# Effects Expert

Visual Effects

User Guide

Introduction

Effects Expert allows you to produce advanced visual effects shots to take your movie project to the next level.

Major features are:

- a simple user interface that mimics a light-box for lining up and editing the elements that make up your effects shot

- use of Visual Programming that allows effects to be configured by dragging and dropping processing nodes into an Image Flow

- automated compositing that means you don't need to manually process each frame

- an extensive library of processing nodes to handle common image processing and compositing functions

- integrated audio mixing

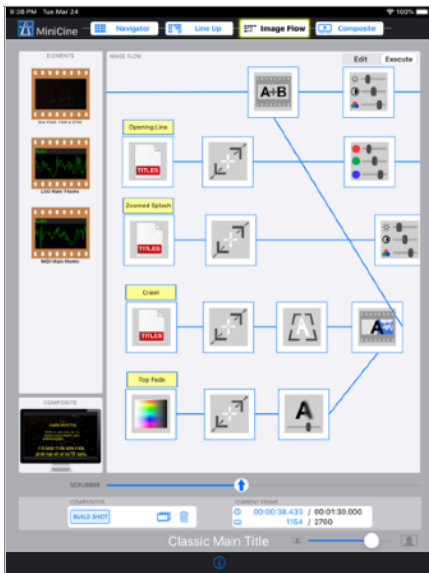- configurable resolution (480, 720, 1080, 4k...)

The app has four key views:
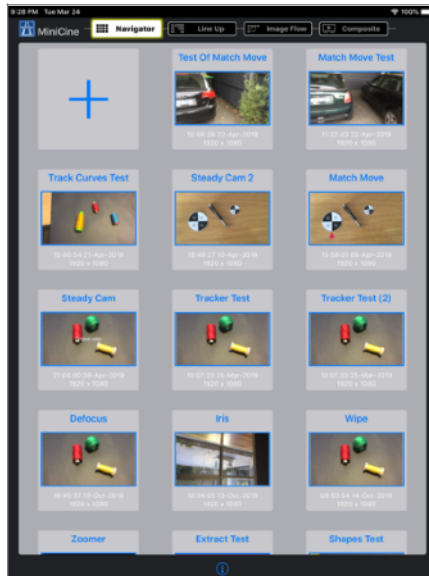
The **SHOT NAVIGATOR** view allows you to create and manage visual effects sequences (or **Shots**).
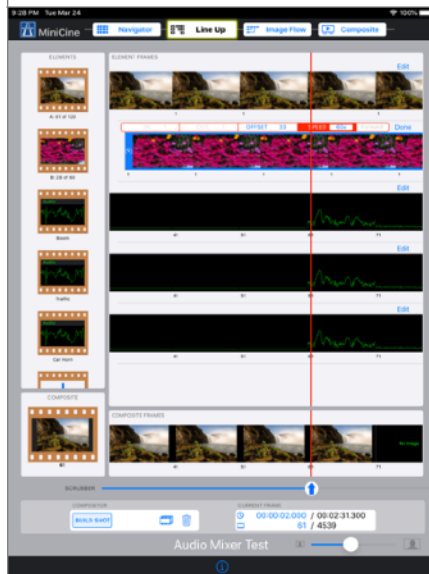

The **LINE UP** view provides a virtual light-box on which the input videos, stills and audio (or **Elements**) are layered and timed.

The **IMAGE FLOW** view provides a tool for visually programming the image processing operations you will apply to the input **Elements** to produce the final **Composite**.

The **COMPOSITE** view allows you to build the composited shot and create the final video, as well as manage the shot metadata.
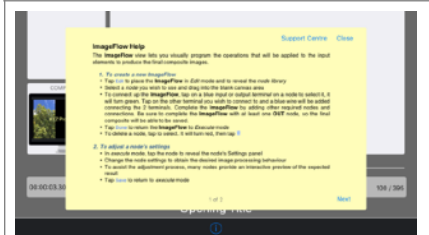
To help you use **Effects Expert**, contextual help and a full **User Guide** are included, together with a **Contact Us** function.
If in doubt, tap on ⓘ.

Shot Navigator Help

The **Shot Navigator** lets you manage the creation and selection of **Effects Expert** effects shots.

1. To create a shot
- Tap **+** to create a shot
- The **Create New Shot** wizard appears
- Complete the wizard with:
  Title   a name for the shot
  Notes   any info that helps you to identify the contents of this shot
  Final Composite Resolution
          determines the resolution of the final video created for this shot

2. To open an existing shot
- Tap the shot icon to open it in the **Line Up** view
  - A shot can be duplicated and deleted by using a long press gesture
  - Shot metadata can be edited in the **Composite** view

3. To import a shot
- In iPadOS, tap on the file icon, or long press and use **Share**, to open the file in **Effects Expert**
- In MacOS, drag the file to be imported and drop on to an **Effects Expert** view
- You can use these methods to restore a shot (.fxex file) you may have archived using Export To iCloud Drive in the **Composite** view
- PDF files and .m4A or .WAV audio files can also be imported using this method

Line Up Help

The **Line Up** tool lets you collect, edit and time the input elements that will make your effects shot come to life. It resembles a light-box with filmstrips lined up on it.

1. To add an input element

- Tap **+** in the **ELEMENTS** column
- Complete the element name, any notes and select the video, photo, music or audio content via the **Create New Element** dialogue panel
    - Video and still-photo content is selected from the device's **Photos** library
    - Music content is selected from the device's **iTunes Music** library
    - Audio content can be recorded on any **iPhone** using the **Voice Memos** app. Once a recording is saved, send it to the **iPad** running **Effects Expert** using one of these Share actions: **Messages**, **Mail, Airdrop**, or **iCloud Drive**.
        - If sent by Messages or Mail: On the **iPad**, tap on the .m4A attachment. Tap the action button and select **Copy to Effects Expert**. **Effects Expert** will appear and ask: "Import data available – Proceed?". Tap Proceed to add the recording to the **Audio Import Inbox**. The recording is now available to select in the **Audio Import** section.
        - If sent via Airdrop: Select **Open with… Effects Expert** to add the recording to the **Audio Import Inbox**. The recording is now available to select in the **Audio Import** section.
        - If sent via iCloud Drive:
            - In iPadOS, tap on the file, select the action icon ⬆, then **Open in Effects Expert** in the sharing options to make the recording available in the **Audio Import** section.
            - In macOS, drag and drop the file onto the **Effects Expert** window
    - **Effects Expert** also supports import of .wav files.

More Line Up Help

2. To change or delete an input element
- Tap the thumbnail image of the relevant element in the **ELEMENTS** column
- Update the element details via the **Edit Existing Element** dialogue panel
- Tap 🗑 to delete the element

3. To edit or retime an input element
- You can alter the element's edit parameters either numerically or graphically
- In the **ELEMENT FRAMES** panel, tap on the element's **Edit** button and an Edit Parameters table will appear just above the filmstrip.
- To edit the element numerically: Tap on the **IN**, **OUT**, **OFFSET**, **SPEED** **or** **Forward/Reverse** headings to edit these parameters. The first tap enables graphical editing; the second tap displays the keyboard to allow you to edit the chosen parameter.
- To edit the element graphically:
  - Tap **OFFSET**, then drag the filmstrip left or right to alter the element offset to the final composite
  - Tap **IN** to show scissor icons at the clip's start ✂ and the clip's finish ✂. The red scissors at the start means you can alter the **IN** frame by dragging the strip left or right.
  - Tap **OUT** to show scissor icons at the clip's start ✂ and the clip's finish ✂. Drag the strip left or right to alter the **OUT** frame.

More Line Up Help

- Tap **SPEED** to allow retiming of the element, clock icons replace the scissors. Drag left to speed up, or right to slow down the element.
- Tap **Forward/Reverse** to change the running direction of the frames

4. *To edit element layering*

- Tap and hold the thumbnail image of the relevant element in the **ELEMENTS** column
- Drag the element up or down to move it to the new position

5. *To composite part or all of a shot*

- The **COMPOSITOR** panel allows you to control the compositing process
- Tap or to select either multi-frame or single compositing
- Position the scrubber to where you want to start compositing
- Tap BUILD SHOT or BUILD FRAME to begin compositing
- Tap to delete any or all existing composite images

More Line Up Help

6. To zoom the light-box view

- Drag the thumbnail slider to reduce or increase the size of the thumbnails shown in the light-box.
- In the fully zoomed-in position (to the right), all individual frames are shown in the light-box. This mode makes frame-accurate editing easy and is signified by film perforations appearing around each frame's thumbnail.

