key

[key: 9 ✂] Use **CUT BACK** to eliminate a group of recently shot frames. You might cut back to a point before the animation went awry.

To cut back to an earlier frame:

1. Press **CUT BACK**. Dragonframe opens the Cut Back dialog.

2. Enter the number of the frame you want to cut back to.

3. (Optional) Un-check **DELETE INTERMEDIATE FRAMES** if you only want to move back to an earlier point in the sequence.

4. Click **OK**. Dragonframe jumps to the frame you specified, and, if selected, deletes the intermediate frames.

NOTE: Deleted frames go in the backup folder.

Loop Key/Ping-Pong

Press **LOOP** to loop the entire frame sequence.

Press and hold **LOOP** to turn on ping-pong playback: playing to the end of the sequence, then reversing through it. Press and hold **LOOP** again to return to regular looping.

NOTE: When ping-pong playback is on, all other playback options will continue functioning normally. For example, if you have both ping-pong and short play selected, Dragonframe will ping-pong through the last twelve frames.

NOTE: Add a loop hold, where Dragonframe pauses for a set time on the Live View, from the Playback Preferences.

Short Play Key

Press **SHORT PLAY** to play back only some of the frames you've shot. By default, Dragonframe will play only the last twelve frames.

NOTE: Press and hold **SHORT PLAY** to change the number of frames for playback. Or, set it in Playback Preferences.

Black (End in Black) Key

Press **BLACK** to add one second of black frames at the end of playback or during looping.

Or, press and hold **BLACK** to add one second of the live frame during looping.

NOTE: Change the timing for the Black key in Playback Preferences.

High-Res Key

By default, Dragonframe uses video assist frames for playback in the Animation workspace. To play back the final capture frames, press **HIGH-RES**. This will play back proxy frames taken from your full-resolution captures. Switch back and forth between video assist frames and full-res frames at any time.

Onionskin Keys

To overlay frames from the same scene over each other, use the Onionskin opacity keys.

115

Press **ONIONSKIN RIGHT** to begin onion-skinning the last frame over the Live View.

Step to any frame, then press **ONIONSKIN LEFT** to begin onion-skinning that frame over the Live View.

Mute Key

Press **MUTE** to turn off sound.

3-Step (Optional Hot Key)

To always step through the last three frames when stepping forward or back, turn on 3-step.

By default, 3-step isn't assigned a hot-key. Assign one by selecting **PREFERENCES|HOT KEYS**.

- Once you've assigned the hot key, press it to activate 3-step.
- By default, press it again to toggle through the speed that Dragonframe will play the three frames. Or, change the speed you'll step with in General Preferences.
- Once 3-step is activated, press the **STEP** keys to 3-step forward or backward through the last three frames in the sequence.

Playback Options

Adjust the way your sequence plays back in Dragonframe, change the playback speed, or choose a section of your frames to play.

Playback Speed

Adjust the playback speed from the Animation tools.

1. Click **24 FPS** to view a drop-down list of speeds.

2. Select a frame speed or create a custom speed.

NOTE: Each scene has a project frame rate, set in scene settings. You should only change the playback speed if you want to temporarily view the scene at a different speed.

Play Section with the Nav-Line

Choose which frames to include in playback with the Nav-Line.

1. Use the in and out points to define which frames you want to include in playback:

    •   Step through the frames, then press **I** to set the in point and **O** to set the out point. Or,

    •   Move the in and out points on the Nav-Line.

A. *In point.* **B.** *Playhead position.* **C.** *Out point.*

2. Press **PLAY** to start playback for the section you chose.

NOTE: You can set the out point as far as your scene end frame (set the scene end frame in the X-Sheet.) This allows you to move past what you've shot to play back a reference layer or audio file.

Shoot Multiple Frames

Shoot multiple frames in a row with the Shoot Multiple Frames dialog.

To shoot multiple frames:

1. Open the Cinematography workspace. Verify that auto-capture is on for all of your exposures, even if you only have one. That means that Dragonframe will capture all frames and exposures automatically, instead of waiting for you to press **SHOOT** for each one. The arrows next to each arrow should be blue:
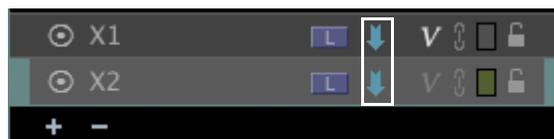
Auto-capture on for both exposures.

CAUTION: If auto-capture is not enabled for all exposures, Shoot Multiple will not work.

2. (Optional) Select **CAPTURE|SHOOT MULTIPLES AS VIRTUAL HOLDS** if you want Dragonframe to shoot the first shot and then create a hold for all subsequent shots, instead of taking unique images.

3. Choose how many frames to capture at once:

- To capture from two, three or up to ten frames, press **COM-MAND+2**, **COMMAND+3**…**COMMAND+0** (Mac) or **CTRL+2**, **CTRL+3**…**CTRL+0** (Win/Linux). Dragonframe captures the frames from the Shoot Multiple dialog. Click **x** to stop capture.

- To capture more than four multiple frames:
  Press and hold **SHOOT**. The Shoot Multiple dialog appears.
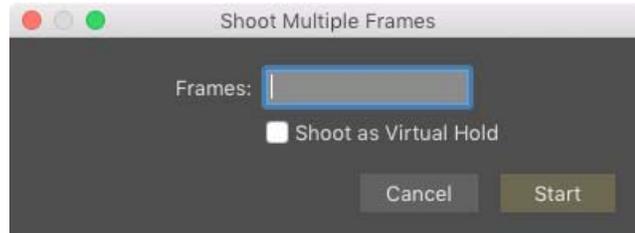
  Enter the number of frames you want to shoot and click **OK**. Dragonframe opens a progress dialog and shoots the number of frames you specified.
  (Optional) Click **x** in the progress dialog to stop shooting.

NOTE: If you have multiple exposures set up, Dragonframe will shoot all of them as one "frame". For example, if you have three exposures, and press **COMMAND+4** (Mac) or **CTRL+4** (Win/Linux) to capture four "frames", Dragonframe will take a total of twelve shots: three exposures, four times.

See also:
"Manual vs. Automatic Captures" on page 97.

Capture Options for Shooting on Twos

When you shoot on twos, there are two different ways you can capture frames.

- The default option is to actually trigger the camera twice. You may want to shoot this way if you have any motion control or lighting programs.

- Alternatively, you may want to capture a single frame and have Dragonframe hold that frame. To shoot this way, select **CAPTURE| SHOOT MULTIPLES AS VIRTUAL HOLDS**. This saves time and is a great way to work if you don't have lighting or motion control programs.

The sections that follow describe how to shoot on twos using the default option.

Occasional Twos

There are times when an animator may want to shift between single frame animation and shooting on twos during the same take. We call this "occasional twos".

Occasional twos can be achieved in three ways:

- Simply shoot the extra frames with the **SHOOT** button.
- Press **COMMAND+2** (Mac) or **CTRL+2** (Win/Linux) on the keyboard to capture two frames.
- Assign **SHOOT 2** as a hot key on the Dragonframe keypad.

Consistent Twos

If you plan to shoot on twos only, you have a couple options depending on your editorial needs:

- Assign **SHOOT 2** as a hot key on the Dragonframe keypad and never shoot singles.

NOTE: You can check **SHOOT MULTIPLE AS VIRTUAL HOLDS** to have Dragonframe create holds for the second frame, instead of shooting two frames. If you do choose this option, make sure that your DMX or motion control programs are set up for twos as well.

- Use half-speed playback. Set your playback FPS rate (for example, 12 FPS, 15 FPS) and shoot single frames only. The playback will be correct for a twos effect.
 If you need to edit your animation in a 24 or 30 FPS time line, double the frames in post.
 If you are just showing work on the web, you can leave your final movie at the lower frame rate. This will save download time and bandwidth.

Shoot Order

When you have multiple exposures set up, such as for a front light shooting on twos, or shooting multiple frames in a row, you can change the shoot order for the sequence.

The normal shooting order is to capture all exposures for a frame, and then move on to the next frame.

Frame 14 Exposure 1		Frame 15 Exposure 1		Frame 16 Exposure 1
↓	↗	↓	↗	↓
Frame 14 Exposure 2		Frame 15 Exposure 2		Frame 16 Exposure 2
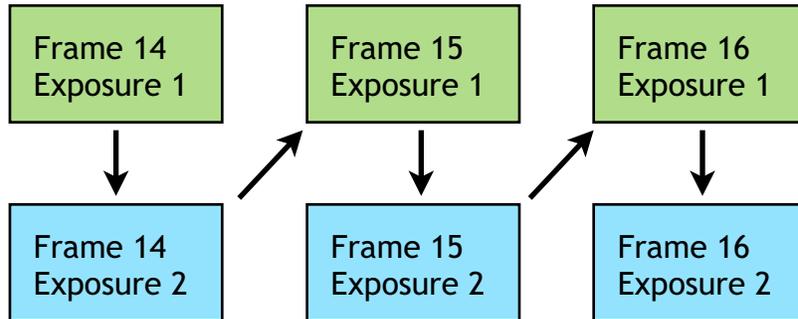
Shoot all exposures in the frame, then move on to the next frame.

You may find situations where you want to change the shoot order. Instead of the default, you would shoot the first exposure for two or more frames, then move on to the second exposure:

Frame 14 Exposure 1	→	Frame 15 Exposure 1	→	Frame 16 Exposure 1
Frame 14 Exposure 2	→	Frame 15 Exposure 2	→	Frame 16 Exposure 2
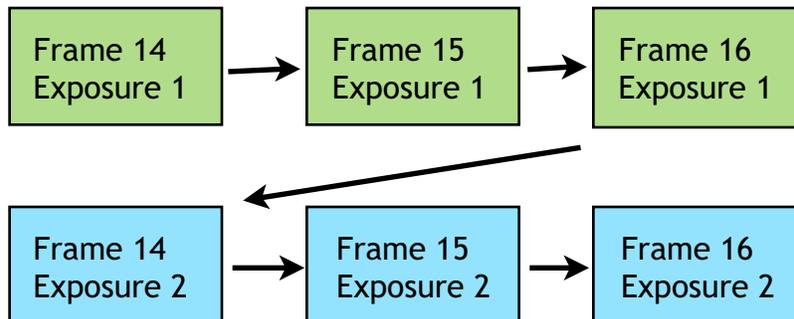
Shoot the first exposure for all frames, then move on to the next exposure.

To change the shoot order from its default:

1. Select **DRAGONFRAME|PREFERENCES** (Mac) or **FILE|PREFER-ENCES** (Win/Linux) then click **CAPTURE.**

2. Select **SHOOT FIRST EXPOSURE FOR ALL FRAMES, THEN MOVE ON TO NEXT EXPOSURE**.

Shooting in Reverse Order

It is sometimes desirable to capture the last frame of your animation and work your way back to the start. For example, if you are animating something coming together from many pieces.

Select **CAPTURE|SHOOT IN REVERSE**. The camera icon in the timeline changes to make it clear you are shooting in reverse:
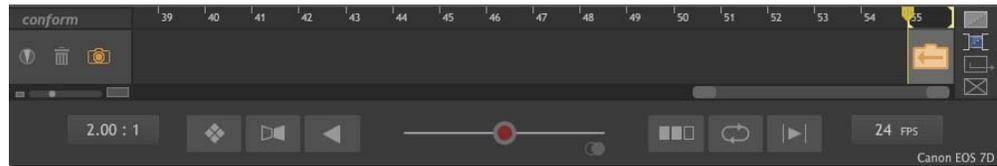
While **SHOOT IN REVERSE** is enabled:

1. Every time you capture a frame, the camera moves back a frame.

2. If the camera runs into the start of the scene, or already captured frames, shooting returns to normal mode.

3. Deleting a frame by double-tapping the delete key will delete the last frame you shot.

4. Cutting back will take you forward in the timeline.

Using Onionskin

The Onionskin opacity slider adds an onionskin layer of a previous frame over the Live View. You can adjust how translucent that layer appears, or select which frame you choose to layer, as shown in the following image:

A. Step to any frame, then move the slider left to blend that frame over the Live View.

B. Move the slider right to blend the last frame over the Live View. This is only active when you are on the **READY TO CAPTURE** frame.

C. Configure additional onionskin settings.

Additional onion skin settings are available in the Onion Skin Mode dialog. Press ⬭ to open the settings:

Onion Skin Mode [X]

A — ● Normal   ☐ Darks — C
B — ☐ Difference   ☐ Lights — D
Frame Echo 1 ●——————— E
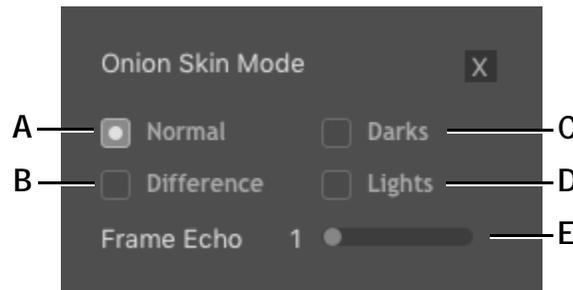
A. *Normal onionskin mode.*

B. *Difference mode: when images are the same, image becomes black. Differences show as gray/white.*

C. *Darks prominent: Use with "Frame Echo" to make dark colors stand out.*

D. *Lights prominent: Use with "Frame Echo" to make light colors stand out..*

E. *Move the slider right to onionskin more than one frame at once.*

Finally, press **ONIONSKIN LEFT** or **ONIONSKIN RIGHT** on your Dragonframe keypad to adjust opacity by small increments.

Dissolving the Last Frame Over the Live View

To view the last frame onion-skinned over the Live View:

1. Press **LIVE** to move to the live shot.

2. Press **ONIONSKIN RIGHT** on your Dragonframe keypad to move the slider in small increments. Or, click and drag the opacity slider to the right from the Animation workspace or Animation palette.

As the slider moves to the right, the previous frame appears in increasing clarity. When the slider is all the way to the right, you will only see the previous frame; the Live View will be obscured.

Dissolving the Last Few Frames Over the Live View

To onionskin multiple frames over the Live View:

1. Press **LIVE** to move to the Live View.

2. Select the Onionskin tool in the Animation palette.

3. Press **ONIONSKIN RIGHT** on your Dragonframe keypad to move the slider in small increments. Or, click and drag the opacity slider to the right from the Animation workspace or Animation palette.

4. Click and drag the frames slider in the Animation palette to the right. When it's all the way to the right, it will layer five frames over the Live View.

Dissolving the Live View Over Any Other Frame

To onionskin any frame over the Live View:

1. Step through the frames until you find the frame you want to layer with the Live View.

2. Press **ONIONSKIN LEFT** on your Dragonframe keypad to move the slider in small increments. Or, click and drag the opacity slider to the left from the Animation workspace or Animation palette.

As the slider moves to the left, the frame you've selected appears with increasing clarity, while the Live View fades. When the slider is all the way to the left, you will only see the frame you've selected; the Live View will be obscured.

Other Modes: Lights Prominent, Darks Prominent, Difference

If you want to make some features in the onionskin layer easier to see, use the Onionskin transfer modes.

This mode:	Highlights this information:
DARKS PROMINENT	The dark values in the image. This would be useful if you were animating a black line drawing on a white piece of paper. Instead of seeing the white of the paper equally prominent as the black lines, making **DARKS PROMINENT** would draw more attention to the black lines you were animating.
LIGHTS PROMINENT	The light values in the image. This might be useful if you were animating a bright object on a dark set. Rather than viewing the darks and lights as equally prominent, **LIGHTS PROMINENT** would draw more attention to the light areas you were animating.

This mode:	Highlights this information:
DIFFERENCE MODE	What has changed between the current frame and the Live View. Any changes will appear as white in a black background. For example, imagine your last frame looked like the picture below: If you then moved the ball slightly to the right, you could see how much it had changed using Onionskin. With Onionskin on, layering the last frame over the Live View, and with **DIFFERENCE** selected, you'd see: You can see white anywhere the ball has moved, giving you greater precision when lining up your next shot.

Using Roto Layers

Load reference material to help with animating. You can load movies, images, and other Dragonframe scenes into your project. Blend it with your scene, pull a chroma-key, or set up a garbage matte.

See "Media Layers" on page 63.

Drawing on the View Pane

The drawing tools provide a way to mark the screen to assist with animation. Previously this was called "grease pencil" in homage to how it was done a long time ago...

See "Drawing Layers" on page 59.

Punch-in with Live View Magnification

If you have a supported Canon, Nikon or Olympus DSLR, you can use Dragonframe's Live View Magnification to zoom in on a portion of your Live View.

This is a way to animate fine details within a larger scene.

See "Live View Magnification" on page 68.

Adjusting Video Assist Levels

Adjust the Live View's brightness, contrast, and gamma levels with the Video Assist Levels tool in the palette or Guide Layers. This basically works like the levels adjustment in Adobe Photoshop.

When working with video assist levels, keep in mind that:

- These levels only affect the video assist.
- The level changes are an effect on top of the image. The original video assist image remains unchanged.

See "Video Assist Levels" on page 67.

External Monitoring

Dragonframe provides several ways to set up a secondary view of the animation view area. This is useful if you need to set up an extra monitor for an animator to work with, or if you need to set up a way for clients to see what is happening on set.

Using an Auxiliary Monitor

Use an auxiliary monitor to display a full screen view of the Live View or playback on another monitor. You can:

- Start an auxiliary monitor by clicking **VIEW|AUXILIARY MONITOR|MONITOR #**

Select **MONITOR 1** to open it on your computer, or **MONITOR 2** to open it on a second monitor.

- Turn the auxiliary monitor off by selecting **VIEW|AUXILIARY MONITOR|OFF**.

- Adjust the image framing with **VIEW|AUXILIARY MONITOR|FIT TO WIDTH** or **FIT TO HEIGHT**.

- Show (or hide) any overlays, such as the grid or broadcast-safe overlays by selecting **VIEW|AUXILIARY MONITOR|SHOW OVERLAYS**.

- Show (or hide) drawing layers by selecting **VIEW|AUXILIARY MONITOR|SHOW DRAWINGS**.

- Show what the active workspace shows by selecting **VIEW|AUXILIARY MONITOR|NORMAL DISPLAY**, or always show the live view by selecting **VIEW|AUXILIARY MONITOR|ALWAYS LIVE DISPLAY**.

Blackmagic Design Output

Output devices by Blackmagic Design are a good option for setting up a client viewing area. Since some Blackmagic devices have SDI output, it provides a convenient way to set up a monitor far away from the computer.

Dragonframe supports the following Blackmagic device families:

- Intensity / Intensity Pro
- UltraStudio
- DeckLink

Configure your Blackmagic Design output view via the menus:

- Choose **VIEW|BLACKMAGIC OUTPUT|[DEVICE]** to send the output to the device.

- Choose **VIEW|BLACKMAGIC OUTPUT|OFF** to turn it off.

- Adjust the image framing with **VIEW|BLACKMAGIC OUTPUT|FIT TO WIDTH** or **FIT TO HEIGHT**.

- Show (or hide) any overlays, such as the grid or broadcast-safe overlays by selecting **VIEW|BLACKMAGIC OUTPUT|SHOW OVERLAYS**.

- Show (or hide) drawing layers by selecting **VIEW|BLACKMAGIC OUTPUT|SHOW DRAWINGS**.

- Show what the active workspace shows by selecting **VIEW|BLACK-MAGIC OUTPUT|NORMAL DISPLAY**, or always show the live view by selecting **VIEW|BLACKMAGIC OUTPUT|ALWAYS LIVE DISPLAY**.

If your device does not show up in the output list, make sure that you have installed the latest version of the Blackmagic software. It includes drivers that Dragonframe requires in order to detect the device.

NOTE: This output is not frame-rate accurate, so it is not suitable as a secondary monitor for animators.

Live View Server (WebSockets)

Dragonframe can provide the animation view over the local network. This feature is somewhat experimental, and does not provide real-time performance, so it is not suitable for animation. It does provide a way for clients to see what is happening on set via their own computers, smartphones, or tablets.

To enable the live view server, go to **PREFERENCES|ADVANCED** and check the **ENABLE** box after **LIVE VIEW SERVER**:

Live view server: ☑ Enabled   HTTP Port: 8888   Web Socket Port: 8555
URL: http://192.168.0.17:8888/

Then direct clients to go to the URL provided in the same area.

Syphon (Mac Only)

Syphon is an open source macOS technology that allows applications to share OpenGL frames. Dragonframe can share the animation view with other programs via Syphon.

Choose **VIEW|OUTPUT TO SYPHON** to enable or disable Syphon output.

For more information about Syphon, visit their website:
http://syphon.v002.info/

Spout (Windows Only)

Spout is essentially a Windows version of Syphon

Choose **VIEW|OUTPUT TO SPOUT** to enable or disable Spout output.

For more information about Syphon, visit their website:
http://spout.zeal.co/

Chapter 7: Using the Timeline

Use the timeline for managing playback of frames, for frame editing, and for viewing frames along with the audio track reading.

The timeline opens in the Animation workspace. Press ⊞ to open it.

Press the timeline button to open the timeline.

The next page gives an overview of the timeline's features.

Timeline Map
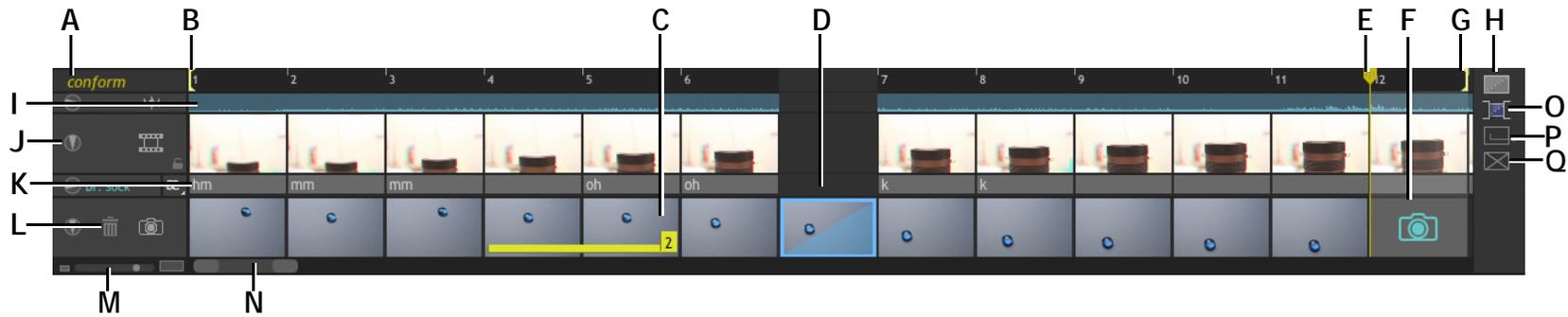
A. *Conform: Render all of the virtual edits in the source files.*

B. *In point: Start playback here.*

C. *Held Frames: This means the same frame is repeated.*

D. *Hidden Frames: These frames won't appear in playback, but they have not been deleted until you conform them. You can hide or show these hidden frames in the timeline.*

E. *Playhead. Move through the timeline.*

F. *Camera: See which frame will be captured next. Move the camera earlier in the sequence to reshoot frames.*

G. *Out Point: End playback here.*

H. *Hide Button: Hide the selected frame, or reveal the hidden frame.*

I. *Audio: View the waveform, if one is loaded.*

J. *Minimize: Minimize or maximize the row.*

K. *Face Sets: View phonetic information, face set names, or dialogue cues.*

L. *Trash Can: Show or hide the delete bin.*

M. *Scale: Adjust the scale of the timeline.*

N. *Scroll bar.*

O. *Show/Hide Hidden button: Show or hide hidden frames in the timeline.*

P. *Hold Button: Hold the selected frame.*

Q. *Delete Button: Delete the selected frame and move it to the delete bin.*

Using the Timeline for Playback

Use the timeline to select the playback area so you can see exactly which frames will be included.

To set the playback area:

- Step through the frames, then press **I** to set the in point (B.) and **O** to set the out point (G.).

- Or, use the mouse to click and drag the in and out points.

Press **PLAY** to start playback.

Adjusting a Reference Layer from the Timeline

If you add a reference (line-up) layer movie to your project, you can adjust how it syncs with your animation, when it starts and stops, and how it overlays with your animation. To work with the Reference Layer in the timeline:

1. Add a Reference Layer movie from the Guide Layers or Animation Floating Tool Palette.

2. Open the timeline. The reference layer appears above the frames:
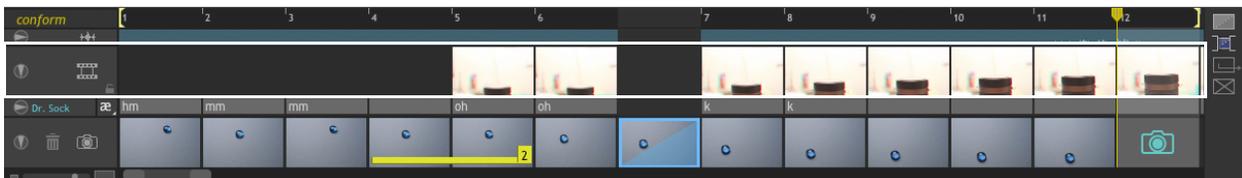
Reference Layer in the timeline.

Adjusting Reference Layer Time Sync

By default, the first frame of your reference layer will be synced to the first frame of your animation. To adjust the reference layer synchronization point:

1. Click on one of the reference layer thumbnails in the timeline.

2. Drag the reference layer up or down the timeline.

NOTE: To restore the clip synchronization to the initial position, choose **RESET LAYER POSITION** from the layer's contextual menu.

Adjusting Reference Layer In/Out Points

By default, the entire reference layer movie will appear in the timeline. To adjust the in or out points of the layer.

1. Click and drag the start or end of layer.

2. Drag the end in or out to shorten or length the layer.

NOTE: To restore the clip in/out points, choose **RESET LAYER LENGTH** from the layer's contextual menu.

NOTE: An image reference layer starts with a length of about 120 frames. You can drag the end of the layer to increase the duration that the image will appear.

Adjusting the Layer Visual Order

Reference layers and your scene layer are overlayed on top of each other, much like layers in Photoshop. The layer that is lowest in the timeline will be the first layer drawn in the Animation View pane.

You can reorder layers in the timeline, and correspondingly change the way they are ordered in the View pane.

Here the reference layer is above the scene layer:

Click and drag the layer header to move it to a new position:

Now the reference layer is below the scene layer:
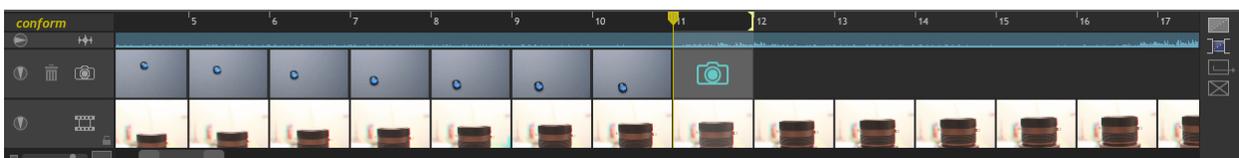
NOTE: Changing the order of the layers here also changes the order within the Guide Layers.

Using a Reference Layer as a Lead-In Shot

Sometimes you may want to play the previous scene as a lead-in to the current scene, so you can judge how they fit together.

You can do this with the pre-roll feature of the timeline:

1. Select **PLAYBACK|INCLUDE PRE-ROLL**. A special area of the timeline appears, before the first frame of your scene:
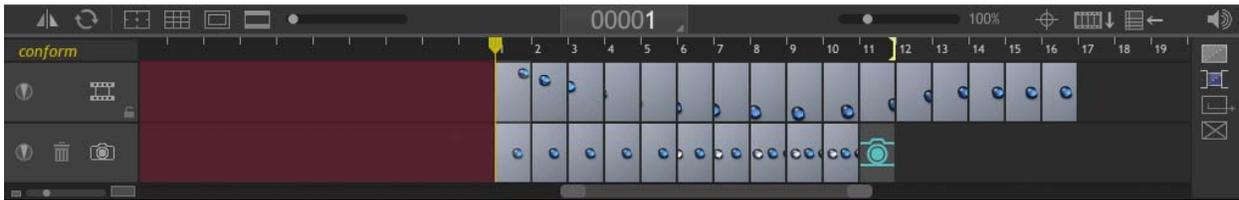
2. Choose **USE AS PRE-ROLL** from the layer's contextual menu, or just drag reference layer back there. Your timeline will look like this:
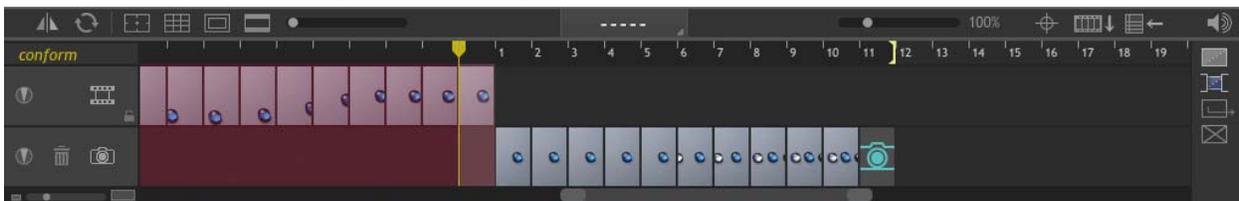
3. Adjust the in and out points for playback.

4. Step or play through the scene.

The pre-roll area is provided just for this type of situation, and is not part of your scene in any way. You cannot do any frame editing there. You will also notice that the frame counter switched to "-----" instead of providing a frame number.

NOTE: You can change the pre-roll time in Playback Preferences.

Frame Editing with the Timeline

Use the timeline to edit your frame sequence. You can cut, copy, and paste frames, add holds, hide or delete frames, or retrieve frames from the delete bin.

NOTE: The timeline shows a thumbnail for the first exposure of a frame. Selecting one frame (one thumbnail) selects *all* the exposures for the frame.

This is true for all frame editing, such as deleting, cutting, or reshooting frames. You can reshoot individual exposures with the X-Sheet.

Moving Frames in the Timeline

Click and drag frames to move them to new locations in the frame sequence. This is a quick, visual way to replace frames or insert frames. You can move one frame at a time, or move a section of frames.

There are two ways to move frames. One moves just the frames you selected, the other selects and moves frames from your selection to the end of the sequence.

- Select the frame(s) you want to move, then click and drag them *up*. This will move just the frame(s) you selected.

  If you move them in between two frames, Dragonframe shows a yellow "insert" marker between the frames:
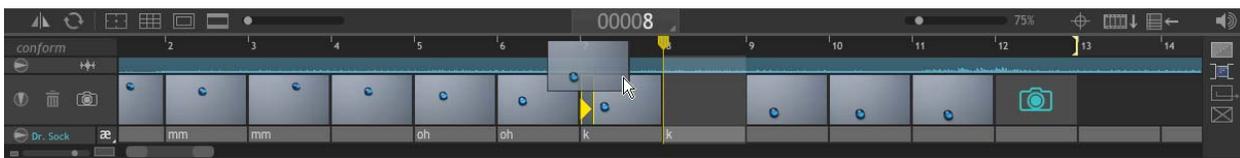
*Dragging **up** moves just the frame(s) you selected. Here you'll insert the frame at yellow insert marker.*

  If you move them over another frame, Dragonframe shows a red "delete" marker over the frame(s) you'll replace:
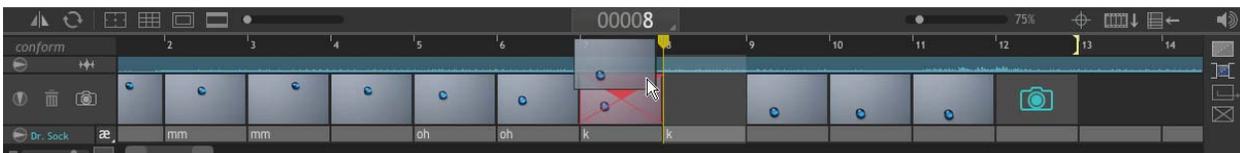
*Dragging **up** moves just the frame(s) you selected. Here you'll overwrite the frame marked with red X.*

- Select a frame, then move it *sideways,* left or right. Dragonframe selects the frames to the beginning (left) or end (right) of the sequence and moves them. It shows where the frames will be inserted or replaced just as before:
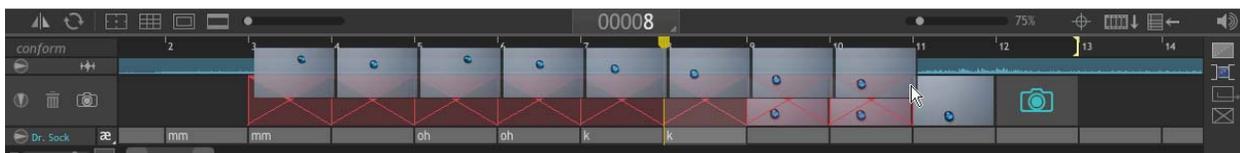
*Dragging **to the left** selects all the frames to the beginning of the sequence. Here, you'll move the beginning of the sequence over one frame.*

NOTE: To paste frames in reverse order, cut or copy them, then paste them with the keyboard.

Holding Frames with the Timeline

When you hold frames, you repeat them. It's like copying and pasting one frame multiple times.

To hold a frame:

1. Select the frame you wish to hold.

2. Choose which frames to hold:

   - Click ⌞⌟₊: A dialog appears. Enter how long to hold the frame and click **OK**.
   - Move the mouse to the right edge of the selected frame and click and drag the cursor over for the number of frames you wish to hold.
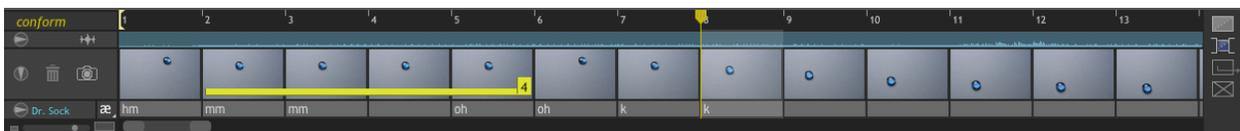
Frame 2 held for four frames.

To remove the held frames:

- Use the mouse:
  a. Move the cursor over the right edge of the last frame held.
  b. Click and drag the cursor to the left. Dragonframe moves the marked area until it reaches the original frame. The hold marker disappears.

- Delete the frames. See "Deleting Frames from the Timeline", below.

- Use ⌞⌟₊:
  a. Select one of the held frames.
  b. Click ⌞⌟₊. A dialog appears. Enter **0** and click **OK**.

NOTE: When you shoot multiple frames, you can have Dragonframe hold the first frame as many times as you need by checking **CAPTURE|SHOOT MULTIPLE AS VIRTUAL HOLDS.**

Cutting, Copying or Pasting Frames with the Timeline

You can cut, copy and paste selected frames to edit the frame sequence.

- Use standard keyboard commands (such as **COMMAND+V** or **CTRL+V**) to cut, copy and paste frames.
- Select a frame, then right-click (Mac **CTRL**-click) and select edit commands from the contextual menu.

NOTE: When you paste frames, you can choose four paste options:

- Insert frames,
- Overwrite frames,
- Insert frames in reverse order, and
- Overwrite frames in reverse order.

Hiding Frames with the Timeline

Hide a frame to leave it out of the thumbnails and playback without having to completely delete it.

To hide frames:

1. Select the frame(s) you want to hide:
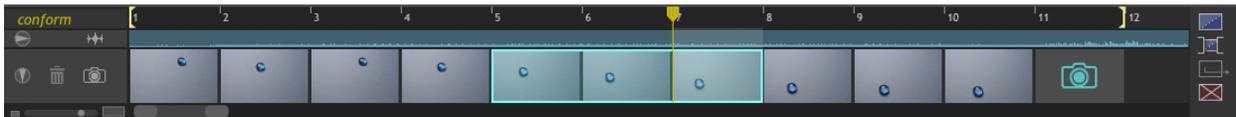
Frames 5-7 selected; camera ready to shoot frame 11.

2. Click ▨. Dragonframe hides the frames. They show in the timeline as shaded frames, with no frame numbers or audio track:
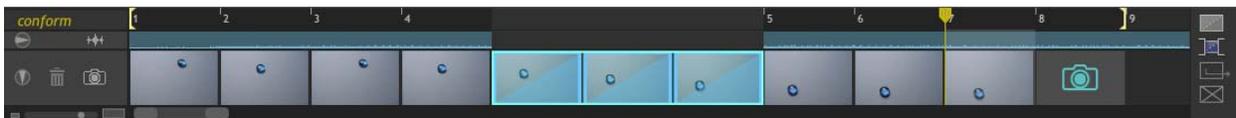
Shaded thumbnails for hidden frames 9-11. Camera is now ready to shoot frame 8 since three frames of the sequence are hidden.

Or, press and hold **ALT/OPT** while selecting the frames to hide them.

Options for Viewing Hidden Frames in the Timeline

Once you've hidden frames, you can toggle whether hidden frames are shown or hidden in the Timeline. By default, hidden frames will show up in-line.

To show or hide hidden frames in the timeline:

- Press ▮▯ to hide hidden frames. Dragonframe displays a marker where the hidden frames would go:
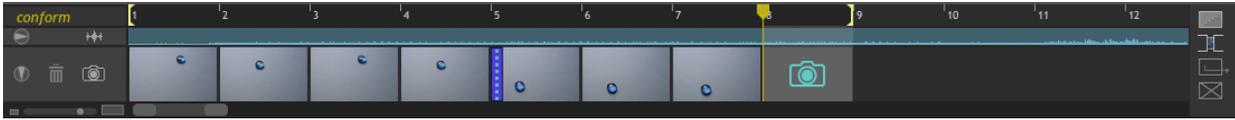
- Press ▯▮ to show hidden frames.
- Press **H** to toggle back and forth.

Un-hide Hidden Frames from the Timeline

To re-display frames that you hid:

1. Select the hidden frame thumbnails or markers.

2. Click ▮. Dragonframe restores the hidden frames.

Deleting Frames from the Timeline

To delete frames from the timeline:

1. Select the frames you want to delete. The frame thumbnails you select have a cyan outline.

2. Press ✉, or right-click (Mac **CTRL**-click) and select **DELETE**. Dragonframe deletes the selected rows, including all exposures, and places the files in the delete bin.

NOTE: To replace just one exposure in a frame, you can reshoot it from the X-Sheet.

Reshooting Frames from the Timeline

Reshoot frames in two ways:

- Delete one or more frames, then reshoot them. Dragonframe moves the camera back to the end of the sequence when you've replaced the deleted frames.

- Insert the camera into the frame sequence, then continue shooting from there. You can manually move the camera when you've finished adding frames.

NOTE: Reshooting from the timeline will replace all exposures of each frame. The only way to reshoot a single exposure is from the X-Sheet.

Replacing Frames (Reshooting)

- To reshoot a single frame:

  a. Click and drag the camera to the frame you want to reshoot. Dragonframe places a red delete marker over the frame to be reshot:

  b. Drop the camera on the frame. Dragonframe replaces the frame with the camera.

  c. Press **SHOOT**. Dragonframe shoots the frame, then moves the camera back to the end of the sequence.

- Reshoot a section of frames.

  a. Select the frames you want to replace.
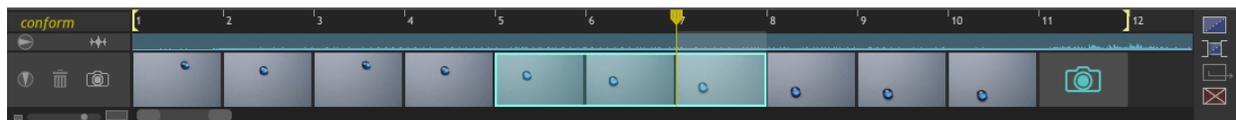
  b. Right-click (Mac **CTRL**-click), and select **RESHOOT FRAMES**. Dragonframe deletes the frames, then moves the camera to the first deleted frame:
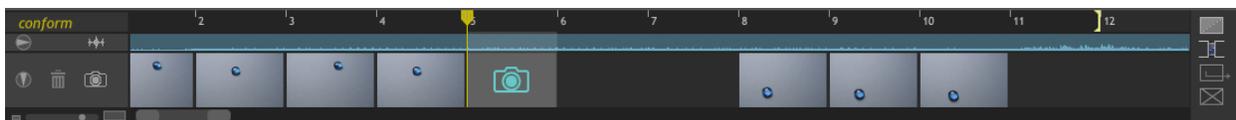
  c. Reshoot the sequence. When you've replaced each deleted frame, Dragonframe moves the camera back to the end of the sequence.

Inserting the Camera

If you want to add frames to the middle of a frame sequence, insert the camera:

- Move the camera with your mouse:

a. Click and drag the camera in-between two frames. Dragonframe places a yellow insert marker in between the frames:

Drop the camera at the marker.

b. Press **SHOOT** to add frames.

c. Click and drag the camera back to the end of the sequence when you're done.

- Right-click (Mac **CTRL**-click) to insert the camera:

a. Select a frame.

b. Right-click (Mac **CTRL**-click), then select **INSERT CAMERA**. Dragonframe inserts the camera before the selected frame.

c. Press **SHOOT** to add frames.

d. Right-click (Mac **CTRL**-click), then select **RETURN CAMERA TO END**.

Restoring Frames from the Delete Bin

When you delete frames from the timeline, Dragonframe moves them to the Delete Bin. You can restore them by moving them out of the bin. Using the timeline, you can also choose where the deleted frames will go in the frame sequence.

To restore deleted frames:

1. Click 🗑 or press **CTRL+ALT+B** (Mac **COMMAND+OPT+B**). Dragonframe opens the delete bin:
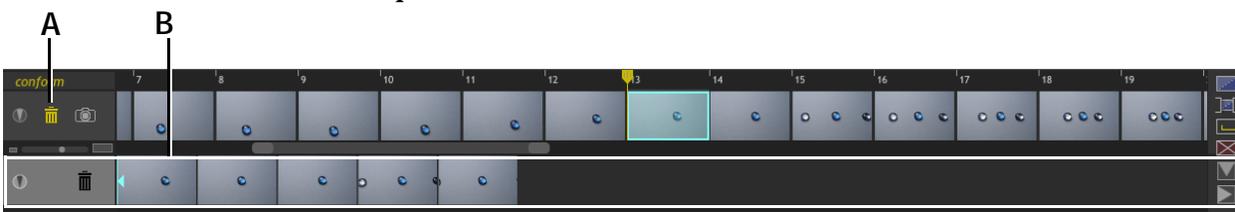
A. *Delete Bin button.* **B.** *Delete bin.*

3. Restore the frames:

- Click and drag a deleted frame back into the timeline. Just as with moving any frame, Dragonframe shows you whether it will insert or overwrite with the frame using the red and yellow markers.

- • Move the playhead in the timeline to the place you want to insert or overwrite frames.

  Select a deleted frame, then click ▶ (insert) or ▼ (overwrite). Dragonframe inserts the deleted frame, or overwrites the frame after the playhead.

CAUTION: Dragonframe shows only a thumbnail of the first exposure of a frame in the delete bin. It will not tell you if any exposures for that frame are missing. To see the source files for the frames, right-click (Mac **CTRL**-click), then select **REVEAL IN FINDER**.

Navigating the Delete Bin

Once you've deleted several frames from the scene, or done a lot of editing in the timeline, it may be hard to figure out where the deleted frames came from originally. Dragonframe uses cyan markers on the frames in the timeline and delete bin to help you figure out where the frames came from.

Keep a few principles in mind as you navigate through the frames in the delete bin:

- • All of the frames in the delete bin are placed in the order they were shot.
- • When you select a frame in the delete bin, Dragonframe will mark two frames in the timeline: the frames shot before and after the selected frame:
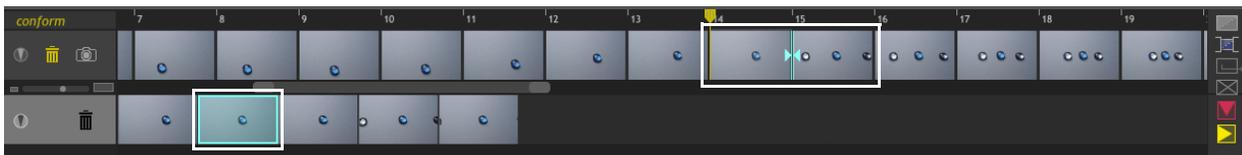
Deleted frame selected; timeline shows two frames marked. Frame 13 was shot before the deleted frame, frame 14 shot after it.

- • If you select a frame in the timeline, Dragonframe will mark the frames in the delete bin that were shot before and after that frame.

One frame in the timeline selected. Dragonframe has marked two deleted frames; the selected frame was shot in between the marked frames.

- • To view the source files for any deleted frame, right-click (Mac **CTRL**-click) and select **REVEAL IN FINDER**.

Conforming Timeline Edits

Dragonframe is designed to give you access to the high-res frames at any time without having to perform an export. However, when you use the timeline, many of the edits you perform are "virtual". For example, if you hide frames, Dragonframe removes them from the timeline without doing anything to your source files.

Any edits you make with the timeline that are not reflected in the source files are not "conformed" to disk. To make the edits in the timeline be reflected in the source files, you must conform them.

CAUTION: Once you conform edits, you cannot undo them.

When you make virtual edits in the timeline, Dragonframe highlights the conform button in the timeline to alert you.

Edited timeline with conform button highlighted.

Press **CONFORM** to render all of the virtual edits in the source files. Dragonframe will:

- Delete any hidden frames.
- Permanently renumber "held" frames. This will remove the hold marker from the frames.
- Renumber the sequence permanently if you've moved, deleted, copied, or cut any frames.
- Move all deleted frames to the delete bin.

After you conform your edits, all special markings (like held or hidden frames) will disappear:

Keyboard Shortcuts and Contextual Menus for the Timeline

Use the following keyboard shortcuts and contextual menus to access many of timeline tools:

Timeline Keyboard Shortcuts

Press:	To	See this section for more information:
DELETE or **BACK-SPACE**	Delete selected frames.	"Deleting Frames from the Timeline" on page 137.
CTRL+C COMMAND+C	Copy selected frames.	"Cutting, Copying or Pasting Frames with the Timeline" on page 135.
CTRL+X COMMAND+X	Cut selected frames.	"Cutting, Copying or Pasting Frames with the Timeline" on page 135.
CTRL+V COMMAND+V	Paste selected frames.	"Cutting, Copying or Pasting Frames with the Timeline" on page 135.
CTRL+Z COMMAND+Z	Undo frame edits.	"Cutting, Copying or Pasting Frames with the Timeline" on page 135.

Contextual Menu for the Scene Frames

Right-click (Mac **CTRL**-click) over any scene frame thumbnail to see the timeline's contextual menu:

Select:	To:	See this section for more information:
CUT	Cut the selected frame.	"Cutting, Copying or Pasting Frames with the Timeline" on page 135.
COPY	Copy the selected frame.	"Cutting, Copying or Pasting Frames with the Timeline" on page 135.
PASTE INSERT		"Cutting, Copying or Pasting Frames with the Timeline" on page 135.
PASTE OVERWRITE		"Cutting, Copying or Pasting Frames with the Timeline" on page 135.

Select:	To:	See this section for more information:
PASTE REVERSE OVER-WRITE		"Cutting, Copying or Pasting Frames with the Timeline" on page 135.
DELETE		"Deleting Frames from the Timeline" on page 137.
HIDE FRAMES		"Hiding Frames with the Timeline" on page 136.
UNHIDE FRAMES		"Un-hide Hidden Frames from the Timeline" on page 137.
HOLD FRAMES…		"Holding Frames with the Timeline" on page 135.
RETIME SEQUENCE		Create holds on a sequence of frames.
RESHOOT FRAMES		"Replacing Frames (Reshooting)" on page 138.
INSERT CAMERA		"Inserting the Camera" on page 138.
RETURN CAMERA TO END		"Inserting the Camera" on page 138.
REVEAL IN FINDER		"Restoring Frames from the Delete Bin" on page 139.
USE AS REFERENCE LAYER		"Loading Reference Material" on page 63.
COMPARE WITH LIVE		Compare selected frame with live.

Contextual Menu for the Delete Bin

Select:	To:	See this section for more information:
INSERT DELETED FRAMES AT PLAYHEAD	Move selected frames to timeline	"Restoring Frames from the Delete Bin" on page 139.
OVERWRITE DELETED FRAMES AT PLAYHEAD	Move selected frames to the timeline	"Restoring Frames from the Delete Bin" on page 139.
REVEAL IN FINDER	Show the file in the file system	"Navigating the Delete Bin" on page 140.

Contextual Menu for Reference Layers

Select:	To:	See this section for more information:
RESET LAYER LENGTH	Set layer to original length and in/out points	"Adjusting Reference Layer In/Out Points" on page 132.
RESET LAYER POSITION	Set layer sync point to start with scene start.	"Adjusting Reference Layer Time Sync" on page 131.
USE AS PRE-ROLL	Move layer into position to be lead-in.	"Using a Reference Layer as a Lead-In Shot" on page 133.
COMPARE WITH LIVE	Compare selected frame with live.	N/A

Chapter 8: Alternative Shooting Techniques (Non Stop Motion)

Dragonframe is primarily designed for stop motion animation, and its default settings cater to that type of shooting. However, many users adapt it to other uses. Here are some recommendations for other types of shooting:

Time-Lapse

You can use Dragonframe to set up and capture a time-lapse sequence.

To set up a time-lapse:

1. (For still cameras only) Select **CAPTURE|[YOUR CAMERA NAME] STILLS.** This changes your video source to avoid using your camera's Live View.

CAUTION: Keeping Live View on for your time lapse may overheat your camera. This makes it more prone to capture errors.

2. Open the Cinematography workspace. In the Camera Settings pane, verify that auto-capture is on for all of your exposures. That means that Dragonframe will capture all frames and exposures automatically, instead of you having to press **SHOOT** for each one. The arrows next to each arrow should be blue:

Auto-capture on for both exposures.

CAUTION: If auto-capture is not enabled for all exposures, time-lapse will not work.

3. Select **CAPTURE|TIME-LAPSE**. The Time-lapse dialog appears.
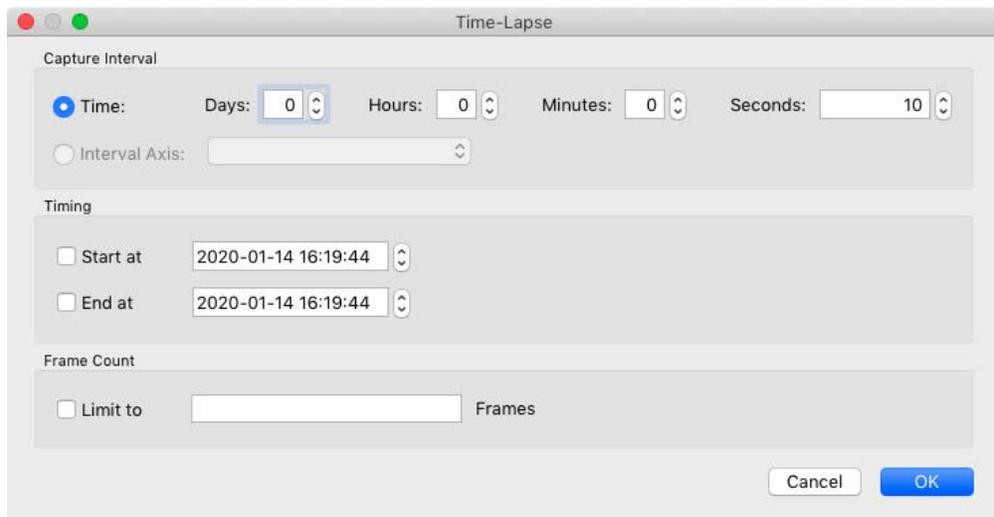
4. Enter the capture interval you want to use. The default is 10 seconds. For example, if you want to capture a frame every hour, enter **1** in the **HOURS** field.

CAUTION: The time-lapse interval must be greater than the time it takes for Dragonframe to shoot a frame with your camera and download it to your computer. For example, if Dragonframe takes three seconds to download an image from your camera, don't set the interval to one second—Dragonframe can't download the frames quickly enough. How quickly Dragonframe downloads the image depends on your setup, but it probably can't shoot one frame per second.

5. (Optional) Set a **START** and **STOP** time.

6. (Optional) Set up a frame number limit:

    a. Check **LIMIT TO _____ FRAMES** to end the time-lapse after Dragonframe captures a certain number of frames.

    b. Enter the number of frames you want the time-lapse limited to. The default is **1**.

6. Click **OK**. The Time-lapse dialog appears. Dragonframe automatically captures the shots you set up, and shows the progress you've made in the dialog. Click **x** if you want to stop the time-lapse sequence.

Programming a Complex Capture Interval

Instead of using a constant capture interval, it is possible to program one that changes over the course of the time-lapse.

In the motion control workspace, add an axis and set its **FUNCTION** to **INTERVAL**. The axis will represent seconds between shots of your time-lapse.

Program the interval axis by double-clicking into the axis table and entering values (see motion control portion of user guide for more details.)

Then, in the time-lapse window, choose the interval axis as the capture interval.

Pixilation

Pixilation is similar to stop motion, but with live objects (such as people) instead of inanimate objects. Here are a few guidelines to keep in mind:

- It is crucial to understand that your video assist (the Live View you see from your camera) and you final high-resolution images are not the same thing, and are captured sequentially, one right after the other.

    Press the high-res key on the keypad (shown at right) to only view high-res images in the Animation workspace.Viewing only high-res images will avoid error when working with moving objects, since Dragonframe will display only the high-res image.

(Optional) Open Preferences, then click the **CAPTURE** tab, you can set three options that may help shooting live objects.

- Set the Capture Delay to **0.0 SECONDS**. This will tell Dragonframe to capture the frame as quickly as possible after you press **SHOOT**.
- Set the Capture Review time to **2.0 SECONDS**. This way you can see your high resolution image immediately after Dragonframe captures it.
- Select **CAPTURE TONE**. Dragonframe will play a sound when the camera's shutter is open.

Traditional 2D Animation

Dragonframe can make a great tool for traditional, hand-drawn 2D animation. Use a few settings to aid your 2D project:

- In the X-Sheet, click and choose **FILE #**. This will show the unique file number for every image you capture, even if you copy, cut or paste images.

- From Preferences, select the **GENERAL** tab. Then select **DISABLE CONFORM OPTIONS**. This will prevent Dragonframe from conforming your edits, which would overwrite your original file numbers.

Chapter 9: Managing Your Projects and Files

The Dragonframe file structure is clear, simple, and easy to navigate. This section explains how to create new scenes, takes, and manage them.

CAUTION: Dragonframe relies on the naming structure of your scene and take folders to locate your files. If you need to rename a scene or take, you *must* do it by duplicating your scene, or by renaming the take through the Managing Takes dialog. Dragonframe will not be able to open a project that has been renamed elsewhere.

Creating a New Scene

When you open Dragonframe, the splash screen opens. From there, you can create a new scene or open an old scene.

To create a new scene:

1. Click **NEW SCENE**. The New Scene dialog appears:
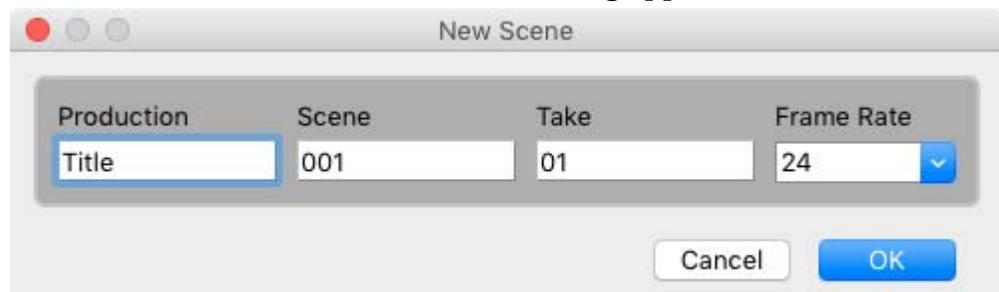
2. Enter a production name or number, up to five characters.

3. Enter a scene name or number, up to three characters.

4. Enter a take name or number, up to two characters.

5. Enter a project frame rate. You can change this later in Scene Settings.

6. Click **OK**. The New Scene Chooser dialog opens.

7. Navigate to the folder on your hard drive where you'd like to save Dragonframe projects.

8. Click **SAVE**. The Animation workspace opens with the scene you just created.

If you have a supported video source connected, the feed will open in the View pane automatically. If no supported video source is connected, the View pane will read **NO VIDEO SOURCE**.

CAUTION: Dragonframe relies on the naming structure of your scene and take folders to locate your files. If you need to rename a scene, you *must* do it from within Dragonframe by duplicating your scene and renaming that. Dragonframe will not be able to open a scene that has been renamed elsewhere.

Simplifying Scene Names

By default, the New Scene dialog prompts you to name both your production and scene. However, you can change the naming convention to be simpler from Naming Preferences. If you change that preference, the New Scene dialog will only include the **SCENE** field.

The file name of your project will depend on which naming convention you chose.

- Generally, your project will be saved with the default file convention **PRODUCTION NAME_SCENE NAME.DGN.** For example, the name could be **TITLE_001.DGN**.

- If you choose the Scene/Take convention from Naming Preferences, the project will be saved with the file convention **SCENE NAME.DGN**. For example, the name could be **TITLE.DGN**.

See also:
"Naming Preferences" on page 353.

Changing Scene Name Length

You can change how long your production and scene names can be from Naming Preferences.

See also:
"Naming Preferences" on page 353.

Changing Take Names

When you create a new scene, Dragonframe creates a take with the name you specified. Select **FILE|MANAGE TAKES…** to change take names.

CAUTION:Dragonframe relies on the naming structure of your scene and take folders to locate your files. If you need to rename a take, you *must* do it as described above. Dragonframe will not be able to open a take that has been renamed through your computer's file system.

See also:
"Managing Takes" on page 153.

Opening a Previously-Shot Scene

Once you've created a scene, you can always open it back up to continue work.

To open a scene:

1. Select **FILE|OPEN SCENE**. The Open Scene dialog opens.

2. Navigate to the folder where you store your scene files, and select the scene you want to open. Use the slider button below the preview image that appears to scroll through the scene's frames, to help ensure that you're opening the correct scene.

Preview image with slider button.

