

# **Cortex User Manual**

Version 5.6

Dated April 1st, 2024

For use with all Cortex Editions. All modules and features will be covered in this manual. Please refer to the Cortex Editions section to determine which modules and features are available in your software package.



## What's New in CORTEX v5.6?

#### **New Features**

- 1. Automated Watch folders to trigger render events. (SEE NEW TIPS AND TRICKS)
- 2. Import / Export QC comments and markers, .CSV, .XML (import).
- 3. Exported Dolby Vision XML now contains target displays from all events.
- 4. Latest Dolby Atmos version upgraded and supported.
- 5. Automatically import and validate IMF after creation.
- 6. Expanded DCP agency ratings.
- 7. DCP render mode selection.
- 8. Refined time-to-complete values for render events.
- 9. Render path length check before render.
- 10.AS-11 insertion metadata editing.
- 11. Dead pixel algorithm improvement.
- 12.New HDR Gamut analysis report.
- 13. Thumbnails now included in a detailed QC report.
- 14.Latest Nagra NexGuard support provided to licensed users.

#### V5.6 Release Notes: TIPS and TRICKS

#### Watch Folders

#### **Render Watch Folder**

A Windows folder(s) can be set up for automation, to serve as the source location for a Cortex render. The render will launch once triggered by the presence of either a complete source file or image sequence folder that is no longer changing in size.

#### To create a new Render Watch folder:

- 1. Click the [New] button at the top of the UI from any of the Cortex Tools other than the Copy Tool.
- 2. Choose Automation in the drop-down menu.
- 3. Define a unique name
- 4. Choose Render for AUTOMATION TYPE.
- 5. Click the [...] button for WATCH FOLDER to browse to a folder to be the Watch Folder for media input.

Note that you may right-click in the folder selection window and create a new folder if needed.

- 6. Click the [Select Folder] button.
- 7. Click the [...] button for REPORTS FOLDER to browse to a folder to be the Reports Folder for reports output. Note that you may right-click in the folder selection window and create a new folder if needed.
- 8. Click the [Select Folder] button.
- 9. Select the desired DELIVERABLES in the list. (Note that a Deliverable Configuration must first be defined for this step.)
- 10. Click the [Create] button.

This will create a watch folder automation task for rendering that will remain active as long as Cortex is running the Job that contains it. To view the status and activity of the watch folder(s), navigate to the Render Tool and view it as an automation task that permanently resides in the column: IN PROGRESS (REEL OPEN)

#### **QA Analysis Watch Folder**

A Windows folder(s) can be set up for automation, to serve as the source location for a Cortex QA Tool. The analysis will launch once triggered by the presence of either a complete source file or image sequence folder that is no longer changing in size.

#### To create a new QA Analysis Watch Folder:

- 1. Click the [New] button at the top of the UI from any of the Cortex Tools other than the Copy Tool.
- 2. Choose Automation in the drop-down menu.
- 3. Define a unique name
- 4. Choose Analysis for AUTOMATION TYPE.
- 5. Click the [...] button for WATCH FOLDER to browse to a folder to be the Watch Folder for media input.

#### Note that you may right-click in the folder selection window and create a new folder if needed.

- 6. Click the [Select Folder] button.
- 7. Click the [...] button for REPORTS FOLDER to browse to a folder to be the Reports Folder for reports output. Note that you may right-click in the folder selection window and create a new folder if needed.
- 8. Click the [Select Folder] button.
- 9. Choose the desired Analysis tasks to be performed when new media triggers this watch folder. Select each analysis sub-type using the check-box on each tab, and select analysis parameters and report details in each sub-tab.
- 10. Click the [Create] button.

This will create a watch folder automation task for analysis that will remain active as long as Cortex is running the Job that contains it. To view the status and activity of the watch folder(s), navigate to the Render Tool and view it as an automation task that permanently resides in the column: IN PROGRESS (REEL OPEN)

Other TIPS and TRICK - Coming Soon

## **Table of Contents**

MTI Film - Cortex User Manual version 5.6

Welcome	13
Cortex Editions	13
Getting Started	15
Installing Cortex	15
Hardware Requirements	15
Download The Installer	15
Prerequisites	15
Installation Wizard	15
Licensing and Activation	17
How To License CORTEX:	18
How does this work?	18
Upgrades and Support	18
The Cortex Keyboard Stickers	18
Cameras, Codecs, and Outputs supported by Cortex	19
First a Few Definitions:	20
Clip	20
Composition	20
Deliverable	20
Print Status	20
File per Clip	20
File per Reel	20
Clips Reel	21
Composition Reel	21
Open Reel	21
Closed Reel	21
One to One Render	21
One to Many Render	21
Cortex Application Overview	22
The Project Manager	22
Assets Tab	22
Find Tab	23
Project Notes	24
Deliverable Configuration Editor	25
Codec and Color Properties	26
Audio Matrix	26
Burns Canvas	27
Cortex Tools - Brief Overview	28
The Copy Tool	28
MTI Film - Cortex User Manual version 5.6	3

The Color Tool	28
Primary Color Corrector	29
The Image Stores	30
Waveform, Vectorscope, Color Gamut Display	31
LUTs	31
Functions	32
The Sync Tool	34
The Edit Tool	34
The QA Tool	35
The Render Monitor Tool	37
Utility Tools	37
Bins & the Media Player	38
Bins	38
The Media Player	39
The Edit Tool Media Players	39
Parts of the Source Single Media Player	40
The Player Window	40
Zooming the Picture	40
The Player Timeline	40
Add Source Clip to Clip Reel	41
Mark In and Out	41
Mark Clip or Segment (Shot)	41
Go to Previous/Next Clip or Break/Cut	41
Navigation	41
Jog by Frame	41
Timecode Position and Mark Registers	42
Add Dissolve or Effect	42
Mark IN Dissolve or Effect	42
Mark OUT Dissolve or Effect	42
Add and Go to Comments	42
Parts of the Composition Single Media Player	43
Examples of Marks	43
Media Player Shortcut Keys	44
The Project Manager	46
Advanced Project	46
Basic Project	47
Creating a Project	48
Advanced Project Information	50
Conventions	50
File Organization	50
Creating Episodes, Workflows and Deliverables	51
Episodes or Folders	51
MTI Film - Cortex User Manual version 5.6	4

Workflows	51
Deliverables	52
How to Create a Deliverable Configuration	53
Deliverable Configuration Editor	53
The Preview Deliverable	53
Encoding Section	54
Presets	54
Templates	55
Favorites	55
Defaults	55
Import	56
Encoding	56
Sizing	57
MTI HQ	57
MTI-Samsung	58
Framing	58
Method	58
Audio	58
Dolby Atmos <sup>®</sup>	59
Color Section	59
Deliverable LUT	60
SDI LUT	60
SDI Channel	60
Apply Creative Color Correction	60
Repair Dead Pixels	60
Apply SMPTE Legal Clipping	60
Included LUTs	61
ACES	61
Working with the Burns Canvas for Metadata	62
Font	63
Background	64
Shadow	64
Flash	64
Matte	65
Head	65
Format	65
Adding a Watermark Graphic	68
Creating a Job	68
Workspaces	69
ALL	70
Dailies	70

Editorial	71
QC	72
The Parts of the UI	73
The Master Clip Bin	73
The Bin Sidebar	74
Sub-Bins	74
"New" Menus	74
In the Copy Tool, New:	75
In the Color, Sync, and Render Monitor Tools, New:	75
In the QA tool, New:	75
In the Edit Tool, New:	75
Importing Media	75
"Import" Menu	76
Working with CORTEX Manifest Files	77
Creating a Manifest from a Job	77
To create a Manifest file	77
Importing a Manifest and Relinking to Media	77
To Import a Manifest	78
Dailies Workflow	78
Composition Workflows	80
Clip Bin Views	81
The Text View	81
The List/Thumbnail View	82
The Thumbnail View	82
Exporting Reports	82
Project Actions and Reports	84
Color Trace EDL	84
Convert to UTF-8 (Unicode Transformation Format - 8 bit)	85
Delete	85
Edit	85
Export Database	85
Export Support Manifest	85
Import Database	85
Merge DCP or Merge IMF Packages	85
Filtering and Sorting Source Clips	86
Filter options:	86
Filtering and Sorting Composition Events	86
Sorting	86
The Timeline	86
The Edit Tool Timeline	87
The Master Track Controls	87
Adding a Metadata, Subtitle, or Video Track	87

Follow Source	87
Link	87
Undo/Redo	88
Timecode Bar	88
Lasso Drawing Area	88
Edit and Trim Controls	89
Audio Source and Record Monitor Controls	89
Individual Source/Record Track Controls	89
"Thumb" Slider	89
The Color and QA Tool Timelines	91
Editing and Monitoring Video Tracks	91
Zooming the Timeline	91
Using the Mousewheel	91
Using the Keyboard	91
Timeline Shortcut Keys	93
Cortex Tools in Depth	94
The Copy Tool	94
Using The Copy Tool	94
Copy Task Setup	94
Destinations	95
Options for a Copy Task	95
Copy Task Status	95
Copy Task Reports	96
Archive Tasks	96
Verify Tasks	98
The Color Tool	98
Color Pipeline Tabs	100
Camera Tab	100
ACES Input Tab	100
Framing	101
Input LUT	102
Primary Tab	102
Output LUT	102
Functions	102
Pipeline	103
Using the Framing Tool	103
Quibi	103
The Primary Color Corrector	104
Using the GUI to Color Correct	104
Saving Color Settings	104
To the current clip:	104
To Multiple clips:	104

Using the Keyboard to Color Correct	105
Dissolves	105
Dissolve Timeline	105
To Create a Dissolve:	106
To Adjust the Length of a Dissolve:	106
To Navigate Between Dissolves	106
To Remove a Dissolve	106
Printer Lights GUI Controls	106
Image Stores	107
The Six Image Stores	107
Still Store	108
Timeline Store	108
Favorites Store	108
Imported Stills Store	108
Importing Stills	109
LUTs Store	109
Imported CDLs Store	109
Importing CDL Values	109
Filtering and Searching	110
Saving and Recalling Stills	111
To recall and load a still's color settings to another clip:	111
To add a comment to a still:	111
To go to the clip of the selected still:	111
Still Functions	111
Exporting Stills	112
Exporting Stills via a Job in the Project Manager	113
Memories	113
The Functions Tab	114
Film Grain	114
Aperture Correction Settings	114
MTI HQ	115
Matte Function for MTI HQ	115
MTI-Samsung	115
Matte Function for MTI-Samsung	116
Creating Dolby Vision <sup>™</sup> Level 1 HDR Metadata	116
Edit Tool Steps for Creating a Dolby Vision™ Composition	118
Color Tool Steps for Processing Dolby Vision™	118
Pipeline Tab	120
Wave Panel Button Functions	120
Keyboard Shortcuts	123
The Sync Tool	126
The Master Clips Bin	127

The Audio Bin	130
Audio Metadata	130
Metadata Input	131
Additional Metadata entry	132
Modifying Multiple Clips	132
Synchronization Tools	132
Timeline	132
Mark Window	132
Synchronizing Audio and Video	133
Auto-syncing a single clip	133
Auto-syncing multiple clips	133
Using Timecode to search for Audio Sync Points	134
Using Timecode to search for Picture Sync Points	134
Adjusting Clip Synchronization	134
Adjusting audio sync against the current picture frame	135
Adjusting the picture sync against the current audio frame	135
Changing Clip Play Speed	135
In and Out Points	135
AutoTrim	136
Tail Sticks Syncing	136
Sync Tool Shortcut Keys	136
The Edit Tool	138
Parts of the Edit Tool	138
The Sidebar	138
The Clips Bin(s)	138
The Project Library	139
Compositions	139
The Media Players	139
Switching Focus between the Media Players	140
Navigation Controls	140
The Source Media Player Controls	141
The Composition Media Player Controls	141
Edit Command Buttons	143
Timeline Comments Buttons	143
Timecode Position Registers	143
Timecode Mark Registers	143
Timeline Tracks Commands	144
Follow Source Checkbox	144
Link Checkbox	144
Context Menu	144
The EFX Palette	146
The Slate Generator	146

Composition Timeline	147
The Control Columns	148
The VU/Loudness/Metadata Tabs	148
Creating a Composition	149
Composition	150
IMF Composition	150
Composition Tab	151
IMF Metadata Tab	151
File Naming Tab	152
Locale Info Tab	152
OPL Tab	152
Sidecar Assets	152
Additional Metadata Tab	152
Audio Configs Tab	153
DCP Composition	153
Composition Tab	154
CPL Metadata Tab	154
DCP Metadata Tab	155
KDM Tab	156
AS-11 Composition	156
Composition Reel	156
Auto Compositions	157
To create an Auto Composition:	157
Editing in the Edit Tool	157
3 Point Editing	158
Setting a Duration	158
Edit Commands	159
Drag and Drop Editing	159
Drag and Dropping an Overwrite 3 Point Edit	159
Drag and Dropping an Insert 3 Point Edit	159
Adding Multiple Clips to the Timeline	159
When Dragging and Dropping Multiple Clips	160
If from the Context Menu:	160
Drag and Drop and then Shift	160
Lift or Extract a Marked Range	161
Lift and Extract Commands	161
Graphical Trim Types	161
Gap Trim	162
Executing a Gap Trim	163
By Dragging the Mouse Cursor	163
Using the Numeric Keypad	163
Selecting Edit Points for Gap Trims on Multiple Tracks	163

Example Gap Trim	164
Gap Trim View	164
Ripple Trim	164
Executing a Ripple Trim	164
By Dragging the Mouse Cursor	164
Using the Numeric Keypad	165
Selecting Edit Points for Ripple Trims on Multiple Tracks	165
Example Ripple Trim	165
Ripple Trim View	165
Rolling Trim	166
Executing the Rolling Trim	166
By Dragging the Mouse Cursor	166
Using the Numeric Keypad	166
Selecting Edit Points for Rolling Trims on Multiple Tracks	166
Example – Rolling Trim	167
Rolling Trim View	167
Slide Trim	167
Executing the Slide Trim	167
By Dragging the Mouse Cursor	167
Using the Numeric Keypad	167
Example – Slide Trim	167
Slide Trim View	168
Slip Trim	168
Executing the Slip Trim	168
By Dragging the Mouse Cursor	168
Using the Numeric Keypad	168
Example – Slip Trim.	168
Slip Trim View	169
Selecting, Repositioning, and Deleting Segments	169
Selecting a single segment	169
Selecting multiple segments	169
Repositioning Segments on the Same or to Like Tracks	170
Movement Behavior	170
Repositioning a Segment In Gap Trim Mode	170
Repositioning a Segment in Ripple Mode	170
Deleting Segments with or without a Ripple	170
The Lasso Area and Selecting Multiple Tracks or Edit Points	171
Lassoing Segments	171
To select segments with a lasso:	171
Lassoing Edit Points	171
To select edit points with a lasso for Gap Trims:	171
To select edit points with a lasso for Rolling Trims:	171

To call at a dia sociate with a large few Discale Triver	172
To select edit points with a lasso for Ripple Trims:	172
Creating a Dolby Vision <sup>™</sup> / Dolby Atmos <sup>®</sup> Composition	172
Dolby Atmos® Dolby Vision™ Metadata	173 174
Missing DoVi Metadata	174
Three Methods of Fixing Bad Metadata	175
Copy Dolby Vision <sup>™</sup> Metadata	175
Use the Trim Function to Extend Metadata from an Adjacent Segment	175
Use the Color Tool to Analyze Level 1 Content Mapping	176
ScratchPad Audio and Creating Audio Configurations for Compositions	170
Adding Audio Tracks to the ScratchPad	177
-	178
Saving Audio Configurations For the 5.1 Mix:	178
For the LTRT Mix:	178
Move an Audio Configuration	179
Copy, Delete, or Edit an Audio Configuration	179
To Copy an Audio Configuration	180
To Delete an Audio Configuration	180
To Edit an Audio Configuration	180
Sync Loss Indicators	180
Effects and Transitions	180
Working With Fades	181
To Create a Fade In:	181
To Create a Fade Out:	181
Effect Symbols	181
To Delete an Effect	182
Navigating the Timeline	182
Searching a Timecode	182
Moving by Timecode or Frames	182
Jumping Edit by Edit	182
Showing Source Timecode in the Composition	183
Zooming the Timeline	183
Matchframes	183
Simple Matchframe	183
Lengthening the Tail of a Shot	184
Lengthening the Head of a Shot as an Overwrite	184
Lengthening the Head of a Shot as an Insert	184
Reversing a Jump Cut	184
Edit Function Keys	184
The QA Tool	186
The Dead Pixel Module	187
Preparing Deliverables for Dead Pixel Correction	188

Detecting a Single Camera Clip	188
Detecting Edited Media	189
The Detection Workflow	189
Selecting a Pixel	191
Segment Play	191
Assigning Status	192
Automatic Status Rippling	192
By x/y coordinates	192
By Tapename	192
Copying and Pasting a Pixel Record	193
Deleting a Pixel Record	194
Editing a Pixel Record	194
Copying and Pasting Dead Pixel Records to New Media	194
Importing A Dead Pixel CSV Provided by a Third Party QC	195
Filtering Events with Imported Pixels	196
Remapping X/Y Coordinates	196
Steps to Remapping x/y Coordinates	197
Manually Creating a New Pixel	197
Rendering Corrected Dead Pixels	197
Rendering the Whole Composition	198
Rendering Filtered Events	198
Create a Composition Reel	198
Dead Pixel Module Function Keys	198
The Graphs Module	200
Video Analysis	201
SDR Analysis	202
HDR Analysis	206
Audio Analysis	208
Scopes Module	211
Video Scopes	212
Waveform Scope	212
Vector and Gamut Display Scopes	213
Audio Scopes	214
Performance Module	215
IMF Validation	216
Steps to IMF Validation	216
Dolby Vision <sup>™</sup> Metadata Validation	217
Steps to DOVI Validation	217
Rendering and the Render Monitor Tool	217
Definitions Worth Repeating	218
Events, Segments, or Shots	218
File per Clip	218

File per Reel	218
Clips Reel	218
Composition Reel	218
Open Reel	218
Closed Reel	218
Render Methods	218
One to One Render	219
One to Many Render	219
Creating a Clips Reel or Composition Reel	219
Continuous Timecode Reels	221
Determining One to One and One to Many Renders	222
The Render Monitor Tool	223
Closing a Reel	223
Selecting Deliverables in the Render Monitor Tool	223
Rendering a Composition	225
The Render Composition Dialog Box	225
Quicktime Audio Track Labels	227

# Welcome

MTI Film has created a family of applications, known as Cortex, that host a suite of tools designed to assist a variety of users to accomplish critical work-product. DITs and Dailies Personnel, Assistant Editors, Transcoding Operators, IMF, DPP, and DCP creators, and anyone interested in file based workflows will find Cortex to be their go-to application. Each Cortex software edition can interact with all other editions via the Cortex Manifest, allowing metadata to be conveyed from one system to another. Cortex Enterprise can be networked with other Enterprise systems via a shared database, facilitating concurrent Workflows and distributed rendering.

## **Cortex Editions**

FEATURES	DIT	DIT+	DAILIES	ENTERPRISE	QC
Project Manager / Deliverables Templates	1	~	1	1	1
Playback All Camera & Codec Formats	<b>√</b> <sup>1</sup>	<b>√</b> <sup>2</sup>	1	1	1
SDI & HDMI Output up to 4K	1	1	1	1	1
Background Transcoding/Rendering (see note 3)		<b>√</b> <sup>3</sup>	1	1	
Copy & Archive Tool with MD5 Checksum or XXHash*	1	~	1	1	
Color Tool - ASC CDL / ACES Support	1	1	1	1	1
Color Tool - Universal Color LUTs Export/Import	1	1	1	1	1
Color Tool - Hybrid View with Edit Timeline or Sync Tool	1	1	1	1	
Color Tool - Dolby Vision <sup>™</sup> Level 1 Analysis/Metadata/Software CMU**				1	
Color Tool - Color Space Conversions	1	1	1	1	1
Color Gamut Diagram	1	1	1	1	1
Color Trace			1	1	
Sync Tool - Automatic / Manual	1	1	1	1	
Cortex Manifest Data Tracking	1	1	1	1	1
Traceback Media and Metadata			1	1	
VFX / EDL Pulls			1	1	
Edit Tool - Edit Functions, Slates, EDL Conform			1	1	1
Edit Tool – IMF, AS11, AS02, DCP Creation/Packaging				1	✓ <sup>4</sup>
Edit Tool - Dolby Vision <sup>™</sup> IMF and Metadata Editing**				1	✓ <sup>4</sup>
Edit Tool - ProRes Insert Editing				1	✓ <sup>4</sup>
QA Tool - Dead Pixel Detection	✓ 5	✓ 5	1	1	1
QA Tool - Dead Pixel Correction				1	
QA Tool - HDR & SDR Scopes / Color Gamut Diagram				1	1

MTI Film - Cortex User Manual version 5.6

FEATURES - Continued	DIT	DIT+	DAILIES	ENTERPRISE	QC
QA Tool - Video Analysis with Graphs and Reports				<i>✓</i>	1
QA Tool - Editorial Comments pinned to Timeline with Report				<i>✓</i>	1
MTI HQ UpRes	1	1	1	~	
MTI – Samsung UpRes				<b>~</b>	
Loudness Monitoring				<i>✓</i>	1
Cortex Share for Multiple Users				<i>✓</i>	1
OPTIONS			DAILIES	ENTERPRISE	QC
Dolby Vision <sup>™</sup> - Level 1 Analysis /Metadata Track Editing/Software CMU**				<i>✓</i>	
Dolby Atmos <sup>®</sup> support for IMF, DCP and general compositions	Include Vision	ed w∕ Do ™	olby	1	
Dolby Digital <sup>™</sup> Audio - Includes 5.1, 7.1, DolbyE, & Loudness Correction				1	1
Loudness Correction				<i>✓</i>	
DVD - Automatically Authored			1	1	
Blu-ray - Automatically Authored			~	<b>√</b>	
HEVC			1	<i>✓</i>	1
Annual CORTEX 24-Hour Site Support			1	1	

1. DIT is not licensed to read H.264, DVCPro/HD or MPEG2 codecs

2. DIT+ is not licensed to read DVCPro/HD or MPEG2

3. DIT+ encodes ProRes, DnxHD, and H.264 up to 1920 x 1080

4. QC can create IMF, AS-02, DPP, DCP packages, and Compositions but not render them

5. DIT and DIT+ detect dead pixels on source clips only, not compositions with edits

\* The Copy/Archive tool supports up to 3 destinations including LTFS LTO with MD5 Checksum or XXHash and multiple reports.

\*\* Available with MTI's Dolby Vision<sup>™</sup> Option

# **Getting Started**

## **Installing Cortex**

#### **Hardware Requirements**

- Windows 10 or 11 x64
- 64 GB RAM Minimum
- CPUs:
  - Intel or AMD Threadripper CPUs where clock speed is as high as possible
  - Minimum 2 x 6-core >3 GHz recommended for best rendering performance and playback of some CPU-intensive codecs
- Recommended GPUs:
  - 2 to 4 GeForce GTX 3080 ti
- If 2, when possible, a 3rd GPU, i.e. GeForce 1650 for UI use only.
- Video Cards:
  - $\circ$   $\,$  AJA Kona 4 or 5  $\,$
  - BMD Decklink series

#### **Download The Installer**

You can access the latest Cortex installer on our Forum at forum.mtifilm.com

Download the installer file and double-click it to begin installation.

All Cortex editions share a single installer. Your feature set is enabled by licensing.

#### Prerequisites - Check with MTI FILM support for latest updates

Cortex requires that the following prerequisites are installed on the system before Cortex can be installed. The Cortex Installer will scan your system, determine which prerequisites are missing and link you to the download(s). An internet connection is required.

- Entity Framework 4.1 Update 1
- QuickTime 7.7.1
- Intel IPP v7.1 Runtime
- Visual C++ 2005 SP1 Redistributable
- Visual C++ 2008 SP1 Redistributable
- Visual C++ 2010 SP1 Redistributable
- Visual Studio 2012 Redistributable
- .NET Runtime 4.5
- Java SE Runtime Environment 8u60

#### **Installation Wizard**

The Setup Wizard will guide you through the installation process. Simply click Next on each screen to install using default settings.

Take a moment to read and agree to the Cortex End User License Agreement.

### **Upgrade Older Version**

Unless you are just testing a new version, it's generally recommended that you choose 'Yes, remove older versions':

- Yes, replace older version.
   This will upgrade your existing version to this new version.
   The old version will no longer be accessible
- No, install side by side with other versions.
   This will create a separate directory for the new version, leaving your old version intact. You will be able to run either version using individual menu and Desktop shortcuts.

# **Licensing and Activation**

The Licensing window will open automatically the first time you run Cortex.

You can open this window from the Licensing utility button in the upper right of Cortex.

Depending on the Edition, the Features box displays the options available. Ignore the CORTEX Dailies under *NOTE: The Product as this field does not display the complete actual licensed version of CORTEX.* 

Licensing	Second reasons			x
CORTEX License In	formation			
ACTIVATION KEY		EVALUATION KEY		
			Activate Online	
LICENSE KEY				
			Enter Manually	
COMPUTER NAME	PRODUCT v3.1.3	COMPUTER ID for 3085A91EEC	46	
LARRY-ROG	CORTEX Dailies			
LICENSED COMPANY		FEATURES		
MTI Film, LLC		CX_BASE		<b>A</b>
LICENSED USER		CX_DAILIES		
larry chernoff		CX_ENT CX_BETA		
LICENSE EXPIRES		CX_DEADPIX		
Never		CX_CDC_FREE		
UPGRADES EXPIRE		CX_CDC_H264		
4/15/2017 11:41:27 AM		CX_CDC_STD		
		CX_CDC_ENT CX_ALC_IPAD		
		CX_ALC_DVD		
CORTEX Enterprise Edit	ion			V
	www	.mtifilm.com	Ok	

#### **How To License CORTEX**

- 1. If you do not already have an Activation Key, contact your Reseller or MTI Film Support. You will receive an email containing your Activation Key as a text string.
- 2. Copy the entire Activation Key text.
- 3. If you are running a Demo/Eval version of Cortex, be sure to check the Evaluation Key checkbox
- 4. Paste the Activation Key text into the Activation Key box in the Licensing module.
- 5. Click Activate Online (Note: you must be connected to the internet to complete this step).
- 6. After a moment, the Licensing module will populate the rest of the form with the information received from MTI Film's Licensing server.
- 7. Click OK and Cortex will launch.

#### How does this work?

When you enter your Activation Key, the software connects to MTI Film's licensing server to complete activation of your license. Once a license has been activated, it is tied to a single machine and can not be moved or re-used on a different computer

# **Upgrades and Support**

All Cortex editions come with one year of Upgrades & Support included. For Additional information, requesting help and accessing our knowledge base, you can access MTI Film's Support resources by registering on our Forum at <u>forum.mtifilm.com</u>, which also includes the most up-to-date version of the software.

# **The Cortex Keyboard Stickers**

MTI FILM makes an optional, backlit, custom keyboard with all the hot keys labels. For existing keyboard owners, MTI Film recommends the Cortex Keyboard Stickers for greater efficiency and interaction with the application. It's best to purchase the keyboard stickers when ordering the software. The stickers can be applied to any American style QWERTY keyboard.



## Cameras, Codecs, and Outputs supported by Cortex

#### Supported Cameras & Recorders

- ARRI Alexa 65 •
- ARRI Alexa LF, LF Mini, S35 •
- **ARRI Alexa ARRIRAW** •
- ARRI Alexa ARRIRAW MXF •
- ARRI Alexa ProRes & DNxHD
- Blackmagic Cinema •
- Canon 5D & 7D •
- Canon C300 •
- Canon C500 RAW •
- **Convergent Design Gemini**
- **Convergent Design NanoFlash** •
- GoPro •
- Panasonic P2 AVC-Intra .
- Panasonic P2 DVCProHD
- Panasonic Varicam 35 •
- Panavision DXL M •
- Phantom Gold and Flex •
- RED One, Scarlet, Epic, Weapon •
- **RED Rocket-X support** •
- Sony F3 & F5 •
- Sony F55 & F65 .
- Sony VENICE 2 and Burano •
- Sony XDCAM EX3 •

#### Supported Output Formats

- AS02\*\* •
- AS11 •
- Avid DNxHD (all bitrates) •
- Avid MXF 1-to-1 .
- Avid DNxHR .
- Apple ProRes 422, 4444
- Apple ProRes 4444 XQ •
- Blu-ray (automatically authored with chapters)\* •
- DCP •
- DPX
- DPP
- DVD (automatically authored with chapters)\* •

#### Supported File Codecs

- **Apple ProRes** •
- Apple ProRes XQ •
- Apple ProRes RAW •
- ARRI DNxHD (VC3 Op1a)
- AS-11
- Avid DNxHD (Op-Atom) •
- Avid DNxHR •
- Avid DNxHR MOV/MXF OP-1a •
- Avid MXF 1-to-1 •
- Blackmagic Raw
- Cineform
- CinemaDNG •
- DPX
- DVCProHD •
- EXR •
- H.264 / AVC / XAVC •
- H.265 / HEVC
- JPEG2000
- MPEG2 / XDCAM
- RED R3D •
- Sony SRMaster .
- TIFF
- XAVC
- H.264 (QuickTime / MP4)
- HEVC\*
- IMF\*\*
- JPEG (QuickTime / JPG)
- JPEG2000\*
- MPEG1
- MPEG2
- OpenEXR
- TIFF
- XAVC
- XDCAM
  - \* Available as add on options
  - \*\* IMF, AS02, AS11, DCP, and DPP Enterprise only

# First a Few Definitions:

#### Clip

A clip is a source file that consists of video and/or audio, metadata (i.e. subtitles, Dolby Vision<sup>™</sup>, etc.) or any standalone file recognized by Cortex.



A Composition is a grouping of clips that have been organized into a timeline. Clips contained in the timeline are interchangeably defined as Events, Segments, or Shots, which refer to either a whole or part of a clip. The

#### Deliverable

A Deliverable is a codec type that consists of a configuration of properties as defined by the user in the Deliverable dialog. Properties such as Codec, Bit Rate, Name, Print Status, Resolution, Framing, Color properties, and Audio configuration, etc. help define the Deliverable.

#### **Print Status**

Each Deliverable contains a property called the Print Status. Upon import, every clip is assigned a default Print Status of "Circled". There are three statuses:

- 1. Circled meaning "Yes, Print this clip"
- 2. Non-Circled meaning "No, do not print this clip"
- 3. Starred meaning this clip is important so "Yes, Print this clip"

Composition icon is placed before the composition name in the Sidebar.

The Print Status of the Deliverable, therefore, acts as a filter through which all clips or segments contained in a reel flow, which determines whether they will be rendered into the Deliverable.

Since the default state of the Print Status is "Circled", it is generally inconsequential unless the Deliverable is part of a Workflow, such as Dailies, that requires deliverables to discriminate which clips contained in a reel will be included in the render.

DELIVERA	BLE CONF	GURATION	N		
ENCODIN PRESETS	G				
Avid Media	Templates	Favorites	Defaults	Import	<b>_</b>
DELIVERABLE 1	TYPE				
Avid Med	ia				✓ ○ Ø ★

#### File per Clip

Any Deliverable that has its "Packaging" property set to File per clip will begin rendering clips immediately upon being added to the reel. If the clip is modified while the reel is still "Open", the clip will be re-rendered.

### File per Reel

A few deliverable types require the whole reel rendered once it is "Closed" to ensure its complete continuity. This means that every clip intended to be in the reel has been added and that the reel is closed by the user.

## Clips Reel 🏵

A Clips Reel is a collection of one or more clips intended to be transcoded to one or more Deliverables. Clips added to the reel can be assigned a Print Status. The Clips Reel icon is placed before the composition name in the Sidebar.

## Composition Reel

The Composition Reel is a collection of one or more composition events. All events added to the reel will be rendered. The Composition Reel icon appears before the composition name in the Sidebar.

### **Open Reel**

An Open Reel is one where clips are still being added to it or where clips contained in it require modification. In order for a clip in a reel to be modified, the reel must be open. If the reel is closed, the clip can be "Duplicated" for modification leaving the one contained in the reel as is. Reels can be reopened if there is a need to modify a clip. Once modified, the clip will be re-rendered.

### **Closed Reel**

A Closed Reel precludes any changes to be made to any clip contained in the reel. If the reel is closed and a clip that is contained in the reel is selected, all tool modules are disabled including Marks In/Out.

#### **One to One Render**

One to One renders one source to one Deliverable at a time.

#### **One to Many Render**

One to Many renders one source to many Deliverables simultaneously. When viewed in the Render Monitor Tool, each Deliverable of the Many group will have an asterisk in front of it.

# **Cortex Application Overview**

## **The Project Manager**

The Project Manager is where you create, organize, and maintain projects, episodes, Workflows, Deliverables and Jobs. There are two project types, Advanced and Basic. The Advanced view is used for Episodic Television or Feature Films. The Basic view is used for one-off or generic transcoding jobs.

Project Manager										Database	Hardware	Log	Licensing	DCP	Tutorials	Help	About
			Nev					Assets									
garth		Episode 101		cameras		20191022_poli_101											
Hans				dailies		20190801			larry_demo		Selected		✓ Selected		✓ Select	ted	
High Fidelity				dcp													
Hollywood				dpd				REELS									
How The Light Gets In				imf_DoVi					Name	Num E	vents   Total Ru	intime					
Hunter_2398				imf_sdr					REPS_101_20180906	even 2	00:00:						
Hunter_24FPS				upres													
Hunter_2997																	
lan Testing Ice Age: Dawn of the Dinosau																	
ice Age: Dawn of the Dinosau ice_age_continental_drift	irs																
ice_age_continentai_ontt ice_age_meltdown																	
Jackie Test																	
jackie_test																	
joe_test																	
jtest_2997					New												
Kidding S2				Preview				COMPOS	ITIONS								
Kidding_S2_2997				dpx					Name			Start			ype		
kyle -									poli_ep101			00:00:00	0:00 01:04:38:1	7 🛞			
kyle_2997									poli_ep101_cn			00:00:00	01:01:34:1	s 😔			
lar_aces_11									poli_ep101_2			00:00:00	0:00 01:04:38:1	7 😣			
larry_24fps																	
larry_demo																	
Manifest																	
Manifest_s2																	
mauricio																	
mauricio_test																	
Outpost 1313 outpost_24								PROJECT	NOTES Edit								
Outpost_24 Outpost_25																	
Outpost_29																	
pack_up_your_troubles_2640																	
park_season_01																	
paul test																	
pistole																	
Pose																	
Pose_2997																	
randy2																	
randy3																	
Ratched																	

The Project Manager - Advanced View

The Project Manager is divided into several sections below.

- Assets Tab
- Find Tab
- Project Notes

### Assets Tab

The Assets Tab provides a view into the contents of each job including reels and compositions.

Assets	Find						
	Project	Episodes		Workflows		Jobs	
Search in:	dit_test_project	Selected	~	Selected	~	Selected	~
REELS							
#	Name	Num Events Total Run	time				
1	flak_dpd_nab.086400_ree	el 3 00:00:13	}				
COMPOS	ITIONS						
#		Title	Start	End	Туре		
	flak_dpd_nab.086400		01:00:00:00	01:00:33:14	⊕ .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		

#### **Find Tab**

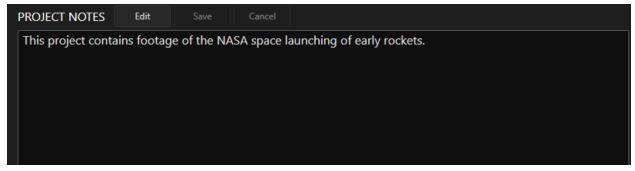
Using the Find Tab, you can search for media contained in Cortex Jobs. Enter search criteria at the top of the tab, click the Find button to return the results, and then Right-click on any clip for a Context Menu. Select clips to add to the Current or New job. Select a single clip to Go To Job or Remove the selected clip(s). Use the Show/Hide Columns to customize the view. To set <u>new</u> search criteria, press the Clear button.