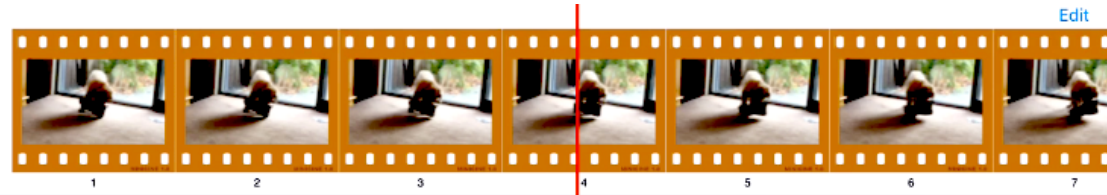- To more easily visualise and handle lengthy elements, drag the thumbnail slider to the left.
- In the fully zoomed out position (to the left), the entire composite element length fits inside the light-box width. This mode makes the element timing of a complex shot easier to grasp and is signified by film perforations disappearing and only frame thumbnails appearing. Not every frame thumbnail is visible. The number skipped depends on the magnitude of the zoom. You can still use the scrubber to select each individual frame; you just don't see every frame's thumbnail.
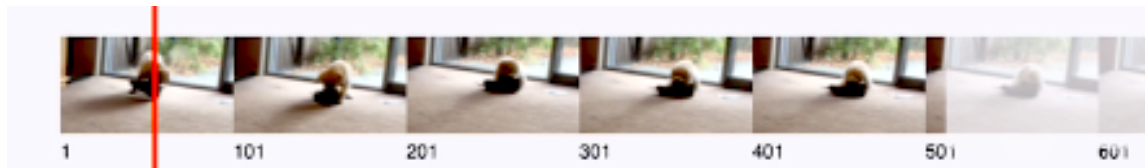
Image Flow Help

The **Image Flow** view lets you visually program the operations that will be applied to the input elements to produce the final composite images.

1. ***To create a new Image Flow***
   * Tap **Edit** to place the **Image Flow** in Edit mode and to reveal the **Node Library**
   * Select a node you wish to use and drag into the blank canvas area
   * To connect up the **Image Flow**, tap a blue input or output terminal on a node to select it. It will turn green. Tap on the other terminal you wish to connect to and a blue line will be added connecting the 2 terminals. Complete the **Image Flow** by adding other required nodes and connections. Be sure to complete the **Image Flow** with at least one **OUT** node, so the final composite will be able to be saved.
   * To delete a node, tap to select. It will turn red, then tap 🗑
   * Tap **Execute** to return the **Image Flow** to Execute mode

2. ***To adjust a node's settings***
   * In **Execute** mode, tap the node to reveal the node's **Settings** panel
   * Change the node settings to obtain the desired image processing behaviour
   * To assist the adjustment process, many nodes provide an interactive preview of the expected result
   * Tap SAVE to return to **Execute** mode

More Image Flow Help

3. *About key-frames*
- Key-frames allow different settings to be applied at different frame numbers within a shot. This feature allows a node to behave differently from frame to frame
- All nodes have a default key-frame preset at frame 1. Settings applied in this key-frame apply for the whole shot unless other key-frames are added.
- Settings applied between 2 key-frames are interpolated from the key-frames and applied to these in-between frames. The interpolation rule can be set to Step, Linear or Spline.

4. *To add a key-frame*
- To add a key-frame, move the scrubber to the frame where the key-frame is to be set
- Open a node's **Settings** panel, adjust the settings and press SAVE to set the key-frame
- Key frames can be set independently for each node

5. *To view key-frame and in-between settings*
- To view a graph of how settings are changed from frame-to-frame, press Show Curves from within a node's **Settings** panel

6. *To composite part or all of a shot*
- The **COMPOSITOR** panel allows you to control the compositing process
- Tap or to select either multi-frame or single compositing

More Image Flow Help

- Position the scrubber to where you want to start compositing
- Tap BUILD SHOT or BUILD FRAME to begin compositing
- Tap 🗑 to delete any or all existing composite images

7. *To mix the audio track*

- By default, the **OUT** node mixes all input element audio together to produce the final composite audio. To modify the mix, select the Audio tab in **OUT settings** to adjust levels and implement fades using key frames.

Composite Help

The **Composite** view lets you build a composite, create a video, view the completed video and edit the shot metadata.

1. ***To Build the composite***
    - Once the input elements have been configured in **Line Up** and the processing steps defined in **Image Flow**, tap on **BUILD** in the **COMPOSITOR** control panel. The processed frames will appear in **COMPOSITE FRAMES**.
    - Tap ⬚ or ⬚ to select either multi-frame or single-frame processing
    - Tap 🗑 to delete any or all existing composite images
    - Use the scrubber ─○─ or tap on a frame in **COMPOSITE FRAMES** to select and view the frame in **FRAME VIEWER**

2. ***To Create a completed video***
    - Tap on **CREATE** in the **VIDEO** control panel. After rendering and writing, the video is available in **VIDEO PLAYER** .
    - Tap ▶ to play the video
        - Adjust the scrubber ─○─ to view a particular frame
    - Tap **SAVE** if you wish to save the video to the **Photos** app library
    - If a composite video has been created previously, a green video play icon ▶ appears in the **Composite** tab
    - Tap 🗑 to delete the video and allow a new one to be created

3. ***To View the detailed information for a shot***
    - Tap More... to display shot title, creation and modification dates, resolution info and shot notes
        - Tap a field to edit it
    - Tap …Less to hide this information

More Composite Help

4. To Delete a shot
- Tap 🗑 then tap Delete Shot to delete the current shot

5. To Export a shot or composite images
- Tap ⬆ to select export options
- Select Export Composite Frames to create a folder of PNG image files, one for each composite frame
  - iPadOS: The folder is saved to the **iCloud Drive** or **On My iPad** depending on the **Use iCloud** app preference
  - macOS: The folder is saved to the 'Documents/Effects Expert' folder in your home folder
- Select Export Shot File to save an **Effects Expert** data file (.fxex)
  - iPadOS: The file is saved to the **Effects Expert iCloud** folder
  - macOS: The file is saved to the 'Documents/Effects Expert' folder in your home folder
- Select Share Shot Data to send an **Effects Expert** data file (.fxex)
  - The data file contains all the information to create a shot, but not the input element image data

Effects Expert Terminology

Effects Expert uses the following terminology:

Shot	A short video sequence that is edited together with other shots to produce a movie
Element	A video, photo, music track or audio recording that is combined with other elements to produce a visual effects **shot**
Frame	A frame is an image of a moving object that when combined with other frames produces a video
Composite	The resultant video obtained after combining elements to produce a visual effects **shot**
Line Up	The process of gathering together **elements**, editing the duration and timing and defining the order of layering to be used when combining them into a final **composite**. **Effects Expert** uses a view resembling a light box to assist line up of elements.
Image Flow	A visual representation of the processing steps to be applied to elements when producing a composite. **Nodes** carry out the processing steps. **Nodes** can be connected in an **Image Flow** to automatically apply a series of processing steps to elements.
Build (Shot or Frame)	The process of running the Image Flow to combine the input elements to produce the composite
Node	A node carries out a specific type of processing step on each frame of an element. There are many different types of node available in the **Node Library** for users to choose from. When nodes are combined together in an **Image Flow** it is easy to create more complex compositing operations.

More Effects Expert Terminology

Node Settings	Some nodes can have their behaviour modified by adjusting their Settings. These Node Settings can be constant for the duration of a Shot or be adjusted dynamically frame by frame.
Key Frame	A key frame defines a set of **Node Settings** that apply at the time of that frame. Many nodes allow you to change their behaviour by adjusting their settings. When you change a setting on a particular frame, that frame becomes a **Key Frame**. Each node keeps track of the settings you defined on a Key Frame and adjusts its node settings accordingly when that frame number is reached.
In Between Frame	The frame or frames in between Key Frames. **Effects Expert** interpolates the value of Node Settings for these In Between Frames. For example, if the user defines a brightness setting of 0 for frame 1, and a value of 1 for frame 3. **Effects Expert** will determine that 0.5 is to be used for frame 2.
Scrubber	A slider that allows the user to easily change the current frame number selected for viewing or processing.
Matte	An element that contains images that control what parts of an element will be transparent or opaque. Used extensively when layering elements.