3. Click **OK**. The Choose Take dialog opens, along with a preview image of the highlighted take. Use the slider button to scroll through the frames as before.

4. Select a take that you've already created, or create a new take.

Dragonframe opens the Animation workspace with the scene you selected.

Duplicating Your Scene

You may want to make a copy of your scene, or rename a scene. To do so, duplicate your scene:

1. Select **FILE|DUPLICATE SCENE**. The New Scene dialog appears.

2. Enter a name for the duplicated scene, then click **OK**. Dragonframe opens the Save Scene As dialog.

3. Navigate to the place where you want to save the file, then click **OK**.

A progress bar appears. Dragonframe duplicates the scene.

CAUTION: Duplicating your scene is the only way to rename a scene. Dragonframe relies on the naming structure of your scene and take folders to locate your files. If you rename a scene through your computer's file structure Dragonframe will not be able to open it.

Creating a New Take

Create a new take of a scene at any time. A new take keeps all of the important information from your previous take.

To create a new take:

1. Select **FILE|NEW TAKE**. The New Take dialog opens.

2. Enter the take number, or any name you choose.

3. Click **OK**.

Dragonframe creates a new take within the Scene folder and opens the Animation workspace. Since you're starting a new take of the same scene, the Capture and frame counters will indicate that you're ready to capture the first frame.

Switching Takes

To open a different take of the scene you're shooting, select **FILE|SWITCH TAKES...** to open the Choose Take dialog. Once you select a take, Dragonframe closes the take you were working on and loads the take you selected.
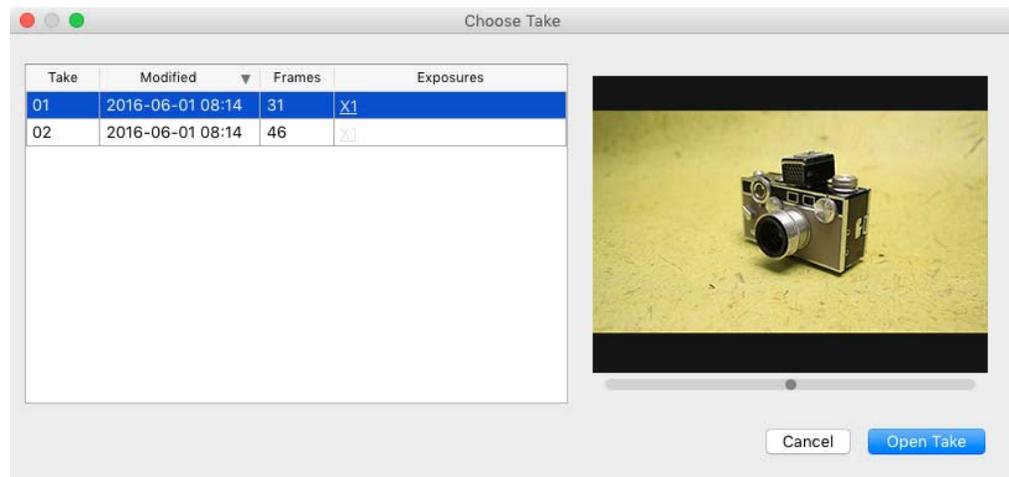
Managing Takes

Copy, rename, and delete your scene's takes from the Manage Takes dialog. The dialog shows you all of the current takes, and also displays a preview alongside that enables you to scroll through the frames in each take:
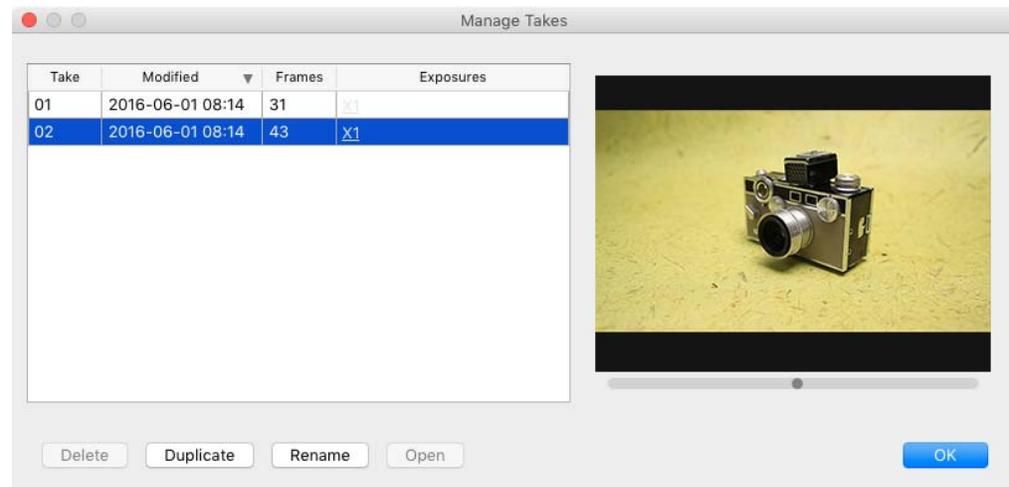
- To delete a take, select the take and click **DELETE**. You can't delete the first take of any scene.

- To copy a take, select the take and click **DUPLICATE**. Dragonframe creates a new take based on the one you copied.

- To rename a take, select the take and click **RENAME**. Dragonframe opens the Rename Take dialog.
  Rename the take, and click **OK**.

Importing Images

You can import existing images into a Dragonframe take. This may be useful if you have already shot images in the field without the use of Dragonframe.

NOTE: Dragonframe is intended to capture scenes of animation, which are put together in post-production software. Do not use Dragonframe as video editing software, stitching together thousands of images into a single long animation.

To import images:

1. Select **FILE|IMPORT|IMAGE SEQUENCE**. Dragonframe opens the Import Image Sequence dialog.
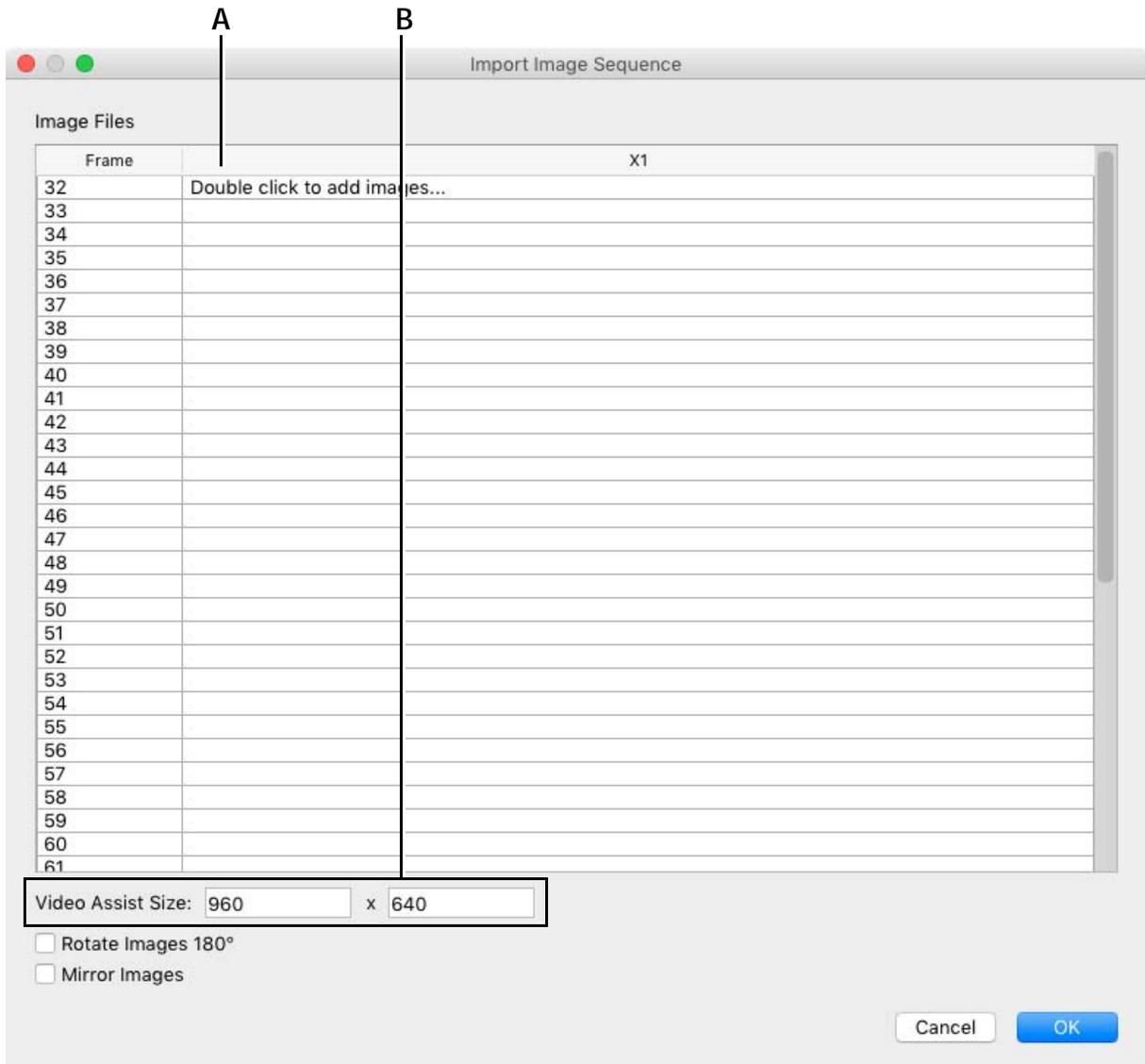
A. *Exposure column.* **B.** *Video Assist Size.*

3. Double-click the exposure column (A.). Dragonframe opens the file dialog. Select the files you want to add and click **OPEN**. Dragonframe adds the file names to the table.

4. (Optional) Drag and drop the image names to reorder the image files.

5. Set the Video Assist Size (B.). If you have a camera set up, Dragonframe will use the video assist dimensions from it.

NOTE: Do not use dimensions greater than 1024 x 1024. The video assist won't play properly if the dimensions are larger.

6. Click **OK** to import the image sequence.

Importing Scene Settings

You can import exposures, camera moves, dialogue cues, DMX keyframes, the drawing layer, and notes from other scenes into the scene you're working on.

By default, each new take you create has the same settings as the scene it was created within.

To import settings:

1. Select **FILE|IMPORT>|SCENE SETTINGS**. Dragonframe opens the Import Scene dialog.

2. Select the scene you want to import settings from. Click **IMPORT SCENE**. Dragonframe opens the Open Take dialog.

3. Select the take you want to use and click **OPEN TAKE**. Dragonframe opens the Import Scene Settings dialog. By default, all the settings for the scene are selected.
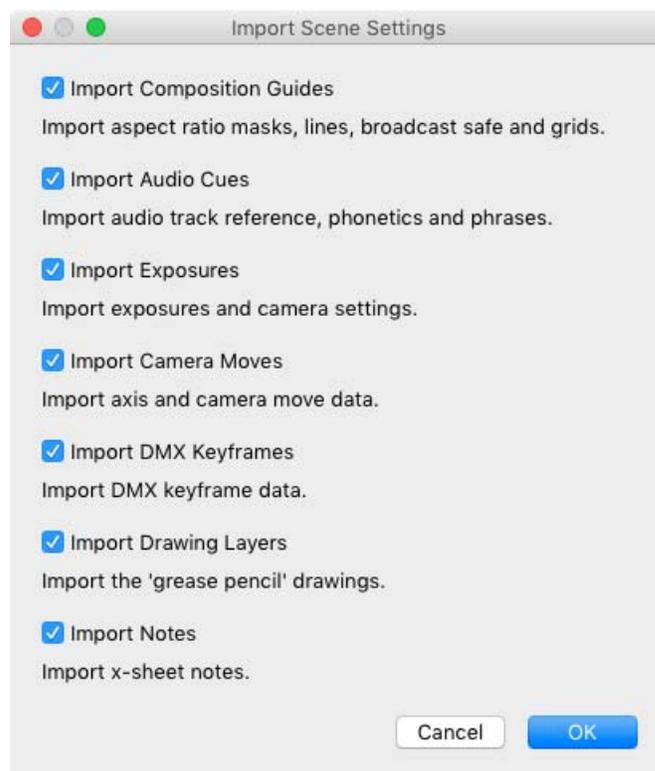
4. (Optional) Un-check any settings you do not want to import.

5. Click **OK** to import the settings.

Using a Scene Template

You can set up a template for your scene that includes elements like composition guides or track reading character setup. When you create a new scene, all of the metadata for the scene will come from the template. This is a more comprehensive alternative to importing scene settings.

The scene's metadata is stored in a file called **TAKE.XML**. You'll use **TAKE.XML** as the template for new scenes.

NOTE: If you do not want *all* of the metadata (such as drawings, DMX settings, track readings) from the template to appear in the new scene, import its settings instead.

To set up a template and use it to create new scenes:

1. Set up the skeleton scene in Dragonframe.

2. Find **TAKE.XML** and copy it to a new location. You may also want to rename it to make it easier to find.

3. Open Preferences, then select **ADVANCED**. Advanced Preferences appears:
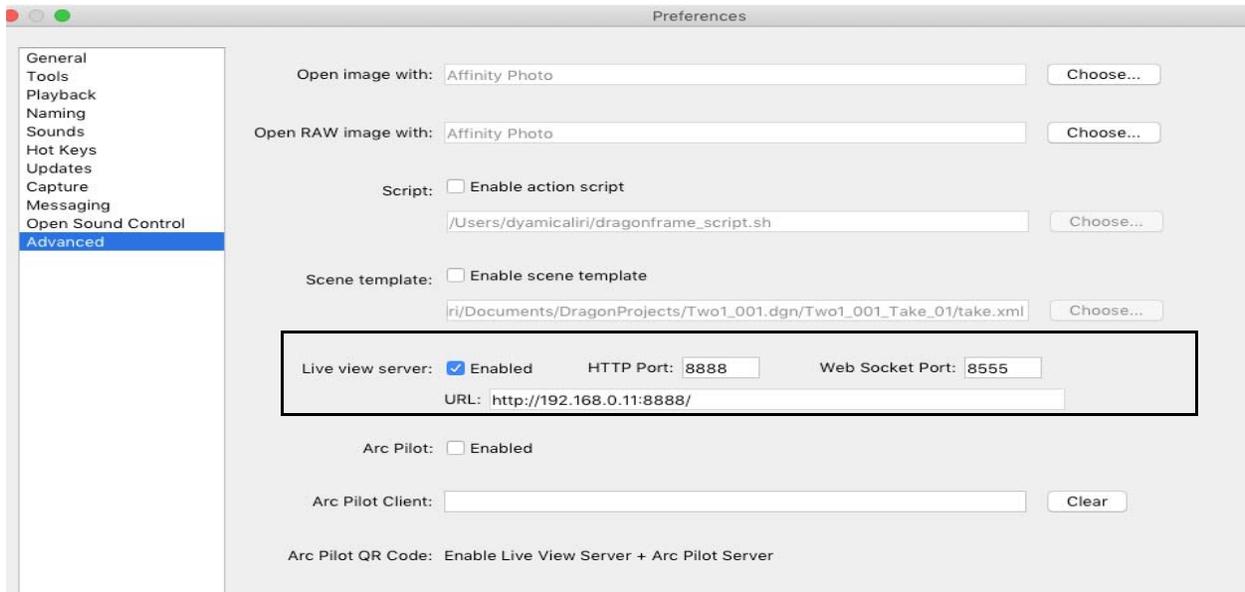
Scene template preferences.

4. Click **ENABLE SCENE TEMPLATE**, then navigate to the **TAKE.XML** file you saved in step 2. Click **OK**.

Dragonframe loads the template for the new scene. The metadata (such as composition guides, masks, drawings, DMX settings, or track reading mouth sets) appears.

NOTE: To keep from applying the scene template to some scenes, uncheck **ENABLE SCENE TEMPLATE**.

Chapter 10: Working with Audio Clips

Dragonframe provides an Audio workspace for loading audio clips and performing basic edits. You can create multiple tracks, then load audio clips into those tracks. You can select a portion of an audio clip and discard the parts you don't need, or change where the clip starts or ends.

Audio editing takes place in the playback portion of the workspace:
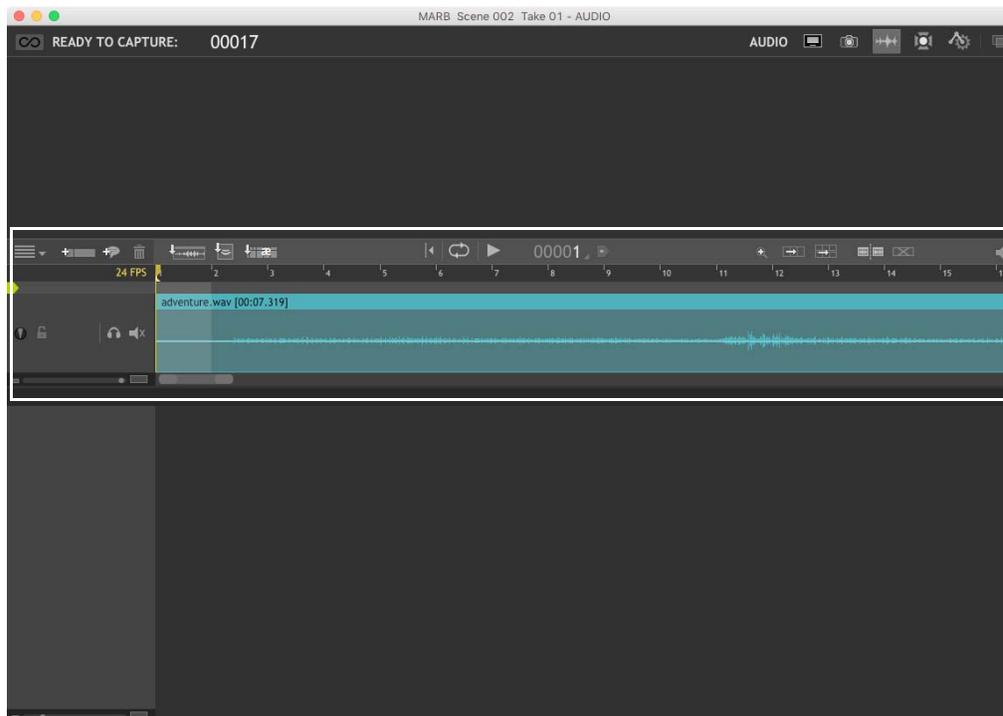
Playback portion of Audio workspace, where you can load, edit, and mark the audio clip.

The audio map on page 160 gives an overview of the playback portion of the workspace, as well as the track reading tools.

Audio Workspace Map

A. *Character Preview area: View how the face cues will look during playback.*

B. *Audio tools: Use the drop-down menu to add characters or an audio. Play back or loop the clip, mark the clip, select a row or all rows, and split or delete sections of the clip.*

C. *Waveform: Select parts of the audio clip, or move the playhead.*

D. *Character: Add face cues, phonetics, or dialogue for the characters.*

E. *View the face set for the currently selected character.*

160

Audio Tracks

An audio track is a placeholder for audio clips.

Your scene will start with one empty track. When you import a new audio clip it will show up in the first empty track, or create a new track if there are none.

Adding a Track

You may want to organize your audio clips across multiple tracks. To create a new track:

Click ![add track icon]. A new, empty, audio track appears:

A   B   C   D

A. *Expand or collapse the track.*	**C.**	*Solo the track.*
B. *Lock the track to prevent changes.*	**D.**	*Mute the track.*

Removing a Track

To delete a track, right-click (Mac **CTRL**-click) and choose **REMOVE TRACK** from the contextual menu.

Reference Audio Track

If you loaded a reference movie in the Guide Layers, you can load its audio into the Audio workspace. This could be useful if you have audio on an animatic or other reference video that you want to use for track reading.

Click ![menu icon], then select the layer from the bottom of the menu in the **REFERENCE AUDIO** section. A reference audio track appears:

A   B   C   D E   F
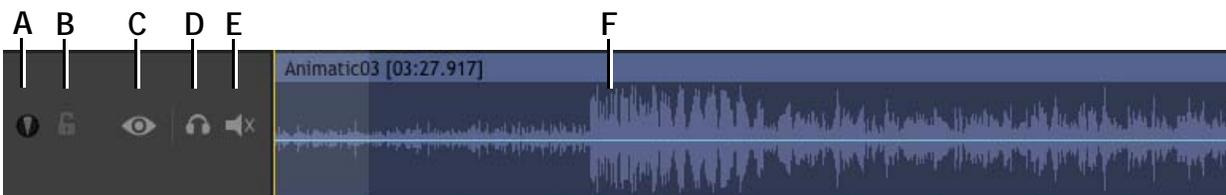
A. *Expand or collapse the track.*	**D.**	*Solo the track.*
B. *Lock the track to prevent changes.*	**E.**	*Mute the track.*
C. *Show the reference layer's video.*	**F.**	*The reference audio waveform.*

NOTE: You can only have one reference audio track in the Audio workspace.

Loading Audio Files

Add a new audio clip to your scene from the Audio workspace. To import an audio file, do one of the following:

- Click ![icon]. Navigate to the audio file, and click **OK**.

- Click ![icon], then select **IMPORT AUDIO**. Navigate to the audio file, and click **OK.**

- Drag a supported audio file into an empty area of an audio track.

NOTE: Dragonframe accepts most standard audio formats, and can also pull audio from a movie file, including .wav, .au, .aiff, .aif, .mp3, .m4a, .aac, .mov, .mp4, .m4v, .avi, and .wmv.

Dragonframe loads the audio file. The clip appears in the playback area of the workspace:
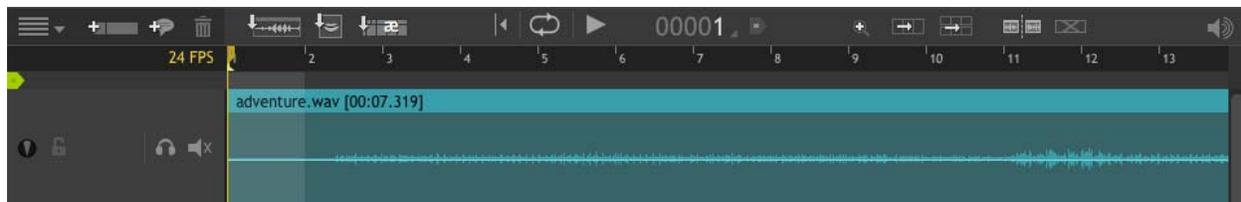
Scrubbing the Audio

Once the audio clip is loaded, you can to move through it.

- Drag the mouse through the playhead area.

- Use the arrow keys on the keyboard to step through the clip frame-by-frame.

- Press the spacebar to play the audio clip.

Playing Back the Audio

While scrubbing audio, you may want to play back all of the audio clip you've loaded, a short section of it, or play back one frame at a time to help you add audio cues and prepare to animate to the clip.

NOTE: Press ![icon] to loop playback.

Playing Back All of the Audio

To play back the entire clip, press the spacebar.

Playing Back a Section of the Audio

To play back a section of the clip:

- Move the in and out markers in the playhead area by dragging.
- Or, click and drag within the waveform area of a clip. This will also move the in and out markers.
- Press the spacebar.

Playing the Audio One Frame at a Time

- Press the arrow keys on the keyboard to step through the audio clip one frame at a time.
- Click the frame number above the portion of the clip you want to play. Dragonframe plays that frame's audio. Press and hold to loop the audio.

Muting/Soloing a Track

Each track has a mute button and a solo button:

- Click ◁× to mute the track. The track will not be heard during playback.
- Click ⌒ to solo the track. If any tracks are soloed, only those tracks will be heard.

Editing the Audio

Once you've loaded one or more audio clips, you may want to edit them, either deleting unnecessary sections, marking sections of the clips, or splitting the clips into different pieces.

NOTE: Undo any edits by pressing **CTRL+Z** (Mac **COMMAND+Z**).

Selecting the Audio Clip

Click the cyan bar over the waveform to select the entire clip. The clip turns blue:
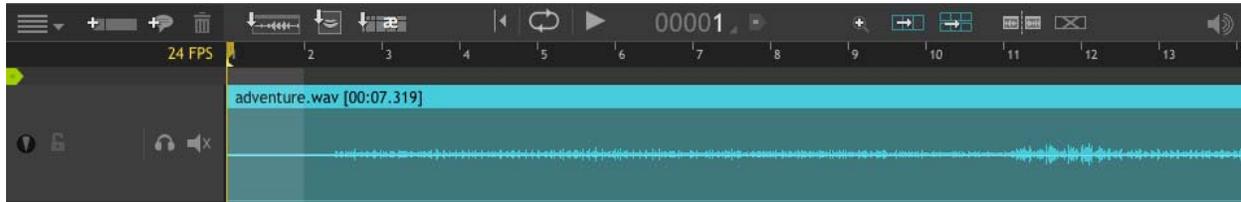
Click outside of the selection to remove it.

Splitting a Clip into Sections

You may wish to split an audio clip into sections, perhaps to have one portion play for one part of a scene, and then another portion to play later in the scene.

To split an audio clip, you can:

1. Click the cyan bar over the waveform to select the clip.

2. Move the playhead to where you want to split the audio.

3. Press ⬛⬛. Dragonframe splits the clip into two parts on either side of the playhead.

Nudging an Audio Clip

By default, Dragonframe aligns the beginning of the audio clip with the first frame. However, you may want the audio clip to start before or after the first frame, or at some other point. Offsetting the audio clip lets you adjust the start time of the clip to the nearest thousandth of a second. If you've already started entering audio cues for the clip you want to offset, you can offset the cues with the clip.

You can offset the clip in a few ways:

- Move the selected clip with the mouse. The clip snaps to the nearest frame.
- Press **SHIFT**, then move the clip with the mouse. It does not snap to the nearest frame.
- Press **SHIFT**, then the **STEP** keys to move the clip back or forward without the cues.

- Click to select audio cues and the clip together and move them in tandem.

- Right-click (Mac **CTRL**-click) the waveform, then select **NUDGE AUDIO**. From the dialog you can move the audio forward or backward by whatever frames/seconds you need.

Cropping an Audio Clip

To crop an audio clip to a selection:

1. Click and drag the left side of a clip to change where it starts.

2. Click and drag the right side of the clip to change where it ends.

Deleting an Audio Clip

To delete a portion of the audio clip:

1. Split the clip into sections on either side of the portion you want to get rid of.

2. Click above the clip you want to delete to select it:
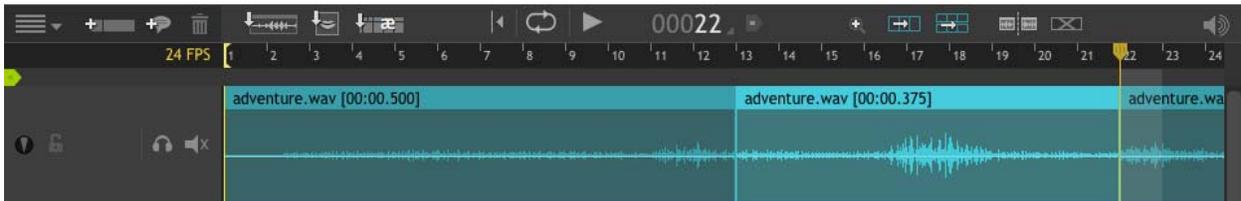
3. Press **DELETE**.

Adjusting Clip Volume

Each clip has a volume bar that you can adjust. It is a horizontal line that runs the length of the clip. By default it is located in the vertical middle of the clip.

You can adjust the clip volume relative to other clips:

1. Click the volume line within the clip.

2. Drag it up or down to the desired volume.
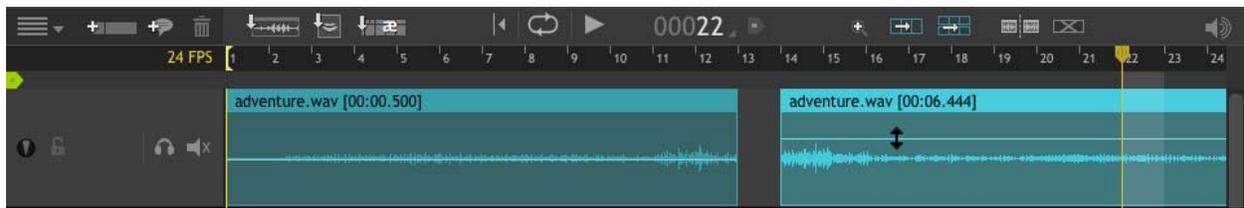
Duplicating a Clip

You can copy and paste a clip using normal keyboard shortcuts. This may be useful for repeating sound effects.

To duplicate a clip:

1. Select the clip by clicking on the area above the waveform.

2. Copy the clip using a keyboard shortcut: **CTRL+C** (Mac **COM-MAND+C**).

3. Move the playhead to a different area. This will define the starting point for the copied clip.

4. (Optional) Click on a different track. This will define which track the clip is copied into.

5. Use a keyboard shortcut to paste the clip: **CTRL+V** (Mac **COM-MAND+V**).

Exporting an Edited Audio Track

You can export an edited track to use in other scenes. This creates a new audio file that incorporates the edits you've made.

To export a clip:

1. Edit the audio as needed.

2. Click ![icon], then select **EXPORT AUDIO EDIT.** An export audio edit dialog appears.

3. Navigate to where you want to save the file, and press **SAVE**. Dragonframe saves the file.

Keyboard Shortcuts and Contextual Menus for the Audio Workspace

Use the keyboard shortcuts and contextual menus listed below to quickly access many of the Audio tools.

Keyboard shortcuts for the Audio Workspace

Press:	To	See this section for more information:
SPACE	Play or pause the audio track.	"Playing Back the Audio" on page 162.
DELETE/BACKSPACE	Delete selected clip or cues.	"Deleting an Audio Clip" on page 165.
UP	Navigate up to the next track or character.	"Scrubbing the Audio" on page 162.
DOWN	Navigate down to the next track or character.	"Scrubbing the Audio" on page 162.
LEFT	Scrub the previous frame.	"Playing Back the Audio" on page 162.
RIGHT	Scrub the next frame.	"Playing Back the Audio" on page 162.
SHIFT+LEFT	Nudge the selected items back one frame.	"Nudging an Audio Clip" on page 164.
SHIFT+RIGHT	Nudge the selected items forward one frame.	"Nudging an Audio Clip" on page 164.
CTRL+LEFT	Move to previous marker.	"Navigating Through Markers" on page 182.
CTRL+RIGHT	Move to next marker.	"Navigating Through Markers" on page 182.
CTRL+A COMMAND+A (MAC)	Select all clips and all cues.	"Selecting the Audio Clip" on page 164.
HOME	Move to the start of the audio track.	"Scrubbing the Audio" on page 162.
END	Move to the end of the audio track.	"Scrubbing the Audio" on page 162.
PAGE UP	Move backwards in the timeline by one page.	"Scrubbing the Audio" on page 162.
PAGE DOWN	Move forward in the timeline by one page.	"Scrubbing the Audio" on page 162.

Contextual Menus for the Audio Timeline

Menu Item:	To:	See this section for more information:
NUDGE AUDIO	Move the audio clip over by a few seconds, a frame, or another measurement.	"Nudging an Audio Clip" on page 164.

Chapter 11: Reading Dialogue Tracks

Besides editing a audio clips, you can use Dragonframe's Audio workspace for track reading, adding face sets, phonetic symbols, and dialogue cues. You can mark the track reading into different sections (such as scene 1 or scene 2), export all or part of the track reading to other scenes, and export a preview movie of the characters "talking."

The audio workspace map on page 160 gives an overview of the playback and track reading tools in the Audio workspace.

Setting Up Face Sets in Photoshop Layers

Set up your face sets in Photoshop (PSD) files that follow the conventions for our Audio workspace. When Dragonframe imports the files, it will organize each face cue, and, if you set it up, add things like phonetic cues and hot keys.

Dragonframe uses Photoshop layer groups to organize the shapes.

- Set up each shape with its own layer.
- Size all shapes 200 x 200 or 300 x 300. Any other size will get cropped and scaled when Dragonframe loads it.
- Use **RGB** for the Image Mode.

Creating Mouth Shapes

To create a set of mouth shapes:

1. Create a group called **MOUTH**.

2. Add a layer to this group for every mouth shape.

Creating Eye Shapes

1. Create a group called **EYE**.

2. Add a layer to this group for every eye shape.

Creating Additional Shape Groups

You can actually create abitrary groups to suit your characters (not just **MOUTH** and **EYE**), each with shape layers in them.

The groups will be layered according to the order they appear in Photoshop. It is important that the **MOUTH** group is the lowest, and other shape groups are stacked on top of it.

Here is a hypothetical layout of face set with groups for **MOUTH**, **EYE** and **BROW** shapes:

- **BROW** (Group)
  - **BROW_STRAIGHT** (Layer)
  - **BROW_ANGRY** (Layer)
  - **BROW_QUESTION** (Layer)
- **EYE** (Group)
  - **EYE_CLOSED** (Layer)
  - **EYE_WINK** (Layer)
- **MOUTH** (Group)
  - **AH** (Layer)
  - **OH** (Layer)
  - **K** (Layer)
  - ...

Creating the Background Layer

You can also have a background layer that provides a common background for all shapes.

- Name the layer **BG** or **BACKGROUND**.
- Create the layer at the top level (not within a group).

If the background layer exists, all other shapes will be composited on top of it.

Mouth and Eye Shape Naming Conventions

Name each layer so Dragonframe can recognize your shapes and display them properly.

CAUTION: Each layer must have a unique name. For example, if you name an eye layer **CLOSED** and a mouth layer **CLOSED**, Dragonframe will not recognize that they are two separate shapes.

In addition to the shape name, you can specify a shape sound and a hot key within the layer name.

Add a period (.) in between the layer name, the sound name, and the hot key.

The table below gives examples of how you might name your layers:

This Layer Name:	Is named:	Has this Sound:	And this Hot key:
A1	A1.	None.	None.
A1.AH	A1.	Ah	None.
A1.AH.A	A1	Ah	**A**
A1..A	A1	None.	**A**

Here's a Photoshop file set up for a character called Dr. S. Monkey:
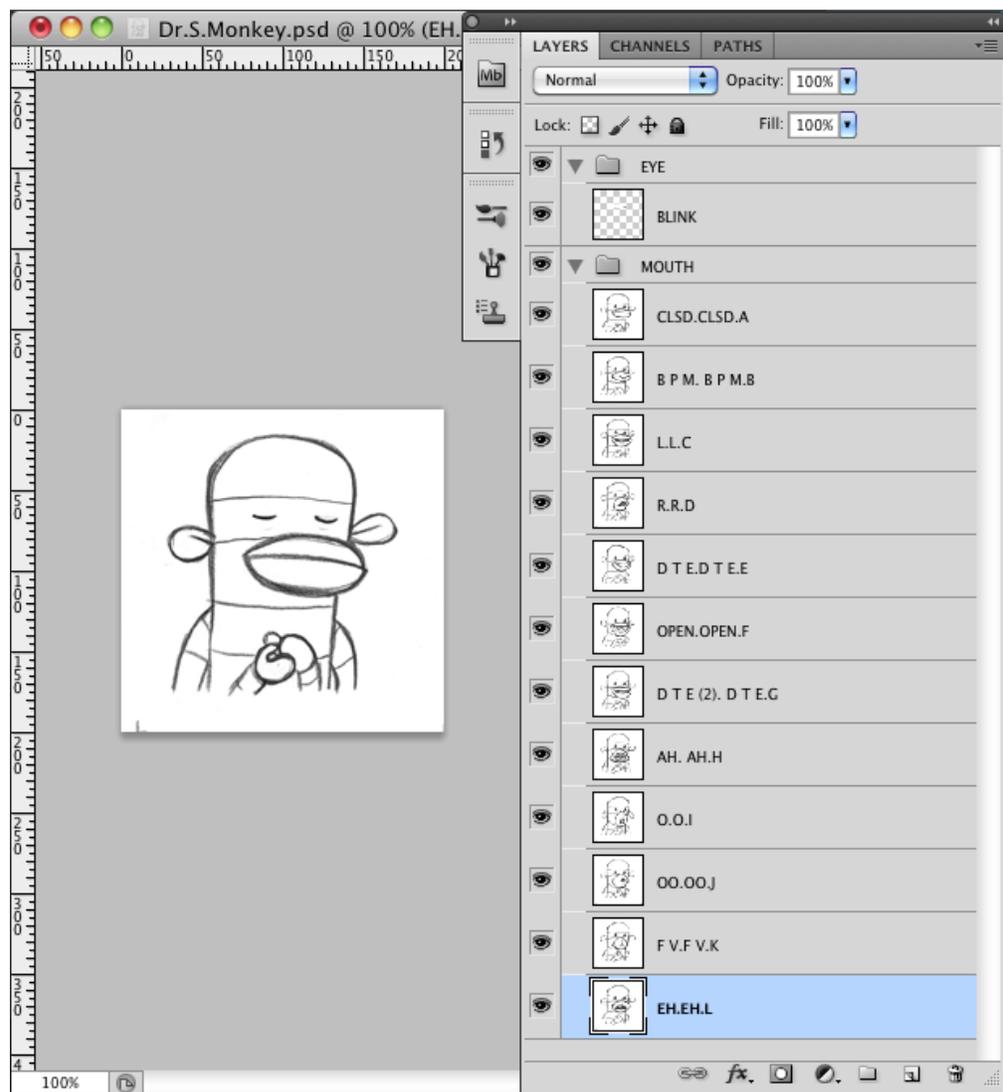
The face set shown in this manual comes with your copy of Dragon-frame. Access it here:

<INSTALLATION FOLDER>/RESOURCES/FACE SETS.

Loading Face Sets

Once you've set up the face sets in Photoshop, you're ready to load them into Dragonframe.

To load face sets:

1. Open Dragonframe and the Audio workspace.

2. Import the face set:

- Click ⮌. Or,

- Click ≡ ▾, then select **IMPORT FACE SET.**

3. The Import Face Set dialog opens. Navigate to the saved .psd file and click **IMPORT FACE SET**. Dragonframe confirms it loaded the face set.

Work with the face sets by setting up your characters. See "Setting Up Characters", below.

Managing Face Sets

You can see which face sets you have loaded, and reload them or delete them from the scene.

To manage face sets:

Click ≡ ▾, then select **MANAGE FACE SETS.** The Manage Face Sets dialog appears:
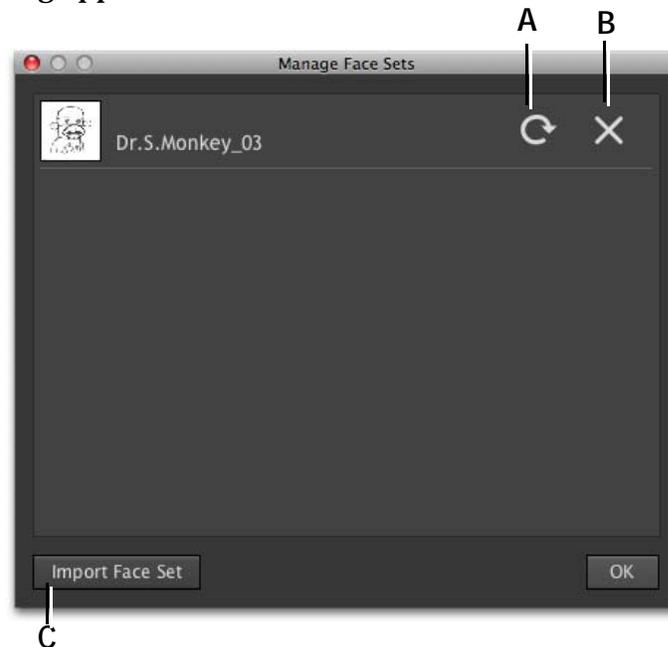
A. Reload: Reload the face set from disk. B. Remove the face set. C. Import: Import a new face set.

Setting Up Characters

Create separate track reads for each character in your scene, including face sets, phonetic symbols, and dialogue cues. Export your results to a track reading preview.

To create a new character:

1. Add the character:

    *   Click 🐾.

    *   Click ≡ ▾, then select **ADD CHARACTER.** In this example, we'll create a character named Dr. S. Monkey.

The character dialog opens.

2. Name the character, then press **OK**. Dragonframe creates a new character row. If you have face sets loaded, it automatically loads the first face in the face set:
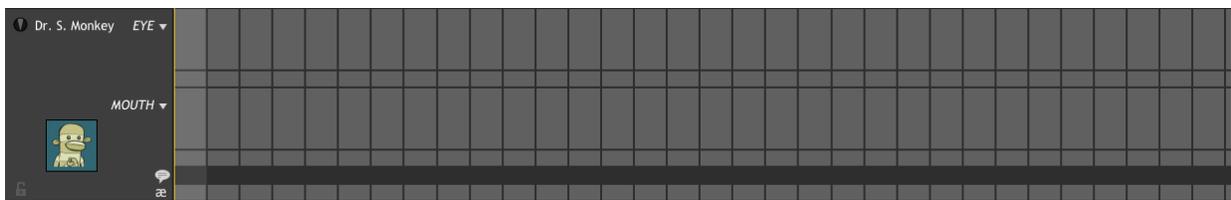
Click the face or in the character row to display the entire face set.

Adding Face Cues to the Track Reading

Once you load face sets and add the characters you need to the scene, you are ready to add the cues to the track reading.

The Audio workspace looks like this when you're ready to start adding face cues:
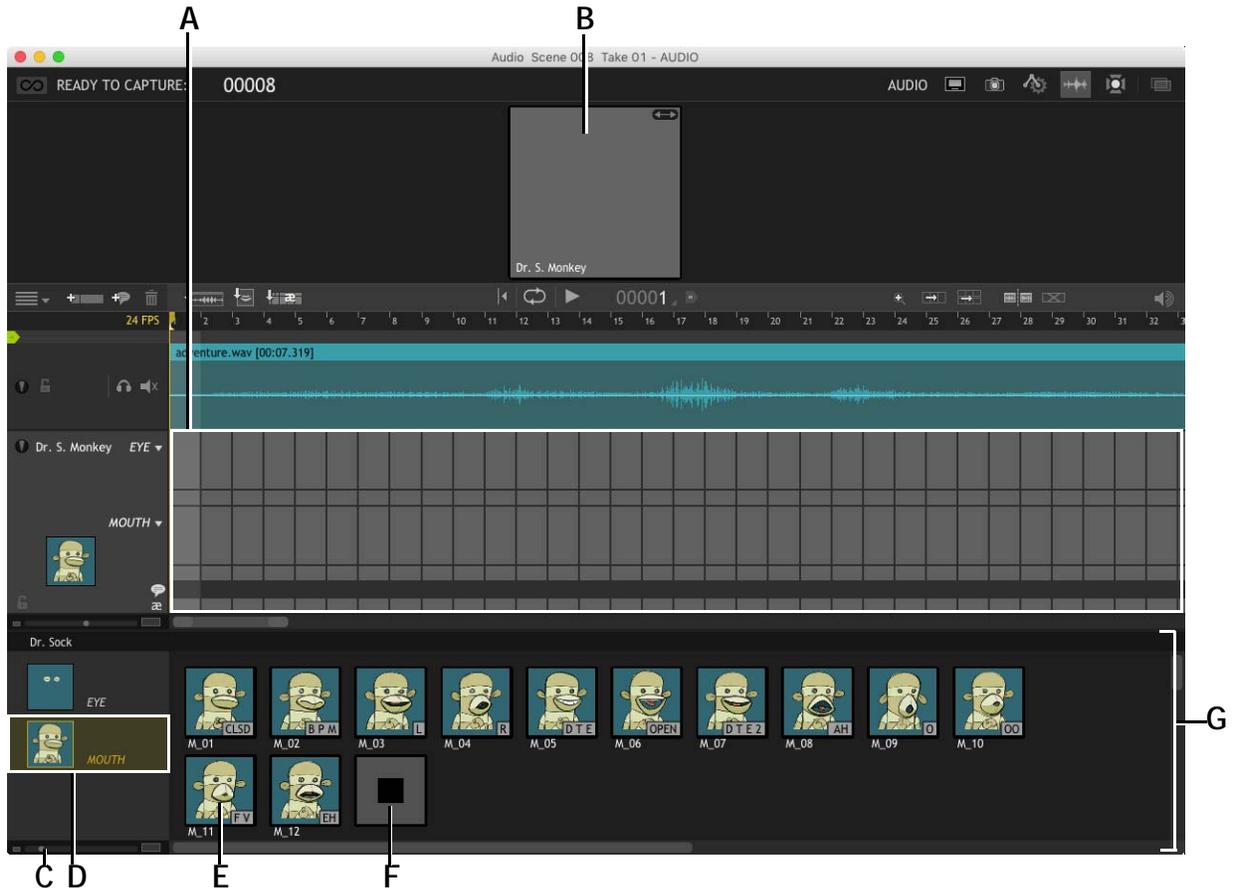
A. Character row: The track reading (faces, phonetics, etc) will all appear here.

B. Track Reading Preview area: See enlarged face cues while adding them, and during playback.

C. Resize: Adjust the size of the face set.

D. Sets: Select the group for the face set. Here, there are **MOUTH** and **EYE** groups, and **MOUTH** is displayed.

E. Mouth cue: Shows the mouth shape and the shape sound set up in the Photoshop file. Click and drag the mouth shapes to rearrange them. Or, right-click (Mac **CTRL**-click) in the mouth shape area and select **CLEAN UP SHAPES** to arrange them.

F. Stop Cue: Add when the character leaves the scene.

G. Face Set Area: View all the face shapes in the set. Move the face shapes around if needed, or right-click (Mac **CTRL**-click) in the area to snap shapes back into rows.

Adding Mouth Cues

To add mouth cues:

1. Step to the frame you'll begin with.

2. Click a mouth shape from the face set. Dragonframe adds the mouth shape to that frame and the frames that follow:
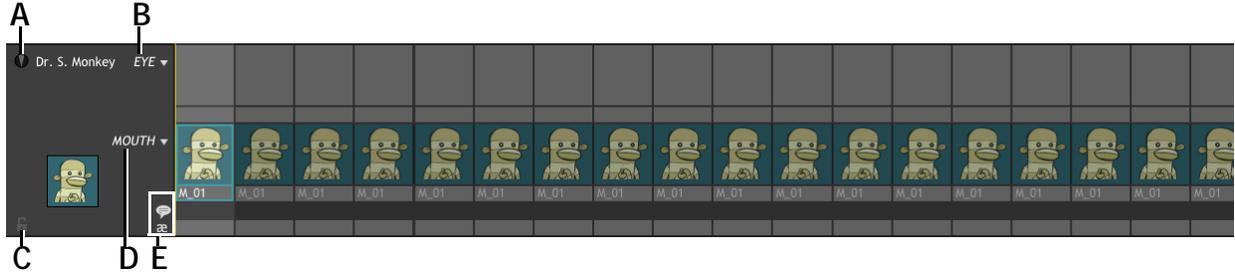
A. *Show/Hide Faces: Display or hide the face cues.*

B. *Eye row: Expand or collapse row.*

C. *Lock: Lock the character's track reading for editing.*

D. *Mouth row: Expand or collapse row.*

E. *Phonetic/Dialogue Rows.*

3. Step to the frame where the character's face changes next.

4. Select a second face shape from the face set.

Adding Eye Cues

If your Photoshop file has eye and mouth layers (or other additional layers), you can add those as well.

To layer an eye shape on top of the mouth set:

1. In the character row, click ≡┳ (B.), then select **EYES**. Dragonframe shows the eye row.

2. Navigate to the frame you'll edit.

3. Add the mouth shape to the frame as described above.

4. In the face set area, click **EYES**:
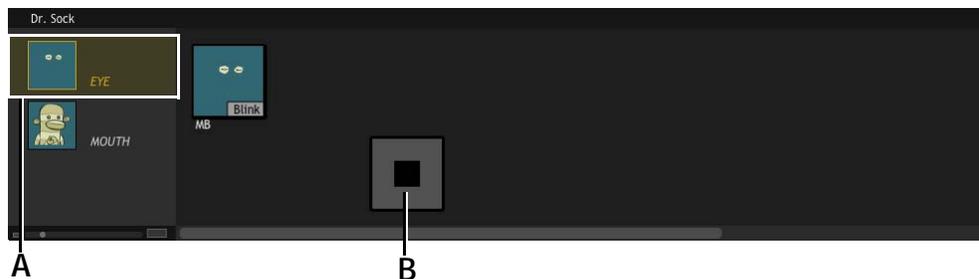
A. *Face set with "Eye" group selected.* B. *Stop cue.*

3. Select the eye cue you need. Dragonframe layers the eye set over the mouth set.

4. (Optional) To remove the eye layer from subsequent frames, click the **STOP** cue.

Selecting Cues

You can select individual rows of cues, or select the audio track and all cues at once. This makes it easy to move cues to the right frame, or to move the audio track and cues together.

- To select all or part of one row:

    a. Select the cell where you want to begin the selection:
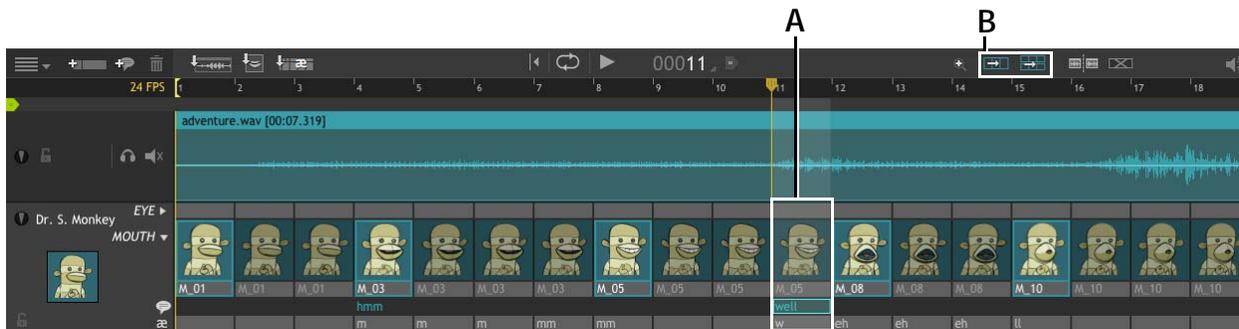
A. *Track reading with one word of dialogue selected.* **B.** *Select buttons.*

    b. Click (B.). Dragonframe selects the selected cell, and all of the frames that follow.

Dialogue row selected from original cell.

- To select all cues:

    a. Select the cell where you want to begin the selection.

b. Click ▣▣ (B.). Dragonframe selects the selected cell, all of the cues that follow, and the audio clip:

Track Reading Preview Area

As you add face cues to the character, they appear above the audio clip, in the preview area:
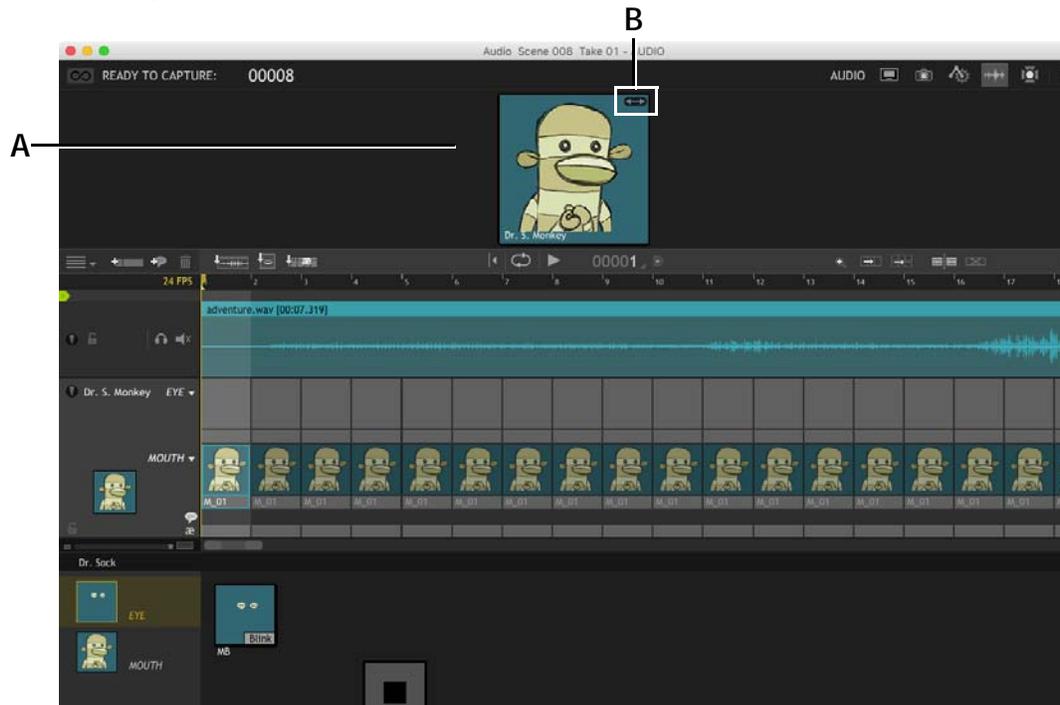
A. Preview area. *B.* Flip: Move the mouse over the character's image to display the flip button. Click it to flip the image left to right. If there are two characters, using **FLIP** can make them "face" each other.

See also:
"Exporting a Track Reading Preview" on page 184.

Adding Phonetics and Dialogue Cues

Add phonetics and dialogue above the face set in the character row:
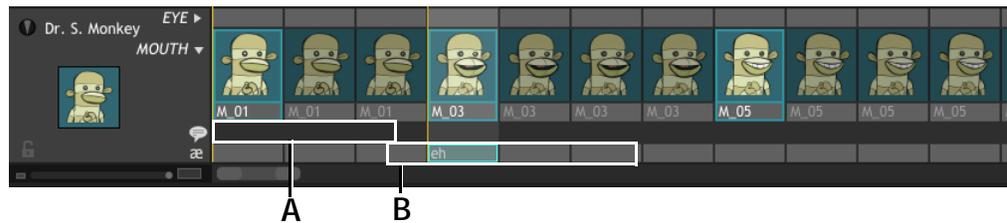
A. *Dialogue row.* **B.** *Phonetics Row with one cell selected.*

To add phonetics:

1. Double-click the first cell where you need to add the phonetics.

2. Type the phonetic cue, then use the arrow key to move to the next cell.

3. Type the phonetic cue, then move the next cell.

4. Continue until you've added all the cues.

Adding Dialogue Cues

You can add dialogue exactly the way you add phonetics: by clicking in to a cell, typing, then moving to a new cell.

Alternatively, you can enter a line of dialogue and then move the text around:

1. Double-click the first cell where you need to add a dialogue cue.

2. Type the dialogue for that character. You can type the entire section of dialogue for the scene with only one cell selected.

3. Click outside of the row. Dragonframe automatically moves each word to a separate cell:

4. Click and drag each word to the appropriate place alongside the audio clip.

NOTE: Adjust the scale of the audio clip and character to make it easier to drag the dialogue cues.

Marking the Track Reading

You can place markers throughout the track reading for easier navigation, or to section the reading into scenes. When you import the reading, you can select which marked sections to import.

Use the marker tools in the workspace to add and manage markers:

A. Marker menu. Click the icon to see a list of all markers. B. Marker 1 for the scene. C. Add/ Remove Marker: Click to add an marker, or click a selected marker to delete it. When the icon is green, the playhead is currently over a marker.

To place markers on the scene:

1. Move the playhead to the frame you want to mark.

2. Click ▶ (C.). Dragonframe adds a marker. Click ▶ again to remove the marker.

3. (Optional) Double-click the marker to edit its name.

Navigating Through Markers

*   Press **CTRL** and the arrow keys to step through the markers one at a time. Or,

*   Open the marker menu (A.) to see a list of all markers.

Viewing the Track Reading in the X-Sheet or Timeline

You can view track reading information, including mouth and face shapes, in the timeline. You can view the same information in the X-Sheet as well, without the shapes.

The Heads-Up Display

You can view audio cues and mouth shapes in the Heads-Up Display (HUD) within the Animation workspace.

To view the display, turn on the track layer within the Guide Layers of the Animation workspace:
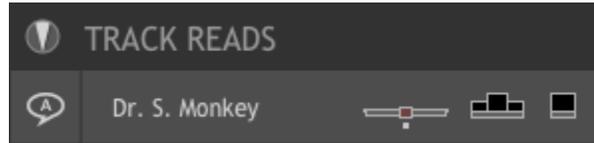
The default HUD appears:
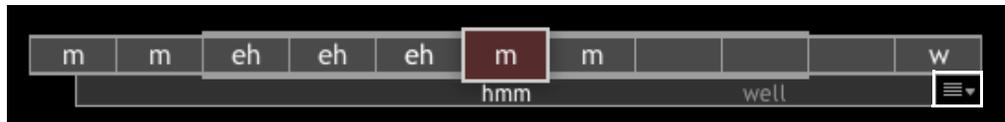
HUD with phonetics and dialogue showing. Menu is highlighted on the right.

Alternatively, you can choose one of the other two HUD views, which show the face shapes three- or one-at-a-time:
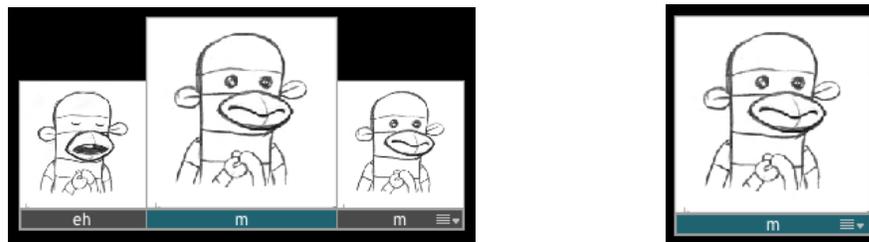
Use the menu to show phonetics or the names of the face shapes.

Exporting the Track Reading

You can export the track reading, including face cues, phonetic cues, and markers.

1. To export the track reading, click ☰ ▾, then select **EXPORT TRACK READING.** Dragonframe opens an export dialog.

2. Navigate to where you want to save the reading and click **SAVE.**

Dragonframe exports the track reading.

Importing a Track Reading

Once you've exported a track reading, you can import it into other scenes. If you've marked the track, you can import a single section or the entire track.

To import the track reading into another scene:

1. Open the scene you want to import the reading to.

2. Click ⊬ to open the Audio workspace.

3. Click 🎞æ. Navigate to the saved track reading and click **IMPORT TRACK READING**.

The Import Track Reading dialog appears.