																			_	_
A	ssets		Fi	nd																
		Project				Episode					Vorkflows					Jobs				
Searcl	h in:	MTI_C	ortex_D	)emo		Selec	ted		~		Selecte	ed			×	Select	ted			~
						Episo	Episode 101			Dailies				20200	212					
		File Na				Camera	Roll		Scene					Take				ound Roll		
Crite		b33	9*																	
		Fi	ind	Clea	ar	Cancel														
RESUI	LTS																			
#	I	Status	I	N	lame	I		Pictur	re				A	udio			I	Clip Start	Ι	Clip
1	Ŷ	ð 🗞	8	🔵 9D-2	(B)	B	339C005_	_111215	j_R2HX.m	100	C	0159	9026.WAV					14:53:49:11		14:50
2	Ŷ	} ⊛ ⊑	í 🏵	🔵 9D-1	(B)	B	339000	Add	Selected	Cli	ip(s) to ▸		Current J	lob	]			14:51:41:07		14:52
3		&	⇔	🔵 9D-3	(B)	B	339C00		lo Job				New Job					14:57:33:16		14:59
4	Ŷ	) 🛞 🕯	í 🏵	🔵 9A-1	(B)	B	339C00	Rem	iove			59	9022.WAV					14:32:49:00		14:35
								Show	w/Hide C	olu	imns 🕨									

To clear the Results list, click the Clear button on the lower right of the tab.

#### **Project Notes**

The Project Notes section provides for entering freestyle text relating to the project.



# **Deliverable Configuration Editor**

Clicking the New button at the top of the Deliverables column opens the Deliverable Configuration Editor. This is where you choose the various settings for each Deliverable including:

DELIVERABLES

avid\_media

prores422HQ

h.264

New

- File format
- Codec
- Bit rate
- Packaging
- Resolution
- Color properties
- Audio Mix
- Burn Windows
- Head Formatting

Project Manager				Database Hardware Log Electising DCP Totohais	нер моон
DELIVERABLE CONFIGURATION					
ENCODING					
PRESETS			Apply Dolby Vision Content Mapping	MIX PASS THROUGH NO AUDIO	
Avid Media Templates Favorites	Defaults Import		Appy Doldy Vision Content Mapping 100-nit, BT.709, BT.1886, Full, (type 1)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	0 21 22 23 24
DELIVERABLE TYPE					
Avid Media	~ • • • *	t			
NAME				] •	
Avid_4_Editorial			None v		
BIT RATE					
DNxHD 36			Channel A		
FILE FORMAT					
MXF OP Atom					
AUDIO OUTPUT			None × …		13
Embed / mux in file			✓ Apply Creative Color and Effects		
PACKAGING			✓ Repair Dead Pixels		
File per clip					
SIZING			Apply SMPTE Legal Clipping		
RESOLUTION			SOURCE DECODING QUALITY		
HD 1080p 1.77:1	🗸 🖲 MTI HQ. 🔿 MTI-Samsung		Best      Optimized      Faster		
WIDTH					
1920					
FRAMING				BURNS	
Color Tool		~			
					Create Cancel
					Curren

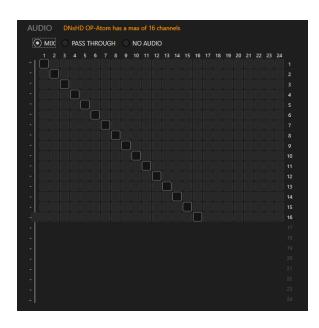
### **Codec and Color Properties**

After choosing a codec, enter the parameters for the encoding and color properties that accurately serve the Deliverable, and name it so it can be easily recognizable in the project manager page.

DELIVERABLE COM	NFIGURATION									
ENCODING presets							COL			
Avid Media Template	s Favorites	Defaults	Import				✓ A	pply Dolby Vision Content Mappi	ng	
							100	-nit, BT.709, BT.1886, Full,	(type 1)	
DELIVERABLE TYPE					PRINT STATUS		S	how v4 targets		
Avid Media				~		7				
NAME										_
Avid_4_Editorial							Nor	ne		
BIT RATE										
DNxHD 36						*				
FILE FORMAT							Cha			
MXF OP Atom						~				
							Nor	ne		
AUDIO OUTPUT										
Embed / mux in f	ile					*	🗸 A	pply Creative Color and Effects		
PACKAGING							V R	epair Dead Pixels		
File per clip			`	/						
SIZING							<b>A</b>	pply SMPTE Legal Clipping		
RESOLUTION			SIZE QUALITY							
HD 1080p 1.77:1				MTI-Samsun	a			IRCE DECODING QUALIT lest		
				ann sansan	9		0			
WIDTH										
1920										
FRAMING										
Color Tool			enter Extra	ct		<b>v</b>				
00011001			enter Extra							

#### **Audio Matrix**

The Audio section allows for each Deliverable to have its own configuration of channel assignments.



### **Burns Canvas**

The Burns Canvas provides a flexible graphical display of metadata that can be formatted to suit each user's requirements.



# **Cortex Tools - Brief Overview**

## The Copy Tool

The Copy Tool has a simple interface to create an unlimited number of Copy and Archive Tasks and concurrently run up to three at a time. Each Copy Task has a single source (for example, a camera card) and up to three target destinations. The target destinations can include a combination of internal storage, shared storage, attached storage, shuttle drives or LTFS LTO drives. Archive Tasks can have up to two target destinations, which are usually LTFS LTO drives.

Project Manager dit_test_project > Episode 101 > dpd > 20191202 ×			
SOURCE 806 Files 37.4 GB total		NAME	
V:\show05\test01\media\NAB_Demo_Media\nab_2018\dead_pixl\flaked_nab2016	~	flaked_nab	2016
DESTINATIONS ✓ PRIMARY 353 GB free of 476 GB 37.4 GB pending 316 GB remaining after copy		VOLUME NAME	
C:\	~	Local Disk	
		BARCODE	
BACKUP 1 0.0 KB free of 0.0 KB 0.0 KB pending 0.0 KB remaining after copy		VOLUME NAME	
		BARCODE	
BACKUP 2 0.0 KB free of 0.0 KB 0.0 KB pending 0.0 KB remaining after copy		VOLUME NAME	
✓ Copy to Primary first Overwrite existing files if present Import files to Clip bin after Offload		BARCODE	
наян туре			
MD5 V			
None MD5		Start Copy	Cancel
P xxHash BACKUP 1		BACKUP	2

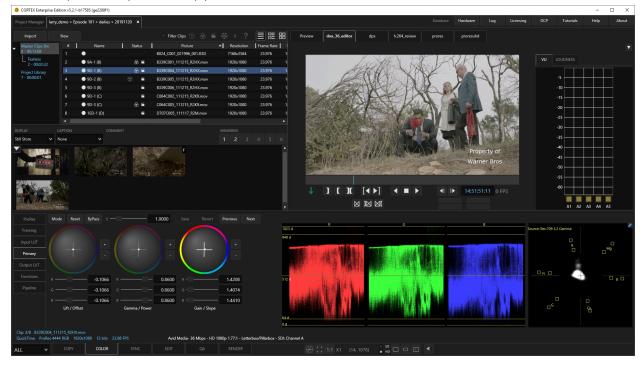
Each Task can generate optional MD5 or xxHash Checksums for verification. These checksums will be available in any Manifest file created from the job.

In addition, Cortex also offers MHL Verification (Media Hash List), which works similarly to the Copy and Archive Tasks. If a folder contains the MHL file, Cortex will validate the list against the media contained in the folder.

## The Color Tool

The Color Tool provides tabs for different image processing functions:

- Source Decoding Parameters
- Framing
- Input LUT
- Primary Color Correction
- Output LUT
- Functions includes modules for Aperture, Grain, MTI Samsung Resize settings, Dolby Vision<sup>™</sup> L1 Analysis
- Pipeline maps the color pipeline from start to end



#### **Primary Color Corrector**

Primary color correction can be operated in two modes: Lift Gamma Gain or Printer Lights. Values can be adjusted using the UI, keyboard shortcuts or a tactile panel. All values are converted to industry standard ASC CDL-SOP / Saturation. Currently, the Tangent Wave (1 & 2), Tangent Element, and Nucoda Precision panels are supported. 3rd party Stills, LUTs and CDLs can be imported via the Image Stores..

ProRes	Mode Reset	ByPass S —		1.0000	Save Revert	Previous Next
Framing						
Input LUT						
Primary						
Output LUT						
Functions		0.1066		0.8600	R -	- 1.4208
Pipeline		-0.1066		0.8600		1.4074
		-0.1066		0.8600		- 1.4410
	Lift / Offset		Gamma / Power		Gain / Slope	

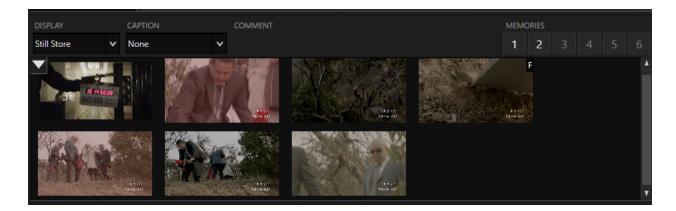
### **The Image Stores**

Source Color Space	٠
Target Color Space	٠
Hide During Play	
Channel Order	٠
Waveform Scale	٠
Monochrome Waveform	
Show Vectorscope	
Highlight Gamut Errors	

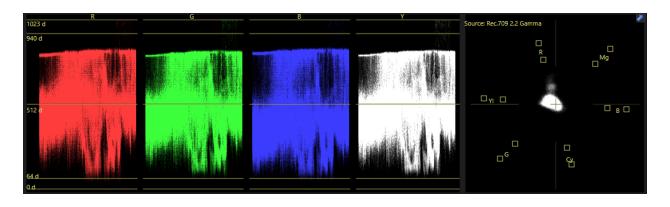
The Image Stores provide different options for capturing, importing, working with and exporting stills. There are 6 stores including:

- 1. Still Store for user captured stills
- 2. Timeline
- 3. Favorites
- 4. Imported Stills
- 5. Imported CDLs
- 6. LUTs

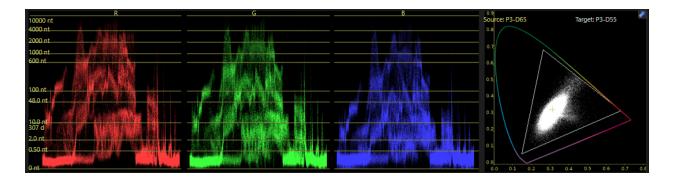
The Imported Stills, Imported CDLs and LUTs stores can be used to import industry standard files.



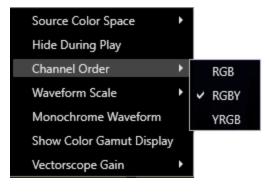
### Waveform, Vectorscope, Color Gamut Display



A waveform monitor and vectorscope provide additional feedback for color correction under different viewing conditions. The vectorscope can be replaced with a Color Gamut Display (seen below).



Right-clicking on the waveform will present a Context Menu with a variety of view options.



Source Color Space	Þ		
Target Color Space	٠		
Hide During Play			
Channel Order	٠		
Waveform Scale	۲		IRE %
Monochrome Waveform			Millivolts
Show Vectorscope			Code Value
Highlight Gamut Errors		~	Nits
			Content Mapping

### LUTs

Cortex provides a number of included LUTs ranging from simple rescaling to more complex colorspace transforms.

Input LUT	None	~
Primary	None	
Output LUT	Full_to_Legal.clf	
Functions	Legal_to_Full.clf	
	P3D55_to_rec2020_1.02.ctf	
Pipeline	P3D60_to_rec2020_1.02.ctf	
	P3D65_ST2084_1000nits_to_Rec2020_ST2084_1000nits.clf	
	P3D65_ST2084_1000nits_to_rec709_100nits.clf	
	P3D65_to_ACES_1.01.clf	
	P3D65_to_rec2020_1.02.ctf	
	P3D65_to_rec709_1.02.ctf	
	P3DCI_to_rec2020_1.02.ctf	
	P3DCITheater_to_rec709.clf	
	rec2020_ST2084_1000nits_to_rec709_100nits.clf	
	rec2020_to_ACES_1.01.clf	
	Rec2020_to_P3_clipped.clf	
	rec2020_to_P3D65_1.02.clf	
	rec2020_to_rec709_1.02.ctf	T

#### **Functions**

In addition to color correction, the Color Tool offers several image processing modules, which can be enabled clip by clip, or for compositions on a shot by shot basis.

Framing	FILM GRAIN	APERTURE	MTI-SAMSUNG	DOLBYVISION HD	r metadata			
Input LUT	Reset	ByPass			Save R	evert	Previous	Next
Primary	ENABLE 🗸	Default						
Output LUT	GRAIN SIZE		GRAIN LE	VEL LOW				
Functions	_	2.0000			5.0000			
Pipeline		50.0000			7.0000			

## The Sync Tool

The Sync tool provides an interface for synchronizing audio and picture clips as well as viewing, adding, and modifying metadata for each clip.

CORTEX Enterprise Edit	ion v5.2.1-b17853 (gbdc3bf4)					- 🗆 ×
Project Manager lar_der	no > Episode 201 > dailies > 20200402 🗙			Data	base Hardware Log Licensing	DCP Tutorials Help About
Import	New	Filter Clips 🕥 🛞 🖆 🛞 8 🤶	Preview dra36	h.264 prores422HQ		
Master Clips Bin 7 - 00:11:59			Resolution F			
Project Library			920x1080	B339_9A_1		
3 - 00:00:01	2 B339C004_111215_R		920x1080	B339_9A_1		
@ <sup>R01</sup> 1 - 00:02:53	3 B339C005_111215_R		920x1080			-5
IIIComp01	4 B339C006_111215_R		920×1080			
comport	5 0 C064C002_111215_R		920x1080			-10
	6 C064C005_111215_R 7 D707C005_111117_R		920×1080	THEESENES		-15
	7 ● D707C005_111117_R	Online D707C005_111117_R2M.mov 1	920×1080	SEL		-20 -25 -30 -35
			•			
	# SR_Sc_Tk	Audio Timecode 🛧 D			Property of	-40
	1 Ø 0159_98_1 0159023.WAV		0.01:53:11 5 14:32:59:04	B339C001_111215_R2HX.	Warner Bros	-45
	2 Ø 0159_9C_1 0159024.WAV		0.01:20:14 5 14:32:59:06	0159022.WAV		-50
	3 Ø 0159_9D_1 0159025.WAV		0.01:10:02 5			-55
	4 Ø 0159_9D_2 0159026.WAV		0:03:10:15 5			-60
	5 Ø 0159_9D_3 0159027.WAV				IIII ■ 14:32:59:04 0 FPS	
	6 ⊘ 1117_1ED_1 1117030.wav	14:59:49:17 0	0:01:26:12 4			A1 A2 A3 A4 A5
EPISODE		JMP CAMERA ROLL SCENE				
Episode 201	04/02/2020 📼 🛨 🐳	- + B339 9A	1 0159			
TAPE NAME						
B339C001_111215	24 1X 14:32:59:04		ku i	ADD		
SOUND TC FPS		*********	10 m	TO REEL		
23.976	48000 14:32:59:06	CH 1 14:32:59:04	00:00:00:02.29 14:32:59:06.30	LUC L		
		CH 1 14:52:59:04	00000002.29 14:52:59:06:50			
v						
A1	Here and the second second					
	Level of the data of the second s	, lille,, , ii. lille	ulu Indu I	1" IP' IP IP'		<u>IIIIN: Nuk</u>
Clip: 1/7 B339C001_1112 QuickTime ProRes 4444	215_R2HX.mov RGB 1920x1080 12 bits 23.98 FPS	Event: 1/1 B339C001_111215_R2HX.mov Preview - Don't Resize - SDI: Channel A				
ALL Y	COPY COLOR SYNC			(539, 600) 🔒 😼 🖬 🗖 🖬 🖬 🔹 📢		

Multiple comments for "Discrepancies" can be assigned to each clip with 4 different "Severity" ratings. Comments are included in the Cortex PDF Report along with their timecode locations. Standard ALEs, AAF, Final Cut and Cortex Manifest reports can also be exported for dailies. Severity ratings include:

ADD COMMENT	SEVERITY
14:53:57:00 - S1 - Mislated on the report	

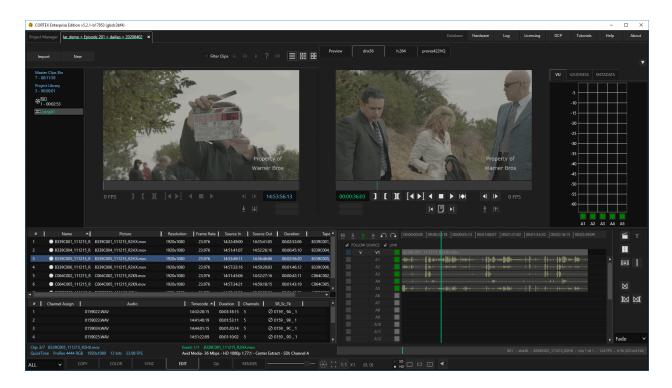
- 0. Comment Only
- 1. Severity 1
- 2. Severity 2
- 3. Severity 3

1

Comments made for clips in the Sync Tool are different from comments made in a composition, which is explained later in the Edit Tool.

## The Edit Tool

The Edit Tool in Cortex is a non-linear edit utility. Containing familiar edit functions such as Overwrite, Insert, Lift, and Extract, it can be used for a variety of reasons including on-set preview of shot assemblies, trimming sections of a rendered file, inserting or removing black between acts, replacing slates, and conforming a cuts-only CMX 3600 EDL or AAF. Three-point and drag and drop edits are supported as well as Gap and Ripple trims.



The Edit Tool is also used to assemble IMF, AS11, DPP, and DCP compositions prior to rendering.

## The QA Tool

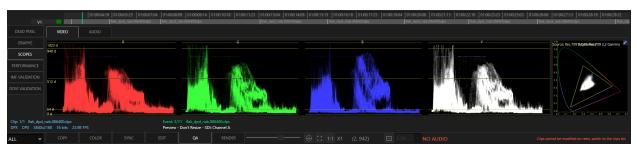
The QA Tool provides functionality for Dead Pixel Detection & Correction, Graphical Analysis of video levels for SDR, HDR, and Audio Loudness with corresponding reports that itemize discrepancies based upon user defined thresholds. The QA Tool also provides statistical feedback of hardware and software performance, validates Cortex and 3rd party IMF packages, and Dolby Vision<sup>™</sup> metadata.

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The Dead Pixel Module



The Graphs Module for Video and Audio Metrics



The Scopes Module. Also included are VU and Loudness Meters.



The Performance Module.



IMF and Dolby Vision<sup>™</sup> Metadata Validation.

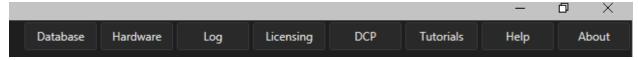
## The Render Monitor Tool

The Render Monitor Tool allows you to monitor the progress and manage the priorities of the background encoding of all Deliverables.



## **Utility Tools**

Along the top bar of Cortex are a series of utility based tools.



These utilities include the ability to select a Cortex Database, adjust hardware settings, review error and general information logs, copy your DCP certificate, link to our Cortex Tutorials, access Function and Keyboard Shortcut Help, and review information about Cortex.

## **Bins & the Media Player**

### Bins

Along the left side of the UI, the Sidebar displays the Master Clips Bin, Sub-Bins, Project Library, Reels and Compositions. Imported media is stored in the Master Clips Bin. The Project Library contains Bars, Black, and user created slates. Clips can also be added to the Project Library for easy access to media that recurs throughout the project. Sub-Bins contain clips that were copied from the Master Clips Bin though they still exist in the Master Clips Bin.

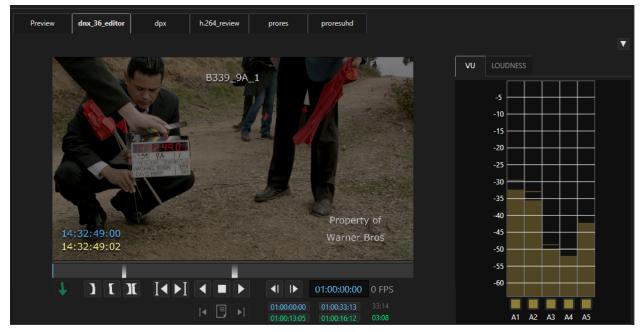
								Filter Clips				? 🗐	
Import	New												
Master Clips Bin 7 - 00:11:59		#		Name	<b>^</b>		Clip Status	•	Pict			Resolution	
Textless		1	B339				-			_R2HX.mov		1920x1080	2
2 - 00:02:55		2	B339				Online			_R2HX.mov		1920x1080	2
Project Library 3 - 00:00:01		3	• B339				Online			_R2HX.mov		1920x1080	2
		4	• B339				Online			_R2HX.mov		1920x1080	2
⊛ <sup>R01</sup> 1 - 00:02:53		5	• C064	IC002_1	11215_F	1	Online	C064C00	2_111215	_R2K9.mov		1920x1080	2
TTCortex_Comp	osition_Demo	6	C064	4C005_1	11215_F	۲.	Online	C064C00	5_111215	_R2K9.mov		1920x1080	2
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		#	SR_Sc	_Tk			Audio			Timec	ode 🔶	Duration	Chanr
			Ø 0159 _	9B_1	01	59023.WAV				14:41:4	0:19	00:01:53:11	5
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		3	Ø 0159_	9D_1	01	59025.WAV				14:51:2	2:09	00:01:10:02	5
		4	⊘ 0159_	9D_2	01	59026.WAV				14:53:4	0:07	00:03:10:15	5
		5	Ø 0159_	9D_3	01	59027.WAV				14:57:0	3:00	00:02:25:04	5
		6	⊘ 1117_	1ED_1	11	17030.wav				14:59:4	9:17	00:01:26:12	4

The Sync & Edit tools also display audio clips in their own bin.

## The Media Player

In all tools, except the Edit Tool where there are two players, a Single Media Player switches between playing source files or the composition depending on which is focused. A single click on a clip or composition event will focus and load the media ready to play.

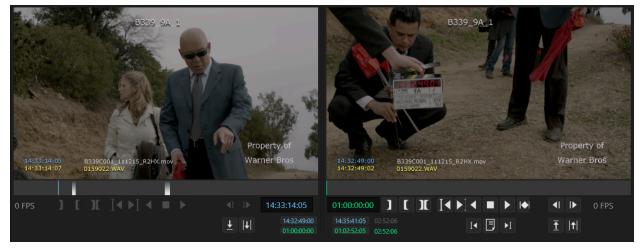
The Deliverable Tabs located above the Media Player provide the ability to select different previews of the output.



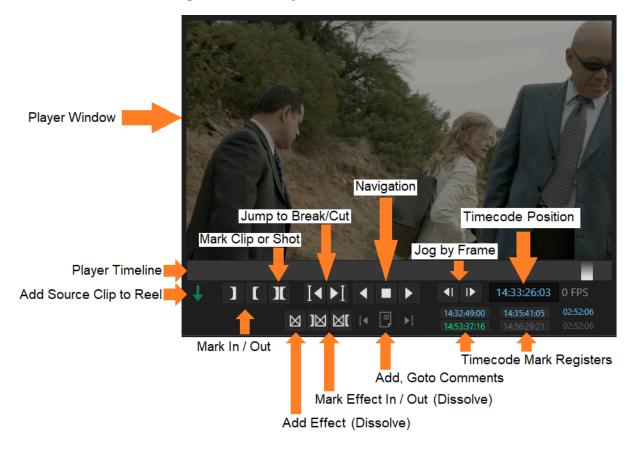
When playing a <u>source</u> clip with audio, the VU meter bars are <u>yellow</u>. When playing a <u>composition</u> with audio, the VU meter bars are <u>green</u>.

#### The Edit Tool Media Players

The Source on the left. The Composition (Record) on the right.



#### Parts of the Source Single Media Player



The Player Window is where the video portion of a clip is displayed. The aspect ratio of the display is determined by the Deliverable Configuration as explained in the <u>How to Create a Deliverable</u> <u>Configuration</u> in the Project Manager section below.

#### **Zooming the Picture**

Using the mouse, hover over the picture:

- 1. Scroll up to zoom in and down to zoom out.
- 2. Press the / key on the numberpad in every tool except the Sync Tool (where it is used to enter a picture timecode). Shift+/ to zoom out.

In either case, double click the picture to zoom out completely.

Note: This method of zooming does not affect the framing of the picture and is only for viewing.

#### **The Player Timeline**

The Player Timeline shows the full length of a source clip or composition segment. If a color dissolve(s) has been added, it appears as a shaded area on the timeline.



#### Add Source Clip to Clip Reel

If a Clip Reel has been created and a source clip is loaded in the player, pressing the Add Source Clip to Reel button will add the clip to the reel. The button is only visible when a source clip is loaded. It will only be enabled when a source clip is loaded and a Clip Reel has been created; otherwise it appears dim green.



The Mark In and Out buttons are used to mark both source and composition timecode positions.

#### Mark Clip or Segment (Shot)



The Mark Clip or Segment button is used to mark an entire source clip or a segment within two breaks in a composition. For compositions, the track that is enabled will determine the marked segment. If a video and audio track are enabled, the mark will default to the video track.

# Go to Previous/Next Clip or Break/Cut



Depending on which is focused, a clip or composition, the "Go to" buttons will either go to clips or breaks/cuts. Breaks and cuts are only found on a composition timeline. A Break reflects a cut generated by the import of an EDL or where a shot has been split by manually adding a Break. It is represented as a white vertical line. A Cut is a point at which two clips of media are joined editorially within the Cortex Edit Tool. It is represented as a black vertical line.



The three navigation buttons are, from left to right, Play Reverse, Stop, and Play Forward. Pressed once, the play speed is real time, pressed 2x doubles the speed, and press 3x sets the speed to fast forward or fast reverse.



Press once per frame either forward or reverse.

#### **Timecode Position and Mark Registers**

When a video source clip is loaded, the Timecode Position display is blue. When a composition is loaded, the timecode display is green. When an audio source clip is loaded in both the Sync or Edit tools, it will be yellow.

Source Position	Comp Position	_
14:53:49:11	00:00:00	
14:53:49:11 00:00:00:00	<b>14:56:46:06</b> 02:56:20 00:02:52:05 02:52:06	Source Duration Comp Duration
Source In Comp In	Source Out Comp Out	

Mark In and Out points are also displayed in their corresponding color. The marks, once entered, follow the clip and are displayed in the timecode mark registers whenever the clip is loaded into the player.

Left click on any register to jump to the corresponding location.

Right click on any register to copy the timecode entry.

#### Add Dissolve or Effect



The Add Effect button is used in both the Color and Edit tools. In the Color Tool, it is the Add Dissolve command. In the Edit Tool, it is referred to as the Add Effect command.

#### Mark IN Dissolve or Effect



When a Dissolve or Effect is added to a clip or composition segment, the Mark Effect IN is defaulted to the timecode position where the dissolve or effect was added. Once the dissolve or effect has been given an Mark Effect Out and, therefore, a duration, the in point can be adjusted by clicking the Mark Effect In button.

## Mark OUT Dissolve or Effect



The Mark Effect Out determines the duration of a dissolve or effect after being added. The duration can be adjusted by the Mark Effect Out as long as it does not cause an overlap of like dissolves or effects. A color dissolve and effect, however, are permitted to overlap each other.

#### Add and Go to Comments



The Add and Go to Comments array of buttons are used to create and place comments in a composition timeline for QC or other user defined purposes. The comments can be exported as a QC .pdf report. Since the Edit Tool has its own composition player, the buttons and commands are always available for use. In the other tools, the Add and Go to Comments buttons are only enabled when a composition is loaded into the player, otherwise they are dimmed.

#### Parts of the Composition Single Media Player



When in a single media player tool, the only differences between the Source and Composition Media Players are

that the composition player has a Segment Play Mode button that limits play from cut to cut within a

segment while the Source Player has an Add Source Clip to Reel button which is only available when the source player is active since only source clips can be added to a Clip Reel.

#### **Examples of Marks**

Note: When In and Out marks are present in both the source and composition timecode registers, the duration always defaults to the composition. If a timecode and/or duraton is displayed in grey, it means that the timecode and/or duration was calculated based on the other timecode registers' duration.

Source timecodes are shown in blue. Composition timecodes are shown in green.

01:00:00:00	01:00:33:13	33:14	Both the source and composition In and Out are marked, therefore the composition takes precedence.
01:00:13:05	01:00:16:12	<b>03:08</b>	
15:00:14:04	15:03:06:09	02:52:06	This represents a 3 point edit where the source Out mark is determined by the duration of the composition marks.
14:53:37:16	14:56:29:21	02:52:06	
15:00:14:04	<b>15:00:19:09</b>	<b>05:06</b>	This represents a 3 point edit where the composition Out mark is determined by the duration of the source marks.
14:53:37:16	14:53:42:21	05:06	
10:13:07:07	10:15:59:12	02:52:06	This represents a 3 point edit where the source In mark is determined by the duration of the composition marks.
01:00:00:00	01:02:52:05	02:52:06	
<b>10:14:50:09</b>	10:15:59:12	<b>01:09:04</b>	This represents a 3 point edit where the composition In mark is determined by the duration of the source marks.
01:01:43:02	01:02:52:05	01:09:04	

## Media Player Shortcut Keys

Description	Shortcut Keys
Go to Previous Clip in Master Clips Bin	E or Up Arrow when Clips Bin is focused
Go to Next Clip in Master Clips Bin	R or Down Arrow when Clips Bin is focused
Add Source Clip to Clip Reel	G
Mark In	1
Go to Mark In	Shift+I
Clear Mark In	Ctrl+l
Mark Out	0
Go to Mark Out	Shift+O
Clear Mark Out	Ctrl+O
Mark Clip or Shot	Z
Clear Mark In and Out for Source and Composition	Ctrl+Alt+I or O
Add Break	, (comma)
Clear Break	Ctrl+,
Go to Previous Break/Cut on Composition Timeline	E or Shift+S when composition is focused
Go to Next Break/Cut on Composition Timeline	R or Shift+F when composition is focused
Play Forward	V or Spacebar, VV for 2x speed, VVV for fast forward
Play from middle of clip	Shift+V
Play Reverse	X, XX for 2x speed, XXX for fast reverse
Go to middle of clip	Shift+X
Play limited to within composition segment	Ctrl+Shift+C
Stop	C or Spacebar
Jog forward by frame	F or Right Arrow
Jog reverse by frame	S or Left Arrow
Add Effect in Edit Tool or Dissolve in Color Tool	Р
Mark Effect or Dissolve In	[
Mark Effect or Dissolve Out	]

Go to beginning of Next Effect/Dissolve	Shift+[
Go to beginning of Previous Effect/Dissolve	Shift+]
Delete Effect or Dissolve	Ctrl+P while located at beginning of effect/dissolve
Add Comment to composition timeline	Ctrl+Shift+O
Go to Next Comment	Ctrl+Shift+F
Go to Previous Comment	Ctrl+Shift+S

## The Project Manager

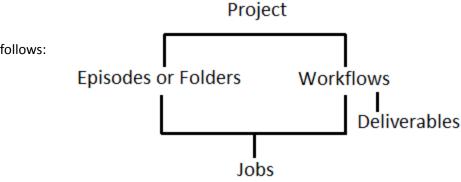
The Project Manager is the starting point for using any of the CORTEX editions. The Project Manager allows you to define and organize projects, Workflows, Workflow Deliverables and corresponding Jobs. There are two Project types, Advanced and Basic, each serving a different purpose.

### **Advanced Project**

CORTEX Enterprise Edition	/5.2.1-b1728	1 (g18	8924c)																-	
Project Manager Kidding S2			dailies > 20190905 🗙											Hardware	Log	Licensing	DCP	Tutorials	Help	About
									Edit	Assets										
AFI			kidd_s2_master_ocn2		am			20191210_96fpsTo2398												
All Rise Season 1			kidd_s2_master_ocn					20190905		Search in: Kie				Selected		✓ Selec			lected	
andrew_util			kidd_s1_test		credits			20190904						Selected		<ul> <li>Delet</li> </ul>	teu	• 56	lected	
angel_2783_WJ			Episode_210		dailies			20190903		REELS										
barry_test			Episode_209		delivery			20190830		#	Name		Num E	vents   Total i	Runtime					
barry24			Episode_208					20190829		1 kide	1_210_20190	1905 dav	62	00:53	:20					
Black Excellence			Episode_207		verify			20190828												
Black Excellence_2997			Episode_206		vfx_pulls			20190827												
Brent			Episode_205					20190826												
Buchanan Rides Alone			Episode_204					20190823												
bxcl_fiji			Episode_203					20190822												
carl_test			Episode_202					20190821												
Chingon_test			Episode 201					20190820												
Community			camera_test					20190819												
Dispatches_From_Elsewhere			All Shows			New	Edit	20190816												
edwin_2997										COMPOSITIC	าพร									
edwin_test					Preview					#	Name			Title		tart	End	Туре		
edwin_test_24					drx36_editorial						Name			litte	5	tart	End	Туре		
ENG Test					h264_dax															
Eng-ACES					jpeg															
Estuardo Test					prores422_PROMO_nocolo															
fox_upres_2018					prores422hq															
Garrick Test					prores_4444_XQ															
garth					prores_4444_dailies_master	s_no_resize														
Hans																				
High Fidelity																				
Hollywood How The Light Gets In																				
Hunter_2398																				
Hunter_2398 Hunter_24FPS										PROJECT NO	OTES									
Hunter_2997																				
lan Testing																				
Ice Age: Dawn of the Dinosau	-																			
ice_age_continental_drift																				
ice_age_meltdown																				
Jackie Test																				
jackie_test																				
joe_test																				
jtest_2997																				
Kidding S2																				
	_	'																		

Cortex's Advanced project manager is divided into 5 main sections as follows:

- 1. Projects
- 2. Episodes or Folders determined by the project type, either Episodic or Monolithic.
- 3. Workflows
- 4. Deliverables
- 5. Jobs

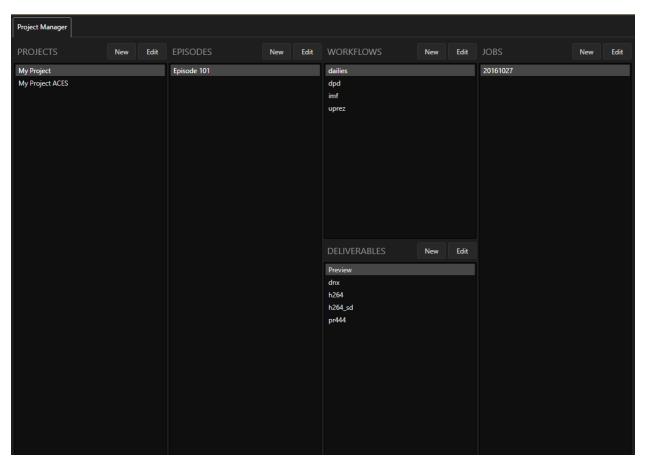


The Project hierarchy is as follows:

A Cortex Advanced Project normally corresponds to a TV show (Episodic) or Feature film (Monolithic). Projects can contain one or more Episodes for TV shows, or Folders for Feature films.

Each Advanced Project can contain one or more Workflows. A Workflow is a collection of Deliverables intended to be rendered for a specific stage of post production. For example, a Workflow called "Dailies" could possibly contain editorial, studio review, and mezzanine Deliverables, whereas a "Final Delivery" Workflow could contain Deliverable files such as an IMF or DCP.

Jobs are created under a combination of a Project, Episode/Folder, and Workflow. When a Job is ready to render, the render dialog will present the Deliverables associated with the Workflow as the first option. However, within any Job, all Workflows and their Deliverables are accessible as render options.

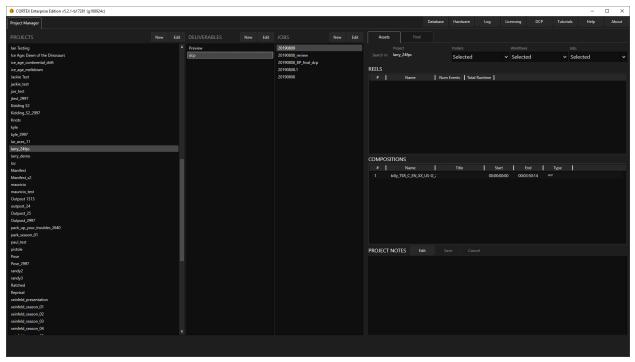


"My Project" has one Episode and four different Workflows. Each Workflow consists of a unique set of Deliverables. In the case of "dailies", there are five Deliverables including the "Preview" default, which will be explained in the <u>How to Create a Deliverable Configuration</u> section below.