Support

If you have a problem using Effects Expert, or have an idea for an improvement, please email us at:
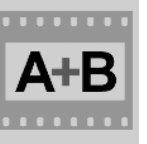
support@lnaapplications.com
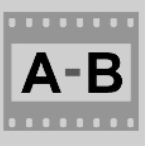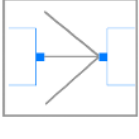
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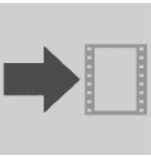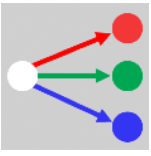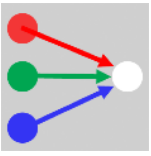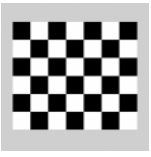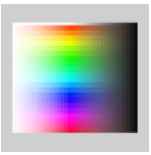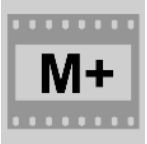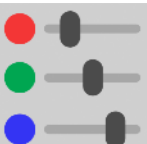
Appendix 1 - Node Library List
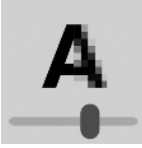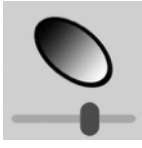
Version 2.5.3
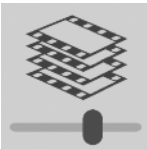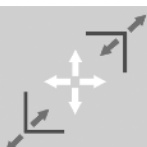
Icon	Title	Category	Description
	MIX	Layering	Mixes 2 images using either a matte image or proportionally according to a Mix % value. Rule: Output = InputA x (1.0 – Matte) + InputB x Matte ; Using Matte image alpha = InputA x (100 – Mix%)/100 + InputB x Mix%/100 ; Using Mix%
	MIN	Layering	Combines 2 elements by taking the image pixel with the least value Rule: Output = InputA } If InputA < InputB = InputB } If InputB < InputA
	MAX	Layering	Combines 2 elements by taking the image pixel with the greatest value. Rule: Output = InputA } If InputA > InputB = InputB } If InputB > InputA
	OVER	Layering	Combines 2 elements by using the transparency information contained in the alpha channel of the Foreground Input Rule: Output = BG Input } If FG Input Alpha = 0.0 = FG Input } If FG Input Alpha = 1.0
	SCREEN	Layering	Implements blue, green or custom-colour compositing of a foreground element (shot in front of a colour screen) onto a background element.
	ADD	Layering	Mixes 2 elements by adding pixel values together. Rule: Output = InputA + InputB
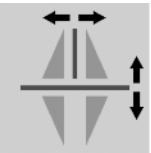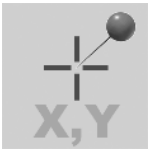
	SUBTRACT	Layering	Mixes 2 images by subtracting pixel values. Rule: Output = InputA - InputB
	MATTE	Layering	Replaces non-white areas in a monochrome image with increasing levels of transparency (black = 100% transparency).
	EXTRACT	Layering	Provides a magic-wand style tool that allows areas of similar colour and tone to be selected to allow extraction of objects for compositing.
	MULTIPLY	Layering	Extracts foreground objects when combined with a matte element containing transparency (eg. after processing by the MATTE node). Rule: Output = InputA x InputB (for RGBA)
	TRANSITION	Layering	Performs a scene transition between two elements. Transition types supported include: Dissolve, Slide, Wipe, Iris, Blur, PageCurl and more.
	WIRED-OR	Layering	When multiple node outputs are connected to the one node input, a 'WIRED-OR' connection is created. There is no library node for this function; rather creating the connections forms it. The node input attached to this connection takes one of the images available from the multiple node outputs using this priority: 1. Input Element (lowest element number available) 2. Node Output (lowest node number available)

	OUT	Utilities	Takes a node output and makes it available as the **Composite** result. Multiple OUT nodes can be added, however only one can be enabled at a time. The Composite can be saved to Photos as a video with a user supplied name. Optionally, time-code can be superimposed on the output video. On the Audio tab, the audio levels can be adjusted for each element to produce a final mix. The audio levels can be changed on key frames and interpolated.
	SPLIT	Utilities	Takes a colour input and splits it into separate colour channels, to allow different processing to be carried out on each channel. There is a choice of output channels available: 1) Red, Green and Blue 2) Hue, Saturation and Value 3) Combined RGB colour and Matte
	COMBINE	Utilities	Takes separate colour input channels and combines them into a single RGB and Matte output. There is a choice of input channels available: 1) Red, Green and Blue 2) Hue, Saturation and Value 3) Combined RGB colour and Matte
	TEST	Utilities	Generates fixed test patterns to assist with Image Flow set-up or debugging. Available patterns are checkerboard, SMPTE test chart and PAL test chart.
	SWATCH	Utilities	Generates a fixed element with user defined colour and transparency.

	MEMORY	Utilities	Stores an image for later recall in a future frame. The number of frames that the output is delayed compared to the input can be set.
	TITLES	Drawing	Generates opening or closing titles that can be overlayed on any image or video. Text can be entered and formatted directly by the node or a PDF file can be imported into **Effects Expert** and made available to the TITLES node via the app's inbox.
	SHAPES	Drawing	Creates basic graphic shapes for use as garbage mattes or video content. Colour and transparency is configurable. Geometry can be key-frame animated.
	BCS	Filters	Allows **B**rightness, **C**ontrast and colour **S**aturation to be adjusted.
	RGB	Filters	Adjusts levels in each of the RGB image channels.
	CURVES	Filters	Allows the tone-scale curve to be adjusted for each or all of the R, G, B or Matte channels.

	SHARPNESS	Filters	Allows an element to be sharpened or blurred.
	PIXELATE	Filters	Allows an element to be pixelated.
	MOTION BLUR	Filters	Allows an element to have a simulated motion blur effect.
	LENS FILTER	Filters	Emulates optical lens filters including Graduated Neutral Density, Black and White, Soft Focus and Star filters.
	FACE MASK	Filters	Detects and obscures people's faces.
	INVERT	Filters	Inverts colours of an image. Can also be used to produce inverted mattes (place before the MATTE node). Rule: Output = - InputA

	Name	Category	Description
	GRAIN	Filters	Simulates a film 'look' by adding simulated film grain noise.
	STACK	Filters	Averages together a stack of consecutive frames. Useful for simulating slow shutter speeds and for noise reduction.
	COMPOSE	Transforms	Allows the user to adjust an element's image content by selecting what part of an image is used and how it is displayed. The image can be cropped to size to remove unwanted image content. The cropped result can then be scaled to the required size and panned to the desired location. XY movement data can also be received from a TRACK node to implement 'match-move' operations.
	PERSPECTIVE	Transforms	Applies a perspective warp to an image to simulate a 3D perspective view.
	FILL	Transforms	Fills the sides of a portrait video in a landscape element with a softened stretched background image using the video itself as source.
	ROTATE	Transforms	Rotates an element by user-defined angle.

	FLIP	Transforms	Flips an image horizontally and/or vertically.
	TRACK	Transforms	Tracks a selected image area to stabilise the image and/or feed the area's XY movement distances to a COMPOSE node for a 'match move' operation.
	NOTE	Other	Permits notes to be placed within an Image Flow to assist users understand its function and or options.
	Error	Other	Displayed when the required node cannot be found in the Node Library. Could mean that the Base version of Effects Expert is opening a shot created by the PRO version (which has a more extensive node library). It may also mean that an older version of Effects Expert (or MiniCine) is trying to process a shot that features a node that has not yet been implemented in that app version.

Appendix 2 – Detailed Node Information
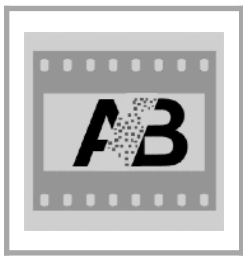
Node: MIX

Description: Mixes 2 images using either a matte image or proportionally according to a Mix % value.

Notes:

- Rule: Output = InputA x (1.0 – Matte) + InputB x Matte   ; Using Matte image alpha

    = InputA x (100 – Mix%)/100 + InputB x Mix%/100   ; Using Mix%

- Use the **Mode** control to select the type of mix. **Mix%** uses a fixed percentage applied for the whole frame. **Matte** uses a matte image applied to the **Matte** Input to selectively combine the 2 inputs pixel by pixel. **Auto** causes the node to use a matte image (if available) otherwise **Mix%** is used.