A — Section: All

B — Start frame: 1 (This will be the first frame of the imported track read.)

C — ☑ Move start and end frames of scene to match track reading

Cancel   OK
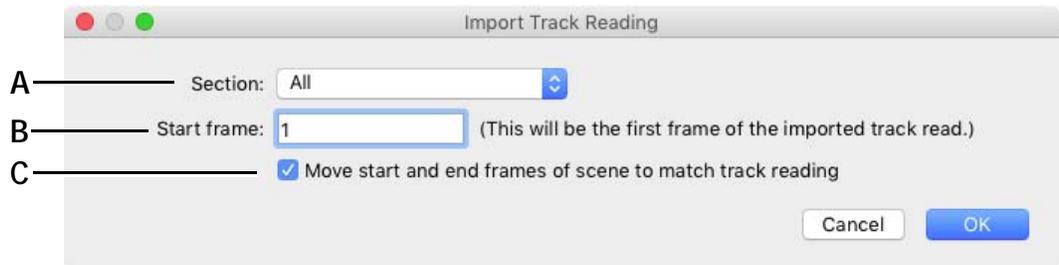
A. *Section Drop-down list: Select only one of the marked sections from the track reading, or import all the sections.*

B. *Start Frame: Select which frame number to start the scene with.*

C. *Match the starting and ending frame numbers to the frame numbers in the marked section. For example, if the section starts with frame 48 and ends with 156, the new scene will start on frame 48 and end with 156.*

4. Select the options you need and click **OK**.

Dragonframe imports the selected sections into the new scene.

Exporting a Track Reading Preview

You can create a video preview of the face cues from your scene.

To export a track reading preview:

1. Click ☰ ▾, then select **EXPORT PREVIEW.** The Export Preview dialog appears.
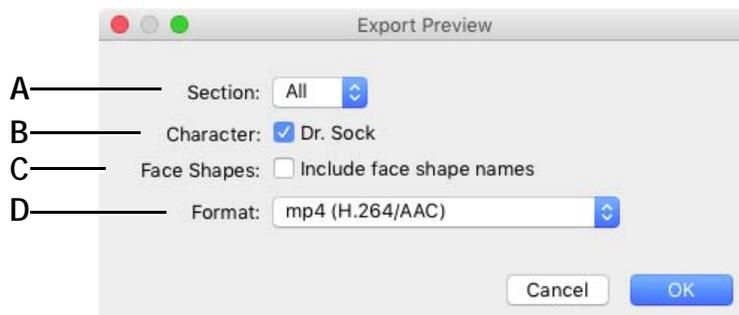
A. *Section: Choose which marked section to export to the preview, or choose* **ALL**.

B. *Character: Choose which character to include.*

C. *Face Shapes: Show face shape names in the exported video.*

D. *Format: Video export format.*

2. Adjust the export options as needed, and click **OK**. Dragonframe exports the preview. A dialog appears.

3. Navigate to where you want to save the file, and click **SAVE**.

See also:
"Marking the Track Reading" on page 182.

Exporting an After Effects Time Remap

Dragonframe can produce an After Effects "Time Remap" file from your audio track reading. This is a special text data file that instructs After Effects to show a specific layer at a specific time. Using advanced After Effects knowledge, you can use this to make an animation from your track reading.

See also:
Creative Cow's tutorial about how to use time remap information in After Effects:

http://library.creativecow.net/articles/rabinowitz_aharon/lip_synch/video-tutorial

Contextual Menus for the Audio Face Set Area

Right-click (Mac **CTRL**-click) in the audio face set area to access a contextual menu.

Select:	To:	See this section for more information:
CLEAN UP SHAPES	Snap the face shapes into rows and columns.	"Adding Face Cues to the Track Reading" on page 176.

Chapter 12: Using the X-Sheet

The X-Sheet is your scene's timing roadmap. It can also be referred to as an exposure sheet or a dope sheet.

The X-Sheet gives an overview of your scene, with exposures, audio cues, and any reminders you've set for yourself. Draw on the X-Sheet, or customize its layout. As you update your scene, the X-Sheet updates automatically as well. You can also print a hard copy of the sheet for easier reference while you're animating.

X-Sheet Map

A. *Print: Print the X-Sheet.*

B. *Production Information. Click editable cells to add info.*

C. *Column Headers: Click and drag to rearrange columns. Columns can include Frame numbers, exposures, dialogue information, notes and custom columns.*

D. *Rows: Keeps track of scene information, including held or hidden frames, exposures, and dialogue information.*

E. *Add Column: Add a preset or custom column.*

F. *Text Size: Adjust the sizing of the X-Sheet.*

G. *Layout: Change the X-Sheet's on-screen color scheme.*

H. *Sheet #: Shows the page you're currently viewing. When printed, each page contains 48 frames.*

I. *Scroll Bar: Page through the X-Sheet.*

J. *Frame Editing Tools: Hide, show hidden, hold and delete frames.*

K. *Drawing Tools: Mark up the X-Sheet.*
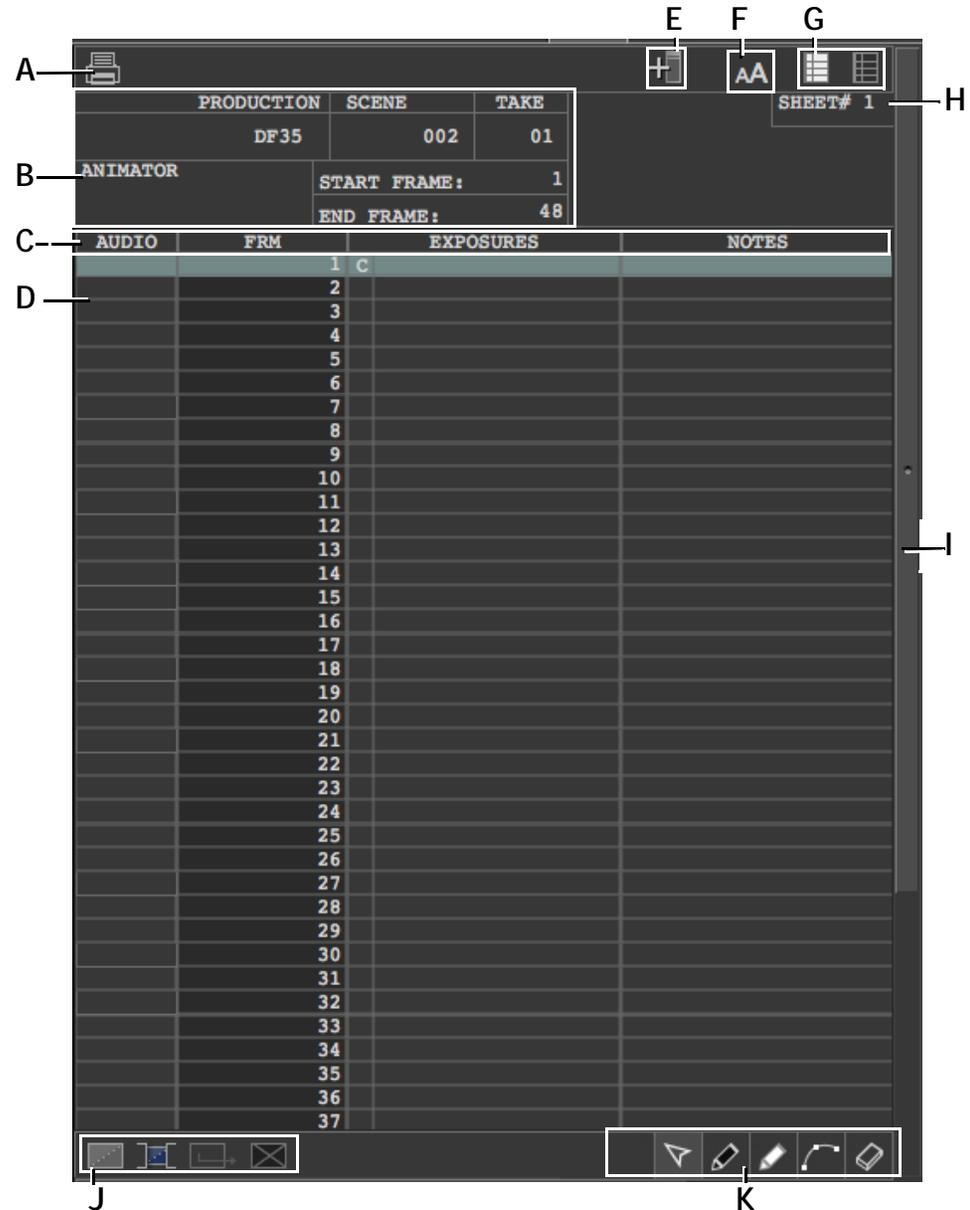
Understanding the X-Sheet

When you're shooting your scene, the X-Sheet updates dynamically to help you keep track of the elements of the scene.

To open the X-Sheet, click ▥ in the bottom right corner of the Animation workspace.

As you capture frames, the X-Sheet gives you another way to keep track of what you've shot and which frame (and exposure) you're about to capture:

A. *Current Frame. This frame is the frame currently showing in the View pane.*

B. *Selected frame. This frame has been selected with the mouse. You could copy, cut, or otherwise edit the frame in the X-Sheet.*

C. *Frame about to be captured. It's highlighted with blue.*
x marks an already-captured exposure.
c marks the exposure to be captured.
In this example, you are about to capture frame 9, exposure 1.

Adding Production Information to the X-Sheet

The information for your scene and take appear in the X-Sheet automatically when you create a new scene. Some of the areas in the X-Sheet header are editable. Click inside the header to add your animator's name, a note about the scene, or to edit the scene length.

Setting Scene Length and Starting Frame

The X-Sheet is set at 48 frames long. As you shoot past frame 48, the X-Sheet grows accordingly.

Preset the length of the X-Sheet in two places:

- Click **SCENE|SETTINGS**. The Settings dialog opens:
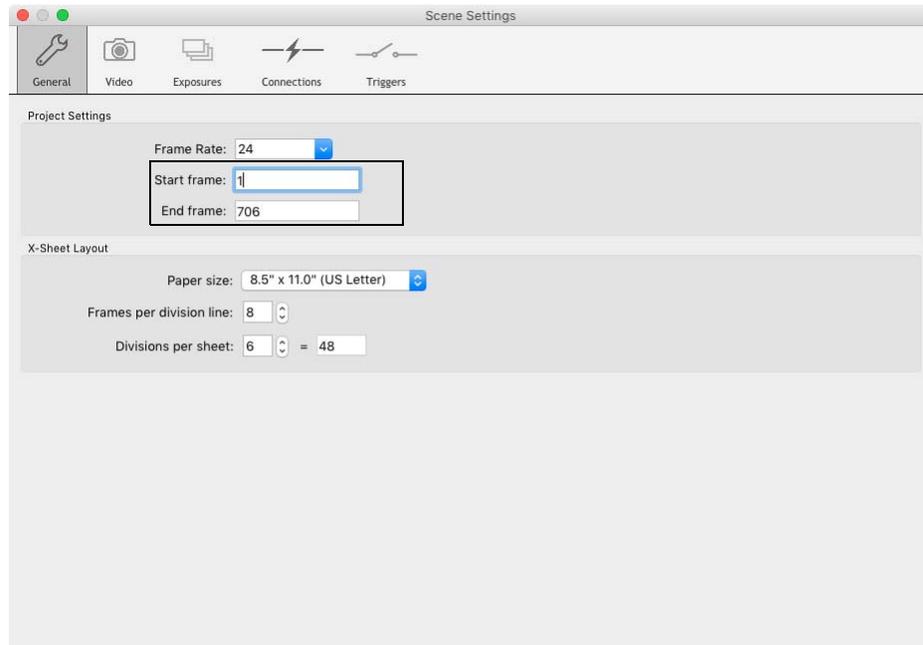
Start Frame and End Frame fields in General Settings.

- Open the X-Sheet (**WINDOW|X-SHEET**) and look for **START FRAME/ END FRAME** in the header:
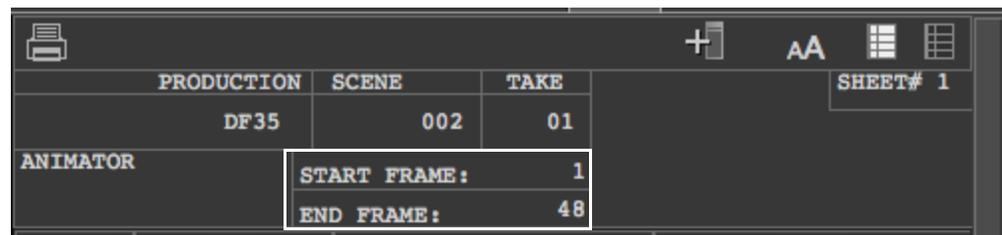
Start Frame and End Frame fields in the X-Sheet.

From either the Settings dialog or the X-Sheet, change the length of the scene by entering values in the **START FRAME** or **END FRAME** fields.

The X-Sheet updates automatically to reflect your changes.

NOTE: You can set your scene to start at a frame other than 1.

Frame Editing From the X-Sheet

You can cut, copy and paste frames within the X-Sheet, instead of doing it with the timeline. The X-Sheet gives you a broad overview of the entire scene in a table format.

See also:
"Frame Editing with the Timeline" on page 133.

Cutting or Copying from the X-Sheet

To cut or copy frames from the X-Sheet:

1. Select rows:

    -   Click the row of the first frame you want to cut or copy, then drag the cursor over any additional rows to include. The rows you select have a cyan outline. Or,

    -   Click the first frame you want to cut or copy, press **SHIFT**, then click the row of the last frame you want to include. The rows you select have a cyan outline.

2. Cut or copy the section:

    -   Right-click (Mac **CTRL**-click) and select **CUT**, or **COPY**. Or,

    -   Press **CTRL+X** (Mac **COMMAND+X**) or **CTRL+C** (Mac **COMMAND+C**).

Pasting Frames from the X-Sheet

To cut or copy frames from the X-Sheet:

1. Click the row of the frame where you want to paste cut or copied frames. The row has a cyan outline.

2. Paste the frames:

    -   Right-click (Mac **CTRL**-click) and select one of the four paste options. Or,

- Press **CTRL+V** (Mac **COMMAND+V**). The paste dialog appears:
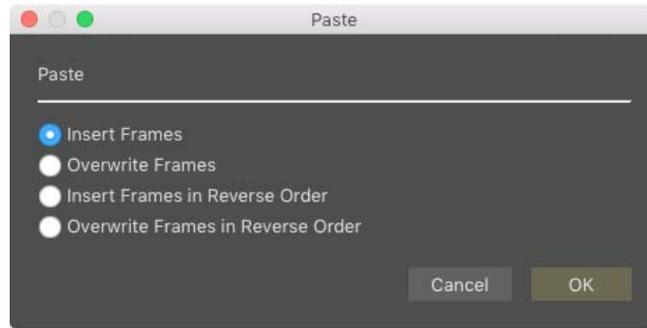
Choose one of the four paste options and click **OK**.

Holding a Frame in the X-Sheet

If you wish to repeat a frame, or hold it, you can do so from the X-Sheet. This is the same thing as copying the frame and pasting it multiple times.

To hold a frame:

1. Move the mouse to the bottom edge of a frame and click and drag the cursor down for the number of frames you wish to hold.

Frame 2 selected. Cursor hovers over the bottom edge of the cell for frame 2 in the FRM column.

Or, select a frame, then click ⬚. A dialog appears. Enter how long to hold the frame and click **OK**.

Dragonframe marks the frames held:

Frame 2 is held (repeated) from frame 2 to frame 4.

Hiding a Frame in the X-Sheet

Hide a frame to leave it out of the X-Sheet and Timeline without completely deleting it. Dragonframe marks hidden frames in the X-Sheet; you can either show or hide hidden frames while you're working them.

NOTE: Dragonframe will only hide entire frames, not individual exposures.

To hide frames:

1. Select the frame(s) you want to hide:

Frames 5-7 selected; camera ready to shoot frame 9.

2. Click ▬. Dragonframe hides the frames, renumbering the frame sequence:

The old frames 5-7 are now hidden. Camera is now ready to shoot frame 6 since three frames of the sequence are hidden.

3. (Optional) Hide the hidden frames in the X-Sheet by clicking ▣.
    Dragonframe removes the hidden frames and replaces them with a
    marker:

Showing Hidden Frames

To show hidden frames, click ▣. Dragonframe shows the hidden
frames in the X-Sheet:

Unhide Hidden Frames from the X-Sheet

To unhide frames that you hid:

1. (Optional) Show any hidden frames.

1. Select the hidden frames.

2. Click ▣. Dragonframe unhides the hidden frames.

Deleting Frames from the X-Sheet

To delete frames from the X-Sheet:

1. Select the rows you want to delete. The rows you select have a cyan outline.

2. Press ✉, or right-click (Mac **CTRL**-click) and select **DELETE**. Dragonframe deletes the selected rows, including all exposures, and places the files in the delete bin.

NOTE: To replace just one exposure in a frame, you can reshoot it from the X-Sheet.

Reshooting a Frame Sequence from the X-Sheet

There are three ways to reshoot frames:

- To reshoot one or more frames, select those frames and right-click (Mac **CTRL**-click), then select **RESHOOT FRAMES**. Dragonframe clears the old frames from the X-Sheet, and replaces them with the frames you shoot next. When you're finished, Dragonframe will continue shooting at the end of the frame sequence.

- To insert one or more frames earlier in the sequence, select a frame and right-click (Mac **CTRL**-click), then select **INSERT CAMERA**.

  Dragonframe will add frames from that part of the frame sequence until you right-click (Mac **CTRL**-click), then select **RETURN CAMERA TO END**.

- To reshoot a single exposure earlier in the sequence, double-click the cell of the exposure you want to reshoot. The **C** moves to the cell you selected. Press **SHOOT** to overwrite the exposure.

  To reshoot the exposures that follow, continue shooting. Dragonframe will overwrite the rest of the frames.

  Or, right-click (Mac **CTRL**-click), then select **RETURN CAMERA TO END.**

Retiming a Frame Sequence from the X-Sheet

Dragonframe can set holds of one to four frames for every frame in a sequence. This makes it easy to experiment with different timing.

To retime a frame sequence:

1. Select the rows you want to retime. The rows you select have a cyan outline.

2. Right-click (Mac **CTRL**-click), then select **RETIME SEQUENCE**. In the submenu that appears, select **ON ONES**, **ON TWOS**, **ON THREES** or **ON FOURS**. Dragonframe will create a hold of one, two, three or four frames for every frame in the sequence.

Customizing the X-Sheet's Columns

You can add, delete, or customize the X-Sheet's columns.

- Click column headers and drag them to rearrange the columns.
- Click and drag the right edge of a column header to resize the column.
- Right-click (Mac **CTRL**-click) a NOTES column header and click **ALERTABLE** to make Dragonframe display a pop-up reminder for the notes in that column.
- Right-click (Mac **CTRL**-click) a column and click **CLEAR COLUMN** to remove all of its data.
- Right-click (Mac **CTRL**-click) a column and click **REMOVE COLUMN** to remove it from the X-Sheet.
- Add custom or preset columns:

  a. Click ⊞ (at the top of the X-Sheet). A drop-down menu appears.
  b. Select a preset column, or a custom (**EMPTY**) column. The column appears.
  c. (For a custom column) Right-click (Mac **CTRL**-click) the new column's header and select **RENAME COLUMN** to add a header.
  d. (For a custom column) Double-click in rows to add content, just as you would in the **NOTES** column.

Importing X-Sheet Data

You can import data from a .csv file into the X-Sheet. Dragonframe allows you to choose which columns and data to include in the import.

To import X-Sheet data:

1. Click **FILE|IMPORT|X-SHEET DATA…** Dragonframe opens the Import X-Sheet dialog.

2. Navigate to the .csv file you want to import, and click **IMPORT X-SHEET DATA**. Dragonframe opens the Import Track Reading dialog:

3. (Optional) Select whether to import all frames or a range of frames.

4. Choose which columns to include in the import. You can have Dragonframe include the data in new columns, the existing notes column, or new or existing audio columns.

5. Click **OK**. Dragonframe imports the data into the X-Sheet.

Leaving Reminder Notes in the X-Sheet

You can add notes to the X-Sheet and set them to pop up before you shoot a frame. You can also clear selected notes from the X-Sheet.

To set a reminder note:

1. Double-click the **NOTES** column in the X-Sheet, in the row of the relevant frame.

2. Type the note.

3. (Optional) To make the note pop up on that frame, click the dia-
   mond that appears next to the note:

Note with diamond selected. The note will pop up on frame 4.

When you're about to shoot a frame where you've added a pop-up note,
Dragonframe opens the note:
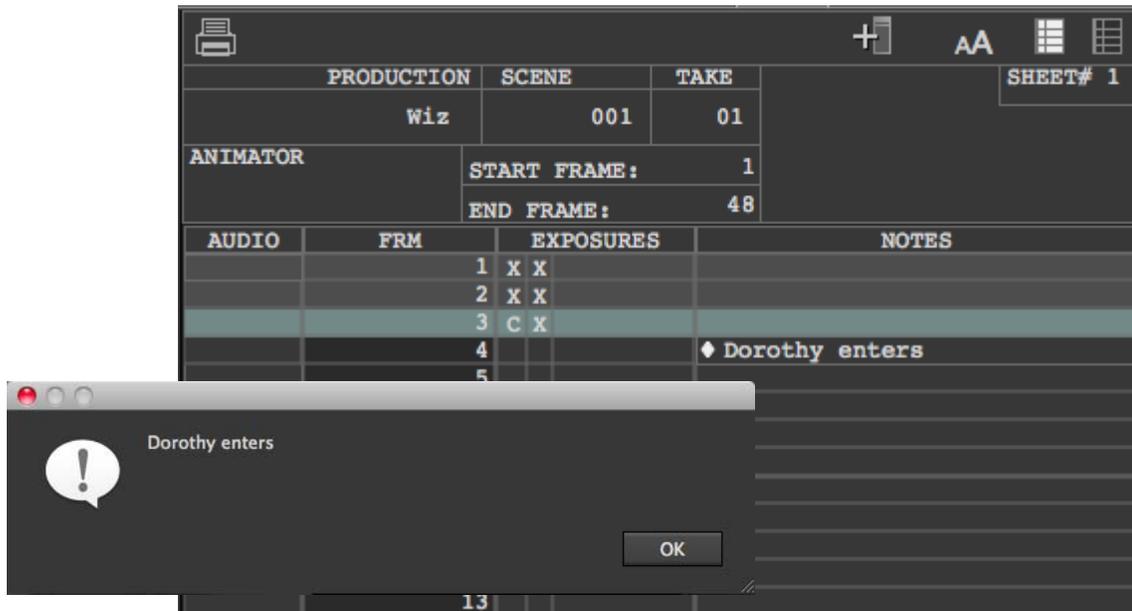
Note added in Notes column, with corresponding pop-up reminder.

To clear a note:

Select the notes you want to clear, then right-click (Mac **CTRL**-click) and
select **CLEAR SELECTED NOTES.**

Editing Notes

You can edit notes much like you would edit in a spreadsheet program.

- To change a note, double-click in the cell and edit it.

- To copy, cut, or paste a note, use standard shortcuts or the contextual menu.

- To move one or more notes, select them, then drag them to a new location.

Creating Post-Production Notes

The animator may want to communicate frame-specific things to post-production. For example, maybe something was left in the shot that will need to be digitally removed.

Add a special POST NOTES column to the X-Sheet via the add column (+ sign) menu at the top top of the X-Sheet.

AUDIO	FRM	EXPOSURES	NOTES	POST NOTES
	1	X X		
	2	X X		
	3	X X		
	4	X X		Coffee cup in shot. Sorry!
	5	X X		
	6	X X		
	7	X X		Note rigging in corner
	8	X X		
	9	X X		
	10	X X		
	11	X X		
	12	X X		
	13	X X		

Any notes in this POST NOTES column will be saved to the scene metadata file. Learn more about this in "Exporting Post-Production Metadata" on page 346.

Drawing on the X-Sheet

The X-Sheet has simple drawing tools at the bottom of the workspace:

A. *Selection tool.*

B. *Freehand drawing tool in black.*

C. *Freehand drawing tool in white.*

D. *Curve drawing tool.*

E. *Eraser tool. Double-click to erase all drawings.*

Viewing Audio Information in the X-Sheet

You can view audio information in the X-Sheet, such as the waveform, phonetic cues, or mouth names.

You can add columns for audio cues by pressing ⊹. An X-Sheet with all audio information displayed might look like this:

Printing the X-Sheet

To print a hard copy of the X-Sheet, click **FILE|PRINT**, or click 🖨 in the X-Sheet.

NOTE: The X-Sheet shows a dotted line where the page break falls:

X-Sheet with a page break alongside the Notes column.

Customizing the X-Sheet's Print Layout

By default, the X-Sheet will fit a standard 8 ½ by 11 inch sheet of paper. It will contain 48 frames per sheet. Frames are grouped by thicker, "division" lines. By default, there are eight frames per division, and 6 divisions per page.

Click **SCENE|GENERAL** to adjust the size and layout of the printed X-Sheet. The Scene dialog appears:
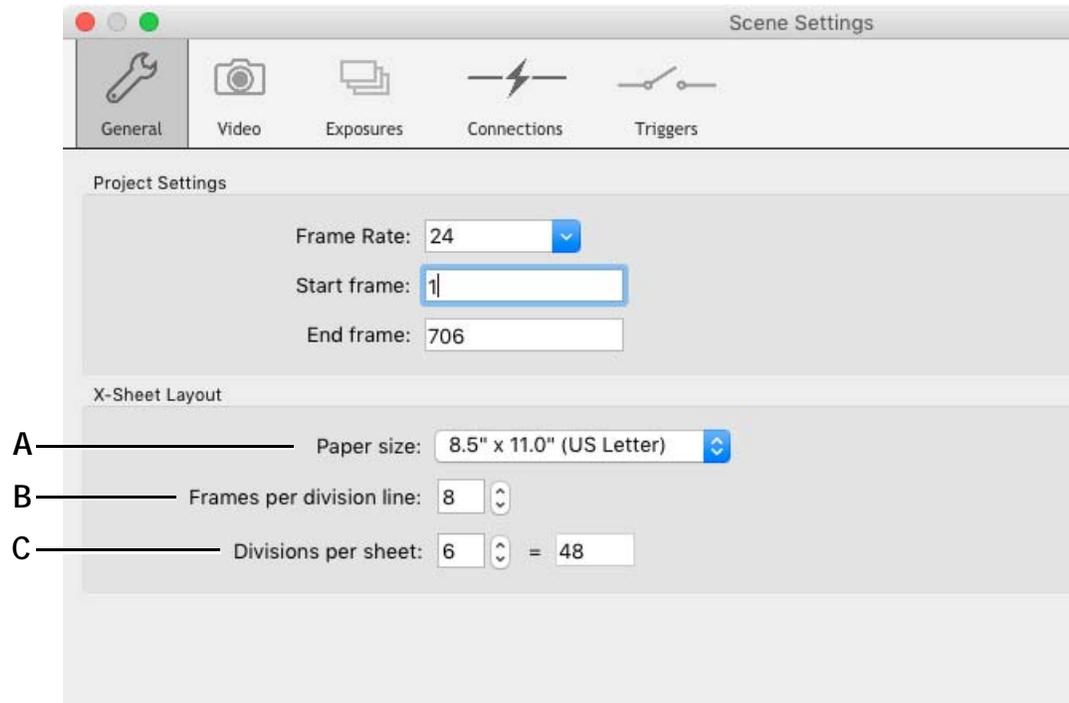
A. *Select a new paper size.* **B.** *Change how many frames are grouped together between division lines (thicker lines) on the page.* **C.** *Change how many divisions will appear on each page.*

You can also add, delete, or resize columns to change the print layout.

Exporting the X-Sheet as a CSV

Export the X-Sheet to give you more control over formatting, or to review the data in another program (such as Excel).

Click **FILE|EXPORT X-SHEET** to export the X-Sheet as a CSV file. It will include all audio track reading information, camera move data and notes.

Keyboard Shortcuts and Contextual Menus for the X-Sheet

X-Sheet Keyboard Shortcuts

Press:	To	See this section for more information:
ESCAPE	Exit the drawing tool.	"Drawing on the X-Sheet" on page 201.
DELETE or **BACK-SPACE**	Delete selected drawing objects.	"Drawing on the X-Sheet" on page 201.
COMMAND+D **CTRL+D**	Duplicate selected drawing objects.	"Drawing on the X-Sheet" on page 201.

X-Sheet Contextual Menu for Cells

Select:	To:	See this section for more information:
CUT	Cut the selected frame.	"Cutting or Copying from the X-Sheet" on page 191.
COPY	Copy the selected frame.	"Cutting or Copying from the X-Sheet" on page 191.
PASTE INSERT	Paste the frame in between the existing frames.	"Pasting Frames from the X-Sheet" on page 191.
PASTE OVERWRITE	Paste the frame over existing frames.	"Pasting Frames from the X-Sheet" on page 191.
PASTE REVERSE	Paste the frames in reverse order in between existing frames.	"Pasting Frames from the X-Sheet" on page 191.
PASTE REVERSE OVERWRITE	Paste the frames in reverse order overwriting the existing frames.	"Pasting Frames from the X-Sheet" on page 191.

Select:	To:	See this section for more information:
DELETE	Delete the selected frame.	"Deleting Frames from the X-Sheet" on page 196.
HIDE FRAMES	Hide frames from the X-Sheet without deleting them.	"Hiding a Frame in the X-Sheet" on page 193.
UNHIDE FRAMES	Restore hidden frames to the X-Sheet.	"Unhide Hidden Frames from the X-Sheet" on page 195.
HOLD FRAME…	Repeat the selected frame (like copying and pasting it).	"Holding a Frame in the X-Sheet" on page 192.
RETIME SEQUENCE	Create holds on a sequence of frames.	"Retiming a Frame Sequence from the X-Sheet" on page 196.
RESHOOT FRAMES	Reshoot the selected frames.	"Reshooting a Frame Sequence from the X-Sheet" on page 196.
INSERT CAMERA	Move the camera earlier in the sequence and insert additional frames	"Reshooting a Frame Sequence from the X-Sheet" on page 196.
RETURN CAMERA TO END	Move camera back to the end of the sequence after you're done inserting new frames.	"Reshooting a Frame Sequence from the X-Sheet" on page 196.
REVEAL IN FILE SYSTEM	Show the selected frame's file location.	"Finding Your Source Files" on page 335.
USE AS REFERENCE LAYER	Use the selected frame as a reference layer.	"Loading Reference Material" on page 63.
CLEAR SELECTED NOTES	Remove any notes from the selected row.	"Leaving Reminder Notes in the X-Sheet" on page 198.

X-Sheet Contextual Menu for Notes Header

Select:	To:	See this section for more information:
RENAME COLUMN	Change the columns name.	"Customizing the X-Sheet's Columns" on page 197.
ALERTABLE	Choose whether the column will be "alertable"--whether Dragonframe will alert you when you reach a certain note.	"Leaving Reminder Notes in the X-Sheet" on page 198.
CLEAR COLUMN	Remove any data from the column.	N/A
REMOVE COLUMN	Remove the column from the X-Sheet.	"Customizing the X-Sheet's Columns" on page 197.

Chapter 13: Using the Notepad

Use the Notepad to keep track of scene notes. It's an alternative to writing individual frame notes within the X-Sheet.

It also provides a convenient way to make those notes show up in the X-Sheet.

The Notepad is one of the tabs on the right side of the Animation workspace, next to Guide Layers and the X-Sheet.
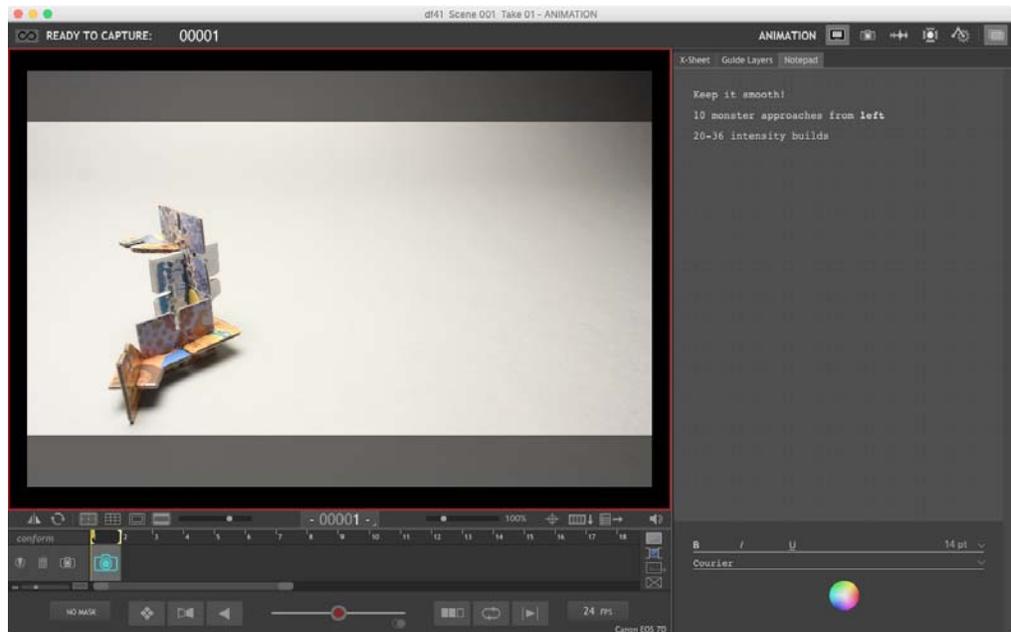
Press the Notepad tab to open the Notepad.

The next page gives an overview of the Notepad's features.

Notepad Map

A. *Regular note.*

B. *Frame note. If you start a line with a frame number and a space, this will show up in the X-Sheet.*

C. *Frame range note. Specify a frame range and the whole range will be marked in the X-Sheet in a special way.*

D. *Choose style and color for selected text.*
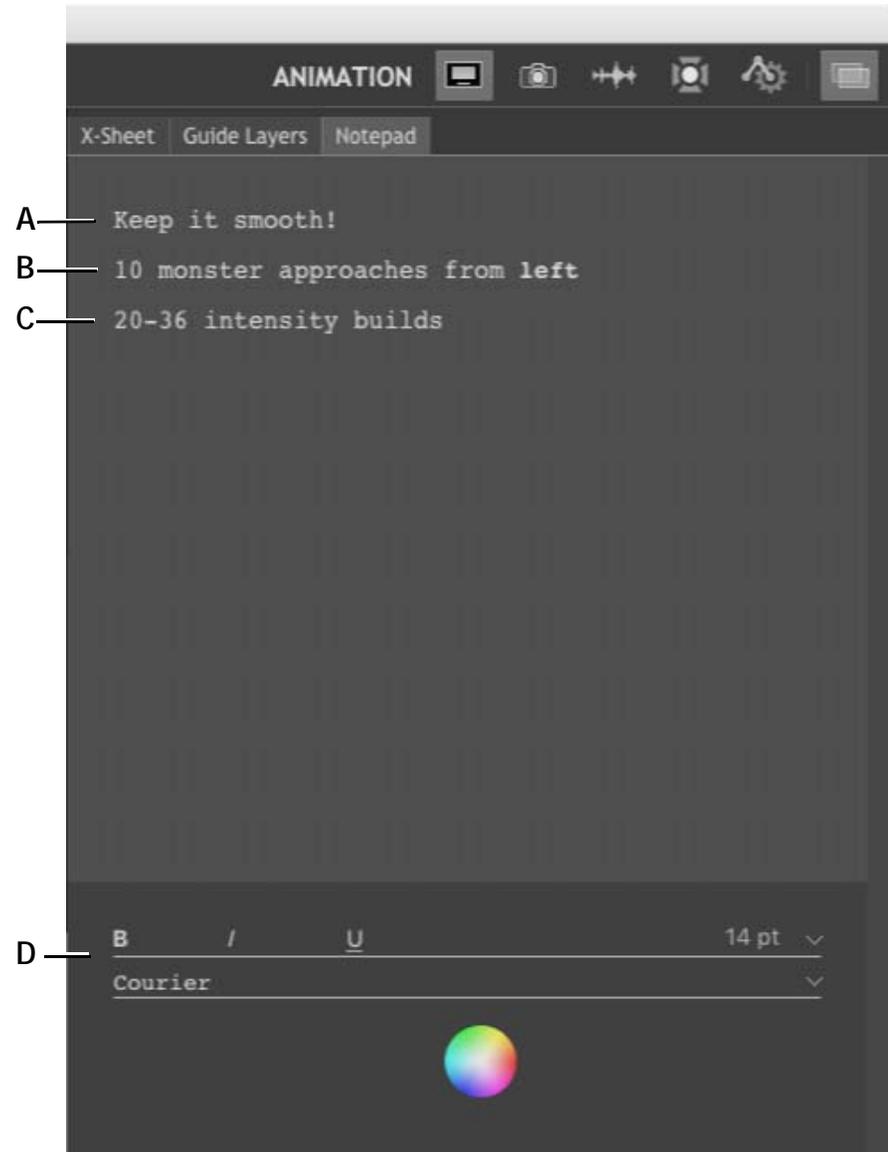
About the Notepad

The notepad is a simple text editor that you can use however you need.

We've heard from animators who say they get a lot of notes from the director, or other departments. It's not always convenient to write those out as individual frame notes in the X-Sheet. And the X-Sheet isn't convenient for doing a quick review of all the notes at once (since they are spread out over the timeline).

Writing Notes

Since it's a simple text editor, you simply click into it and start typing. You can select text and change the font and color, and apply bold, italic and underline styling.

You can perform basic text editing operations as well: cut, copy, paste, undo and redo. Use the standard shortcut keys for these operations.

Creating Frame Notes

Do you want a note to appear in the X-Sheet? You can do that.

Start a line with a frame number, followed by a space. Dragonframe automatically shows that note in the X-Sheet. It will be in italics and not be editable within the X-Sheet.

Example:
10 monster approaches from left

Additionally, you can set a frame range by starting a line with a frame number, a dash (minus sign), and a second frame number. This will show up as a colored block in the X-Sheet.

Example:
20-36 intensity builds

Here is how those two "magic" notes will appear in the X-Sheet:

		8		
		9		
		10		◊ *monster approaches from left*
		11		
		12		
		13		
		14		
		15		
		16		
		17		
		18		
		19		
		20		◊ *intensity builds*
		21		
		22		
		23		
		24		
		25		
		26		
		27		
		28		
		29		
		30		
		31		
		32		
		33		
		34		
		35		
		36		
		37		
		38		
		39		

Notes from Notepad appearing in X-Sheet.

Chapter 14: Automate Lighting with DMX

This chapter covers using DMX to automate lighting. DMX512 (or "DMX" for short) is a protocol to control lights. Connecting DMX-enabled tools to Dragonframe, like the DDMX-512 and a dimmer pack, allows you to automate lighting, or turn off work lights automatically. The DMX interface in Dragonframe also helps you visualize your lighting setup to make it easier to set up and play back your programs. In addition, you can completely customize lighting programs for different exposures.

Understanding DMX Components

DMX is often used to control lights at theaters, concert venues, and film studios. A typical setup has the following components:
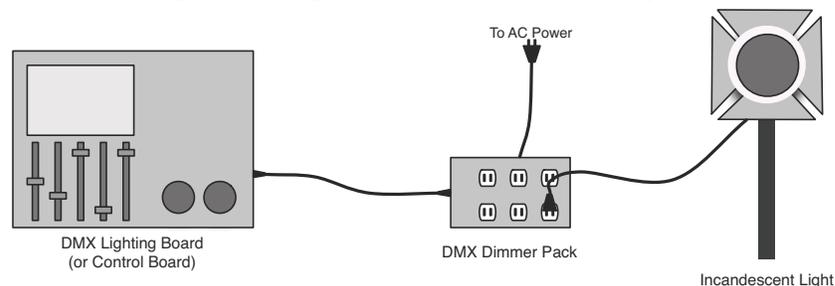
DMX Lighting Board

The lighting board is a hardware device to set light levels. It has a DMX512 output on it, either a 3-pin or 5-pin. A cable runs from the lighting board to a DMX Dimmer Pack.

DMX Dimmer Pack

A dimmer pack is a specialized power strip. You plug the dimmer pack into AC wall power, and then you plug lights into it. The dimmer pack takes the DMX512 input and modulates the power output to achieve the desired lighting levels.

Incandescent Light

Incandescent lights can be dimmed by modulating the AC power provided to them, which is what dimmer packs do.

NOTE: LED lights do not work with standard dimmer packs, because they do not like modulated AC power. Many LED light panels that are made for

film have a direct DMX input on them. In that case you would not need a dimmer pack.

DMX Output with Dragonframe

Dragonframe provides a software lighting board via the DMX workspace. This means you can set lighting levels and create programs within the software.

Your computer does not have a DMX port on it, so Dragonframe must be paired with special hardware to generate the signal. Dragonframe can provide DMX output with the following hardware:

1. **DDMX-512**. Our most popular DMX device. It is a small, rugged, dedicated DMX box with some additional I/O ports. Provides 512 channels of DMX output.

2. **DDMX-S2**. Our original DMX device. Provides 99 channels of DMX output. (You can purchase an upgrade chip from our store to convert to 512 channels in DF4.)

3. **DMC-16**. Our powerful 16-channel realtime motion control coordinator. Provides 512 channels of DMX output.

4. **DMC+**. Realtime motion control coordinator with eight powered drivers. Provides 512 channels of DMX output.

5. **ENTTEC DMX USB PRO**. Third-party USB devices, and other compatible devices. Provides 512 channels of DMX output.

6. **ArtNET DMX**. Standarized network protocol for DMX. Provides 512 channels of DMX output.

7. **IOTA Controller**. Two-channel driver with DMX. Provides 99 channels of DMX output. *(Discontinued.)*

Dragonframe software, along with one of the above devices, replaces the hardware lighting controller in the typical DMX setup diagram.

NOTE: If you want to configure the input/output triggers on these devices, see "Adding Input and Output Triggers" on page 241.

The image on the next page gives an visual overview of the DMX workspace's features.

DMX Workspace Map
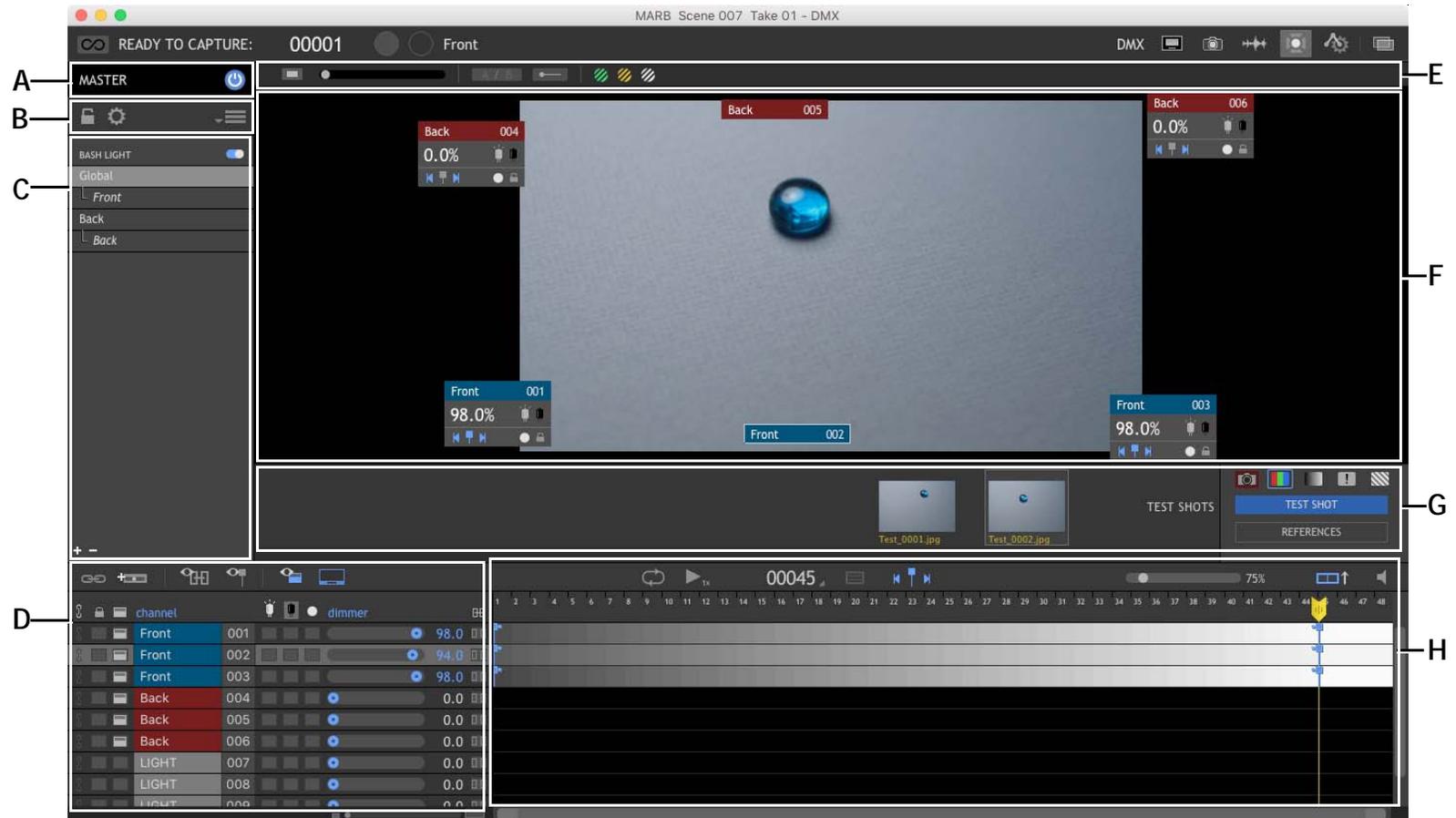
A. Master on/off power button. Slowly fades all lights down to zero, or up to programmed levels.

B. Master lock and settings. Program menu.

C. Lighting Programs: Manage lighting programs. Create custom programs for each exposure, or set up a bash light for your project.

D. Keyframe Setup: Adjust levels and settings for each channel's keyframes.

E. Adjust background color. A/B comparison tool. Color detection.

F. Virtual Lighting Workspace: Lay out badges representing each light around the Live View. Create and customize keyframes from each badge.

G. Test Shots tray within DMX.

H. Key Frame Timeline: View how the lighting will change for each channel over the course of the scene.

213

Connecting DMX to Dragonframe

Connect the DDMX-512 to Dragonframe to control the DMX dimmer pack. This is the starting step for automating and animating the lights on your set, or automating a work light.

Once you've attached the DDMX-512 to Dragonframe, you can attach your lights to the channels on the DMX Dimmer Pack.

NOTE: All the instructions about the DDMX-512 in this chapter apply to the DDMX-S2, DMC-16, DMC+ and IOTA Controller, since they have the same DMX functionality as the DDMX-512.

1. Connect the DDMX-512 to your computer with the USB cable.

2. Connect the DDMX-512 to the DMX dimmer pack.

3. Select **HELP|INSTALL FTDI SERIAL DRIVERS (DDMX-512/IOTA)**. On macOS, this provides an information message, since it does not need the drivers. For Windows and Linux, this opens the FTDI website. There, you can download and install the drivers for your computer to use to work with the DDMX-512.

4. In Dragonframe, select **SCENE|CONNECTIONS**. The Settings dialog appears, showing the Connections tab:
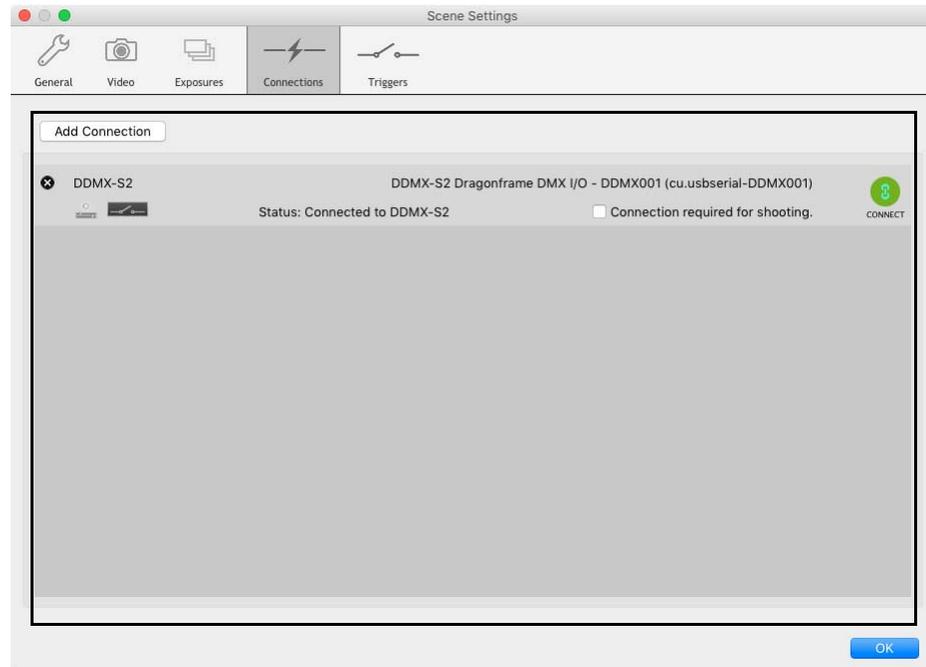
Connections tab with DMX/IO connection and Arc Moco connection.

5. Press **ADD CONNECTION** to create a new connection.

6. Choose **DDMX-512** (or the appropriate device).

7. Choose the serial port, then click **CONNECT**.

NOTE: Windows users should check the Device Manager if the correct serial port doesn't appear in the dialog.

Dragonframe connects to the device, then automatically checks the **CONNECTION REQUIRED FOR SHOOTING** check box. When this box is checked, you will not be able to capture any frames for the scene until Dragonframe is connected to the hardware.

CAUTION: If you uncheck the **CONNECTION REQUIRED FOR SHOOTING** box, you could shoot all or part of a scene without running the lighting program.

8. Plug the lights you want to use into the dimmer pack. Note the channel each light is plugged into.

Creating a Lighting Program

Create a lighting program for your project by adding keyframes for the lights (channels) on your set.

A keyframe is the setting for a particular channel at a point in time. For example, you might want the light connected to channel 1 to be at 50% at frame 1, then fade to 0% by frame 48. To do so, you'd create a keyframe for frame 1 at 50%, and a keyframe for frame 48 at 0%. Dragonframe would gradually fade the light from frame 1 to 48.

Create keyframes in the timeline and keyframe area, at the bottom of the screen. Here's an example of what a program might look like:
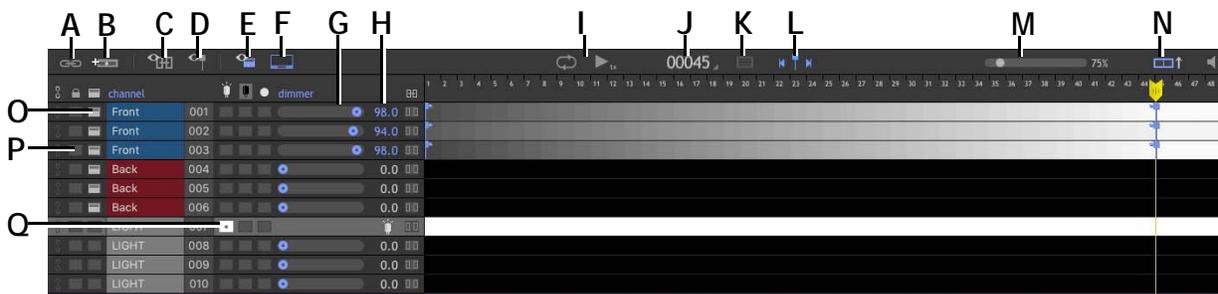
A. Create new group.

B. Add channel. You can create up to 99.

C. Show/hide linked channels.

D. Show/hide programmed channels.

E. Show/hide badges.

F. Show/hide live view display.

G. Dimmer: Adjust the level for a channel. Creates a keyframe at the point where the playhead is.

H. Level field: Shows level for channel as a percentage.

I. Playback controls for previewing the DMX program in real-time.

J. Frame counter.

K. Toggle the table/graphical view.

L. Keyframe: Add a keyframe at the current location of the playhead for the selected channel, or step to the previous or next keyframe.

M. Live view scale.

N. Open the Test Shots area.

O. Badge: Shows or hides a badge. See page 228.

P. Lock: Locks the channel for editing. With channel locked, its timeline is grayed out.

Q. Light on: Set a light on for the scene.

Adding a Channel

A channel in the DMX workspace controls one light. When you create a new scene, it will not have any channels in it. You may add up to 512.

Press ▭ to add a channel. A new channel bar appears:
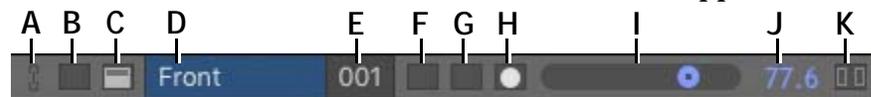
A. *Group membership. Click to change grouping.*

B. *Lock channel.*

C. *Show badge.*

D. *Channel name. Double-click to edit.*

E. *DMX output channel. Double-click to edit.*

F. *Light on. Disregards program.*

G. *Light off. Disregards program.*

H. *Solo channel.*

I. *Level slider. Click and drag to edit.*

J. *Level value. Double-click to edit.*

K. *Link to parent program.*

Once you have the channels you need, you can continue to set them up as you need.

Rearranging Channels

Drag a channel to move it to a new position. This way you can keep related lights together.

You can also edit the DMX output channel (E.) to re-patch a program to a different output.

Using a Custom Light Profile

By default, the values on your keyframes are translated linearly to the DMX output for that channel. Sometimes, though, you have lights that responds to level changes differently.

To use a custom light profile, right-click (Mac **CTRL**-click) on the channel, then select **LIGHT PROFILES** and choose a custom profile or open the profile editor.

See "Creating Custom Light Profiles" on page 225.

Direct DMX Mode (0-255)

The DMX workspace uses keyframes with percentage values, 0-100%. In reality, DMX512 uses a 0-255 range for specifying light levels.

If you need to set a specific number value on your light, right-click (Mac **CTRL**-click) on the channel, then select **DIRECT DMX MODE 0-255**. The levels change to 0-255 value in a yellow color:

Adding a Keyframe

Add a keyframe from the most convenient place in the workspace:

A. Percentage value in the channel's badge. *B.* Badge keyframe button. *C.* Workspace Keyframe button. *D.* Channel's dimmer.

Move the playhead to the frame where you want the keyframe, then:

- Adjust the channel's dimmer.
- Press the keyframe button (C.).
- Press the keyframe button in the channel's badge.
- Click on the percentage value in the channel's badge, and drag to the left or right.

NOTE: For more information about badges, see "Visualizing Your Lights in the Lighting Workspace" on page 228.

Adjusting a Keyframe Level

Adjust keyframe levels from the most convenient place in the workspace:

A. Channel dimmer. *B.* Keyframe.

Move the playhead to the frame you want the keyframe, then:

- Adjust the channel's dimmer (A.).

- Click on the percentage value in the channel's badge, and drag to the left or right. See "Visualizing Your Lights in the Lighting Workspace" on page 228.

- Click on the lower half of the keyframe (B.), then drag the mouse left or right.

Adjusting Keyframe Smoothness

By default, keyframes transition linearly from one value to the next. You can adjust the way keyframes transition to each other by extending the smoothing handles on the left or right of the keyframe:
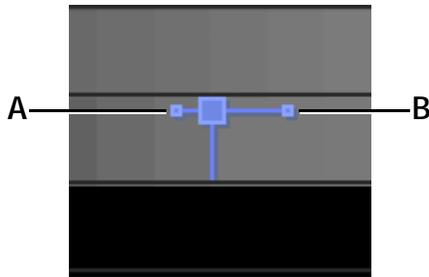
A. *Left keyframe smoothing handle.****B.*** *Right keyframe smoothing handle.*

Adjusting Multiple Keyframes

Select more than one keyframe to adjust their levels together.

If you adjust a channel's dimmer:

- All other selected channels' faders will move relative to it. This may create or adjust keyframes on those channels.

- If you hold **SHIFT**, all of the selected channels' faders will be set to the same level.

- If you hold **ALT/OPTION**, only the channel you are touching will adjust.

If you adjust a keyframe level by clicking and dragging on its bottom half:

- All other selected keyframe values will move relative to it.

- If you hold **SHIFT**, all of the selected keyframes will be set to the same level.

- If you hold **ALT/OPTION**, only the keyframes you are touching will adjust.

Moving Around the Lighting Program

Use the **STEP** keys to move through your lighting program:

- Step left or right to move the playhead forward or back one frame.

- Press **1** or **2** to move the playhead forward or back one frame.

- Press **CTRL** and step to move to the next keyframe or the previous keyframe.

- Press **HOME** to move to the beginning of a program.

- Press **END** to move to the beginning of a program.

Selecting Keyframes

- Click to select a keyframe.

- **CTRL**-click (Mac **COMMAND**-click) to toggle selection of keyframes.

- **SHIFT**-click to select a group of keyframes.

- Click and drag the mouse to select a large group of keyframes.

When you select multiple keyframes that span across multiple frames, you will see a special selection rectangle:
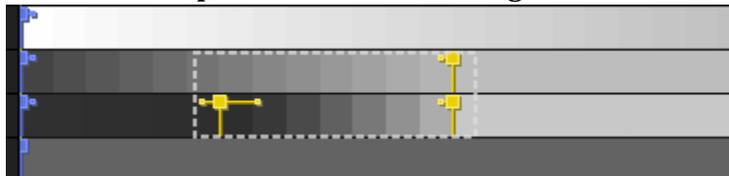
- Click and drag the left or ride side of the selection rectangle to adjust the time range for the selected keyframes.

- Click and drag in the middle area of the selection rectangle to move all of the selected keyframes up or down the timeline.

Cutting, Copying, Pasting, and Deleting Keyframes

You can cut or copy keyframes and paste them to other channels. You can also delete them.