## **Basic Project**

A Basic Project contains 3 main sections:

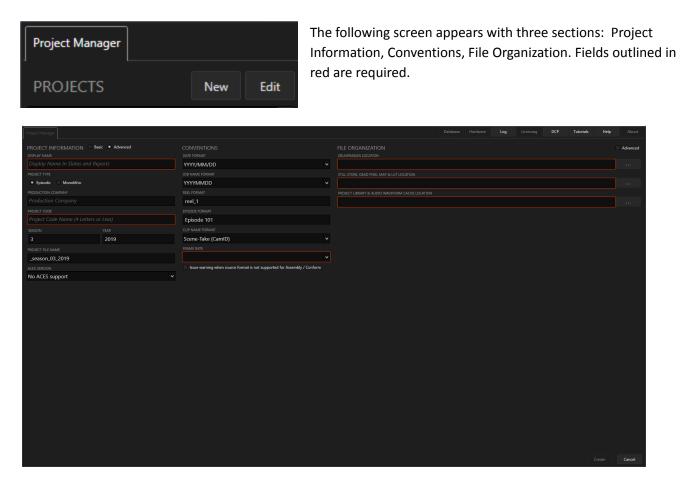
- 1. Projects
- 2. Deliverables
- 3. Jobs



The Basic Project is used for simple, straight-forward file rendering, for example, IMFs and DCPs.

## **Creating a Project**

In the Project Manager tab, click the New button.



#### Choose your Project Type, Basic or Advanced.

Project Manager									
PROJECT INFORMATION Bas	ic   Advanced								
Display Name In Slates and Reports									
PROJECT TYPE									
Episodic OMonolithic									
PRODUCTION COMPANY									
PROJECT CODE									
Project Code Name (4 Letters or									
SEASON									
3	2019								
PROJECT FILE NAME									
_season_03_2019									
ACES VERSION									
No ACES support	~								

#### **Advanced Project Information**

- 1. Use the Display Name field to enter the name of your project
- Select the appropriate PROJECT TYPE: Episodic or Monolithic. If you choose Episodic, two additional fields appear below the Project Code: "Season" & "Year"
- 3. Enter the PRODUCTION COMPANY
- 4. Enter a PROJECT CODE (nickname)
- 5. For Episodic, enter SEASON number & YEAR
- 6. Based on the Project Code, a PROJECT FILE NAME will be created automatically
- Determine whether the project will support ACES color space. An ACES project impacts the types of color space choices available for Deliverables and Color Tool options

PROJECT INFORMATION DISPLAY NAME	Basic	Advanced	
My Project			
PROJECT TYPE			
Episodic O Monolithic			
PRODUCTION COMPANY			
MTI Film			
PROJECT CODE			
proj			
SEASON		YEAR	
1		2019	
PROJECT FILE NAME			
proj_season_01_2019			
ACES VERSION			
No ACES support			¥

#### Conventions

Cortex provides for default values to be entered into various fields throughout the application.

- 1. DATE FORMAT. In this field choose the date format that will be used throughout the application
- 2. JOB NAME FORMAT. This field determines how your Jobs will be named initially.
- 3. REEL FORMAT. Enter the desired formatting for when reels are created. If ending in a number, it will auto-increment per reel.
- 4. EPISODE FORMAT. For episodic job types, enter the desired formatting. If ending in a number, it will auto-increment per episode.
- 5. CLIP NAME FORMAT. Editors have preferences as to how their clips will be named in their bins. A variety of options are provided.
- 6. FRAME RATE. Enter the frame rate for the project. When enabled in the reel creation dialog, an

ATE FORMAT YYYY/MM/DD  IOB NAME FORMAT YYYYMMDD  REEL FORMAT reel_1 Episode FORMAT Episode 101 CLIP NAME FORMAT Scene-Take (CamID)  RAME FORMAT FRAME RATE		
YYYY/MM/DD   IOB NAME FORMAT  YYYYMMDD   REEL FORMAT  reel_1  Episode FORMAT  Episode 101  CLIP NAME FORMAT  Scene-Take (CamID)  RAME FARME RATE	CONVENTIONS	
INDE NAME FORMAT YYYYMMDD  REEL FORMAT reel_1 Episode FORMAT Episode 101 CLIP NAME FORMAT Scene-Take (CamID)  FRAME RATE	DATE FORMAT	
YYYYMMDD        REEL FORMAT        reel_1        Episode FORMAT        Episode 101        CLIP NAME FORMAT        Scene-Take (CamID)        FRAME RATE	YYYY/MM/DD	۷
REEL FORMAT reel_1 EPISODE FORMAT EDISODE 101 CLIP NAME FORMAT Scene-Take (CamID) FRAME RATE	JOB NAME FORMAT	
reel_1 EPISODE FORMAT Episode 101 CLIP NAME FORMAT Scene-Take (CamID) FRAME RATE	YYYYMMDD	~
EPISODE FORMAT EDISODE 101 CLIP NAME FORMAT Scene-Take (CamID) FRAME RATE	REEL FORMAT	
Episode 101 CLIP NAME FORMAT Scene-Take (CamID) FRAME RATE	reel_1	
CLIP NAME FORMAT Scene-Take (CamID)	EPISODE FORMAT	
Scene-Take (CamID)	Episode 101	
FRAME RATE	CLIP NAME FORMAT	
	Scene-Take (CamID)	~
23.976 fps 🗸 🗸	FRAME RATE	
	23.976 fps	~

optional warning appears when adding clips to reels that do not match the project frame rate. For example, if a 30 fps file is added to a 23.976 reel and the warning has been disabled, the result would be a file that plays back 25% slower than the original.

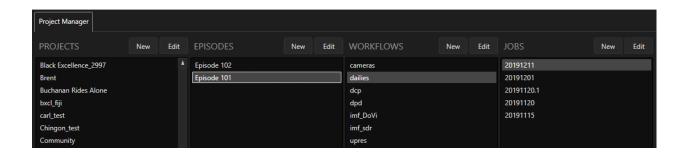
### **File Organization**

FILE ORGANIZATION	Advanced
DELIVERABLES LOCATION	
V:\t1\cortex\deliverables	
STILL STORE, DEAD PIXEL MAP & LUT LOCATION	
V:\t1\cortex\stills_and_luts	
PROJECT LIBRARY LOCATION	
V:\t1\cortex	

The File Organization determines where you want your renders, Stills, LUTS, and Dead Pixel Maps to be created. The Advanced checkbox allows you to alter the Deliverables directory paths if desired.

Once you've finished entering all the Project information, click the Create button at the bottom right of the screen.

## **Creating Episodes, Workflows and Deliverables**



#### **Episodes or Folders**

For Advanced projects, the second section header will be either Episodes or Folders depending on the chosen project type.

If the EPISODE/FOLDER NAME default ends in a number, the number will auto-increment each new episode/folder.

The TITLE or DESCRIPTION and PRODUCTION NUMBER fields are available as burn-ins (discussed later in the Deliverables section) and can be added to Deliverables or slates.

The INTERNAL JOB NUMBER is for reference only.

The FILE NAME reflects the folder that will be created as part of the directory path into which Deliverables will be rendered.

EPISODES	N	ew	Edit							
EPISODE / FOLDER NAM	E									
Episode 102										
TITLE OR DESCRIPTION										
The Title for ep 102										
PRODUCTION NUMBER										
tv102	tv102									
INTERNAL JOB NUMBER										
wo5555										
FILE NAME										
episode_102										
	Save	Ca	ancel							

#### Workflows

A Workflow represents a stage of the Project's post production process and is a collection of specific Deliverables that pertain to it.

Enter the Workflow Name and, if desired, a description.

To use the default Burn-in for the Preview Deliverable, enable the checkbox.

WORKFLOWS		New	Edit
WORKFLOW NAME			
delivery			
DESCRIPTION Ad	d Default	Burn-Ins	to Preview
	Creat	e	Cancel

#### Deliverables

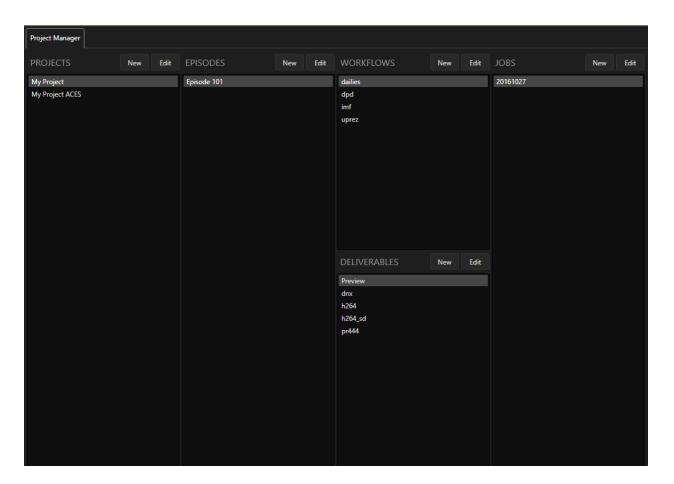
A Deliverable is associated with a Workflow and consists of a configuration of codec parameters that satisfies a specific delivery purpose, such as a H.264 file for customer review. The Preview Deliverable is used for viewing only and is created using basic properties, which can be modified if desired.

DELIVERABLES	New	Edit
Preview		
dnx_36_editor		
h.264_review		
prores		

## How to Create a Deliverable Configuration

#### **Deliverable Configuration Editor**

The Configuration Editor is divided into four basic sections: Encoding, Color, Audio, and Burns Canvas.



#### **The Preview Deliverable**

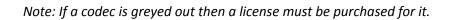
The Preview Deliverable is automatically created for each Workflow with default properties, which include

No Resize for picture, Pass Through for sound, and a standard set of graphical burn-ins if the Workflow checkbox for the burn-ins is enabled. It is designed to preview picture and sound as recorded. You can modify the Preview, but it can not be deleted or used for rendering.

WORKFLOWS	New	Edit	
WORKFLOW NAME			
dailies			
DESCRIPTION 🖌 Add	d Default I	Burn-Ins	to Preview
	Create		Cancel

#### **Encoding Section**

In the Encoding section, all fields required for profiling and formatting the file are available.



Project Manager				C	Database	Hardware	Log	Licensing	DCP	Tutorials	Help	About
DELIVERABLE CONFIGURATION												
ENCODING												
PRESETS					AUDI			is a max of 16 ch				
Avid Media Templates Favorites E	Defaults Import		Apply Dolby Vision Content Mapping					NO AUDIO 9 10 11 12	13 14 15 16	i 17 18 19 20	21 22 23 3	54
DELIVERABLE TYPE												
Avid Media	<ul> <li>Ø</li> </ul>	*										
NAME												
dnx_36_editor			None 🖌									
BIT RATE												
DNxHD 36			Channel A 🗸					íonnn				
FILE FORMAT												
MXF OP Atom			soi.ut None v									
AUDIO OUTPUT			None Y									
Embed / mux in file			✓ Apply Creative Color and Effects									15
PACKAGING			✓ Repair Dead Pixels							ío_ i		
File per clip			Apply SMPTE Legal Clipping									18 19
SIZING												
RESOLUTION	RESIZE QUALITY  MTI HQ MTI-Samsung											
HD 1080p 1.77:1	HEIGHT		Best   Optimized Faster									23 24
1920												
					BURN	4S						
FRAMING	METHOD							LSSS_TV				
Color Tool	<ul> <li>Letterbox/Pillarbox</li> </ul>											
					12:54	SERIC SEAUD						

ENCODIN	G						
PRESETS							
Avid Media	Templates	Favorites	Defaul	ts Impo	rt		
DELIVERABLE T							
Avid Medi	a					<b>~</b> [	
NAME							
dnx_36_e	ditor						
BIT RATE							
DNxHD 3	6						~
FILE FORMAT							
MXF OP A	tom						~
AUDIO OUTPU							~
Embed / r	nux în file						*
PACKAGING							
File per cl	ip				*		
SIZING							
RESOLUTION				RESIZE QUALI	ТҮ		
HD 1080p	1.77:1		~	MTI HQ		Samsung	
WIDTH				HEIGHT			
1920				1080			
FRAMING				METHOD			
Color Too			~	Letterbox	/Pillar	oox	~

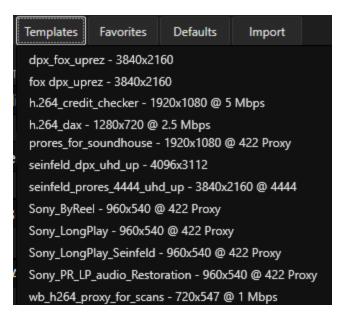
#### Presets

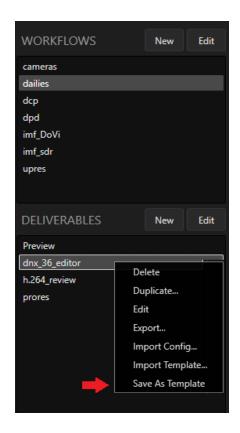
At the top of the Encoding Section are the Presets Drop-down buttons. The first button will be named and contain a quick view of the codecs last created for the selected "Deliverable Type".

PRESETS										
Avid Media	Templates	Favorites	Defaults	Import						
dnx175x_pr	dnx175x_promo - 1920x1080 @ 175 Mbps									
dnx36 19	20x1080 @ 3	6 Mbps								
dnx36_edit	- 1920x1080	@ 36 Mbps								
dnx36_edite	orial - 1920x1	080 @ 36 Mb	ps							
dnx36_edite	orial 1920x	1080 @ 36 MI	ops							
dnx36_edite	orial_911 - 19	20x1080 @ 36	o Mbps							
dnx36_edite	orial_fit_heigh	t_1.46matte -	1920x1080 @	36 Mbps						
dnx36_pass	through_clea	n - 1920x1080	) @ 36 Mbps							
dnx36_pass	dnx36_passthrough_clean_V2 - 1920x1080 @ 36 Mbps									
dnx36_sdr_	dnx36_sdr_1920x1080_2.2matte_fit_width - 1920x1080 @ 36 Mbps									
DNxHD - 19	920x1080 @ 3	36 Mbps								

#### **Templates**

The Templates list is created by Right-clicking on a Deliverable in the Deliverables section and choosing "Save As Template" in the Context Menu. Other options include Exporting and Renaming Templates.





#### **Favorites**

Favorites consists of a list of user defined configurations tagged as "Favorite" from the Templates list. Right-click on the Template configuration and choose "Add to Favorites".

#### Defaults

The Defaults provide a quick view of the most frequently used output codecs.

PRESETS			,			• MIX •	PA
DNxHD	Favorites	Tem	plates	Defaults	Import	1 2 3	4
NAME				AS-02 JPEC	G 2000 - 1920	x1080	
DNX36-E	ditor			Blu-Ray (H	.264) - 1920x:	1080 @ 30 Mbps	
FNCODIN	c			Blu-Ray (N	IPEG-2) - 1920	0x1080 @ 35 Mbps	5
ENCODIN	9				Wave - 1920x		
DELIVERABLE T	TYPE				- 1920x1080 (		
DNxHD					.920x1080 @		
				-	on JPEG 2000	- 1920x1080	
BIT RATE				DPX - 1920			
DNxHD 36					- 1920x1080		
FILE FORMAT				EXR - 1920	x480 @ 6 Mb <sub>i</sub> w1080	ps	
Mxf					,x1080 80x720 @ 2.5	Mbos	
					20x1080 @ 5	•	
AUDIO OUTPUT						80 @ 80 Mbps	
Embed / m	nux in file			IMF - 3840			
PACKAGING				IMF Dolby	Vision - 1920	x1080	c
File per cli	D			IMF Netflix	a - 3840x2160		Ì
riie per eii	٢			IMF Sony -	3840x2160		
SIZING				JPEG - 192	0x1080		
RESOLUTION			RESIZE	JPEG 2000	- 1920x1080		
HD 1080p	)	~	MTI		352x240 @ 0.		
				MPEG-2 - :	1920x1080 @		
WIDTH			HEIGHT		G - 1920x108(		
1920			108(		920x1080 @ 3	35 Mbps	
FRAMING			METHO	TIFF - 1920			
Original C	lin	~		AAVC - 20-	48x1080 @ 10		
Original C	μþ	v	Anar	XUCAM - J	1440x1080 @	25 Mbps	

Import Import Config... Import Template...

#### Import

The Import button provides the option to import a configuration or template that was exported from a Cortex workstation not attached to the current database.

#### Encoding

Fill in the fields as indicated:

**DELIVERABLE TYPE.** Select the Deliverable Type from the Drop-down list. The Deliverable Type determines the available encoding options.

**NAME.** Enter the name you wish to associate with the Deliverable. For example, DNx36\_Editor would indicate that the Deliverable is intended for the edit room.

DELIVERABLE TYPE	PRINT STATUS		DELIVERABLE TYPE				PRINT STATUS	s
Avid Media	✓ ○ Ø ·	★	IMF Netflix				~ • Ø	$\star$
NAME			NAME					
DNx36_Editor			IMF_4_Netflix					
BIT RATE			DELIVERY TYPE					
DNxHD 36		~	4K/UHD Dolby Vision HDR					~
FILE FORMAT			MODE				COLORSPACE	
MXF OP Atom		~	Lossy			~	RGB 12 bit	~
			OPERATIONAL PATTERN					
Embed / mux in file		*	OP-1a			×	Advanced	
PACKAGING			BIT RATE				UNITS	
File per clip	~		800				Mbps	~
SIZING			SIZING					
RESOLUTION	RESIZE QUALITY		RESOLUTION		RESIZE QUALITY			
HD 1080p 1.77:1	🗸 🖲 MTI HQ 🔿 MTI-Samsung		UHD 2160p 1.77:1	~	<ul> <li>мті но</li> </ul>	MTI	I-Samsung	
			WIDTH					
			3840					
FRAMING	METHOD		FRAMING		METHOD			
Color Tool	<ul> <li>Center Extract</li> </ul>	*	Original Clip	۷	Center Extra	act		~

DNx36 encoding options

UHD IMF Netflix HDR encoding options

#### Sizing

In the Sizing section choose the RESOLUTION, RESIZE QUALITY, FRAMING, and framing METHOD. The choices for resolution are determined by the selected codec. If "Don't Resize" is selected for resolution, the Resize Quality, Framing, and Method fields will be hidden. For Resize Quality, MTI HQ comes standard in Cortex. MTI-Samsung is included with Enterprise only.

SIZING			
RESOLUTION		RESIZE QUALITY	
UHD 2160p 1.77:1	~	💿 MTI HQ 🔵 MTI-Samsung	
WIDTH		HEIGHT	
3840			
FRAMING		METHOD	
Original Clip	۷	Center Extract	¥

#### MTI HQ

MTI HQ provides a high quality up and down rescaler that can be used for projects requiring faster and higher throughput. MTI HQ can be used on frame and field-based media.

#### MTI-Samsung

MTI-Samsung is a frame-based rescaler that produces high quality results that requires more time for processing. MTI-Samsung has proven very successful for animation projects and is the preferred rescaler by several content owners. MTI-Samsung only works with frame-based media.

#### Framing

There are two choices to decide which framing settings will be used during the resizing of the Deliverable.

- 1. Original clip If no change to the input framing is desired, choose this option. Cortex will resize the media for this Deliverable based on the original frame size and aspect ratio of the source clip.
- Color Tool This option allows use of the framing module in the Color Tool, which provides the ability to modify framing with Zoom, Vertical and Horizontal positioning, Flip for both horizontal and vertical directions, and Aspect.
  - a. For Quibi projects, rotation is provided for clockwise and counterclockwise positioning.

#### Method

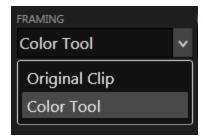
There are six choices for the method by which Cortex will resize media for a Deliverable:

- 1. Center Extract Cortex will extract an image based upon the Deliverable's aspect ratio using the source's center point.
- 2. Anamorphic Cortex will compress or stretch the image to match the desired new Deliverable size.
- 3. Letterbox/Pillarbox Cortex will add letterbox or pillarbox bars to the image to compensate if necessary for the new Deliverable size. This choice never crops the image.
- 4. Fit Width uses the sides of the source image and fits them to the Deliverable's sides
- 5. Fit Height uses the top and bottom of the source image and fits them to the Deliverable's top and bottom.
- 6. Crop (1:1) will calculate a horizontal and vertical pixel count in order to present a pixel to pixel view based upon the resolution of the target monitor's viewing area.

#### Method Example:

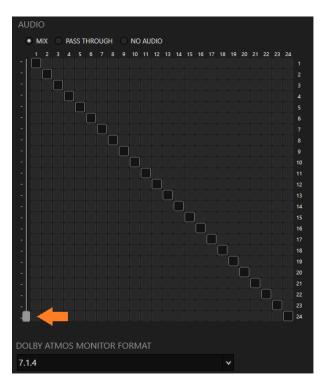
An example of how to use the framing Method to properly frame an anamorphic 2:39 image into a Deliverable with a 1:78 aspect ratio is to choose the Letterbox option. Cortex will automatically frame the picture into the 1:78 canvas within a letterbox with black on the top and bottom. Framing and Method are interactive so it is important to experiment with different combinations of source and Deliverable aspect ratios to fully understand the process of making correct choices.

#### METHOD Center Extract Center Extract Anamorphic Letterbox/Pillarbox Fit Width Fit Height Crop (1:1)



#### Audio

The audio for each Deliverable can be configured uniquely. The Audio Mixer is a 24 by 24 matrix of Source Audio tracks along the top and Destination Audio tracks along the right-hand side. There are 3 available modes:



- Mix In Mix mode all channels are available. Use the handle located at the bottom left to eliminate or add tracks by sliding it up or down, or click on the track buttons you wish to silence.
- 2. Pass Through Pass Through will pass the audio to the Deliverable as it was recorded on the source.
- 3. No Audio No Audio will pass silence.

Once the Deliverable is fully configured, click the Create button located on the lower right.

#### Dolby Atmos®

If your Cortex Enterprise edition is licensed for the Dolby Vision<sup>™</sup> option, it will also be licensed for Dolby Atmos<sup>®</sup>. There are three Dolby Atmos<sup>®</sup> file types, all of which contain a series of potential Monitor Formats. The ADM BWF is essentially a broadcast wave file with Atmos metadata. The IAB MXF file is the Atmos bitstream wrapped in a MXF file, which is currently used for IMF creation. The DAMF is the Dolby Atmos<sup>®</sup> Master Format,

DOLBY ATMOS MONITOR FORMAT	
Stereo	~
5.1	
7.1	
7.1.4	
Stereo	

consisting of 3 files. The one used for import is the .atmos file. Depending on the chosen Deliverable Type, a Monitor Format, derived from the file, can be assigned to it. Be careful to choose the Monitor Format that conforms to the number of channels the Deliverable Type supports.

For certain Deliverables, like an IMF, the Atmos file is simply passed through without the ability to configure it.

#### **Color Section**

The Color Section contains fields that impact the color pipeline of a Deliverable.

If the project is created with "No ACES Support", there's a choice for applying Dolby Vision<sup>™</sup> content mapping for compositions containing Dolby Vision metadata, two LUT options and three color utility checkboxes.

COLOR			
Apply Dolby Vision Content Mapping			
100-nit, BT.709, BT.1886, Full, (type	1)		×
Show v4 targets			
DELIVERABLE LUT			
None	~		
Show LUTs from current job only			
sdi Channel A			
None	~		
Show LUTs from current job only			
✓ Apply Creative Color and Effects			
✓ Repair Dead Pixels			
Apply SMPTE Legal Clipping			

#### **Deliverable LUT**

Apply a specific LUT that only affects the Deliverable's color pipeline.

#### **SDI LUT**

Apply a LUT to the SDI color pipeline without affecting the color of the Deliverable.

#### **SDI Channel**

Assign an SDI Channel for video output. Cortex offers two SDI channels allowing for simultaneous streaming of two different deliverables such as Dolby Vision HDR and SDR signals. Note that this only works in concurrence with a video card with two SDI channels, such as a Aja Kona 5.

#### **Apply Creative Color Correction**

Enable this checkbox if you wish to render color decisions made in the Color Tool.

#### **Repair Dead Pixels**

For jobs where Dead Pixel Detection was processed, enable this checkbox to apply the corrections.

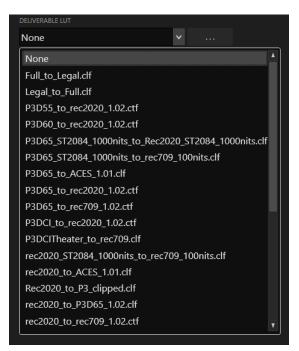
#### **Apply SMPTE Legal Clipping**

With this checkbox enabled, white and black values will be clipped to absolute SMPTE legal levels.

Note: Dead Pixel <u>Correction</u> is only available in the Enterprise edition of Cortex. QC and Dailies can detect dead pixels in both clips and compositions, but cannot render corrections. Cortex DIT and Cortex DIT+ can detect dead pixels in source clips only.

#### Included LUTs

Cortex provides more than 25 different LUTs and color transforms.



#### ACES

If the project is created with ACES Support, the ACES Colorspace and Output Device Transform fields are provided.

Cortex supports ACES versions 1.0 and 1.1 and all standard ACES Output Transforms.

COLOR			
ACES COLOR SPACE			
ACEScc			*
OUTPUT DEVICE TRANSFORM			
ACES 1.0 Output - Rec.709			~
Apply Dolby Vision Content Mapping			
None	*		
SDI CHANNEL			
Channel A 💙			
None	*		
✓ Apply Creative Color and Effects			
✓ Repair Dead Pixels			
Apply SMPTE Legal Clipping			

#### Working with the Burns Canvas for Metadata

Font	Backgro	Shac	low	Flas		Matte												
							OPACITY					Ψ#	ш	##				
<ul> <li>Project</li> <li>Job</li> <li>Reel</li> <li>Clip</li> <li>Counters</li> <li>Custom</li> </ul>																		
HEAD FORMAT								Head Sla	ite					Burns /	Overlay	Wild Trac	k Slate	
	30 No tone	60	1KHz@-2	20dB	× 10	No tone	<b>~</b> 10	No tone	`	· 10	No tor	ne	*					

- Project
- Job
- Reel
- Clip
- Counters

Clip Audio TC Clip Audio Aux TC Clip Picture TC Clip Abs TC Clip Abs Frame Count Clip Abs Feet Plus Frames Reel Record TC Reel Record 24 TC Reel Record 25 TC Reel Record 30 ND TC Reel Record 30 DF TC To access the Burn Canvas, click the small BURN alias in the lower right corner. The canvas will go to full screen.

If a Job is open and a source clip is selected, the picture will show up on the canvas. You can then use the SIZING METHOD drop-down field located on the lower right of the UI to select a framing method.

Most of the metadata fields available throughout the Cortex application can be "burned in" using the character sets available on the Canvas. Each Category, for example Counters, has a unique set of metadata burn-ins that can be placed onto the canvas. Click on the triangle immediately to the left of the Category to display the complete list.

To place a burn-in onto the canvas, left click on it and drag it to the desired position on the Canvas.

There are a number of ways to change the properties of a burn-in. The properties are as follows:

- 1. Font
- 2. Background
- 3. Shadow
- 4. Flash
- 5. Matte

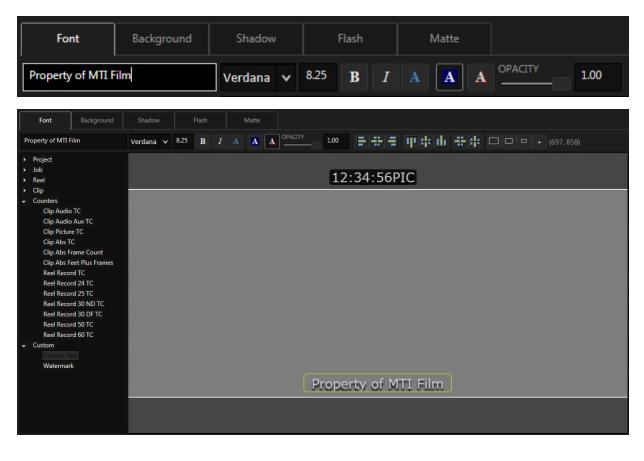


Once a burn-in is positioned on the canvas and selected (indicated by a yellow border) its properties can be modified. You can select one or more metadata burns to modify but at least one must be selected to affect a change.

#### Font

The Font tab contains variables such as style and size. It also has the ability to quickly add Background and Shadow properties with default values.

Dragging a "Custom Text" burn-in from the "Custom" category and typing into the text field will populate the burn-in with the entered text.

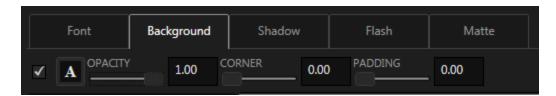


Use the alignment controls for centering and spacing horizontally and vertically.



For complete control of all variables of the burn-in property choose its corresponding tab:

#### Background



The Background property tab includes the following variables:

- 1. Color Click the "A" button to open a color selection window.
- 2. Opacity
- 3. Corner from angular to rounded.
- 4. Padding the vertical size of the background.

#### Shadow



The Shadow property tab includes the following variables:

- 1. Color click the button to open a color selection window.
- 2. Opacity use the slider to determine the transparency of the shadow
- 3. Blur the degree the shadow is blurred
- 4. Depth the distance from the font at which the shadow is applied
- 5. Angle the position of the shadow relative to the font

#### Flash

The Flash property tab controls the visibility of the burn-in. There are four possible visibility choices, each with a default duration, which can be adjusted.

Font	Background	Shadow	Flash		Matte	
✓ Interval	V DELAY (SEC)	<b>0.00</b>	RATION (SEC)	5.00	INTERVAL (MIN)	1.00

- 1. Head will flash at the head from the first frame of picture
- 2. Head and Tail will flash at the head from the first frame of picture, and at the tail beginning at the frame calculated by the last frame of picture minus the assigned Duration.
- 3. Interval will flash at the first frame of picture offset by the Delay value (default is 0 so it will be visible at the first frame of the clip); it will cut on and remain visible for the Duration, which defaults to 5 seconds, at intervals defined by the assigned value, which defaults to 1 minute.
- 4. Tail will flash at the tail beginning at the frame calculated by the last frame of picture minus the assigned Duration.

#### Matte

The Matte property tab provides the ability to superimpose a graphical display of popular and custom aspect ratios with controls for transparency and whether to add a line at the matte edge.

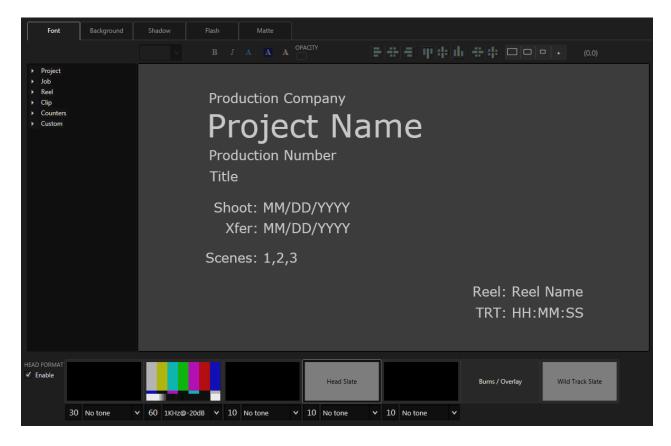
Project Manager	Database Hardware Log Licensing	
		Head
	Studiow Rash Matte	
✓ OPACITY 50% ✓ ASPECT	RATIO Custom v 2,40 V Add Matte Line BLACK LEVEL Full - 0 v	
<ul> <li>▶ Project</li> <li>▶ Job</li> </ul>		
Reel	12:34:56PIC	
Clip     Counters		
Custom Custom Text		
Watermark		
	Property of MTI Film	
HEAD FORMAT	Head State Burns / Overlay Wild Track State	
30 No tone	v         60         1KHz@-2DdB         v         10         No tone         v         10         No tone         v	

#### Format

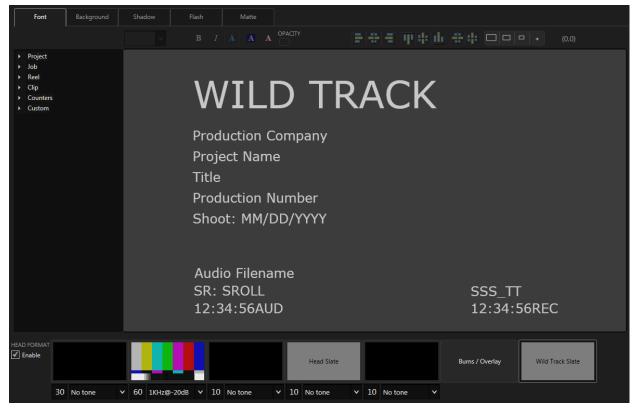
For reels that are comprised of a single file (i.e. DVD), head formatting is often desired including bars, black, and slate. Enable the Head Format checkbox to define the duration of each segment by entering a value, in seconds, for each. To bypass a segment, enter 0.



The Head Slate has a default configuration of burn-ins, which can be modified as desired.



The Wild Track Slate has a default configuration, which can be modified as desired.



Changing the Background Color or Importing a Background Image for Slates

Font	Background	Shadow	Flash	Matte	
	o (	ORNER		SLATE	BACKGROUND COLOR 👬 SLATE BACKGROUND IMAGE 🔤

The Slate Background Color or Background Image can be changed by clicking their associated icon button. Clicking the Background Color button will open a color palette. Clicking the Background Image will open a browser for the image selection.

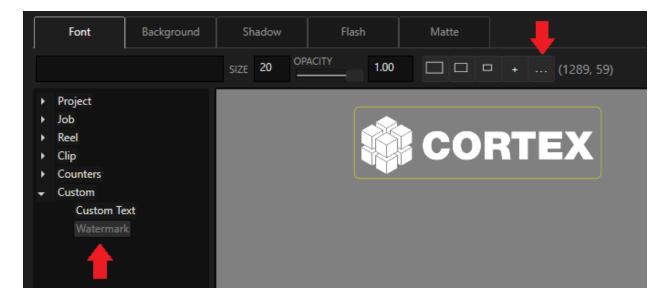
Color × Basic colors:

Click on the Burns/Overlay button to return to the current canvas configuration.

#### **Adding a Watermark Graphic**

To add a graphic, such as a logo:

- 1. Click on the Watermark option under the Custom category.
- 2. Drag it onto the canvas. It will appear as the Cortex logo.
- 3. Click the ... browse button on the Font tab. A browser window will open.
- 4. Choose your graphic file and click Open.
- 5. The Cortex Logo will change to your chosen graphic.

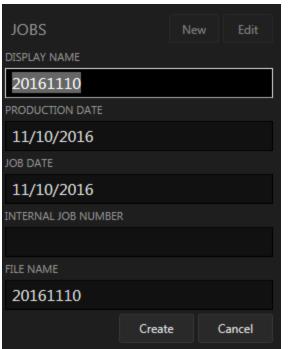


Once all the burns are in place and finalized, click the OK button on the lower right of the UI to save the layout.

## **Creating a Job**

In the Jobs section of the project manager, click the New button

JOBS	New	Edit



By default, a name is automatically created based upon the project convention default. You may change it to anything you wish.

Fill in the remaining fields as desired.

The FILE NAME folder for this Job will be automatically created based upon the Display Name and will be part of the Deliverable directory path.

Click Create and the new job will be loaded.

## Workspaces

A Workspace determines the visibility and behavior of the tools necessary to perform functions related to the three major post-production tasks served by Cortex: Dailies, Editorial and Quality Control.

The workspaces can be found in the bottom left corner of the application in a drop-down menu where you can choose one of four options: ALL, DAILIES, EDITORIAL, and QC.

ALL	1					
DAILIES						
EDITORIAL	5_111215_R2K9.mov	,				
QC	-	1080 12 bits 23.9	98 FPS	Preview -	Don't Resize - SDI:	Channel B
ALL 🖌	СОРУ	COLOR	SYNC	EDIT	QA	RENDER

Cortex is comprised of 6 tools: COPY, COLOR, SYNC, EDIT, QA, and RENDER. Depending on which edition you are currently running, certain tools and functions may be limited or restricted. The following information is based on the Enterprise Edition, wherein all the tools, functions and rendering options are included. For a comprehensive look at which tools and functions are included in each Edition, please refer to the Cortex Editions page of the manual. <u>Cortex Editions</u>

### ALL



The All workspace enables the complete toolset in Cortex, making any task or function available to the operator. When in the Copy tool, you can choose one of three new tasks: Archive, Copy and MHL Verification. When in the Color, Sync, Edit, QA and Render Monitor Tools you can choose to create new reels in order to start a queue for file transcoding. When in the Edit Tool, you can create a variety of compositions, including DCP, IMF, and AS-11. Each composition has its own creation dialog that assists in determining the properties associated with the composition. As explained later, when in Hybrid Mode, The Color Tool can also create compositions.