- In **Mix%** mode, use the slider to select the proportion of A that is mixed with the remaining proportion of B

- The **PREVIEW** control allows you to select the image shown in the **MIX settings** panel

    - Choose between Input A, Input B, Matte Input (if available), the node Output or the final Composite

    - If the Output preview is selected a real-time preview is provided as the **Mix %** slider is moved (in Mix% mode)

- If the **Mix %** is changed on a frame other than the first frame, a new key-frame will be created. The **Mix %** will now be animated by the node between the value set for frame 1 and the value set at the new key-frame. The node will create in-between values automatically.

    - Tap SHOW CURVES to display a graph showing how the **Mix %** varies for each frame. Tap SHOW OPTIONS to allow you to change the curve fitting rule used for creating the in-between values.

Typical uses:

- Element layering using a matte image
- Fade or Dissolve transitions
- Superimposition
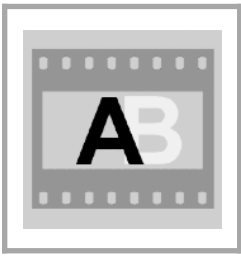
Node: MIN

Description: Combines 2 elements by taking the image pixel with the least value.

Notes:

- Rule: Output = InputA } If InputA < InputB

              = InputB } If InputB < InputA

- The **PREVIEW** control allows you to select the image shown in the **MIN settings** panel
    - You can choose between Input A, Input B, the node Output or the final Composite
- See also the MAX node which performs a similar but opposite function

Typical uses:

- Element layering where a matte has not been extracted for an element but the element is distinctively darker than the its background, and the background it is to be added to
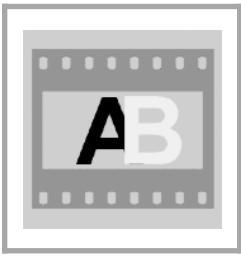
Node: MAX

Description: Combines 2 elements by taking the image pixel with the greatest value.

Notes:
- Rule: Output = InputA } If InputA > InputB

             = InputB   } If InputB > InputA
- The **PREVIEW** control allows you to select the image shown in the **MAX settings** panel
  - You can choose between Input A, Input B, the node Output or the final Composite
- See also the MIN node which performs a similar but opposite function

Typical uses:
- Element layering where a matte has not been extracted for an element but the element is distinctively lighter than the its background, and the background it is to be added to

Node: OVER

Description: Combines 2 elements by using the transparency information contained in the alpha channel of the Foreground Input

Notes:

- Rule: Output = BG Input   } If FG Input Alpha = 0.0

  = FG Input   } If FG Input Alpha = 1.0 .

- The node supports soft edged mattes and proportionally mixes the background and foreground elements as Alpha varies between 0.0 and 1.0.

- Mattes can be created for elements by using the following nodes:
  - EXTRACT: using a 'magic-wand' style selection tool
  - SHAPES: to produce garbage mattes
    - Feed the shape into a MATTE node then into one side of a MULTIPLY node, the element into the other side of the MULTIPLY. The MULTIPLY output has the element less the garbage area which has now become transparent

- The **PREVIEW** control allows you to select the image shown in the **OVER settings** panel
  - You can choose between Input A, Input B, the node Output or the final Composite

Typical uses:

- Element layering where the foreground element has a matte channel defining the foreground object to be layered on to a background element

Node: SCREEN

Description: Implements blue, green or custom-colour compositing of a foreground element (shot in front of a colour screen) onto a background element.

Notes:
- The **TYPE** control allows you to select the screen type that the foreground object has been shot in front of
- Three types are selectable: Green, Blue or Custom
- When the Custom Type is selected, a second tap on the control will reveal a colour picker from which you can choose the screen colour. Alternatively you can press and hold on a point on the foreground preview image to select the colour at that point.
- The **TOLERANCE %** slider lets you choose how close the image content needs to be to the selected screen colour to produce a transparent area. 0% means all content is rejected as transparent. 100% will allow colours not that close to the screen colour to be selected and made transparent.
- The **PREVIEW** control allows you to select the image shown in the **SCREEN settings** panel
  - You can choose between Background, Foreground, the node Output or the final Composite

Typical uses:
- Background replacement for green or blue screen elements
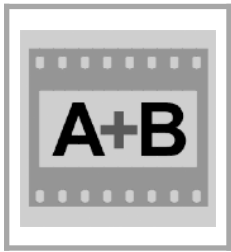
Node: ADD

Description: Mixes 2 elements by adding pixel values together.

Notes:

- Rule: Output = InputA + InputB.
- Performs a simple arithmetic addition of pixel values to combine images
- Best results are obtained when one image has black where the other image has content
- When both images have relatively bright values in similar areas the image will most likely appear over exposed as it will clip at the white level
- In these cases, better results might be obtained by using the MIX node instead of ADD
- The **PREVIEW** control allows you to select the image shown in the **ADD settings** panel
  - You can choose between Input A, Input B, the node Output or the final Composite

Typical uses:

- Fade or Dissolve transitions
- Superimposition
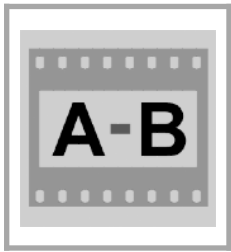
Node: SUBTRACT

Description: Mixes 2 images by subtracting pixel values.

Notes:

- Rule: Output = InputA - InputB.
- Performs a simple arithmetic subtraction of pixel values to combine images
- Best results are obtained when Image A has light content where Image B has content
- When Image B has relatively bright values in areas that Image A has low brightness content, the output will most likely appear under exposed as it will clip at the black level
- In these cases, better results might be obtained by using the MIX node instead of ADD
- The **PREVIEW** control allows you to select the image shown in the **SUBTRACT settings** panel
  - You can choose between Input A, Input B, the node Output or the final Composite

Typical uses:

- Superimposition
- Producing a negative image effect
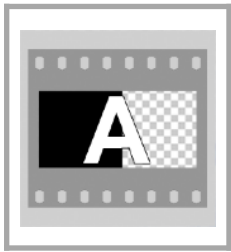
Node: MATTE

Description: Produces matte images by replacing non-white areas in a monochrome image with increasing levels of transparency (black = 100% transparency).

Notes:

- Allows you to produce a matte image from simple black and white graphics images
    - White equates to opaque
    - Black equates to transparent
- Matte images can be used with a MULTIPLY node to perform basic layering
- For example,
    - Produce a matte image by drawing white shapes on black
        - Using the SHAPES node
        - Or a graphics package such as **'Graphic'** or similar
            - Save the graphics as an image to **Photos**
            - Import the image via **Line Up** as an input element
    - Use the MATTE node to convert the element to a matte element.
    - Combine the matte element with a foreground via a MULTIPY node to extract a region of the foreground.

Typical uses:

- Conversion of graphics to mattes for extracting wanted objects or masking unwanted objects
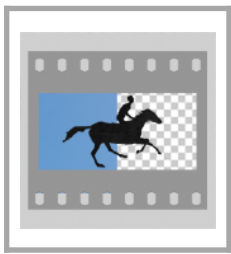
Node: EXTRACT

Description: Provides a magic-wand style tool that allows areas of similar colour and tone to be selected to allow extraction of objects for compositing.

Notes:

- Multiple objects can be selected as separate objects and their position can be followed by defining new positions or selections at key-frames
- Add the target areas for each selection using the **SELECT** mode, Use the **EDIT** mode to modify existing selections
- The **Tolerance** slider adjusts how close pixels need to be to the target pixel area to be within the selection.
  - Too broader tolerance may result in complex or noisy selections which require lengthy processing time, so try to use the lowest tolerance setting to achieve the required result
- Edges can be reduced or enlarged in size using the **Erode-Dilate** slider
- Matte edges can be softened using the **Softness** slider
- The node **Output** provides the extracted object(s) over a transparent background
- Use the **Invert** button to make the selection transparent and the background opaque if required
- A matte channel output is also available where a matte is needed to control further layering
- The **PREVIEW** control allows you to select the image shown in the **EXTRACT settings** panel
  - You can choose between Input, Matte, the node Output or the final Composite

Typical uses:

- Extraction of foreground objects for layering when the element has not been shot in front of a blue or green screen
- Production of mattes
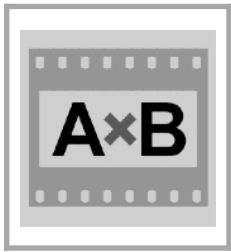
Node: MULTIPLY

Description: Extracts foreground objects when combined with a matte element containing transparency (eg. after processing by the MATTE node).