To cut, copy, and paste keyframes:

1. Select the keyframes you want to cut or copy.

2. Press **CTRL+X** (Mac **COMMAND+X**) or **CTRL+C** (Mac **COMMAND+C**).

3. Select the channels where you want to paste the keyframes.

4. Press **CTRL+V** (Mac **COMMAND+V**). Dragonframe pastes the keyframes into the selected channels.

To delete keyframes:

1. Select keyframes.

2. Click **DELETE** to delete them.

Editing with the Keyframe Table

As an alternative to the graphical keyframe timeline, you can edit a channel's keyframes via a table.

To switch between the keyframe timeline and the table view, press the table icon (⊞) to the right of the frame number display. The display changes to a table:
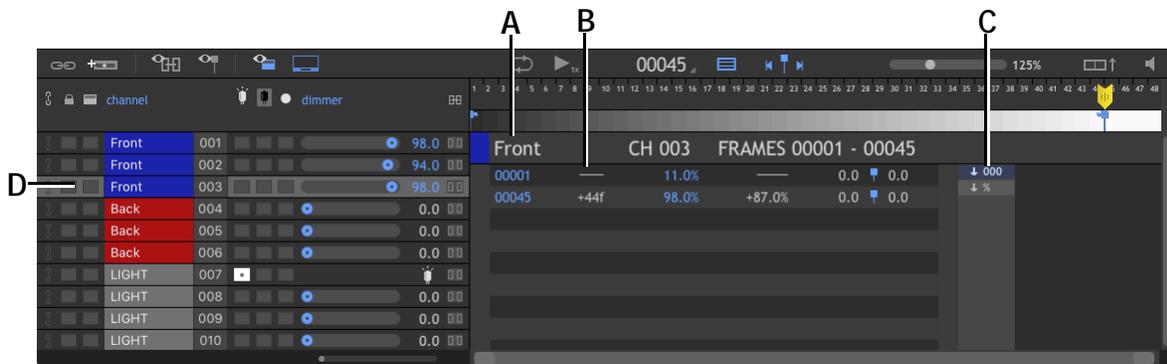
A. Selected channel information: name, channel number, and active keyframe range.

B. Keyframe data: Frame, frame delta, value, value delta, feathering values.

C. Sort order: sort keyframes by frame number or value, ascending or descending.

D. Selected channel.

Note that the table shows keyframes for one channel at a time.

Click on a channel on the left to select it, and show its keyframes in the table.

Double-click a value in the table to edit it. Enter a numerical value and press **ENTER**.

Using Arithmetic Expressions to Change Values

Any of the numerical fields in the DMX and ARC workspaces can handle basic arithmetic expressions.

Here are some examples (you do not use quotes):

- "+5" Adds 5 to current value
- "+-5" Subtracts 5 from current value
- "*5" Multiplies current value by 5
- "/5" Divides current value by 5

Additionally, for time-based fields, you can use "s" and "m" to represent seconds and minutes, respectively:

- "+2.5s" Adds 2.5*FPS to current value
- "+1m" Adds 1*FPS*60 to current value

Editing Multiple Values at Once

You can select more than one keyframe in the table:

- Press **SHIFT** while clicking a keyframe to select a range of keyframes.
- Press **CONTROL** while clicking a keyframe to toggle its selection state.

Double-click a value of one of the selected keyframes to begin editing.

If you enter a number, that value will be applied to all selected keyframes.

If you use an arithmetic expression (see above), the expression will be applied to each value. For example, you could increase the value of a set of keyframes by 20% by entering "*1.2".

Clearing a Channel

To remove all of the keyframes from a channel, select the channel, **CTRL**-click (Mac **COMMAND**-click) it, then select **CLEAR CHANNEL**. Dragonframe clears all the keyframes from the channel.

Saving and Loading a Channel

Save a channel's keyframes and levels to load into a lighting program later.

1. Select the channel you want to save.

2. Right-click (Mac **CTRL**-click) the channel and click **SAVE CHANNEL**. The Save Channel dialog appears.

3. Enter a file name and choose where you want to save the file, then click **OK**.

4. When you're ready to load a channel, select the channel you want to overwrite.

5. Right-click (Mac **CTRL**-click) the channel and click **LOAD CHANNEL**. The Load Channel dialog appears.

6. Find the channel file you'll use to overwrite the channel, and click **OK**. Dragonframe overwrites the channel with the saved channel's keyframes and levels.

Grouping Channels

Create a group from a set of channels so you can edit keyframes for all channels in the group at the same time. This way you can quickly switch between sets of channels. A lighting program with two groups might look like this:
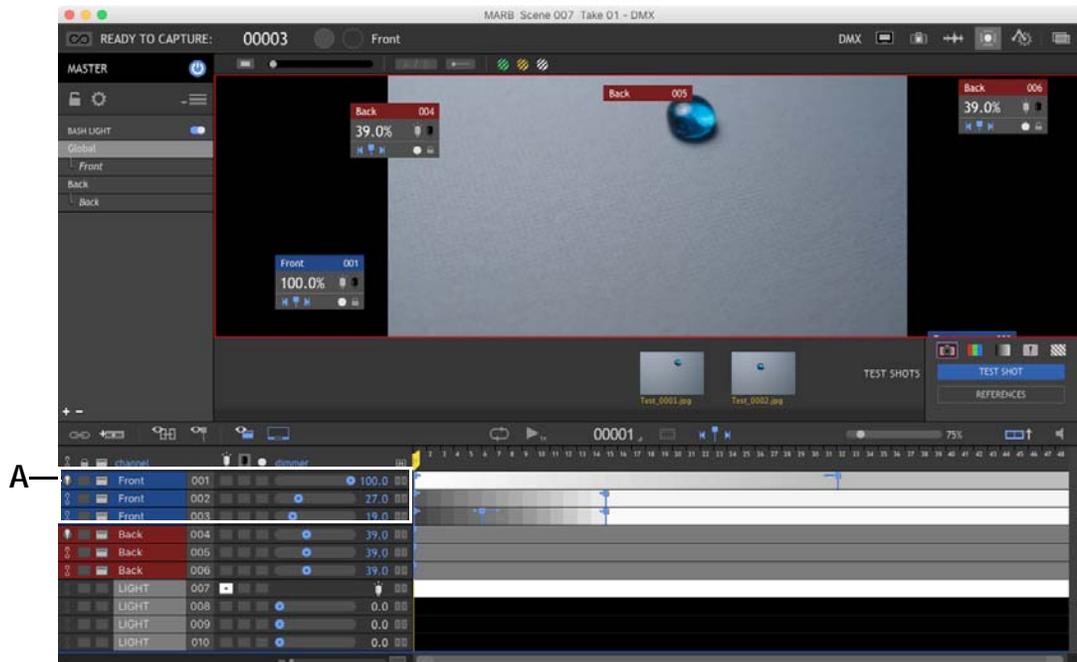
A. Group **FRONT** with three channels.

To group channels:

1. Select one or more channels, then

   - Click ⥮ , or
   - Right-click (Mac **CTRL**-click) and select **NEW GROUP**.

   The Group dialog appears:
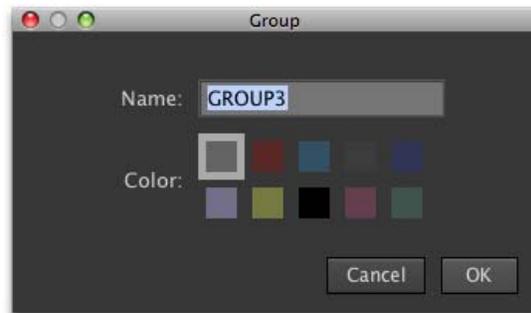
2. Enter a group name, pick a color for the group, and click **OK**.

Dragonframe places the grouped channels together and applies the colors you chose.

The first channel in the group becomes the "group leader" and has special behavior. Once you've created a group:

- Clicking on the first channel in a group (group leader) selects the entire group.
- Adding or editing a keyframe from the group leader adds/edits it for all other channels in the group.
- You can drag other channels into the group, making them become members of the group.
- You can drag group members out of the group.

NOTE: To modify only one channel in a group, hold **ALT/OPTION** while dragging the level slider.

Deleting or Editing a Group

- To remove the grouping from a set of channels, right-click (Mac **CTRL**-click) the channels and choose **REMOVE FROM GROUP.**
- To change the color of a group, right-click (Mac **CTRL**-click) on the top channel in the group and select a different color from the menu.

Adding a Channel Filter

A channel filter is a special channel that adjusts the levels of the channel or group that is directly below it.

Imagine that you have created a complicated flicker effect that you really like:
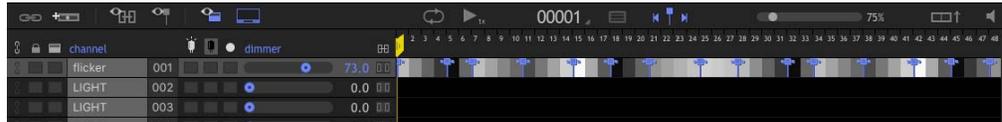
Then you decide that you want it to fade up at the start. You don't want to rework all of the values at the beginning. This is a great use for a filter.

Right-click (Mac **CTRL**-click) the channel and select **ADD FILTER**. A new filter appears above the channel:
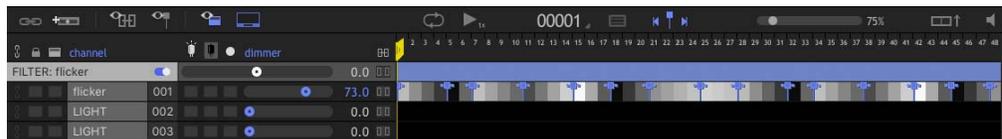
A filter has a distinctly different look from a regular channel. Its slider ranges from -100% to +100%, which represents how much to adjust the filtered channel. Otherwise keyframe editing on a filter works exactly the same as with regular channels.

Now that we have our filter, let's ramp up the flicker program:

Here we set an initial filter keyframe at -87% for frame 1, which reduces the output of the flicker channel to almost nothing. At frame 28 we set a second keyframe, at +0%. From that point on the flicker program will be at its original values.

Creating Custom Light Profiles

A light profile allows you to change the way a light responds to keyframe percentage values.

The default profile for every light is linear:

- 0% keyframe -> 0% dmx output

- 50% keyframe -> 50% dmx output

- 100% keyframe -> 100% dmx output.

It is common for different kinds of lights to respond differently to dmx levels. For example, a light might not come on at all until you hit 20%. Instead of just remembering that, and working around it, you could create a custom light profile that more accurately maps the keyframe 0-100% range to 0-100% of the light's brightness.

To use a create a custom light profile, right-click (Mac **CTRL**-click) on the channel, then select **LIGHT PROFILES|PROFILE EDITOR**. The profile editor opens up:
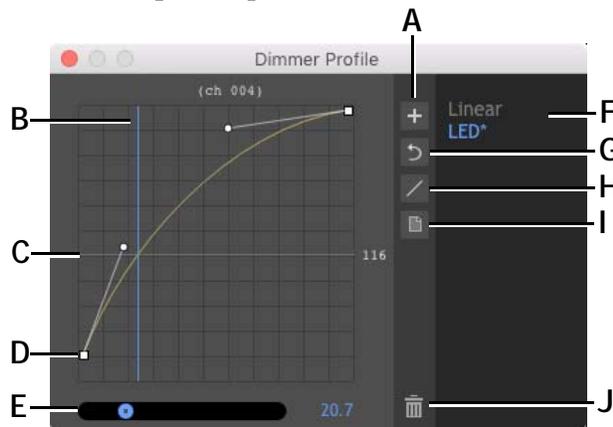
A. New profile. Copies the currently selected one.	**F.** Available profiles.
B. Shows light percent value.	**G.** Revert modified profile.
C. Shows DMX512 output value (0-255).	**H.** Reset profile to linear.
D. Profile curve. Adjust handles to change profile.	**I.** Profile menu with Import and Export options.
E. Light percent slider. Slide back and forth to visualize profile.	**J.** Delete profile.

To create a new profile:

1. Press ➕ to create a new profile. It will appear at the end of the list, and be selected.

2. Double-click the name to edit it.

3. Adjust the bezier handles (D.) to change the curve.

4. Move the start and end points up or down to change the output range.

5. Use the slider (E.) to visualize the relationship of the input to output values.

226

Sharing Light Profiles

Use the profile menu to import and export light profiles. They are stored in a proprietary format with a **.DFLP** extension.

User light profiles are stored in:
<user home directory>/Dragonframe/LightProfiles

On a multi-stage environment you could pre-populate that folder with the required light profiles for your setup.

Previewing Your Lighting Program

Use the playback controls at the top of the timeline to preview your lighting program.
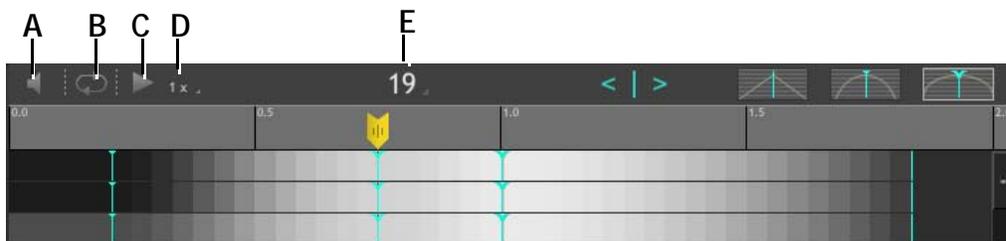
A. Volume. B. Loop. C. Play. D. Playback Speed drop down list. E. Frame number. Click to change the display style.

Soloing a Channel

You can select one or more channels to "solo". Dragonframe will play back only those programs, while leaving all other channels static.

To solo a channel:

1. Select the solo box for the channels you want to solo:

Channel with the solo box enabled.

2. **PLAY** the program.

Working with Test Shots

You can take test shots directly within the DMX workspace. This means you can quickly make lighting adjustments and compare the results in the final images.

The test shots and references trays in the DMX workspace represent the same images as they do in the Cinematography workspace. They have the same functionality.

See "Working with Test Shots" on page 75.

Press ▬▬↑ to open the test shots tray. The test shots tray opens:
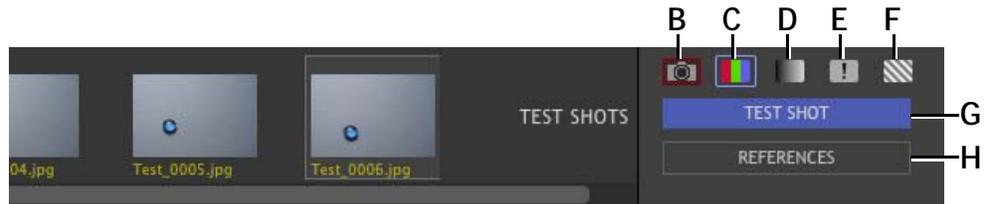
A. Test shots tray. Shows existing shots.	**F.** Open the Color Detection tool.
B. Switch to live view.	**G.** Take a Test Shot.
C. View the current image in color.	**H.** Open the References tray.
D. View the current image in grayscale.	
E. View the current image in grayscale with clipping information.	

Press the **TEST SHOT** button (G.) to take a new test shot. Once the shot has been captured, a thumbnail will appear in the test shots tray

NOTE: To change camera settings, use the Cinematography workspace.

Color Detection Tool

The DMX workspace has a special popup version of the Color Detection tool that is available in the Cinematography workspace.

Press ▧ to open the color detection tool.

For instructions on using the color detecting tool, see "Comparing Colors between Shots" on page 90.

Comparing Images with the A/B Tool

The DMX workspace also has the same A/B image comparison tool as the Cinematography workspace.

For instructions on using the A/B tool, see "Comparing Images with the A/B Tool" on page 85.

Visualizing Your Lights in the Lighting Workspace

Dragonframe's DMX workspace includes an area for laying out your lights on screen. This could help you remember which lights you

plugged into which channels in the DMX box. That way, when you start setting up keyframes, you'll have a visual reminder which channels control which lights.

NOTE: Arranging channels in the lighting workspace is optional; it just provides a visual way of working with the channels.

To lay out a channel in the workspace, click the badge icon next to the channel you want to lay out.

A badge appears in the workspace.

Click and drag the badge to move it. Double-click it to open it.

A. Channel Name.	**E.** Previous keyframe.
B. Light On: Turn the channel light on for the scene.	**F.** Keyframe button.
C. Channel Number.	**G.** Next keyframe.
D. Percentage Value: Adjust the dimmer. If the playhead is over a keyframe, you'll adjust the keyframe value. If the playhead is not over a keyframe, you'll add a keyframe.	**H.** Solo. Solo the channel for playback.
	I. Lock. Lock the channel for editing.
	J. Light Off: Turn the channel's light off for the scene.

Automating a Bash Light

Use DMX to automate a work light. The light will be on when you're not shooting, then turn off after your camera captures the video assist frame.

NOTE: You can automate a work light without a DMX dimmer pack. See "Using an External Relay Switch or a Logic Output to Automate a Bash Light" on page 245.

To automate a bash light:

1. Connect the DDMX-512 and the dimmer pack to your computer as described in "Connecting DMX to Dragonframe" on page 214.

2. Note which channels your work lights are plugged into.

3. Select **WINDOW|DMX**. The DMX workspace opens with the Global lighting program showing.

4. Click bash light to view and edit the program for the work light:
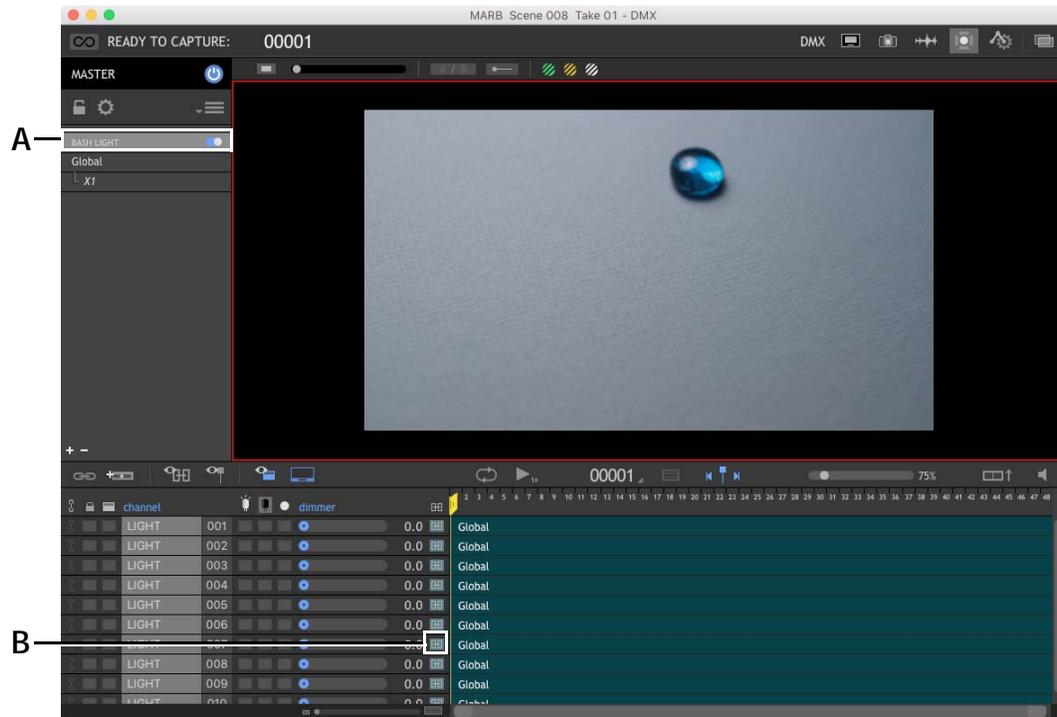
*A. DMX **BASH LIGHT** program. B. Link Icon.*

All of the channels and settings are blued out (not editable) because they are set to be the same as the **GLOBAL** program (the parent program).

3. Click ⊞ (B.) next to the channel(s) you noted in step (2.). This detaches that channel from the global program.

Dragonframe makes the channel(s) editable.

4. Change the settings for the channel as needed.

Bash light set up at 50%.

Creating Custom Lighting Programs per Exposure

If your project has multiple exposures (a front light/backlight, for example), you can set up separate lighting programs for each exposure. You can set up each lighting program to be completely different, or quickly change one or two channels for each exposure. Dragonframe manages the programs for you, and automates the lighting for each exposure seamlessly.

When you work in the DMX workspace, you'll see your default programs on the left side of the workspace.

*DMX window with the default **BASH LIGHT** program, the default parent program named **GLOBAL**, and two child programs, **X1** and **X2**, created by default when you set up two exposures named **X1** and **X2** in the Cinematography window.*

You will always have the following programs:

- **GLOBAL:** This is the default program. If you don't need any lighting variations (for exposures or bash lighting), you will only work with the **GLOBAL** program.

- **BASH LIGHT:** If you want to configure certain lights as bash/work lights, you customize those lights' channels in the **BASH LIGHT** program.

- One child program for each exposure you've created (**X1**, **X2**, etc). By default, the exposure programs inherit all of their settings from their parent program, **GLOBAL**. But you can choose to customize individual channels in any of the exposure programs. You can also detach it from the parent if you want to start from scratch.

Whenever you set up lighting program, you can choose to create a parent program, or a child program.

- A parent program is an independent program. You set up all of its attributes from scratch.

- A child program inherits all of its attributes from its parent. You can customize a few attributes without having to set up everything from scratch.

The previous sections all explained how to modify the **GLOBAL** lighting program. The ones that follow will show how to set up work lights, and add or modify lighting programs.

Modifying the Default Exposure Lighting Programs

The simplest way to customize lighting per exposure is to change one or two channels on the default exposure programs (**X1**, **X2**, etc). All of the rest of the settings for the exposures will remain the same as the parent program, **GLOBAL**.

To customize a few attributes of an exposure:

1. Select the program in the program list. Below, **x2** is selected:
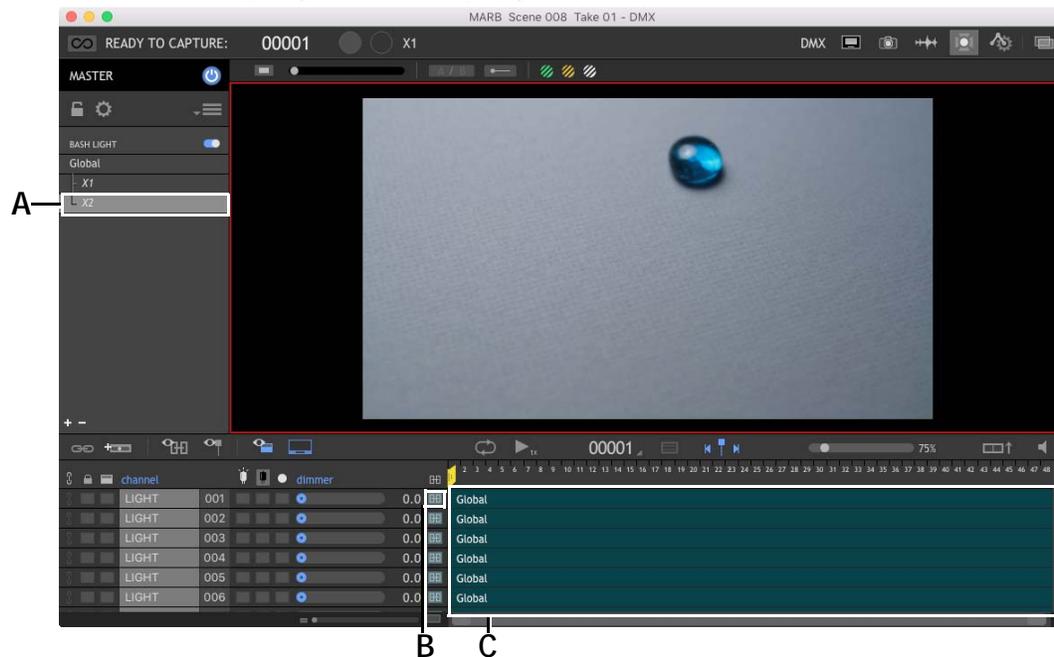
A. **x2** *(child) program selected.* *B.* *Link icon.* *C.* *Keyframe timeline is blued out (not editable), and labeled* GLOBAL*, because currently all of its settings come from the* GLOBAL *program.*

2. Click the link icon (B.) next to the channels you want to customize.

3. Edit the channels as needed.

Setting Up an Exposure from Scratch

If you want the lighting for an exposure to be completely different from the lighting for the global program, detach it completely. That way, you'll create its lighting from scratch.

To detach an exposure from its parent:

1. Create any exposures you need in the Cinematography window.

2. Open the DMX workspace. Any exposures you created appear in the program list.

3. In the lighting program list, click and drag the exposure you're going to edit until it detatches from its parent.

All of the settings inherited from the parent disappear. Now you can create the lighting program from scratch.
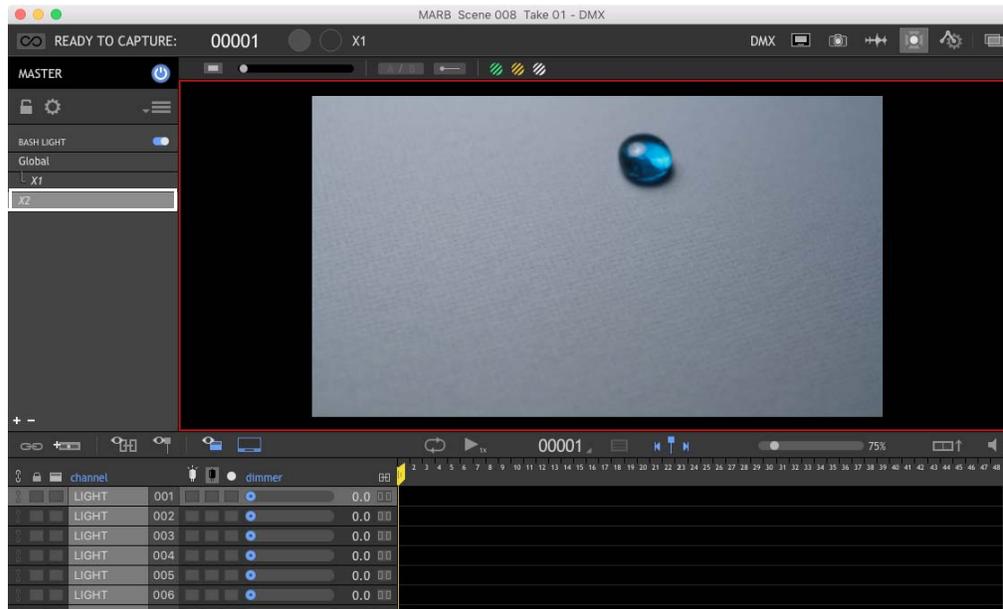
X2 *is now detached from the* **GLOBAL** *parent program, and is now a top-level program itself.*

4. Set up the new lighting program for the exposure.

NOTE: A parent program must have an exposure associated with it to run when you're shooting. For example, if you create a new program called **BACKLIGHT**, but don't link any exposures to it as children, the program will not run. Or, if you set up the **GLOBAL** program, but detach all default exposures from it, the **GLOBAL** program will not run.

NOTE: You can change your mind and reattach an exposure to its original parent, **GLOBAL,** without completely losing customizations. When an exposure is reattached, any custom settings will seem to disappear, since all the channels will be inherited from **GLOBAL**. However, if you click the link icon for a channel that you had previously edited, Dragonframe will restore the customized settings.

Creating a New Parent Program for Exposures

If you want more than one exposure to share the same attributes, you can create a new parent program, then attach each of the exposures to it.

To create a parent program and attach exposures to it:

1. Create any of the exposures you need in the Cinematography workspace.

2. Click + in the bottom of the program list. A new program appears in the program list.

3. Name the program. Here, we'll call it **BACK-LIGHT**:

4. Set up the lighting program as needed.

5. Drag and drop the exposures you're linking onto the program name. Dragonframe links them to the parent program, and shows them in the hierarchy:
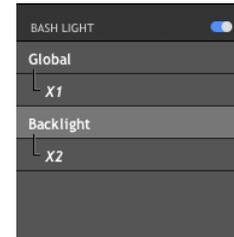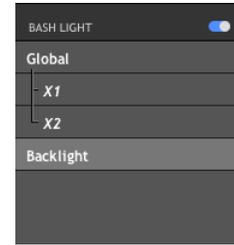
Now any settings you created in the parent program, **BACKLIGHT**, will apply to the exposures you linked to it.

Deleting a Lighting Program

You can delete any lighting program that you've created. In other words, you *cannot* delete default programs like **GLOBAL**, **BASH LIGHT** or the default exposure programs.

To delete a lighting program:

1. Select the program in the program list.

2. Click - (minus) at the bottom of the program list. Dragonframe deletes the lighting program. Any of its children will appear as parents in the program list.

Saving, then Loading a Lighting Program

You can upload a lighting program and apply it to another scene. When you load a program, you can overwrite a current program's settings, or add the saved program as a new program.

To save a program:

1. In the program list, right-click (Mac **CTRL**-click) and select **SAVE PROGRAM**. The save program dialog appears.

2. Choose where to save the program and click **OK**.

To load a program:

1. Select **FILE|OPEN SCENE...**, then select the scene you want to use the saved program in. Click **OK**.

2. Open the DMX workspace.

3. Load the saved program:

   - To overwrite the settings of another program:
     Select the program you want to overwrite.
     Right-click (Mac **CTRL**-click), and select **LOAD PROGRAM…**
     Navigate to the saved program, and press **ENTER**. Dragonframe overwrites the old program with the saved one.

   - To add the saved program:
     Right-click (Mac **CTRL**-click) in the open area below all of the program names, and select **LOAD PROGRAM…**
     Navigate to the saved program, and press **ENTER**. Dragonframe adds the saved program to the list.

Preparing Dragonframe for Shooting with DMX

Once you have set up your lighting program, you must place Dragonframe into the ready-to-capture mode in order to shoot. This moves all external hardware to the starting position, including your lights and motion control rig.

To prepare Dragonframe for shooting, press ⬚. Dragonframe moves all external hardware to the ready-to-capture position. While in ready-to-capture mode, you cannot edit lighting programs or motion control moves.

Keyboard Shortcuts and Contextual Menus for the DMX Workspace

Use the keypresses and menus in this section to access all of the workspace's tools.

Keyboard Shortcuts for the DMX Workspace

Press:	To	See this section for more information:
SPACE or **0**	Play the DMX Program.	"Previewing Your Lighting Program" on page 227.
LEFT or **1**	Step back one frame.	"Moving Around the Lighting Program" on page 220.

Press:	To	See this section for more information:
RIGHT or **2**	Step forward one frame.	"Moving Around the Lighting Program" on page 220.
DELETE or **BACK-SPACE** or *	Delete selected keyframes.	"Cutting, Copying, Pasting, and Deleting Keyframes" on page 220.
CTRL LEFT	Move to previous keyframe.	"Moving Around the Lighting Program" on page 220.
CTRL RIGHT	Move to next keyframe.	"Moving Around the Lighting Program" on page 220.
HOME	Move to the start of the DMX timeline.	"Moving Around the Lighting Program" on page 220.
END	Move to the end of the DMX timeline.	"Moving Around the Lighting Program" on page 220.
3	Switch to live view.	"Working with Test Shots" on page 227.
' (single quote)	Take a test shot.	"Working with Test Shots" on page 227.

DMX Contextual Menus: Programs

Select:	To:	See this section for more information:
ADD PROGRAM	Add a new lighting program.	"Creating Custom Lighting Programs per Exposure" on page 231.
RENAME PROGRAM	Rename the current program.	"Creating Custom Lighting Programs per Exposure" on page 231.
DUPLICATE PROGRAM	Copy the current program.	"Creating Custom Lighting Programs per Exposure" on page 231.
DELETE PROGRAM	Delete the current program.	"Deleting a Lighting Program" on page 235.
SAVE PROGRAM	Save the current lighting program.	"Saving, then Loading a Lighting Program" on page 235.
LOAD PROGRAM	Load a saved program.	"Saving, then Loading a Lighting Program" on page 235.
PROFILE EDITOR...	Open the light profile editor.	"Creating Custom Light Profiles" on page 225.

DMX Contextual Menus: Lighting Workspace

Select:	To:	See this section for more information:
EXPAND BADGES	Expand all minimized light badges.	"Visualizing Your Lights in the Lighting Workspace" on page 228.
COLLAPSE BADGES	Minimize all badges.	"Visualizing Your Lights in the Lighting Workspace" on page 228.
CLEAN UP BADGES	Snap badges into rows.	"Visualizing Your Lights in the Lighting Workspace" on page 228.
GATHER BADGES	Move badges that are off screen back into the lighting workspace.	"Visualizing Your Lights in the Lighting Workspace" on page 228.

Select:	To:	See this section for more information:
HIDE BADGES	Remove badges from the lighting workspace.	"Visualizing Your Lights in the Lighting Workspace" on page 228.

DMX Contextual Menus: Channels

Select:	To:	See this section for more information:
REMOVE CHANNEL(S)	Delete selected channels.	"Adding a Channel" on page 216.
NEW GROUP	Create a new group of channels.	"Grouping Channels" on page 223.
REMOVE FROM GROUP	Remove the selected channel from the group.	"Grouping Channels" on page 223.
ADD FILTER	Create filter for selected channel or group.	"Adding a Channel Filter" on page 225.
CLEAR CHANNEL	Clear all the keyframes from the channel.	"Clearing a Channel" on page 222.
SAVE CHANNEL	Save the channel for use in another lighting program.	"Saving and Loading a Channel" on page 222.
LOAD CHANNEL	Load a saved channel.	"Saving and Loading a Channel" on page 222.
RESIZE/SHIFT MOVE	Move selected keyframes in time.	N/A
REVERSE MOVE	Reverse selected keyframes in time.	N/A
LIGHT PROFILES	Choose a custom profile or open the editor.	"Using a Custom Light Profile" on page 217.
DMX DIRECT MODE 0-255	Use 0-255 range for keyframes.	"Direct DMX Mode (0-255)" on page 217.
NEW GROUP	Create a new group of channels.	"Grouping Channels" on page 223.
REMOVE FROM GROUP	Remove the selected channel from the group.	"Grouping Channels" on page 223.

Chapter 15: Adding Input and Output Triggers

You can use Dragonframe to trigger external devices, or use external devices to tell Dragonframe to shoot. To do so, you must first connect Dragonframe to the DDMX-512, DDMX-S2, DMC-16, DMC+ or IOTA Controller.

Adding an Input Trigger

Use the DMX Logic Input to have an external device (such as a push button or a moco system) trigger an event in Dragonframe. For example, you might connect a push button to Dragonframe with the DDMX-512, and set a trigger for **SHOOT**. When you press the push button, Dragonframe will shoot a frame.

To trigger a Dragonframe event with an external device:

1. Connect the DDMX-512 to your computer as described in "Connecting DMX to Dragonframe" on page 214.

2. Connect the external device you're using to the input terminal and ground (labeled **IN** and **GND**) on the DDMX-512. For information about the DDMX-512's terminals, see the DDMX-512 Brochure and Technical Specifications at https://www.dragonframe.com/product/DDMX-512/

3. Select **SCENE|TRIGGERS**. The triggers setup dialog appears:
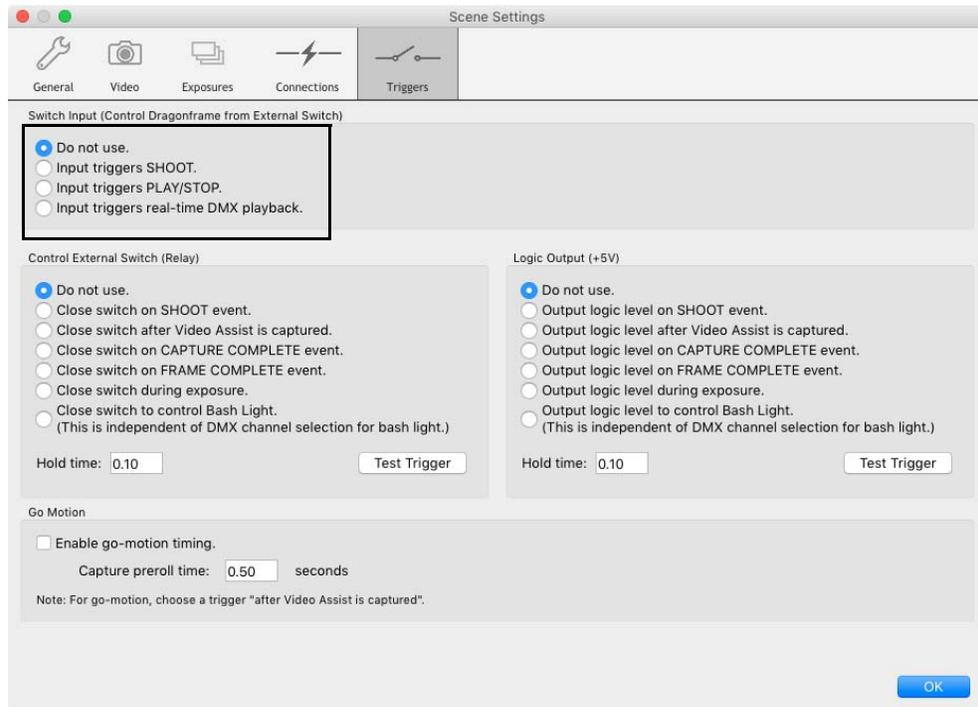
Triggers dialog with Switch Input settings

4. Select which event you want your external device to trigger in Dragonframe:

- **SHOOT**: Dragonframe will shoot a frame,

- **PLAY/STOP**: Dragonframe will begin or stop playback of your frames, or

- **REAL-TIME DMX PLAYBACK**: Dragonframe will play your DMX lighting program.

Adding a Switch/Relay Output Trigger

You can use Dragonframe to trigger external devices with a switch. For example, you might connect an unsupported camera to Dragonframe via an external switch. When you press **SHOOT** in Dragonframe, Dragonframe would close the switch, and your camera would capture a frame.

To trigger an external device with Dragonframe using a switch/relay:

1. Connect the DDMX-512 to your computer as described in "Connecting DMX to Dragonframe" on page 214.

2. Connect the external device you're using to the switch/relay output terminal (labeled **RELAY**) on the DDMX-512. For information about the DDMX-512's terminals, see the DDMX-512 Brochure and Technical Specifications at https://www.dragonframe.com/product/DDMX-512/

3. Select **SCENE|TRIGGERS**. The triggers setup dialog appears:
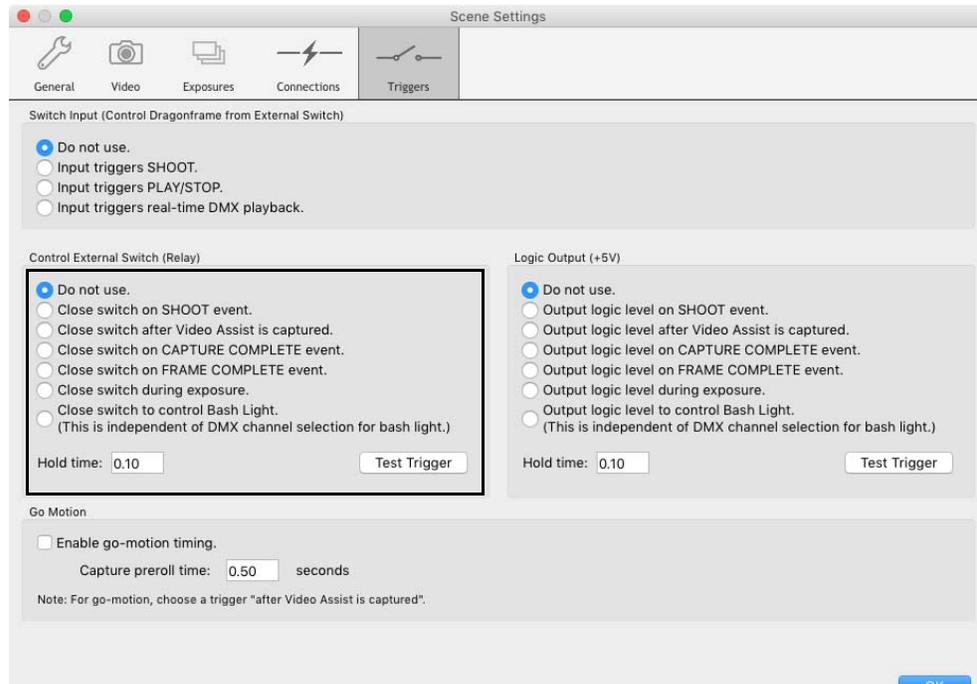
Triggers dialog with External Switch (Relay) settings.

4. Select which Dragonframe event will trigger (close) the external switch:

- When you press **SHOOT** in Dragonframe,

- When Dragonframe is finished capturing a video assist,

- When Dragonframe has completed capturing the high-res frame,

- When Dragonframe has completed capturing all exposures for a frame,

- When Dragonframe is capturing a frame,

- When a work light should be on. The switch will be closed during video assist, and open for the high-res capture.

5. (Optional) Adjust the hold time for the trigger. This is the amount of time Dragonframe will hold the switch closed.

Adding a Logic Output Trigger

You can use Dragonframe to trigger external devices with a logic output trigger of plus or minus five volts.

To trigger an external device with Dragonframe using a logic output:

1. Connect the DDMX-512 to your computer as described in "Connecting DMX to Dragonframe" on page 214.

2. Connect the external device you're using to the logic output terminal (labelled **LO** or **HI** and **GND**) on the DDMX-512.
    For information about the DDMX-512's terminals, see the DDMX-512 Brochure and Technical Specifications at
    https://www.dragonframe.com/product/DDMX-512/

3. Select **SCENE|TRIGGERS**. The triggers setup dialog appears:

Trigger dialog with Logic Output settings.

4. Select which Dragonframe event will trigger a logic level (HI or LO):

    *   When you press **SHOOT** in Dragonframe,
    *   When Dragonframe is finished capturing a video assist,
    *   When Dragonframe has completed capturing the high-res frame,
    *   When Dragonframe has completed capturing all exposures for a frame,
    *   While Dragonframe is capturing a frame,

- When a work light should be on. The level will be active during video assist, and inactive (grounded) for the high-res capture.

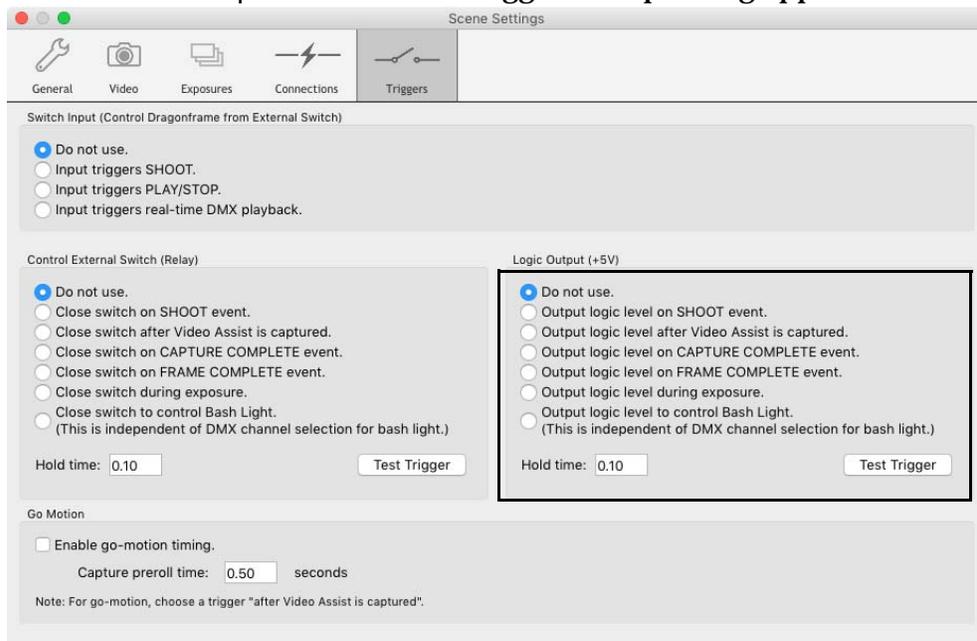5. (Optional) Adjust the hold time for the trigger. This is the amount of time Dragonframe will hold the switch closed.

Using an External Relay Switch or a Logic Output to Automate a Bash Light

If you want to automate a bash light without having to purchase a DMX dimmer pack, you can connect a bash light to an external switch, then to the Output or Logic terminals on the DDMX-512. Dragonframe will close the switch (or set your logic level HI/LO) when the bash light should be on, and open the switch (or set your logic level to ground) when the bash light should be off. To set up a work light with the DDMX-512:

1. Connect the DDMX-512 to your computer as described in "Connecting DMX to Dragonframe" on page 214.

2. Connect the external device you're using to:

   - The switch/relay output terminal (labeled **RELAY**) on the DDMX-512, or

   - The logic output lo or hi terminal (labelled **LO** or **HI** and **GND**) on the DDMX-512.
     For information about the DDMX-512's terminals, see the DDMX-512 Brochure and Technical Specifications at https://www.dragonframe.com/product/DDMX-512/

3. Select **SCENE|TRIGGERS**. The triggers setup dialog appears.

4. Set up the work light:

   - If you connected to the switch/relay output terminal, select **CLOSE SWITCH TO CONTROL BASH LIGHT** in the **CONTROL EXTERNAL SWITCH (RELAY)** section of the dialog.

   - If you connected to the logic output lo or hi terminal, **SELECT OUTPUT LOGIC LEVEL TO CONTROL BASH LIGHT** in the **LOGIC OUTPUT SECTION** of the dialog.

5. (Optional) Adjust the hold time for the trigger. This is the amount of time Dragonframe will hold the switch closed.

Using Go-Motion with an External Motion Control System

If you are shooting go-motion with an external system such as Kuper or Flair, set up your system according the information in this section.

NOTE: The DMC-16, DMC+, and DFMoco-based devices can perform go-motion. The instructions in this section are only for external systems such as Kuper and Flair.

To enable go-motion timing:

1. Connect the DDMX-512 to your computer as described in "Connecting DMX to Dragonframe" on page 214.

2. Connect the external device you're using to:

   - The switch/relay output terminal (labeled **RELAY**) on the DDMX-512, or

   - The logic output lo or hi terminal (labeled **LO** or **HI** and **GND**) on the DDMX-512.

3. Select **SCENE|TRIGGERS**. The triggers setup dialog appears:
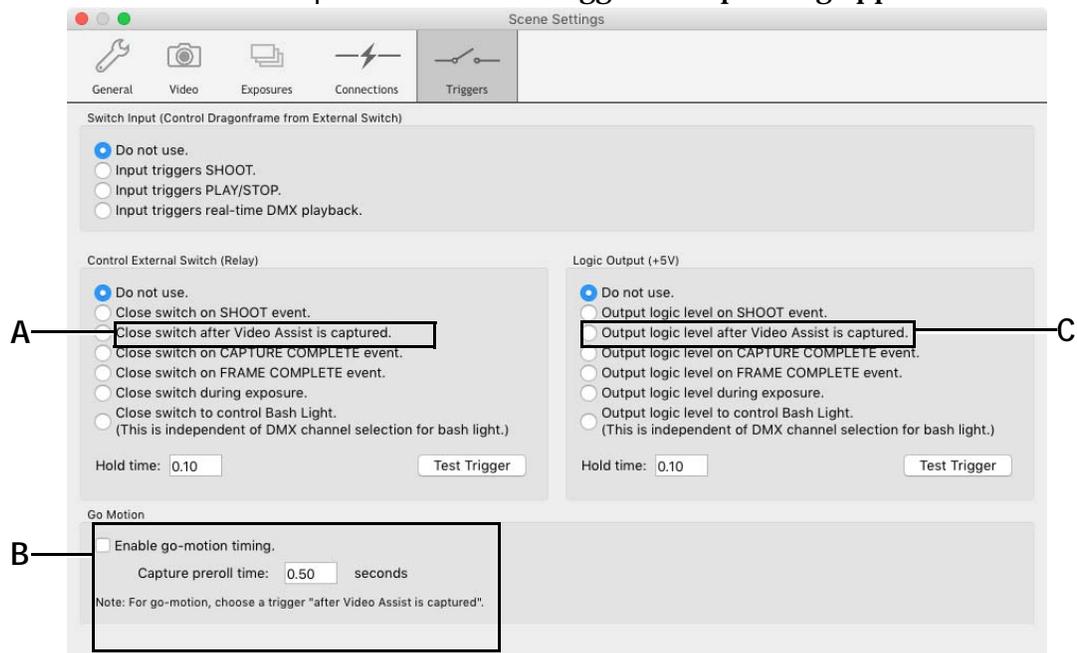
A. *Click this option if you connected to the switch/relay output terminal.* **B.** *Trigger dialog with go-motion settings.* **C.** *Click this option if you connected to the logic output lo or hi terminal.*

4. Choose a trigger depending on what you connected to in step 2.

- If you connected to the switch/relay output terminal, click **CLOSE SWITCH AFTER VIDEO ASSIST IS CAPTURED**.

- If you connected to the logic output lo or hi terminal, click **OUTPUT LOGIC LEVEL AFTER VIDEO ASSIST IS CAPTURED.**

5. Check **ENABLE GO-MOTION TIMING**.

6. (Optional) Adjust the **PREROLL TIME**. This is the time between when the trigger is fired, and when Dragonframe captures an image.

With go-motion enabled, every time you capture a frame, Dragonframe will:

1. Capture the video assist frame.

2. Get the camera ready to shoot high-res.

3. Fire the **AFTER VIDEO ASSIST** trigger. This will trigger Kuper or Flair to run the move.

4. Wait for the **PRE-ROLL** time.

5. Capture the high-res frame.

Calculating the Go-Motion Pre-Roll Time

In our testing with a Kuper motion control system, we achieved repeatable blur at different shutter speeds by using the following formula:

Pre-Roll = (Exposure Time / 2) + 0.15 seconds

Set the exposure time in Kuper to twice the exposure time of the camera set in Dragonframe. This is because Kuper was originally designed for film cameras, where the film is exposed for half of the exposure time.

Here are some examples:

Shutter Speed	Kuper Exposure Time	Pre-Roll Time
0.5	1.0	0.40
1.0	2.0	0.65
2.0	4.0	1.15
4.0	8.0	2.15

Chapter 16: Motion Control

This chapter covers integrating Dragonframe with motion control systems, including Arc, the moco interface within Dragonframe. You can also create action scripts to automate some of Dragonframe's features, and use Dragonframe to calculate camera moves for a hand-cranked camera rig through Arc.

WARNING: All motion control has inherent risks. Make sure that you are clear of moving rigs at all times. Set your motor speeds low at first to make sure the speed is safe.

Using the Arc Motion Control Workspace

The Arc motion control workspace provides an interface for programming complex, multi-axis camera moves, directly within Dragonframe.

Dragonframe can interface with:

- Our DMC-16 and DMC+

- The IOTA Controller (discontinued)

- Arduino or compatible boards running our DFMoco sketch. The Arduino can interface with any standard stepper motor drivers. To control up to four motors, you can use:
  - Arduino Uno
  - Arduino Duemilanove
  - Arduino 101

    To control up to eight motors, you can use:
  - Arduino Mega
  - Arduino Mega 2560

- Compatible third-party hardware listed on our site: https://www.dragonframe.com/faq/#moco

Understanding Real-time vs Non Real-time Shooting

When choosing a motion control system it is important to understand what we mean when we say a rig supports real-time shooting.

Real-Time Shooting

Real-time shooting in Dragonframe means that Dragonframe can run a move at full speed, or reduced speed, with all axes fully synchronized.

If you want to program real-time moves (for live action) in Dragonframe, you need a real-time capable rig.

A real-time rig makes shooting test moves much faster and smoother.

These devices provide real-time capabilities with Dragonframe:

- DMC-16
- DMC+
- eMotimo spectrum ST4

Non Real-Time Shooting (Shoot-Move-Shoot)

A non real-time rig will move each axis to the next position of a move at separate speeds.

This is perfectly adequate for shooting stop-motion animation.

You cannot run a live action move with a non real-time rig.

NOTE: Some rigs are capable of real-time shooting when used with the third-party's custom controllers, but their Dragonframe integration may only provide shoot-move-shoot capabilities. Only the DMC-16, DMC+ and eMotimo spectrum ST4 motion controllers can provide real-time capabilities with Dragonframe.

The sections that follow describe how to connect hardware to Dragonframe, gives an overview of the entire Arc workspace, and then detail how to set up axes and moves in the workspace.

Understanding Stepper Motors

Stepper motors are very common for motion control, because they can be easily and accurately controlled, and are relatively low-cost. Internally they have four magnets that can be activated in sequence to move the motor by steps.

There are usually three components to a stepper motor system:

- A signal generator. This generates step and direction signals, which are logic-level signals (3.3-5V, low current).
- A stepper motor driver. This turns step and direction signals into high-powered signals that control the stepper motor magnets.
- A stepper motor: This takes the powered signals from the driver and rotates in order to move your axis.

For example, a Kuper card is a step/direction signal generator. Typically this feeds into one or more high-powered driver boxes (such as Gecko Drivers). Each stepper motor on a motion control rig is then plugged into the driver boxes.

Using the Arduino for Motion Control

We have written a sketch (program) for the Arduino that turns it into a stepper motor signal generator for 4-8 axes. The sketch is called **DFMOCO** and is installed with Dragonframe at:
 <Dragonframe Installation Folder>**/RESOURCES/ARC MOTION CONTROL/DFMOCO**.

You can load the sketch onto an Arduino Uno, Duemilanove, Mega, or Mega 2560 (others may work, but these are the ones we have tested). The step and direction pins for each axis are described in the introductory comments of the DFMoco sketch.

If you already have stepper motor drivers, you could easily wire up the step and direction signals into a connector for your motor drivers.

Alternatively, you could wire up the step and direction signals to a small stepper motor driver, such as the Big Easy Driver. Find the Big Easy Driver at: https://www.sparkfun.com/products/11699

The Big Easy Driver has power output of about 1A. This is suitable for smaller motors but not full-scale rigs.

Connecting Dragonframe to Moco Hardware

Once you've connected your hardware, connect Dragonframe to it.

1. In Dragonframe, select **SCENE|CONNECTIONS**. The Settings dialog appears, showing the Connections tab.

2. Click **ADD CONNECTION**. A new connection appears:
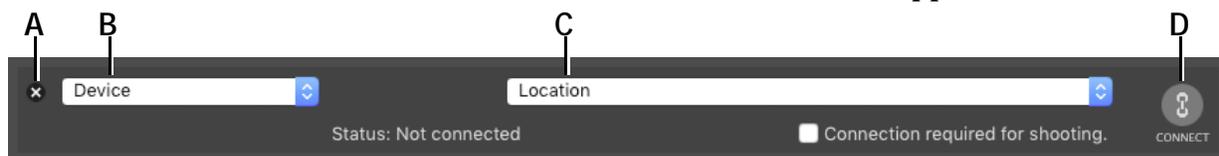
A. *Delete connection. Disconnects from device and removes it from the list.*

B. *Device type, such as "DDMX-512", "DMC-16", etc.*

C. *The serial port the device is located at.*

D. *Connect button. Green when connected.*

3. Choose the device. A special **ARCMOCO** selector appears between (B.) and (C.).

4. Choose **ARCMOCO 1, 2, 3** or **4**. You can have up to four different motion control devices connected to Dragonframe.

5. Click **CONNECT**. The connection changes appearance:
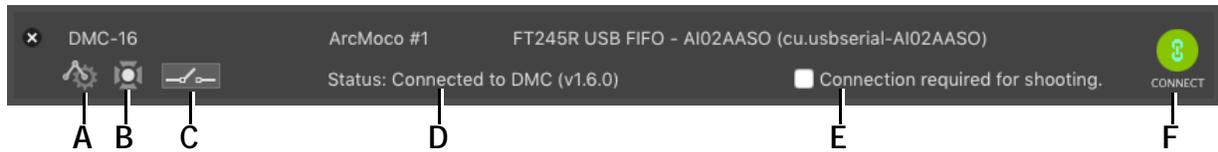
A. Motion control indicator. Shows that this device controls motors via Arc Motion Control workspace.

B. DMX indicator. Shows that this device controls lights via the DMX Workspace. Only one device may be selected for DMX.

C. Triggers indicator. Shows that this device controls I/O triggers. Multiple devices may be used for triggers.

D. Connection status. Shows device information.

E. Connection required for shooting. Check if shooting should fail if this device is not connected.

F. Connect button is green when connected.

NOTE : For Windows, if the correct serial port doesn't appear in the dialog, look for it in your PC's Device Manager.

Dragonframe connects the device, then automatically checks the **CONNECTION REQUIRED FOR SHOOTING** check box. When this box is checked, you will not be able to capture any frames for the scene until Dragonframe is connected to the hardware.

CAUTION : If you uncheck the **CONNECTION REQUIRED FOR SHOOTING** box, you could accidentally shoot all or part of a scene without your motion control setup working.