# Dailies

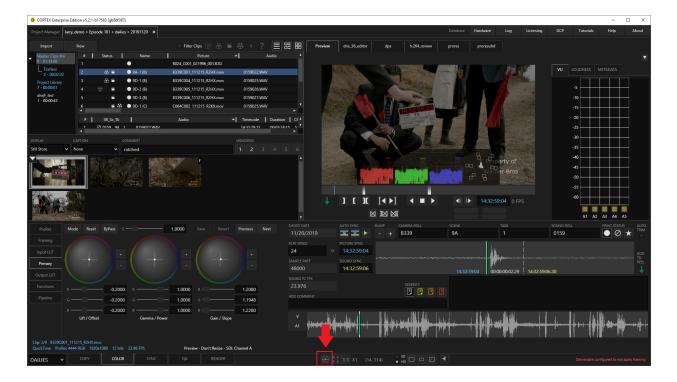


The Dailies Workspace hides the Edit Tool, leaving only the tools required to complete daily operations. While in the **Color Tool**, the **Hybrid Mode** can be activated so the Color and Sync modules are accessible for concurrent syncing and coloring.



Pressing F12 or clicking the Vectorscope icon button at the bottom of the UI will activate the Hybrid Mode by relocating the Waveform/Vectorscope (WFM/VEC) to the Media Player and adding the required Sync Tool metadata fields in its place. Pressing F12 again cancels the Hybrid Mode.

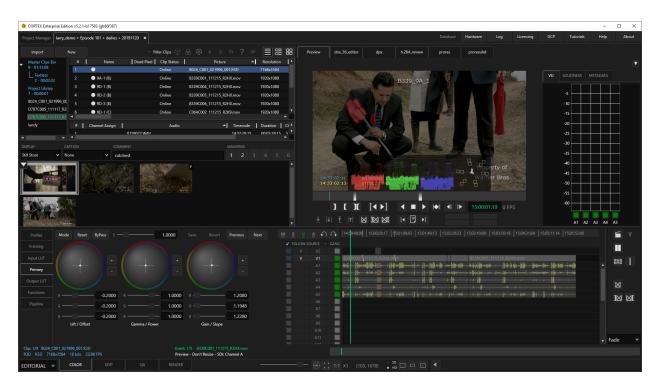
Pressing Shift+F12 hides the WFM/VEC <u>during playback</u>. Ctrl+F12 toggles hide/show the WFM/VEC while in Hybrid Mode. Ctrl+Shift+F12 unlocks and floats the WFM/VEC.



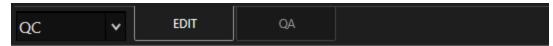
# **Editorial**

Editorial Workspace hides the Copy and Sync Tools, enabling only the Color, Edit, QA and Render Monitor Tools. In this workspace, while in the **Color tool**, a **Hybrid Mode** can be activated so both the Color modules and Edit Timeline are accessible. Pressing F12 or clicking the Vectorscope icon button will activate the Hybrid Mode. Pressing F12 again cancels the Hybrid Mode.

Pressing Alt+F12 cycles the WFM/VEC and the Mark Window from the Sync Tool Pressing Shift+F12 hides the WFM/VEC <u>during playback</u>. Ctrl+F12 toggles hide/show the WFM/VEC while in Hybrid Mode. Ctrl+Shift+F12 unlocks and floats the WFM/VEC.



# QC



The QC workspace only enables the Edit and QA tools where one can perform a variety of tasks including Dead Pixel Detection and Correction, image and audio analysis, IMF and Dolby Vision<sup>™</sup> validation and system performance evaluation.

# The Parts of the UI

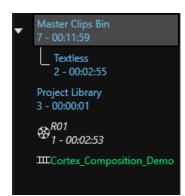
Each tool has its own distinct UI that accommodates its intended use. There are some common parts as per below:

# The Master Clip Bin

The Master Clip Bin displays all picture clips. The Audio Bin is visible in the Sync and Edit tools.

Project Manager	ar_demo > Episc	ode 201 :	> dailies > 20200402	×							
Import	New					Filte	er Clips 💮	֎ ≝	🛞 в	? 🔳	83 88
Master Clips Bin		#	Name	-	Status	Clip Status		Picture		Resolution	Fram
7 - 00:11:59		1	B339C001_11	1215_R	i 🏵	Online	B339C001_	111215_R2F	HX.mov	1920x1080	23.9
Textless 2 - 00:02:55		2	B339C004_11	1215_R		Online	B339C004_	111215_R2F	łX.mov	1920x1080	23.9
Project Library		3	B339C005_11	1215_R		Online	B339C005_	111215_R2F	łX.mov	1920x1080	23.9
3 - 00:00:01		4	B339C006_11	1215_R		Online	B339C006_	111215_R2H	IX.mov	1920x1080	23.9
€ <sup>R01</sup> 1 - 00:02:53		5	C064C002_11	1215_R		Online	C064C002_	111215_R2	(9.mov	1920x1080	23.9
IIICortex Comp	osition_Demo	#         Name         Status         Clip Status         Picture         Resolution         Fram           1              B339C001_111215_R	23.9								
		7	D707C005_11	1117_R		Online	D707C005_	111117_R2I	M.mov	1920x1080	23.9
											Þ
		#	SR_Sc_Tk	I		Audio		1	Timecode 🔺	Duration	Channels
		1	⊘ 0159_9B_1	0159	023.WAV				14:41:40:19	00:01:53:11	5
		2	Ø 0159_9C_1	0159	0024.WAV				14:44:01:15	00:01:20:14	5
		3	Ø 0159_9D_1	0159	025.WAV				14:51:22:09	00:01:10:02	5
		4	Ø 0159_9D_2	0159	0026.WAV				14:53:40:07	00:03:10:15	5
		5	Ø 0159_9D_3	0159	0027.WAV				14:57:03:00	00:02:25:04	5
		6	⊘ 1117_1ED_1	1117	7030.wav				14:59:49:17	00:01:26:12	4
											Þ

# The Bin Sidebar



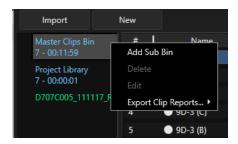
The Bin Sidebar changes the Bin View:

- Master Clips Bin Displays the clips in current Job
- Sub Bin Displays clips in the selected Sub Bin.
- **Project Library** Displays all clips added to Project Library and any slates created in Cortex.
- **Reels** All Reels in the current job are listed. Click on any Reel to change to Reel Bin view. The green highlighted Reel is the currently open and active Reel.
- Files A list of Copy Task files in the Job and their Manifest verification status.
- **Copy Tasks** All Copy Jobs will be listed here. Click on the Job to display a list of files that were copied during the Job.
- Compositions All Compositions created in Cortex.

If focused on a composition or reel, pressing the Q or J keys switches to the Master Clips Bin. Pressing Q or J keys repeatedly cycles between the Master Clips Bin and the Project Library. If focused on the Master Clips Bin or Project Library, pressing the W or K keys switches to the Master Clips Bin. Pressing the W or K keys repeatedly cycles between Compositions.

# Sub-Bins

For organizing purposes, if you wish to segregate clips, you can create Sub-Bins.



Right click on the Master Clips Bin and select: Add Sub Bin

Name the Bin, click Create, and drag clips into it.

	Import	New		
Ŧ	Master Clips Bin 7 - 00:11:59	#		
	7 - 00:11:39	1	•	90
		2	•	90
	Project Library	3	•	94
	7 - 00:00:01	4	•	90
	D707C005_111117_R2	5	•	90

You can create as many Sub-Bins as required and drag any type of clip into it including audio clips.

# "New" Menus

In the Copy Tool, New:

- Archive Task Create a job to archive all media contained inside the current job.
- **Copy Task** Create a new copy job to copy media from a source to up to 3 destinations.
- MHL Verify Task Verify MHL files

## In the Color, Sync, and Render Monitor Tools, New:

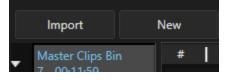
- Clips Reel Create a new Clips Reel for adding source clips for rendering
- Composition Reel Create a new Composition Reel for adding composition events for rendering

## In the QA tool, New:

• **Composition Reel** - Create a new Composition Reel for adding composition events for rendering. This can be useful, for example, when used in conjunction with Dead Pixel Detection. After detecting and approving Dead Pixels for correction, if you only require certain shots to be rendered and you filter the event list by "Accepted Dead Pixels" you can add those events to a Composition Reel for rendering.

#### In the Edit Tool, New:

- Composition Create a composition for editing in the Edit Tool
- IMF Composition Create an IMF composition for assembly of an IMF Package
- DCP Composition Create a DCP composition for either Interop or SMPTE DCPs
- **AS-11 Composition** Create an AS-11 composition for assembly of an AS-11 Package
- Composition Reel Create a new Composition Reel for adding composition events for rendering



# **Importing Media**

For picture and audio media, you can drag media from their source folders into either of the bins. Cortex will then populate picture and audio media into their respective bins.

You can also **Import** media via a file browser for existing media on a storage network or create a **New Copy Task** to copy media from an external source to the storage network, which will automatically import into Cortex.#heading=h.z2zw24z5lmut

NOTE: To learn about creating a New Copy Task, see the section on The Copy Tool

## "Import" Menu

- Media File(s) Select specific file(s) to import into the Job
- Media Folder Select an entire folder and all its subfolders to import into the Job
- Media Folder (Fast) This mode is useful when a large amount of files need to be imported for VFX pulls, for example. It makes the import process faster since a "source extractor" is not applied.
- File Per Frame Seq. Use this option to import file per frame sequence clips such as DPX, tiff, or Raw File sequences.
- XML Import .xml files supported by Cortex including .cap, .tt and .ttml subtitle files for use in the edit tool with IMF or DCP Packages.
- **IMF** Import an IMF package for QC and creating Supplementals.
- AS-02 Import an AS-02 package
- AS-11 Import an AS-11 package
- **EDL** Select an EDL to merge with a composition, or conform an edit with imported media.
- **Cortex Manifest** Select a Cortex Manifest to relink and verify media files from jobs between systems (for example, a Manifest passed from on-set to post)
- ACES Clip Metadata Here you can import ACES metadata, including color corrections and IDTs, for existing clips.
- ALE Select an ALE to reconcile imported media
- AAF Import an AAF sequence to conform with existing media. Currently supports cuts only.
- Color from CDL CDL values are displayed as color bars in the Imported CDLs store in the color tool.
- Dead Pixel CSV Import a CSV to locate and fix dead pixels.

Import	
Media File(s)	
Media Folder	
Media Folder (Fast)	
File Per Frame Seq.	
XML	
IMF	
DCP	
AS-02	
AS-11	
EDL	
Cortex Manifest	
ACES Clip Metadata	а
ALE	
AAF	
Color from CDL	
Dead Pixel CSV	

## Working with CORTEX Manifest Files

The CORTEX Manifest is a lightweight sidecar file that contains all the media and metadata information about a CORTEX Job. It can be passed between on-set and post installations to ensure complete coherence of media and other metadata.

The Manifest can be used in all job types whether for dailies, transcodes, compositions of all kinds including IMF, DCP, AS11, etc, and Dead Pixel Detection and Correction.

The Manifest file includes information about:

- Audio and Image files that have been copied or imported
- Checksum for verification
- LUT files applied
- CDL values of primary color correction applied
- Framing settings
- Synchronization points
- Scene/Take/Camera
- Comments & Discrepancies
- Edit markers (trim points)
- Dead Pixel Correction
- Compositions

Manifest files can be loaded into a CORTEX job first and then relinked to the underlying media or the media can be imported first and then traced back with a Manifest.

#### **Creating a Manifest from a Job**

A Manifest file can be created at any phase of a job. For example, a Manifest can be generated after Copy & Color or later after synching, Dead Pixel Detection, IMFs, DCPs, etc.

#### To create a Manifest file

- 1. Go to the Project Manager
- 2. Right-click on the Job name
- 3. Select Export Manifest
- 4. Choose a location and Save the file.
- 5. The file can now be emailed, shared via networked storage, sent via thumb drive or added to a shuttle drive.

#### Importing a Manifest and Relinking to Media

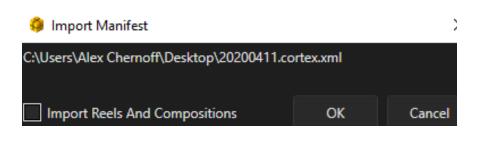
The purpose of the Manifest is to allow work to be done in one Cortex system and imported into another system that does not share the same storage. Using the Manifest will allow for the relinking of media and its corresponding metadata, recreating the exact same parameters and properties generated by the originating system.

An example of this workflow would be dailies generated onset and then imported by facility for rendering and distribution.

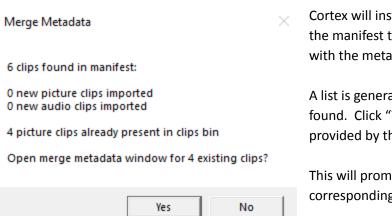
#### **To Import a Manifest**

#### **Dailies Workflow**

- 1. Create or Open a Job
- 2. Import the corresponding media into the Master Clips Bin
- 3. Click Import and select Cortex Manifest
- 4. Browse to the file location and click Open
- 5. Disable Import Reels and Compositions and click OK







Cortex will instantly scan through the imported media, using the manifest to identify which clips are needed to merge with the metadata.

A list is generated indicating how many clips have been found. Click "Yes" to merge the clips with the metadata provided by the manifest.

This will prompt the Traceback tool to open with corresponding clips in the list.

🏮 Tra	aceback							-		×
DATABA	ASE TYPE		FILE/FOLDER NAME							
Corte	ex Manifest, FCP XI	ML, ALE (Files) 🗸	C:\Users\Alex C	hernoff\Desktop	\20200411.c	cortex.xml				
#	Name	Pic	ture	Audio		Resolution	Frame Rate	Source In	Source	Out
1	Ø B339_9A_1	B339C001_11121	5_R2HX.mov	0159022.WAV		1920x1080	23.976	14:32:58:06	14:35:4	1:05
2	Ø B339_9A_1	B339C004_11121	5_R2HX.mov	0159025.WAV		1920x1080	23.976	14:51:46:12	14:52:2	6:16
3	Ø B339_9A_1	B339C005_11121	5_R2HX.mov	0159026.WAV		1920x1080	23.976	14:53:56:00	14:56:4	6:06
•										F
Modify	Clips in Bin with Selecte	d Metadata from Cortex	Manifest, FCP XML, AL	E (Files)	201			01		
√ Co	lor 🖌 Audio Sync 🖌 S	late Info 🖌 In & Out Ma	arks 🖌 Grab Timeline	Stills	3/3 clips trace	d. 0 clips not trace	ed yet. Trace	ОК	Can	cel

Click "OK" to merge the clips with the manifest metadata. Now, any clips that were synched and colored in the originating system will be migrated to the new system with color and proper synching, ready to be added to reels.

#### **Composition Workflows**

Composition workflows, such as Dead Pixel Detection or IMF creation, require a different order of operation regarding Cortex Manifests.

- 1. Create or Open Job
- 2. Click Import and select Cortex Manifest
- 3. Enable Import Reels and Compositions

🏮 Import Manifest		×
C:\Users\Alex Chernoff\Desktop\dead_pixel_r	manifest.cortex	xml
✓ Import Reels And Compositions	ОК	Cancel
		·

The metadata for the clips will be imported along any compositions that were created, however, the media will be offline.

Master Clips Bin 1 - 00:00:34	# Name 🔺 Dead Pixel Cli	ip Status Picture		Audio					
Project Library	1 🔵 Complete Off	fine Add Clip(s) to Timeline	•						
9 - 00:00:01		Add Handles							
IIII flak_dpd_nab.08640		Add to New Reel							
		Add to Project Library							
		Audio Info							
		Auto-Composition							
						Me	dia Offlin	ie	
							ala olimi		
		Browse to Video File							
		Сору То							
		Delete							
		Delete Layout							
		Detect Dead Pixels							
		Duplicate Clip			1 C X				01:00:00:0
		Edit Name							
		Edit Tape Name		Þ					
		Edit Timecode					TOTAL		
DEAD PIXEL	ENABLE ROI	Import Audio					#		
		Load Layout							octenty -
		Load Source Extractor Relink							
		Neimk		0					

In the Master Clips Bin, highlight the media, right-click and select "Relink."

Now the media will come online and work can resume. In the case of Dead Pixel Detection, click on the composition to reveal the detection from the originating system.

# **Clip Bin Views**

Import New Filter Clips 🔗 🗟 🖀 😤 B 🔶 🗮 🖽

The Clip Bin Offers three views of clips

- 1. Text Detail listing of the clip/file metadata
- 2. List & Thumbnail- Thumbnail view with clip details
- 3. Thumbnails Timeline thumbnail only view



ASC SAT

ASC SOP

✓ Aud End
 ✓ Audio

Aud Path

Aud Start
Bit Depth
CamRoll

Clip End

Clip Start

Record In Record Out Reel Resolution Scene SRoll Status

Audio Channels
 Aud In
 Aud Out

#### **The Text View**

Each clip is displayed in text as a line item. The available metadata, as shown on the right, are presented alphabetically and appear as columns of information in various orders depending on the "Layout" selected. Those with check marks will be visible in the view.

To determine the visibility of each column, right-click anywhere in the Master Clips Bin and select Show/Hide Columns in the Context Menu.

In Detail View, you can rearrange the order of columns and create custom layouts by clicking on a column header and then dragging and dropping it to a new location.

		Clip Status
Load Layout	Load saved layouts by right-clicking and selecting Load Layout	✓ Codec
coud cayour	from the Context Menu.	Comments
Load Source Extractor	from the context menu.	<ul> <li>Dead Pixel</li> </ul>
		<ul> <li>Duration</li> </ul>
Relink		<ul> <li>EDL Comments</li> </ul>
Remove Audio		✓ File Type
Remove Addio		✓ Frame Rate
Resample Audio		IDT
		✓ Input LUT
Reset Embedded Audio		✓ In-Out
Save Color to Selected Clips		✓ Mark In
·		✓ Mark Out
Save Layout	Save and name layouts by right-clicking and selecting Save	✓ Name
Shaw/Uida Calumaa		✓ Output LUT
Show/Hide Columns	Layout from the Context Menu.	Pic Path
Traceback		✓ Picture
	l	<ul> <li>Play Speed</li> </ul>

# The List/Thumbnail View

Contains a thumbnail along with clip information.

New		Filter Clips 🕥 🛞	🎬 🛞 в	? ≣⊞⊞
	B024 10:14:50:09 10:15:59:12 00:01:09:04	B024_C001_021996_001.R3D	l O ch	R3D R3D 7168x3584 16 bits 23.976 100%
9 9A-1 (B) 🕑 🖆	8339 14:32:49:00 14:35:41:05 00:02:52:06	B339C001_111215_R2HX.mov 0159022.WAV	0159 14:32:49:02 14:35:41:07 5 ch	QuickTime ProRes 4444 RGB 1920x1080 12 bits 23.976 100%
• 9D-1 (B) 🛞 🛎	B339 14:51:41:07 14:52:26:16 00:00:45:10	B339C004_111215_R2HX.mov 0159025.WAV	0159 14:51:41:09 14:52:26:18 5 ch	QuickTime ProRes 4444 RGB 1920x1080 12 bits 23.976 100%
• 9D-2 (B) 🕥 🖆	B339 14:53:49:11 14:56:46:06 00:02:56:20	this is a comment for b339 B339C005_111215_R2HX.mov 0159026.WAV	0159 14:53:49:14 14:56:46:09 5 ch	QuickTime ProRes 4444 RGB 1920x1080 12 bits 23.976 100%
	0000		0150	o ∵i∓ ►

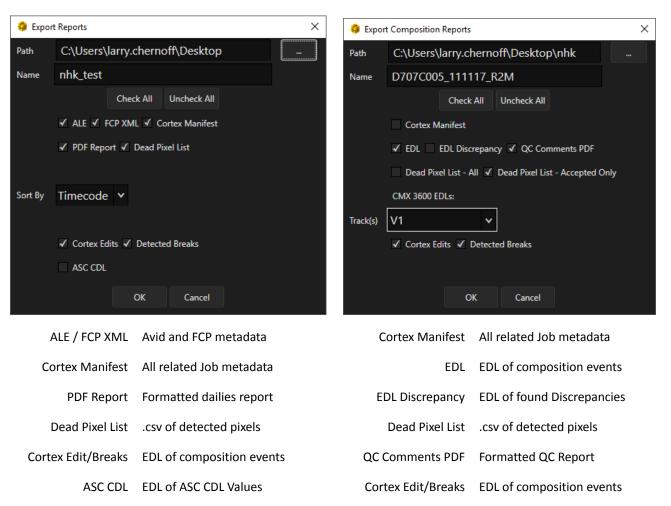
# The Thumbnail View

Displays thumbnails of each clip in a still-store mode with the Camera Roll Letter and Scene/Take metadata.



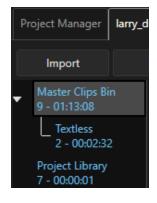
# **Exporting Reports**

Right click on a reel or composition to export a variety of report types.



#### **Export Reports For Reels**

#### **Export Reports for Compositions**



#### **Export Reports for Job**

Right click the Master Clips Bin to export a variety of reports related to the clips in the bin.

Or, you can right-click on the job record in the Project Manager for the report.

🏮 Exp	ort Job Repor	t		_		×				
Path	C:\Users\	larry.cherno	off\Desktop	)						
Name	lar5_episode_101_20191120.pdf									
	✓ Dailies Comments									
	✓ Reel Details									
	✓ File Detai	ls								
	Copy Tasl	c Details								
	Offline Clip Details									
	✓ Dailies Co	blor								
		ОК	Cancel							

# **Project Actions and Reports**

est

Color Trace EDL
Convert to UTF-8
Delete
Edit
Export Database
Export Support Manit
Import Database
Merge DCP Packages

Merge IMF Packages

## Color Trace EDL

When dailies color is processed through Cortex with ASC CDL values, either directly or through imported 3D LUTs, Cortex can trace the color values when an EDL with Tapenames is imported and traced through this utility.

- 1. In the Project Manager, Right click on the Project and choose Color Trace EDL
  - a. A Windows explorer will open
- 2. Navigate to the EDL and Open it
  - a. A Cortex Traceback Dialog will open
    - i. Enter the "Database Type"
      - 1. Normally it will be the Current Project but other choices are available such as a folder of ALEs.
    - ii. In the Episode field, choose All or a specific one

t) pre	od\pose\season (	02_2019\ep_210\edl\assembly\pose	e 210 20190813 ar	m\nose 210 20190	813 am EDI					
TABASE					ono_anneo e					
		pose_season_01_2019								
urren	t Project	pose_season_o1_2019	Episode 210							
#	Name	Picture	Audio	Clip Start	Clip End	Duration	Mark In	Mark Out	In-Out	
967										
968										
969										
970										
971										
972										
973										
974										
975										
976										
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987		B317C001 190803 R1CJ.mov								

In the lower left of the UI, make sure the Color checkbox is enabled. In the lower right corner of the UI, click Trace. When the result is found, click OK. This will open a Windows Export window. Navigate to the directory you wish to save the new EDL that contains the ASC SOP values processed in the Color tool.

# Convert to UTF-8 (Unicode Transformation Format - 8 bit)

If a project was created in standard ASCII, it can be converted in order to UTF-8 in order to support the expanded character library.

#### Delete

To delete a project click the Delete option.

## Edit

To Edit a project click the Edit option.

## **Export Database**

To export a database click the Export Database option

## **Export Support Manifest**

If requested by MTI Film's support team, this option generates a Manifest report of the project..

#### **Import Database**

Use this option to import a database from another Cortex system.

#### Merge DCP or Merge IMF Packages

To merge DCP or IMF packages, click the corresponding option:

🧔 Merge IMF Packages			_		×
IMF PACKAGES		Include	Subdirectories	Ad	d
OUTPUT DIRECTORY					
PKL NAME					
PKL_{id}.xml					
Move files instead of copy	ing				

- 1. The Merge DCP **or** IMF Packages Dialog Box appears.
- 2. Click the Add button to navigate to the DCP packages directories to be merged.
- 3. Click the ... (browse) button to navigate to an output directory
- 4. If you wish to Move the files instead of copying them, enable the checkbox
- 5. When ready, click Start

# **Filtering and Sorting Source Clips**

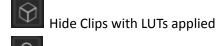


The Clip list can be filtered to hide or show clips that have already had a LUT applied, color correction applied, synchronized, added to a Reel, placed in a Bin, and offline. This is useful to ensure that no clips within a job are missed and to make viewing long lists of clips easier for the user.

#### To Filter:

- 1. Check the Filter checkbox to turn filtering on.
- 2. By default, all clips are shown. Toggle one or more filter buttons to hide or show the clip types.

## Filter options:



- Hide Clips with Color applied
- Hide Clips Logged and Sync'd
- Hide Clips Added to a Reel(s)
- Hide Clips in Master Clips Bin that are also located in Sub-Bins
- Show Clips that are Offline

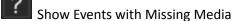
# **Filtering and Sorting Composition Events**

# ✓ Filter Events G FX ? DP

It might be necessary to show certain types of events in a composition created by an imported EDL or natively in Cortex. When a composition is focused, the following buttons provide filtering options:

G Show EDL Gap Events (where the EDL has gaps in record time)

Show EDL FX Events



Show Events with Accepted Dead Pixels

## Sorting

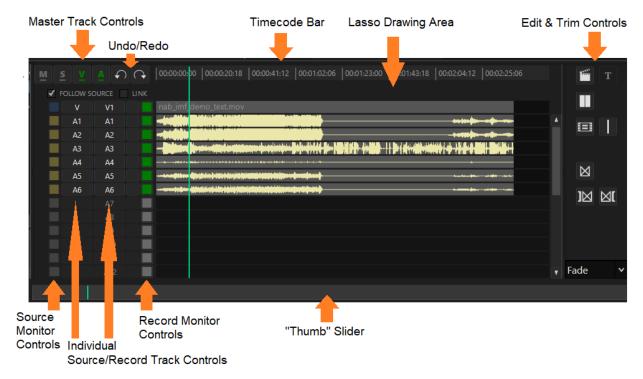
The Bin can be sorted on any column header, either ascending or descending, by clicking on the header.

# The Timeline

The Timeline is displayed when a composition is created in a Job. There are three tools in which the Timeline is displayed, The Edit Tool, the Color Tool, and the QA Tool. In the Color and QA tools, only the video tracks are displayed; the audio tracks are hidden.

# The Edit Tool Timeline

The Edit Tool timeline is comprised of several sections:



## **The Master Track Controls**



The Master Track Controls provide a global method of enabling or disabling a track type. For example, if there are six audio tracks enabled and you wish to turn them all off, clicking the A button will toggle them off/on.

## Adding a Metadata, Subtitle, or Video Track

In the Edit Tool, right-click anywhere on the composition to display the Context Menu and choose Add. Then from the extended menu choose which Track Type to add. Shift+clicking on the M, S, or V buttons will add the corresponding track.

The timeline contains 1 Metadata, up to 2 Subtitle, 1 Video, and up to 24 Audio tracks.

#### **Follow Source**

With Follow Source enabled, Cortex will automatically enable the Video and/or Audio Tracks contained in the source file. For polyphonic audio files, the number of tracks will be automatically enabled. For Monophonic files, pressing Ctrl and clicking on each file sequentially will number them in the order clicked. Follow Source is useful when simple assembly type editing is required.

#### Link

When the Link checkbox is enabled, the Track and Monitor buttons switch together when either is clicked or Alt+Y is pressed.



#### Undo/Redo

Self explanatory. Just click. You can use Ctrl+Z to undo. The normal Windows Redo shortcut, Ctrl+Y, is not available in the Edit Tool since it is used for other commands.



## **Timecode Bar**

M S V A O 00:00:00:00 00 00:26:04 00:00:52:08 00:01:18:12 00:01:44:17 00:02:10:21 00:02:37:01 00:03:03:05

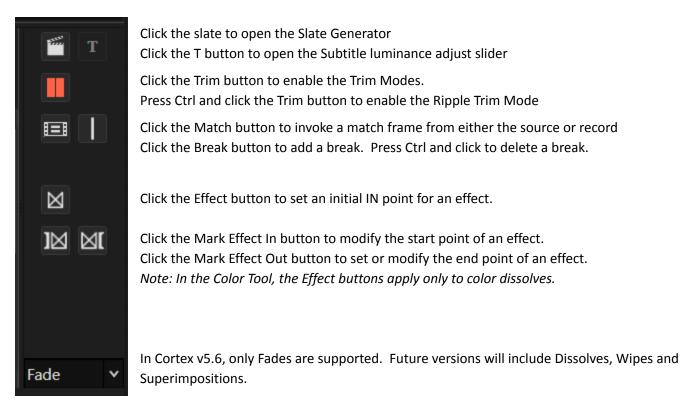
Use the Timecode Bar to scrub the timeline. Click and drag starting at any position.

#### **Lasso Drawing Area**

In order to select multiple tracks, enable the desired tracks and then click and drag a lasso from within the Lasso Drawing Area. In this example, only the audio tracks are enabled.

00:00:00:00	00:00:35:22	00:01:11:21	00:01:47:20	00:02:23:19	00:02:59:18	00:03:35:17	00:04:11:
MTL Cortor	CDemo_S1_e	aisada 101.2	020-02-12 IN	4E m vf			
						M <b>4-</b> Pil. • • 1	
and the second sec			ALL MARKED MARKED		·····		
i al ci i dill'i como dalla	ahi ka di 1999			lender (hereitet) A			
00:00:00:00	00:00:35:22	00:01:11:21	00:01:47:20	00:02:23:19	00:02:59:18	00:03:35:17	00:04:11:
MTI Cortex	CDemo S1 ei	pisode 101 2	020-02-12_IN	1E.mxf			
	ny agyang salah 1990) ipunakan And Salah na ang pulak, falika dila			•=••••••			
	property of the spectrum party of the sector						

# **Edit and Trim Controls**



## Audio Source and Record Monitor Controls

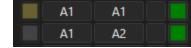
<b>√</b> F	OLLOW S	OURCE	LINK
		V1	
	A1	A1	
	A2	A2	
	A3	A3	
	A4	A4	
	A5	A5	
	A6	A6	

The yellow Source Monitor buttons control which source audio channels are monitored. The green Record Monitor buttons control which composition audio tracks are monitored. Click a button to toggle its state. Press Shift+click to toggle between isolating the monitor and enabling all monitors.

# Individual Source/Record Track Controls



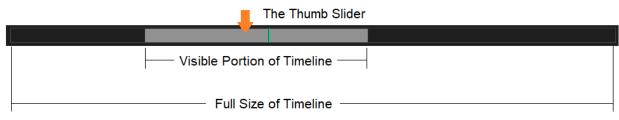
The track buttons on the left determine which source audio channel will be assigned to a record track on the right. Right clicking the source or record track button provides a list of available channels for assignment.



Clicking the Individual Record Track Control buttons determine which tracks will be affected by an edit decision. Click a track button to toggle its state. Press Shift+click to toggle between isolating the track and enabling all tracks containing media.

# "Thumb" Slider

When the timeline is zoomed, the Thumb Slider, the lighter gray bar, determines which portion of the timeline is visible.



Click and drag the slider to move the timeline to the desired view.

You can also use the following commands:

Pressing Ctrl+Mousewheel Up will move the timeline upstream.

Pressing Ctrl+Mousewheel Down will move the timeline downstream.

# The Color and QA Tool Timelines

 LINK
 01:00:00:00
 01:00:00:1:14
 01:00:03:04
 01:00:06:09
 01:00:07:23
 01:00:09:13
 01:00:11:03
 01:00:12:18
 01:00:15:22
 01:00:17:13

 V2
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## **Editing and Monitoring Video Tracks**

There are a few states that determine which video track is being monitored and which is actionable. Bear in mind that Cortex uses a hierarchical operation to determine which video track is being monitored with V2 taking priority when media exists on both tracks at the same timeline location.



V2 is visible and actionable if its track is selected and monitor is enabled.

*Note: In order for both monitors to be enabled, the Link checkbox must be disabled.* 

Both Timelines consist of up to two video tracks. The audio tracks are hidden.



V2 is not visible or actionable if its monitor is disabled. If the V1 monitor is enabled, it will be visible but not actionable.

Note: When a monitor button is orange, that is an indication of a conflict between the visibility and actionability for the selected track.



If V1 is selected but its monitor is "blocked" by the V2 monitor, then V1 is neither visible or actionable and V2 is visible.

# **Zooming the Timeline**

## Using the Mouse wheel

To zoom the timeline, position the mouse cursor over any area of the timeline and move the mouse wheel up or down to zoom in or out respectively.

Double click any portion of the Thumb Slider bar area to size the timeline to full visibility.

## Using the Keyboard

Press Shift+= to zoom in Press Shift+ - (minus on the keyboard) to zoom out Press Shift+Ctrl+ - (minus on the keyboard) to zoom out to the full extent of the timeline

# **Timeline Shortcut Keys**

Function	Shortcut
Add Metadata Track	Shift+Click M button
Add Subtitle Track	Shift+Click S button
Enable/Disable Video Track(s)	Υ
Add Video Track	Shift+Click V button
Enable/Disable Audio Track(s)	U
Switch Video Tracks - no state change for monitors	Ctrl+Y
Switch Video Tracks - monitor follows active track	Alt+Y
Enable/Disable active track's monitor	Shift+Y
Lock a track	Ctrl+Click Track button
Lock/Unlock all tracks	Ctrl+Shift+Click any track button
Enable the Gap Trim Function	Shift+T
Enable the Ripple Trim Function	Ctrl+T
Invoke Match frame on either source or record	М
Add a Break	, (comma) or click button
Delete a Break	Ctrl+, (comma) or button
Add Effect and set initial IN point	Ρ
Modify Effect IN	[
Mark or Modify Effect OUT	]
Go to next Effect	Shift+]
Go to previous Effect	Shift+[
Delete Effect (must be at Effect IN location	Ctrl+P

# **Cortex Tools in Depth**

# The Copy Tool

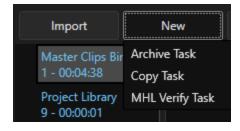
The Copy Tool serves as an interface for copying media from one source to up to three potential destinations with MD5 or xxHash verification. It allows for up to three copy tasks to run concurrently.

On set it would be used for offloading and backing up camera and audio cards throughout the day. In a facility, the Copy Tool can be used to transfer and backup media to and from shared storage, shuttle drives or LTFS LTO tapes, all while creating a full audit trail. It can also run Media Hash List (MHL) verification tasks.

The Copy Tool can also archive media contained in a job, copying to up to two destinations with a PDF Report. The report reflects a detailed list of the media along with corresponding thumbnails for each clip.

# Using The Copy Tool

In a new Cortex Job, select the Copy Tool and click New.



From the Drop-down menu, choose Copy Task. Cortex will then open the Copy Task setup window.

# Copy Task Setup

The Copy Task setup screen allows you to specify all the parameters of a copy task. Cortex keeps track of how many tasks are running, allowing up to 3 concurrently.

SOURCE		
806 Files 37.4 GB total		NAME
$\label{eq:linear} V:\show05\test01\mdia\NAB\_Demo\_Media\nab\_2018\dead\_pixl\flaked\_nab2016 ~~ \label{eq:linear}$		flaked_nab2016
DESTINATIONS PRIMARY 76.8 TB free of 109 TB 37.4 GB pending 76.7 TB remaining after copy		VOLUME NAME
V:\rest02 v		SAN
		BARCODE
✓ BACKUP 1 985 GB free of 10.8 TB 37.4 GB pending 948 GB remaining after copy		VOLUME NAME
P:\_prod v		production (\\ice.rr
		BARCODE
BACKUP 2 0.0 KB free of 0.0 KB 0.0 KB pending 0.0 KB remaining after copy		VOLUME NAME
✓ Copy to Primary first Overwrite existing files if present		BARCODE
✓ Import files to Clip bin after Offload HASH TYPE		
MD5 v		
	c	tart Copy Cancel
	3	cancer

#### Destinations

**Source** - This is where the file path to the source media is entered using the ... (*ellipsis*) button **Destinations** - This is where the Primary and Backup destinations are entered using the ... button.