Notes:

- Rule: Output = InputA x InputB   (for RGBA)
- Performs a simple arithmetic multiplication of pixel values to combine elements
- Best results are obtained when one element is monochrome, or a matte, and is being used to extract objects from the other element for layering
- Use in combination with a matte element produced by the **MATTE** or **EXTRACT** nodes
- The **PREVIEW** control allows you to select the image shown in the **MULTIPLY settings** panel
    - You can choose between Input A, Input B, the node Output or the final Composite

Typical uses:

- Layering when combined with the mattes produced by the MATTE or EXTRACT nodes
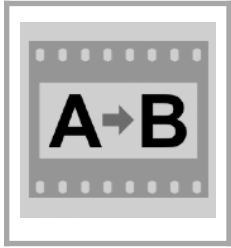
Node: TRANSITION

Description: Performs a scene transition between two elements. Transition types supported include: Dissolve, Slide, Wipe, Iris, Blur, PageCurl and more..

Notes:

- Rule: Output = Input A   Completion = 0 ; Transition Starting frame and before

   Output = Input A combined with Input B   0 > Completion <1 ; Transition frames

   Output = Input B   Completion = 1 ; Transition Ending frame and after

- Commences the transition with full-screen representation of Input A then over the course of the transition progressively replaces Input A with Input B and finally at the end of the transition is presenting only Input B.

- Transition effects supported are : Dissolve, Wipe (Left, Right, Up and Down), Bars Swipe, Copy Machine, Flash, Mod, Pixelate, Page Curl (Bottom Left, Top Left, Bottom Right, Top Right), Iris and Blur

- Initially the transition is created with a 1 second transition time following a linear law. Keyframe animation can be used to alter the timing, and alter the curve shape of the transition. The transition can also be run backwards using key frame animation.

- The **PREVIEW** control allows you to select the image shown in the **MULTIPLY settings** panel
  - You can choose between Input A, Input B, the node Output or the final Composite

Typical uses:

- Implementation of interesting effects at scene changes
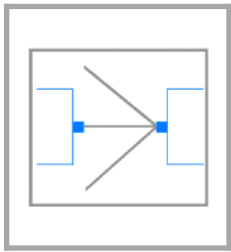
Node: WIRED-OR

Description: When multiple node outputs are connected to the one node input, a 'WIRED-OR' connection is created. The node takes the first available image from the previous image sources attached via this connection.

Notes:

* There is no library node for this function; rather creating the connections forms it.
* The node input attached to this connection takes one of the images available from the connected sources using the following priority:
    * Input element (lowest element number first)
    * Node output (lowest node number first)
* Where no image is available from a source, the next source in the priority is used
* This form of connection provides a compact way to combine many elements together without having to use many cascaded instances of layering nodes such as **OVER** or **ADD**

Typical uses:

* An easy way to combine edit many input elements together:
    * Line up any number of elements in **LINE UP**, adjust editing timing
    * Connect all the input elements to a single **OUT** node in Image Flow
    * A single video is then produced from the combined elements with only the one **OUT** node
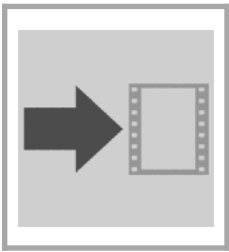
Node: OUT

Description: Takes a node output and makes it available as the **Composite** result. Control the audio mix.

Notes:

- There must be at least one **OUT** node in an **IMAGE FLOW**
- Multiple **OUT** nodes can be added. Use the **ENABLED** switch to set the active **OUT** node.
- The **COMPOSITE** can be saved to Photos as a video. The video name defaults to the shot name unless a different name is entered in the **VIDEO NAME** field.
- SMPTE time-code can be superimposed on the output video by setting the **TIMECODE** switch to on.
- On the **AUDIO** tab, the audio levels can be adjusted for each element to produce a final mix. The audio levels can be changed on key frames and interpolated.
    - Each input element is assigned an audio channel numbered sequentially but with the element name appearing just above this number
    - The slider adjusts the audio level and be animated using key frames to produce automated fades
    - The **MUTE** button mutes the channel while preserving the level settings
    - The **SOLO** button mutes all the other channels to allow just the one channel to be heard
    - The **MAIN** channel controls the mixed signal once all channels are combined
- Tap **SHOW CURVES** to see the animation curves and how levels are animated over time
- Tap an input element title to reveal the audio waveform and a mini-player
    - Use these to determine key-frame numbers that will sync sound to vision
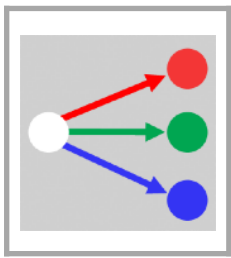
Node: SPLIT

Description: Takes a colour input and splits it into separate colour channels, to allow different processing to be carried out on each channel.

Notes:

- There is a choice of output channels available. The **Output** control allows you to choose one of:
    1. Red, Green and Blue (RGB)
    2. Hue, Saturation and Value (HSV)
    3. Combined RGB colour and Matte (RGB-Matte)

- The **Output Mode** control allows you to choose whether the output channel takes up the 3 channels of the output (Monochrome) or is restricted to just the one (Colour). The following table details how the channels are mapped:

Output:	RGB						HSV						RGB - Matte					
Output Mode:	Monochrome			Colour			Monochrome			Colour			Monochrome			Colour		
Output No.:	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Channels:	RRR1	GGG1	BBB1	R001	0G01	00B1	HHH1	SSS1	VVV1	H001	0S001	00V1	RGB1	-	AAAA	RGB1	-	000A

- Each node output consists of 4 channels of 8 bits. Normally red, green, blue and alpha. Each channel can represent a number from 0 to 255.
- Each mode can have its outputs recombined, after processing, by a COMBINE node back into a single output.
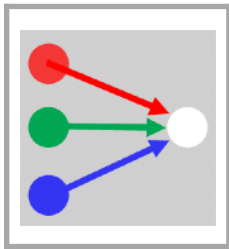
Node: COMBINE

Description: Takes separate colour input channels and combines them into a single RGB and Matte output.

Notes:

- There is a choice of input channels supported. The **Input** control allows you to choose one of:
    1. Red, Green and Blue (RGB)
    2. Hue, Saturation and Value (HSV)
    3. Combined RGB colour and Matte (RGB-Matte)
        - The matte can be represented in monochrome or colour-alpha mode
- The following table details how the input channels are mapped to the output:

Input:	RGB			HSV			RGB - Matte					
Matte Mode:							Monochrome			Colour-Alpha		
Input No.:	1	2	3	1	2	3	1	2	3	1	2	3
Channels:	R - - -	- G - -	- - B -	H - - -	- S - -	- - V -	RGB-	_	AAAA	RGB-	_	- - - A

- The output consists of 4 channels of 8 bits: Red, Green, Blue and Alpha. Each channel can represent a number from 0 to 255. In the matte or alpha channel, transparency varies from 0 (transparent) to 255(opaque).
- This node can perform the inverse operation to the SPLIT node, no matter if the SPLIT node is in Monochrome or Colour mode.
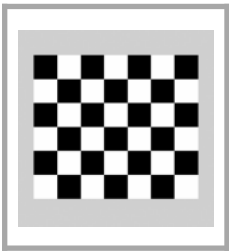
Node: TEST

Description: Generates fixed test patterns to assist with Image Flow set-up or debugging. Available patterns are checkerboard, SMPTE test chart and PAL test chart.

Notes:

- A constant video test card is often useful when setting up more complex image flows.
- Three types of chart are available:
    1. Checker Board
    2. SMPTE Test Card
    3. PAL Test Card
- The **TEST IMAGE** type can be animated using key-frames if required.

Typical uses:

- Provides a simple predictable element for debugging complex Image Flows

Node: SWATCH

Description: Generates a fixed element with user defined colour and transparency.

Notes:
- Produces a full frame video element containing the selected colour
- Tap on the swatch next to the **COLOUR** label to reveal a colour picker
- Use the **OPACITY %** slider to adjust transparency
- Alternatively, press and hold on a point on the **COMPOSITE** preview to pick a colour from the composite
- Each of the **Red**, **Green**, **Blue** and **Opacity** channels can be key-frame animated if required.
    1. Tap **SHOW CURVES**
    2. Tap on the channel name
    3. Adjust the **SCRUBBER** and swipe up or down on the graph to adjust the curves
    4. Use **CURVE OPTIONS** to select required curve fitting rule

Typical uses:
- Creation of full screen uniform colour backgrounds
- Test image
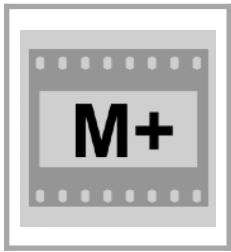
Node: MEMORY

Description: Stores an input frame for later recall in a future frame. The number of frames that the output is delayed compared to the input can be set.