6. Open the Arc Motion Control workspace. The map that follows gives an overview of the workspace.

Arc Motion Control Workspace Map

A. *Velocity Graph: See the velocity of each axis over time. This helps you create a smooth move.*

B. *Position Graph: See each axis and the audio waveform over time. Adjust the move directly in this window by moving keyframe handles.*

C. *Workspace Tools: Open the main menu for the window, add axes, or link the Arc playhead with the DMX program. Add keyframes, mark up the axis, view the jog box window, adjust the axis style, or open the Live View.*

D. *Axis Controls: Work with an axis: jogging the motor, setting keyframes, and setting limits.*

E. *Keyframe List: See the keyframes for the selected axis in an editable table. You can add, edit and delete keyframes from this list.*

F. *Live View: Preview the move test.*

G. *Motor Controls: Move all of the motors together, run a move test, or engage the system for shooting.*

Adding an Axis

1. Click ⬚. Dragonframe opens the Configure Axis dialog:
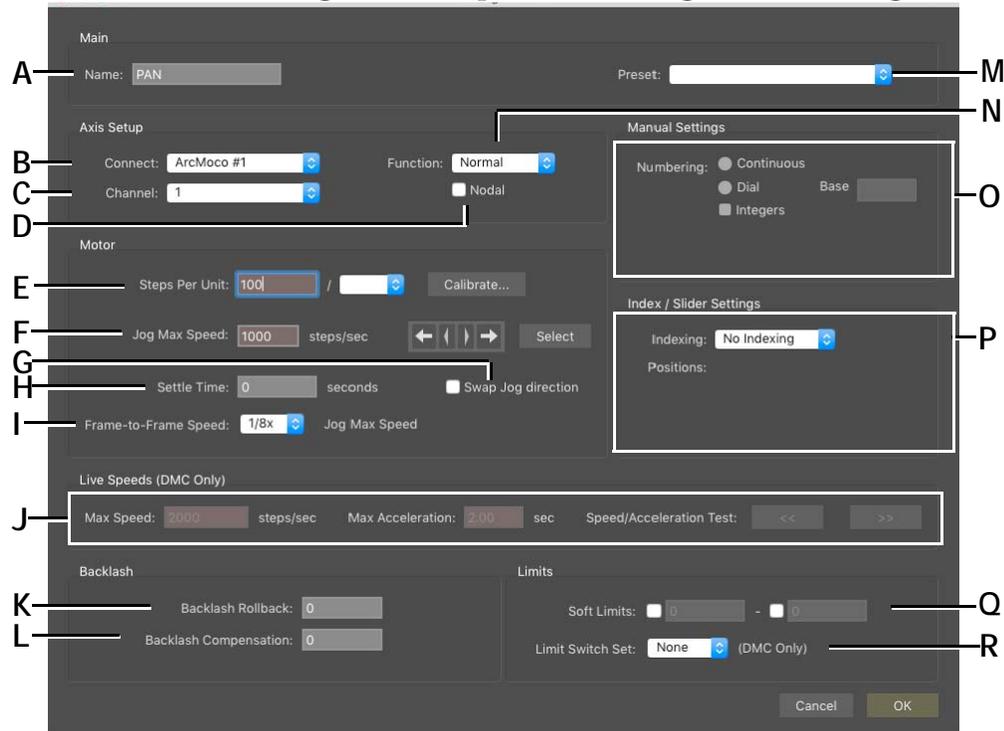
A. **Name:** Name the axis.

B. **Connect:** The device you're connected to, such as ArcMoco #1-#4, Digital Focus, or Flair.

C. **Channel:** Only for ArcMoco. Select the channel you're using for the axis. You noted this earlier.

D. **Nodal:** Specify that this is a nodal (rotational) axis. Useful when scaling moves.

E. **Steps Per Unit.** Use CALIBRATE if you need help.

F. **Jog Max Speed:** Enter the maximum speed of the device, specific to the motor you're using. Use the Jog Test Buttons to test the speed. **Start the speed slowly at first for safety.**

G. **Swap Jog Direction:** Swap directions to have the orientation of the jogging match your frame of reference.

H. **Settle Time:** Enter the amount of time to wait after the axis moves before shooting a frame.

I. **Frame-to-Frame Speed:** speed used when moving from one frame to the next during shooting.

J. **Max Speed, Acceleration and Test Buttons:** The very fastest you want this axis to go when running moves, and the number of seconds it will take to reach the maximum speed. Use the test buttons to

test the speed as you adjust settings. **Set speeds as slowly as possible for safety.**

K. **Backlash Rollback:** Set your rig to roll back before moving in the direction of your move, so you always enter a position with any slack removed. Make the rollback amount equal to or greater than the backlash in your rig.

L. **Backlash Compensation:** Enter the compensation amount. Dragonframe will factor it out.

M. **Preset:** Choose from a provided preset, or adjust settings and click SAVE AS to save your own for later use.

N. **Function:** Choose whether you're setting up regular moco moves, a 3D slider, a focus motor or a manual axis.

O. **Manual Settings:** Set up numbering for manual rigs.

P. **Indexed / Slider Settings:** Set up 3D stereo positions or other indexed configuration.

Q. **Soft Limits:** Set software-based limits for the axis.

R. **Limit Switch Settings:** One of eight limit switch sets on the DMC-16. A limit switch set is a set of lower limit and upper limit physical switches.

2. Select the kind of device you're using. (B.)

3. Choose which channel you connected your rig to. (C.)

4. Choose which moco function (N.) to use:

    - **NORMAL**: Regular moves, such as pan and tilt.

    - **3D**: Configure a 3D stepper such as the IOTA Controller.

    - **FOCUS**: Set up an axis to control a focus motor.
      If you configure an axis for focus, you can use the focus controls in the Cinematography window to jog the focus motors.

    - **MANUAL**: Set up a hand-cranked rig.

    - **INTERVAL**: Set up an axis to represent a time interval that can be used in the time-lapse dialog.

5. (Optional) Fill out the rest of the dialog with the settings that apply to your rig and project.

6. Click **OK**. Dragonframe adds an axis to the position graph, the axis list, and the keyframe list. In the example below, the new axis is named **PAN**, and its assigned color is red.
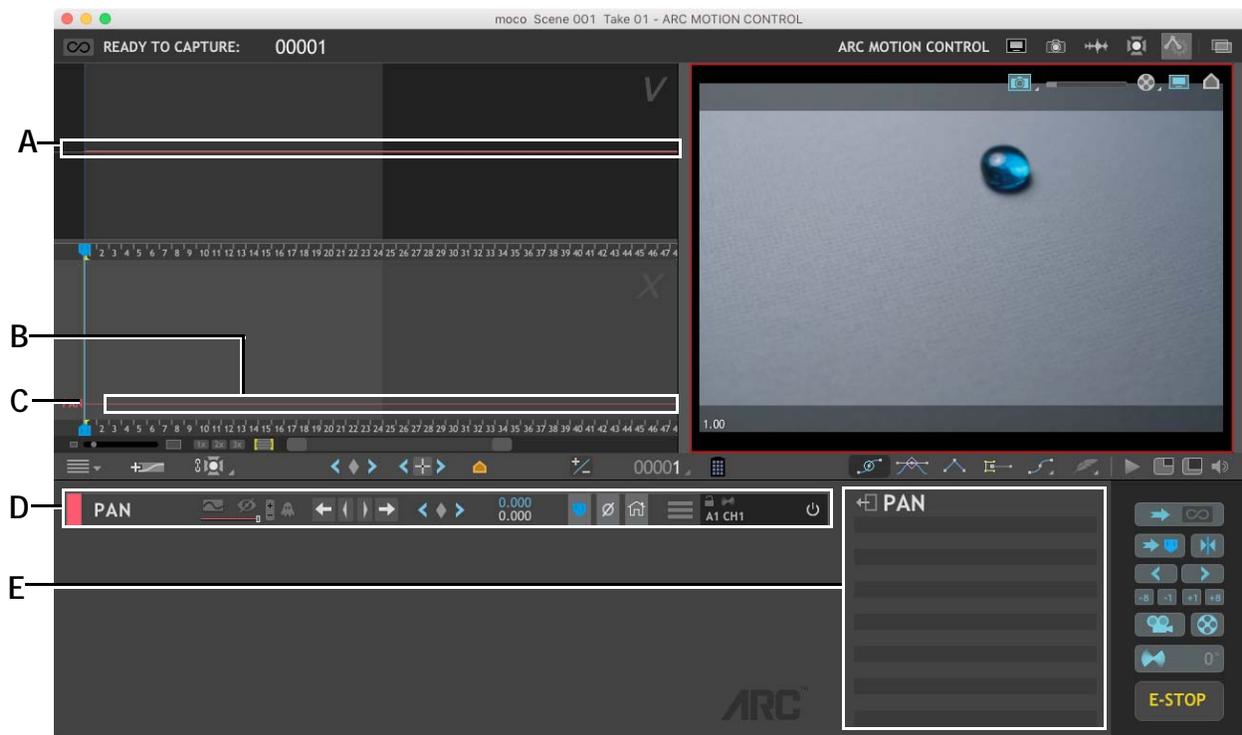
A. *Velocity graph: View the axis' speed over time.*

B. *Motor: View the current position of the motor assigned to **PAN**.*

C. **PAN:** *View **PAN**'s position graph here once you add keyframes.*

D. *Axis list. Use the axis-specific tools, such as jog and inch.*

E. *Keyframe list. View keyframes in a table format Click a row to add or edit them.*

Calibrating Steps per Unit

If you need help calibrating an axis' steps/unit, press **CALIBRATE** in the axis configuration screen. The calibration dialog opens:

A. Step count.

B. Reset the step count to zero at the current position. (Note that this does not change the zero point of your axis—it's only for calibration.)

C. Enter the position of your axis, according to your target unit type.

D. Choose the unit type.

E. Inch or jog the axis to the target position.

To calibrate an axis:

1. Use a ruler to mark off a known number of units on your axis. For example, if you wanted to calibrate an axis in inches, you could mark two points that are 10 inches apart.

2. Move to the first position.

3. Press **RESET/ZERO** to zero the step counter.

4. Jog and inch to precisely line up with the second marker.

5. Enter the number of units between the two markers (in our case 10").

6. Set the unit type.

7. Press **OK**. Dragonframe calculates the steps per unit and sets it within the axis configuration dialog.

NOTE: If you measure a larger distance (such as 10" instead of 1") your calibration will be more accurate.

Configuring Backlash Settings

The Configure Axis dialog provides a couple of settings for backlash. It is important to understand these settings, and know when and how to use them.

"Backlash" refers to the amount of slack in an axis when it changes direction. Although many rigs advertise as having no slack, in practice they almost always have some.

BACKLASH ROLLBACK is applied when the you cut back in your animation. For example, you shoot up to frame 100, then decide you need to go back to frame 80 and reshoot. If you have a backlash rollback value set for an axis, the rig will go back to frame 80, then roll back the extra amount you specified, before rolling forward into place.

BACKLASH COMPENSATION is useful if you have a large amount of backlash in an axis, and your move changes direction, and you want to avoid lulls (or dead spots) in the movement. The lull would occur when the direction changes, since the motor would move for a while before all of the slack is gone. Backlash compensation avoids the lull by removing the slack as soon as you change directions.

Of the two, **BACKLASH ROLLBACK** is the simpler to configure. You measure the amount of slack in an axis, and make sure the backlash rollback setting is at least that amount.

BACKLASH COMPENSATION must be precise in order to be effective.

In general, we recommend setting up just backlash rollback.

Digital Focus Control for Some Webcams

Some Logitech webcams allow you program focus pulls in Arc. To control digital focus for a compatible webcam, set it up as an axis in the Add Axis dialog. Choose **DIGITAL FOCUS** from the **CONNECT** drop-down list.

Controlling an Axis

Once you've added an axis, you can jog the motors on the position graph, set the zero and home points for the axis, and follow your motor's progress along the axis. You can also disable an axis if you're not using it.

Jogging and Inching your Motors

Jog and inch the motors from the Axis list (D.).

- Click ◀ or ▶ to inch the motors.
- Click ← or → to jog them.
- Click and hold the buttons to move more quickly.

NOTE: If you've set up a move to control focus, you can also use the focus check buttons in the Cinematography workspace to jog your focus motor.

See also:
"Focus Check During Live View" on page 80.

Setting the Zero Point and Going to the Zero Point

To set a zero point:

1. Jog the motor to the zero position of the axis.

2. Choose **SET ZERO** from the axis menu. Dragonframe sets the zero point at the current position and lights up the zero icon.

To return to the zero point:

Click ⊘. Dragonframe sends the motor to zero.

NOTE: Any time your motor returns to the zero point, the zero icon will light up.

Setting a Home Point and Going to Home

To set a home point:

1. Jog the motor to the position you want to be home.

2. Choose **SET HOME** from the axis menu. Dragonframe sets the home point at the current position and lights up the home icon.

To return to the home point:

Click 🏠. Dragonframe sends the motor to the home point.

NOTE: Any time your motor is at the home point, the home icon will light up.

Setting the Limits for the Axis

If you didn't set limits for your device when you configured an axis, you can set them using the jog buttons. To set limits:

1. Jog the motors until you reach the limit for your device.

2. See if the position for the values are positive or negative.

3. Select the menu in the Axis list, then set either a lower limit or upper limit, depending on the motor's position information.

NOTE: When you move away from the limits of the devices, the icons go dark. When you arrive at a limit, Dragonframe lights the icon.

Reading the Position Counters

As you jog the axis motor or reposition the playhead, you can keep track of where you are.

The Arc workspace displays both motor and playhead positions at all times in the Axis list:

Two axes set up, playhead (blue) and motor (white) positions for each.

Disable an Axis

You can disable one or more axes without deleting them.

To disable an axis, click ⏻. Dragonframe removes the axis from the position graph.

Adding Keyframes

Once you've added an axis to the graph, add keyframes.

1. Jog the motors to the desired position.

2. Move the playhead to the frame you want. By default, moving the playhead in the Arc window will move you through your DMX lighting program as well.

3. Press the keyframe button on each axis you want to keyframe. If you want to keyframe all axes, press the keyframe button in the main control bar:
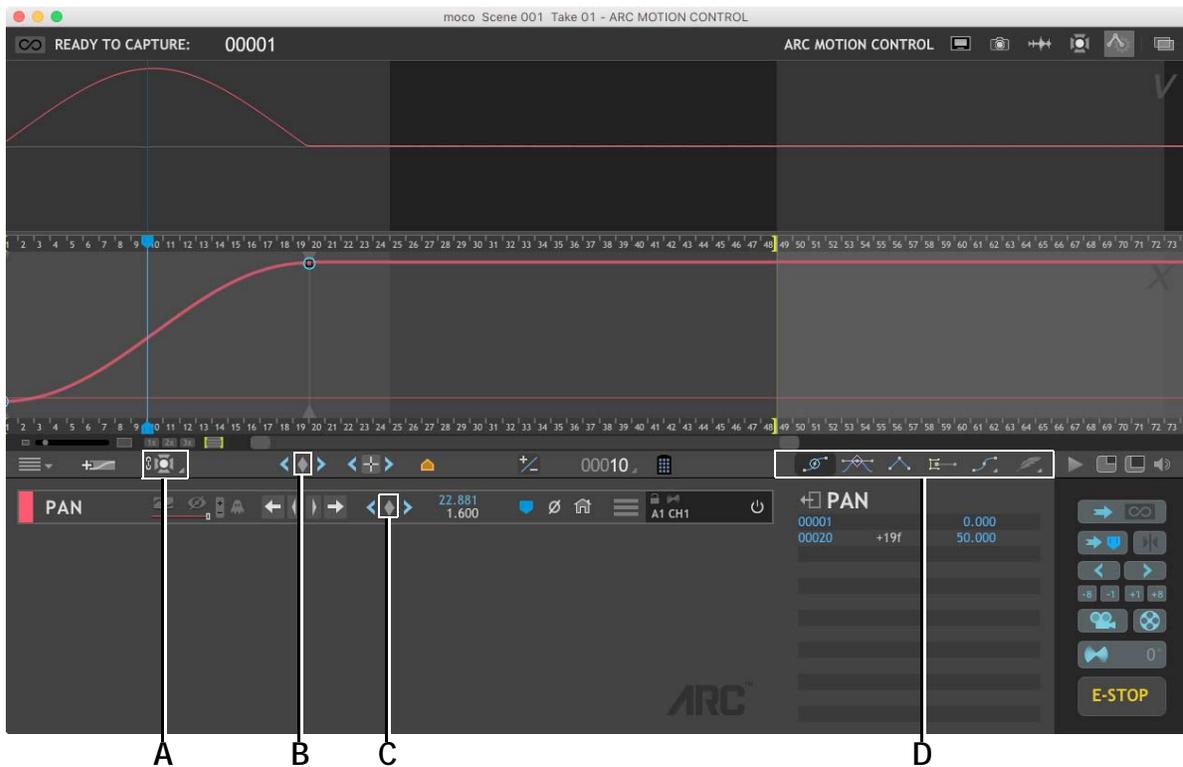
A. *Unlink the playhead from the DMX lighting program. When the playhead is linked, your lighting program will play back as you move the playhead.*

B. *Press the keyframe icon in the main control bar to add keyframes for all axes. Hold* **SHIFT** *to place new keyframes on the existing move path.*

C. *Press the keyframe icon in the Axis list to add a keyframe only for* **PAN**.

D. *Select a keyframe style.*

4. Select a keyframe style:

- Auto-smooth the curve.

- Ease in and out.

- Make the keyframe linear.

- Ease to linear keyframe. This style has a perfectly linear middle section, with eases on each end.

- Bezier keyframe.

- Ease into the keyframe. (In Bezier keyframe contextual menu.)

261

- ∠ Ease out of the keyframe. (In Bezier keyframe contextual menu.)

If you have applied auto-smooth or auto-ease to a keyframe, a colored shape appears around it:

A. *Blue circle around keyframe: Auto-smoothing applied.* B. *Purple diamond around keyframe: Auto-ease applied.*

At any time you may:

- Click the keyframe in the axis to select it.
- Move the bezier handles of selected keyframes.
- Click an axis to select it.
- Double-click on an existing curve to add a keyframe to it.

Create Smooth Transitions with Feathering

To create extra smooth transitions, apply feathering to the keyframes. You can apply feathering to any bezier keyframes (not linear or ease-to-linear styles).

1. Select one or more keyframes:
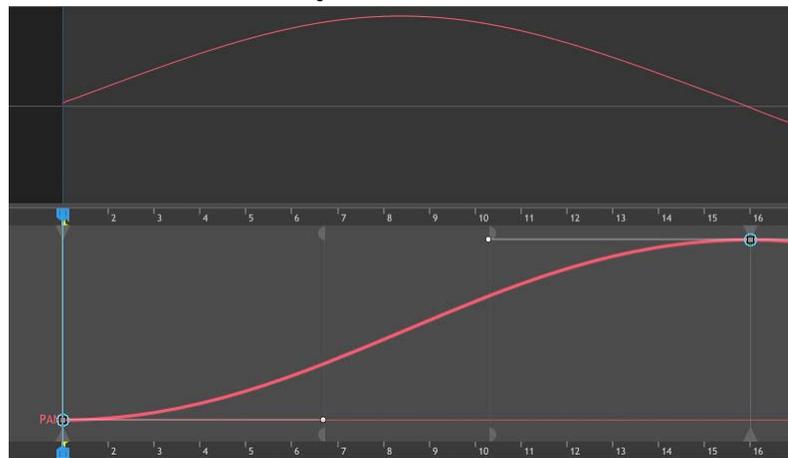
2. Press the feather icon   to enable feathering. A special feathering handle will appear:
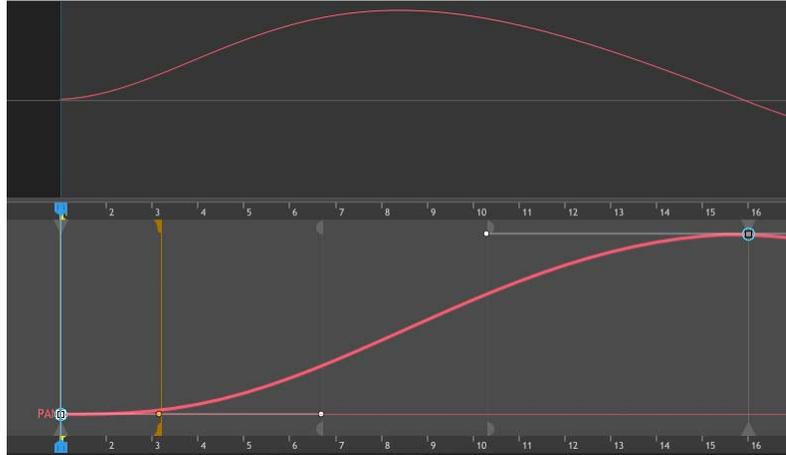
3. Adjust feathering by grabbing the handle (only the one at the top or bottom of the graph will work) and sliding it up or down the timeline:
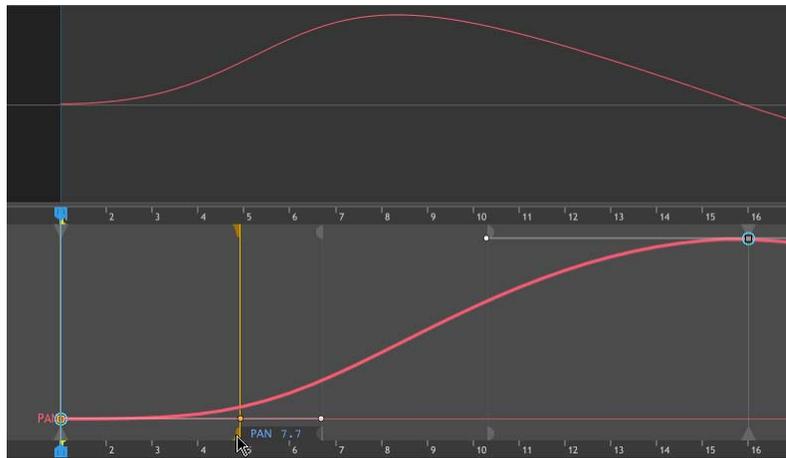
Notice how the velocity curve adjusts to the feathering. Initially, the acceleration started out fairly constant. When you add feathering, the acceleration ramps up gradually.

Using Ghosts to Redraw a Path

Sometimes you need to redraw a path, and it would be nice to be able to compare the new path to the previous one. One example is when you import a raw move from another program. In that case, you end up with one keyframe on every frame. This will play back fine in Dragonframe, but would be very difficult to edit.

On the axis controls, click the ghost icon and choose **NEW GHOST**. A copy of your move at that point will show up in white. Initially it will be underneath your axis curve.

At that point, you could delete the entire move for that axis, and then start to redraw it with fewer keyframes, matching the original move by lining up to the ghost image.

Learn more by watching the tutorial on ghosting:
https://www.dragonframe.com/tutorials

Using an Adjustment Layer to Modify an Axis Move

Imagine that you want to add a hand-held camera feel to a move you've already programmed. Rather than adding lots of extra keyframes on top of your nice smooth move, you can add an adjustment layer to the axis.

The adjustment layer is another editable axis that combines with the primary axis to add bumps or other adjustments, as needed.

To add an adjustment layer, click on the axis menu and select **ADD ADJUSTMENT LAYER**.

Learn more by watching the tutorial on adjustment layers:
https://www.dragonframe.com/tutorials

Using Time Warp to Stretch or Squash Your Final Move

There are lots of tools to grab your keyframes and stretch them out over time. However, sometimes you need to leave the move exactly as it is, but just stretch out the end, or stretch out an area that doesn't have a lot of keyframes.

In the Arc menu, choose add time warp. This adds a special layer that can be used to stretch or squash your final move.

Learn more by watching the tutorial on time warp:
https://www.dragonframe.com/tutorials

Using Targets to Plot a Path

Often the best moves have the fewest keyframes. Targets are a way of marking your desired path without keyframes. To add targets:

1. Jog the motors to the desired position.

2. Move the playhead to the desired frame.

3. Click (B.).

4. Dragonframe adds a target to the location you chose:

A. Target navigation buttons. *B.* Target button. *C.* Hide targets. *D.* Target added.

When you've added multiple targets:

- Click < and > to move through them one by one.

- Click ⬆ to hide all targets.

- To delete a target, select it, then press **DELETE**.

Stepping Through a Move

Use the motor controls to move the motors along your axis frame by frame.
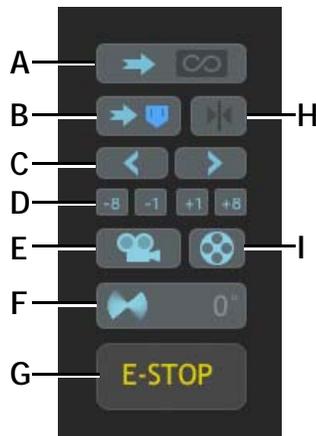
A. To Camera Position: Move the motors to the frame that is ready to be captured, and prepare to shoot. This also moves any DMX lighting programs you created to a ready-to-capture mode.

B. To playhead: Move the motors to the playhead. When you're on the playhead, this button turns blue.

C. To Frame: Move the motors to the previous or next keyframe.

D. Move rig up or down timeline by frame count.

E. Run Move Test: Run a test of the move with video assist frames.

F. Blur Amount: Adjust the blur amount for go-motion if you are using the DMC-16.

G. E-Stop (**ESC**): Stop all motors.

H. Backlash rollback on all axes. Must be "on play-head".

I. Create move test movie.

NOTE: By default, the Arc playhead is linked with DMX. That means that as you step through the move, Dragonframe will also run your lighting program. Enable or disable the link to DMX by pressing ⟰|◉| in the workspace tools.

Running a Move Test

Once you have created a move, you can run a test of it. Once you run the test, you can play the test back, adjust the move and re-shoot sections of the test, or create a movie of the test.

To run a move test:

1. Click [camera icon] in the motor controls on the bottom right of the screen. The Run Move Test dialog appears:
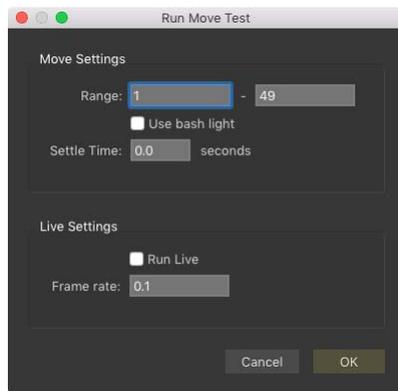
2. (Optional) Enter a range for the test. If you have in and out points set for playback, those frames will automatically appear in the dialog.

3. Check the **USE BASH LIGHT** check box to have your bash light settings active during the test.

4. (Only for real-time controllers) Check whether you want the move to run at live speeds, and enter the frame rate to use.

5. Click **OK**. Dragonframe opens the Move to Position dialog:
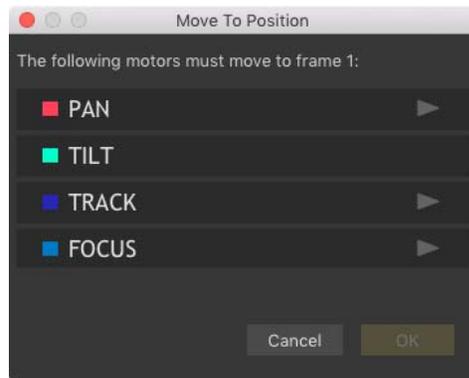
6. Click ▶ for each axis. Dragonframe moves the motor for the axis to the starting position. When all the motors are in place, click **OK**.

Dragonframe runs the move test.

NOTE: When it runs the test, Dragonframe captures only video assist frames for speed. If you need to test high-quality stills, run the move.

Playing Back the Move Test

Once you've shot a move test, play it back, or play back just part of it.

- Press **PLAY** to play back the test.

- Set in and out points to play back only a section of the test. Move the playhead, then press **I** for in or **O** for out. When you press **PLAY**, only that section will play back.

Reshooting Part of a Move Test

You can reshoot part of a test and Dragonframe will automatically replace the frames in the original test.

To reshoot a section of a test:

1. Adjust the move as needed.

2. Set in and out points around the section you adjusted. In this example, you'd set the in point for frame 14, and the out point to frame 21.

3. Click . The Run Move Test dialog appears:
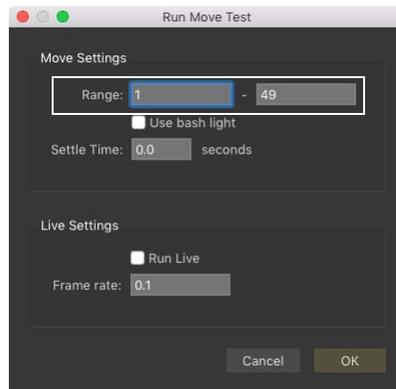
Run Move Test dialog. The range matches the in and out points set in the Arc workspace.

4. Click **OK**, and run the rest of the test as you normally would. Dragon-frame runs the test. It replaces the frames from your original test with the new frames.

5. Press **PLAY** to play back the modified test.

Creating a Movie of the Test

You can export a movie of the completed test.

1. Click . Dragonframe displays a message: **EXPORT MOVE TEST TO MOVIE.** The Save Movie dialog appears.

2. Choose a location for the movie and click **OK**. sDragonframe exports the movie.

Making Adjustments to the Move

There are many tools within the Arc workspace to modify your move. You can scale the entire move in time or space, or extend portions of it to adjust the overall timing.

Resizing a Portion of the Move

You can resize a portion of the move:

1. Select a range of keyframes.

2. A cyan box will highlight the range of keyframes you have selected.
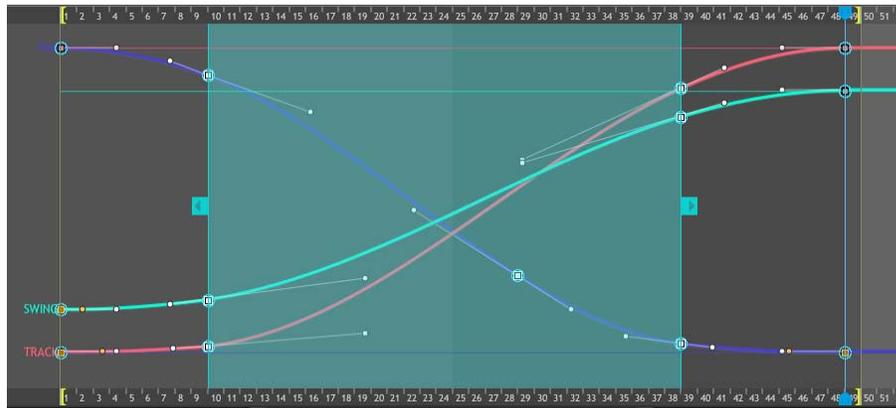
3. Drag the left or right handle of the box to resize that portion of the move.
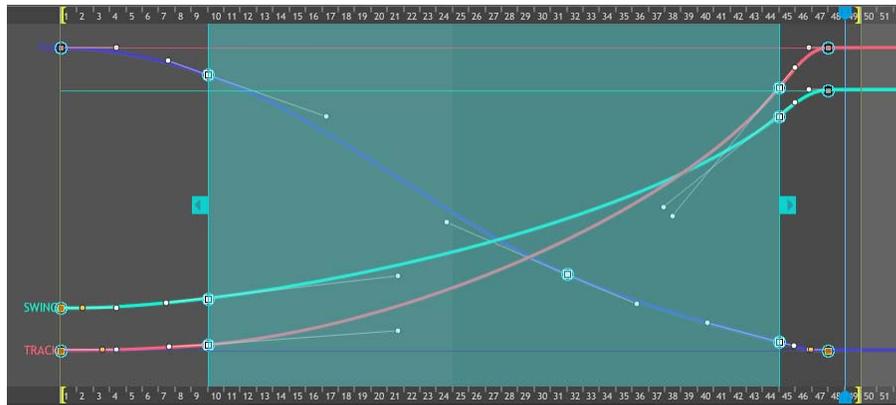
By default, this resize will leave other portions of the move untouched. This can cause the keyframes to bunch up together (see above picture).

To push other keyframes down the timeline instead, press **SHIFT** while you drag the handle. It will turn white to show you it is in a different mode.
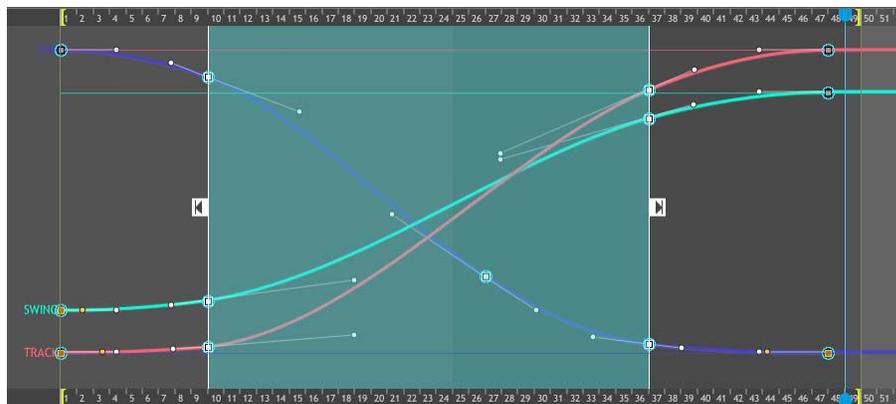
After performing the same drag, you can see how the results vary:
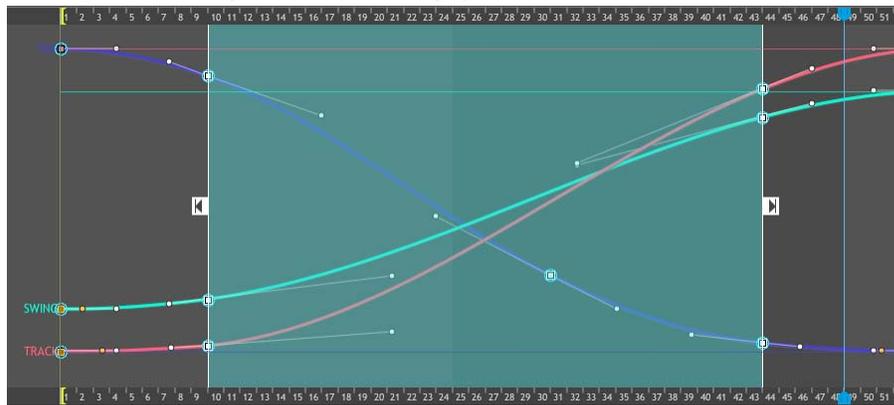
Resizing the Move in Time

After programming a beautiful move, you decide it needs to be ten frames longer. Resize the move with the temporal motion math dialog:

1. Click the move math icon in the workspace tools, then select **MOTION MATH : TEMPORAL**. Dragonframe opens the motion math dialog:
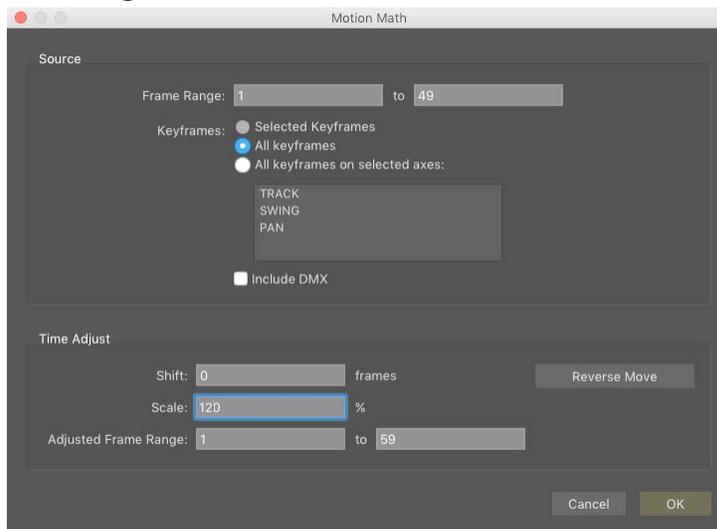
2. Configure your **SOURCE** settings. By default it uses the entire move, and all axes/keyframes.

3. Configure your time adjustment. **SHIFT** moves the keyframes up or down the timeline. **SCALE** and **ADJUSTED FRAME RANGE** are two ways of editing the same thing: how long the adjusted move will be.

4. Press **OK** when you want to commit the changes.

Resizing the Move in Space

Resizing a move spatially is less common, but it has uses. Perhaps you need to shoot a move at two different scales. Scale the positions of the move with the spatial motion math dialog:

1. Click the move math icon [icon] in the workspace tools, then select **MOTION MATH : SPATIAL**. Dragonframe opens the motion math dialog:
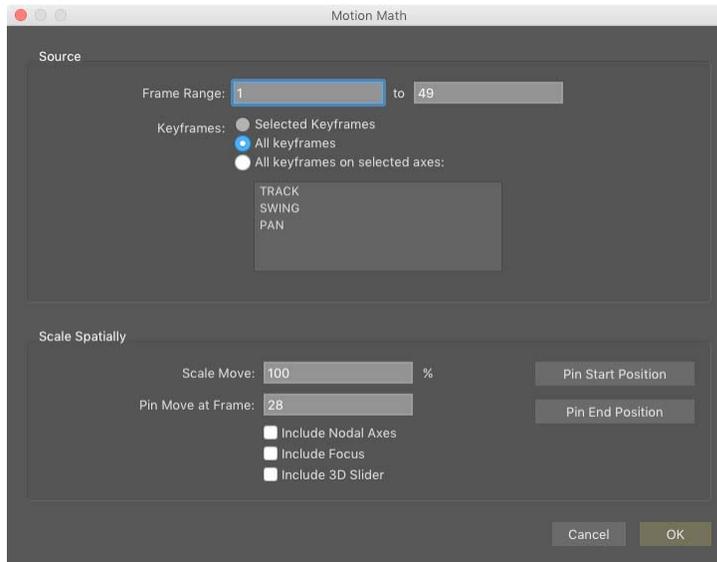
2. Configure your **SOURCE** settings. By default it uses the entire move, and all axes/keyframes.

3. Configure your spatial adjustment. If you shot your scene at full scale, and now you need to repeat the move at 1/4 scale, you would enter "25%" for the scale.

4. Press **OK** when you want to commit the changes.

Adding Many Keyframes to an Existing Path

It can be useful to "pin" a move in place before stretching it out. You can add many keyframes at once on the existing path:

1. Click the move math icon ⬚ in the workspace tools, then select **ADD MULTIPLE KEYFRAMES**. Dragonframe opens the multiple keyframe dialog:
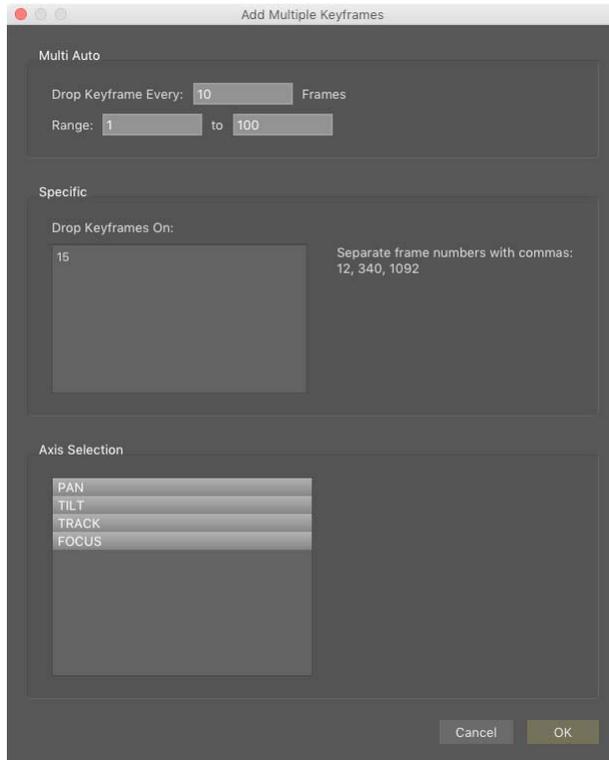
2. If you want keyframes automatically placed across your move at a given interval, fill out the **MULTI AUTO** section. In the above example, the program would put a keyframe at frame 1, and then every 10 frames after that: 11, 21,...,91, and finally at the end frame, 100. The start and end of the range are always included, even if the end frame does not line up with the interval.

3. In the **SPECIFIC** section, you can write specific frames that you want keyframes to appear on. This can be used instead of or in addition to the **MULTI AUTO** feature.

4. Choose which axes to modify in the **AXIS SELECTION** area. By default all axes are selected.

5. Press **OK** to accept the changes or **CANCEL** to restore the move to how it was.

Preparing Dragonframe for Shooting from the Arc Workspace

Once you are done programming your move, you must engage the Dragonframe for shooting. This moves all external hardware to the ready-to-

capture position, including your motion control rig, and the DMX dimmer pack, if you've created a lighting program.

1. Press [→] [∞] . Dragonframe goes into ready-to-capture mode; and the button turns blue.

The Move To Position dialog appears:
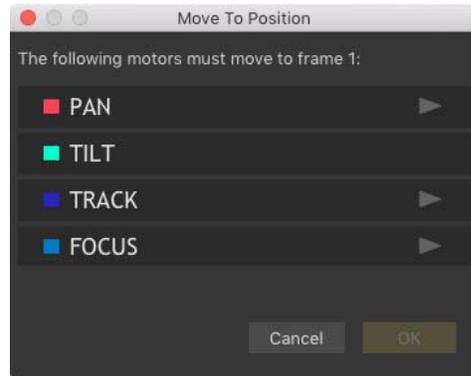
2. Click [▶] for each axis. Dragonframe moves the motor for the axis to the ready to capture position. When all the motors are in place, click **OK**.

3. Open the Animation workspace and begin shooting. Dragonframe moves the motors and DMX Lighting program to the correct position as you shoot frames.

NOTE: You can't edit your move or lighting programs while in shooting mode.

To exit shooting mode, press [→] [∞] .

Shooting with Motion Control

After you've placed Arc motion control in **READY TO CAPTURE** mode, you're ready to shoot your animation. The sections that follow explain some tools you can use while shooting.

Shoot Move and Move Shoot Modes

By default, Dragonframe will move the motors to the next position right after you shoot. This is called the Shoot Move mode. However, you may prefer to line up the animation *before* the motion control moves to the next frame position. This is called the Move Shoot mode.

To switch from the default mode, select **CAPTURE| MOVE SHOOT MODE.**

Dragonframe will show a moco frame position alongside the **READY TO CAPTURE** frame number:
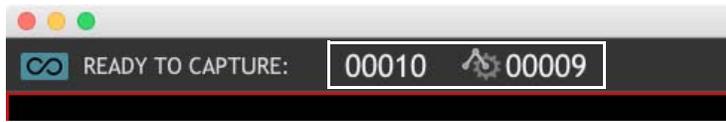
Moco frame position alongside the ready-to-capture frame number at the top left of window.

Moving the Rig Manually

While you are shooting, you may want to peek a few frames forward into the move to make sure you will hit your marks.

To safely preview motion control forward or backwards, one frame at a time, press **SHIFT + ALT/OPTION** and the arrow keys.

Dragonframe will show the moco frame position alongside the **READY TO CAPTURE** frame number:
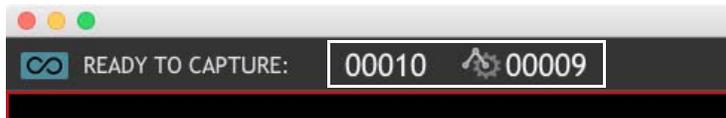
Moco frame position alongside the ready-to-capture frame number at the top left of window.

After preview, Dragonframe will return the rig back to the correct frame, when you press **SHOOT**, no matter its current position.

Handling Cutbacks and Edits

After a cutback or other edit, Dragonframe may need to move your rig to a new position. If the rig needs to move more than a couple of frames forward or backward, the moco stepping window appears:

A. *1x-24x: Change stepping speed.* **B.** *Stop: Stop stepping.*

Your rig will begin stepping to the new position.

- Stop the movement by pressing **STOP** (B.), or **ESC** on the keyboard.

- Change the speed by pressing **1X**, **4X**, **12X**, or **24X** (A.).

WARNING: All motion control has inherent risks. Make sure that you are clear of moving rigs at all times. Set your motor speeds low at first to make sure the speed is safe.

If Dragonframe moves the rig backwards, and you have backlash roll-back amounts set for one or more axes, Dragonframe will display a dialog that prompts you to **PRESS ENTER TO PERFORM BACKLASH ROLLBACK**.

Press **ENTER**. Dragonframe will automatically back up and then move into the proper position.

Viewing Your Move in the X-Sheet

Once you're in the Animation window, you can see the positions for each frame in the X-Sheet:
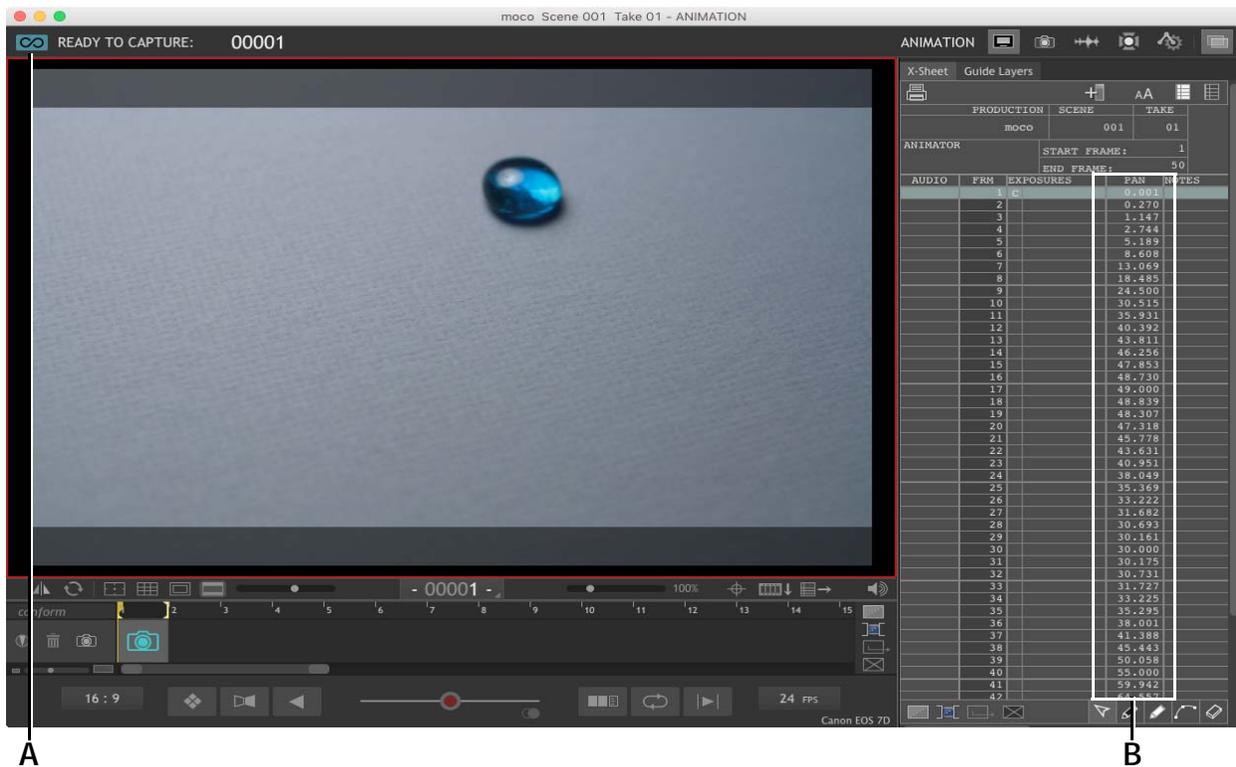
A. RTC (Ready to Capture): Shows if the motion control system is engaged for shooting.
B. Pan column: Position information for the move named **PAN** in the X-Sheet.

Importing or Exporting Your Axis Setup

Once you have axes set up, you can export them to other projects. This will export the configuration information (limits, channel, etc) without exporting keyframe information. For example, if you always work with a particular rig, exporting an axis setup would allow you to quickly start a new project without having to re-configure each axis on your rig.

Exporting an Axis Setup

To export an axis:

1. Click the main menu for the workspace (in the workspace tools), then select **EXPORT|ARC AXIS SETUP (ARCX)**. Dragonframe opens the Export Axis Setup dialog.

2. Choose where you want to save the setup, and click **OK**. Dragonframe exports the setup.

Importing an Axis Setup

To import an axis setup into another scene:

1. Click the main menu for the workspace (in the workspace tools), then select **IMPORT|ARC AXIS SETUP (ARCX)**. Dragonframe opens the Import Axis Setup dialog.

2. Navigate to the saved axis setup file (.arcx), and click **OK**. Dragonframe imports the axis setup information. You can now add keyframes for the axis.

NOTE: Once you import axis setup information, you can disable any axes you aren't using. For example, if your rig has four axes, but you're only using two for a particular project, click ⏻ in the Axis list to disable the axes you're not using.

Importing and Exporting Camera Moves

You can export an entire move (axis information and keyframe information) to other Dragonframe projects.

Exporting a Move

To export a move:

1. Click the main menu for the workspace (in the workspace tools), then select **EXPORT|ARC MOVE (ARCM)**. Dragonframe opens the Export Move dialog.

2. Choose where you want to save the move, and click **OK**. Dragonframe exports the move.

Importing a Move

To import a move into another scene:

1. Click the main menu for the workspace (in the workspace tools), then select **IMPORT|ARC MOVE (ARCM)**. Dragonframe opens the Import Move dialog.

2. Navigate to the saved move file (.arcm), and click **OK**. Dragonframe imports the move and shows it in the Arc workspace. You can now edit the move, or begin shooting.

NOTE: Once you import a move, you can disable any axes you aren't using. For example, if your rig has four axes, but you're only using two for a particular project, click in the Axis list to disable the axes you're not using.

Importing and Exporting Raw ASCII Moves

Use raw ASCII formats such as text or csv files to transfer moves between Dragonframe and external programs such as Maya, Blender, or Excel.

Exporting a Raw ASCII Move

To export a raw move:

1. Click the main menu for the workspace (in the workspace tools), then select **EXPORT|RAW MOVE (TXT/CSV/MOV)**. Dragonframe opens the Export Raw Move dialog:
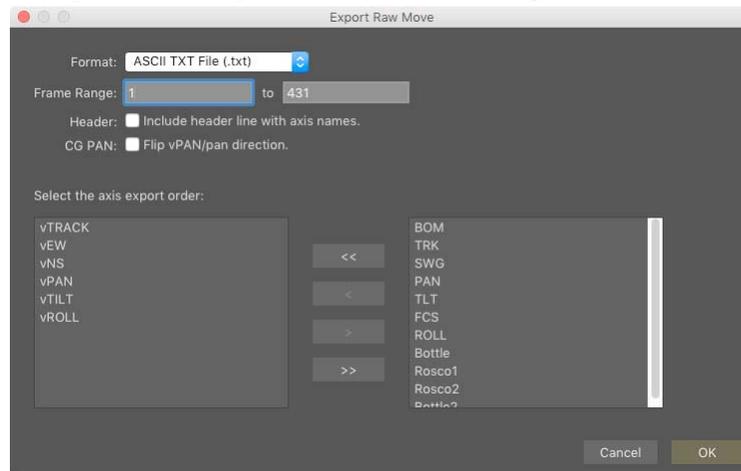
2. Choose your output format, and select which axes you want to export, then click **OK**. Dragonframe opens the Export Raw Move file dialog.

3. Choose where you want to save the move, and click **OK**. Dragonframe exports the move.

Importing a Raw ASCII Move

To import raw move data from another scene:

1. Click the main menu for the workspace (in the workspace tools), then select **IMPORT|ARC MOVE (ARCM)**. Dragonframe opens the Import Raw Move file dialog.

2. Navigate to the saved move file (.txt/.csv/.mov), and click **OK**. Dragonframe opens the Raw Move dialog:
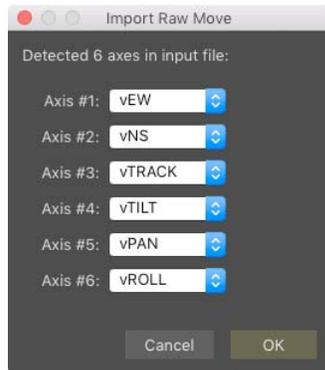
3. Choose which fields from the file you want to import into which Dragonframe axes, and click **OK**.

4. Dragonframe imports the move and shows it in the Arc workspace. You can now edit the move, or begin shooting.

NOTE: Dragonframe imports a raw move as a series of keyframes, with one keyframe on every frame. It will not be easy to make slight adjustments a the move that has been imported this way.

Configuring an Axis for Multiple Positions per Frame

There are times when you may want to shoot multiple sub-frames (exposures) with an axis in different positions. The most common use of this is 3D stereoscopic shooting, which is covered in "Shooting in 3D" on page 319.

Other uses include focus stacking and background plate automation.

Dragonframe provides this feature through "Indexing".

In the Configure Axis dialog, you can configure an axis to have up to 50 unique positions.

As soon as you do this, the representation of the axis in the Arc workspace changes to show you these indexed positions.
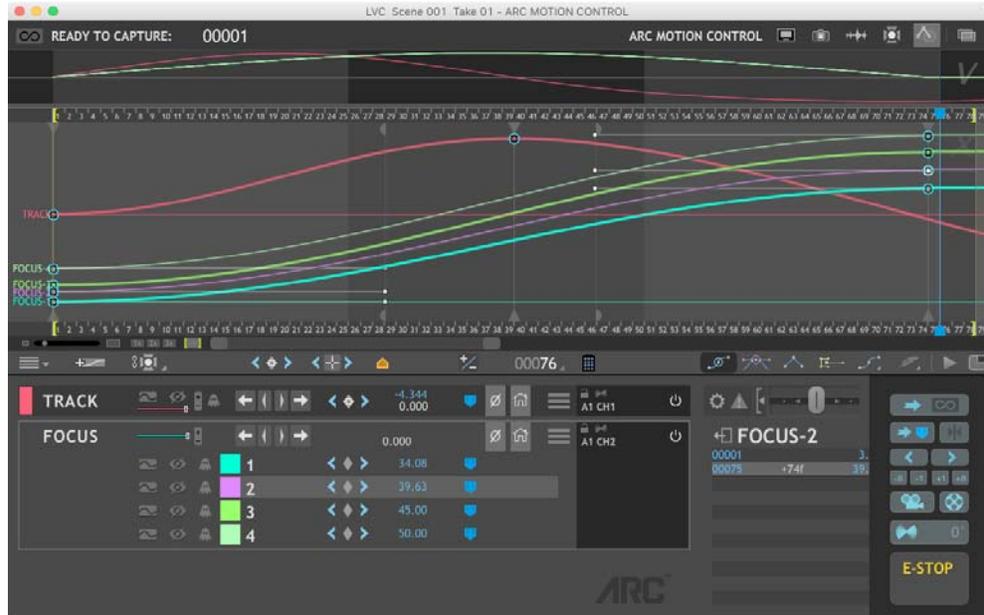
Once you've configured multiple positions, you must assign these to specific Exposures using the exposure settings dialog:
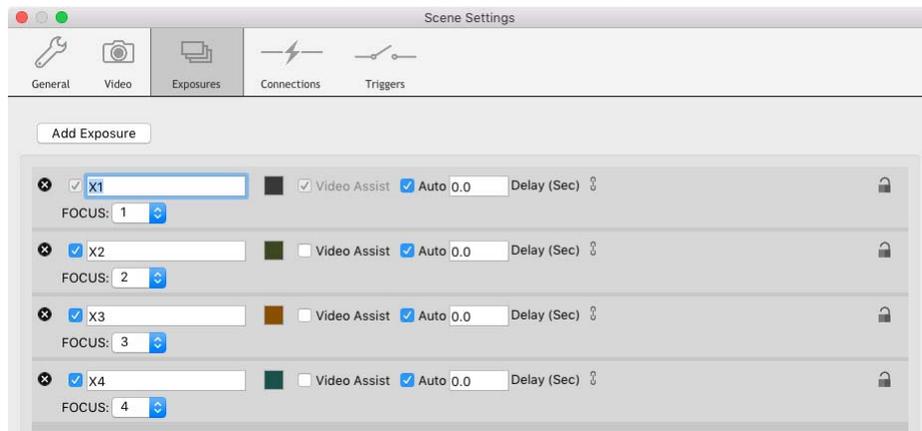
In this example, each frame has four exposures, X1-X4, and each of those has a different focus position assigned. This is a simple example; you can create much more complicated scenarios to meet your needs.

Using the Jogpad Window with the Dragonframe Keypad

While using Arc, you can convert the Dragonframe keypad into a jog box (the Jogpad), allowing you to move around your rig and control it without touching the computer.

Opening the Jogpad Window

To open the Jogpad window, click ▦ . The jogpad window appears:
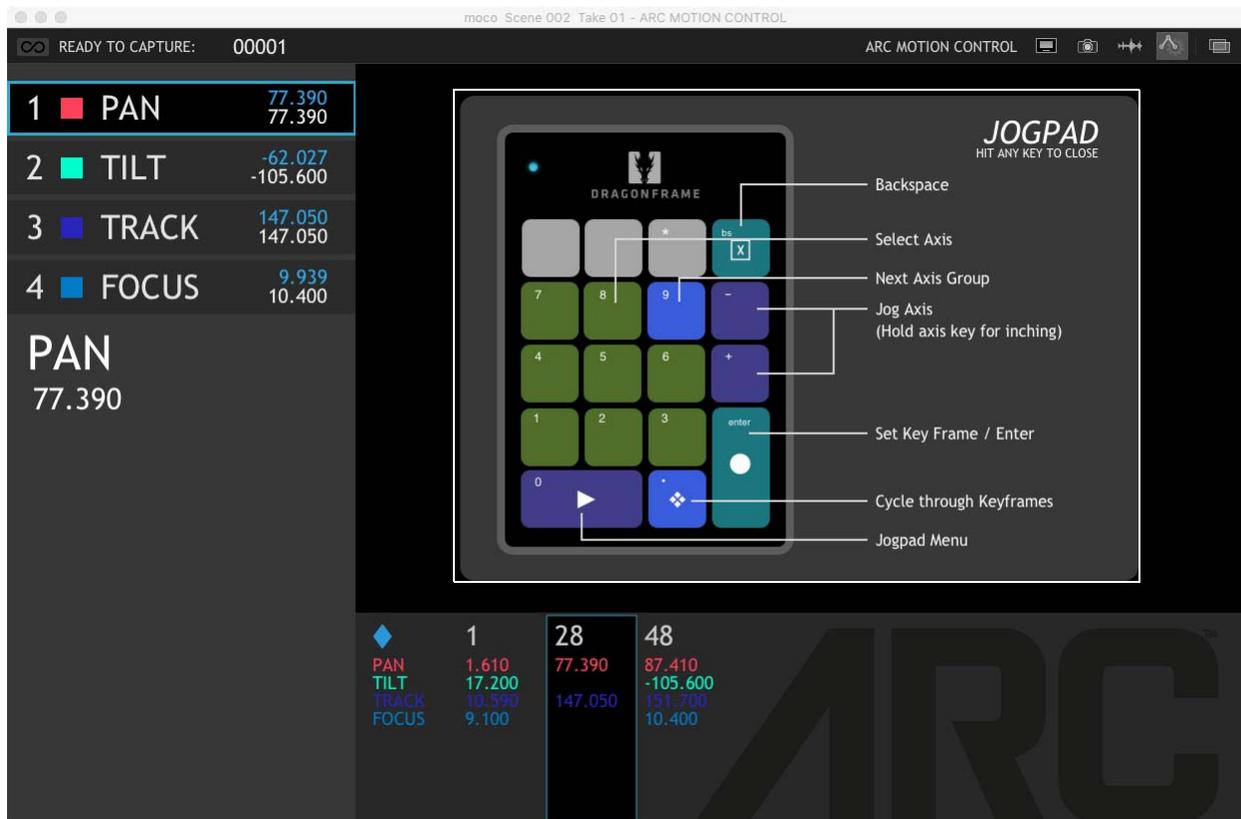
Jogpad guide within the Jogpad window.