Primary - Typically the primary storage associated with a Cortex workstation

Backup 1 and Backup 2 - Additional copy/archive destinations

**Volume Name** - This unique identifier for destination drives, which defaults from the drive name, is used to record media storage in reports for later identification.

Barcode - The Barcode for destination drives can also be used to identify media storage, such as LTOs.

#### **Options for a Copy Task**

**Copy to Primary First** - When enabled, Cortex will copy media from Source to Primary first, then create the remaining backup copies using Primary as the source. Recommended for use on-set to free up cards.

Verify copies using MD5 or xxHash checksums - Verify copies with checksums (recommended)

**Import files to Master Clips bin after Offload** - When selected, loads copied files into the Master Clips Bin of the current job so work can proceed.

# **Copy Task Status**

Once a Copy Task has been created, it will appear in the list in the left hand column. When selected, the copy & verify status of each individual file is displayed.

Import	New					*	Show Clips	Source 1_dailies	Prin (SSI
ps		Path	Status	File	Size	Primary (SSD)	Backup1		
	1	relink_shot_nab	Copied	A669C001_041616.mov	50.8 MB	Copied	Pendin		
lailies - 21.8 GB	2	Training_closer\audi	Copied	0159022.WAV	137 MB	Copied	Pendin		
	3	Training_closer\audi	Copied	0159023.WAV	78.0 MB	Copied	Pendin		
		Training_closer\audi	Copied	0159024.WAV	55.4 MB	Copied	Pendin		
		Training_closer\audi	Copied	0159025.WAV	48.2 MB	Copied	Pendin		
		Training_closer\audi	Copying		131 MB	Copying	Pendin		
		Training_closer\audi	Pending	0159027.WAV	99.8 MB	Pending	Pendin		
		Training_closer\audi	Pending	1117030.wav	47.6 MB	Pending	Pendin		
		Training_closer\ocn\	Pending	B339C001_111215_R2HX.	mov 5.4 GB	Pending	Pendin		
		Training_closer\ocn\	Pending	B339C004_111215_R2HX.	mov 1.4 GB	Pending	Pendin		
		Training_closer\ocn\	Pending	B339C005_111215_R2HX.	mov 5.6 GB	Pending	Pendin		
		Training_closer\ocn\	Pending	B339C006_111215_R2HX.	mov 3.4 GB	Pending	Pendin		
		Training_closer\ocn\	Pending	C064C002_111215_R2K9.	mov 1.3 GB	Pending	Pendin		
	14	Training_closer\ocn\	Pending	C064C005_111215_R2K9.	mov 3.3 GB	Pending	Pendin		
		Training_closer\ocn\	Pending	D707C005_111117_R2M.r	nov 626 MB	Pending	Pendin		
	◄ 1_dailies -	15 files - 21.8 GB	_			_		a.	
	Source: Primary:		C:\media\demo S:\primary_des	_2016\1_dailies				•	
	Backup 1:		E:\backup_dest						
	Backup 2: Options:	Primary first: True / MD5	Verify: True / I	mport after Offload: True					
IMARY				ACKUP 1		r	BACKUP 2		
dailies		53.5 MI		1_dailies		0.0 KB/s avg	DACKUP Z		
	369 MB / 21.8 GB				GB Os elapsed	0.0 KB/S avg 0s remaining			
159025.WAV		53.5	MB/s cur			0.0 KB/s cur			

The overall status of each copy task is displayed in the columns at the bottom.

If "Import files to Clip Bin after Offload" has been enabled, you can switch to another tool as soon as the files are loaded and begin working while other copy tasks are running.

# **Copy Task Reports**

You can generate a full accounting of the Copy Task results in PDF format:

- 1. Select the Copy Task from the left Sidebar
- 2. Right click and choose Export Report
- 3. Select a File Path by clicking the ... (browse) button
- 4. The default file name will be jobname.data.pdf, you can edit this if you wish
- 5. Click OK

## **Archive Tasks**

Similar in functionality to a Copy Task, the Archive Task archives media contained in an <u>open</u> Cortex Job. To archive all media in the current Cortex job click **New**. From the Drop-down, select **Archive Task.** Cortex will open the Archive Task setup window.

NOTE: An Archive Task can only be run when all media in a Job lives on the same volume.

MTI Film - Cortex User Manual version 5.6

The Primary Destination option is automatically disabled to prevent the possibility of the Primary being used to copy to other destinations. Choose Backup 1 and/or Backup 2 destinations.

SOURCE 231 Files 385 GB total			NAME
V:\show04\media\kidd_season_02\master_ocn\block_6	•		block_6
DESTINATIONS PRIMARY 0.0 KB free of 0.0 KB 0.0 KB pending 0.0 KB remaining after copy			VOLUME NAME
			BARCODE
✓ BACKUP 1 985 GB free of 10.8 TB 385 GB pending 600 GB remaining after copy			VOLUME NAME
P:\_prod	×		production (\\ice.m
			BARCODE
BACKUP 2 0.0 KB free of 0.0 KB 0.0 KB pending 0.0 KB remaining after copy			VOLUME NAME
✓ Export Archive Report Edit Metadata			BARCODE
Copy to Primary first Overwrite existing files if present Copy all files HASH TYPE			
MD5			
		St	art Copy Cancel

You have the option to export an Archive Report into the destination folder as well. Right click on the task and choose Export Report. The Archive Report is a PDF document listing all clips archived. It contains all relevant reporting data, including file and clip names, timecode, and thumbnail of each clip.

it View Document Comments Forms	Tools Advanced Window Help			
Title: NAB Show	Season: 3	Episode#(s): episode_101	LTO Barcode:	
Shoot Date: 05/02/2016	Shoot Day Number: 1235	Tape Date: 02/11/2017	QA Date: 05/02/2016	
Vendor: MTI Film	Number of Files: 14	Number of Files in QAD: 14	Tape Type: LTO6	
Software: CORTEX Enterprise Edition v3.1.3	Drive Man: G	Total Contents Size: 23,335,589,036		
Data Payload Format: NTFS	Data Bundling: NTFS	Block Size: 2222		

To make changes to certain header data within the Archive Task report, click Edit Metadata and fill in the customizable fields for items like Shoot Day, Tape Type or Episode Number.

✓ BACKUP 2 1.1 TB free of 10.8 TB 74.7 GB pending 1.0 TB rer	maining afte 🧳 Manifest Metadata	×
P:\	VENDOR DRIVE MANUFACTURER	
✓ Export Archive Report Edit Metadata	MTI Film HP	
Copy to Primary first Overwrite existing files if present V Copy HASH TYPE	y all files SHOOT DAY NUMBER TAPE TYPE	
MD5 v	1 LTO-8	
	EPISODE #(s) BLOCK SIZE	
	episode_101 1024	
PRIMARY BAC	CKUP 1	
	OK	

When the Archive Task is complete, Cortex will have copied relevant media and reports to the destination in a folder structure similar to the media's original source.

## **Verify Tasks**

You can create a Verify Task to reconcile media that already exists within the Cortex workstation's network against a Cortex Manifest file.

In a job containing the existing media, import a corresponding Cortex Manifest. Then, in the Copy Tool, create a New Copy Task. In the Source field, navigate to the source directory where the footage resides on your local storage. Disable the destination fields and leave them blank.

#	Path	Status	File	Size	Primary (SSD)	
1	audio	Verified	0159022.WAV	137 MB	Verified	
2	audio	Verified	0159023.WAV	78.0 MB	Verified	
3	audio	Verified	0159024.WAV	55.4 MB	Verified	
4	audio	Verified	0159025.WAV	48.2 MB	Verified	
5	audio	Verified	0159026.WAV	131 MB	Verified	
6	audio	Verified	0159027.WAV	99.8 MB	Verified	
7	audio	Verified	1117030.wav	47.6 MB	Verified	
8	ocn\B339R2HX	Verified	B339C001_111215_R2HX	(.mov 5.4 GB	Verified	
9	ocn\B339R2HX	Verified	B339C004_111215_R2H)	(.mov 1.4 GB	Verified	
10	ocn\B339R2HX	Verified	B339C005_111215_R2H)	(.mov 5.6 GB	Verified	
11	ocn\B339R2HX	Verified	B339C006_111215_R2H)	(.mov 3.4 GB	Verified	
12	ocn\C064R2K9	Verified	C064C002_111215_R2K9	.mov 1.3 GB	Verified	
13	ocn\C064R2K9	Verified	C064C005_111215_R2K9	l.mov 3.3 GB	Verified	
14	ocn\d_cam	Verified	D707C005_111117_R2M	.mov 626 MB	Verified	
Training (	loser - 14 files - 21.7 GB					F
Source:			_2016\1_dailies\Training_closer			
Primary:	SSD	S:\primary_dest				
Backup 1:						
Backup 2: Options:		05 Verify: True / Im	port after Offload: False			
	in the second					

# The Color Tool

The Color Tool provides an interface for setting or adjusting primary color correction, importing and applying LUTs and CDLs, framing, processing Dolby Vision<sup>™</sup> Level 1 analysis, adding Grain or Aperture Correction effects, setting MTI-Samsung resizing parameters, managing looks via multiple still stores, and exporting color decisions via LUT, ASC CDL and/or stills.

*NOTE:* Each project may demand a different configuration for monitoring color correction. Be sure to familiarize yourself with the <u>Deliverables/Color Section</u>

NOTE: Clips on "Closed" Clip Reels cannot be modified. Therefore, Cortex will block the "reuse" of a clip once it is added to a clips reel unless the reel is open or the clip is duplicated. Modifying a clip on an open reel, including changing In/Out marks, will cause the clip to be rerendered.



To access the Color tool, click the **Color** tab, or press the F2 key

# **Color Pipeline Tabs**

The Color Pipeline Tabs appear on the left side of the UI.

- Camera Camera-specific settings when available
- ACES Input Set clip ACES Input Device Transform (if working in an ACES project)
- Framing Adjust image framing
- Input LUT Select Input LUT
- Primary Primary Color Correction tools
- Output LUT Select clip-specific Output LUT
- **Functions-** Add Grain, add Aperture Correction, set MTI-Samsung resize parameters, and process Dolby Vision<sup>™</sup> Level 1 analysis
- Pipeline Viewall Color and Configuration settings



## Camera Tab

The Camera Tab provides properties options related to the currently selected clip's camera source.

RED									
Framing	RED 0 RED 1	RED 2	RED 3	RED 4					
Input LUT						Save	Revert	Previous	Next
Primary	PLAYBACK QUALITY		GAMMA CU	IRVE		SHADOW			
Output UIT	Full Res Premiur	n v	RED Log	g Film	~	—	}	- 0.0000	
Output LUT	ISO		KELVIN			DRX			
Functions	800	~			3200			- 0.0000	
Dia alian	COLOR SPACE		FLUT			CAMERA LI			
Pipeline	RED Wide Gamu	ut RGB 🗸 🗸	(		0.0000				
	Get Default Value:	Get Clip Valu	Jes						

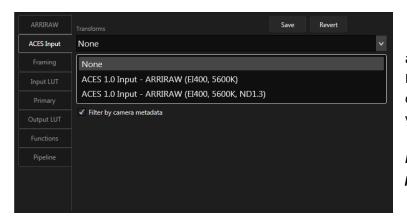
The Camera Tab label will change depending on the clip's camera source.

## **ACES Input Tab**

Set the Input Device Transform (IDT) for your media.

#### Select the desired IDT from the Drop-down.

DPX	Transforms Save Revert Previous Next							
ACES Input	ACES 1.1 Inverse Output - P3-D65	~						
Framing	ACES 1.0 Input - GoPro Protune Flat	٨						
Input LUT	ACES 1.0 Input - Panasonic Varicam							
Primary	ACES 1.0 Input - Sony SLog1							
	ACES 1.0 Input - Sony SLog2 (daylight)	CES 1.0 Input - Sony SLog2 (daylight)						
Output LUT	ACES 1.0 Input - Sony SLog2 (tungsten)							
Functions	ACES 1.0 Input - Sony SLog3 SGamut3							
Pipeline	ACES 1.0 Input - Sony SLog3 SGamut3Cine							
	ACES 1.0 Inverse Output - DCDM							
	ACES 1.1 Inverse Output - DCDM (P3D65 limited)							
	ACES 1.0 Inverse Output - P3-D60							
	ACES 1.1 Inverse Output - P3-D65							
	ACES 1.1 Inverse Output - P3-D65 (D60 simulation)							
	ACES 1.0 Inverse Output - P3-DCI (D66 simulation)							
	ACES 1.1 Inverse Output - P3-DCI (D65 simulation)							
	ACES 1.0 Inverse Output - Rec.2020							
	ACES 1.0 Inverse Output - Rec.709							
	ACES 1.0 Inverse Output - Rec.709 (D60 sim.)							
	ACES 1.0 Inverse Output - sRGB							
Clip: 2/4 poli_10 DPX DPX 3840	ACES LU INVERSE QUIDUL - SKUB (DOU SIIIL)	v						
ALL 🗸	COPY COLOR SYNC EDIT QA RENDER							



If using media that has a large number of available IDTs, use the Filter by Camera Metadata option to filter the list based on camera metadata in each clip. This should give you a smaller list of IDTs to choose from.

Note: RED files automatically apply an IDT provided by the RED SDK.

# Framing

The framing tab provides all the necessary controls to modify the displayed dimensions of the media clip which include Zoom, Horizontal and Vertical positioning, and Aspect Ratio. In addition, Horizontal and Vertical Flip and Rotation.

# Note: The Framing module is used to modify the framing of the picture and can be saved as a property of the clip. Zooming the picture with the mouse while hovering over the Media Player does not affect the output framing and is only used for viewing purposes.

## Input LUT

From the Drop-down list, select an Input LUT to apply to the clip before Primary color correction from one previously used, from the Cortex provided LUTs, or by importing a new LUT.

Cortex comes standard with a set of typical LUTs for use with common camera and codec types.

## **Primary Tab**

The Primary tab includes:

- A view of color parameters as they've been adjusted.
- GUI interface to adjust color parameters consisting of three color wheels that act as Lift(Offset), Gamma(Power), and Gain(Slope) controls, which are converted to ASC SOP CDL values for reporting via ALEs, CDLs, EDLs and Cortex Manifests.
- Saturation control
- Waveform and vectorscope displays.

## **Output LUT**

From the Drop-down list, select an Output LUT to apply to the clip after Primary color correction from one previously used, from the Cortex provided LUTs, or by importing a new LUT.

# **Functions**

The Function tab provides options to add Film Grain or Aperture correction to the output. MTI-Samsung Upres settings can be adjusted if the Resize Quality "MTI-Samsung" option has been applied to the active Deliverable. When a Dolby Vision<sup>™</sup> composition is selected, Dolby Vision<sup>™</sup> Level 1 analysis can be processed.

# **Pipeline**

The pipeline tab displays all framing, color and function information applied to the active clip. It also displays, in Magenta, the current Deliverable configuration and any relevant metadata for the active clip.

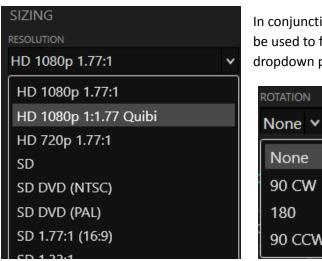
# Using the Framing Tool

ProRes	RGB Reset ByPass		Save	Revert	Previous	Next
Framing						
Input LUT	гоом	4 0000	Zoom Unity			
Primary	H POSITION	1.0000	200m onity	FLIP H		
Output LUT		0.0000	H Center			
Functions				FLIP V		
Pipeline		0.0000	V Center			
Pipeline	ASPECT			ROTATION		
		1.0000	Aspect Unity	None Y		

Use the **ZOOM**, **H POSITION**, **V POSITION** and **ASPECT** sliders to adjust the framing of the active clip. **H Center**, **V Center** and **Aspect Unity** will reset each of these parameters. The **Flip H** and **Flip V** checkboxes will respectively flip the image horizontally and vertically.



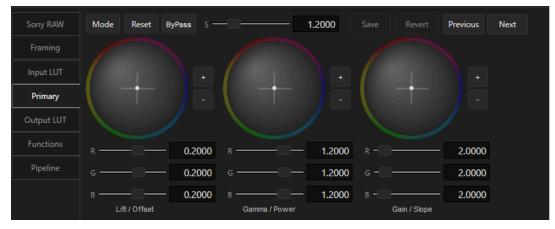




In conjunction with the Deliverable's Resolution, the framing tool can be used to frame 9x16 Quibi images using the Rotation function. The dropdown provides clockwise and counterclockwise rotation.

# **The Primary Color Corrector**

# Using the GUI to Color Correct



From left to right, the color wheels are represented as Lift, Gamma, and Gain or as ASC values of Offset, Power and Slope respectively. Using the mouse, click on any of the three color wheels and drag in the desired direction. Use the + and - buttons to raise or lower the values of each color component.

The three Individual sliders for each color component can be adjusted by left-clicking and dragging the slider or by clicking in the numeric box and using the up and down arrows to adjust values.

To toggle between the pending and existing color tool corrections press, hold and release the T key.

To revert all pending color tool settings to the existing correction press the A key.

To bypass pending color correction back to raw press, hold and release the 6 key.

To bypass pending color correction and LUTs back to raw press, hold and release the Shift+6 keys.

To reset existing color correction back to raw press the 5 key.

To reset existing color correction and LUTs back to raw press Shift+5.

Framing functions must be reset individually on the Framing tab.

What follows are keyboard shortcuts for the Color Tool. A complete list of shortcut keys will be found at the end of this tutorial section.

## **Saving Color Settings**

#### To the current clip:

Press the Save Button or press Ctrl+S

#### To Multiple clips:

Using the settings on the <u>current</u> clip, select the span of clips you wish to apply the settings and click the Save button or press Ctrl+S. A Dialog Box will appear. Carefully enable those properties you wish to apply and click the Save button.

# Using the Keyboard to Color Correct

You can also use the keyboard to color correct as follows:

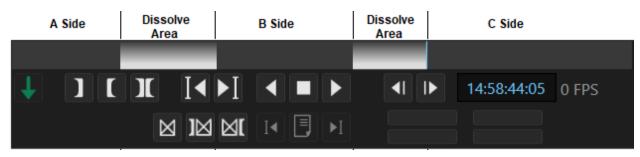
Color Function	Shortcut Key	Description
Lift	1	Selects the Lift Color Wheel
Gamma	2	Selects the Gamma Color Wheel
Gain	3	Selects the Gain Color Wheel
Lift Color	1 - Press and Hold	Adjust Red - Up/Down arrows; Adjust Blue - Left/Right arrows
Gamma Color	2 - Press and Hold	Adjust Red - Up/Down arrows; Adjust Blue - Left/Right arrows
Gain Color	3 - Press and Hold	Adjust Red - Up/Down arrows; Adjust Blue - Left/Right arrows
Luminance	Alt + up/dn arrows	Click + or - buttons
Saturation	4	Adjusts the saturation value using the Up/Down Arrows. Enter to accept

Button	Shortcut Key	Description
Mode	~	Switches between Lift Gamma Gain and Printer Lites modes
Luminance	Ctrl+Shift+	Click + or - buttons
Reset	5	Reverts the primary correction settings to Unity
Shift+Reset	Shift+5	Reverts the primary correction and LUT settings to Unity
Bypass Primary	6	Bypass the primary color correction only - (Hold key down)
Bypass Primary/LUT	Shift+6	Bypass the primary color correction and LUT - (Hold key down)
Toggle Preview	т	Toggle between the pending and existing corrections - (Hold key down)
Save	Ctrl+S	Saves the current settings to the active clip
Revert	A	While previewing the pending settings, reverts to the last saved settings
Previous	8	Successively applies color and sizing settings of the Previous clip(s)
Shift+Previous	Shift+8	Successively applies only color settings of the Previous clip(s).
Ctrl+Previous	Ctrl+8	Shows correction menu for Previous clip(s) or segment(s)
Next	9	Successively applies color and sizing settings of the Next clip(s)
Shift+Next	Shift+9	Successively applies only color settings of the Next clip(s).
Ctrl+Next	Ctrl+9	Shows correction menu of the Next clip(s) or segment(s)

# Dissolves

## **Dissolve Timeline**

The Timeline Bar beneath the Media Player displays the location of dissolves for the active clip.



Cortex supports adding dissolves from one setting to another setting within the same clip.

#### To Create a Dissolve:

•

- Create settings for a clip.
- Navigate to the frame where the dissolve is to start
- Click the **Add Dissolve** button are press the **P** key
  - Navigate to the frame where the dissolve is to end
- Click the Mark Dissolve Out button or press the ] key
- Create new settings for the clip and review the dissolve

## To Adjust the Length of a Dissolve:

Use the Mark Dissolve In button ([) or Mark Dissolve Out button (]) to adjust the Dissolve.

- If you Mark Dissolve In **before** the dissolve, it will lengthen the dissolve to the new mark
- If you Mark Dissolve In within the dissolve, it will shorten the dissolve to the new mark
- If you Mark Dissolve Out after the dissolve, it will lengthen the dissolve to the new mark
- If you Mark Dissolve Out within the dissolve, it will shorten the dissolve to the new mark

#### To Navigate Between Dissolves:

- Press Shift+Mark Dissolve In button or press Shift+[ to navigate to the previous dissolve start
- Press Shift+Mark Dissolve Out button or press Shift+] to navigate to the next dissolve start

#### To Remove a Dissolve:

- Navigate to the beginning of the dissolve
- Press Ctrl+click Add Dissolve button
   or press Ctrl+P

#### Notes

- If you copy color from a clip with a dissolve, it will copy the first color correction only
- ALEs will export only the CDL values for the first color correction
- When you grab a still from a clip with a dissolve, it will grab the color correction for the frame currently located in the Media Player

# **Printer Lights GUI Controls**

ProRes	Mode	Reset		Save	Revert	Previous	Next	
Framing								
Input LUT								
Primary	-							
Output LUT								
Functions	R		 	 		2	1.4912	
Pipeline	G ——		 	 		2	0.0000	
	в ——		 	 		2	0.0000	

The **RGB Sliders** adjust the Red, Green and Blue levels. A color-coded box indicates the active slider(s), which can be adjusted with the mouse wheel. Use the 1, 2, and 3 keys to select Red, Green, Blue respectively. The **+ and -** buttons gang the controls in their relative positions.

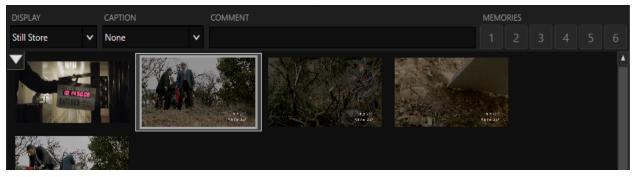
# **Image Stores**

The Image Stores contain stills saved or imported by the user into Cortex. There are six different image stores, each serving a unique function.

The	Six	Image	<b>Stores</b>
-----	-----	-------	---------------

	Image Store	Shortcut Key	Displays:
Still Store 🗸	1. Still Store	;	Stills explicitly saved by user
Still Store	2. Timeline	L	A still for each clip with current color decision
Time Line Favorites	3. Favorites	1	Stills saved to Faves list by user
Imported Stills	4. Imported Stills	Shift+'	Imported Cortex Stills or 3rd party stills
Imported CDLs LUTs	5. Imported CDLs	Shift+'	Imported CDL Values as Bars thumbnails
	6. LUTs	Shift+L	Imported LUTs as Bars thumbnails

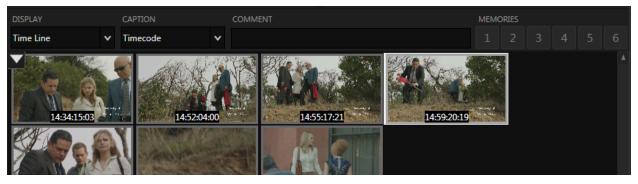
# **Still Store**



Stills "grabbed" from clips during the course of color correction are automatically saved to the Still Store. All properties are saved with the still, which can be recalled later and applied to other clips. The stills can also be exported as jpegs or Cortex Stills. Cortex Stills can be imported into other non-networked Cortex hosts where all aspects of the properties saved in the still can be recalled and applied to clips.

To Grab the current clip's color settings to a still, press the **B** key or right-click the still and choose "Grab Still" from the Context Menu.

### **Timeline Store**



The Timeline store displays a thumbnail, saved from the middle of each clip in the bin, with the currently applied color properties. As color tool properties are saved, the corresponding still will be updated with the revised properties. While all properties are saved to the still, framing changes will not be reflected in the thumbnail. *Note:* By default, Cortex does not populate the Timeline store automatically since it is time consuming and, perhaps, not needed. To populate the Timeline store, right-click on and choose "Update Timeline Stills" from the Context Menu.

### **Favorites Store**

To use stills across multiple jobs in a project, the Favorites store is where user defined favorites are saved. To add (or remove) stills to the Favorites store, select the still(s) and press the keyboard **0** (zero) key or right-click on any still(s) and choose "Toggle Favorite".



A still marked as a favorite will have an located against a black background in the upper righthand corner of the still. The Favorites Still Store defaults to filtering by Job but setting the Job Drop-down field to **All** shows all Favorites saved within the Project.

### **Imported Stills Store**

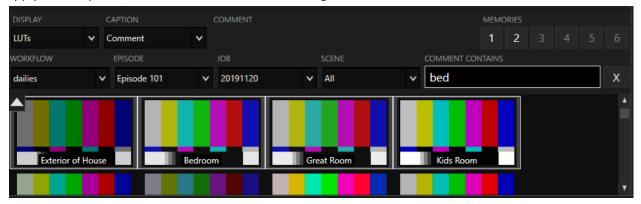
The Imported Stills store allows you to import stills from 3rd party or Cortex Stills exported by a Cortex host. 3rd party stills, such as jpegs, are used for reference only unless accompanied by corresponding LUTs or CDL values. Cortex Stills, which can be generated via any Cortex edition, will contain all saved color properties and, once imported, can be applied to any clip. Stills with color properties can be tagged as Favorites.

### **Importing Stills**

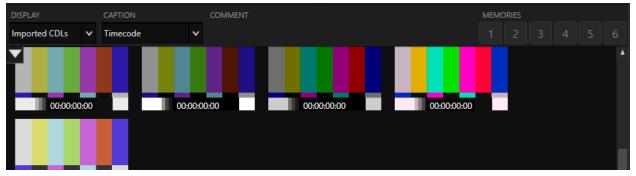
- 1. Right-click in any image store
  - a. Select Import Stills... in the Context Menu. A Windows Browser will appear. Navigate to and select the stills to be imported and then click Open.
     File types supported include: bmp, Cortex Still, dpx, exr, jpeg, tiff.

### LUTs Store

The LUT Store lets you access LUTs that have been imported into the Job. The Comment field can be used to apply a description, which can then be searched using the "COMMENT CONTAINS" field.



### **Imported CDLs Store**



CDLs created by 3rd party or other Cortex hosts can be imported into Cortex and applied to their corresponding clips. All CDL values are displayed as color bars.

### Importing CDL Values

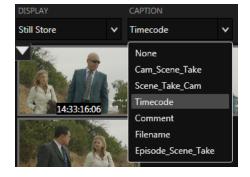
- 1. Right-click in any image store
  - a. Select Import Color From ALE/EDL/CDL...
  - b. The **List Import** window will open. Click **Browse (...).** A Windows Browser will appear. Navigate to and select the color line items to be imported and then click Open.
  - c. Use the checkboxes to select/deselect which items to import
  - d. If desired, use the checkbox to "Apply Corrections to Existing Clips"
  - e. Click Import

🏮 Lis	t Import									_		×
Sele	ect All	Select	t None			🗸 Ap	pply Correction	ns to Existing C	lips			
		Scene	Take	Camera	Tape	Reel	Comments	Description	Picture Timecode	SOP SAT		Ι
	$\checkmark$						INT BAR	INT BAR	10:15:59:12	(1.266810 1.241570 1.213860)(-0.038920 -0.013670 0.011460)(1.319040 1.377	140 1.417	22(
	$\checkmark$						INT BAR	INT BAR	14:35:41:05	(1.266810 1.241570 1.213860)(-0.038920 -0.013670 0.011460)(1.319040 1.377	140 1.417	22(
	$\checkmark$						INT BAR	INT BAR	14:52:26:16	(1.266810 1.241570 1.213860)(-0.038920 -0.013670 0.011460)(1.319040 1.377	140 1.417	22(
4	$\checkmark$						INT BAR	INT BAR	14:56:46:06	(1.266810 1.241570 1.213860)(-0.038920 -0.013670 0.011460)(1.319040 1.377	140 1.417	22(
	$\checkmark$						INT BAR	INT BAR	14:59:20:03	(1.249870 1.230280 1.186080)(-0.040380 -0.015100 0.007730)(1.369870 1.439	730 1.503	81(
	$\checkmark$						INT BAR	INT BAR	14:52:27:16	(1.253800 1.229980 1.240430)(-0.037100 -0.011810 0.009800)(1.342580 1.400	0290 1.470	
	$\checkmark$						INT BAR	INT BAR	14:59:18:15	(1.282040 1.262450 1.218240)(-0.057980 -0.032700 -0.009870)(1.369870 1.43	9730 1.50	381
8	$\checkmark$						INT BAR	INT BAR	15:00:59:06	(1.253800 1.229980 1.240430)(-0.037100 -0.011810 0.009800)(1.342580 1.400	0290 1.470	
EVENTS	5 FOUND:	: 8								Cancel	Imp	ort

If the "Apply Corrections to Existing Clips" is enabled, Cortex will attempt to match the CDL line items to their corresponding clips using the Picture Timecode, Tape Name, Scene/Take/Camera, or a combination. If no metadata is present for any of the fields, it will simply import the values.

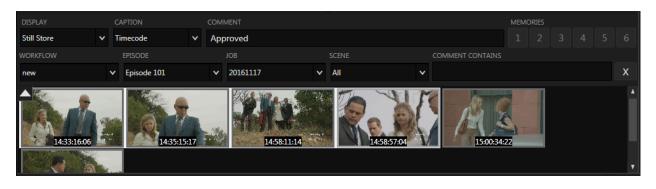
Stills can be displayed with a Caption for identification. Caption options are:

- None
- Cam\_Scene\_Take
- Scene\_Take\_Cam
- Timecode
- Comment
- Filename
- Episode\_Scene\_Take



Stills are automatically sorted in the same sort order chosen for the clips bin.

# **Filtering and Searching**



You can access stills saved in other jobs for the selected image store using the Filter/Search feature. To toggle the Search bar, click the Down Arrow button on the left side of the still store. It will expose a series of fields by which you can filter a search. You can filter by **Workflow**, **Episode**, **Job**, and **Scene**. Using the **Comment Contains** field, you can search for a text string by entering any text and pressing Enter. For example, to search for Favorite stills, first select the Favorites still store and then enter search criteria as desired.

### Saving and Recalling Stills

To save (Grab) the current clip's color settings to a still, press the **B** key or right-click the still and choose "Grab Still" from the Context Menu. The still will appear in the Still Store.

### To recall and load a still's color settings to another clip:

- 1. Select the clip to be colored
- 2. Press N or choose Play from the Context Menu
- 3. Navigate to the desired Still. Once you've found the desired Still, press **N** again to return to the active clip
- 4. Pres Shift+N or Double Click the still to load the color settings
- 5. Click Ctrl+S to save the color decision to the clip

### To add a comment to a still:

- 1. Select the still
- 2. Type the comment in the comment box and press ENTER

### To go to the clip of the selected still:

*Note: Applies only to stills with corresponding clips in the current Job.* 

- 1. Select the still
- Right click on the still and select "Go to Clip" or press Alt+Left click on the still or press Ctrl+Shift+N

Delete
Grab Still
Update Timeline Stills
Play
Go to Clip
Toggle Favorite
Load All
Load Source Settings
Load ACES Input
Load Framing
Load Input LUT
Load Color Correction
Load Output LUT
Load Effects
Sort by
Import to Current Job
Export Stills
Import Stills
Export as CDL
Export as simple 3D LUTs
Import LUTs
Import Color From ALE/EDL/CDL

### **Still Functions**

There are a number of options for working with stills:

• Double-click - load color decisions from still into current clip

Right click for a Context Menu with the following options:

- Grab Still grab a still of the color correction options on the current clip
- Update Timeline Stills Refresh the stills within the Timeline store
- Play Toggle between the selected still and the current clip within the Media Player.
- Go To Clip load the corresponding clip the still was grabbed from
- Toggle Favorite Add or remove from Favorites
- Load All Load all color parameters related to this still. You can choose to selectively:
  - Load Source Settings
  - Load Framing
  - Load Input LUT
  - Load Color Correction
  - Load Output LUT
  - Load Effects
- Import to Current Job Enabled when viewing stills from other Jobs via search/filter
- Export Stills Export Cortex or JPEG stills from your active store.
- Import Stills Import Cortex or JPEG stills to the Imported Stills store.
- Import Color from ALE/EDL/CDL Import color decisions via ALE/EDL/CDL into the Imported CDLs Store
- **Delete** Delete the selected still.

### **Exporting Stills**

Stills can be exported from any Image Store, or via the Project Manager for the Still and Timeline stores. In the desired Image Store, **select** the Still(s) you want to export, right-click and choose **Export Stills**.

When exporting stills from the Image Store,

Cortex provides the following options:

File Types - Which kind of Stills to export

- All Export both types of stills
- Cortex (.still) Export stills in a format readable by other Cortex systems
- JPEG (.jpg) Export stills as standard JPEG files

Name Stills By - Select the file naming convention

- Scene-Take-Camera
- Filename
- Verbose (includes S/T/C and Filename info)

Second Stills		100.000	×
FILE TYPES	NAME STILLS BY  Scene-Take-Camera		
O Cortex (.still)	Filename		
JPEG (jpg)	O Verbose		
LOCATION			
C:\Desktop			
		Export	Cancel

### Exporting Stills via a Job in the Project Manager

To Export stills located in a job, right-click on the job in the Project manager and choose "Export Stills..." Cortex provides options to export stills from:

- All (meaning both from the Still Store and Timeline Store)
- Still Store
- Timeline

Specify an output file location using the **Browse** button, then click **Export**.

#### **Memories**

You can save up to 6 color corrections by storing them in the Memories buffers. Above the Still Stores are 6 buttons for saving user defined color corrections.

#### The Keyboard shortcuts are as follows:

Ctrl+Shift+Delete	Save MEM 1
Ctrl+Shift+End	Save MEM 2
Ctrl+Shift+PgDn	Save MEM 3
Ctrl+Shift+Insert	Save MEM 4
Ctrl+Shift+Home	Save MEM 5
Ctrl+Shift+PgUp	Save MEM 6
Shift+Delete	Recall MEM 1
Shift+End	Recall MEM 2
Shift+PgDn	Recall MEM 3
Shift+Insert	Recall MEM 4
Shift+Home	Recall MEM 5
Shift+PgUp	Recall MEM 6

To use the mouse, replace the keys with the corresponding buttons.

If a Memory button position is unused, it will be Dim.

If a color correction has been saved to a button position it will be White.

The last recalled Memory will be Green.

# **The Functions Tab**

The Functions tab provides modules to add grain, aperture correction, adjust settings for MTI-Samsung resizing, and processing of Dolby Vision<sup>™</sup> Level 1 analysis.

Note: Grain and Aperture Correction settings are "baked in" to Deliverables and do not carry as metadata in CDL files. However, they are passed on as metadata in Cortex Manifest Files.

# Film Grain

ProRes	FILM GR4		APERTURE	MTI-SAMSUNG	DOLBYVISION	HDR METADA	AT			
Framing		Reset	ByPass			Save	Revert	Previous	Next	
Input LUT	ENAE	BLE 🗸	Default							
Primary	GRAIN SIZE			GRAIN LE	VEL LOW					
Output LUT			2.5000	GRAIN LE		26.6364				
Functions						27.2727				
Grain Size	С	reate l	arger or smal	ller Grain						
Grain Saturati	on C	olor sa	turation of th	ne grain						
Grain Level Lo	v Make the grain more or less apparent in dark regions of the frame									
Grain Level Hi	gh N	1ake th	ne grain more	or less appare	nt in light reg	gions of the	e frame			

# **Aperture Correction Settings**

ProRes	FILM GRAIN	APERTURE	MTI-SAMSUNG	DOLBYVISION H	HDR METADA	ATA		
Framing	Reset	ByPass			Save	Revert	Previous	Next
Input LUT	ENABLE 🗸	Default						
Primary	SPREAD							
Output LUT	STRENGTH	1.7500						
Functions		0.8000						
Spread	Determ	ines the amou	unt of noise sup	opression				
Strength	Determ	ines the stren	gth of edge det	tection				

# MTI HQ

Framing	FILM GRAIN APERTURE	MTI-HQ	DOLBYVISION HDR METADATA
Input LUT	Reset ByPass		Save Revert Previous Next
Primary	APERTURE		ENABLE MATTE:
Output LUT	ENABLE     Default		BLACK LEVEL: Full - 0
Functions	SPREAD 1.00	00	25
Pipeline	STRENGTH 0.80		0 RESET 1919
			1050

If your Deliverable is set to resize using MTI HQ, the MTI HQ module will be available. MTI HQ supports progressive and interlaced frames.