Notes:

- The number of frames that the output is delayed compared to the input can be set between 1 (previous frame) up to 100.
- Use the **FRAME DELAY** slider to adjust the delay
- A black placeholder image is provided when a previously stored image is not available.
- The **PREVIEW** control allows you to select the image shown in the **MEMORY settings** panel
    - You can choose between Input, the node Output or the final Composite
    - Input displays the image to be stored for future use
    - Output displays the image recalled from a previous frame

Typical uses:

- Motion Blur
- Long exposure time simulation
- Implement recursive filters with multiple 'taps' at different frame delays

Node: TITLES

Description: Generates opening or closing titles that can be overlayed on any image or video.

Notes:

- Text can be entered and formatted directly by the node or more elaborate graphics and text can be imported into **Effects Expert** via a PDF file.
  - For example, PDFs can be produced using Keynote and by selecting Export can be copied across to the **Effects Expert** inbox. Select **IMPORTED PDF**, then **EDIT** to select the file
- To produce simple text titles using only the **TITLES** node, Select **TEXT** as the **SOURCE**.
  - Tap **EDIT** to reveal the text editor
  - Use the **COLUMNS** control to set whether you will be using one or two columns
  - To add the first page and first line tap **+**
  - Tap on **ENTER TITLE TEXT** to enter the text
  - Tap on the line outside the text field to reveal the text style formatting tools.
  - Tap **+** to add the next item. If you wish to add a new page, tap on the page header before where you require the next page and tap **+**.
  - The first default style, STYLE 1, is used until you wish to create a new style by modifying the style of an item by changing the text attributes. A new style, STYLE 2 is then created. I this way, many styles can be produced and reused as required.
  - If a Style label is red it is the master. Changing its text formatting will change the style for this item and all subsequent items that use this style.
  - The node defaults to running the title over the full length of the current shot. You can change the timing by enter values into the **TIMING** control and modify the **TOTAL**, **BEFORE** and **AFTER** frames. You can also alter the timing and profile by using the Animation curves.
- Choose whether you require the titles displayed as **STATIC** pages or as a continuous **CRAWL**
- The **SIZE** slider allows you to adjust the overall size of the titles or to animate via **SHOW CURVES**
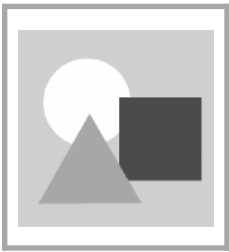
Node: SHAPES

Description: Creates basic graphic shapes for use as garbage mattes or video content. Colour and transparency is configurable. Geometry can be key-frame animated.

Notes:

- Select the shape **TYPE** by choosing from **LINE**, **CIRCLE**, **TRIANGLE** or **RECTANGLE**
- Set **TRANSPARENCY** and **FILL COLOUR** as required
- Tap on the preview canvas to create and set the initial position for the new shape
- Drag the handles or central cursor to adjust size, shape and position as required. Rotation can be adjusted using a multi-touch rotate gesture.
- Use the **+ / EDIT** control to select whether you wish to add a new shape or modify an existing shape
- You can **PREVIEW** the node **OUTPUT**, **MATTE** or view the shape over the final **COMPOSITE** in **EDIT** mode if required.
- All shape parameters can be key frame animated, individually, as required by using **SHOW CURVES**.

Typical uses:

- Creation of garbage mattes
- Creation of simple graphics content
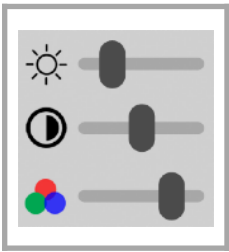
Node: BCS

Description: Allows **B**rightness, **C**ontrast and colour **S**aturation to be adjusted.

Notes:

- Analogous to colour TV controls, the **BCS** node lets you manipulate an element's **BRIGHTNESS**, **CONTRAST** and **SATURATION**.
- The **PREVIEW** control allows you to select the image shown in the **BCS settings** panel
    - You can choose between **Input**, the node **Output** or the final **Composite**
- The **BCS** settings can be key-frame animated by using **SHOW CURVES**

Typical uses:

- Correction of the image characteristics of elements to match surrounding elements or achieve an artistic look
- Animated transitions via fading brightness, contrast, or saturation
- Colour grading when used in conjunction with **RGB** and/or **CURVES** nodes.
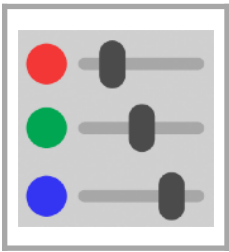
Node: RGB

Description: Adjusts levels in each of the RGB image channels.

Notes:
- Analogous to video production equipment controls, the **RGB** node lets you manipulate an element's **RED**, **GREEN** and **BLUE levels independently**.
- The **PREVIEW** control allows you to select the image shown in the **RGB settings** panel
    - You can choose between **Input**, the node **Output** or the final **Composite**
- The **RGB** settings can be key-frame animated by using **SHOW CURVES**

Typical uses:
- Correction of the image characteristics of elements to match surrounding elements or achieve an artistic look
- Animated transitions via changing element tint
- Colour grading when used in conjunction with **BCS** and/or **CURVES** nodes
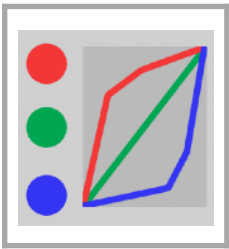
Node: CURVES

Description: Allows the tone-scale curve to be adjusted for each or all of the R, G, B or Matte channels.

Notes:

- The **Channel** control allows you to select one of 5 'channels' in which you can manipulate the tone-scale curve.
- The tone scale curve maps the input value to an output value. A straight line of gradient of 1 passes the input value straight to the output. A steeper line increases contrast. A flat line ignores the input and provides a single output.
- There are five control points that can be moved to alter the shape of the tone-scale curve. The left most control point must stay on the Y-axis, but can be moved vertically to determine the output when the input is 0.0. The right most control point must stay at X = 1.0 but can be moved vertically. The three other control points can be moved anywhere in the intervening region, but must stay in horizontal order. The node determines the tone scale curve by fitting a spline curve to the 5 points.
- The **'All'** channel allows the RGB channels to be controlled by the one curve. Use this channel when you want to make tone-scale changes that are independent of colour.
- The **'R'**, **'G'** and **'B'** channels allow you to change the tone-scale in each of the colour channels independently. These tone-scale corrections are applied after the 'All' channel curve is applied.
- The **'Matte'** channel allows you to alter the transparency response curve.
- Like many of the **Effects Expert** nodes, control points can be animated over time by adjusting their position at different frames to set new key-frames. The normal key-frame animation tools are available to adjust control point in-betweening.
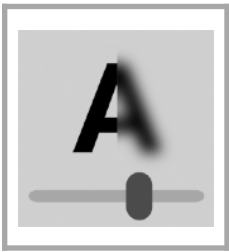
Node: SHARPNESS

Description: Allows an element to be sharpened or blurred.

Notes:

- Use the **SHARPNESS** slider to either blur or sharpen elements
- A value to the left of the slider centre produces blur, a value to the right produces sharpening
- An element's sharpness or blur can be key-frame animated using **SHOW CURVES**

Typical uses:

- Correcting an elements apparent level of sharpness or blurriness
- Simulating 'focus pull'
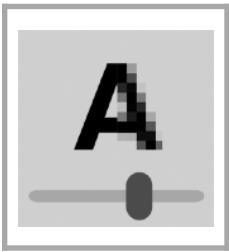
Node: PIXELATE

Description: Allows an element to be pixelated.

Notes:

- Use the **PIXEL SIZE** control to adjust the level of image pixilation. **1X** means no pixilation (1 pixel in = 1 pixel out). **MAX** produces an approximate 2x2 array depending on aspect ratio.
- Pixel size can be key-frame animated using **SHOW CURVES**

Typical uses:

- Reducing image resolution to simulate low-res image sources eg. simulate low-tech or CCTV images from footage sourced using HD devices
- Simulating common media techniques for anonymising faces, concealing prohibited content
    - Use in conjunction with a tracking matte centred on a face (ie. using **SHAPES** and **TRACK** to mask out the high res portion of the image and to composite in the pixelated version of the image)
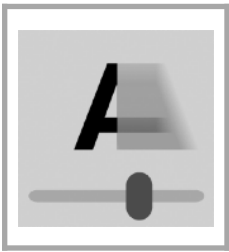
Node: MOTION BLUR

Description: Allows an element to have a simulated motion blur effect.