Any time this window is open, you can use the keypad as the Jogpad.

The Jogpad guide appears when you first open the window, showing the layout of the Jogpad.

Click the guide to close it and see the Live View:

A. *Axis list. The list of axes. If there are more than eight, Arc displays axes in groups of eight. Press the number of the axis to select it. Press* **9** *for the next axis group.*

B. *Live View. See how jogging the motors affects the shot.*

C. *Frame number: The frame number of the currently selected keyframe.*

D. *Axis: The currently selected axis and its motor position.*

E. *Keyframe list: All of the keyframes for the current axis group. Press . (period) to cycle through keyframes.*

- Press the number of the axis to select it in the axis list. For example, to view **BOOM**, click **3**. Dragonframe displays the current position of that axis' motor below the axis list.

- Press ⬧ to move through the axis' current keyframes in the keyframe list.

- Press **9** to display the next eight axes, if there are more than eight.

- Click anywhere in the window to return to the Arc workspace.

Jogging an Axis with the Jogpad

Use the Jogpad to move the axis motors.

1. Press the number of the axis to select it.

2. Press ⊞ and ⊟ to jog the motor for the selected axis. Press and hold to move more quickly.

Setting a Keyframe with the Jogpad

1. Press **ENTER** to set a keyframe. The Frame Number dialog appears.

2. Press **ENTER** to set a keyframe at the current frame number.

   Or, enter a new frame number. Then press **ENTER**. The Set Keyframe dialog appears:

SET KEYFRAME				
1 ■ PAN				
2 ■ TILT				
3 ■ TRACK				
4 ■ FOCUS				
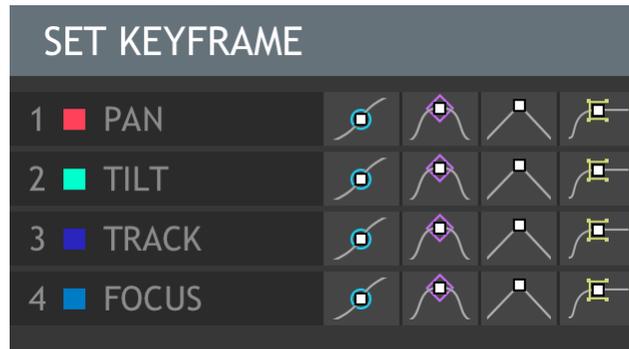
3. Enter the axis number to select an axis. Dragonframe highlights the smooth keyframe style for that axis.

4. (Optional) Keep pressing the axis number to toggle through the keyframe styles for that axis, and then to deselect the axis.

5. (Optional) Press the axis numbers for any other axes to add keyframes for them.

6. (Optional) Press **9** to view the next axis group.

7. Press **ENTER** when you've added all the keyframes you need for that frame. Dragonframe adds the keyframes you selected and displays them in the keyframe list.

Setting Zero or Home with the Jogpad

Use the Jogpad's menu button to set a zero or home point.

1. Move the motors to the point you want to set for zero or home.

2. Press **PLAY** to open the jogpad's menu. The menu appears:

MENU

```
0 - SWITCH MENU
1 - GO TO FRAME
2 - GO TO KEY
3 - GO TO ZERO
4 - GO TO HOME
5 - SET ZERO
```
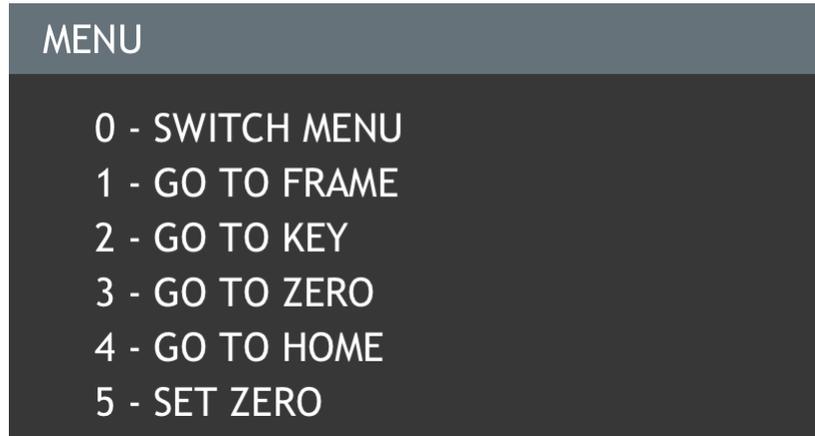
3. Press **5** to set the zero point; press **6** to set the home point.

NOTE: Press **ENTER** to close the menu without selecting anything.

Going to a Frame with the Jogpad

1. Press **PLAY** to open the Jogpad menu.

2. Press **1** to go to a frame number. The frame dialog opens.

3. Enter the frame number you want to go to and press **ENTER**.

4. Dragonframe opens the Go to Frame dialog:

Go To Frame

```
1 ■ PAN
2 ■ TILT        ▷
3 ■ TRACK       ▷
4 ■ FOCUS       ▷
```
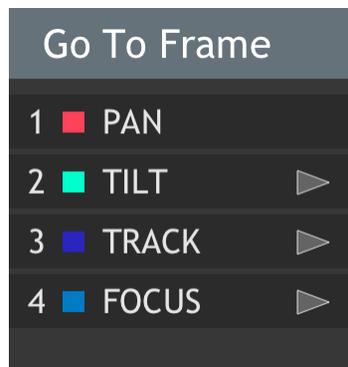
The Go to Frame dialog. Here Dragonframe has already moved the motor for the **PAN** *axis to the correct position.*

5. Enter the frame number for the axis you want to move. You can enter more than one.

6. Dragonframe moves the motors for the axes you chose to the frame number you selected. When Dragonframe has moved the axis, the arrow next to the axis turns green, as shown above for **PAN**.

Going to a Keyframe with the Jogpad

1. Press **.** (period) to move to the keyframe you want to select.

2. Press **PLAY** to open the Jogpad menu.

3. Press **2** to move the motor to the keyframe you selected. Dragonframe opens the Go to Key dialog:
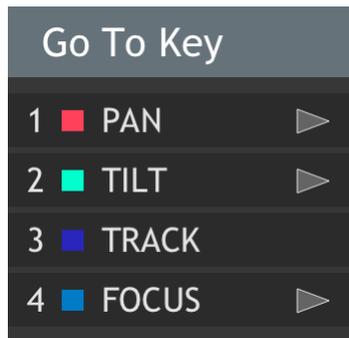
4. Press the number of the axis you want to move. You can enter more than one. Here, the **TRACK** axis does not have an arrow next to it because the axis is already at the keyframe's position.

Dragonframe moves the motors for the axes you selected.

5. Press **ENTER** when you're finished moving the motors.

Go to the Home Point or Zero Point with the Jogpad

1. Press **PLAY** to open the Jogpad menu.

2. Press **3** to go to the zero point, OR

   Press **4** to go to the home point.

Dragonframe moves the motors to the point you selected.

Stopping the Motors with the Jogpad

Press **/** (slash) , ***** (asterisk) or **BS** (backspace) to stop the motors.

Setting Limits with the Jogpad

You can set or clear the soft limits of each axis from within the jogpad mode.

1. Select the axis you want to set or clear a limit on.

2. Jog to the limit location you want to set. (Not required if you are going to clear a limit.)

3. Press **PLAY** to open the Jogpad menu.

4. Press **0** to move to the second menu.

5. Choose from one of the options to set the upper or lower limits (or clear them.)

Focus Check with the Jogpad

You can control your focus motor and activate the camera's live view magnification from within the jogpad mode.

1. Press **PLAY** to open the Jogpad menu.

2. Press **7** to enter the Focus Check mode:
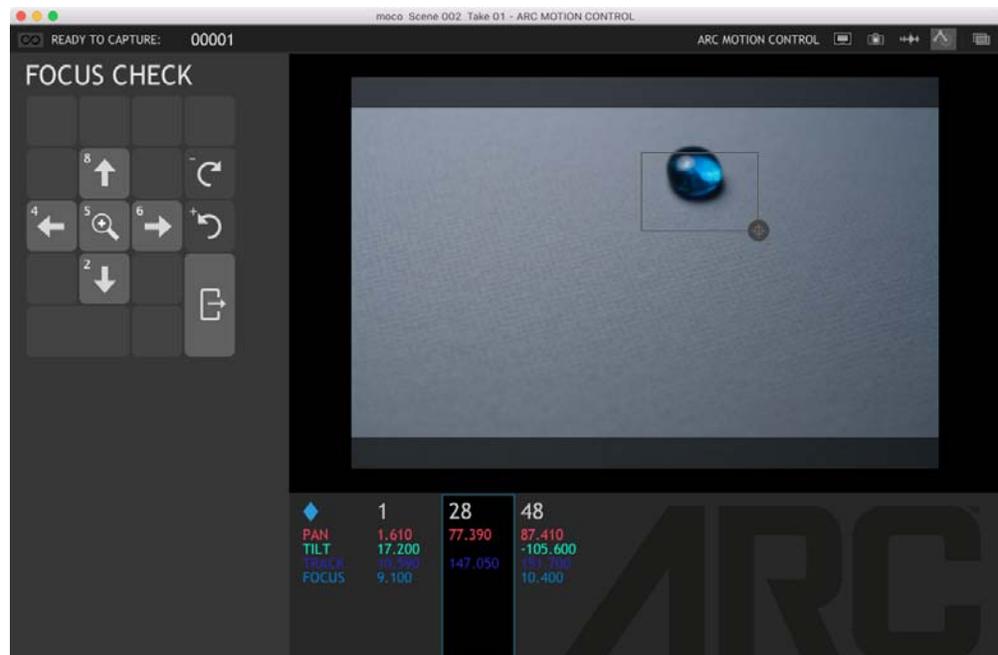
3. Press **2**, **4**, **6**, or **8** to move the focus rectangle around.

4. Press **5** to toggle live view magnification.

5. Press - or + to adjust the focus.

6. Press **ENTER** to exit focus check mode.

Real-time Motion Control with DMC-16/DMC+/ST4

Using the DMC-16, DMC+ or eMotimo spectrum ST4 adds extra motion-control capabilities to Dragonframe.

NOTE: In the sections that follow, DMC-16 will be used to refer to functionality in any of the real-time capable motion control devices.

Running a Live Move Test

With DMC-16, DMC+ or eMotimo ST4, you can run the move live (or at a reduced frame rate). The rig will capture video assist frames while moving continuously during the capture.

To run a live move test, click ▣. The Run Move Test dialog appears:
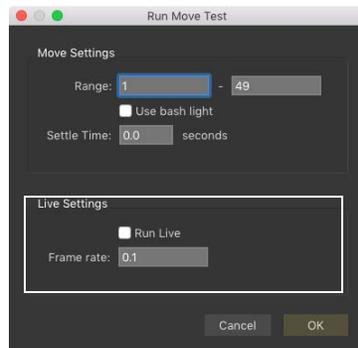
Run Move Test dialog. With the Live settings, run the move live, and adjust the frame rate.

Using the Live Jog Controls

With the DMC-16, DMC+ or eMotimo ST4, you can run your move at live speeds, and jog the entire rig through the move, instead of just one axis at a time.

WARNING: All motion control has inherent risks. Make sure that you are clear of moving rigs at all times. Set your motor speeds low at first to make sure the speed is safe.

To use the live jog controls:

1. Set up your move in the Arc workspace. Once you've created the move, a button appears above the axis keyframe data:
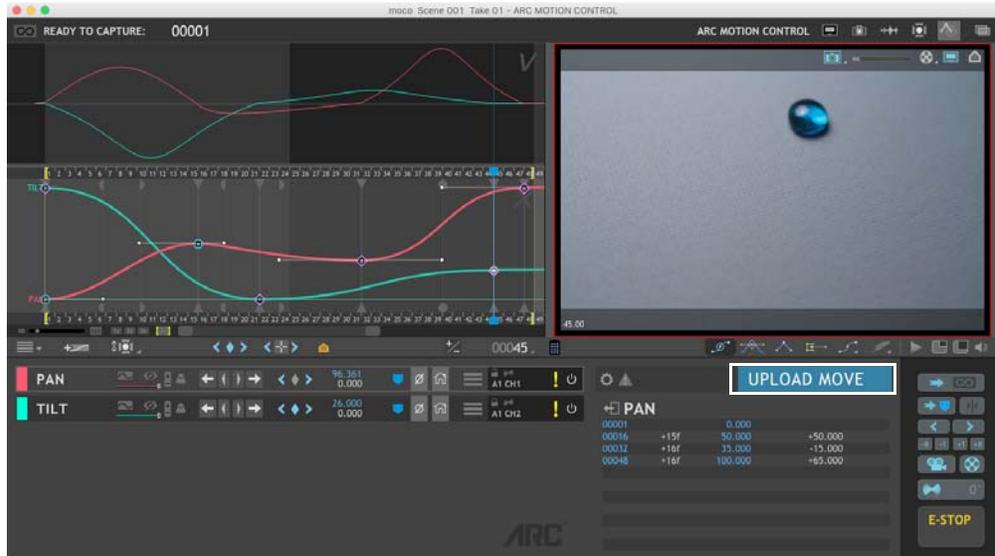
Upload Move button. Press to upload your move and ready the device to run it at live speeds.

2. Press **UPLOAD MOVE** to upload your move info to the device. Drag-onframe displays the jog controls:

A. *Settings: Adjust the move settings.*

B. *Live Warnings: The move exceeds the maximum velocity or acceleration of the axis.*

C. *Backward: Lock the slider to the left.*

D. *Slider bar: Move left or right to jog forward or backwards. The farther left or right you slide it, the faster it moves.*

E. *Forward: Lock the slider to the right.*

F. *Play the move live.*

G. *Go to Frame: Move all axes to the same frame.*

3. Press (G.) to move all of the axes onto one frame.

4. Jog through your move using the controls:

- Move the slider bar (D.) right or left to jog the rig forwards or backwards. The farther you go to the right, the faster it goes to the end of the move. The further you go to the left, the faster it goes back to the start of the move.

- Press ◀ (C.) or ▶ (E.) to lock the slider to the left or right so you don't have to hold it in position.

- Hover over the slider bar to see a maximum FPS for the move. This maximum speed is either your project FPS or the maximum speed that can be achieved given your move and each motor's maximum velocity and acceleration.

Go to a Specific Frame on Move Path

The previous sections show how to run a live move test, and how to jog the rig along the move path.

If the rig is already at a frame within your move, you can move it to another frame in the move.

Hold down **ALT/OPTION** on the keyboard while clicking and dragging the playhead to another position. A second, white playhead will move to the new position.

When you release the mouse, the blue playhead will make its way towards the white playhead. The rig will follow the programmed move path.

Run Your Move Live

The DMC-16, DMC+ or eMotimo ST4 also allows you to run your move at full speed.

WARNING: All motion control has inherent risks. Make sure that you are clear of moving rigs at all times. Set your motor speeds low at first to make sure the speed is safe.

To run your move:

1. Press ➡️ 🔵 (G.) to move all of the axes onto one frame.

2. (Optional) Right-click (Mac **CTRL**-click) on the Run Live button and select a move speed from the menu.

3. Press the Run Live button. The rig will rewind to the start frame (marked with the In marker). It will also back up (pre-roll) to the pre-roll position.

   As the rig moves backwards, the Run Live button will blink blue. When the move is ready to run, the Run Live button changes to solid blue. Dragonframe displays this message: **READY TO RUN MOVE.**

4. Press the Run Live button again. Dragonframe starts the move.

   At the end of the move, the rig will decelerate.

5. (Optional) Press **ESCAPE** to cancel the run and slow down the rig.

Run Live Settings

Click the settings button (⚙) to access the Run Live settings. The Moco Settings dialog opens:
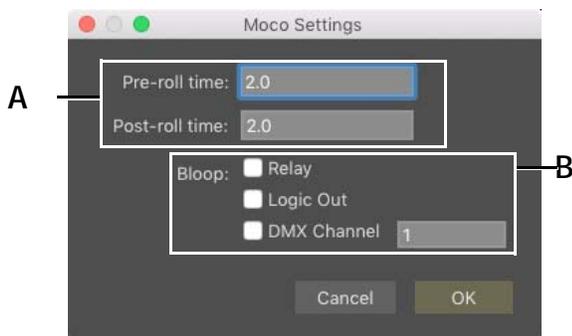
A. Pre- and Post-roll time: Set the time in seconds. B. Bloop: Check the boxes to have Dragonframe trigger the relay, logic out or a DMX channel one second before starting the live move.

Understanding Live Warnings

If you program a move with a real-time controller, and it exceeds the maximum velocity or acceleration of the axis at your current scene FPS, Dragonframe will display warnings in the Arc workspace:
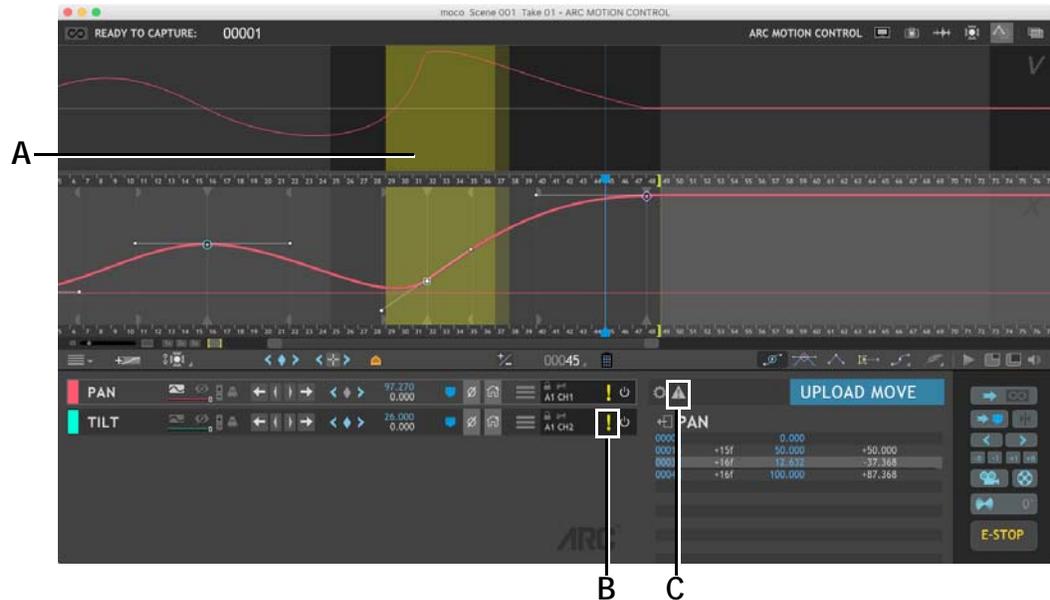
A. Highlight on Velocity graph: The abrupt change of velocity at this point of the graph exceeds the maximum acceleration for the graph. B. ! in Axis Control Panel: There is a warning for the axis. C. Triangle button: Click to remove warning highlights.

In this Velocity graph above, there is a rather abrupt change in velocity. This curve is probably exceeding the maximum acceleration that you set in the Configure Axis dialog.

To eliminate the problem:

• Adjust your maximum speed and acceleration in the Configure Axis dialog (if your rig can go faster), or

• Smooth out your move if you need to run it live.

These warnings are only important if you intend to run the move at full speed. If you are just going to shoot stop motion, you can turn them off and disregard them.

To turn the warnings on or off, click ⚠ (C.).

Using Go-Motion with the DMC-16/DMC+/ST4

DMC-16, DMC+, eMotimo ST4 and Arduino DFMoco can perform go-motion. Adjust the blur for go-motion in the Arc workspace:

Blur button.

1. Click ⋈ to set the blur amount. Usually this is 180 degrees. This sets how much of the move is captured while the shutter is open.

2. For each axis, press ⋈ in the axis list to enable blur:
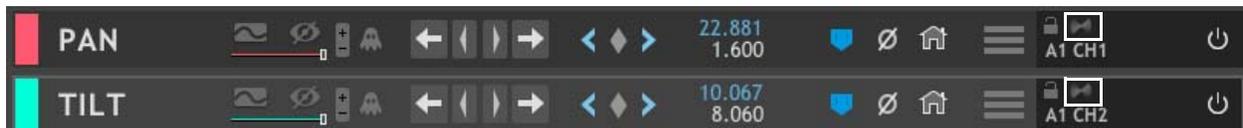
Blur button for each axis. Click to enable blur for that axis.

Virtual Axis Configuration with DMC-16/DMC+

The DMC-16 and DMC+ can be configured to use virtual cartesian axes ("virtuals") when controlling a boom/track/swing rig. In this setup, instead of directly controlling boom, track and swing, you control cartesian axes labeled vTRACK (z-axis), vEW (x-axis) and vNS (y-axis), and the DMC-16 moves the real motors as needed.

Many people find it easier to program moves in this mode. It also makes it easier to work with 3D data, since Dragonframe can import or export x/y/z coordinates for the move.

Supported Crane Configurations

Dragonframe supports three different rig styles for use with full virtuals:

1. Boom + Track + Swing: This is the most common style rig for stop motion. It has a linear track, and radial boom, and a radial swing arm.

2. Y + Swing: Similar to Boom+Track+Swing, but using a straight up/down 'Y' axis along with a radial swing arm.

3. Cartesian (X/Y/Z): A rig that is already x/y/z should still be set up for virtuals to take advantage of nodal offsets and 'jog on line' functionality.

The configuration in the following sections will focus on Boom+Track+Swing, because that is the most common, and most complicated style. It should be fairly straightforward to determine how to configure the other styles.

Configuring Virtuals

To configure virtuals, you will need to calibrate it the rig (make sure all of the steps/unit are accurate) and provide some measurements from it. It is important to do this correctly, or else the virtual math will not work properly.

NOTE: If you have a Volo, we can provide a configuration file with all of the necessary information.

Here is a basic model of a boom/track/swing rig:
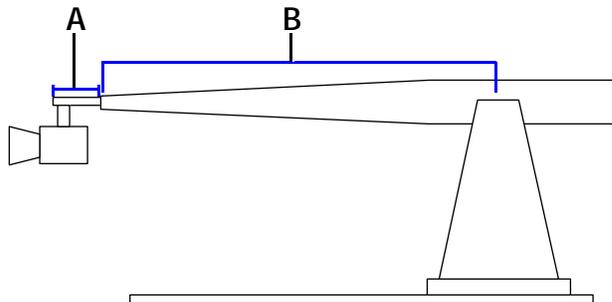
A. *Boom arm extension length.*   **B.** *Boom arm length, measured from pivot point to end.*

Calibrating the Units

Start by ensuring that your rig is calibrated properly for virtuals:

1. Configure track in inches, with negative moving in the arm direction, towards the set. You can use negative steps per unit if you need to.

2. Configure boom in degrees, with positive units corresponding to the arm moving up. If boom is driven by a lead screw, just use an average value at this point, and we will compensate for it later.

3. Configure swing in degrees, with positive units corresponding to the arm swinging to the right.

4. Configure Pan in degrees, with positive units corresponding to camera panning right (image panning left).

5. Configure Tilt in degrees, with positive units corresponding to camera tilting up (image tilting down).

6. Configure Roll in degrees, with positive units corresponding to camera rolling CW (image rolling CCW).

See also:
"Calibrating Steps per Unit" on page 257.

Zeroing the Rig

Your rig must be zeroed properly in order for the virtuals to work correctly:

1. Zero the track at the back of the track. Alternatively you could zero towards the front of the track.

2. Zero the boom axis so that the arm is perfectly level.

3. Zero the swing axis so that the boom arm is pointing directly down the track.

4. Zero pan, tilt and roll so that the camera is facing in the direction of the track, and is not rotated in any way.

Nodal Offsets

If possible, your camera should be configured to be "on-nodal" in order for virtuals to be most accurate. This means that any pan, tilt, or roll of the camera should rotate around the image plane of the camera.

Sometimes the camera cannot be perfectly on-nodal. In that case, you can configure nodal offsets to compensate for this, and the DMC-16 will make your virtual pan, tilt and roll fully nodal.

Boom Compensation Table

If your boom arm is driven by a lead-screw, there is no way to directly provide a steps/unit in degrees. In this case, you must provide a set of measured points that Dragonframe can use to calculate a boom motor position for a given degree value.

The boom compensation table is a set of numbers in a plain text field. There are two different formats:

- Height, Boom Position and Track Position

```
; boom compensation data
; based on boom 3975.1 steps/unit
; height, boom, track
 25.607    14.602     -7.499
 16.898     6.434     -3.164
  8.31      1.581     -0.767
  0          0          0
-8.146      1.553     -0.771
-16.143     6.166     -3.185
-24.023    13.792     -7.612
```

- Angle and Boom Position

```
; boom compensation data
; based on boom 3975.1 steps/unit
; angle, boom
 35        25.607
 20        16.898
 10         8.31
  0         0
-10        -8.146
-22        -16.143
-35        -24.023
```

Some things to know about the boom compensation data:

- Lines that start with ";" are comments. They are not required.

- Your data set must have one row with all zeros (when the arm is level).

- You should have 2-6 data points above zero, and 2-6 data points below zero. If your rig does not go below zero, you don't need those sample points.

- The values you use do not need to be symmetrical. In other words, if you provide a value at height=10", you are not required to provide a value at height=-10" (although you could).

It may seem that the second option (angle + boom) is easier. However, it is very difficult to find an accurate angle measurement device. We've found that entering data in the first format is usually more accurate.

Collecting the Boom Compensation Data

We recommend Steve Switaj's excellent guide on virtual boom compensation calibration. It was written for Kuper, but our data format is almost identical:

http://flywom.com/support/support_files/Calibrating%20virtual%20axes%20and%20geometry%20files.pdf

1. Set the boom motor steps/unit to something other than 1. You might, for example, set it to inches. This can be a very rough calibration. However, it's important to keep this value the same once you've set it.

NOTE: We recommend including the boom steps/unit within the data as a comment.

2. Make sure the rig is zeroed with the boom arm level and facing straight down the track.

3. Hang a small weight from the camera plate and mark the point where it touches the floor.

4. Measure the distance from the camera plate to the floor. You will have to subtract this value from the height of the plate in future steps.

5. Raise the boom a few inches.

6. Track forward until the weight hits the same point on the floor (you will need to adjust the length of the string).

7. Measure the distance from the camera plate to the floor. Subtract the value you measured in step 4.

8. Record your set of three values: height (current height from ground minus the original height), boom value (read from Dragonframe) and track value (read from Dragonframe).

9. Repeat steps 5-8 at different boom positions, including below the starting point.

Setting up Virtuals within Dragonframe

Now that you have all of virtuals configuration data, you are ready to set it up within Dragonframe:

1. Choose **VIRTUALS…** from the Arc menu on the left of the main controls.

The configure virtuals dialog opens:

A — Virtual Setup: Crane (Boom/Swing/Track)

Boom Compensation Data — F

B —
Boom Axis: BOOM
Swing Axis: SWING
Track Axis: TRACK
Pan Axis: PAN
Tilt Axis: TILT
Roll Axis: ROLL

```
34.769 25.607
22.381 16.898
10.966 8.31
0 0
-10.992 -8.146
-22.457 -16.143
-35.040 -24.023
```

C — Boom Length: 42.000

D — Boom Extension Length: 14.000

E —
Nodal Offset X: 0.000
Nodal Offset Y: 0.000
Nodal Offset Z: 0.000

Cancel   OK
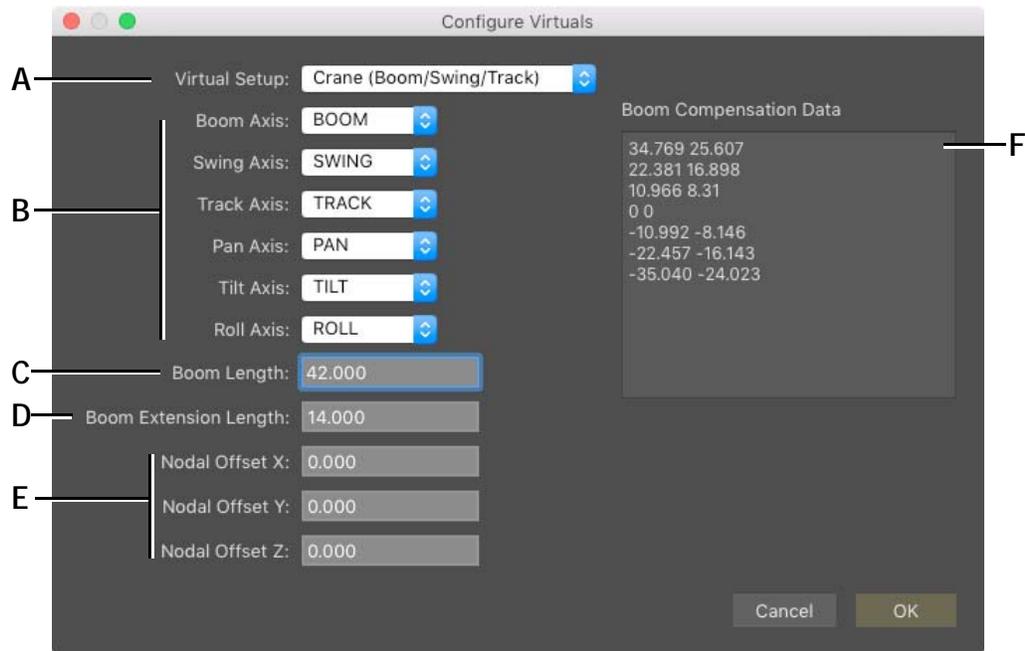
A. *Virtual Setup: choose 'None', 'Crane' or 'Swing/ Pan'*

B. *Axis Choices: choose the corresponding axes, depending on the virtual setup type.*

C. *Boom Length: the length of the boom arm from the pivot point to the end.*

D. *Boom Extension Length: many crane rigs have an extension arm the keeps the camera level.*

E. *Nodal Offsets: x/y/z nodal offsets for the camera, if it is not perfectly nodal.*

F. *Boom Compensation Data: if the boom arm is driven with a lead-screw, you will need to provide extra data to convert boom to degrees.*

2. Enter all of the data from your rig, and your boom compensation data, if application.

3. Click **OK**.

4. Dragonframe creates new virtual axes and modifies the look of the real motors.

5. To enter virtuals, press ↔V↔. Dragonframe switches into virtuals, showing new virtual axes and a custom jog-on-line panel:
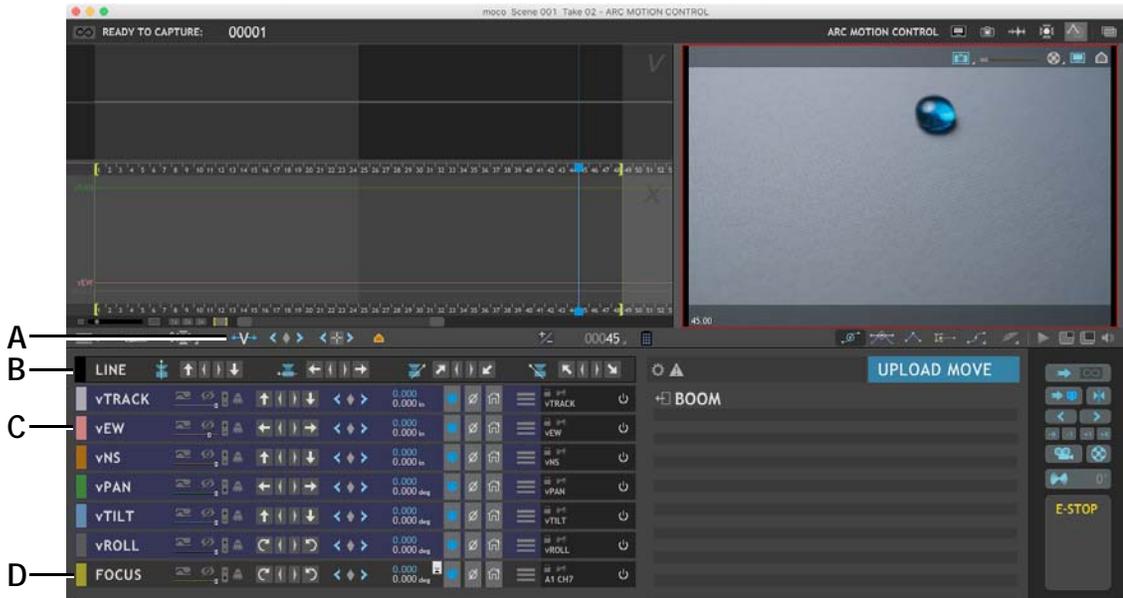
A. *Virtuals engaged. Press to enter/exit virtuals.*

B. *Special jog-on-line axis jogs in the direction of the camera.*

C. *Virtual axes: vTRACK, vEW, vNS, vPAN, vTILT, vROLL are created by Dragonframe and cannot be removed.*

D. *Focus axis. Any axis that is not involved in virtuals will still show up when virtuals are engaged.*

Entering/Exiting Virtuals

When you have virtuals configured, all of your keyframe programming and jogging must be done in virtuals. It would not make sense to key-frame a real motor (such as "swing") and also keyframe a virtual motor (such as "vEW") at the same time.

While you have virtuals engaged, any of the "real" motors will be hidden. If you need to zero the rig, or adjust any of the real motors, you will want to exit virtuals.

Press ↔V↔ to exit virtuals. You will see all of the "real" motors that are used in the virtual setup.

To enter virtuals again, press ↔V↔. Dragonframe may require you to move some of the motors to get into position.

Jog on Camera Line

Another advantage of virtuals is that the DMC has an understanding of where the camera is pointing. This opens up new jogging options: jogging in the direction of the camera lens, or at an angle to it.

When virtuals are engaged, you get a special axis that allows you to jog in the direction of the camera lens:

A. *Move in the direction of the lens, in or out.*

B. *Move perpendicular to the direction of the lens, left or right.*

C. *Move forward and to the right of the lens (or back and to the left).*

D. *Move forward and to the left of the lens (or back and to the right).*

Swing/Pan Virtual Mode

An alternative virtual axis mode is called "Swing/Pan". It can work with any rig that has pan and swing axes that can both be configured in degrees.

In this setup, pan is automatically adjusted to compensate for swing:
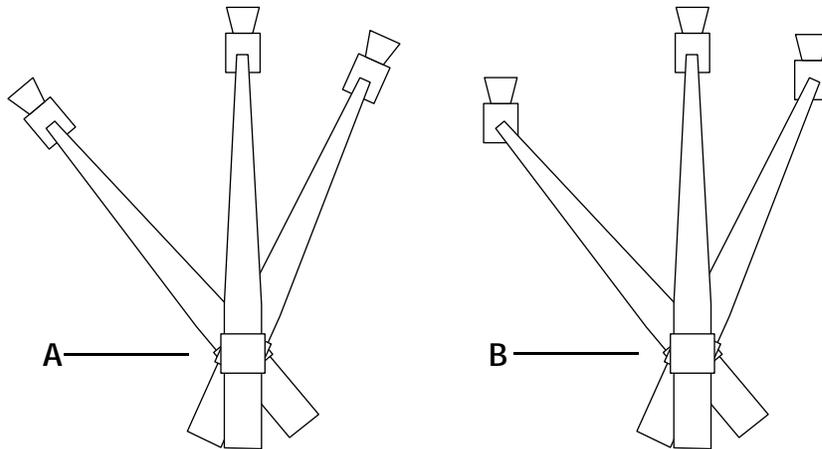
A. *Uncompensated pan (normal). With pan at zero, camera points in direction of boom arm.*

B. *Using swing/pan virtual mode. With pan at zero, camera always points forward.*

To configure Swing/Pan virtual mode:

1. Configure your swing axis in degrees, with positive moving the camera to the right (image to the left).

2. Configure your pan axis in degrees, with positive turning the camera to the right (image to the left).

3. Choose **VIRTUALS…** from the Arc menu on the left of the main controls.

4. For **VIRTUAL SETUP**, choose **SWING/PAN**.

5. Set the **SWING AXIS** to your swing axis.

6. Set the **PAN AXIS** to your axis.

7. Click **OK**.

Using a Gamepad to Program Moves

Configure Dragonframe to use a standard gamepad controller for moving motors, setting keyframes, and jogging through a move.

Supported Gamepads

Dragonframe should work with most standard gamepads: Xbox or Playstation style controllers that are intended to be used with a computer. Since you are using this for motion control, you should probably get a wireless model.

Here are some models we can recommend:

SteelSeries Nimbus. This is a great controller, but it macOS only.

Xbox One Wireless Controller. Get a model that says it works with Windows 10 and uses Bluetooth. Works on Windows 10, macOS, and Linux.

GameSir G3s Wireless Controller. This comes with a 2.4Ghz USB dongle, which allows it to be wireless on macOS, Linux, and Windows 7/8.1/10.

Sony PS4 DualShock Controller. This has a great feel and works on Windows 10, macOS, and Linux.

Configuring the Gamepad

To configure a gamepad:

1. Choose **CONFIGURE GAMEPAD...** from the Arc menu on the left of the main controls. Dragonframe opens the Configure Gamepad dialog:

A. Connected gamepad name, or "No Gamepad Detected".

B. Modifer button engages "jog on line" feature when in virtuals.

C. Graphical representation of gamepad. May not perfectly represent your gamepad.

D. Choose which motion control axis will be controlled by this gamepad stick/pad/trigger.

E. E-Stop button tells the rig to stop moving.

F. Invert the gamepad control for a motion control axis. (Reverse direction.)

2. Choose motion control axes for each gamepad stick, direction pad axis, or trigger. The changes you make take immediate effect, and the motors will jog as you move the gamepad.

3. If a motor moves the opposite direction of what you would like, click the **INV** button to reverse the controls.

Setup for Virtual Axes

If you have virtual axes configured, you will notice that the virtual axes are not available to assign to gamepad axes. This is intentional.

You map the real motors to gamepad axes, and Dragonframe will assign the corresponding virtual axes to those motors. This allows you to use the gamepad naturally when you switch in and out of virtuals.

For example:

- The gamepad assignment for TRACK will be used for vTRACK or Z.

- The gamepad assignment for SWING will be used for vEW or X.

- The gamepad assignment for BOOM will be used for vNS or Y.

Virtual Jog on Line

The rear left button, marked **MODIFIER** in the diagram, engages the "jog on line" virtual axis feature. This means that when you hold it, the X/Y/Z gamepad controls will be oriented to the direction the camera is facing.

The orientation is reset when the rig is stopped.

Emergency Stop

The rear right button, marked **E-STOP** in the diagram, performs a hard stop on the rig. It is the same as pressing **ESC** on the keyboard, or the **E-STOP** button in the Arc workspace.

Programming Moves with the Gamepad

With the gamepad configured, you can jog multiple motors around simulateously. To set keyframes and do more advanced programming from the gamepad, you must bring up the special gamepad menu.

Press the **GUIDE**, **MENU** or **START** button on your gamepad to open the gamepad menu. On the SteelSeries gamepad, this is the **MENU** button. On the Xbox controller, it's the 'X' logo button.

The menu opens:

A —
FRM **00020**   SEC **00:00:20**

B —
🛡 Ø 🏠	ALL AXES	KEYFRAME	
🛡 Ø 🏠	vTRACK	ON FRAME	
🛡 ○ 🏠	vEW	ZERO	
🛡 ○ 🏠	vNS	UPPER LIMIT	
🛡 Ø 🏠	vPAN	LOWER LIMIT	
🛡 Ø 🏠	vTILT	HOME	
🛡 Ø 🏠	vROLL	VIRTUALS	

D

E

🖋 4.0

SET

EXIT

C — **A** SELECT   **B** JOG MOVE   **X** FOCUS   **Y** E-STOP

A. *Frame and second counter. Use the right analog stick to move up and down the timeline.*

D. *Actions. Pick an action you want to perform on the selected axes.*

B. *Axis selection. Choose one or more axes to be acted upon. Use the direction pad (up/down/left/right) or left analog stick to move around the menu.*

E. *Action options. Choose settings for the action, and perform the action.*

C. *Button guide. Use **A** to make selections as you move around the menu.*

Use the direction pad (up/down/left/right) to navigate the menu.

Use **A** to make selections.

To exit the menu, you can select **EXIT** or press the **GUIDE**, **MENU** or **START** button you pressed to open the menu.

Setting a Keyframe with the Gamepad

1. Open the gamepad menu with the **GUIDE**, **MENU** or **START** button.

2. Select one or more axes in the left section.

3. Select **KEYFRAME** in the middle section.

4. On the right, choose a keyframe style.

5. Select **SET**.

Other operations are similarly straightforward.

Jogging Move with the Gamepad

If you have a real-time capable motion control device, such as the DMC-16 or DMC+, you can perform a live jog of the entire move. This means you jog through the move in time, with all motors synched together.

To do this with the gamepad:

1. Open the gamepad menu with the **GUIDE**, **MENU** or **START** button.

2. Select **ALL AXES** on the left.

3. Select **ON FRAME** in the middle.

4. Select **GO** on the right. The motors will all move to get onto a particular frame. (The frame number at the top of the menu.)

5. Press **B** to enter live jog mode. The gamepad menu changes to a special live jog display:

Blur button for each axis. Click to enable blur for that axis.

6. Use the right analog stick to jog through the move in time.

7. Press **B** to exit live jog mode.

Checking Focus with the Gamepad

If your camera supports focus check via Dragonframe, you can do this with the Gamepad.

1. Open the gamepad menu with the **GUIDE**, **MENU** or **START** button.

2. Press **X** to enter focus check mode.

3. The right analog stick moves the focus check rectangle.

4. Press **A** to magnify the selected area.

5. Use your assigned gamepad control to move the focus motor. If you have a digital lens or did not assign controls for focus, use the left analog stick (x-axis) to control focus.

6. Press **A** to restore normal live view.

7. Press **X** to exit focus check mode.

Adding an Unsupported Gamepad

Dragonframe uses SDL2 to support a wide variety of gamepads. If your gamepad isn't working with Dragonframe, and you think it should, you can try to create an SDL mapping to recognise it.

To generate the mapping, download and run **SDL2 Gamepad Tool** by **General Arcade**:

http://generalarcade.com/gamepadtool/

1. Plug in (or pair) your gamepad, then start the program. If it sees the gamepad, a name will appear at the top. (If it doesn't, you are out of luck.)

2. Click **Create A New Mapping**.

3. Follow the steps, pressing the buttons as it highlights them on the screen. (Note that for the analog sticks, the first thing you do is push it, like a button. Later you will move it left, right, up and down.)

4. If all of that succeeds, the program will give you a text string that you need to copy. It will look something like this:

    03000000d62000006dca000011010000,PowerA Pro Ex,a:b1,b:b2,back:b8,dpdown:h0.4,dpleft:h0.8,dpright:h0.2,dpup:h0.1,guide:b12,leftshoulder:b4,leftstick:b10,lefttrigger:b6,leftx:a0,lefty:a1,rightshoulder:b5,rightstick:b11,righttrigger:b7,rightx:a2,righty:a3,start:b9,x:b0,y:b3,platform:Linux,

5. Create a new plain text file (for example, mycontroller.txt) at Dragonframe's gamepad mapping folder:
    <DF INSTALLATION FOLDER>/RESOURCES/GAMEPADS

6. Copy and paste the mapping from SDL2 Gamepad Tool into that file, and save it.

7. The next time you run Dragonframe it will load this mapping, and your controller should work.

Using Arc Pilot to Control Your Rig

Arc Pilot is an iOS app for controlling your rig. It is specifically designed for use with the iPad mini + GameVice controller.

We will provide video tutorials to show how to use Arc Pilot.

https://www.dragonframe.com/tutorials/

Using a 3D Mouse to Control Your Rig

Another option for controlling a rig that is in virtuals is the 3Dconnexion SpaceNavigator or SpaceMouse. This is a 3D mouse that is often used by 3D designers.

https://www.3dconnexion.com/spacemouse_wireless/en/

You must have your rig configured for virtuals with the DMC-16 or DMC+ to use this.

Make sure you install the drivers for the device.

Since your rig is virtualized in 3D space, and you have a 3D mouse, the control is fairly straightforward. There is no configuration.

Hold down **ALT/OPTION** on the keyboard while driving to re-orient the movement to the direction the camera is facing. The orientation is reset when the rig stops.

3D Mouse Setup for Linux

The 3D SpaceNavigator or SpaceMouse may require additional setup on Linux. We recommend using the open-source SpaveNav driver from http://spacenav.sourceforge.net/.

If Dragonframe doesn't detect your device:

1. Install the **SPACENAVD** package for your distro.
   Ubuntu: sudo apt-get install spacenavd

2. Create or edit **/ETC/SPNAVRC** to set the **SENSITIVITY** to **1.5**:
   # /etc/spnavrc settings file
   # sensitivity is multiplied with every motion (1.0 normal).
   sensitivity = 1.500

Using External Moco Systems with Dragonframe

If you do not want to use the Arc motion control interface within Dragonframe, you can use external motion control systems instead. Choose an option that fits your equipment and your needs.

Two-Way Control with Arduino

Arduino (http://arduino.cc/) is a hobby electronics board with open-source software and hardware specifications. With some simple wiring and pre-made software, you can wire the Arduino to control Dragonframe, or to control an external system based on events from Dragonframe.

Find a Dragonframe library for Arduino, sample code, and instructions: https://www.dragonframe.com/faq/#arduino

3D (Stereo) Shooting

You can configure the Arduino to trigger a stereo camera head mover, such as the Mark Roberts S3 Stereoscopic 3D Stepper: http://www.mrmoco.com/heads-dslr/products/stop-frame/s3/

See also:
"Shooting in 3D" on page 319.

Using DDMX-512 to Trigger Motion Control

If you have a motion control system that controls the camera position, but want Dragonframe to take care of shooting, use the DDMX-512 box to coordinate both events. You will shoot a frame in Dragonframe, and then have Dragonframe trigger the motion control system to move to the next position.

To set up shoot-move-shoot with the DDMX-512, connect the DDMX-512 and use the relay or logic output to trigger the motion control system after **CAPTURE COMPLETE**.

Dragonframe controls the camera, but the motion control system controls the position of the camera.

NOTE: With this mode, you cannot do go-motion (blur) effects. For go-motion with an external motion control system, you can have Kuper control Dragonframe, or you can set up triggers with the DDMX-512.

Flair Controls Dragonframe

Dragonframe can control the frame position of a rig programmed by Flair. Using Dragonframe with Flair gives you these capabilities:

- Automatic synchronization of Dragonframe and Flair during animation.
- Easy set-up for shooting move tests through the Dragonframe Moco interface.

- Shoot-Move or Move-Shoot options for the animator.

- Single-frame forward or backward movement of Flair for animators or operators during the shoot.

- Synchronization warnings.

Setting Up Flair

Get setup instructions from Mark Roberts Motion Control (http://www.mrmoco.com/). You need Flair 6 or newer to connect to Dragonframe.

Connect Flair

1. Connect the two computers to the same network. Alternatively, you can run both Dragonframe and Flair on the same computer.

2. For Flair, add the following lines into Flair.ini:

   - *API: TCP

   - *APIPort: 53025

3. In Dragonframe, select **SCENE|CONNECTIONS**.

4. Press **ADD CONNECTION** to create a new connection.

5. Choose **FLAIR INTERFACE** and enter the IP address and port of the machine running Flair:
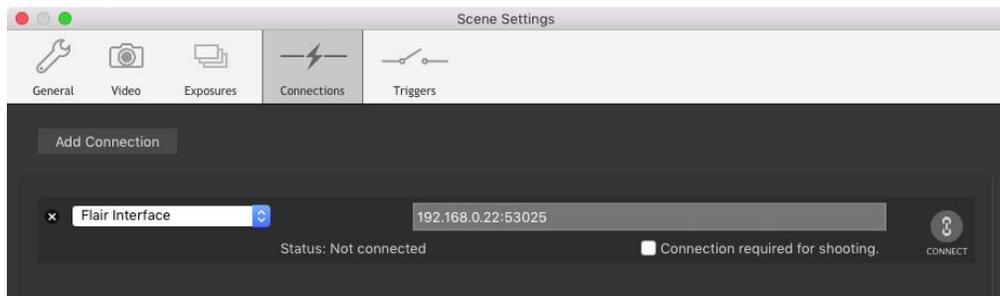
6. Click **CONNECT**. Dragonframe connects to Flair, and creates a special axis called "Flair" within the Arc workspace:.
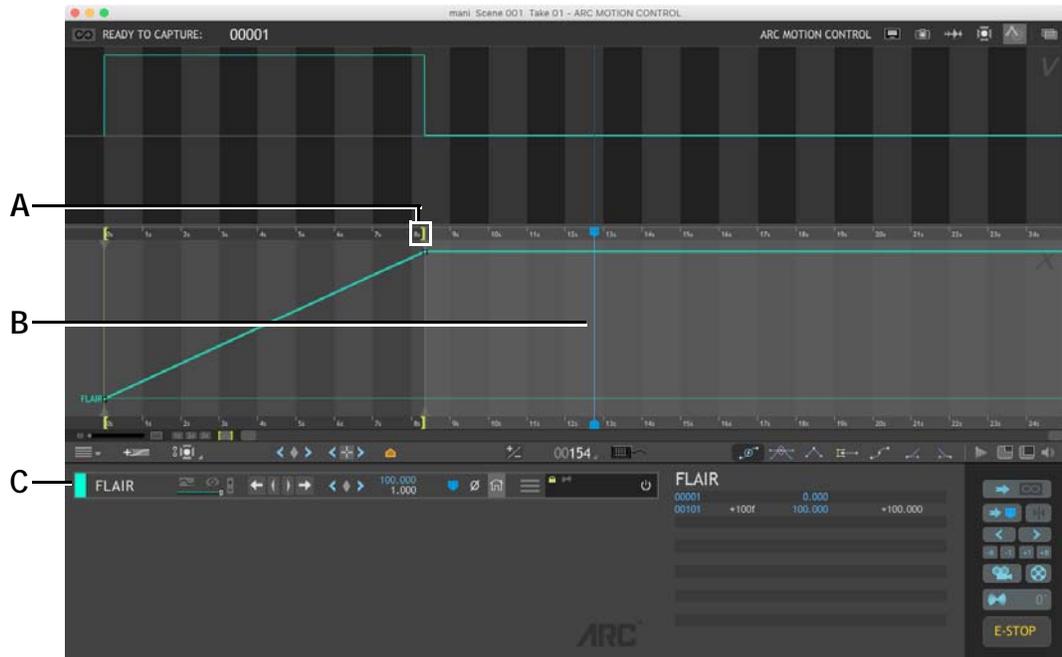
A. *Out point: The out point for th emove. Change this to match the end point of your Flair move.*

C. *Special Flair axis maintained by Dragonframe.*

B. *Blue playhead: Move through the timeline.*

7. Move the blue playhead to the end frame of your Flair move, and press **O**. This sets the out point in the Arc timeline to match the length of your move in Flair.

Troubleshooting the Flair Connection

If Dragonframe does not connect to Flair, here are some things to look into:

1. Is the Flair machine running a firewall or anti-virus software? Make sure it is not blocking Flair.exe from using the network, or blocking incoming TCP traffic on port 53025.

2. Make sure that the Dragonframe machine and Flair machine are on the same network, configured with IP addresses in the same subnet.

3. If you have set up both machines with a direct, static IP connection, for the Flair-Dragonframe interface, make sure to use a different subnet from your normal network. (For example, if your computer uses WiFi, and has IP 192.168.0.10, make sure your static connection uses IP addresses with a different subnet, such as "192.168.1.x".

Synchronizing Flair and Dragonframe

Synchronize Flair in two ways:
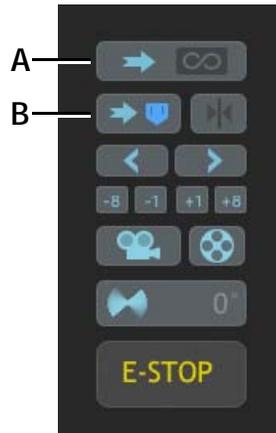
A. *Ready to Capture: Sync the Flair position to the Ready to Capture frame.* **B.** *Go to Frame: Sync the Flair position to the blue playhead.*

- Press when you are ready to animate the shot or shoot pose tests.

- Press for testing and lighting.

If the moco frame position is different than the Ready to Capture frame, the frame number appears in the upper-left corner of the Dragonframe interface:

Moco frame position alongside the ready-to-capture frame number at the top left of window.

Shoot-Move or Move-Shoot

You can line up animation before the motion control moves to the next frame position, or vice-versa. Select **CAPTURE|SHOOT MOVE MODE** or **CAPTURE |MOVE SHOOT MODE** to change the mode.

Previewing Moves

While you are shooting, you may want to peek a few frames forward into the move to make sure you will hit your marks.

To safely preview motion control forward or backwards, one frame at a time, press **ALT/OPTION** and the arrow keys.

Running Move Tests

You can run a move test where Dragonframe moves Flair to each position and captures test frames.

Synchronizing Flair Stereoscopic Shooting with Dragonframe

If you use Flair for motion control, and want to use it's settings to set up stereoscopic shooting, you can integrate that with Dragonframe.

1. Set up stereoscopic shooting within Flair.

2. Connect to Flair from Dragonframe. If you had already connected, you may have to disconnect and re-connect.

3. The special Flair axis in Dragonframe will now be 'indexed', having a left and right position.

4. In Dragonframe's Cinematography workspace, add at least one other exposure (so you can shoot left and right). For any exposures that you want on the right eye position, click the small "L" that's in the exposure settings. It will change to "R1".

5. Start capturing! Dragonframe will tell Flair to move into the left or right eye position to match your exposure setup.

Kuper Triggers Dragonframe

Kuper is an industry-standard motion control system. Typically, it controls a film camera, but you can use an electronic shutter control to trigger a digital still camera. Dragonframe supports the following shutter control devices:

• Dragonframe Electronic Shutter Control (DESC). This product is discontinued.

• The Kuper Still Camera Trigger Box from Flying Wombat Industries:
  http://flywom.com/products/KuperStillCam/kuperstillcam.html

In the following documentation, any references to DESC also apply to the Kuper Still Camera Trigger Box.

There are three different reasons you might use this integration:

• You prefer to control the shooting from Kuper.

• You need exact timing of the motion control move and the camera shutter release. For example, perhaps you are doing go-motion.

- You need exact timing of both the open and close of the shutter. For example, you may be doing special effects sequences at different speeds.

To have Kuper control Dragonframe you will need:

1. A Kuper motion control system.

2. The DESC or some other way of externally controlling the shutter.

3. A serial port connector to connect your computer to the DESC.

    - If your computer does not have a serial port, you will need a USB serial port adapter.

    - Mac: If you have not done so already, you will need to install the Mac USB serial port drivers. There is an option for this in the Dragonframe Help menu.

4. A wired remote trigger for your camera, which you will have to disassemble.

Configuring Kuper, DESC, and Dragonframe involves several steps, described in the sections that follow:

1. Make the connections between the hardware and your computer. See "Making Hardware Connections for External Motion Control" on page 311.

2. Set up Dragonframe's Capture Preferences. See "Setting Capture Preferences for External Motion Control" on page 312.

3. Set up camera settings in Dragonframe's Cinematography workspace. See "Configuring Camera Settings for Motion Control" on page 312.

4. Open Dragonframe's Motion Control workspace to begin working with Kuper and the DESC. See "Connecting to the DESC through Dragonframe's Connections Tab" on page 313.

Making Hardware Connections for External Motion Control

1. Connect the computer running Dragonframe to the DESC box via a serial port adapter.

2. If you are using an **EXTERNAL** or **EXTERNAL BULB** trigger method, connect your remote camera trigger to the DESC.

Setting Capture Preferences for External Motion Control

1. In Dragonframe, open **PREFERENCES** and click **CAPTURE**.
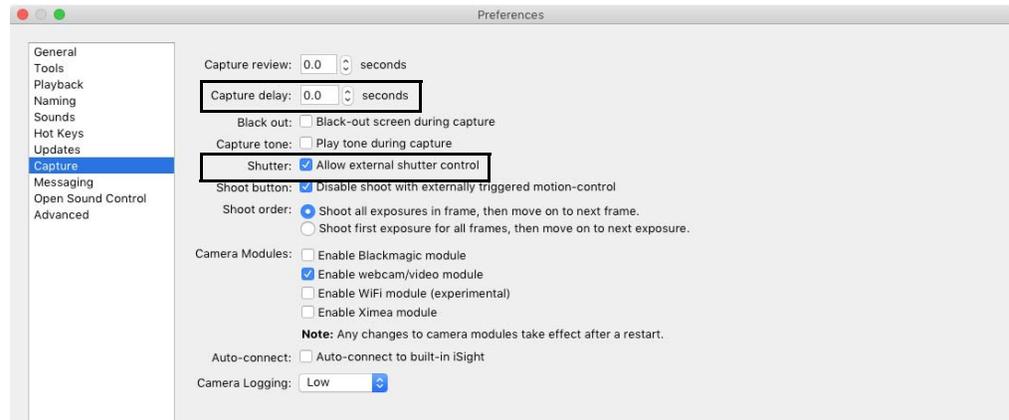
Capture Preferences, with **CAPTURE DELAY** *and* **SHUTTER** *settings.*

2. Set **CAPTURE DELAY** to **0** seconds.

3. Check **ALLOW EXTERNAL SHUTTER CONTROL**. If you are already connected to your camera, press **CTRL+R** (Mac **COMMAND+R**) to reset connections.

Configuring Camera Settings for Motion Control

1. Open Dragonframe's Cinematography workspace. You'll adjust settings in the Camera Settings pane:

Dragonframe's Camera Settings pane with **SHUTTER** *setting.*

2. Set the shutter to **INTERNAL**, **EXTERNAL** or **EXTERNAL BULB**.

- Use **INTERNAL** if you want the DESC to tell Dragonframe to **SHOOT** a frame, but not trigger the camera directly.

- Use **EXTERNAL** if you want the DESC to only control when the shutter is released, but use the camera's pre-set shutter speed.

- Use **EXTERNAL BULB** if you want the DESC to control the open and close of the shutter.

If you're going to shoot in **EXTERNAL BULB** mode, the setup is slightly different, depending on your camera.

- For the *Canon 5D Mark II*, set the Mode Dial to **<B>**, and ignore Dragonframe's warning.