The Aperture function is duplicated from the Aperture Tab and will be identical in both places. To enable

#### Matte Function for MTI HQ

When upscaling video that contains a letterbox or pillarbox matte, the matte line can be compromised by the rescaling. To avoid this, MTI HQ provides a matte replacement function.

- 1. Choose the Black Level; either Full-0 or Legal-64 per code values
- 2. Click on the arrow buttons to adjust the vertical or horizontal position of the matte
  - a. Hold down the Shift button to increase the rate the matte moves

Note: For Preview purposes, the matte will be gray in order to show better the difference between the original matte and what will be the replacement. It will be rendered black according to the level setting.

- 3. Zoom in on the edge of the original matte
  - a. Scroll the mouse wheel up to zoom and left click and drag to position the frame in the Media Player, or click the 1:1 button for a pixel to pixel view of the image
  - b. Double click the image to return to full frame view

Make sure that the original matte is completely covered by the gray matte. Repeat the operation for all sides of the matte and then save the setting by clicking the Save button or pressing Ctrl+S.

Note: When used in a composition, the matte can be enabled or disabled on a shot by shot basis. For best results with MTI HQ, it is recommended to enable the default Aperture setting for all affected clips or composition shots.

# **MTI-Samsung**

ProRes	FILM GRAIN	APERTURE	MTI-SAMSUNG	DOLBYVISIO	N HDR METADA	ATA		
Framing	Reset	ByPass			Save	Revert	Previous	Next
Input LUT	ENABLE 🗸	Default			ENABLE MATTE:	~		
Primary	DEJAGGING 🗸	GAIN			BLACK LEVEL:	Full - 0	~	
Output LUT	NOISE			8		0		
Functions	REDUCTION	GAIN		32		0		
Pipeline	LINE ENHANCEMENT			20		RESET	19	19
	DETAIL ENHANCEMENT	GAIN		5		1079	* *	

If your Deliverable is set to resize using MTI-Samsung, the MTI Samsung module will be available. MTI-Samsung only supports progressive frames. For interlaced frames, use MTI HQ.

Dejagging	Smooths aliasing
Noise Reduction	The default is the recommended setting
Line Enhancement	Particularly helpful for upresing animation
Detail Enhancement	Enhances the amount of detail brought out by the resizing

It is best to use an SDI monitor to observe the effect of settings changes. If no SDI monitor is available, use the

1:1 button

located at the bottom of the UI for a pixel to pixel view of the settings' effect.

#### Matte Function for MTI-Samsung

When upscaling video that contains a letterbox or pillarbox matte, the matte line can be compromised by the rescaling. To avoid this, MTI-Samsung provides a matte replacement function.

- 1. Choose the Black Level; either Full-0 or Legal-64 per code values
- 2. Click on the arrow buttons to adjust the vertical or horizontal position of the matte
  - a. Hold down the Shift button to increase the rate the matte moves

Note: For Preview purposes, the matte will be gray in order to show better the difference between the original matte and what will be the replacement. It will be rendered black according to the level setting.

- 3. Zoom in on the edge of the original matte
  - a. Scroll the mouse wheel up to zoom and left click and drag to position the frame in the Media Player, or click the 1:1 button for a pixel to pixel view of the image
  - b. Double click the image to return to full frame view

Make sure that the original matte is completely covered by the gray matte. Repeat the operation for all sides of the matte and then save the setting by clicking the Save button or pressing Ctrl+S.

Framing	FILM GRAIN	APERTURE	MTI-SAMSUNG	DOLBYVISION HDR ME	TADATA		
Input LUT	The analy	sis will be done for d Source	eliverable:	Entire Comp	position 🗸		
Primary	✓ ANALYZE S		ABLE ROI	SHOT CHANGES	HDR10 LEVELS T	HRESHOLD 100 %	
Output LUT	PRESETS:	v	2.400			Calculate	
Functions							
Pipeline		140 💭					
	0	Reset	1919				
		939		MAX FALL	MAX CLL		
				0.000	0.000		

# Creating Dolby Vision<sup>™</sup> Level 1 HDR Metadata

Cortex Supports the processing of Level 1 Dolby Vision<sup>™</sup> (DoVi) metadata. For example, if an HDR 10 master needs to be converted to DoVi there are different methods for doing that outside of Cortex, generally by tying up a color bay. With Cortex Enterprise, you can generate Level 1 DoVi metadata by using a Cortex created composition.

If you're not familiar with Cortex's Edit Tool, you should review it prior to this section since a composition is essential for processing Dolby Vision<sup>™</sup> metadata. <u>The Edit Tool</u>

Follow the steps below to create a DoVi composition.

### Edit Tool Steps for Creating a Dolby Vision<sup>™</sup> Composition

- 1. In the Edit Tool, create a new composition by clicking the New button
- 2. Select "Composition" from the Drop-down menu

# Note: For this tutorial, we will focus on a normal Composition rather than an IMF Composition since we'll be covering IMF creation in the Edit Tool tutorial.

- 3. In the Create dialog, enter the timecode for the START AT field
- 4. Enter the Black Level, either Full-0 or Legal-64, for insert edits using the Shift+H command

		23.976 fps		
00.00.00.00	VEL OF BLACK INSERT EDIT			
00:00:00 FL	ull - 0 🗸 🗸			
ENABLE HDR	USE EXTERNAL DOLBY METADATA			
DOLBY VISION VERSION: OV2.9 💽 V4 PRE	ESETS: 1000-nit, P3, D65, ST	2084, Full, (type 20)	~	
DISPLAY PRIMARIES (X, Y) WHI	ITE POINT (X, Y)	IIN MONITOR LUMINANCE	MAX MONITOR LUMINANCE	
		0.0001	1000	

- 5. Check the ENABLE HDR and Dolby Vision<sup>™</sup> checkboxes
- 6. Choose the DoVi version, either v2.9 or v4
- 7. From the PRESETS Drop-down field, choose which monitor type was used
- 8. If needed, modify the MIN and MAX Monitor Luminance fields
- 9. Click Create

Using the Edit Tool, create the composition. Right-click anywhere on the timeline to show the Context Menu and, if a corresponding EDL is available, select Merge EDL or the "Detect Shot Change" option if no EDL exists. If using the "Detect Shot Change" option, be sure to vet the cuts to ensure there are no false positives or negatives.

### **Color Tool Steps for Processing Dolby Vision**<sup>™</sup>

Once the composition is ready and the cuts are vetted:

- 1. Switch to the Color Tool
- 2. Make sure the composition is selected and that the Metadata track (M) is visible though empty.
- 3. Choose the "DolbyVision HDR Metadata" tab

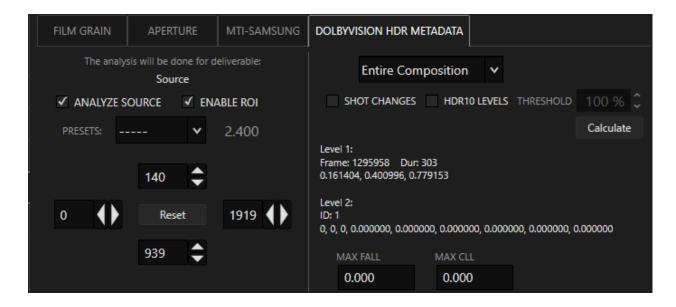
Framing	FILM GRAIN	APERTURE	MTI-SAMSUNG	DOLBYVISION HDR M	ETADATA		
Input LUT	The analy	sis will be done for d Source	eliverable:	Entire Com	position 🗸		
Primary	✓ ANALYZE S		ABLE ROI	SHOT CHANGES	HDR10 LEVELS	THRESHOLD	100 % 🗘
Output LUT	PRESETS:	···· v	2.400				Calculate
Functions							
Pipeline		140 💭					
·	0	Reset	1919				
		939 🌲		MAX FALL	MAX CLL		
				0.000	0.000		

- 4. If you wish to Analyze the source media, enable the ANALYZE SOURCE checkbox. Disabling it will allow you to choose a specific Deliverable's color pipeline for the analysis by selecting its Deliverable tab above the Media Player.
- 5. If the picture content contains a matte, the analysis must exclude the matte from the analysis. To exclude the matte from analysis:
  - a. Check the ENABLE ROI checkbox and choose an aspect ratio from the PRESETS Drop-down list. An ROI with Red line boundaries will appear.
  - b. As needed, adjust the boundaries of the ROI with the arrow buttons.
- 6. If no EDL was merged or shot detection was not run in the Edit Tool, enable the SHOT CHANGES checkbox. You will still have to vet the cuts after the analysis.
- 7. If you wish to generate and include HDR 10 metadata for MAX FALL and MAX CLL enable the HDR 10 LEVELS checkbox and enter a value for the THRESHOLD. The value entered serves as the percent of the total number of frames that will determine the MAX FALL and MAX CLL values. As an example, if the media contains 1000 frames and the threshold is set to 98%, 2% of the frames (20) with the highest values will be omitted from the final result.

# Note: It is not necessary to include these values in a DoVi Deliverable but is available in the event HDR 10 Deliverables are required

8. Press Calculate

The Metadata track will turn purple and the analysis will begin. Once the analysis is complete, the metadata track will turn blue and the Level 1 values will be displayed on the right side of the module.

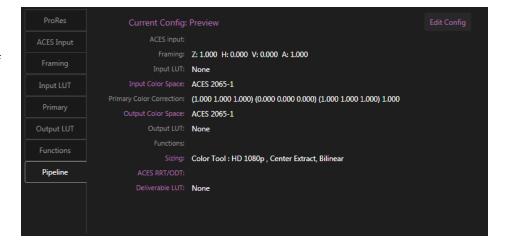


Note that Level 2 (Trims) are unaffected. Cortex does not support changing Level 2 and, therefore, does not require you to purchase a license issued by Dolby.

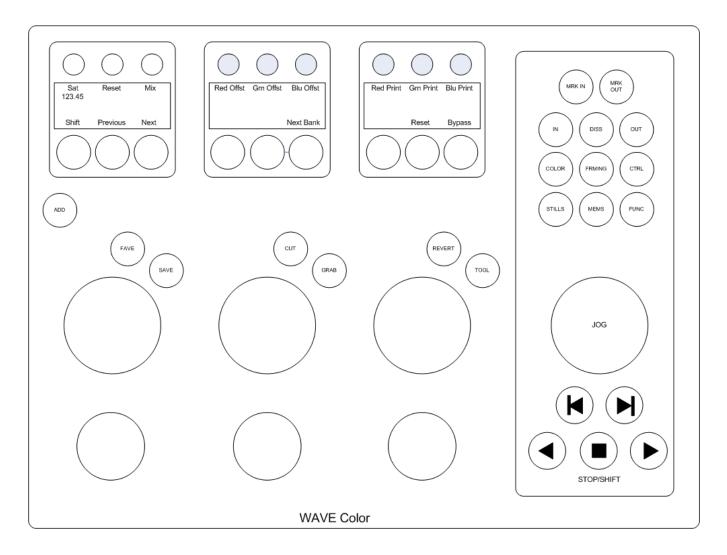
### **Pipeline Tab**

To confirm all color, framing, LUT and Device Transform settings, click the Pipeline tab. This gives you a full list of the active clip's color tool and ACES settings (if applicable), based on the Deliverable configuration currently in the preview monitor.

The items colored magenta are found in the Deliverable configuration. To modify any of these settings, click the Edit Config button to open the configuration window for editing.



# **Wave Panel Button Functions**



Wave Button Function	Qwerty Keyboard Equivalent
ADD	G - Add event to Clip Reel
SAVE	Ctrl+S - Save current color correction
MEMS	Please see Keyboard shortcuts
СUT	N - compare with current still
MODE	~ - Toggle Lift Gamma Gain/Printer Lights
GRAB	B - grab picture to Still Store
REVERT	A - Revert to saved color correction
TOGL	T - Toggle last two viewed color corrections
SCREEN	F11 - Toggle Full Screen/GUI
WFVS	F12 - Toggle Waveform and Vectorscope in Full Screen
MEMS	Show Mems menu
DISS	P - Add dissolve
GRAIN	F2 - Repeat to cycle to Grain Tool tab
COLOR	F2 - Repeat to cycle to Primary Tool tab
FRAMING	F2 - Repeat to cycle to Framing Tool tab
TIMLIN	L - Go to Timeline Still Store
LUTS	Ctrl+L - Go to LUTs still store
STILLS	; - Go to Still Store
FAVES	' Go to Faves Still Store
Imported Stills/CDLs	Shift+' - Toggle Imported Stills/CDLs

# **Keyboard Shortcuts**

For all Color shortcuts, use the top row keyboard numbers unless otherwise indicated

Navigation	Description
Q or J	Switch focus to Clips Bin
W or K	Switch focus to Composition
E or Up arrow	Go to previous clip or edit (when focused on composition)
R or Down arrow	Go to next clip or or edit (when focused on composition)
Shift + S	Go to previous edit (if focus is on clips bin, first press switches to composition)
Shift + F	Go to next edit (if focus is on clips bin, first press switches to composition)
x	Play reverse (press 2x or 3x for faster playback)
Shift + X	Go to center of selected clip
С	Stop
V	Play forward (press 2x or 3x for faster playback)
Shift + V	Play forward from middle of clip or segment
Ctrl + V	Loop Play from mark in to mark out
S	Step reverse one frame
F	Step forward one frame
Space Bar	Toggle Play/Stop
Composition Timeline	
Shift - (minus)	Zoom out timeline
Shift + (plus)	Zoom in timeline to cursor position
Ctrl + Shift - (minus)	Zoom out entire timeline
Mouse Wheel	Zoom timeline in/out while hovering mouse over timeline
Ctrl + Mouse Wheel	Scroll timeline left/right.

Marks	Description
I	Mark In
Shift + I	Go to Mark In
Ctrl + I	Clear Mark In
0	Mark Out
Shift + O	Go to Mark Out
Ctrl + O	Clear Mark Out
Alt+Shift+ I and O	Clear Mark In and Mark Out on both source and composition
Z	Mark entire clip or segment
Color Tool Commands	Description
FUNCTION KEYS	
F2 (Shift to reverse)	Select Color Tool and Cycle through Function Tabs
F11	Toggle Full Screen On/Off
F12	Toggle Waveform/Vectorscope and Sync fields or Timeline
Shift+F12	Move Waveform/Vectorscope to Media Player
Ctrl+F12	Turn off Waveform/Vectorscope in Media Player
Ctrl+Shift+F12	Undock and float Waveform/Vectorscope
ALT+F12	When in Editorial Hybrid - show sound Mark Window
ARROW KEYS (Use Shift and	l Ctrl for greater/lesser increments)
Up arrow	Increase value when cursor is located in field box
Down arrow	Decrease value when cursor is located in field box
COLOR – Lift Gamma Gain N	1ode
~	Toggle Lift Gamma Gain and Printer Lites modes
1	Select Lift; adjust luminance with up/down arrows
1 – Press and Hold	Select Lift; adjust red with up/down arrows; adjust blue with left/right arrows
Ctrl+1	Reset Lift
2	Select Gamma; adjust luminance with up/down arrows
2 – Press and Hold	Select Gamma; adjust red with up/down arrows; adjust blue with left/right arrows
Ctrl+2	Reset Gamma

3	Select Gain; adjust luminance with up/down arrows
3 – Press and Hold	Select Gain; adjust red with up/down arrows; adjust blue with left/right arrows
Ctrl+3	Reset Gain
4	Select Saturation; adjust with up/down arrows
Ctrl+4	Reset Saturation
COLOR – Printer Lites Mode	
~	Toggle Lift Gamma Gain and Printer Lites modes
1	Select Red channel
Ctrl+1	Reset Red channel
2	Select Green channel
Ctrl+2	Reset Green channel
3	Select Blue channel
Ctrl+3	Reset Blue channel
	·
COLOR – COMMON COMM	ANDS
4	Saturation
5	Reset all color to unity
SHIFT+5	Reset all color to unity and clear LUTs
6 – Press and hold	Bypass color correction except LUTs
Shift+6 – Press and hold	Bypass color correction and LUTs
8	Load all corrections of Previous clip(s) or segment(s)
SHIFT+8	Load color correction only of Previous clip(s) or segment(s)
Ctrl+8	Show correction menu for Previous clip(s) or segment(s)
9	Load all corrections for Next clip(s) or segment(s)
SHIFT+9	Load color correction only of Next clip(s) or segment(s)
Ctrl+9	Show correction menu for Next clip(s) or segment(s)
т	Toggle pending and existing corrections
А	Revert to saved correction and reject pending

Ctrl+A	Select all clips or segments
STILL STORE	
В	Grab a still
Ν	Cut to still (toggle)
Shift+N	Load color settings from still
Ctrl+Shift+N	Go to clip of selected still
L	Select Timeline store
; (semicolon)	Select Still Store
' (apostrophe)	Select Faves store
Shift+' (apostrophe)	Toggle Imported Stills/Imported CDLs
Ctrl+L or Ctrl+'(apostrophe)	Select LUTs store
0 (zero)	Toggle "Fave" status of selected still
DISSOLVES	
Р	Add dissolve
[	Mark or Re-mark dissolve in
]	Mark or Re-mark dissolve out
Ctrl+P	Remove dissolve (cursor must be on or at beginning of the dissolve)

# The Sync Tool



The Sync Tool is used predominantly to synchronize audio and picture for Dailies use. However, it can be used, for example, to synchronize a reel of a movie prior to its use in a DCP composition.

The basic operation of the tool is to import picture and corresponding audio into a Job, select a picture clip and use the Auto-Sync options. The tool also provides for manual syncing if needed.

Project Manager MT	1_Cortex_De	mo > Episode	101 > Dai	ilies > 202	200229 ×						
Import	New					Filter Clips	\$ &	<b>1</b>	89 в	? 🔳	88
Master Clips Bin	#	l N	lame		Status	Picto	ure	•	Resoluti	ion Fran	ne Rate
7 - 00:11:59	1	🔵 9A-1	(B)		<b></b>	B339C001_111215	_R2HX.mov		1920x108	30 23.	976
Project Library 3 - 00:00:01	2	🔵 9D-1	(B)		É	B339C004_111215	_R2HX.mov		1920x108	30 23.	976
Reel_1001	3	🔵 9D-2	(B)		É	B339C005_111215	_R2HX.mov		1920x108	30 23.	976
0 - 00:00:00	4	🔵 9D-3	(B)		<b>1</b>	B339C006_111215	_R2HX.mov		1920x108	30 23.	976
	5	🔵 9D-1	(C)		<b></b>	C064C002_111215	_R2K9.mov		1920x108	30 23.	976
	6	🔵 9D-3	(C)		<b></b>	C064C005_111215	_R2K9.mov		1920x108	30 23.	976
	7	🔵 1ED-	1 (D)		<b></b>	D707C005_111117	_R2M.mov		1920x108	30 23.	976
		L 69.0	-						<del></del>	l n e	
	#	SR_Sc_ ⊘ 0159_		015902		Audio			Timecode 14:32:28:15	Duration 00:03:18	
	2								14:52:20:15	00:03:13	
		Ø 0159_		015902							
	3	Ø 0159_		015902					14:44:01:15	00:01:20	
	4	Ø 0159_		015902					14:51:22:09	00:01:10	
	5	⊘ 0159_		015902					14:53:40:07	00:03:10	
	6	⊘ 0159_		015902					14:57:03:00	00:02:25	
	7	⊘ 1117_	1ED_1	111703	0.wav				14:59:49:17	00:01:26	:12 4
											•

In the Sync Tool, the Master Clips Bin is divided in two sections, video and audio. When media is imported, Cortex places the media in their corresponding sections.

While Cortex allows for dailies operations to be done in any order. The following is a description of a typical dailies session.

- 1. Import picture and audio files
- 2. Using the Sync Tool, synchronize the audio to picture
  - a. Double check sync and verify metata
  - b. Create a Clips Reel
- 3. Color Correct (using Color Tool)
  - a. Add clips to the reel and "Close" the reel when it is completed

If you have one workstation, you can continue working in the foreground while rendering in the background. With multiple workstations licensed for the Enterprise Edition, rendering can be distributed for greater efficiency if each workstation is attached to a central database server.

NOTE: Clips on "Closed" Clip Reels cannot be modified. Therefore, Cortex will block the "reuse" of a clips once it is added to a clips reel unless the reel is open or the clip is duplicated. Modifying a clip on an open reel, including changing In/Out marks, will cause the clip to be rerendered.

### The highlighted options in yellow are NOT available in the Sync Tool:

•	Add Clip(s) to Timeline	Various options how to add clips to timeline					
	Add Handles	Add Handles to clips in reel prior to rendering					
۰	Add to New Reel	Add clips to newly created reel to be rendered					
	Add to Project Library	Add a clip(s) to the Project Library					
	Add to Reel	Add clip(s) to selected Reel					
	Audio Info	When available shows audio metadata					
	Auto-Composition	Create a composition using start TC and fps					
	Auto-Sync with Offset	Sync audio to pix using established offset					
	Auto-Sync without Offset	Sync audio to pix matching pix TC					
	Browse to Audio File	Open containing folder of audio					
	Browse to Video File	Open containing folder of video					
×	Сору То	Open Copy Tool dialog for selected clip(s)					
	Delete	Delete selected clip(s)					
	Delete Layout	Delete a user defined bin Layout					
	Detect Dead Pixels	Show Dead Pixel Dialog (switch to QA Tool)					
	Detect Dead Pixels (cancel)	Cancel Detection processing					
	Detect Dead Pixels (cancel) Duplicate Clip	Cancel Detection processing Duplicate clip for alternate versions					
•	Duplicate Clip	Duplicate clip for alternate versions					
,	Duplicate Clip Edit Name	Duplicate clip for alternate versions Edit the clip name					
,	Duplicate Clip Edit Name Edit Tape Name	Duplicate clip for alternate versions Edit the clip name Edit the clip's Tape Name					
•	Duplicate Clip Edit Name Edit Tape Name Edit Timecode	Duplicate clip for alternate versions Edit the clip name Edit the clip's Tape Name Change the Frame rate of the clip					
•	Duplicate Clip Edit Name Edit Tape Name Edit Timecode Import Audio	Duplicate clip for alternate versions Edit the clip name Edit the clip's Tape Name Change the Frame rate of the clip Import corresponding .wav file to pix clip					
•	Duplicate Clip Edit Name Edit Tape Name Edit Timecode Import Audio Load Layout	Duplicate clip for alternate versions         Edit the clip name         Edit the clip's Tape Name         Change the Frame rate of the clip         Import corresponding .wav file to pix clip         Load a user defined bin Layout					
5	Duplicate Clip         Edit Name         Edit Tape Name         Edit Timecode         Import Audio         Load Layout         Load Source Extractor	Duplicate clip for alternate versions         Edit the clip name         Edit the clip's Tape Name         Change the Frame rate of the clip         Import corresponding .wav file to pix clip         Load a user defined bin Layout         After import Media Folder (fast), enable video					
5	Duplicate Clip         Edit Name         Edit Tape Name         Edit Timecode         Import Audio         Load Layout         Load Source Extractor         Relink	Duplicate clip for alternate versions         Edit the clip name         Edit the clip's Tape Name         Change the Frame rate of the clip         Import corresponding .wav file to pix clip         Load a user defined bin Layout         After import Media Folder (fast), enable video         Relink media to new location after being moved					
•	Duplicate Clip         Edit Name         Edit Tape Name         Edit Timecode         Import Audio         Load Layout         Load Source Extractor         Relink         Remove Audio	Duplicate clip for alternate versions         Edit the clip name         Edit the clip's Tape Name         Change the Frame rate of the clip         Import corresponding .wav file to pix clip         Load a user defined bin Layout         After import Media Folder (fast), enable video         Relink media to new location after being moved         Remove embedded audio from clip					
•	Duplicate Clip         Edit Name         Edit Tape Name         Edit Timecode         Import Audio         Load Layout         Load Source Extractor         Relink         Remove Audio         Reset Embedded Audio	Duplicate clip for alternate versions         Edit the clip name         Edit the clip's Tape Name         Change the Frame rate of the clip         Import corresponding .wav file to pix clip         Load a user defined bin Layout         After import Media Folder (fast), enable video         Relink media to new location after being moved         Remove embedded audio from clip         Reset embedded audio to clip after removal					
•	Duplicate Clip         Edit Name         Edit Tape Name         Edit Timecode         Import Audio         Load Layout         Load Source Extractor         Relink         Remove Audio         Reset Embedded Audio         Save Color to Selected Clips	Duplicate clip for alternate versions         Edit the clip name         Edit the clip's Tape Name         Change the Frame rate of the clip         Import corresponding .wav file to pix clip         Load a user defined bin Layout         After import Media Folder (fast), enable video         Relink media to new location after being moved         Remove embedded audio from clip         Reset embedded audio to clip after removal         In Color Tool save pending color to clips					
•	Duplicate Clip         Edit Name         Edit Tape Name         Edit Timecode         Import Audio         Load Layout         Load Source Extractor         Relink         Remove Audio         Reset Embedded Audio         Save Color to Selected Clips         Save Layout	Duplicate clip for alternate versions         Edit the clip name         Edit the clip's Tape Name         Change the Frame rate of the clip         Import corresponding .wav file to pix clip         Load a user defined bin Layout         After import Media Folder (fast), enable video         Relink media to new location after being moved         Remove embedded audio from clip         Reset embedded audio to clip after removal         In Color Tool save pending color to clips         Save user defined Layout					

Add Clip(s) to Timeline

Add to Project Library

Auto-Composition Auto-Sync with Offset Auto-Sync without Offset

Browse to Video File

Detect Dead Pixels (Cancel

Copy To Delete

Delete Layout Detect Dead Pixels

Duplicate Clip Edit Name

Edit Tape Name Edit Timecode Import Audio Load Layout

Load Source Extractor

Reset Embedded Audio Save Color to Selected Clip

Show/Hide Columns

Save Layout

Traceback

Relink

Add Handles Add to New Reel

Add to Reel **Audio Info** 

# The Audio Bin

#	Ι	SR_Sc_Tk	I	Audio	*	Timecode	I	Duration	I	Channels
1		⊘ 0159_9A_1		0159022.WAV		14:32:28:15		00:03:18:15	;	5
2		⊘0159_9B_1		0159023.WAV		14:41:40:19		00:01:53:11		5
3		⊘0159_9C_1		0159024.WAV		14:44:01:15		00:01:20:14	Ļ	5
4		⊘0159_9D_1		0159025.WAV		14:51:22:09		00:01:10:02	2	5
5		⊘ 0159_9D_2		0159026.WAV		14:53:40:07		00:03:10:15	5	5
6		⊘ 0159_9D_3		0159027.WAV		14:57:03:00		00:02:25:04	Ļ	5
7		⊘ 1117_1ED_1		1117030.wav		14:59:49:17		00:01:26:12	2	4
										Þ

The audio bin displays all imported audio files that have not yet been synchronized.

Audio files are automatically added to the audio bin if they are located in a folder in the same directory path as the video media, otherwise import them separately.

If a video file has corresponding audio with <u>identical start timecode</u>, for example a finished master, you can add an audio file directly to a picture by right-clicking on the picture clip and selecting **Import Audio**. A browser will open allowing you to navigate to the audio file.

If the audio file is located within the same folder as the picture, it will automatically be synched to the clip as long as the two files have identical start timecodes. In the event the timecodes are not identical, the user can use the Sync Tool toolset.

# Audio Metadata

After import, the audio clip will be displayed with the following metadata

- # Import order
- **SR\_Sc\_Tk** Sound Roll/Scene/Take info & status. The symbol to the left indicates the clip's status- Circled, Excluded or Starred. Clips are Circled by default.
- Audio Audio file name
- Timecode Clip start timecode
- Duration Clip duration
- Channels Number of channels detected in the clip.

You can right-click each audio clip and select from the following options:

- Audio Info Display audio file properties
- Resample Make changes to the output frames per second and/or sample rate
- Delete Remove the audio clip from the bin
- **Relink** Relink missing media files by pointing to a new source folder.
- Browse to Audio File Browse to the folder containing the selected source audio files
- Edit Timecode Edit the start timecode and/or framerate of the audio clip.

# Metadata Input

EPISODE	SHOOT DATE	AUTO SYNC	BUMP	CAMERA ROLL	SCENE	TAKE	SOUND ROLL	PRINT STATUS AUTO
Episode 101	11/17/2016	<u> </u>		+ B339	9A	1	0159	
TAPE NAME	PLAY SPEED	PICTURE SYNC				L		
B339C001_111215_	24	1X 14:32:59:04				dik.		ADD
SOUND TC FPS	SAMPLE RATE	SOUND SYNC				- Maryhan		TO REEL
23.976	48000	14:32:59:06			14:32:59:04	00:00:00:02.29	14:32:59:06.30	+

Metadata will be automatically read from the video and audio files where available and can be modified by the user. If no metadata is available, press the Tab key to navigate to each metadata field and manually enter information. Pressing the Up and Down arrow keys will change the values in increments of one based on the last letter or number in the last entry. For example, if the take number of the last entry is 2, pressing the Up arrow will increase the value to 3.

Metadata Field	Source
Camera Roll	Video File
Scene	Audio File
Take	Audio File
Sound Roll	Audio file
Episode	Project Manager
Play Speed	Video File
Shoot Date	Project Manager
Tape Name	Video File
Sound TC FPS	Audio file
Sample Rate	Audio File

# **Additional Metadata entry**

Select Print Status			dd Comment	Sele	ct Severity
_ <b>↓</b>			•		↓
	AUTO TRIM	ADD COMMENT			
		14:32:58:04 - S2 - Boo	m in shot		
	ADD	14:33:56:17 - S2 - Aud	lio interference		
	TO REEL				
	<b>I</b>				Users

can also add additional metadata about a clip:

- **Print Status** There are three options: Circled, Not Circled, or Starred. The user assigns a single Print Status to the clip. Whether a clip is added to a deliverable is determined by which print status options were enabled when the deliverable was created. For example, if a DNx36 deliverable has all three statuses enabled, all clips will be added to that deliverable for rendering. If, however, an H.264 only has Circled and Starred takes enabled, it will exclude any Not Circled clips.
- **Comment** Add a comment at current timecode with specified severity (0-3).

### **Modifying Multiple Clips**

To modify multiple clips, hold the Shift key while clicking to select a span of clips, or hold the Ctrl key while clicking to individually add or remove clips from the selection. You can then modify the Camera Roll, Scene, Sound Roll, Print Status, and Comments fields. The Take field cannot be modified.

# **Synchronization Tools**

### Timeline

The selected clip timeline consists of both Video and Audio tracks. The timeline represents the length of the Video clip and expands to include the full length of the synchronized audio when the audio is longer than the video.



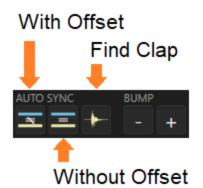
Once audio and video are synchronized, the tracks will be locked together during navigation.

# **Mark Window**

EPISODE	SHOOT DATE			CAMERA ROLL		ENE			AKE			STATUS		AUTO TRIM
Episode 101	11/20/2019	I I I I +		B339	9	A			1		0159	$\oslash$	★ '	
	PLAY SPEED													
B339C001_111215_	24 12	14:33:14:05		Chan	inel 🕨 🗸	1		14.						ADD
		SOUND SYNC		Scale	• •		~~~~~	- <b>H</b>	<del> </del>					to Reel
23.976	48000	14:32:59:06		CH 1			:14:05	_00.00	):14:22.69	14:32:59:06	30			
				CITT		4	.14.05	-00.00	14.22.05	14.32.33.00	.50			

The Mark Window provides a magnified view of 7 frames of the active area of the sound track where the user can mark the exact timecode position of the sync point to within a quarter frame. The video timecode is displayed in blue on the left of the Playhead and the audio timecode is displayed in yellow on the right. The Offset, meaning the difference between the video and audio timecodes, is displayed in white within the playhead, which begins at the serrated yellow line.

To change which audio channel is being displayed, right-click and choose from the extended menu. The scale of the waveform can also be modified.



The Auto Sync buttons allow for Sync with Offset, Sync without Offset, and Find Clap within Mark Window. The Bump - and + buttons bump the audio by one frame. Hold the Ctrl key to bump a quarter frame.

# Synchronizing Audio and Video

# Auto-syncing a single clip

Auto-syncing a single clip uses the video timecode as a control against which Cortex scans the audio files for a matching timecode.

- 1. Select the video clip to be synchronized
- 2. Navigate to the slate close (clap) point (while it is not required, it is recommended)
- 3. Select an auto-sync option via the UI buttons or keyboard shortcuts
  - a. Auto-sync with Offset (\ key) uses the established timecode offset
  - b. Auto-sync without Offset (Shift+\) matches audio timecode to video timecode
- 4. If the clap waveform is visible in the Mark Window but off by a frame or more, click the Find Clap button or press the D key to auto-refine the sync. You can also just click on the Mark Window near the clap

waveform. With either method, doing so will add a "Slate Icon" to the clip Status column in the Master Clips Bin

5. If the sync is correct, you can add the clip to the Clips Reel by pressing the G key or clicking the Add to

Clip Reel button . If you want to color the clips prior to adding them to a reel, jump to the next clip with the R or Down arrow key in order to continue syncing. Later, as color is applied, you can add the clips to the reel one by one or group select them and add all at once.

### Auto-syncing multiple clips

Auto-syncing multiple clips uses matching timecode or an established offset to define sync.

- 1. Select multiple clips using the Ctrl or SHIFT modifiers
- 2. Select an Auto-sync option via the UI buttons or keyboard shortcuts
  - a. Auto-sync with Offset (\ key) uses the established timecode offset
  - b. Auto-sync without Offset (Shift+\) matches audio timecode to video timecode
- 3. It is recommended to check the slate clap of each clip and click the Find Clap button or press the D key to

auto-refine the sync. Doing so will add a "Slate Icon" to the clip Status column in the Master Clips Bin indicating that the take has been checked.

4. If the sync is correct, you can add the clip to the Clips Reel by pressing the G key or clicking the Add to

Clip Reel button . If you want to color the clips prior to adding them to a reel, jump to the next clip with the R or Down arrow key in order to continue syncing. Later, as color is applied, you can add the clips to the reel one by one or group select them and add all at once.

### Using Timecode to search for Audio Sync Points

- 1. Navigate to the desired picture sync frame
- 2. Press the \* key on the Number Pad or click in the Sound Sync field
- 3. Input the audio timecode value or enter a + or before the timecode entry to trim the current position by the input value
- 4. Press Enter.

### Using Timecode to search for Picture Sync Points

- 1. Navigate to the desired audio sync frame.
- 2. Press the / key on the Number Pad or click in the Picture Sync field
- 3. Input the picture timecode value or enter a + or before the timecode entry to trim the current position by the input value
- 4. Press Enter.



OUND SYNC 14:32:59:06

# **Adjusting Clip Synchronization**

There are several methods to adjust the synchronization relationship of the picture and audio.

### Adjusting audio sync against the current picture frame

- 1. Navigate to the desired picture frame.
- 2. Unlock the audio track timeline (U). The picture will remain frozen while the audio clip will be free to navigate.
- 3. Navigate through the audio until you find the desired sync point (probably a clap).
  - a. While in Unlock (U) mode, you can also enter an audio timecode value directly into the Media Player timecode buffer using the number pad; just start typing the timecode, there's no need to click in the buffer.
- 4. To sync and re-lock the audio you can:
  - a. Click in the Mark Window on the magnified waveform where desired
  - b. Press the D key to resync to the detected clap waveform within the Mark Window
  - c. Press the \ key to use the audio currently located at the playhead.

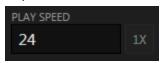
To cancel and return to the original sync relationship, press the U key again or press Esc.