Notes:
- **DISTANCE** adjusts the distance that the scene has moved during this frame
- **DIRECTION** adjusts the direction of travel of the scene relative to the frame
- The **PREVIEW** control allows you to select the image shown in the **MOTION BLUR settings** panel
  - You can choose between **Input**, the node **Output** or the final **Composite**
- The blur parameter settings can be key-frame animated by using **SHOW CURVES**

Typical uses:
- Making objects look like they are moving faster than what they are
- Simulating low-tech or long shutter time imaging devices
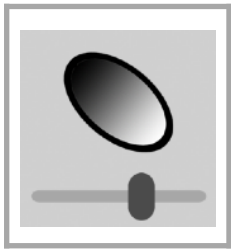
Node: LENS FILTER

Description: Emulates optical lens filters including Graduated Neutral Density, Black and White, Soft Focus and Star filters..

Notes:
- **TYPE** selects one of the available filter types:
  - Graduated Neutral Density - Normal and Reverse
  - Black & White filters - Red, Orange, Yellow and Green
  - Soft Focus
  - Star Filters - Add Glints and Whole Image

Graduated ND:
- There are 2 filter types: **Normal** and **Reverse**
- **Normal** has the neutral density band at the top of the image, **Reverse** at the bottom
- **Density** adjusts the amount of filter density from clear to opaque black
- **Softness** adjusts the width of the graduated density band
- Drag within the red rectangle to adjust the position(**Y**) of the graduated neutral density area
- **Density, Softness and Y** can be key-frame animated by using **SHOW CURVES**

B&W Filters:
- Colour filters are often used in black and white photograph to modify the tone scale of images
  - For example with a Green filter, red objects become dark, green objects are unaffected

More Lens Filter Help

- There are 4 common filters used: **Red**, **Orange**, **Yellow** and **Green**
- **Density** adjusts the amount of filter density from clear to full density in that colour
- **Density** can be key-frame animated by using **SHOW CURVES**
- The colour filtered intermediate result image is available at Output 2 if required
- Output 1 is always monochrome, but with the adjusted tone scale characteristics

Soft Focus:
- A simulated soft focus effect is created by mixing a blurred image withe the original image
- **Mix** adjusts the amount of blurred image mixed with the original image
  - The minimum setting is 100% original mixed with 0% blurred
  - The maximum setting is 0% original mixed with 100% blurred
- **Softness** adjusts the degree of blur applied to the image
- **Density and Softness** can be key-frame animated by using **SHOW CURVES**

Star Filter - Add Glints:
- Star like glints can be added at specific image locations manually
  - Tap the image at the desired location or tap **+** to add a glint
  - Tap within a glint and drag to adjust its location
  - Tap on **Clear** to remove a specific Glint or **Clear All** to remove all at once
  - Use **<** or **>** to change the Glint currently selected

More Lens Filter Help

- **Size** adjusts the size of the rectangle containing the glint features
- **Angle** adjusts the rotation of the glint features
- **Size, Angle, X and Y** can be key-frame animated by using **SHOW CURVES**
- **Glint** location can accept motion tracking input via the **XY** In node input
  - For example, motion trackers can be output by the **TRACK** or **FACE MASK** nodes
  - If one tracker is available, then all glints will be controlled by this tracker
  - If multiple trackers are available, then glints are assigned sequentially to each of the trackers
    - If a tracker is not available, then the first tracker is used by default

Star Filter - Whole Image:
- Simulates a star filter by applying 2 smears of highlight detail at a 90 degree angle to each other
- **Amount** adjusts the spread of the angular smears
- **Angle** adjusts the rotation of the angular smears
- **Amount and Angle** can be key-frame animated by using **SHOW CURVES**

Typical uses:
- These filters emulate optical filters often placed in front of a camera lens to produce in-camera effects
- Provides *similar* results digitally for those used to using these types of optical filters on real cameras
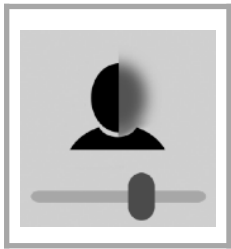
Node: FACE MASK

Description: Detects and obscures people's faces.

Notes:

- **REPLACEMENT** sets the face replacement mode to **OFF**, **PIXELS** or **BLUR** modes
- **OBSCURITY** adjusts the amount of pixelation or blur applied to image regions detected to be a person's face
- **MASK SIZE** adjusts the relative size of the pixelated or blurred region(s) to the detected face size(s)
- The **PREVIEW** control allows you to select the image shown in the **FACE MASK settings** panel
    - You can choose between **Input**, the **Matte** image, the node **Output** or the final **Composite**
- The **replacement mode**, **obscurity**, **mask size** and **obscure-enabled** parameter settings can be key-frame animated by using **SHOW CURVES**
- **EDIT** in the **DETECTIONS** section allows the user to select the individual faces that are obscured
    - Set the **OBSCURE ENABLED** switch to off for individual face detections you do not wish to be obscured
    - Use the **<** and **>** buttons to navigate between the face detections
    - By default all faces detected will be obscured if the **REPLACEMENT** mode is not set to **OFF**
- Reliable face detection requires faces to be reasonably large, not blurred and well lit. The node will use cached matte images to replace the occasional missing detection in a video sequence.

Typical uses:

- Privacy protection
- Simulating privacy protection devices used in news items
- Hiding the identity of all or some of the people in a photo or video, by obscuring their face(s)
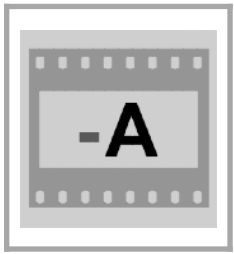
Node: INVERT

Description: Inverts the colours of an image. Can also be used to produce inverted mattes (place before the MATTE node).
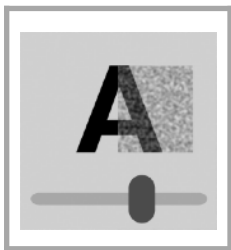
Rule: Output = - InputA

Notes:

- Invert remaps the tone scale in each image channel, so that black becomes white, etc
- Works on monochrome and colour images
- Produces an image that appears like a photographic negative

Typical uses:

- Inverting mattes so that transparent becomes opaque and vice versa
- Simulating a camera negative

Node: GRAIN

**Description:** Simulates a film 'look' by adding simulated film grain noise.

Rule: Output = InputA + Film-Grain-Noise

Notes:

- Produces an image that appears like a photographic film image by adding adjustable levels of pseudo random structured noise representing the presence of film grains or dye clouds.
- **Type** allows selection of the 3 preset film grain types (Fine, Medium, Coarse) or a user defined type (Other).
    - **Fine** generally matches modern fine grain low speed films. **Coarse** models high speed or push processed film used at low light levels.
- **Colour** allows selection of either monochrome or colour grain noise. In the **Off** position grain noise is the same in each of the RGB channels and may appear less intrusive in some scenes. In the **On** position grain noise is different in each of the colour channels and is more representative of the type of grain noise that colour film stock exhibits.
- The **Amount** slider adjusts the level of noise that is added to the image.
- The **Size** slider adjusts the relative size of the grain objects from fine to very coarse grain size.
- Produces an image that appears like a photographic film image by adding adjustable levels of pseudo random structured noise representing the presence of film grains or dye clouds.

Typical uses:

- Simulating the 'film look'
- Simulating low quality image sources, old film stock or low light conditions
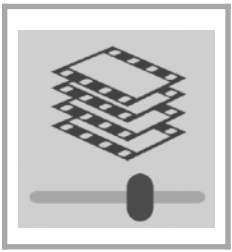
Node: STACK

Description: Averages together a stack of 'n' previous and consecutive frames. Useful for simulating slow shutter speeds and for noise reduction.

Rule: Output = (Input(t) + Input(t - 1)… + Input(t - (n-1))) / n

Notes:

- Combines a stack of previous consecutive frames by averaging the frames together
- The N**umber of Frames** combined is selectable in the **STACK settings** panel, and must be in the range 2 to 256. This parameter is not animatable using keyframes
- Processing must proceed in frame order, from the first frame presented to the node, to produce a valid output for a specific frame
    - Attempts to process images in other than frame order will produce a flow graph error
    - To clear the error return the scrubber to the frame number where the first image is presented to the **STACK** node. Build every frame from this point forward.
- The averaging filter is reset on the first frame presented to the node (eg. Frame 1)
- The averaging effect takes 'n' number of frames before the fully processed averaged effect is visible in the output, so you may want to discard these first frames before using them in a shot.
    - eg. Use step-animated **RGB** or **BCS** node to blackout first 'n' frames
- Processing is memory intensive. Some devices may not support large values of 'n' for high resolution images.