- For the *Canon 1D Mark III*, set the camera to **BULB** mode by holding the Mode button while turning the main dial, until you see **BULB** in the top LCD.

- For *other Canon cameras without an explicit bulb mode*, Dragonframe will set the shutter speed to **BULB** automatically.

- For *Nikon cameras*, Dragonframe will set the shutter speed to **BULB** automatically.

Connecting to the DESC through Dragonframe's Connections Tab

1. In Dragonframe, select **SCENE|CONNECTIONS**.

2. Press **ADD CONNECTION** to create a new connection.

3. Choose **DESC INTERFACE** and select the port that the device is connected on:.
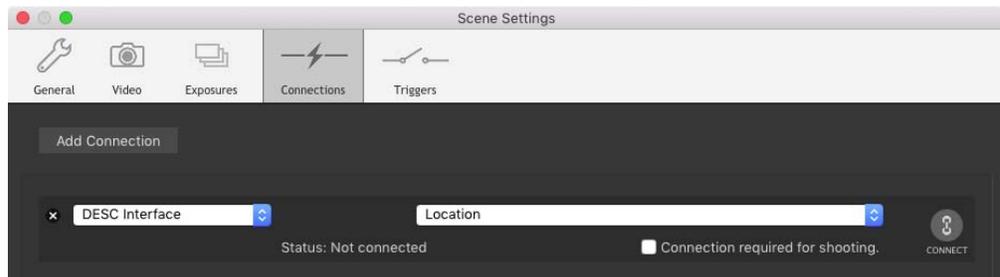
4. Click **CONNECT**. Dragonframe connects to the device.

Dragonframe connects the device, then automatically checks the **CONNECTION REQUIRED FOR SHOOTING** check box. When this box is checked, you will not be able to capture any frames for the scene until Dragonframe is connected to the hardware.

CAUTION: If you uncheck the **CONNECTION REQUIRED FOR SHOOTING** box, you could accidentally shoot all or part of a scene without Kuper working.

The DESC box will send a pre-trigger **P1** message to Dragonframe, and Dragonframe will do the pre-capture: capturing the Live View and disconnecting from the camera.

If the setup described above doesn't work, it's probably because the DESC box isn't set up properly. See the DESC setup manual for setup instructions.

Creating Action Scripts

Dragonframe can call a local script file whenever certain events occur. This is a straightforward integration with many possibilities. For example, you could:

- Back up your high-resolution images whenever Dragonframe downloads a new image.
- Color-process your RAW files whenever Dragonframe downloads a new image.
- Notify a content management system whenever Dragonframe captures a frame.
- Instruct a motion control application to advance its position whenever Dragonframe moves to a new frame.

Dragonframe calls your script file for the following events:

- **SHOOT**: As soon as the user triggers a frame capture.
- **DELETE**: As soon as the user deletes an image.
- **POSITION FRAME**: When Dragonframe is ready to capture another frame or exposure.
- **CAPTURE COMPLETE**: When Dragonframe has downloaded a high-resolution image from your camera.
- **FRAME COMPLETE**: When an entire frame has been shot.
- **TEST**: When a test shot has been captured.
- **EDIT**: When the user has edited frames.
- **CONFORM**: When the user has conformed the take.
- **SAVE**: When Dragonframe saves the take.xml file.
- **NEW TAKE**: When the user creates a new take.

On Windows, your script file is a batch file (**.BAT**).

On Mac and Linux, your script file a bash script (**.SH)**.

Find script examples at our website:
https://www.dragonframe.com/faq/#scripting

NOTE: Script files are run synchronously, meaning that they will block the application until they complete. If you have a long-running operation you should spawn a separate process to complete it.

Adding Hand-Cranked Camera Moves

Dragonframe works with hand-cranked camera rigs to help you plan and execute camera moves. When you set up a camera move, Dragonframe gives you position information for each frame. You can export moves to other scenes.

See also:
"[Importing Scene Settings](#)" on page 156.

## What Gear Do I Need to Use the Hand-Cranked Move Feature?

You can use one of three types of manually controlled rigs:

- A rig using a dial. Print a tape showing evenly spaced increments and tape it on the dial. Your dial must start on 1 (not 0) to work with Dragonframe.
- A rig using a counter that keeps track of increments.
- A millimeter ruler. Your camera should have a pointer on it that can align with the millimeters.

Programming a Basic Hand-Cranked Move

1. On your rig, note your start and end position, and the positions of any keyframes you'll use in-between.

   - For a rig with a dial, note the numbers on the dial, and the number of rotations you use to get to each position.
   - For a rig with a counter, note the counter positions.
   - For a ruler, note the millimeter measurement you'll use.

2. For a rig with a dial, note the total number of increments on the dial tape.

3. From Dragonframe, open the Arc Motion Control workspace.

4. Click ![icon] (in the workspace tools). Dragonframe opens the Configure Axis dialogue:
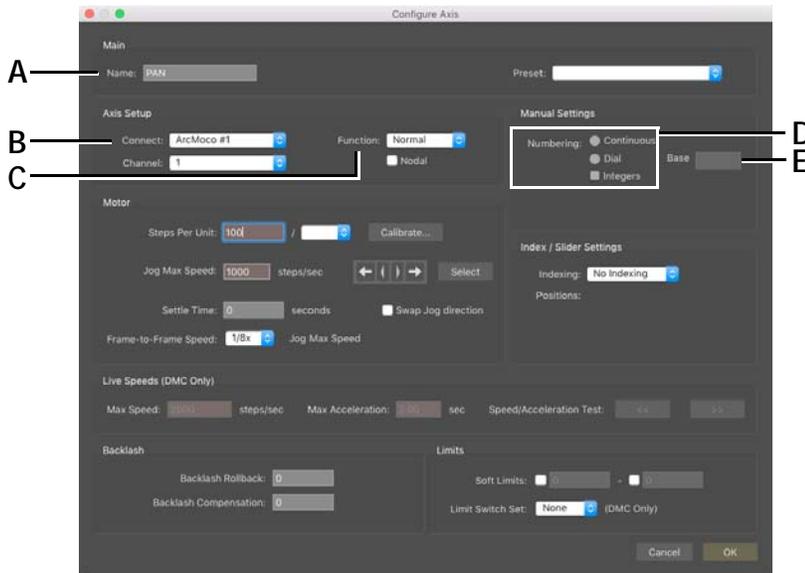
A. *Name: Name the axis.*

B. *Connect: Choose* NONE *for a hand-cranked rig.*

C. *Function: Choose* MANUAL *for a hand-cranked rig.*

D. *Numbering: Select the kind of numbering you'll use: continuous, a dial, or integers.*

E. *Base: Enter the total number of increments for a dial.*

5. (Optional) Enter a name for the axis. For example, PAN.

6. For CONNECT, select NONE.

7. For FUNCTION, select MANUAL.

8. Choose the type of numbering your rig uses:

   • Select CONTINUOUS if you're using a counter or a millimeter ruler.

   • Select DIAL if you're using a dial. Then enter the total number of increments in the BASE field using the information that you found in step 2.

   • (Optional) Check INTEGERS to round all move information to the nearest integer. This makes it easier to decipher the position information.

9. Click OK. Dragonframe creates the axis for your move.

10. In the keyframe list, click a row to add a keyframe.

11. Enter the frame number for the first keyframe.

12. Enter the position for the first keyframe. For example, if you're using a dial and you want the first keyframe to start on 1, you'd enter **0**-**1**. If you wanted a keyframe to start on the third rotation of the dial, number 8, you'd enter **3**-**8**.

Dragonframe adds the keyframes to the axis as you create them.

13. (Optional) Select keyframes and use the bezier handles to adjust the ease-in or ease-out of the move. You can also change the keyframe style.

Understanding the Position Information for a Dial

In Dragonframe, a dial position is listed as a rotation count plus a dial increment in the format **ROTATION COUNT-INCREMENT**. When you add keyframes in Dragonframe, you enter those two values for each keyframe. In the image on the right, the first value (**0-1**) is a typical way a dial rig starts: the dial reads 1 and you have not rotated yet.

The second keyframe has a value of 11-8, meaning you've turned the dial eleven times, and ended with the dial reading eight.

In the final keyframe, you've rotated the dial 31 times, and ended on position five.

Once you set up the move, Dragonframe displays the move information for each frame in the X-Sheet. For example, a position of 1-5 would mean that you move the dial 1 revolution and rest it at increment 5. If the dial will move more than one full revolution from one move to the next, Dragonframe puts the number of revolutions inside brackets next to the position information.

```
        Pan
            0-1
            0-1
            0-1
            0-2
            0-3
            0-4
            0-6
            0-8
            1-2
            1-4
            1-7
            2-2
            2-6
            3-2
            3-7
            4-4
            5-1
            5-7
            6-6
            7-5
            8-5
            9-5
       10-6 [1]
       11-8 [1]
```

For example, if you're using a dial with base eight, the move column for your X-Sheet might look like the image to the left:

The table below gives a further explanation of what those positions mean.

This position:	Means:
0-1	Set the dial to the first increment on the tape.
2-2	You've moved the dial two full revolutions since the beginning of the scene. Set the dial to the second increment.
7-5	You've moved the dial seven full rotations since the beginning of the scene. Set the dial to the fifth increment.
10-6 [1]	You've moved the dial ten full rotations since the beginning of the scene. Set the dial to the sixth increment. The last move was **9-5**, so in brackets, Dragonframe notes that you must turn the dial more than one full revolution to reach position **10-6**.
11-8 [1]	You've moved the dial eleven full revolutions since the beginning of the scene. Set the dial to the eighth increment. The last move was **10-6**, so in brackets, Dragonframe notes that you must turn the dial more than one full revolution to reach position **11-8**.

NOTE: The more increments your dial is broken into, the more flexibility you will have for short moves or longer eases.

Printing a Hard Copy of the Move

To print the move, click **FILE|PRINT**. This prints a copy of your scene's X-Sheet, with the moves for each frame.

Chapter 17: Shooting in 3D

The most common technique for 3D stereoscopic shooting of stop motion animation is to use one camera on a special left/right slider. For every frame of animation, the camera shoots an image for the left eye, moves into the right eye position, and shoots an image in that position.

Connect Dragonframe to a stereo slider to seamlessly automate 3D shooting. This chapter describes how to connect and configure a slider, how multiple exposures allow you to capture left and right frames automatically, and how to review stereo images in the Cinematography workspace.

Connecting to a 3D Slider

Dragonframe can be connected to many different 3D sliders:

- Mark Roberts S3 Stereoscopic Stepper. A lightweight, standalone slider and controller in one.
  http://www.mrmoco.com/heads-dslr/products/stop-frame/s3/

- Arc 3D Slider. An optional accessory for the Arc pan/tilt/roll head.

- IOTA 3D Slider (discontinued). A durable 3D slider. Paired with the IOTA Controller.
  https://www.arcmoco.com/

- Any small slider you can control with a stepper motor via Arduino or DMC-16/DMC+.
  https://www.dragonframe.com/faq/#moco

To connect to the Mark Roberts S3 Stereoscopic Stepper:

1. Connect the MRMC S3 to your computer with the USB cable.

2. In Dragonframe, select **SCENE|CONNECTIONS**. The dialog appears, showing the Connections tab:
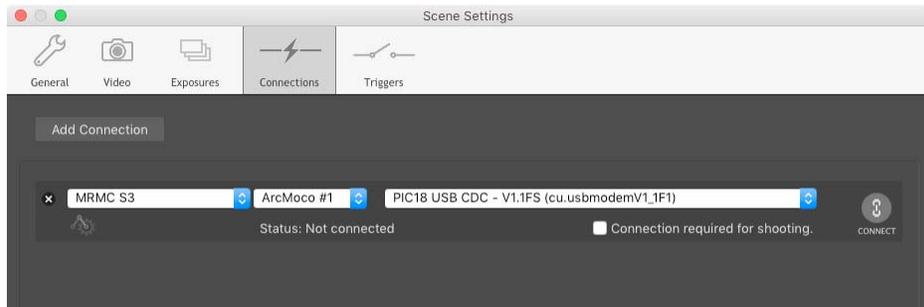
Settings dialog, Connections tab, Arc Moco #1 settings.

3. Choose the device type. For a Mark Roberts S3 slider, choose "MRMC S3".

4. Choose **ARCMOCO 1**.

5. Choose the serial port, then click **CONNECT**.

6. Once the connection is confirmed, click **OK** to close the dialog.

Dragonframe connects the device, then automatically checks the **CON-NECTION REQUIRED FOR SHOOTING** check box. When this box is checked, you will not be able to capture frames for the scene until Dragonframe is connected to the hardware.

CAUTION: If you uncheck the **CONNECTION REQUIRED FOR SHOOTING** box, you could accidentally shoot all or part of a scene without your 3D slider working.

Setting Up the 3D Slider

Once you have connected to the slider, you will configure the slider, and set interocular distances from the Arc Motion Control workspace. You can also use Arc to animate the interocular distances.

Configuring the Slider

To configure the slider:

1. Click ⚙ to open the Arc Motion Control workspace.

2. Click ⊣▰ to add an axis. The configure axis dialog appears. Many of the options in the dialog are specific only to motion control, so only the options for 3D are described below:
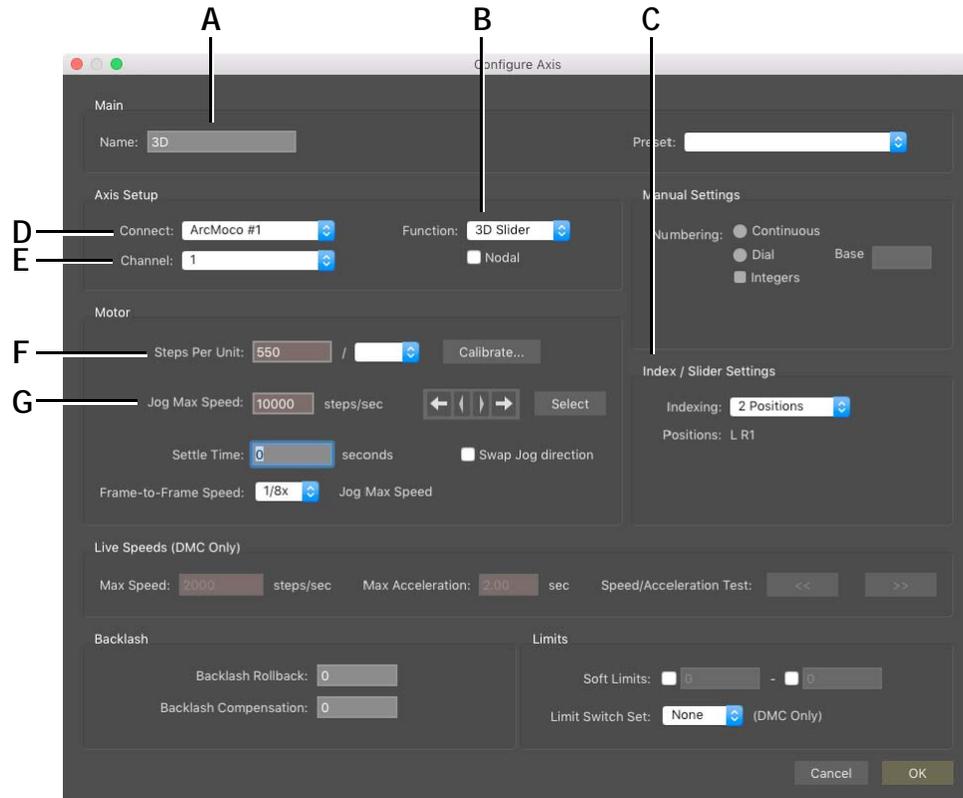

A. *Name: Name the axis.*

B. *Function: Choose 3D slider.*

C. *3D Slider Settings: Set number of indexes (stereo positions).*

D. *Connect: Choose the device you're using. For a slider, it would be Arc Moco 1-4. You would have selected it in "Connecting to a 3D Slider" on page 319.*

E. *Channel: Select the channel you're using for the axis. For the MRMC S3, set it to one. For DMC-16, use the channel number you've plugged the slider into.*

F. *Steps Per Unit: Enter the number of steps per mm/cm/m/ft/in/degrees. The IOTA has 1260 steps/mm.*

G. *Jog Max Speed: The maximum speed of the device, specific to the motor you're using. **Start the speed slowly at first for safety.** Set the IOTA's between 6000-8000.*

3. Name the axis (A.).

4. Select the device (D.) and channel (E.) you set up in "Connecting to a 3D Slider" on page 319.

5. Set the steps per unit (F.). The IOTA takes 1260 steps per mm.

6. Set the maximum speed for jogging (G.) Set the IOTA between 6000-8000.

WARNING: Start the steps per second slowly at first to make sure the rig moves safely.

7. Set the function to **3D**.

8. (Optional) Set the number of index positions. For a 3D axis you can have the primary position plus up to three IOs for a bracketed IO or a center frame. You can assign any of these positions to separate exposures.

9. Click **OK**. Dragonframe adds your axis to the Arc workspace:

A─
B─
C─
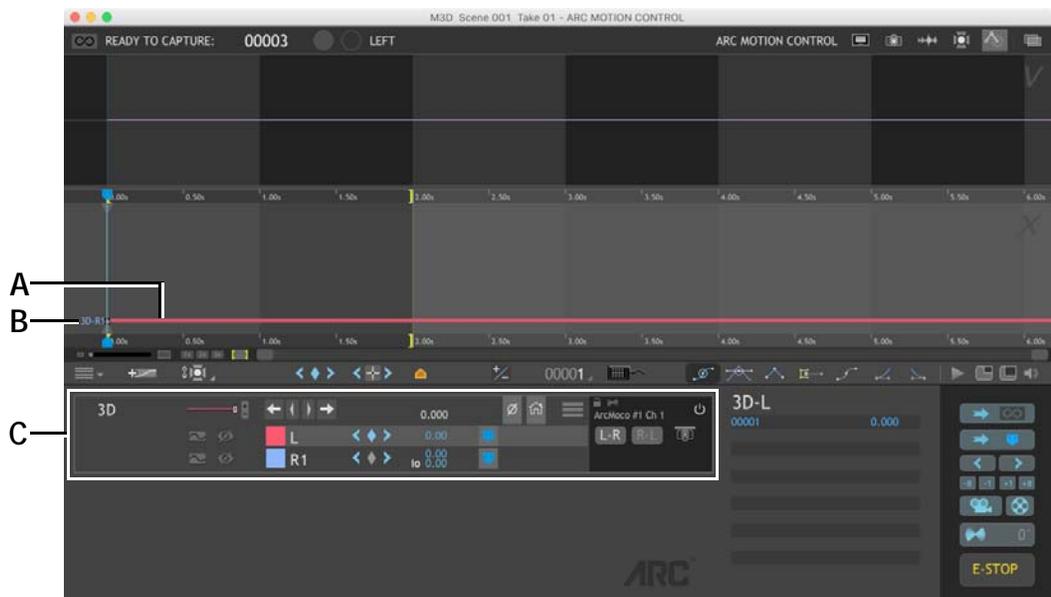
A. Motor's current position (red line). B. Right position (blue) in the position graph. The left position is directly under it because no keyframes have been added yet. C. Axis list with tools for 3D setup.

## Setting the Slider's Interocular Distances

Once you've added your axis, you can set up the slider's interocular distances. The axis you configured appears in the axis list, with both of the eye positions listed:
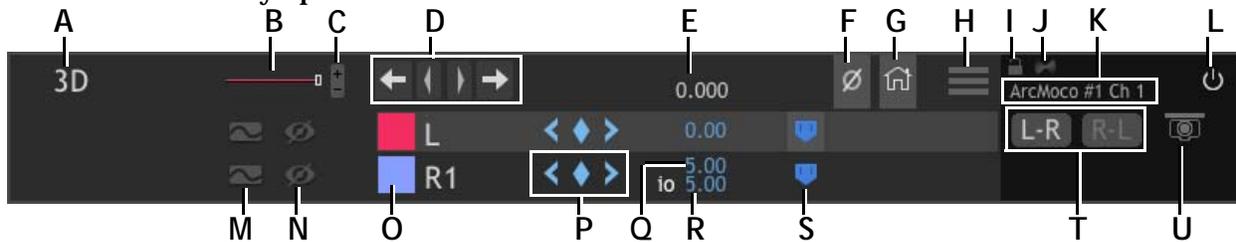
A. *Axis Name: Click to configure the axis.*

B. *Graph scale slider for axis.*

C. *Invert graph for axis.*

D. *Jog/Inch buttons. Move the slider.*

E. *Motor Position: Click to go to a position.*

F. *Zero: Send the axis to zero.*

G. *Home: Send the axis to the home position.*

H. *Menu: Set zero, home, and limits, or clear the axis.*

I. *Lock: Lock the axis for editing.*

J. *Enable motion blur for axis. Not used for 3D.*

K. *Device and channel name.*

L. *Disable: Disable the axis without deleting it.*

M. *Solo axis graph.*

N. *Hide axis graph.*

O. *Graph Color: Change the color of axis on the graphs.*

P. *Keyframe buttons: Click the diamond to define the left and right positions (keyframes). Click < or > to move through keyframes.*

Q. *R1 position: Shows the current R1 position.*

R. *IO distance: Shows the current IO. Click to edit.*

S. *Playhead: Click to send the axis to the playhead.*

T. *L-R/R-L: Choose whether to be left-dominant or right-dominant. Left-dominant is the default.*

U. *Underslung: Click to indicate that your camera is underslung.*

1. (Optional) Click ⬚ to indicate the camera is underslung.

2. (Optional) Click ▬ to turn on Live View so you can see how moving the slider affects the shot.

3. Press the jog buttons (D.) to move to the zero point for your device.

4. From the menu (H.) click **SET ZERO**.

5. Press the jog buttons (D.) to move to the primary eye position.

6. Click the diamond keyframe button (P.) to set the primary eye position.

7. Click the IO for the secondary eye position (R.), and enter the interocular distance. Click **OK**.

8. (Optional) Repeat step 7. to create IOs for any additional eye positions you enabled when you configured the slider.

Once you're done setting up the positions, the workspace will look something like this:
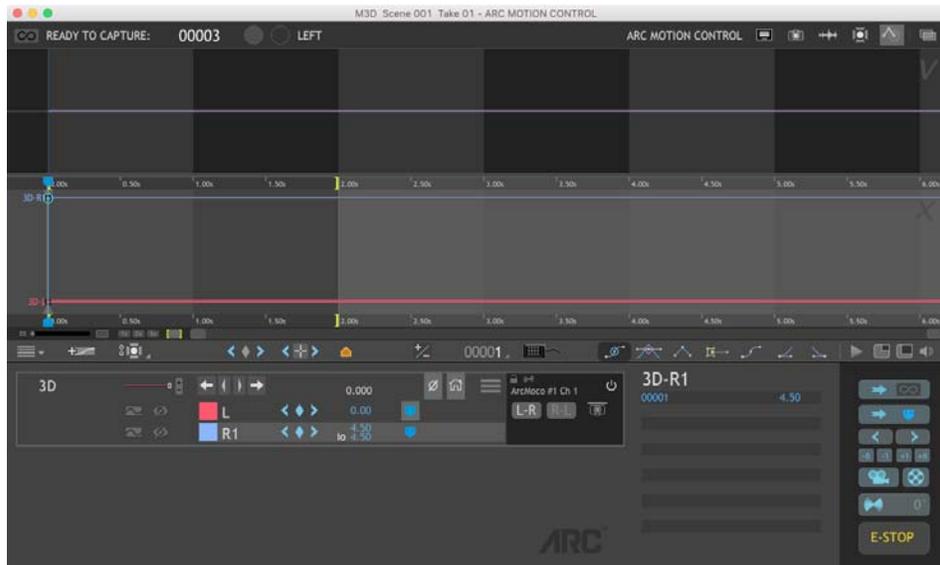
NOTE: You can also set up and refine eye positions from the Cinematography window.

Creating an Animated IO

Your primary and secondary positions can be static or they can be animated throughout the scene. Generally, you will leave your primary eye at one position, and animate just the secondary eye.

To animate the secondary eye (in this example, **R1**):

1. Click **R1** to select that sub-axis in the axis list:

Keyframe list for **R1**.

2. In the keyframe list, double-click an open area.

3. Enter a frame number and IO position for a second keyframe and click **OK**.

4. In the position graph, adjust the keyframe handles to shape the move.

Setting Up Exposures for 3D Shooting

Now that you've configured your stereo positions, you can assign them to exposures, enabling Dragonframe to move your slider automatically. Use Dragonframe's multiple exposure feature to set up left and right "sub-frames". This way, Dragonframe will shoot multiple images per frame. In addition, you can name the exposures to identify if they are left or right eye images, making it easy to work with the files in post-production.

Set up multiple exposures from the Camera Settings pane in the Cinematography workspace. From each location, you can indicate whether the exposure will capture the frame for the dominant eye, or one of the interocular distances:

Cinematography workspace's Camera Settings pane with stereo positions set.

NOTE: When you set up exposures for 3D shooting, make sure to set each exposure to capture automatically. For more information, see "Manual vs. Automatic Captures" on page 97.

Using a Push-In Mask for 3D

We highly recommend shooting 3D with a push-in mask. By composing your scenes with space on the left and right of the image, you will have room to slide the stereo layers in post. Sliding the stereo layers will give you more control of your 3D depth.

See also:
"Aspect Ratio Mask" on page 54.

Reviewing 3D Images

There are a few ways to review 3D images.

- Review 3D test shots in the Cinematography workspace,

- View anaglyph or transparency stills in the Cinematography workspace,

- Play back 3D sequences in the Animation workspace, and

- Export 3D sequences to a movie.

As you use these methods to review your work, Dragonframe also provides a variety of tools to help you refine 3D settings.

Taking 3D Test Shots and 3D Images

Once you have set up a stereo slider, created left and right exposures, and assigned stereo positions to them, you can take 3D test shots or 3D images.

- To take a 3D image, press **SHOOT** as you normally would.

- To take a test shot, maximize the 3D Stereo Review pane, and click the **3D TEST SHOT** button.

3D Test Shot button.

Reviewing 3D Images and Test Shots

To review 3D images, select an image from the Test Shot tray (C.) or the Exposure Image tray (B.). Then select a 3D viewing mode (A.)
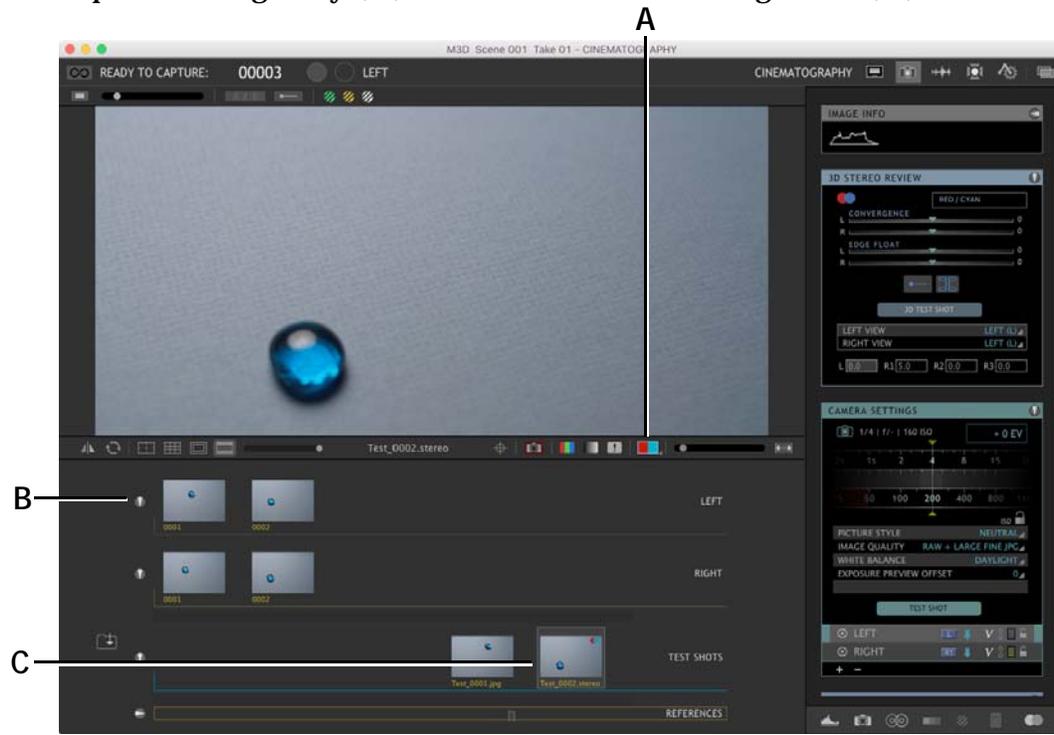
A. *3D Viewing Modes. Click to activate the current viewing modes Click the arrow to select a viewing mode, including* **COLOR ANAGLYPH***,* **BLACK AND WHITE ANAGLYPH, COLOR TRANSPARENCY,** *or* **BLACK AND WHITE TRANSPARENCY***.*

B. *Click an exposure to view it. Left and right pairs appear in the corresponding exposure tray—here, they're labeled* **LEFT** *and* **RIGHT***.*

C. *Click a test shot to view it. Stereo pairs appear with a stereo icon on them.*

Refining 3D Settings from the Cinematography Workspace

You can adjust 3D settings, such as anaglyph colors, convergence, screen edge, right and left exposures, and interocular values from the

3D Stereo Review pane. To view the pane, maximize it on the left side of the Cinematography workspace:
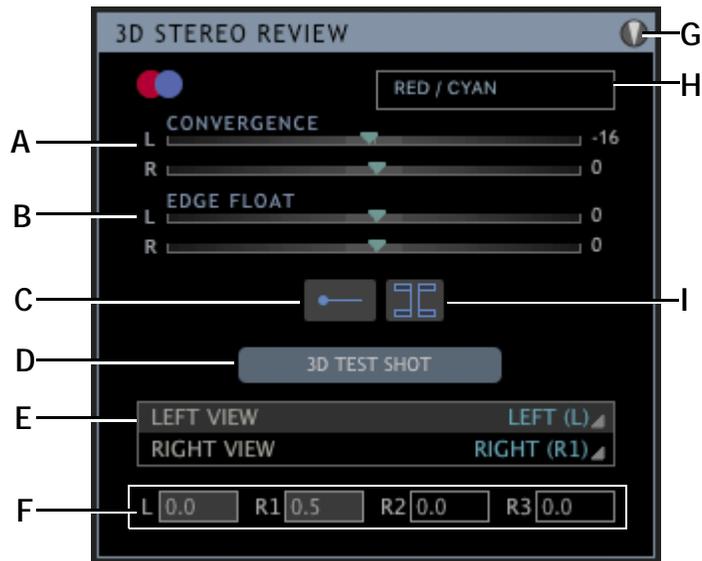
A. **Convergence:** Adjust convergence for horizontal alignment of your left and right views.

B. **Edge float:** Adjust the left and right screen edges in 3D space.

C. **3D Compare Tool**

D. **3D Test Shot:** Take a 3D test shot.

E. **Exposures:** Change which exposures are used for the left and right views.

F. **IO Values:** Change the interocular values for the left and right positions.

G. **Minimize the 3D Stereo Review pane.**

H. **Anaglyph color:** Change the colors used to make anaglyphs from Red/Cyan to Green/Magenta.

I. **Calipers:** Click to open measurement calipers over the View pane.

NOTE: With the exception of the IO adjustments (F.), the settings in the 3D stereo review pane are for preview only. They do not affect your saved image sequences.

Fine-Tuning Convergence and Edge Float

If the slider is not giving you enough control, you can getting finer control over the convergence and edge float values by doing either of the following:

1. Hold **SHIFT** while dragging the slider.

2. Click and drag on the numeric value to the right of the slider.

Using an Edge Float

New to recent 3D movies is a technique called a "dynamic floating window." In this technique, the screen edges (window) are treated as 3D elements along with the movie within. By floating the screen edges in front or behind the actual projection plane, you can solve some 3D issues like edge violations.

Dragonframe includes a basic edge floating system as a 3D previewing tool (B.). The edge float sliders can be set to either make the screen edges float above or behind your projection plane or computer screen.

Using Stereo Calipers

Use the stereo calipers to measure stereo offset.

The stereo calipers can be used to measure pixel offset in stereo pairs. They can help you determine proper interocular settings.

In addition, the calipers can help you make quick decisions about lensing and staging without the need to preview every shot on the big screen in full 3D.

You can set the calipers to measure pixel distances based on your final export size, projection size or post-production size, such as 4K, 2K and HD. This way, even if you are shooting 5000 pixel raw files, you can still communicate clearly with your post production team about intended stereo offsets.

To use the calipers:

1. Shoot a stereo frame, test shot or scene in Dragonframe.

2. (Optional) Set a push-in mask.

NOTE: We highly recommend shooting 3D with a push-in mask. By composing your scenes with space on the left and right of the image, you will have room to slide the stereo layers in post. Sliding the stereo layers will give you more control of your 3D depth.

3. Open the Cinematography workspace and maximize the 3D Stereo Review pane if it's minimized:

A. Stereo viewing modes. Click to turn on the current mode. Click the arrow to select a mode: anaglyph or transparency in color or black and white.

B. 3D Stereo Review pane. Refine stereo settings.

C. Calipers button. Click to view the calipers.

D. 3D Test shot. Take a 3D test shot.

E. 3D Exposure. Select which exposures to use for the left and right views.

F. Test shot. Take a test shot.

4. Set the left and right exposure you wish to preview in the 3D Stereo Review pane (E.).

5. Select a stereo viewing mode (A.). The anaglyph or transparency appears in the View pane.

6. Click the calipers button (C.).

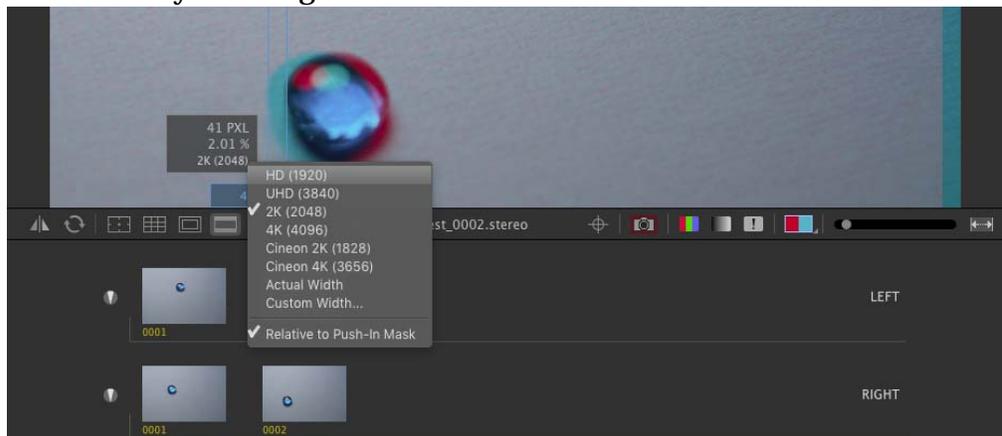The calipers appear in the View pane.
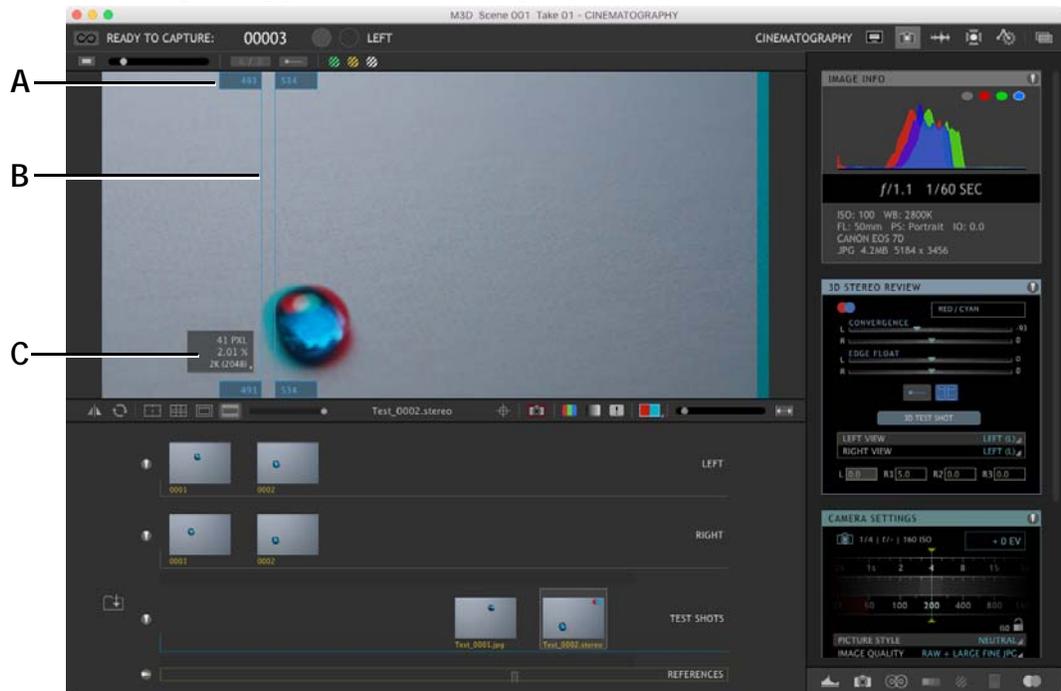
A. Caliper handles.

B. Calipers.

C. Caliper info box.

7. Click the arrow in the calipers info box to select the intended final width of your image:

8. Grab the handles (A.) at the top or bottom of the calipers to take a measurement.

Basic Stereo Caliper Theory

A 3D image will often have elements of the image that appear at the screen level, behind the screen and in front of the screen in 3D space.

Elements that appear at the screen plane in 3D will be aligned horizontally. The left and right image will appear to match up or align. You can use Dragonframe's convergence sliders to visually align what you want appear at screen level in 3D space.

The elements in front or behind the screen plane will appear to be offset from their left or right counterpart. It is this offset that causes the illusion of 3D.

Based on the intended viewing size of your final work, you will find there is a limit to the amount of 3D offset you want to produce. There are physical and creative considerations. Through experience, you will want to understand the effect of the overall stereo offset: from the closest to the farthest object in 3D space. You will also want to judge how much offset is acceptable behind and in front off the screen plane.
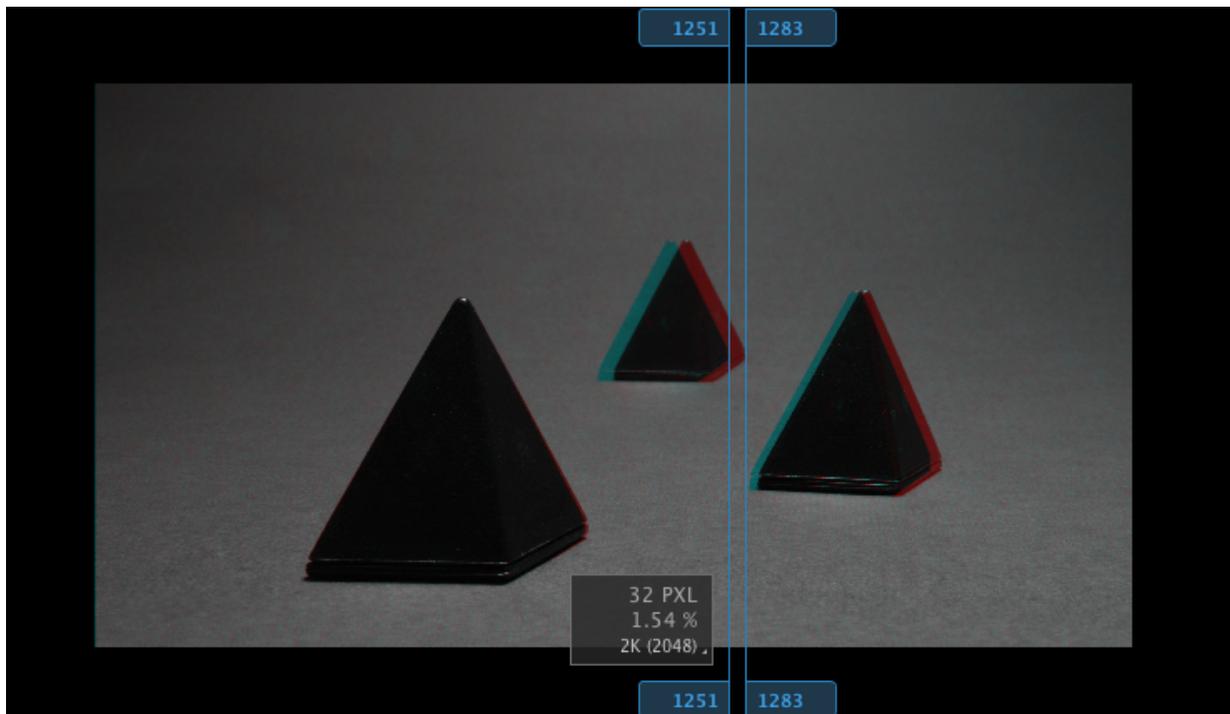
Calipers measuring stereo offset for object in 3D space.

Using the stereo calipers can help you and your team keep track of your stereo offset and reduce the amount of big-screen testing and review you need.

By setting an intended compositing size or projection size in the 3D Stereo Review pane, the camera team, post-production team and 3D supervisor can all talk in the same increments, saving time and confusion.

Using the Stereo A/B Tool

Compare the left and right images with the special stereo A/B tool. It works exactly the same as the regular A/B image comparison tool, except that it compares your chosen left and right images.

See "Comparing Images with the A/B Tool" on page 85.

Press ▭ to enable the stereo A/B mode. The stereo A/B tool shows up in the view pane:
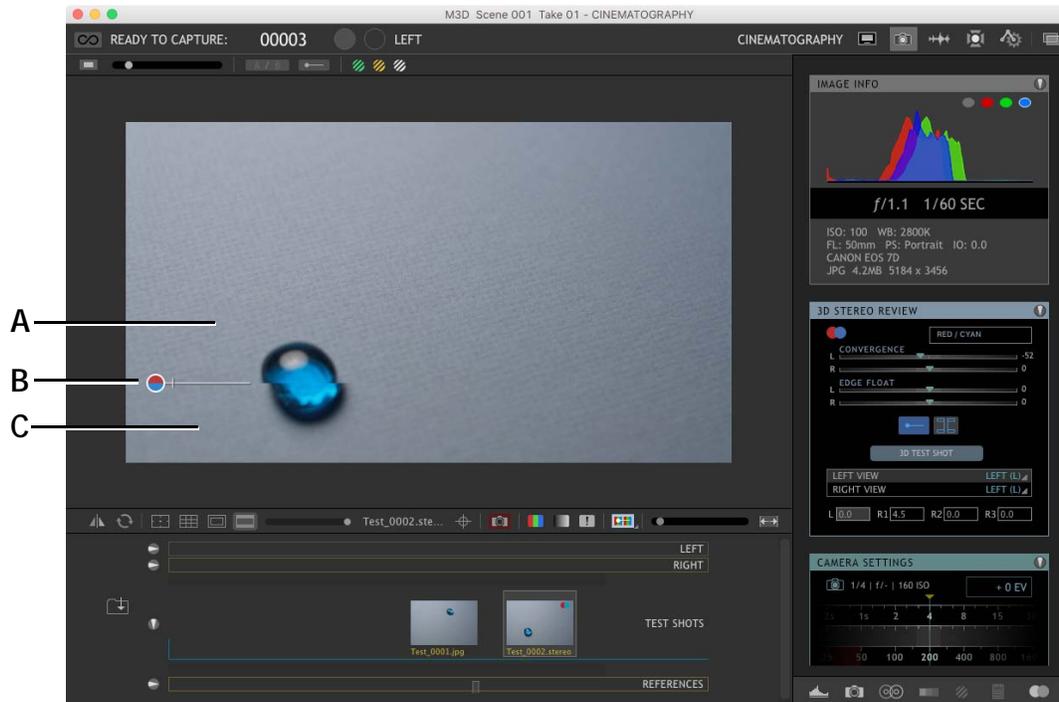
A. The left stereo image. It always appears on the red side of the stereo A/B tool.

B. The stereo A/B tool.

C. The right stereo image. It always appears on the blue side of the stereo A/B tool.

The stereo A/B tool is ideal for pairing with the stereo calipers because it makes it very easy to see the offsets between the images.

Playing Back Stereo Sequences in Dragonframe

To play back footage in 3D:

1. In the Cinematography workspace, choose which exposures are used for the left and right eye using the 3D Stereo Review pane.

2. Refine any other 3D settings needed in the 3D Stereo Review pane.

3. Open the Animation workspace.

4. Click **PLAYBACK**, and then select a 3D playback mode.

Now Dragonframe will play both exposures in the Animation workspace using the normal playback controls. Any adjustments you make in the 3D Stereo Review pane will be reflected in the Animation workspace's playback.

Exporting Stereo Sequences

Export your 3D sequence as a movie to preview your frames, or as a simple way to produce your project. To export your image sequence, select **FILE|EXPORT STEREO (3D) MOVIE**.

See also:

Chapter 18: Exporting Your Take

There are a variety of ways to access your Dragonframe project. We designed Dragonframe to give you direct access to your images.

All frame editing is virtual. That is, once you make any edits, including deletes and cutbacks, you will need to conform your take if you want the files on disk to have frame order numbering on them.

On the other hand, if you are only going to use export from Dragonframe (either exporting movies or image sequenes), there is no need to conform your take. The exported sequences will always be correct.

To export your take, you can do one of the following after conforming your edits:

- Access your files directly. Dragonframe always saves images directly from your camera (for still cameras). *You must conform your edits before you access image files.*

- Import Dragonframe source files as an image sequence into another program, such as AfterEffects. *You must conform your edits before you import an image sequence from Dragonframe.*

- Export a movie for import into another program, such as Final Cut Pro. You do not need to conform edits before exporting a movie.

- Export a frame sequence, including DNG files. You do not need to conform edits before export a frame sequence.

Finding Your Source Files

With Dragonframe, you can always directly access your source files. You can import those files within post-production software, such as AfterEffects.

CAUTION: All frame editing is virtual. That is, once you make any edits, including deletes and cutbacks, you will need to conform your take if you want the files on disk to have frame order numbering on them.

To keep your files organized, Dragonframe creates a file hierarchy automatically as you create new scenes and takes. The capture files and the video assist files are always stored in the same place within the hierar-

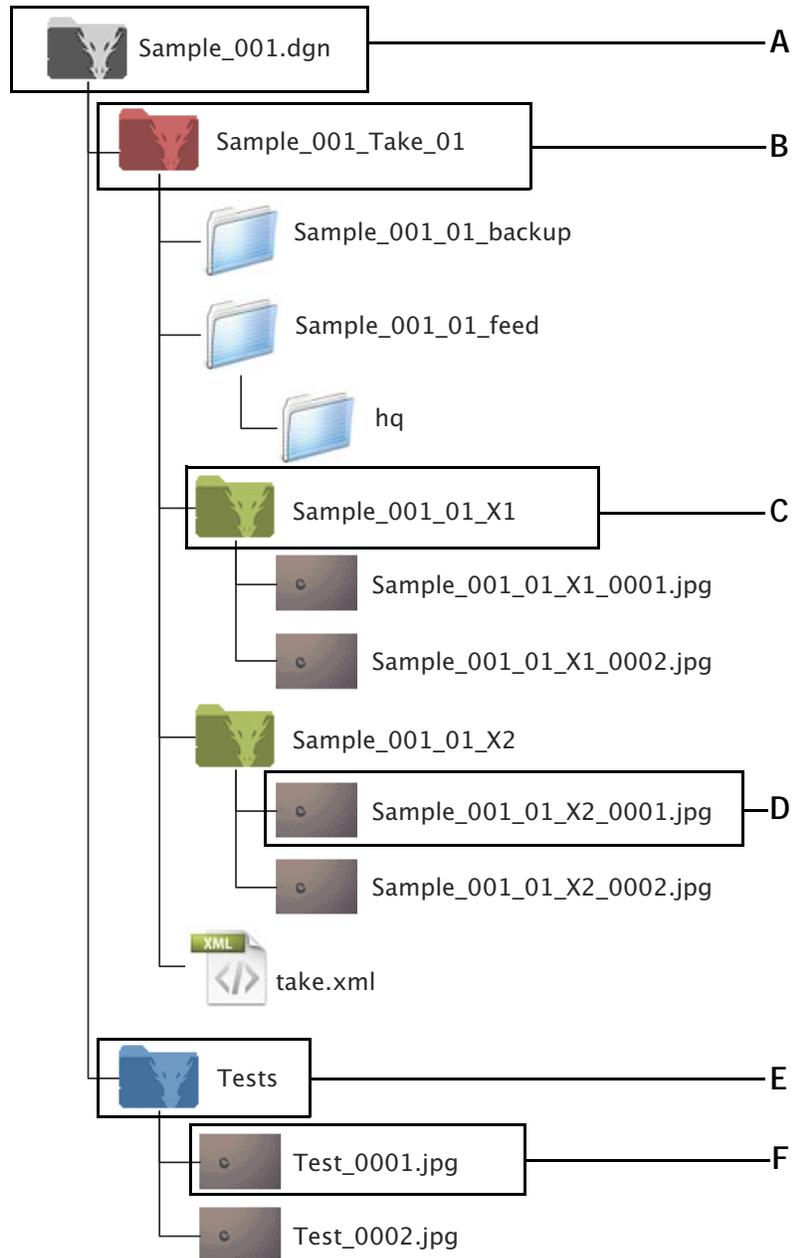chy. Learning Dragonframe's organizational system will help you to get access to those files any time.

A. *The Scene folder.*

B. *The Take folder.*

C. *The Backup folder contains any capture or feed frames you've deleted.*

D. *The Feed folder contains video assist frames, stored as JPEGs. Multiple exposures are stored together.*

E. *The HQ folder contains proxies of the high-res images for playback.*

F. *The Exposure folders. These are your high-res images.*

G. **TAKE.XML** *contains the metadata for the take. (You can use this file to set up a "template" for new scenes.) This is all the information about your take besides media files (images and audio).*

H. *The Test Shots folder contains any test shots you took in the Cinematography workspace.*
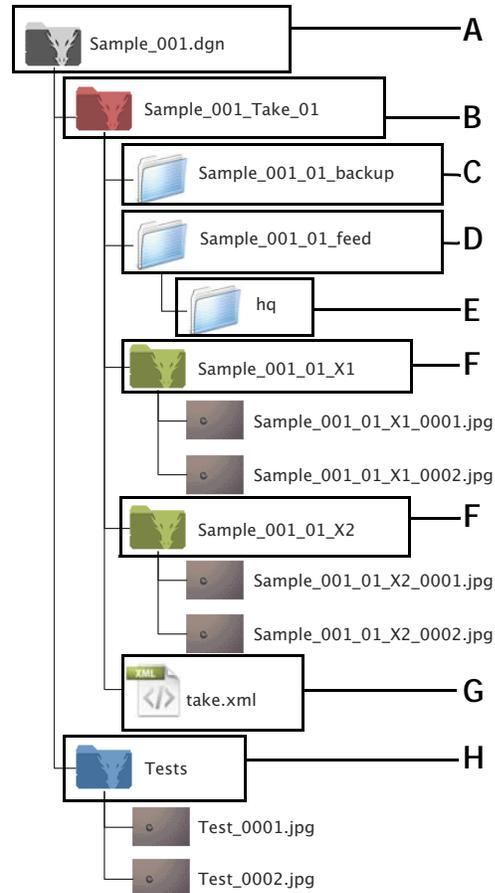
CAUTION:Dragonframe relies on the naming structure of your scene and take folders to locate your files. If you need to rename a scene or take, you must do it within Dragonframe by duplicating a scene or through the Manage Takes dialog. Dragonframe will not be able to open a project that has been renamed elsewhere.

The next pages show a file hierarchy, depending whether you choose the default file names (Production + Scene) or the shorter file names (Scene only). Choose the naming convention with "Naming Preferences" on page 353.

File Hierarchy Map, long

- Sample_001.dgn — A
- Sample_001_Take_01 — B
- Sample_001_01_backup
- Sample_001_01_feed
- hq
- Sample_001_01_X1 — C
- Sample_001_01_X1_0001.jpg
- Sample_001_01_X1_0002.jpg
- Sample_001_01_X2
- Sample_001_01_X2_0001.jpg — D
- Sample_001_01_X2_0002.jpg
- take.xml
- Tests — E
- Test_0001.jpg — F
- Test_0002.jpg

A. *Scene Folder: Production_Scene.dgn*

B. *Take Folder: Prod_Scene_Take*

C. *Exposure Folder: Prod_Sc_Tk_Exposure#*

D. *Capture Images: Prod_Sc_Tk_Ex_Frame#.jpg (Or other file extension)*

E. *Tests Folder*

F. *Test Images: Test.0001.jpg*

File Hierarchy Map, short
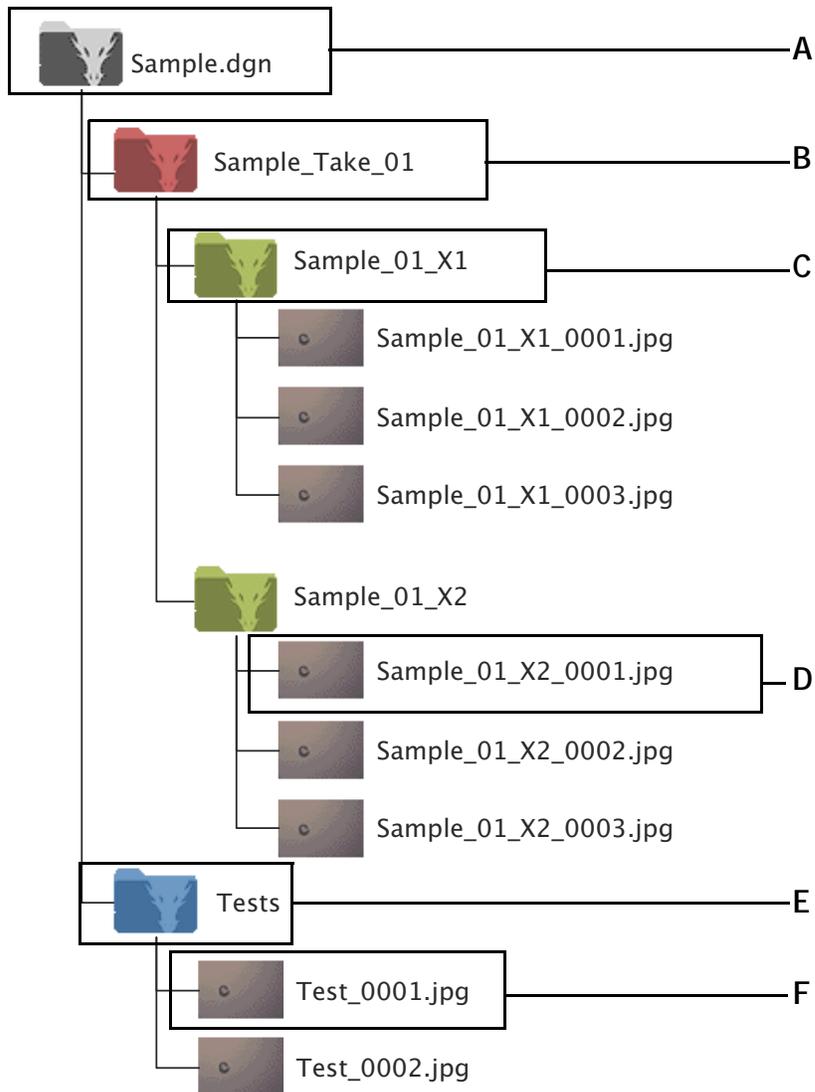
A.   *Scene Folder: Scene.dgn*

B.   *Take Folder: Scene_Take_##*

C.   *Exposure Folder: Sc_Tk#_Exposure*

D.   *Capture Images: Sc_Tk#_Ex_Frame#.jpg (Or other file extension)*

E.   *Tests Folder*

F.   *Test Images: Test.0001.jpg*

Creating a Movie of Your Take

You can export the frames in the take you're working on as a movie in various formats, including QuickTime, mp4 and avi . That way, you can get a quick preview of your take, or have a simple way of producing your project.

To export a movie:

1. Click **FILE|EXPORT MOVIE**. The Export Movie dialog appears.
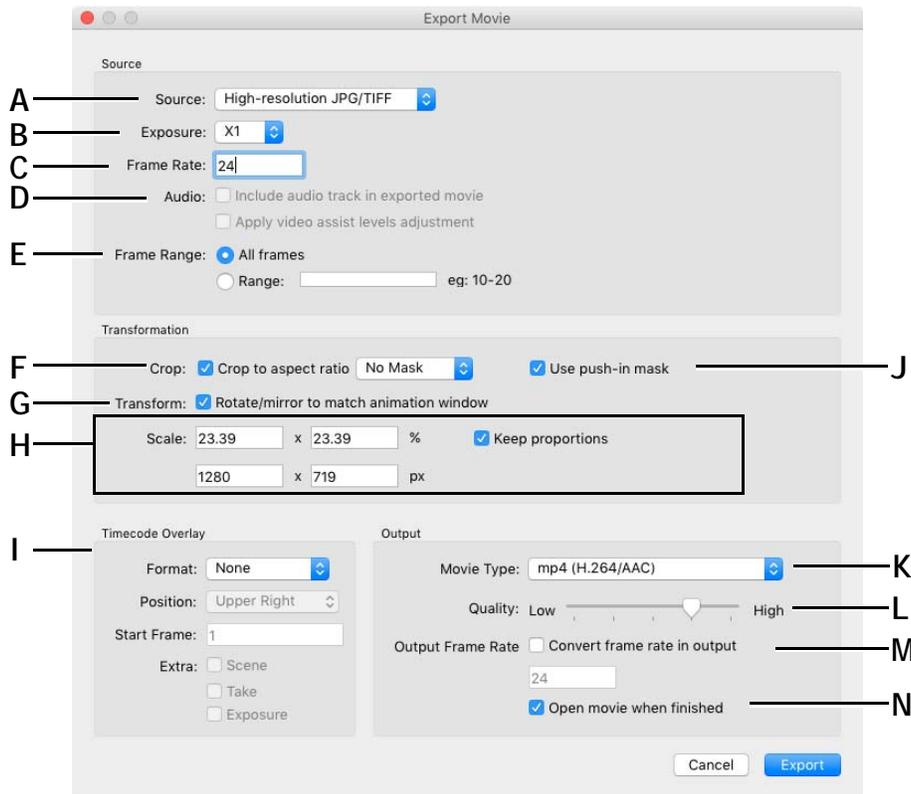
A. Source: Select whether to use low-res video assist frames or high-res capture frames to create the movie.