### Adjusting the picture sync against the current audio frame

- 1. Navigate to the desired audio frame
- 2. Unlock the picture track timeline (Y). The audio will remain frozen while the picture clip will be free to navigate
- 3. Navigate to the desired picture sync frame
  - a. While in Unlock (Y) mode, you can also enter a picture timecode value directly into the Media Player timecode buffer using the number pad; just start typing the timecode, there's no need to click in the buffer.
- 4. Press the \ key to resync the picture at the current frame.

# **Changing Clip Play Speed**

A clip's play speed can be altered by editing the FPS in the **PLAY SPEED** box. This will adjust playback in the Media Player and all Deliverables.



To return to a clip's original play speed, click the **1X** button.

Note: Play speed only affects the video, not the audio. Audio will play at its native speed.

# In and Out Points

You can trim clips manually by using the Mark In and Out functions.

Note: Trimming clips in the Sync or Color tools can only be performed on clips in the Master Clips Bin prior to being added to a Reel.

To trim the head of a clip, navigate to the desired in point and press the I key, or click the In button.

To jump to the Mark In, press Shift+I.

To clear the Mark In, press **Ctrl+I**.

To trim the tail of a clip, navigate to the desired out point and press the **O** key, or click the Out button.

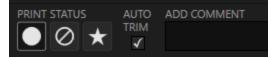
To jump to the Mark Out, press **Shift+O**.

To clear the Mark Out, press Ctrl+O.

To Mark the entire clip, press **Z** or click the **Mark In/Out** button.

### **AutoTrim**

You can automatically trim the head of a clip based upon the sync point by enabling AutoTrim. Navigate to your sync point (usually a slate close) and press the **D** key to refine sync to this point. The head of the clip will be trimmed automatically to 1 second prior to the sync point.



# **Tail Sticks Syncing**

For Tail Sticks:

- 1. Navigate to the tail stick
- 2. Press the \ key to sync the clip.
- 3. Press **Ctrl+D** to refine the tail stick sync if AutoTrim is enabled. This will ignore the AutoTrim option leaving the In-Point at the head of the clip.

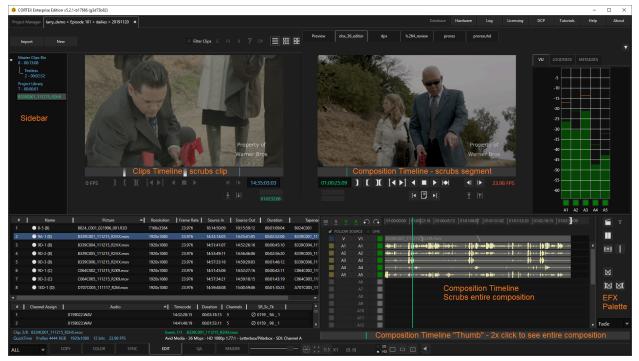
Note: To modify the In point of a tail stick clip, navigate to the desired in-point and press the I key, or click the In button.

# Sync Tool Shortcut Keys

Shortcut Key	Function	Notes
I	Mark In	Shift + I: Go To Mark In Ctrl + I: Clear Mark In
0	Mark Out	Shift + O: Go To Mark Out Ctrl + O: Clear Mark Out
Y	Unlock Video Track	While unlocked, navigation keys move picture only
U	Unlock Audio Track	While unlocked, navigation keys move audio only
١	Auto-Sync with Offset	<ul> <li>When picture and audio are locked: Sync clip using picture and audio timecode difference from previous sync.</li> <li>When picture or audio are unlocked: Use current frame for sync point</li> </ul>
SHIFT + \	Auto-Sync with No Offset	Sync clip with no timecode difference between picture and audio
D	Auto-detect peak waveform	Syncs the peak waveform in the Mark Window to the current picture frame.
SHIFT + D	Go to Sync Point	
Num Pad	Input clip timecode value	Locate and load a specific timecode position within all picture clips in bin.
/ + Num Pad	Input picture sync timecode	Locate and load a specific timecode position within all picture clips in bin and use it as a sync point.
* + Num Pad	Input sound sync timecode	Locate and load a specific timecode position within all audio clips in bin and use it as a sync point.
Enter	Cue to entered timecode	
Arrow Keys	Increase / Decrease	Increment values in the currently selected metadata field (ie Take 1 to Take 2)
Ctrl + 0	Set comment severity to 0	
Ctrl + 1	Set comment severity to 1	
Ctrl + 2	Set comment severity to 2	
Ctrl + 3	Set comment severity to 3	
Ctrl + 4	Set print status to Circled	
Ctrl + 5	Set print status to Excluded	(Uncircled or B-Neg)
Ctrl + 6	Set print status to Starred	

# The Edit Tool

The Edit Tool is a non-linear editor consisting of media bins, a composition timeline and set of function tools that allow the user to perform editorial requirements where Overwrite, Insert, Lift, and Extract are needed. Also provided are a slate generator, trim functions, and video and audio fades.

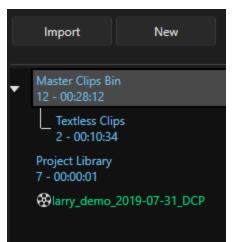


# Parts of the Edit Tool

### **The Sidebar**

The Sidebar is where you'll access your media asset types:

- Master Clips Bin All imported picture and audio media can be found in the Master Clips Bin.
  - Sub-Bins Cortex provides for the creation of Sub-Bins where media can be moved for organizational purposes.
- **Project Library** A bin containing regularly used media, available across Workflows and Jobs for easy access such as Bars, Black and Slates.
- **Compositions** All compositions are listed below the Master Clips Bin and Project Library.



### The Clips Bin(s)

After being imported in the Edit Tool, picture and audio clips are automatically placed in their corresponding bin.

The Audio Bin displays files that have <u>not</u> been previously synchronized to picture or noted as Wild-Track in the Sync Tool. Typically, only polyphonic files are synchronized in the Sync Tool. Monophonic files are edited in sync using the composition timeline.

3	nab_imf_demo_	_txtles	nab_imf_demo_txtless_1.mov	1920x1080	23.976	01:00:17:0	3 01:00:2	5:11 00:0	0:08:09	nab_imf_d	le
4	nab_imf_demo_	_txtles	nab_imf_demo_txtless_2.mov	1920x1080	23.976	01:00:28:1	0 01:00:3	1:01 00:0	00:02:16	nab_imf_d	le 🔻
										•	
#	Channel Assign		Audio	<b>^</b>	Timecode	Duration	Channels	SR_Sc_T	k		
1		LMR	RE_401_2.0_PM_SNC_MASTER_060515_N	VETFLIX.L.wav	00:58:30:00	00:04:09:00	1	0			
2		LMR	RE_401_2.0_PM_SNC_MASTER_060515_N	VETFLIX.R.wav	00:58:30:00	00:04:09:00	1	0			
3		LMR	RE_401_5.1_PM_SNC_MASTER_060515_N	IETFLIX.C.wav	00:58:30:00	00:04:09:00	1	0			
4	A1	LMR	RE_401_5.1_PM_SNC_MASTER_060515_N	NETFLIX.L.wav	00:58:30:00	00:04:09:00	1	0			
5		LMR	RE_401_5.1_PM_SNC_MASTER_060515_N	NETFLIX.LFE.wav	00:58:30:00	00:04:09:00	1	0			
6		LMR	RE_401_5.1_PM_SNC_MASTER_060515_N	NETFLIX.Ls.wav	00:58:30:00	00:04:09:00	1	0			
7		LMR	RE_401_5.1_PM_SNC_MASTER_060515_N	NETFLIX.R.wav	00:58:30:00	00:04:09:00	1	0			T

When editing, source clips are generally always visible in the picture and audio bins. However, when working in a composition, you can choose to show the composition's picture edits as a list of events. Right click on the composition in the Sidebar and choose "Show Event List" in the Context Menu. When the event list is active, clicking on any event will jump the timeline playhead to that location. To go back to viewing source clips in the picture bin, right-click the composition again and choose "Hide Event List"

### **The Project Library**

The Project Library provides a bin in which regularly used media can be stored and used across all Workflows and Jobs in a project. Each project can set a specific directory location for its Project Library during initial setup in the Project Manager. Be mindful that the directory location should be able to accommodate the speed of playback required for media placed in it.

Slates created in Cortex are automatically added to the Project Library. Imported media and still image clips must be manually saved to it. Right click on a clip and choose "Add to Project Library" from the Context Menu.

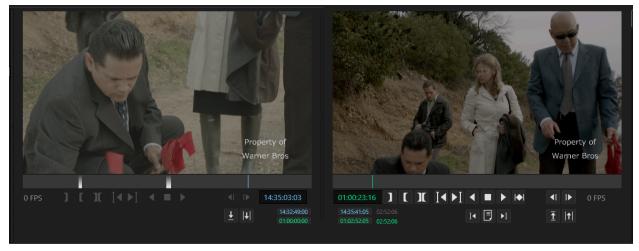
#### **Compositions**

When a composition is created it will be listed in the Sidebar beneath the clips bin and project library. Each newly created composition automatically becomes the active composition, displayed in green. To work in other compositions, choose them from the Sidebar.

To duplicate a composition, right-click on the composition in the Sidebar and select Duplicate.

# The Media Players

The Edit Tool Media Players are set up for source and record (composition) displays. The left player displays the currently selected source clip; the right player displays the composition's current location.



### Switching Focus between the Media Players

To switch focus from the Source to the Composition Media Player:

- Click the desired composition in the Sidebar. The navigation controls will be enabled.
- Press the W or K keys
- press **Shift+S** or **F**. If focus is currently on the Source Player, the first press will switch focus to the Composition Player. Subsequent presses will jump from one event to the other based upon which video and audio tracks are enabled.
- Click any blank space on the Composition timeline.
- Click on the image in the right side media player.

To switch focus from the Composition to the Source Media Player:

- Click on the Master Clips Bin in the Sidebar
- Press the **Q** or **J** keys
- Click on a picture or audio clip
- Click on the image in the left side media player

Note: Pressing the Q or J key repeatedly cycles between the Master Clips Bin and Project Library. Pressing the W or K key repeatedly cycles between Compositions.

Note: If there are gaps between media on the selected timeline track, pressing the E (previous) or R (next) keys will jump to the beginning and end of the next shot.

#### **Navigation Controls**

The Media Players provide controls for playback and navigation of their own timeline and for scrubbing. The Source Media Player font types are blue. The Composition Media Player font types are green.

#### **The Source Media Player Controls**



### **The Composition Media Player Controls**



Button	Кеу	Description
1	। Shift+ I - Go to, Ctrl+ I - Clear	Mark In Ctrl+Alt I - Clear In of Source & Comp
ſ	O Shift+ O - Go to Ctrl+ O - Clear	Mark Out Ctrl+Alt I - Clear Out of Source & Comp
X	Z	Mark Entire Clip
I◀	E or Up Arrow or Shift+ S - Composition	Go to Previous Clip - Source Go to Previous Break - Composition
►I	R or Down Arrow or Shift+ F - Composition	Go to Next Clip - Source Go to Next Break - Composition
•	X - Play Reverse 1x for real time	2x for 2x speed 3x for fast reverse
	C or Spacebar	Stop
	V or Spacebar - Play Forward 1x for real time	2x for 2x speed 3x for fast forward
For Composition	Ctrl+Shift+C	Segment Play
<b>▲</b> I	S or Left Arrow	Jog to Previous Frame
	F or Right Arrow	Jog to Next Frame

### **Edit Command Buttons**

Button	Кеу	Description	
<u>+</u>	G	Overwrite Edit to Timeline	
<b>†</b>	Н	Insert Edit to Timeline	
Ī	, (comma) or Delete	Lift from Timeline	
†	/ on keyboard or Ctrl+ Delete	Extract from Timeline	

## **Timeline Comments Buttons**

You can add and navigate comments on the composition timeline and then print out pdf reports.

Button	Кеу	Description	
I	Ctrl+Shift+S	Go to Previous Comment	
Ctrl+Shift+O		Add Comment	
►I	Ctrl+Shift+F	Got to Next Comment	

# **Timecode Position Registers**



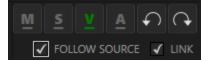
The timecode position display for a Source clip is blue. The timecode position display for the Composition is green. When an audio source clip is loaded, it will be yellow.

#### **Timecode Mark Registers**

14:33:14:05	01:00:38:13		
14:32:49:00	14:33:14:11 25:12		
01:00:22:11	01:00:47:22 25:12		

Below the Timecode Position Registers are Timecode Mark Registers and their durations, displayed with corresponding colors.

#### **Timeline Tracks Commands**



The Timeline Tracks Commands buttons determine which tracks will be affected by an edit. If the track is enabled, it will be green.

Button	Кеу	Description
M	Metadata Track	Used for Dolby Vision <sup>™</sup> Metadata. Press Shift+M Button to add a track or right-click on the timeline and choose Add from menu
<u>s</u>	Subtitle Track	Cortex allows for up to 2 Subtitle tracks. Press Shift+S Button to add a track or right-click on the timeline and choose Add from Context Menu
<u>v</u>	Y - Video Track	Cortex allows for up to 2 video tracks. Press Shift+V Button to add a track or right-click on the timeline and choose Add from Context Menu
A	U - Audio Track(s)	Cortex allows for up to 24 audio tracks. Ctrl+click any track to lock it or Ctrl+Shift+any M, S, V, or A track to lock out all tracks. Shift+Click on any track to enable only those tracks containing media.
€	Ctrl+Z	Undo
C	Ctrl+Y	Redo

#### **Follow Source Checkbox**

If the Follow Source checkbox is enabled, Cortex will automatically enable the corresponding timeline track(s) depending on which source type is selected. For example, if a video-only clip is selected, CORTEX will automatically enable the active video track for editing and disable the rest.

#### Link Checkbox

The Link checkbox maintains the "actionable and visible" state of the selected video track, meaning that clicking on one or the other will automatically make both follow the click. If, for example, the timeline has two video tracks and the user clicks on a video track, it will be enabled for editing (actionable) and loaded in the player (visible).

#### **Context Menu**

Add	٠
Black	٠
Clear Run Through Edits	
Сору	٠
Comments	٠
Composition	٠
Delete	٠
Detect Shot Changes	
Detect Shot Changes (Cancel)	
Dolby Vision Metadata	٠
Export Subtitles	
Hide Breaks	
Hide Audio Waveforms	
Lock Track	٠
Merge EDL	
Show Source Timecodes	

Right clicking anywhere on the timeline will display the Context Menu. From there you can choose a function as follows:

Function	Options
Add	Dolby Atmos Track Metadata Track Subtitle Track Video Track
Black	Full - 0, Legal - 64
Clear Run Through Edits	Will clear all run-through edits
Сору	Breaks Only (from V1 to V2) Breaks and Dead Pixels (from V1 to V2)
Comments	Add, Delete, Edit, Next, Previous
Composition	Create - Various composition types Delete Duplicate
Delete	Audio Track - Extended menu Dolby Atmos Track Metadata Track Subtitle Track Video Track
Detect Shot Changes	Invoke shot detection (Cancel)
Dolby Vision <sup>™</sup> Metadata	Copy Breaks to Video Track Copy (metadata from highlighted shot) Establish Sync (between metadata and video tracks) Export (metadata) Paste (metadata to highlighted shot)
Export Subtitles	Open Windows Browser for target
Hide/Show Breaks	Toggle on/off
Hide/Show Audio Waveforms (on Timeline)	Toggle on/off
Lock Tracks	Use extended menu
Merge EDL	From .edl to timeline
Show Source Timecodes	F8 for each enabled track

# **The EFX Palette**

Under the Media Player is the EFX Palette, which contains buttons and controls for editing in Cortex.

T T	Button	Кеу	Description
	5577	n/a	Create slates, backgrounds, solid frames or Bars/Tone to be added into the Project Library
	Т	n/a	Modify the luminance level of Subtitles
M		Shift+ T Ctrl+ T	Invokes the ability to execute Gap Trims Invokes the ability to execute Ripple Trims
	Match Fr		Match Frame
	—	, (comma)	Add a manual Break to the composition
Fade 🗸	$\mathbb{K}$	Ρ	Add Effect (Fade In or Out only in this version)
	M	[	Mark IN or modify the in point of the effect
		]	Mark Out or modify the out point of the effect

# **Effect Drop-down Field**



Currently contains the Fade Option for Fade In and Out. As more effects are added, such as video dissolves, wipes, and titling, they will be added to the drop-down.

# **The Slate Generator**

To create a slate, click the Slate button on the Command Palette.

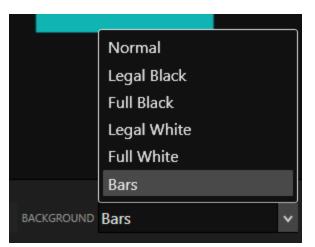


In addition to generating slates, the Slate Generator can create background media such as legal and full black, legal and full white, and color bars, all of which can be or are automatically added to the Project Library for repeated use.

NOTE: The slate generator in the Edit Tool shares the same functionality and metadata fields as the slate generator in the Project Deliverable Configuration Window.

Set a name and a resolution for your slate and then choose its background type in the drop down field.

If you choose Normal, you can use the Background tab to determine the background color or insert an image file.

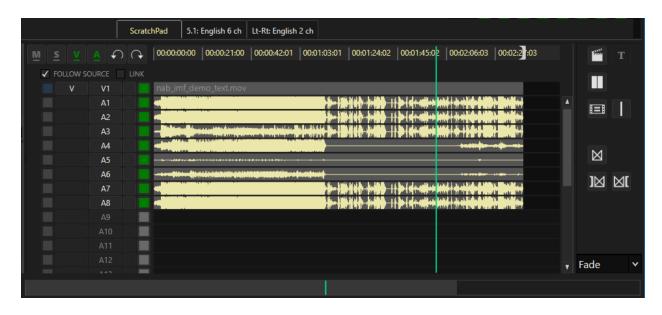


Once you've created your slate, Click Save and the slate will be automatically saved to the Project Library and loaded in the Media Player as a still frame. You can then set any duration for your slates when editing.

If you wish to edit or create another version of an existing slate, right-click on the desired slate and choose "Create New Slate from Existing" from the Context Menu. Make any changes you wish and then click Save.

# **Composition Timeline**

In the Edit tool, the Composition Timeline provides for up to 2 video tracks, up to 24 audio tracks with a "ScratchPad" to assist in creating audio configurations, 2 subtitle tracks, and 1 metadata track used primarily for Dolby Vision<sup>™</sup>.



# **The Control Columns**

	S1	
	V1	
A1	A1	
A2	A2	
A3	A3	
A4	A4	
A5	A5	
A6	A6	
	A7	
	A8	
	A9	
	A10	
	A11	
	410	

The Control Columns are composed of Source and Composition Track and Monitor buttons. When enabled, the source audio monitor buttons are yellow and the composition buttons are green. When disabled, buttons are grey.

As per the example to the left, if a group of source monophonic audio clips are selected, only the first clip can be monitored.

A1	A1	
A2	A2	
A3	A3	
A4	A4	
A5	A5	
A6	<b>A</b> 6	

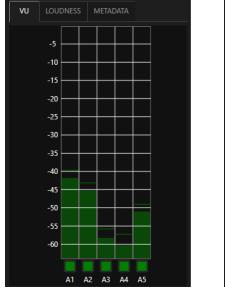
If a polyphonic audio clip is selected, channels are automatically assigned. Clicking an individual monitor button disables/enables monitoring.

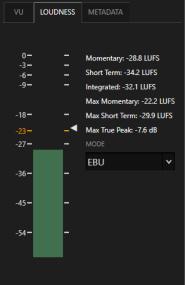
Shift clicking on a monitor button disables/enables all other monitor buttons leaving the clicked button enabled for either isolated or group monitoring.

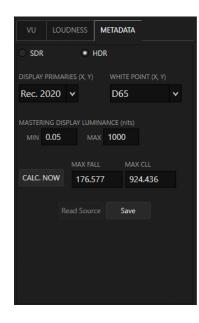
To toggle the V1 or V2 Track on/off, click the Track button or press Y when the track is focused To toggle the V1 or V2 monitor on/off, click the monitor button or press Shift+Y when the track is focused To switch between V1 and V2 you can click on their respective Track button or press Ctrl+Shift+Y To lock/unlock a track, Ctrl+click on its Track button

To lock/unlock all tracks, Ctrl+Shift+click on any Track button. You can also right-click on the timeline and choose "Lock Track" in the Context Menu.

# The VU/Loudness/Metadata Tabs







The VU meter automatically adjusts to display the number of tracks contained in either the source or composition.

Source tracks are displayed in yellow while the composition tracks are green.

The loudness meter dynamically updates the Momentary, Short Term, Integrated, Max Momentary, Max Short Term and Max True Peak in either EBU or ITU modes. The Metadata tab displays HDR video metadata. For Dolby Vision<sup>™</sup>, the metadata is automatically loaded if derived from a DoVi xml file. For HDR10, you can manually enter criteria and then calculate the MaxFALL and MaxCLL values.

# **Creating a Composition**

New
Composition
IMF Composition
DCP Composition
AS-11 Composition
Composition Reel

To create a new composition, click the **New** button at the top of the UI and choose which type of Composition to create from the Drop-down.

Туре	Description	
Composition	Any usual of editorial requirement	
IMF Composition	With specific fields for IMF delivery	
DCP Composition	With specific fields for DCP delivery	
AS-11 Composition	With specific fields for AS-11 delivery	
Composition Reel	Used to render individual segments of a composition	

# Composition

Use this option for simple modifications to a file; normal editorial tasks such as inserting or extracting black, revising slates, replacing shots, etc.

NAME		FRAME RATE			
Demo_Composition		23.976 fps			~
START AT	LEVEL OF BLACK INSERT EDIT				
01:00:00:00	×	BLACK LEVEL	IS REQUIRED		
ENABLE HDR DOLBY VISION	USE EXTERNAL DOLBY METADATA				
DOLBY VISION VERSION: V2.9 V4	PRESETS:				
DISPLAY PRIMARIES (X, Y)	WHITE POINT (X, Y)	MIN MONITOR LUMINANCE	MAX MONITOR LUMINANCE		
		ENABLE	DOLBY ATMOS		
				Create	Cancel

# **IMF** Composition

The IMF Composition shares a number of fields on the naming page with the simple Composition, however, there are additional tabs that can be used.

Composition	IMF Metadata	File Naming	Locale Info	OPL	Side	ecar Assets	Additional Metadata	Audio Configs	
NAME					FRAME RAT				
cortex_demo_S	S1_episode_101_2	020-03-17_IMI			23.976 fp	os			~
START AT		LEVEL OF BL	ACK INSERT EDIT						
00:00:00:00		Full - 0		*					
ENABLE HDR	DOLBY VISION	USE EXTE	RNAL DOLBY METAD	ATA					
DOLBY VISION VERS	5 <b>ION:</b> V2.9 \	/4 PRESETS:							
DISPLAY PRIMARIE	:S (X, Y)	WHITE POINT	(X, Y)	MIN M	IONITOR LUN	IINANCE N	MAX MONITOR LUMINANC		
ENABLE APP	4 INPUT COLOR SPAC					ENABLE DO	UBY ATMOS		
								Create	Cancel

## **Composition Tab**

- 1. Name The name field is automatically inherited from the project name with an IMF extension. It can, of course, be changed to suit the particular delivery
- 2. Frame Rate This is an important field. Bear in mind that the source media must match the composition's frame rate
- 3. Start At Most IMF compositions start at 00:00:00, however, if there is a special requirement, modify it here
- 4. Level of Black Insert If a black insertion is done using the keyboard command, Shift+H, this field determines the black level of that insert, either Full 0 or Legal 64
- 5. Enable HDR Checkbox If the source is HDR, enable the checkbox
- 6. Dolby Vision<sup>™</sup> Checkbox If the source is accompanied by Dolby Vision<sup>™</sup> metadata or will be processed through Cortex's Color Tool for Level 1 analysis, enable this checkbox
- 7. Use External Dolby Metadata Checkbox If the media is accompanied by a Dolby Vision<sup>™</sup> metadata generated by a third party color corrector, enable this checkbox.
- Dolby Vision<sup>™</sup> Version If External Dolby Metadata is used, all remaining fields will be disabled. If, however, the composition will be processed through Cortex's Color Tool for Level 1 analysis, choose between V2.9 or V4. V4 allows for modification of the Min and Max Monitor Luminance
- 9. Enable APP 4 Input Color Space If the IMF needs to be output in XYZ color space, use this field to define the input color space
- 10. Enable Dolby Atmos<sup>®</sup> If the composition requires the use of Dolby Atmos<sup>®</sup>, enable this checkbox and Cortex will automatically provide a DA track in the composition timeline

# **IMF Metadata Tab**

Composition	IMF Metadata	File Naming	Locale Info	0	PL	Sidecar	Assets	Additional Metadata	Audio Configs	
					ORIGINA	TOR (PROD	. CO.)			
The Title for E	pisode 1				mti					
		CONTENT				CPL IN T	MECODE	CPL OUT TIMECODE		
MTI Film		Episoc	le		~	:	::	::		
CPL ANNOTATION							MARKERS			
cortex_demo_	S1_episode_1	01_2020-03-17	7_IMF							
PKL ANNOTATION										
cortex_demo_	S1_episode_1	01_2020-03-17	7_IMF							
CONTENT VERSIONS										
			Add New Versio	on						
									Create	

- 1. Title For episodic TV, this field would describe the episode's title. For monolithic projects, the Name and Title can be the same.
- 2. Originator Normally the Production Company or Studio
- 3. Issuer Your company name
- 4. Content Kind Choose from the options available in the dropdown list
- 5. CPL In and Out Timecode If the desired content start and end is different from the start and end of the composition
- 6. CPL Annotation If the CPL needs to be different from the Name
- 7. PKL Annotation If the PKL needs to be different from the Name
- 8. Markers If Markers were added to the composition, they are listed here. To add a Marker, press Ctrl+Shift+I and choose from the dropdown list
- 9. Content Version Normally associated with the EIDR (Entertainment Identifier Registry) and describes the version of the media. For more information: <u>https://eidr.org</u>

#### File Naming Tab

- 1. CPL Name Composition Playlist. In the event there is a need to modify the name, do it here
- 2. PKL Name Packing List. In the event there is a need to modify the name, do it here
- 3. Image Track Name Defaulted to Composition Name
- 4. Audio Track Name Defaulted to Composition Name and includes the Audio Configuration and language
- 5. Subtitle Track Name Defaulted to Composition Name

#### Locale Info Tab

Similar to DCPs, this information describes which locations the IMF will service

## **OPL** Tab

Output Profile List - A series of macro steps that determine the output from the IMF, for example, an H.264

#### Sidecar Assets

Used for any type of file type to be included in the packaging of the IMF

MTI Film - Cortex User Manual version 5.6

# Additional Metadata Tab

At this time, this is only used for Sony. Fill in fields as required.

Composition	IMF Metadata	File Naming	Locale Info	OPL		Sidecar Assets	Additional Metadata	Audio Configs	
METADATA TYPE									
Sony	~								
GOLD BARCODE					GPM!	5 TITLE			
GPMS TITLE ABBREV	/IATION				VERS	ON			
					Inte	ernational			~
GPMS EPISODE TITL					POST	FACILITY			
					M	'I Film			
TRACK 1 CONTENT	ТҮРЕ				TRAC	K 2 CONTENT TYPE			
				~					~
NUMBER OF AUDIO	CONFIGS					K 2 TIMECODE			
0					00:0	00:00:00			
								Create	Cancel

# Audio Configs Tab

Displays the various audio configurations created for the IMF

# **DCP Composition**

Cortex offers two types of DCP packages, Interop and SMPTE. DCP Compositions are easy to put together on the timeline and, generally, require edits that append each reel to the previous one.

# **Composition Tab**

Composition	CPL Metadata	DCP Metadata	KDM						
I. NAME					ТҮРЕ		FRAME RATE		
Cortex_demo_2	2020-03-17_DCP				Interop	~	24 fps	•	~
START AT		LEVEL OF BLACK I	NSERT EDIT		INPUT COLOR SPACE		AUDIO CONFIGURATION		
00:00:00:00		Full - O		*		*			<b>~</b>
					Colorspace auto-converted to XY	z			
REELS					ENCRYPTION KEY 🖌 Use Encryptic	on	Use SHA-1		
					682d55c6cccc40f982aff7	'd0o	:3e1644a	Genera	te Key
					Previous	lext		Canc	el

- 1. Name The name is normally inherited from the project but can, of course, be changed
- 2. Type Choose either Interop or SMPTE from the dropdown list
- 3. Frame Rate This is an important field. Bear in mind that the source media must match the composition's frame rate
- 4. Start At Most DCP compositions start at 00:00:00:00, however, if there is a special requirement, modify it here
- 5. Level of Black Insert Edit If a black insertion is done using the keyboard command, Shift+H, this field determines the black level of that insert, either Full 0 or Legal 64
- 6. Input Color Space Cortex provides the ability to automatically convert from any color space to the required XYZ color space. Enter the input color space from the drop down list
- 7. Audio Configuration Choose from the dropdown list the audio configuration of the DCP mix
- 8. Encryption Key Checkbox If Encryption is desired for the DCP, enable the checkbox and then use the KDM Tab to add KDM files. Cortex will also generate a KDM for playback for any workstation within the Cortex network. When the DCP is loaded on one of the Cortex networked workstations, the KDM will be validated and able to play back the DCP.
- 9. Use SHA-1 Checkbox SHA-1 (short for Secure Hash Algorithm 1) is one of several cryptographic hash functions. SHA-1 is most often used to verify that a file has been unaltered. This is done by producing a checksum before the file has been transmitted, and then again once it reaches its destination.

# **CPL Metadata Tab**

Composition CPL Metadata DCP Metadat	a	KDM
NAMING CONVENTION 🖌 Use Naming Convention		
_language}_{territory}-{rating}_{audio_type}_{resolutio	on}_	{studio}_{date}_{facility}_{standard}_{package_type}
The-Film-Title_FTR_{projector_aspect_ratio}_EN_XX_U	S-G	_NULL_{resolution}_THE-STUDIO_20200317_MTI-FILM_IOP_OV
FILM TITLE		CONTENT KIND
The Film Title		Feature v
AUDIO LANGUAGE		SUBTITLE LANGUAGE
English (en)	~	No subtitles (xx)
TERRITORY		RATING
United States (us)	~	G
STUDIO		FACILITY
The Studio		MTI Film
CHAIN		LUMINANCE
ALL		15
VERSION TYPE		VERSION NUMBER
Final	×	1
		Previous Next Cancel

- 1. Use Naming Convention Checkbox If enabled, as the other fields are filled in, Cortex will build a industry standard name for the DCP, which is displayed and updated as fields are entered
- 2. Film Title and balance of fields fill as required. The luminance is for the screen luminance the content was mastered.

## DCP Metadata Tab

Composition	CPL Metadata	DCP Metadata	KDM											
TITLE														
[rating]_{audi	o_type}_{resolu	ution}_{studio}_	_{date}_{facility	}_{standard}_{	package_t	type}								
CREATOR														
MTI Film			The Studio											
CONTENT KIND														
Feature		~												
CPL ANNOTATION														
{film_title}_{c	ontent_type}_{	projector_aspe	ct_ratio}_{audi	o_language}_	{subtitle_la	angu								
PKL ANNOTATION														
{film_title}_{c	ontent_type}_{	projector_aspe	ct_ratio}_{audi	o_language}_	{subtitle_la	angu								
					<b>D</b> :									
					Previous		Next			Ca	Cance	Cancel	Cancel	Cancel

- 1. Title Essentially the same as the CPL Metadata Tab. Suggest to leave as is unless otherwise instructed
- 2. Creator Your company name
- 3. Issuer The production company
- 4. CPL Name Composition Playlist. In the event there is a need to modify the name, do it here

5. PKL Name - Packing List. In the event there is a need to modify the name, do it here

#### **KDM Tab**

		DCDM-t-d-t-	KDM				
Composition	CPL Metadata	DCP Metadata	KDM				
RECIPIENT CERTIFIC	ATES Add File	Add Folder					
START TIME	END TIME						
3/17/2020 3:41 P	M 🔳 3/17/2030	3:41 PM 🔳 9 year	s, 11 months, 31 d	lays			
					Previous	Create	Cancel

- 1. Add File Button Add individual KDM files
- 2. Add Folder Add KDM files found in a folder
- 3. Start/End Times Automatically set for 10 years. Use the date fields to modify the duration

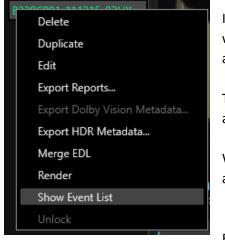
Note: If your workstation will be used to play a DCP from a third party source and requires that you send a KDM valid for your workstation, in the upper right hand corner of the UI is a button named DCP. Click the button and then Save the file to a location from which you can send it. Also, determine prior to saving whether a SHA-1 encryption is required and, if so, enable the checkbox.

# **AS-11** Composition

The initial metadata required for an AS-11 composition is simple. Name, frame rate, start timecode, Level of Black, and RDD6 filename. The RDD6 file would contain a Dolby Digital metadata and is optional to the composition. RDD stands for Registered Disclosure Document.

# **Composition Reel**

A Composition Reel allows you to place segments (shots or "events") of the composition into a reel for rendering. It has the same protocols as the Clip Reel but is intended to be used for compositions.



In the Edit Tool, the bins normally show the source clips regardless of whether the Master Bin or Composition is focused. The other tools automatically switch to the event list when the composition is focused.

To show the event list, right-click on the composition name in the Sidebar and select Show Event List in the Context Menu.

With the list showing, select events to be added to the Composition Reel and then right-click and choose:

- 1. Add selected to Comp Reel
- 2. Add Marked Events Range to Comp Reel

Events can be added one at a time, group selected, or within a marked

range. When completed, right-click on the composition name and select Render in the Context Menu.

# **Auto Compositions**

If a source file is an edited piece of content and you'd like to locate where those edits occur, there are three ways to do this:

- 1. With Shot Detection
- 2. Merging an EDL
- 3. Manually inserting Breaks at each edit point

An Auto-Composition automatically creates a composition using the source clip's name, start and end timecodes, and frame rate. Creating an Auto Composition causes.

## To create an Auto Composition:

Audio Info	
Auto-Composition	Create Auto Composition
Auto-Sync with Offset	Create Auto Composition and Merge EDL
Auto-Sync without Offset	Create Auto Composition with Shot Detection

Right click on the picture clip and select Auto-Composition. There are 3 choices in the extended menu:

- 1. Create Auto Composition Cortex will insert the whole clip into a new composition
- 2. Create Auto Composition and Merge EDL Cortex will open a browser window to locate the EDL
- 3. Create Auto Composition with Shot Detection Cortex will insert the whole clip into a new composition and begin shot detection. Like any shot detection, the results might invoke false positives and negatives so please verify the breaks.
  - a. To add a break press the , (comma) key or click the Break button **I** in the EFX Palette
  - b. To delete a break press Ctrl +,(comma) or Ctrl + Break button

Both Shot Detection and Merge EDL options are always available by right-clicking on the composition timeline and selecting one of them.

Once you've created a new composition, editing in Cortex is a process similar to any nonlinear editing system you might be familiar with. Cortex supports 3 point and drag and drop editing with typical overwrite, insert, lift and extract functions. The Edit Tool in Cortex is designed to perform basic editorial functions in order to complete delivery specifications. As of version 5.6, the Edit Tool has successfully delivered all composition types with particular emphasis on IMF delivery.

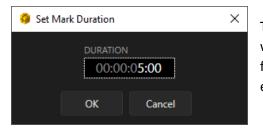
# **3 Point Editing**

Using 3 point editing, below are examples of the logic used for marking source clips, in blue, and compositions, in green:

Note: When In and Out marks are present in both the source and composition timecode registers, the duration always defaults to the composition. If a timecode and/or duraton is displayed in grey, it means that the timecode and/or duration was calculated based on the other timecode registers' duration.