Typical uses:

- Simulating long shutter times to produce motion blur.
- Combining noisy or low light images to reduce random noise and enhance the image content
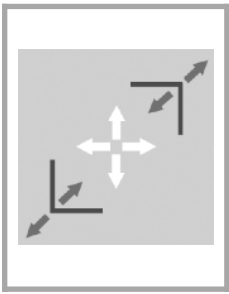
Node:	COMPOSE

Description: Allows the user to adjust an element's image content by selecting what part of an image is used and how it is displayed. The image can be cropped to size to remove unwanted image content. The cropped result can then be scaled to the required size and panned to the desired location.

Notes:

- The first process applied is cropping. Set **PREVIEW** to the **CROP** mode and use the image handles to select the area of the image you want to use. The **CROP** data panel shows the selected image corner co-ordinates and dimensions.
- The next process applied to the cropped image is zooming and panning. Set **PREVIEW** to the **ZOOM / PAN** mode and use the image handles to modify the zoom of the image. Anamorphic zooms (different x and y scale) are also possible. Drag the image selection to perform panning. The **ZOOM** data panel shows the zoom, pan and scaling values.
- Key frame animation allows you to simulate camera zooms and pans across an element's content.
- XY movement data can also be received from a TRACK node to implement 'Match-Move' operations. A Match-Move synchronises the movement of an element to the movement of content in another element. Use this to replace image objects with other images, implement tracking garbage mattes, add moving labels/ arrows or dialogue bubbles.
- If an XY data feed from another node is connected to the **XY In** terminal, an additional data panel shows the input X and Y values that are added to the **Pan X** and **Pan Y** values.

Typical uses:

- Improving composition
- Simulating camera moves and zooms
- Match Moves

Node: PERSPECTIVE

Description: Applies a perspective warp to an image to simulate a 3D perspective view.

Notes:

- A red wireframe defines the output image's new side positions
- Each corner handle is shown as a yellow cross-hair and can be dragged to a new location
- The wireframe is shown over either the **INPUT** or **OUTPUT** images.
- The **OUTPUT** image shows the input image after the perspective warp.
- The **PREVIEW** control allows you to select the image shown in the **PERSPECTIVE settings** panel
    - You can choose between **Input**, the node **Output** or the final **Composite**
- The **PERSPECTIVE** settings can be key-frame animated by using **SHOW CURVES**

Typical uses:

- Replacing images on surfaces filmed at an angle
- Applying reflections
- Simulating 3D perspective views
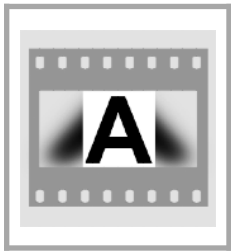
Node:　　　　FILL

Description:　Fills the sides of a portrait video in a landscape element with a softened stretched background image using the video itself as source.

Notes:

- The **ROTATE** control rotates the input element 90 degrees **LEFT** or **RIGHT** if the source element has not auto rotated to the correct orientation

- The **BLUR** control sets the degree of blur applied to the background fill image. This is typically used to focus the viewers' attention on the portrait content that is in sharp focus.

- The **BRIGHTNESS** control sets the overall lightness of the background fill image. This is typically used to focus the viewers' attention on the portrait content that has correct exposure and contrast.

Typical uses:

- Reformatting a video shot in portrait mode for display on a landscape device such as a TV.
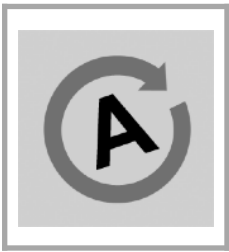
Node: ROTATE

Description: Rotates an element by a user-defined angle.

Notes:

- The ROTATION slider allows the rotation angle to be set between 0 and 360 degrees. The control snaps to 90 degree increments for ease of use
- Exact and multi-revolution angles can be entered using the SHOW CURVES view and by tapping on the DEGREES heading and value to reveal the keyboard
    - accepts input as either negative or positive degrees (< -360 and > 360 allowed)
    - use 'R' as shorthand to specify a whole turn or multiple turn of 360 degrees
    - eg. If 3R45 is entered, it is interpreted as 3 x 360 + 45, anticlockwise
    - eg. If -4R40 is entered it is interpreted as 4 x 360 + 40, clockwise
- The **PREVIEW** control allows you to select the image shown in the **FLIP settings** panel
    - You can choose between **Input**, the node **Output** or the final **Composite**
- ROTATION can be key-frame animated

Typical uses:

- Reformatting of images shot at oblique angles or incorrect orientation
- Spinning effects
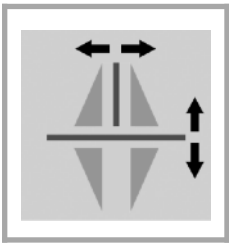
Node: FLIP

Description: Flips an image horizontally and/or vertically.

Notes:
- HORIZONTAL controls whether the image is flipped horizontally around the vertical axis or not
- VERTICAL controls whether the image is flipped vertically around the horizontal axis or not
- The **PREVIEW** control allows you to select the image shown in the **FLIP settings** panel
  - You can choose between **Input**, the node **Output** or the final **Composite**
- FLIP can be key-frame animated

Typical uses:
- Modify images to emulate mirror or reflection/shadow content
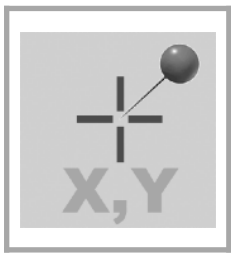
	Node:	TRACK

Description: Tracks a selected image area to stabilise the image and/or feed the area's XY movement distances to a COMPOSE node for a 'match move' operation.

Notes:

- To add a tracker, open **TRACK settings** and tap on the object you wish to track in the preview image. Try to pick an area of the image that has distinctive image content (edges, changing colours…).
- The **Size** slider allows the size of the area matched by the slider to be adjusted. The green outline shows the area matched by the TRACK node. The red outline shows the surrounding area searched in each frame to keep track of the object. If necessary, include image tracker disks in the scene you are filming. Image tracker disks can be downloaded for printing from lnaapplications.com .
- **Smoothing** is available to filter out any rapid jitter of a tracker to produce a more natural move.
- **Confidence** shows the tracker signal strength, high levels will give the best tracking precision.
- The **Co-ordinates** panel shows the **X** and **Y** co-ordinates of the tracker placed in the last active key frame. In addition the distance the tracked object has moved, since that key frame, is shown as **Delta X**, **Delta Y** and **Distance**.
- **Mode** determines the actions taken by the node using the distance the tracked object has moved. **Track** mode outputs the distance(s) moved to the **XY Out** terminal of the node. Other nodes can use this data feed (ie. COMPOSE) to perform operations synced to the position of tracked objects. **Steady** mode pans the input image by the inverse of the distance moved by Tracker 1 so as to keep the tracked object stabilised in the frame. **Both** mode activates **Track** and **Steady** modes simultaneously.
- If a tracker is not reliably holding position from frame to frame, try increasing the tracker size or positioning the tracker over an image area that has high contrast edges perpendicular to the motion direction.
- Tracking information from previous frames is used to follow objects that move significantly, so when setting parameters of frames within a shot, you may need to process previous frames to maintain tracking accuracy.
- Operations executed by the **Track** node can be computationally intensive and take some time to complete. Execution time is sensitive to the tracker size and the number of trackers.
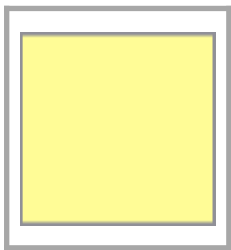
	Node:	NOTE
	Description:	Permits notes to be placed within an Image Flow to assist users understand its function and or options.

Notes:

- For sharing Shots containing **IMAGE FLOW**s, it is a good idea to document the **IMAGE FLOW** by placing a number of **NOTE** nodes around the **IMAGE FLOW**. The **NOTE**s can provide instructions or descriptions of how the **IMAGE FLOW** works
- A **NOTE** node is free-standing and does not support connections

Node: ERROR

Description: Appears in an Image Flow when the required node cannot be found in the Node Library.

Notes:

- If the **ERROR** node appears in an **IMAGE FLOW** it means that this **IMAGE FLOW** uses a new type of node that is not present in the node library of this **Effects Expert** version.

- Either acquire the PRO upgrade for the base version of **Effects Expert,** or update the app by visiting the App Store.