B. Exposure: Select which exposure to used in the QuickTime movie if your scene has more than one exposure.

C. Frame Rate: Set the frame rate for the movie.

D. Audio: Include the imported audio track in the movie.

E. Frame Range: Set the range of source frames that will be exported.

F. Crop: Crop the movie using the Aspect Ratio mask as a guide, or keep the frames un-cropped.

G. Transform: Match the movie's screen orientation to that of the Animation workspace, or ignore orientation settings.

H. Scale: Set the size of the movie as a percentage of the source file's image size, or using a pixel count.

I. Timecode Overlay: Select an optional time code overlay.

J. Use push-in mask: Keep the push-in mask in the exported frames.

K. Movie Type: Choose an output format and compression codec. For example, QuickTime Uncompressed or Windows AVI.

L. Quality: If your format has a variable quality level, you can select it here. 100% would mean the highest quality available from the format.

M. Output Frame Rate: Use this setting if you animate at one frame rate, but want your output to be in another. For example, you animated at 12 FPS, but your post-production work requires 24 FPS movies as input. Here, leave the original frame rate at 12, then set the output frame rate to 24.

N. Open movie when finished: Open the movie once Dragonframe finishes exporting it.

2. (Optional) Change any settings necessary, then click **OK**. Dragonframe opens the Save Movie dialog.

3. Navigate to where you want to save the movie and click **SAVE**.

4. Click **OK**.

Dragonframe exports the movie. If you've selected to open the movie after the export is complete, it will appear in its own window.

Available Movie Formats

Dragonframe supports the following movie formats:

H.264/AAC (.mp4)

The de-facto standard for Internet sharing. It is cross-platform and the recommend format for uploading to YouTube or Vimeo.

This is not available on Linux.

QuickTime Uncompressed (.mov)

A lossless, very large movie file format. May be suitable for post-production on small projects.

QuickTime Animation Codec (.mov)

A lossless codec with smaller file sizes than uncompressed. Commonly used for post-production.

QuickTime Photo JPEG (.mov)

A high-quality, large file codec. May be used for sharing or post-production.

QuickTime ProRes (.mov)

A high-quality, small file codec. Commonly used for post-production.

Windows AVI Uncompressed (.avi)

A lossless, very large movie file format. May be suitable for post-production on small projects.

Windows AVI Motion JPEG (.avi)

Similar to QuickTime Photo JPEG, it has JPEG-compressed frames. May be used for sharing or post-production.
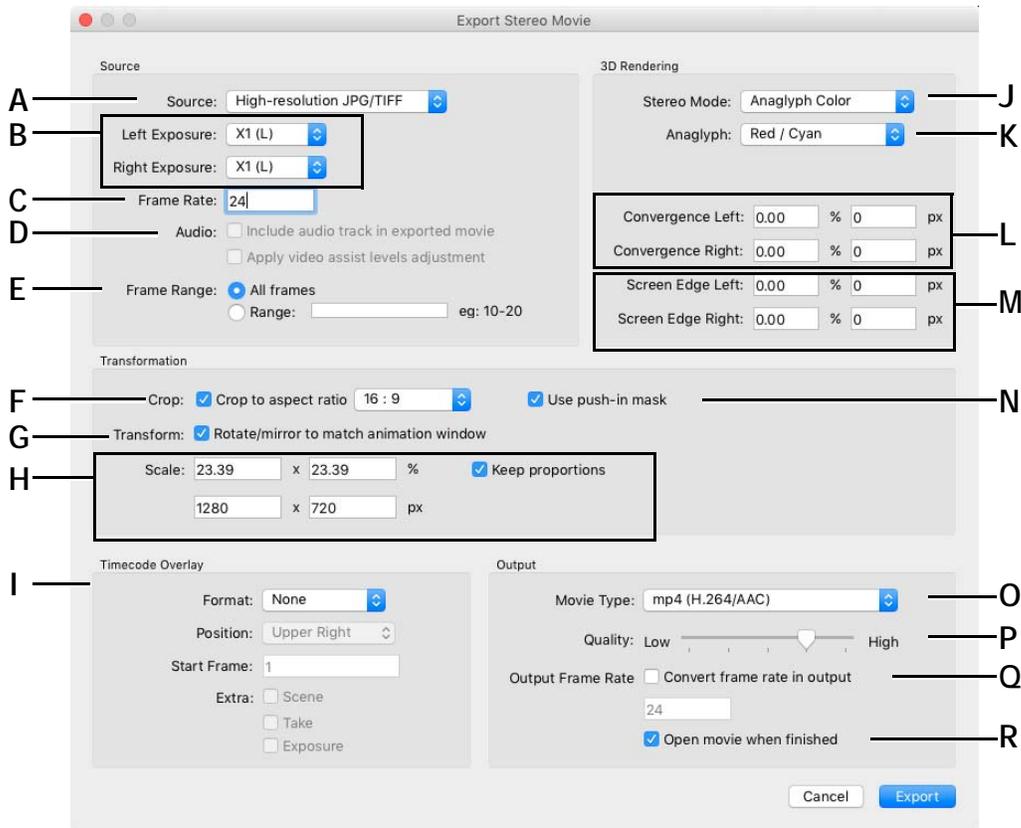
Windows WMV Video 7 (.wmv)

A high-quality, small file codec. Generally used for sharing.

Creating a Movie from a Stereo Image Sequence

Export your 3D sequence to a movie to preview your frames, or as a simple way to produce your project.

To export your image sequence, select **FILE|EXPORT STEREO (3D) MOVIE**.

## The Export Stereo Movie dialog appears:

A. Source: Select whether to use low-res video assist frames or high-res capture frames to create the movie.

B. Left/Right Exposure: Choose the left-eye and right-eye exposures.

C. Frame Rate: Select the frame rate for the movie.

D. Audio: Include the audio track in the movie.

E. Frame Range: Set the range of source frames that will be exported.

F. Crop: Crop the movie using the aspect ratio mask as a guide, or keep the frames un-cropped.

G. Transform: Choose whether to match the movie's screen orientation to the Animation workspace.

H. Scale: Size the movie as a percentage of the source file's image size, or using a pixel count.

I. Timecode Overlay: Select an optional time code overlay.

J. Stereo Mode: Select the stereo mode to use for the QuickTime: anaglyph or transparency in black/ white or color.

K. Anaglyph: Choose which colors to use for the ana-glyph.

L. Convergence L/R: Set convergence values for the left or right image as a percentage, or by specifying the number of pixels.

M. Screen Edge L/R: Set screen edge values for the left or right image as a percentage, or by specifying the number of pixels.

N. Use push-in mask: Keep the push-in mask in the exported frames.

O. Movie Type: Choose an output format and com-pression codec. For example, QuickTime Uncom-pressed or Windows AVI.

P. Quality: If your format has a variable quality level, you can select it here. 100% would mean the highest quality available from the format.

Q. Output Frame Rate: Use this setting if you animate at one frame rate, but want your output to be in another. For example, you animated at 12 FPS, but your post-production work requires 24 FPS movies as input. In that case, leave the original frame rate at 12, then set the output frame rate to 24.

R. Open movie when finished: Open the movie once Dragonframe finishes exporting it.

Exporting Image Sequences

You always have access to your files in Dragonframe. However, you may want to export your images from Dragonframe instead of using the original files. Export files to convert image formats, scale down files, or change the naming convention.

To export a frame sequence:

1. Select **FILE|EXPORT IMAGE SEQUENCE**. The export image sequence dialog appears:
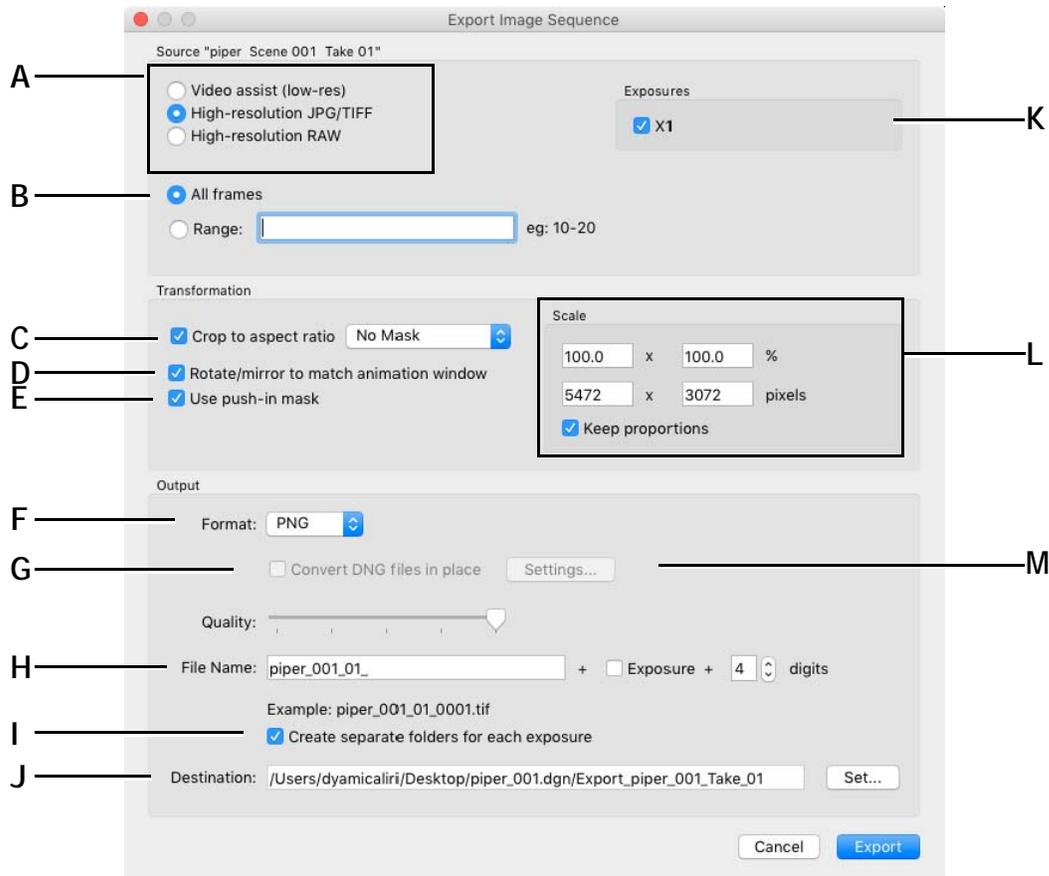
A. Choose which image source to use for the export: video assist, high-res TIFFs/JPGs, or raw files.

B. Choose which frames to include: all of the frames in the scene, or a range of frames.

C. Crop the frames to the aspect ratio you choose. Or, do not crop the frames.

D. Rotate or mirror the images to match the settings you've chosen in the Animation workspace.

E. Use push-in mask: Keep the push-in mask in the exported frames.

F. Choose which image format your exported images will use.

G. Create the DNG files in the Dragonframe folder where the original RAW files are.

H. Specify the file names for the sequence.

I. Select whether multiple exposures will be exported to one folder, or separate folders per exposure.

J. Choose where to export the files. This option is disabled if you choose to convert DNG files in place.

K. Select which exposures to include in the export.

L. Choose the image size.

M. Specify settings for the image formats you chose.

2. Click **EXPORT**. Dragonframe exports the frame sequence with the settings you chose.

Exporting Post-Production Metadata

Dragonframe collects metadata from several locations within the program, and automatically outputs a scene metadata text file.

The file is located within your **DGN** folder and is named with the scene prefix. For example, a scene named "PARIS_001.dgn" will have a metadata file called "PARIS_001_meta.txt".

The main source of information for this file comes from the Camera Notes tool in the Cinematography workspace. There you can specify general information about each take, and the exposures in that take.

See "Adding Camera Notes" on page 92.

If you add a POST notes column to the x-sheet, any frame-specific notes from there will be included in the metadata file.

See "Creating Post-Production Notes" on page 200.

Additionally, Dragonframe will include the name of the camera used in each take, the start and end frame, and the timestamp of the first and last frame captured.

The file is intended to be human readable, as opposed to machine readable.

NOTE: The format of the file is not customizable.

Here is an example:

```
PARIS_001

------------------------------------------------------------
Take_01

    CAMERA: Canon EOS R
    CAMERA OPERATOR: Javier R.
    ANIMATOR: Sarah M.
    FRAMES: 1 - 45
    FIRST FRAME: 2019-11-23 12:12:18
    LAST FRAME:  2019-11-23 16:12:00

    Pop through test

Exposures

    X1
```

```
Frame Notes

    ---

----------------------------------------------------------------
Take_02

    CAMERA: Canon EOS R
    CAMERA OPERATOR: Javier R.
    ANIMATOR: Sarah M.
    FRAMES: 1 - 50
    FIRST FRAME: 2019-11-24 08:15:12
    LAST FRAME:  2019-11-26 19:14:52

    Hero take. Make sure director sees this.

Exposures

    BEAUTY    animation
    BL        back light


Frame Notes

    00012 - pencil left in shot
    00040 - grass shifted
```

Chapter 19: Preferences

Dragonframe contains a number of ways to customize your user experience. Preferences gives you control over settings for your whole project, while the Settings dialog lets you adjust settings for a particular scene.

Configuring Preferences

To open Preferences on macOS, select **DRAGONFRAME|PREFERENCES**.

To open Preferences on Windows and Linux, select **FILE|PREFERENCES**.

General Preferences

Use General Preferences to modify a variety of Dragonframe's functions. Any changes you make will apply to your whole project. Open Preferences and click **GENERAL** to open General Preferences.
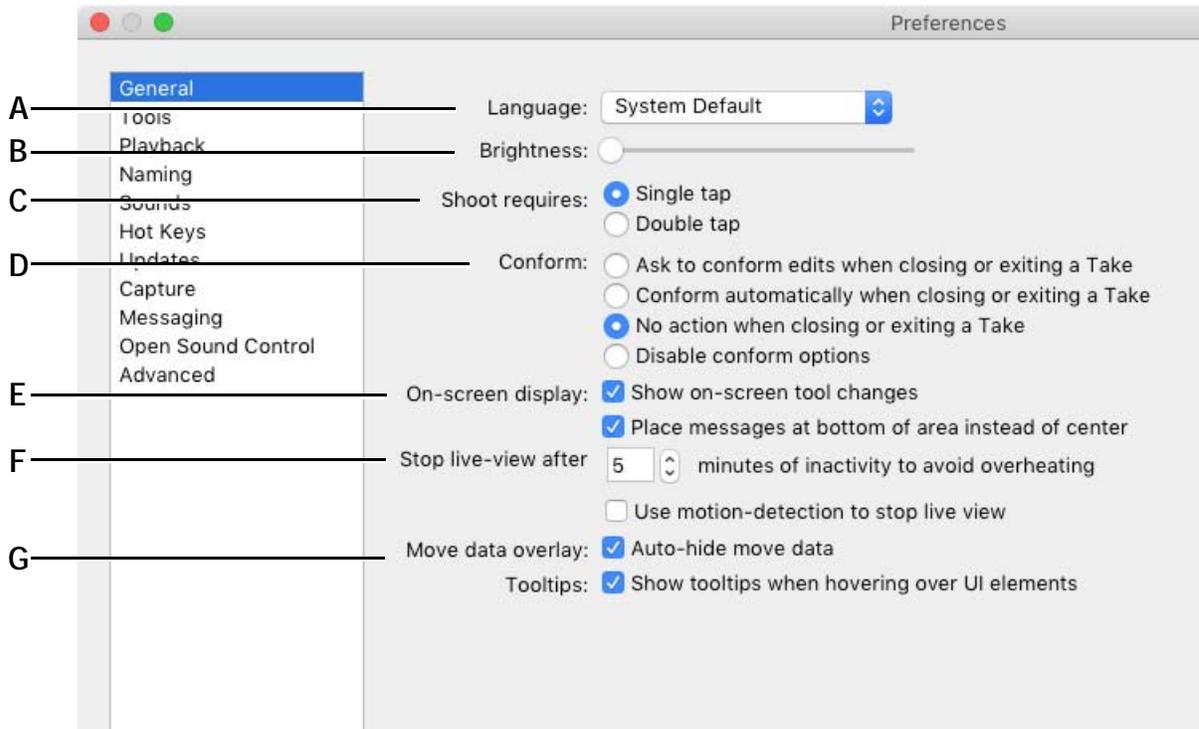
A. *Language: Choose which language to use in the interface.*

B. *Brightness: Adjust the brightness of the user interface.*

C. *Shoot requires: Adjust whether to press **SHOOT** once or twice to capture frames.*

D. *Conform: Change whether Dragonframe prompts you to conform edits when you exit a take.*

E. *On-screen display: Show or hide notes that flash in the View pane when selecting Dragonframe Animation tools.*

F. *Stop live-view after: DSLRs with Live View can overheat. Configure how long auto-shutoff takes, and whether Dragonframe will use its built-in motion detection feature to determine inactivity.*

G. *Move data overlay: By default, Dragonframe displays hand-cranked camera moves in the Animation workspace. Here, make move data disappear when stepping though scenes.*

Any preferences you change will be saved when you close the window.

Tools Preferences

Modify Dragonframe's animation tool features using Tools Preferences. Any changes you make will apply to your whole project. Open Preferences, then click **TOOLS**.
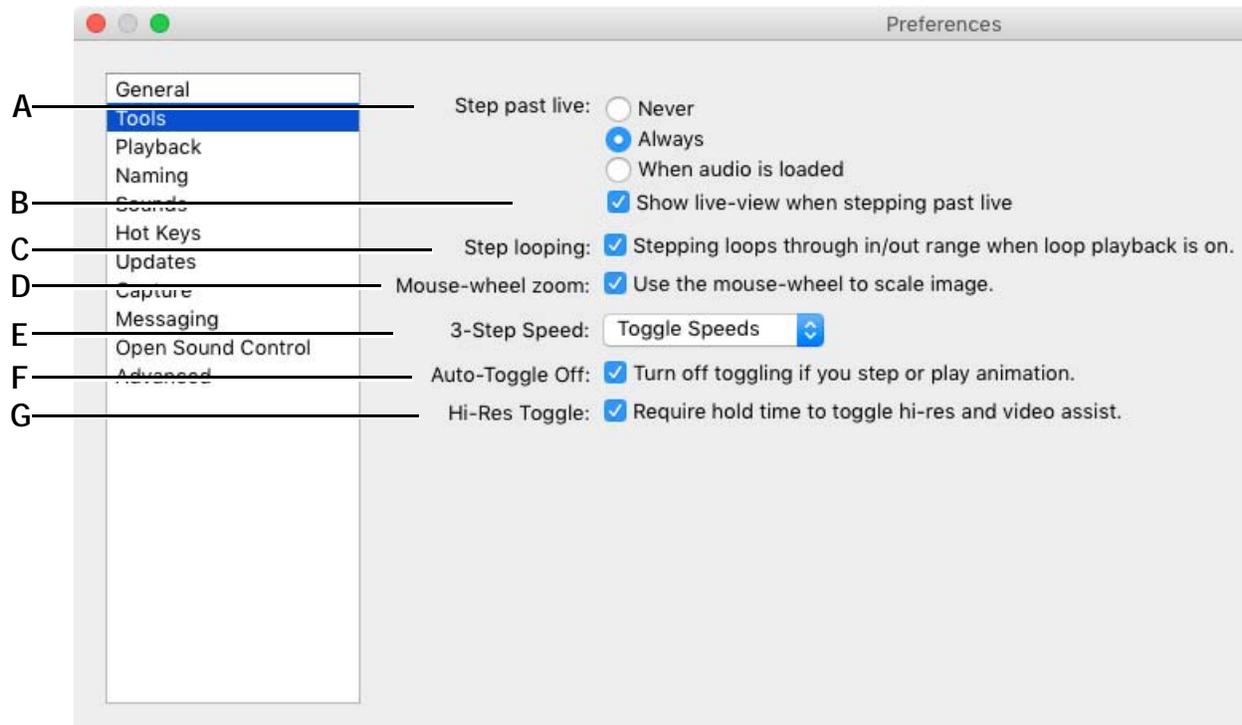

A. *Step past live: Adjust whether you can step past the Live View in the timeline.*

B. *Show live-view...: Check* **SHOW LIVE VIEW WHEN STEPPING PAST LIVE** *to see the Live View when you step into to-be-shot frames.*

C. *Step looping: Stepping past mark-out point jumps to mark-in point, when looping is on.*

D. *Mouse-wheel zoom: Change the scale of the Live View with the mouse wheel or with your mouse pad scroll.*

E. *3-Step Speed: Adjust how Dragonframe plays back frames when 3-Step is activated. You can press the 3-step hotkey to toggle playback speed, or select one speed here.*

F. *Auto-Toggle off: Turn off auto-toggling when you step through your animation or play it.*

G. *Hi-Res Toggle: Require an extended hold of hi-res toggle key in order to switch between hi-res and video assist images.*

Any preferences you change will be saved when you close the window.

Playback Preferences

Modify Dragonframe's playback features using Playback Preferences. Any changes you make will apply to your whole project. Open Preferences, then click **PLAYBACK**.
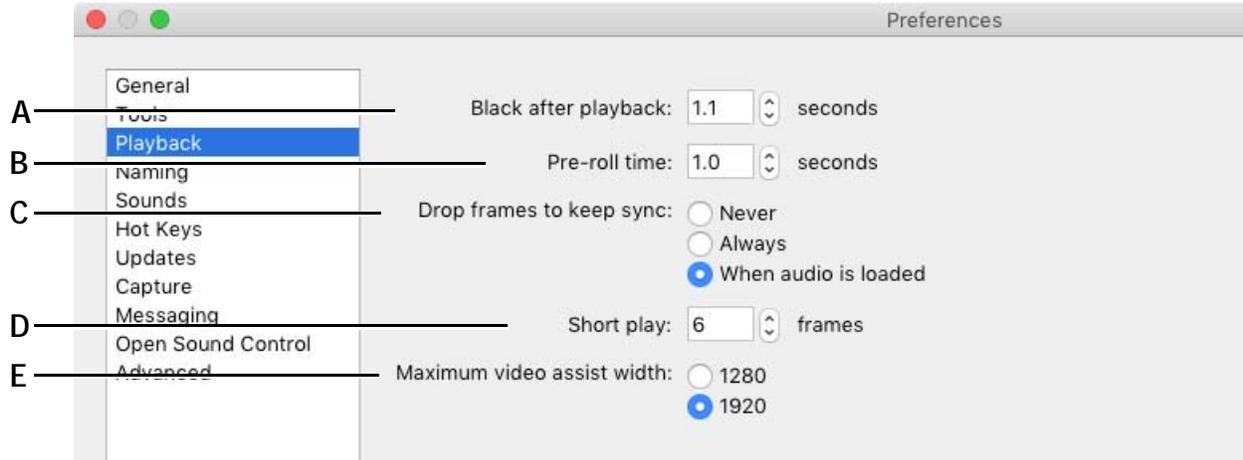
A. *Black after playback: Adjust the number of seconds the black feature adds to playback. Use this timing for a live frame during looping as well.*

B. *Pre-roll time: Adjust how much time is included in the pre-roll portion of the timeline.*

C. *Drop frames to keep sync: Select when Dragonframe will drop frames to keep up with the frame rate. For example, if you check* **WHEN AUDIO IS LOADED***, Dragonframe will drop frames to keep playback in sync with the audio.*

D. *Short play: Adjust how many frames are included for short play.*

E. *Adjust maximum video assist width. Only Canon EOS R (with special firmware), Blackmagic Design devices, and some webcams provide video assist this size. If your computer is not very powerful, you should not enable this.*

Any preferences you change will be saved when you close the window.

Naming Preferences

Change the way Dragonframe names files in its hierarchy from Naming Preferences. Any changes you make will apply to your whole project. Open Preferences, then click **NAMING**.
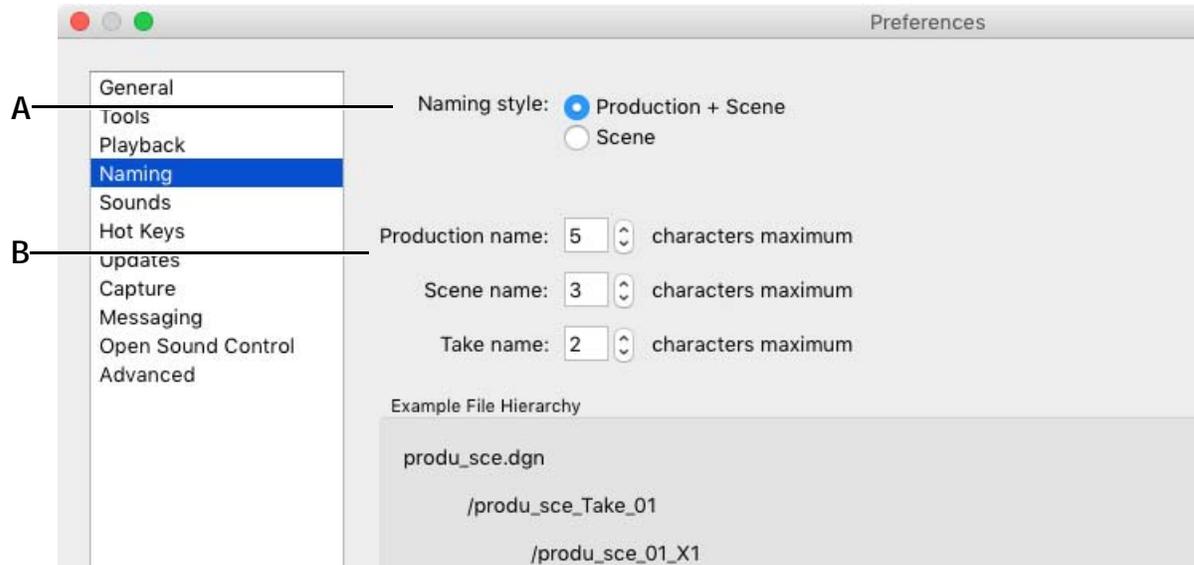
A. Naming Style: Change whether file names include both production and scene names, or just scene names. B. Production, Scene, Take Names: Change how long the production, scene and take names can be.

Choosing Naming Conventions

In Dragonframe, you save every scene with one of two naming conventions. Dragonframe's naming conventions are based on the classic Hollywood clapboard: production, scene, and take. You can choose which naming convention to use in Naming Preferences:

- *Production, Scene.* This is the default preference for Dragonframe. Using all three levels of organization makes it possible to work on more than one project at once without confusing scene names.

- *Scene.* This is a simpler, shorter option, but may be harder to use if you work on multiple projects that overlap.

Dragonframe's Sounds

Select which sounds Dragonframe uses to alert you when certain operations take place. Any changes you make will apply to your whole project. To change sounds, open Preferences, then click **SOUNDS**.
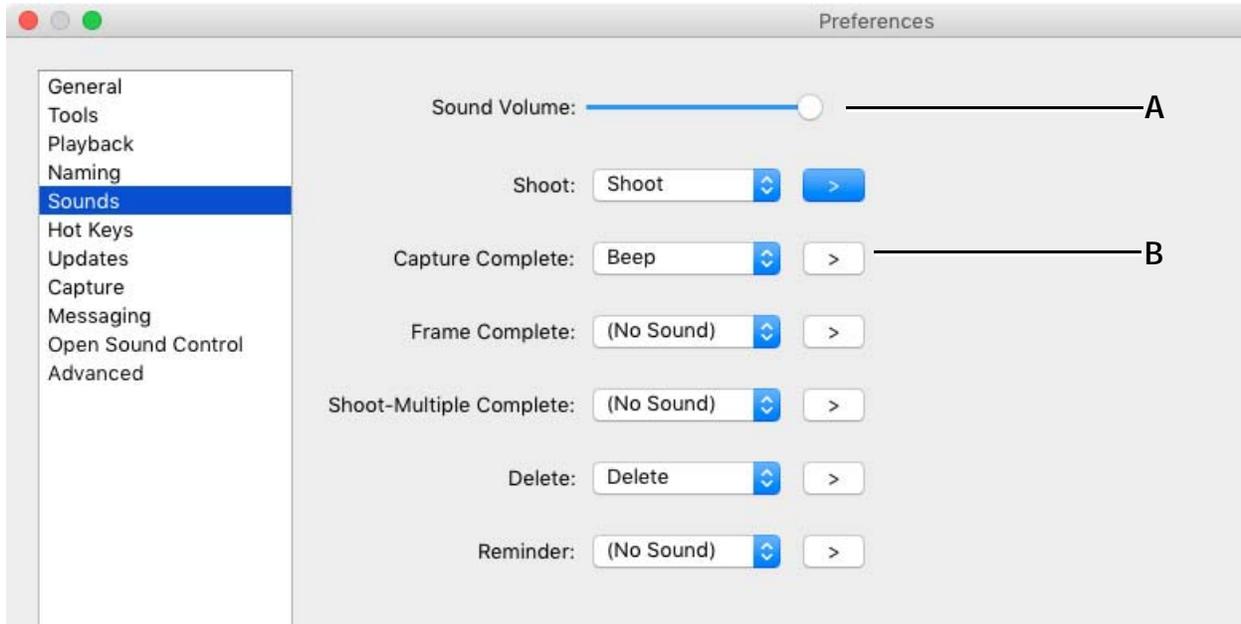
A. *Adjust sound effect volume.* *B.* *Select sounds to associate with shooting a frame, completing a capture, deleting a frame, and a pop-up reminder note. Click > to play the sound.*

Any preferences you change will be saved when you close the window.

Programming Hot Keys

Dragonframe comes with a variety of pre-programmed keyboard controls. Change the default keypresses from Hot Key Preferences. Any changes you make will apply to your whole project. To program custom Hot Keys, click open Preferences, then select **HOT KEYS**:

Preferences

To change a hot key, click on the Hot Key and type new key.

Restore Defaults —— A

Action	Hot Key	Alt 1	Alt 2	Alt 3
Shoot	Return	Enter	NUM Enter	Not Set
Shoot 2 Frames	Q	Not Set	Not Set	Not Set
Shoot 3 Frames	W	Not Set	Not Set	Not Set
Shoot 4 Frames	E	Not Set	Not Set	Not Set
Test Shot	'	Not Set	Not Set	Not Set
Delete	Del	NUM *	Backspace	*
Play	NUM 0	0	Space	Not Set
Step Back	NUM Left	NUM 1	1	Not Set
Step Forward	NUM Right	NUM 2	2	Not Set
Live	NUM 3	3	Not Set	Not Set
Home	Home	Not Set	Not Set	Not Set
End	End	Not Set	Not Set	Not Set
Line-Up Toggle	L	Not Set	Not Set	Not Set
Line-Up Toggle #1	Not Set	Not Set	Not Set	Not Set
Line-Up Toggle #2	Not Set	Not Set	Not Set	Not Set
Line-Up Toggle #3	Not Set	Not Set	Not Set	Not Set
Line-Up Toggle #4	Not Set	Not Set	Not Set	Not Set
Line-Up Opacity Up	K	Not Set	Not Set	Not Set
Line-Up Opacity Down	J	Not Set	Not Set	Not Set

B

C

A. *Restore Defaults: Revert to Dragonframe's default Hot Keys, discarding changes.*

B. *Hot Key Column: Click the column next to the action to reprogram it. Then press the keys you want to use. For example, to re-program* **SHOOT** *to use* **S** *as its Hot Key:*
1. Click next to the current Hot Key (Here, **ENTER***.)*
2. Press **S***. Dragonframe notes the new Hot Key in the dialog.*

C. *Alt 1, Alt 2, Alt 3: Set three alternative Hot Keys for any action. To set alternative hot keys, click in the cell for that action, then type the new Hot Key.*

Any preferences you change will be saved when you close the window.

Update Preferences

Dragonframe automatically looks for software updates to make sure you're using the most recent version. Use Update Preferences to change the settings for the updates.

To change update preferences, open Preferences, then select **UPDATES**:
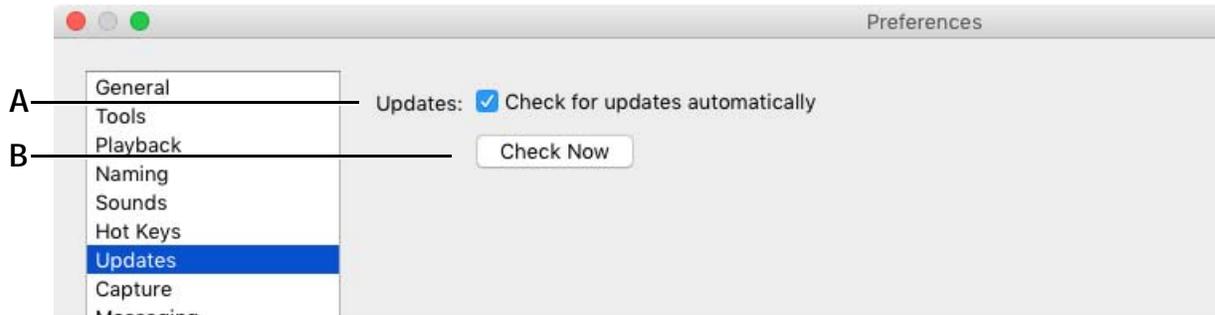
A. Updates: Check to have Dragonframe automatically look for updates and notify you when they're available. *B.* Check Now: Click to immediately check for updates to Dragonframe.

Any preferences you change will be saved when you close the window.

Capture Preferences

Capture Preferences control how Dragonframe works during captures.

To change Capture Preferences, open Preferences, then select **CAP-TURE**:
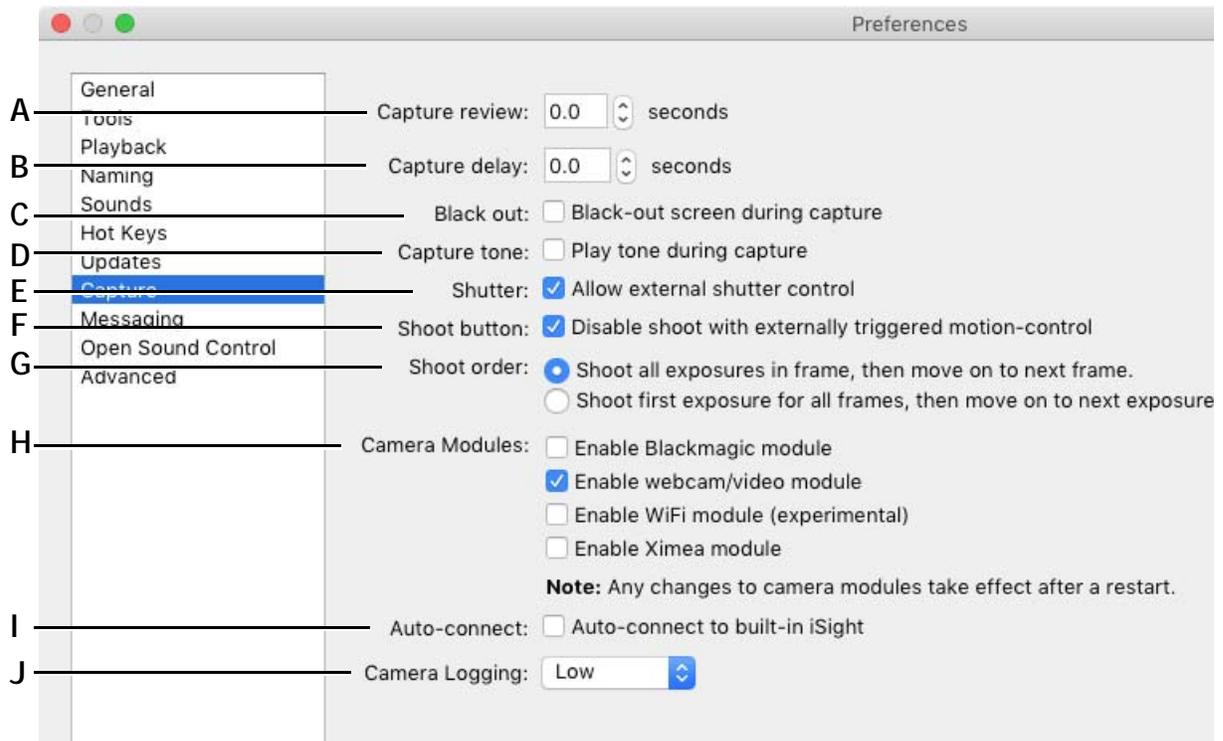
A. *Capture Review: Automatically review high-res proxies in Animation window after every capture.*

B. *Capture Delay: Add a delay between the video assist and high-res captures.*

C. *Black Out: Make your screen black during captures.*

D. *Capture Tone: Enable or disable the sound that plays during a capture.*

E. *Shutter: Enable a supported camera to use an external shutter control, such as the DESC, for motion control. When enabled, the shutter control setting will appear in the Cinematography workspace's Camera Settings.*

F. *Shoot Button: When this box is checked, and you have the Dragonframe External Shutter Control connected, pressing **SHOOT** will not trigger Dragonframe's shoot command. This allows you to control Dragonframe with the DESC.*

G. *Shoot Order: Change the order that Dragonframe shoots frames for shooting on twos, or shooting holds.*

H. *Camera Modules: Enable or disable camera modules. For example, if you never want Dragonframe to connect to a webcam, you could disable the webcam module.*

I. *Auto-connect: Un-check the box to keep a Mac from auto-connecting to its iSight/FaceTime camera.*

J. *Camera Logging: Controls the amount of camera debugging information Dragonframe stores in the log files. If you have a capture issue, we may ask that you increase this before sending in a problem report.*

Any preferences you change will be saved when you close the window.

Messaging Preferences

Dragonframe can send email or text notifications when a long shooting operation finishes. To modify Messaging Preferences, open Preferences, then select **MESSAGING**.
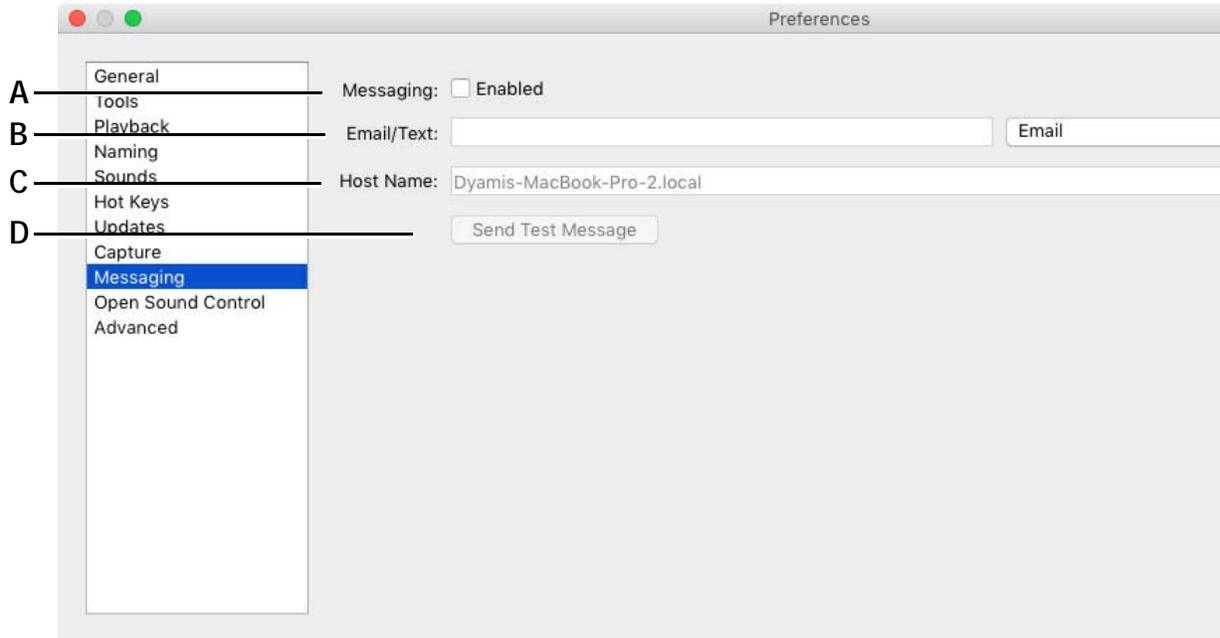
A. *Messaging: Enable the messaging functionality of the program. This adds a message icon in the shoot-multiple and time-lapse progress dialogs.*

B. *Email/Text: Set the target email or text (phone number) to receive messages.*

C. *Host Name: Set the machine name that the messages will originate from. This is important in multi-stage studios.*

D. *Send Test Message: Send a test message with the provided configuration.*

Any preferences you change will be saved when you close the window.

Open Sound Control (OSC) Preferences

Dragonframe can send or receive Open Sound Control (OSC) messages. To modify Open Sound Control Preferences, open Preferences, then select **OPEN SOUND CONTROL:**
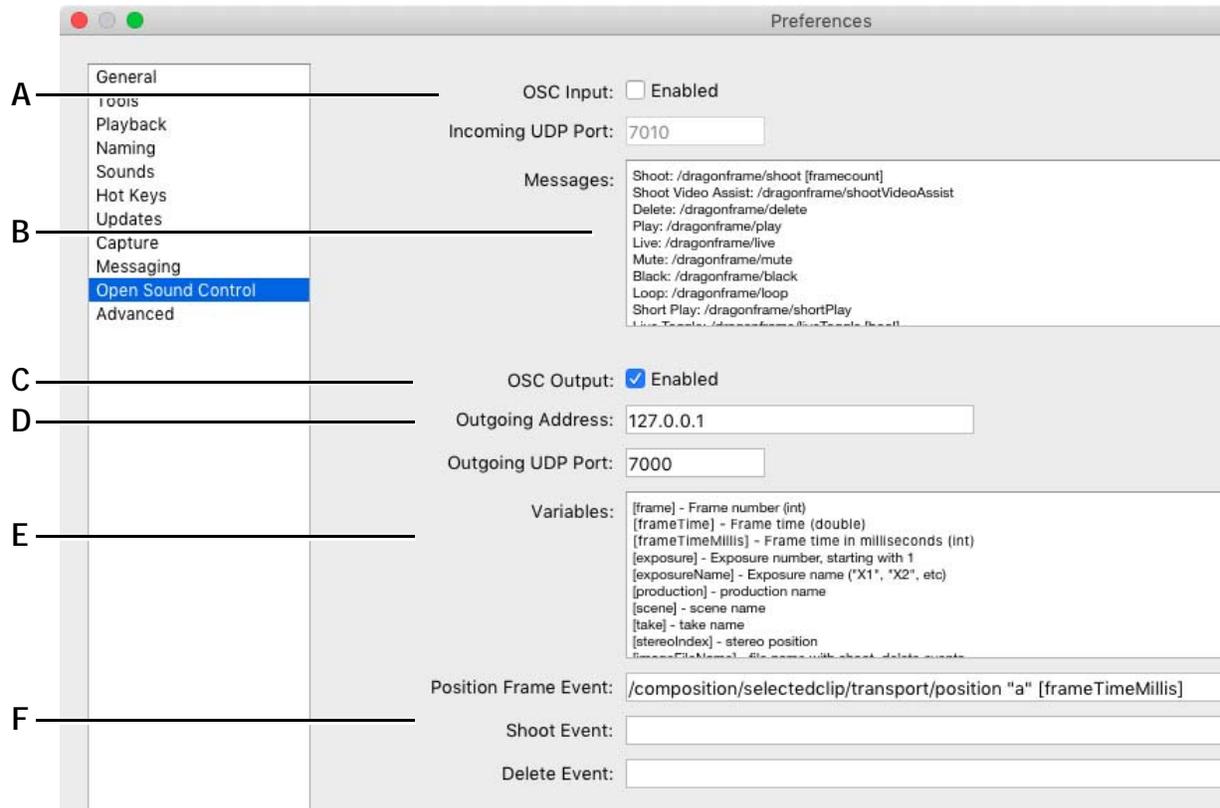
A. Enable OSC input on the Incoming UDP Port. This allows another program to send OSC messages to control Dragonframe.

B. OSC messages that Dragonframe will respond to.

C. Enable OSC output from Dragonframe to the supplied outgoing address and UDP port.

D. Destination IP address and UDP port for outgoing messages.

E. List of available variables that can be used in outgoing events.

F. Events that Dragonframe will send to destination.

Any preferences you change will be saved when you close the window.

Advanced Preferences

To modify Advanced Preferences, open Preferences, then select
ADVANCED.
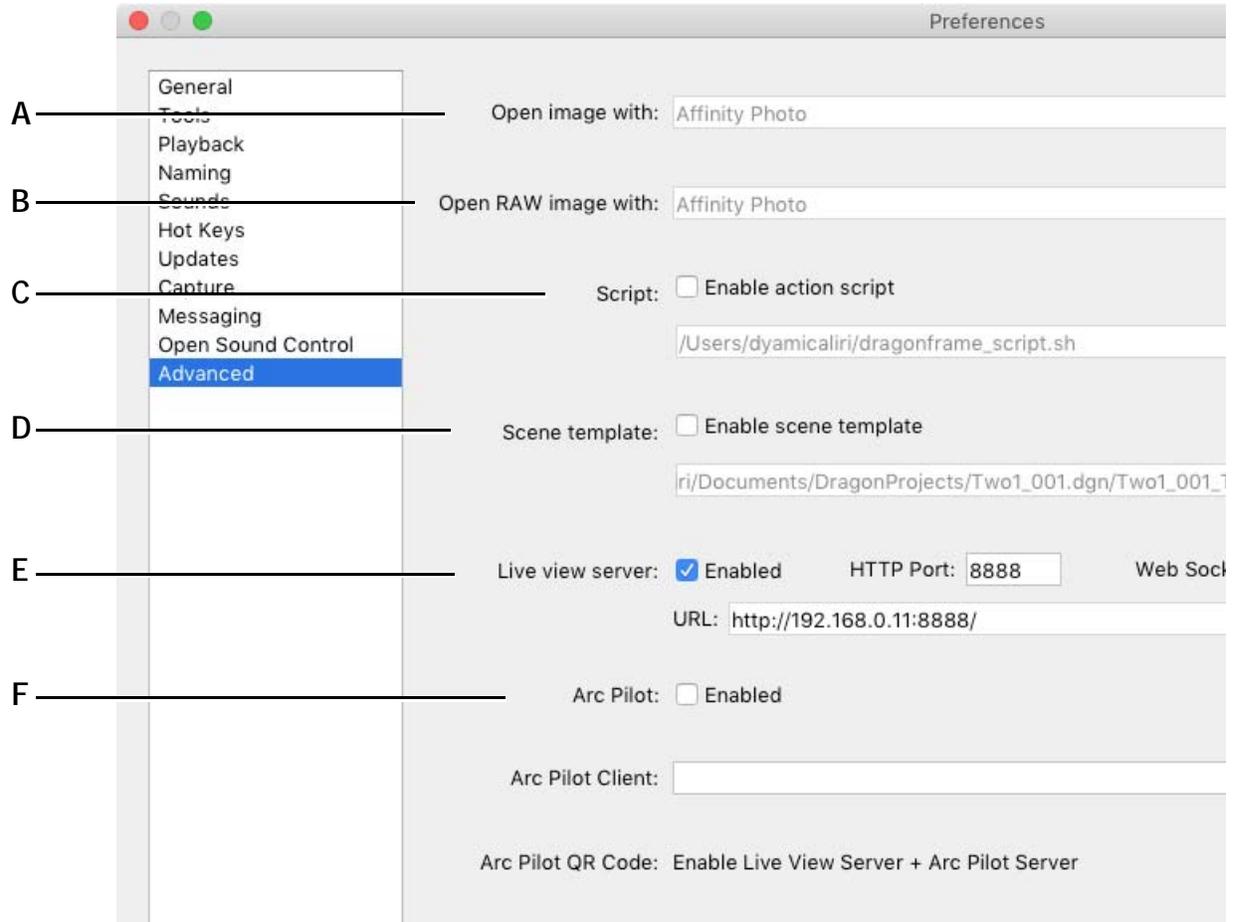
A. Open
image with: Select which photo editing software to
use when opening image files.

B. Open RAW image with: Select which photo editing
software to use when opening RAW image files.

C. Script: Check this box to have Dragonframe use a
script to automate actions.

D. Scene template: Check the box and load an
already-configured **TAKE.XML**. Dragonframe will
use this file as a template for every new scene.

E. Live view server: Check this box to have Dragon-
frame run a local server to view the live view
remotely.

F. Arc Pilot configuration options. Arc Pilot is an iPad
app for interfacing with Dragonframe's motion
control interface.

Any preferences you change will be saved when you close the window.

Configuring Scene Settings

Use Scene Settings to control settings for your scene, including scene length, camera settings, and settings for exposures, X-Sheet layout and triggers.

For information about General settings and Camera settings, see the sections that follow.

For information about exposures and hardware connections, see:

"Connecting DMX to Dragonframe" on page 214.
"Connecting to a 3D Slider" on page 319.

General Settings

The General Settings tab gives you access to three aspects of your scene: frame rate, scene length, and the X-Sheet's page layout. When you adjust those setting, you change the way Dragonframe configures your scene's X-Sheet.

When you select **SCENE|SETTINGS...**, the General settings window opens:
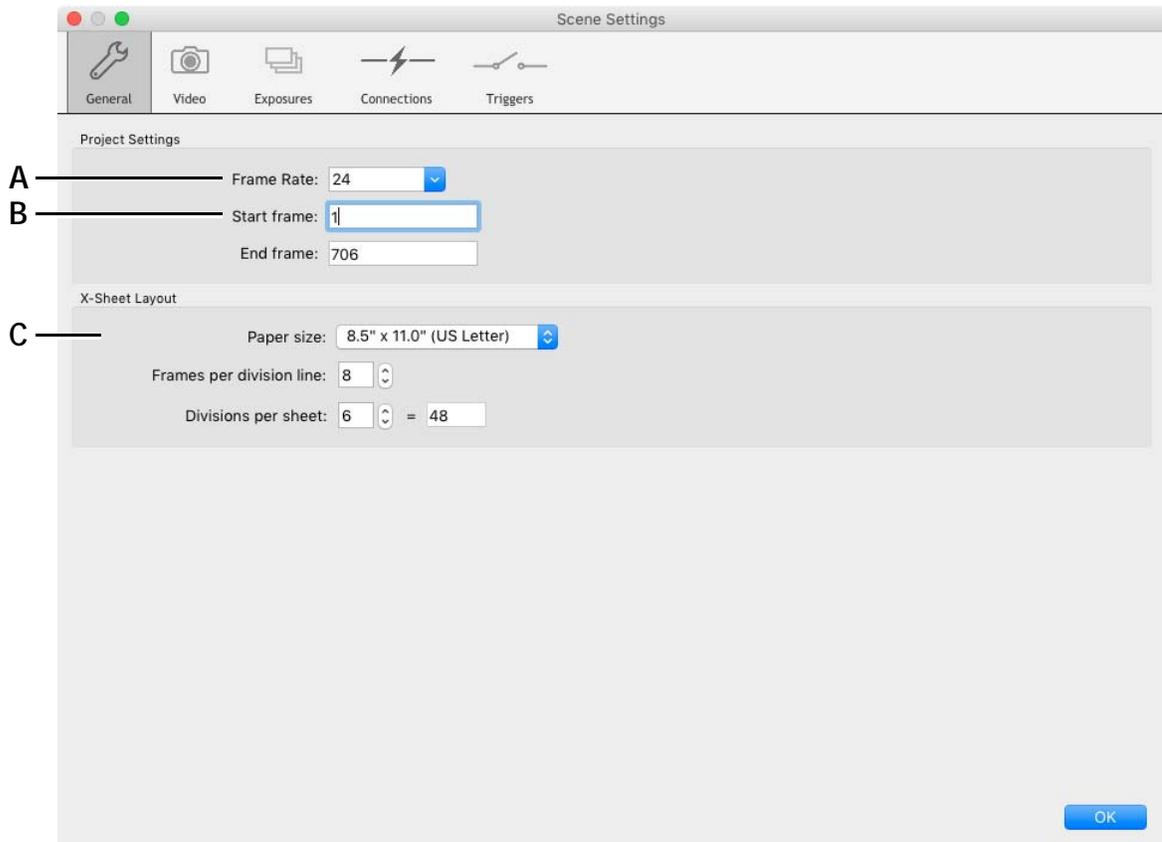
A. *Frame Rate: The project frame rate.*

B. *Start and end frame of project.*

C. *X-Sheet layout and paper size.*

Frame Rate

The project frame rate is important, because any audio or reference video you bring in will be synchronized to your frames at that rate.

If you temporarily change the playback framerate in the Animation workspace, you will notice that the audio will be slower or faster than normal.

See also:
"Setting Scene Length and Starting Frame" on page 190.
"Customizing the X-Sheet's Print Layout" on page 202.

Video Settings

Use the Video Settings dialog to work with your video source. You can select which source Dragonframe uses, or change with video settings.

Click **SCENE|VIDEO** to open Video Settings.
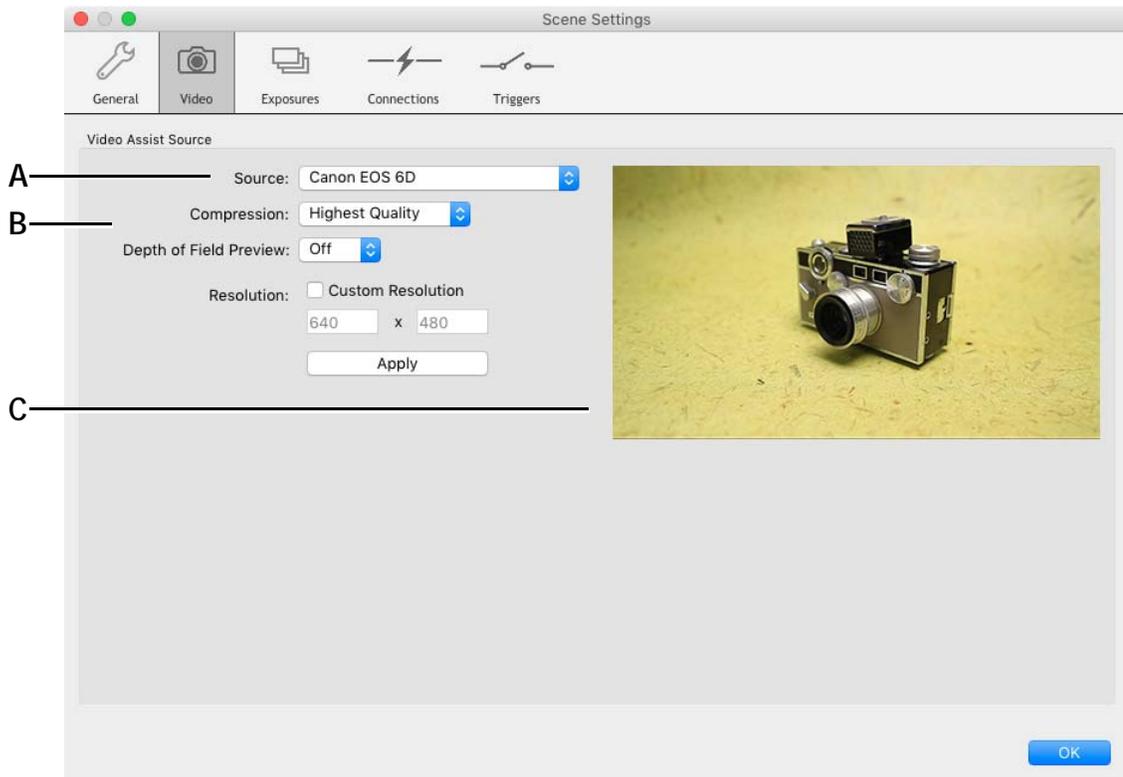
A. Video source: Select the video assist source.

B. Video settings: Adjust the settings specific to your camera.

C. Preview: See how adjustments to settings affect the Live View.

Video Settings

Video devices, such as webcams, will have most of their settings in this window, rather than the Cinematography workspace.

DSLRs may have some settings here, such as Depth of Field Preview (Canon EOS only).

Compression

The compression value here is just for the video assist JPGs that are used for playback during animation. It has no effect on your final high-resolution captures, *even if* you are using a video camera as your capture source.

Custom Resolution

The custom resolution should almost never be used for DSLRs with live view. The live view size should be left at the natural size that comes from the camera.

Any settings you change will be saved when you close the window.

Index

Numerics

3D
    caliper theory 331
    calipers 329
    exporting a movie 333
    pixel distances 331
    playing back 333
    reviewing 327
    test shots 326
3D convergence 328
3D edge float 328
3D shooting 278, 319
3D slider 319

A

Adobe Swatch Exchange 87
alternate composition guide
    adding 58
animator light. See bash light
arduino 249, 306
aspect ratio lines 55
aspect ratio mask 54
audio
    accepted formats 162
    add track 161
    adjusting volume 165
    editing 163
    from reference video 161
    loading from file 162
    muting 163
    remove track 161
    saving 166
    soloing 163
    waveform in x-sheet 201

B

bash light 229, 232, 266
Blackmagic Design
    for HDMI input 43
    monitoring 126

blender
    importing/exporting moves 277
bluescreen. See chroma key
broadcast safe
    adding 57

C

canon 80, 83, 100
chroma key 65
    sampling 65
color detection 90, 228
color palette
    sampling 89
    saving 89
    tool 87
composition guides
    grid 56
    locking 58
conforming 335
    in timeline 141
convergence 328
copying frames
    in timeline 135
    in x-sheet 191
cropping
    aspect ratio mask 54
    in exported image sequence 345
    in exported movie 340

D

DDMX-S3 211, 306
deleting frames
    in timeline 137
    in x-sheet 196
    restoring 139
DESC 310
dimmer pack. See DMX dimmer pack
DMC+ 249, 286
DMC-16 249, 286
DMX
    linked to motion control 266

W

work light. See bash light

X

x-sheet 187
    adding reminders 198
    audio waveform 201
    copying frames 191
    deleting frames 196
    drawing on 201
    exporting to CSV 203
    frame editing 191
    hiding frames 193
    holding frames 192
    paper size 202
    pasting frames 191
    printing a hard copy 201
    reshooting frames 196
    retiming sequence 196

Z

zero point 259