01:00:00:00	01:00:33:13	33:14	Both the source and composition In and Out are marked, therefore the composition takes precedence.
01:00:13:05	01:00:16:12	<b>03:08</b>	
15:00:14:04	15:03:06:09	02:52:06	This represents a 3 point edit where the source Out mark is determined by the duration of the composition marks.
14:53:37:16	14:56:29:21	02:52:06	
15:00:14:04	<b>15:00:19:09</b>	<b>05:06</b>	This represents a 3 point edit where the composition Out mark is determined by the duration of the source marks.
14:53:37:16	14:53:42:21	05:06	
10:13:07:07	10:15:59:12	02:52:06	This represents a 3 point edit where the source In mark is determined by the duration of the composition marks.
01:00:00:00	01:02:52:05	<b>02:52:06</b>	
<b>10:14:50:09</b>	10:15:59:12	<b>01:09:04</b>	This represents a 3 point edit where the composition In mark is determined by the duration of the source marks.
01:01:43:02	01:02:52:05	01:09:04	
Setting a Du	uration		

# Setting a Duration



To set a duration, press the \* key on the number pad. An input window appears. Enter a value and press enter. To enter a value in frames press + before entering the number. To repeat the previously entered duration for the next edit press Shift+\*

Whenever a 3 point edit calculates the in or out mark of either the clip or composition, a blue "phantom mark" will show the calculated position of the mark. In the below example, the source clip dictates the out point of the composition and, therefore, a blue mark indicates the calculated position of the mark.



Once the marks are set, use the following to perform a 3 point Overwrite or Insert edit:

## **Edit Commands**

Button Key		Description			
<u>+</u>	G	Overwrite Edit to Timeline			
<b>+</b>	Н	Insert Edit to Timeline			

# **Drag and Drop Editing**

Dragging a clip from the Picture or audio bin is simple. If the Follow Source checkbox on the timeline is enabled, the tracks affected by the edit will be automatically enabled. If the Follow Source checkbox is disabled, enable the tracks to be affected by the edit before dragging.

When a marked range of a source clip is dragged to the timeline, the segment is represented as a grey bar that is sized relative to the current size of the timeline but is always, at least, perceptible. At a snap point it will turn blue for picture or yellow for audio, but you can drop at any timeline location.

## **Edit Snap Points include:**

- 1. Marks
- 2. Breaks
- 3. Cuts
- 4. The Cursor

# Drag and Dropping an Overwrite 3 Point Edit

To perform an Overwrite edit, mark the In and Out points required for the 3 point edit and then drag the source to the composition timeline:

- 1. You can "snap" the source In or Out to any Edit Snap Points as explained above
- 2. You can drop the source clip at any position on the timeline

## Drag and Dropping an Insert 3 Point Edit

If you wish to Insert the clip and thereby "ripple" the existing media at the insertion point:

- 1. Drag the clip to the timeline
- 2. Press the Ctrl key
- 3. Drop the clip to the timeline

NOTE: After an edit is made using a shortcut key (G or H), the composition Mark In register is updated with the

## Adding Multiple Clips to the Timeline

There are several ways to add multiple clips to the timeline as an Overwrite or Insert Edit using Drag and Drop or the Context Menu selection. For Drag and Drop actions, you must snap to the position desired. Right click on a selection of multiple clips to view the Add Clip(s) to Timeline context menu items.



- 1. At Beginning
- 2. At Cursor Position
- 3. At End
- 4. At Mark In
- 5. At Mark Out
- 6. Based on Source TC

## When Dragging and Dropping Multiple Clips

If there are marks in and out on multiple source clips and they are dragged and dropped anywhere on the timeline, either snapped or not, their duration will be per the source marks.

## If from the Context Menu:

Same as above except:

For At Mark in, the clips will always be front filled starting at the Mark In and beginning with the first clip selected.

For At Mark Out, the clips will always be backfilled starting at the Mark Out and beginning with the last clip selected.

For all cases for "Based on Source TC":

Will always use the first marked frame of the source clip (or if unmarked – the first frame of the clip) and is placed at its corresponding composition location

For At the Beginning, At the Cursor Position, and At End: The clips will always be front filled respecting the durations marked on each source.

If no marks on source: the full clip If only a mark in, then starting at Mark In to the last frame of the clip If only a mark out, then starting at the first frame of the clip and ending at mark out

# Drag and Drop and then Shift

There is another way available through drag and drop only. For example, if there are three textless source clips that have the same mm:ss:ff timecode as the texted clips located in the composition and they need to be placed in sync as either a direct overwrite replacement or on a separate video track:

- 1. Place the composition timeline cursor at the timecode location of the first source clip
- 2. Select the three clips and drag/drop and then press Shift prior to snapping to the cursor The 3 clips will be located to their respective mm:ss:ff positions.

NOTE: The hour number is disregarded if the clips are snapped to the timeline cursor location

NOTE: After an edit is made, the composition Media Player is automatically focused for review.

# Lift or Extract a Marked Range

If you want to remove a marked range of the composition, you can Lift or Extract it.

- 1. Lifting a range leaves black in its place creating a gap.
- 2. Extracting a range shifts everything that followed the extraction upstream filling the gap.

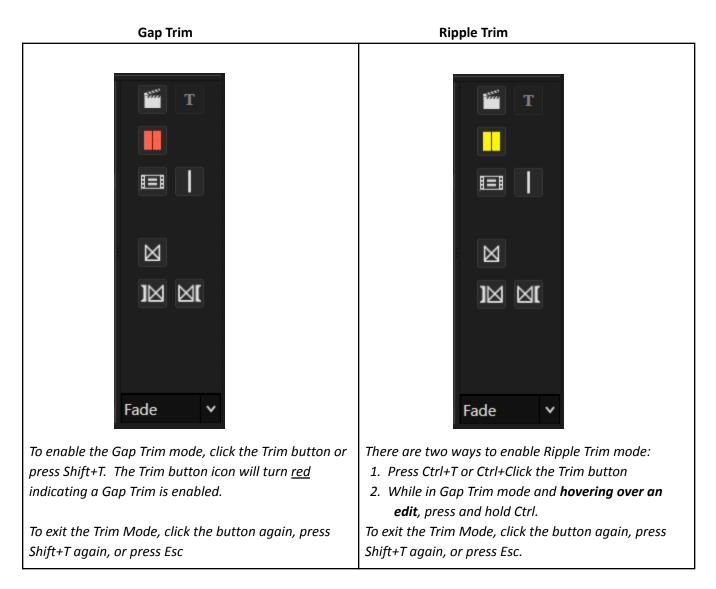
Once the marks are set, use the following to perform a Lift or Extract edit:

#### Lift and Extract Commands

Ī	, (comma) or Delete	Lift from Timeline
†	/ on keyboard or Ctrl+Delete	Extract from Timeline

# **Graphical Trim Types**

Trimming by clicking directly on the timeline and moving the edit points via dragging or by timecode or frames. *NOTE: To execute a Trim or Segment reposition, one of the Trim Modes must be enabled.* 



NOTE: In general, with the Trim Mode enabled, a Left Click or a Modifier Key+Left Click and drag near the edit will initiate the trim, however you can also mouse-up after the click, which leaves the trim mode enabled. After mouse-up, an additional left click (without modifier) near the edit point will allow you to drag the trim too. To cancel the trim

- 1. Press the Escape key
- 2. Click on the Lasso Area located above the video tracks
- 3. Press the Shift+T key or Ctrl+T key
- 4. Click the Trim button.

# Gap Trim



Gap Trims ensure that the overall length of affected timeline track(s) will not be modified by trimming.

If no gap exists between two adjacent segments, only an inward trim is permitted, which creates a gap equal to the trim value.

If a gap does exist, then an outward trim is permitted to overwrite the gap but is limited to the edit point of the adjacent segment or to the extent of the available source media content.

#### **Executing a Gap Trim**

#### By Dragging the Mouse Cursor

While hovering the mouse cursor on either side of the edit point, a red bar appears indicating the segment is ready to be trimmed.

You have two options to execute the trim with a **click and drag action**:

- 1. Left Click and drag the red bar. On mouse-up the trim is completed.
- 2. Left Click on the red bar and mouse-up. Left click again and drag. On mouse-up the trim is completed.

#### Using the Numeric Keypad

Left Click on one side of the edit and mouse-up. A red bar appears indicating the segment is ready to be trimmed. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

#### Selecting Edit Points for Gap Trims on Multiple Tracks

Left Click on one side of an edit and mouse-up. A red bar appears on the side of the click.

Left Click on the same side of additional track edits to execute a gang trim.

Once a trim type and side(s) are chosen for the trim, the other trim types and sides are precluded from being enabled.

All edit points are trimmed equally.

## **Example Gap Trim**

The following demonstrates an inward trim where a gap is created by the action.



An inward trim creates a gap.

The trim will snap to any marker in its navigation path including audio edit points where tracks have been enabled.

# **Gap Trim View**

We see a frozen image of the non-trimmed segment and a continuously updated image of the trimmed segment with the # of frames and timecode trimmed either + or -



# **Ripple Trim**

Ripple Trims lengthen or shorten the head or tail of a segment, moving or "rippling" all downstream segments farther up or downstream based on the direction of the trim. The segments are rippled equal to the trim value.

There are two ways to enable Ripple Trim mode:

- 1. Press Ctrl+T or Ctrl+Click the Trim button. The trim icon will turn yellow.
- 2. While in Gap Trim mode and **hovering over an edit**, press and hold Ctrl. Releasing the Ctrl button prior to left clicking will return the trim state to Gap Trim.

## **Executing a Ripple Trim**

#### By Dragging the Mouse Cursor

While pressing the Ctrl button and hovering the mouse cursor on either side of the edit point, a yellow bar appears indicating the segment is ready to be trimmed.

You have two options to execute the trim with a **click and drag action**:

- 1. Ctrl+Left Click and drag the yellow bar. On mouse-up the trim is completed.
- 2. Ctrl+Left Click on the yellow bar and mouse-up. Left click again and drag. On mouse-up the trim is completed.

#### Using the Numeric Keypad

Ctrl+Left Click and mouse-up on one side of the edit. The yellow trim bar will remain enabled. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

#### Selecting Edit Points for Ripple Trims on Multiple Tracks

Ctrl+Left Click on one side of an edit and mouse-up. A yellow bar appears on the side of the click.

Ctrl+Left Click on the same side of additional edits to execute a gang trim.

Once a trim type and side(s) is chosen for the trim, the other trim types and sides are precluded from being enabled.

All edit points are trimmed equally.

#### **Example Ripple Trim**

In the following figure, segment 1 is being shortened at its tail, which ripples the downstream segments upstream by the amount of the trim.

01:01:15:10	01:01:17:12		01:01:21:15	01:01:23:16	
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
_text.mov				nab_imf_demo_text.mov	
		1	2	3	
01:01:15:10	01:01:17:12		01:01:21:15	01:01:23:16	
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
text.mov				nab_imf_demo_text.mov	
		/		/	
01:01:15:10	01:01:17:12	01/1:19:13		01:01:23:16	
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
text.mov				nab_imf_demo_text.mov	

In the following figure, segment 2 is being lengthened at its head, which ripples the downstream segments farther downstream by the amount of the trim.

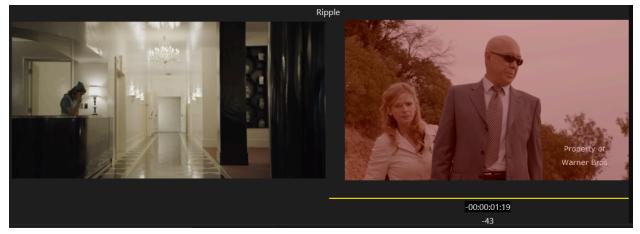
01:01:15:10	01:01:17:12		01:01:21:15	01:01:23:16	
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
		×		Y nab_imf_demo_text.mo	
		1	2	3	
01:01:15:10	01:01:17:12		01:01:21:15		
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
		×		Y nab_imf_demo_text.mo	
01:01:15:10	01:01:17:12		01:01:21:15	01:01:23:16	
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
text.mov			⊐ X	Y nab imf	_demo_text.

Note that the upstream segments have not moved. All ripple trims only affect downstream segments.

MTI Film - Cortex User Manual version 5.6

## **Ripple Trim View**

We see a frozen image of the non-trimmed segment and a continuously updated image of the trimmed segment with the # of frames and timecode trimmed either + or -



# **Rolling Trim**

A Rolling Trim moves the edit point between segments by trimming their respective sides by an equal number of frames thereby maintaining the overall duration of the affected timeline track(s); therefore adjacent segments remain untouched in position or length.



# **Executing the Rolling Trim**

#### By Dragging the Mouse Cursor

While pressing the Shift button and hovering the mouse cursor on the edit point, a red bar appears on both sides of the edit indicating the segment is ready to be trimmed.

You have two options to execute the rolling trim with a **click and drag action**:

- 3. Shift+Left Click and drag the pair of red bars. On mouse-up the trim is completed.
- 4. Shift+ Left Click on the pair of red bars and mouse-up. Left click again and drag. On mouse-up the trim is completed.

## Using the Numeric Keypad

Shift+Left Click on the edit and mouse-up. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

## Selecting Edit Points for Rolling Trims on Multiple Tracks

Shift+Left Click on an edit and mouse-up. A red bar appears on both sides of the click.

Shift+Left Click on additional edits to execute a gang trim.

Once a trim type and side(s) are chosen for the trim, the other trim types and sides are precluded from being enabled.

All edit points are trimmed equally.

MTI Film - Cortex User Manual version 5.6

## Example – Rolling Trim

In the following figure, segment 1 is being lengthened at its tail while segment 2 is trimmed and shortened by an equal amount at its head.

01:01:15:10		01:01:19:13	01:01:21:15	01:01:23:16 0
ext.mov		-What are you doing here?	Did 1 miss something	No. Ha, ha. Shut up. nab_imf_demStrit.mov
01-01-15:10	01:01:17:12	-What are you doing here?	Did I miss something	01:01:23:16 0 No. Ha, ha. Shut up.

## **Rolling Trim View**

We see continuously updated images of both sides of the trimmed segments with the # of frames or timecode trimmed either + or -



# Slide Trim

A Slide Trim places a red trim bar at the tail of the adjacent upstream segment and at the head of the adjacent downstream segment, trimming these segments by an equal number of frames. Slide Trims do not change the overall length of the affected timeline track(s).

#### **Executing the Slide Trim**

#### By Dragging the Mouse Cursor

You have two options to execute the trim with a click and drag action:

- 1. Alt+Left Click near the center and drag the pair of red bars. On mouse-up the trim is completed.
- 2. Alt+ Left Click near the center and mouse-up. Left click again and drag. On mouse-up the trim is completed.
  - a. Dragging Left will trim -
  - b. Dragging Right will trim +

#### Using the Numeric Keypad

Alt+Left Click near the center and mouse-up. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

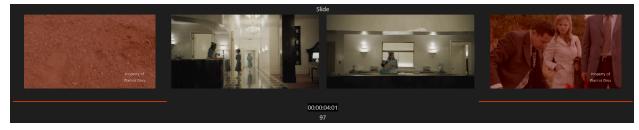
# Example – Slide Trim

The adjacent segments are trimmed based upon the direction the selected segment is slid.

01:01:15:10	01:01:17:12		01:01:21:15		
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
mov nab_imf_de	mo_text.mov			nab_imf_demo_text.mov	
01:01:15:10	01:01:17:12				
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
.mov nab_imf_de		+10 🖒		nab_imf_demo_text.mov	
01:01:15:10	01:01:17:12				
		-What are you doing here?	Did I miss something	No. Ha, ha. Shut up.	
.mov nab imf de	mo_text.mov <	<⊐ -10		nab_imf_demo_text.mov	_

#### Slide Trim View

We see 4 monitors. The two sides of the trimmed segments are continuously updated while the segment being slid is frozen.



# Slip Trim

A Slip Trim places a red trim bar at the head and tail of a single segment. The trim will "scroll" the head and tail of the segment leaving its timeline position fixed, therefore adjacent segments remain untouched in position or length.



## **Executing the Slip Trim**

#### By Dragging the Mouse Cursor

You have two options to execute the trim with a **click and drag action**:

- 1. Shift+Alt+Left Click near the center and drag the pair of red bars. On mouse-up the trim is completed.
- 2. Shift+Alt+Left Click near the center and mouse-up. Left click again and drag. On mouse-up the trim is completed.
  - a. Dragging Left will trim -
  - b. Dragging Right will trim +

#### Using the Numeric Keypad

Shift+Alt+Left Click and mouse-up at or near the center of a segment. To trim by timecode press + or - followed by the value and then press Enter. To trim by frames press ++ or - - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or - entry.

# Example – Slip Trim.

Drag in either direction to slip the media within the existing break locations, or use the numeric keypad to input trim values.



### **Slip Trim View**

We see both sides of the segment continuously updated while the last and first frame of the adjacent segments are frozen.



# Selecting, Repositioning, and Deleting Segments

Clicking on a segment allows the user to reposition or delete the segment respecting the Gap/Overwrite and Ripple trim modes. To select a segment the track must be enabled; segments on locked tracks cannot be modified.

# Selecting a single segment

Left clicking near the center of a segment will highlight and select the segment for repositioning or deleting. Left clicking again near the center of a <u>single selected</u> segment deselects the segment. Alternatively, press Esc.

# Selecting multiple segments

- 1. To select additional segments after selecting the first segment, hold down the Shift key and Left click near the center of additional contiguous segments. Skipped segments will be included in the group selection if they are between the last two clicked segments.
- 2. Ctrl+Left click near the center to select individual segments that are not contiguous. Ctrl+Left click again near the center of <u>selected</u> segments to deselect them.
- 3. To select the current segment and the balance of upstream segments, press Ctrl+Shift+Click.
- 4. To select the current segment and the balance of downstream segments, press Ctrl+Alt+Click.

# Repositioning Segments on the Same or to Like Tracks

### **Movement Behavior**

As all segments are moved, their head <u>or</u> tail will snap to edit points on both video and audio tracks regardless of whether they are enabled or not, to marks in and out, and the cursor position.

Movements are completed on mouse-up regardless of whether the segment has been snapped or simply repositioned to a new location.

## Repositioning a Segment In Gap Trim Mode

With your segment(s) selected as per above you have two options to execute the movement of the segment on the **same** track:

- 1. Left+Click near the center of the segment and drag in either direction.
- 2. To move by timecode press + or followed by the value and then press Enter. To move by frames press ++ or - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or entry.

On mouse-up after the drag or entering a numeric trim value, the moved segment will overwrite the overlapped segment(s) leaving a gap in the area vacated by the moved segment.

#### Repositioning a Segment in Ripple Mode

With your segment(s) selected as per above you have two options to execute the movement of the segment on the **same** track:

- 1. Ctrl+Left+Click near the center of the segment and drag in either direction.
- To move by timecode press + or followed by the value and then press Enter. To move by frames press ++ or - followed by the value and then press Enter. In both cases a Duration Dialog box will appear following a + or entry.

On mouse-up or entering a numeric trim value and based upon the direction of the move, the head or tail of the moved segment determines the insertion point in the timeline track.

If the insertion is not located at an edit point then the insertion bifurcates the overlapped segment:

- 1. When moving a segment upstream (that is, toward the head of the timeline) then the point of bifurcation is determined by the head of the segment being moved.
- 2. When moving a segment downstream (toward the tail of the timeline) then the point of bifurcation is determined by the tail of the segment being moved.

If the segment being moved is relocated directly on an edit point then no bifurcation takes place:

- 1. If the segment is moved upstream and its head is relocated at an edit point then the segment is inserted, shifting the overlapped segment(s) downstream to fill the vacated space.
- 2. If the segment is moved downstream and its tail relocated at an edit point then the segment is inserted, shifting the overlapped segment(s) upstream to fill the vacated space.

In the above cases, the area vacated by the moved segment is shifted, therefore the overall length of the track is not altered.

# **Deleting Segments with or without a Ripple**

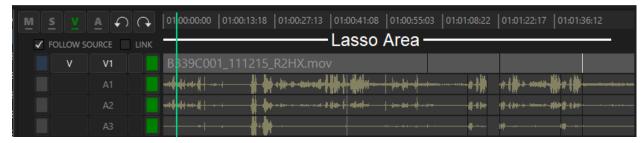
To delete a segment without Rippling the timeline

- 1. Left Click near the center of the Segment and:
  - a. Press the Lift key (. period key) or button

To delete a segment with Rippling the timeline

- 1. Left Click near the center of the segment and:
  - a. Press the Extract key ( / forward slash key) or button . or press Ctrl+Delete

# The Lasso Area and Selecting Multiple Tracks or Edit Points



The Neutral zone is the empty space in the timeline beneath the timecode track and above the media tracks. Clicking in the Lasso Area is equivalent to pressing the Escape key on the keyboard. It can also be used to initiate group selections by Left clicking and lassoing multiple segments or edit points.

# **Lassoing Segments**

## To select segments with a lasso:

Left Click and Drag across the desired segments. Any segment crossed in the path of the lasso will be selected. Once selected, they can be:

- 1. Moved in Gap or Ripple mode
- 2. Lifted or Extracted

## **Lassoing Edit Points**

## To select edit points with a lasso for Gap Trims:

Shift+Left Click and Drag across the desired segments.

- 1. If the lasso is drawn to the left of the edit point(s), a Gap Trim is initiated on the A side of the edits for all segments crossed in the path of the lasso.
- 2. If the lasso is drawn to the right of the edit point(s), a Gap Trim is initiated on the B side of the edits for all segments crossed in the path of the lasso.

## To select edit points with a lasso for Rolling Trims:

Shift+Left Click and Drag across the desired edit points. If the lasso drawn crosses an edit point, a Rolling Trim is initiated.

, or press the Delete key

## To select edit points with a lasso for Ripple Trims:

Ctrl+Left Click and Drag across the desired segments.

- 1. If the lasso is drawn to the left of the edit point(s), a Ripple Trim is initiated on the A side of the edits for all segments crossed in the path of the lasso.
- 2. If the lasso is drawn to the right of the edit point(s), a Ripple Trim is initiated on the B side of the edits for all segments crossed in the path of the lasso.

In all cases pressing escape or Left clicking in the Lasso Area will cancel the selection.

# Creating a Dolby Vision<sup>™</sup> / Dolby Atmos<sup>®</sup> Composition

Before creating a composition for both Dolby Vision<sup>™</sup> (DoVi) and Dolby Atmos<sup>®</sup> (DoAt), make sure that you've created and configured the proper Deliverables, of which there should be, at least two; the IMF Deliverable Type and modifying the Preview to reflect the desired Content Mapping and Audio tracks to be monitored from the Atmos file.

✓ Apply Dolby Vision Content Mapping 100-nit, BT.709, BT.1886, Full, (type 1)	COLOR	
100-nit, BT.709, BT.1886, Full, (type 1)	Apply Dolby Vision Content Mapping	
	100-nit, BT.709, BT.1886, Full, (type 1)	
✓ Show v4 targets	✓ Show v4 targets	

In the "Deliverable Type", Cortex provides a number of templates for various OTT and broadcasters/studios including Netflix, hulu, Fox, HBO, Sony, Apple, etc. The templates only require the "Delivery Type" entered and the balance of properties will be automatically filled.

# **Dolby Atmos®**

If your Cortex Enterprise edition is licensed for the Dolby Vision<sup>™</sup> option, it will also be licensed for Dolby Atmos<sup>®</sup>. There are three Atmos file types, all of which contain a series of potential Monitor Formats. The ADM (Audio Definition Model) BWF is essentially a broadcast wave file with Atmos metadata.

ENCODIN								
IMF Netflix	Templates	Favorites	Defau	lts	Import			
DELIVERABLE T								
IMF Netfli	x					~	$\mathbf{O}$	)★
imf_netfli	x_dovi							
4K/UHD [	Dolby Visio	on HDR						~
						COLORSPA		
Lossy						RGB 12	2 bit	v
OPERATIONAL	. PATTERN							
OP-1a						Advanc	ed	
BIT RATE								
800						Mbps		v
SIZING								
RESOLUTION					E QUALITY			
UHD 2160	0p 1.77:1		~		ITI HQ	TI-Samsun	g	

DOLBY ATMOS MONI	TOR FORMAT	
Stereo		~
5.1		
7.1		
7.1.4		
Stereo		

🌻 Save Audio Config	×
NAME	
IAB	~
LANGUAGE	
English (en)	~
CONTENT KIND	
MCA Audio Content Kind	
ELEMENT KIND	
MCA Audio Element Kind	
AUDIO TRACK LABELS M&E	

## The <u>IAB</u>

(Immersive Audio Bitstream) MXF file is the Atmos bitstream wrapped in a MXF file, <u>which is used for IMF creation</u>. The DAMF (Dolby Atmos<sup>®</sup> Master Format) consists of 3 files. The one used for import is the .atmos file.

When saving the audio configuration for an IMF with Dolby Atmos<sup>®</sup>, be sure to choose IAB as the configuration type.

Depending on the chosen Deliverable Type, a Monitor Format derived from the file can be assigned to it. Be careful to choose the Monitor Format that conforms to the number of channels the Deliverable Type supports. For IMFs, the Atmos file is simply passed through without the ability to configure it.





If the IMF Composition (refer to <u>IMF Composition</u>) has the Dolby Atmos<sup>®</sup> option enabled, a DA track is automatically added to the timeline.

<-- This is where the Atmos<sup>®</sup> track is placed.

# Dolby Vision<sup>™</sup> Metadata

M <u>s</u> <u>v</u>	.▲	$\mathbf{O}$	00:00:00:00	00:00:35:2
FOLLOW S	OURCE	LINK		
M	М			
V	V1		tea_with_alio	ce.000000.c
DA	DA			

When a Dolby Vision<sup>™</sup> xml file is supplied, it is intended to be placed on the Metadata Track in sync with the master video file so that any Content Mapping will be displayed correctly.

Dolby Vision Metadata	Copy Breaks to Video Track
	Сору
	Establish Sync
	Export
	Paste

To copy the breaks contained in the metadata track to the video track, right-click and choose Dolby Vision<sup>™</sup> Metadata/Copy Breaks to Video Track from the context menu.

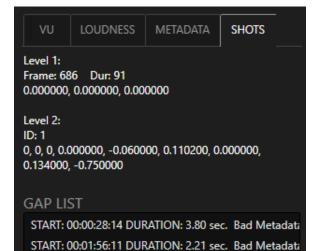
<u>M</u> <u>s</u>	<u>v</u> <u>A</u>	€ €	00:00:00:00	00:00:33:03
🖌 FOLL	OW SOURC	E LINK		
	М	A 🔶 📘		
	v v	/1 🔶 📘	meridian_4	min_seq_p3d@
	DA D	A	meridian_2	398_Atmos_2(

Cortex provides a method to ensure that the Metadata and other tracks remain in sync eliminating the risk of rendering the color metadata out of sync with the video. To Establish Sync between the tracks right-click and choose Dolby Vision<sup>™</sup> Metadata/Establish Sync. Orange diamonds appear after the track names.

#### **Missing DoVi Metadata**



If for any reason illegal or missing Level 1 metadata is present in the .xml file, it will display as a purple segment and also be listed in the GAP LIST of the SHOTS tab.



Double clicking on the Gap List event will jump the timeline to the related segment.

#### **Three Methods of Fixing Bad Metadata**

There are three ways to fix illegal or missing metadata.

- 1. Copy DoVi metadata from other similar segments
- 2. Use the Trim function to extend metadata from an adjacent segment
- 3. Use the Color Tool to analyze Level 1 content mapping

#### 1. Copy Dolby Vision<sup>™</sup> Metadata

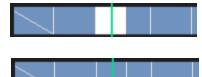
By locating a segment that has similar color characteristics you can copy that metadata and then paste it to the segment with bad metadata.

Click on the good segment and press Ctrl+C or right-click on the timeline and choose:



Dolby Vision<sup>™</sup> Metadata/Copy

Click on the bad segment and press Ctrl+V or right-click on the timeline and choose:

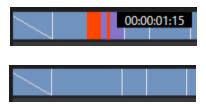


Dolby Vision<sup>™</sup> Metadata/Paste

#### 2. Use the Trim Function to Extend Metadata from an Adjacent Segment

MTI Film holds a patent for editing metadata tracks as you would video or audio media tracks.

Shift+click on an edit to initiate a Rolling trim and then drag the trim to the end of the segment.



When you reach the break of the next segment,

mouse up and observe the two segments have become one

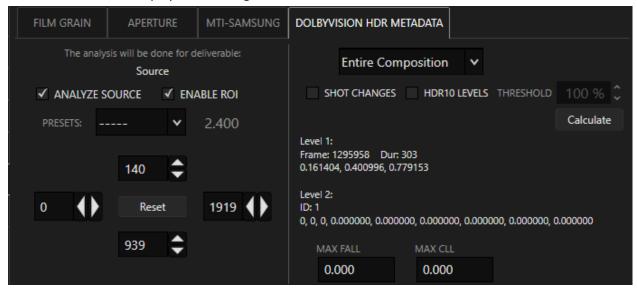
#### 3. Use the Color Tool to Analyze Level 1 Content Mapping

In the Color Tool, select the tab for Functions/DolbyVision<sup>™</sup> HDR Metadata.

V		00:00:18:10	00:00:21:20	00:00:25:06	00:00:28 <mark>:</mark> 16	00:00:32:03	00:00:35:13	00:00:38:23	00:00:42:10 00
	M								
Framing	FILM GR	AIN A	PERTURE		DOLBYVIS	ION HDR MET	ADATA		
Input LUT		ne analysis will	be done for de	eliverable:		Current Ever	nt v	,	
Primary	✓ ANA	ALYZE SOURC		ABLE ROI	SHC	T CHANGES	HDR10 LEVE	<b>LS</b> THRESHOL	▶ 100 % 🗘
Output LUT	PRESET	'S:	~	2.347					Calculate
Functions						6 Dur: 91			
Pipeline		13	31			0.000000, 0.000	0000		
	0		Reset	1919	Level 2: ID: 1 0.0.0.0.0	00000, -0.06000	0 0.110200 0.	000000 0.13400	00.750000
		94	18		MAX		MAX CLL	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.,
Clip: 2/3 teal_e XML DolbyLat	p_101_2018-04 psMDF 1920x			Dolby-V2.9		Event: 1/78 Preview - Do	tea_with_alico on't Resize - SE		

- 1. If you wish to Analyze the source media, enable the ANALYZE SOURCE checkbox. Disabling it will allow you to choose a specific Deliverable's color pipeline for the analysis by selecting its Deliverable tab above the Media Player.
- 2. If the picture content contains a matte, the analysis must exclude the matte from the analysis. To exclude the matte from analysis:
  - a. Check the ENABLE ROI checkbox and choose an aspect ratio from the PRESETS Drop-down list. An ROI with Red line boundaries will appear.
  - b. If needed, adjust the boundaries of the ROI with the arrow buttons.
- 3. With the timeline cursor located on the bad segment, select Current event in the Dropdown field located on the right panel
- 4. Press Calculate

The Metadata track analysis will begin. Once the analysis is complete, the metadata track will turn blue and the Level 1 values will be displayed on the right side of the module.



Note that Level 2 (Trims) are unaffected. Cortex does not support changing Level 2 and, therefore, does not require you to purchase a license issued by Dolby.

# ScratchPad Audio and Creating Audio Configurations for Compositions

The ScratchPad is used to house all audio files required to create audio configurations for all composition types. For example, the mixes provided might include 5.1 and LTRT mixes that both have to be included in the render. In this case, there would be a need to organize the files in a manner that allows for synchronization and review.

	ScratchPad	5.1: English 6 ch	Lt-Rt: English 2 ch		A1	A2 A3 A4	A5	A6 A7	A8
	€ (00:00	:00:00 00:00:20:23	00:00:41:23 00:01:02:23	00:01:23:23 00:01:44:23	00:02:05:23	00:02:26:23		****	Т
✓ FOLLOW SOURCE	LINK								
M M									
S S1									
V V1	nab_i	imf_demo_text.mov							•
A1			444 14 4 14 14			<b>**</b>	<b>_</b>		
A2						•		м	
A3				in the second				$\boxtimes$	
A4								١M	M
A5					•••••				
A6					•	• <b>••</b> • •••			
A7						a vez data			
A8									
A9									
A10								Fade	~

In this illustration the ScratchPad contains a total of 8 audio tracks consisting of 5.1 and LTRT mixes. The 5.1 mix is on tracks A1 - A6 and the LTRT are on A7 and A8.

# Adding Audio Tracks to the ScratchPad

To Add audio tracks to the timeline, if the files are <u>monophonic</u>, Ctrl+click on each channel of audio in the order you wish to populate the ScratchPad timeline. In the below example, the channel assignment order starts with #4 for the 5.1 mix and ends with #2 for the LTRT mix.

#	Channel Assign	Audio	Timecode Duration Channels SR_Sc_Tk	
1	A7	LMRE_401_2.0_PM_SNC_MASTER_060515_NETFLIX.L.wav	00:58:30:00 00:04:09:00 1 🕘	
2	A8	LMRE_401_2.0_PM_SNC_MASTER_060515_NETFLIX.R.wav	00:58:30:00 00:04:09:00 1 🛛 🕘	
3	A3	LMRE_401_5.1_PM_SNC_MASTER_060515_NETFLIX.C.wav	00:58:30:00 00:04:09:00 1 🔗	
4	A1	LMRE_401_5.1_PM_SNC_MASTER_060515_NETFLIX.L.wav	00:58:30:00 00:04:09:00 1 🔗	
5	A4	LMRE_401_5.1_PM_SNC_MASTER_060515_NETFLIX.LFE.wav	v 00:58:30:00 00:04:09:00 1 Ø	
6	A5	LMRE_401_5.1_PM_SNC_MASTER_060515_NETFLIX.Ls.wav	00:58:30:00 00:04:09:00 1 💽	
7	A2	LMRE_401_5.1_PM_SNC_MASTER_060515_NETFLIX.R.wav	00:58:30:00 00:04:09:00 1 🖉	
8	A6	LMRE_401_5.1_PM_SNC_MASTER_060515_NETFLIX.Rs.wav	00:58:30:00 00:04:09:00 1 💽	T

Follow these steps for monophonic "Stem" tracks:

- 1. Ctrl+click on each channel of audio in the order that you wish to populate the ScratchPad timeline. The first clicked track will be the one you can monitor (A1)
- 2. Add them to the ScratchPad Timeline
  - a. Mark the In and Out points as a 3 point edit and either press the G key (Overwrite) or drag to the timeline
  - b. If all the files begin at the same picture timecode location already edited to the timeline just drag them to the timeline; no marks needed

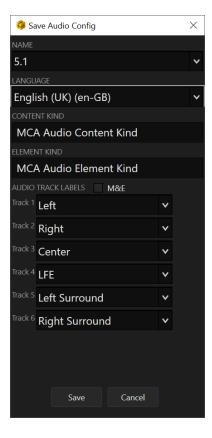
# **Saving Audio Configurations**

#### For the 5.1 Mix:

1. Disable all but the 5.1 audio tracks (A1 - A6 in the example below)

r M	<u>s</u> <u>v</u>		Ģ	00:00:00:00	00:00:20:23	00:00:41:23	00:01:02:23	00:01:23:23	00:01:44:23	00:02:05:23	00:02:26:
✓	FOLLOW S	OURCE	LINK								
c	М	М							$\mathbb{N}$		
		S1									
		V1		nab_imf_de							
		A1			and the second second						
		A2									
		A3									
		A4					• • • • • • • • • • • • • • • • • • • •				
		A5					avijavij —			•••••	
		<b>A</b> 6					institute)				
		A7									
		A8									

- 2. Press Ctrl+S or right-click on the timeline and choose Save Audio Config
- 3. A Dialog Box appears. Fill in the metadata and click Save



The Content Kind and the Element Kind must be filled in. Cortex uses the defaults MCA (Multi Channel Audio) Audio Content Kind and MCA Element Kind for that purpose. However, if the spec requires a different one, this is where you would enter it.

#### For the LTRT Mix:

- 1. Disable all audio tracks and then enable tracks A7 and A8 (they will be rendered to tracks 1&2).
- 2. Press Ctrl+S or right-click on the timeline and choose Save Audio Config
- 3. A Dialog Box will appear. Fill in the needed metadata and click Save

		1	Scratch	Pad	5.1: Eng	lish 6 ch	Lt-Rt:	: English	n 2 ch							A1	A2	A3	A4	A5	A6	A7	A8
M		<u>•</u>	<b>G</b> ]	00:00:00	00 00	:00:20:23	00:00	0:41:23	00:01:02	2:23	00:01:23	:23 0	00:01:44:2	23	00:02:05	5:23	00:02	2:20 2:				-755 V	Т
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For <u>polyphonic</u> wav files, channel assignments are normally automatically created, however, if there are two polyphonic files, after the first file is added to the timeline, the second file will automatically be assigned to A1 and A2. Disable those tracks and assign them to the desired ones, i.e. A7 and A8.

# Move an Audio Configuration

If the configurations are created in an order that is not the desired one, you can click on the configuration tab and drag it to the proper position. For example if the LTRT was created prior to the 5.1 and it needs to be last, click on either tab and drag it to overlap the one to be replaced.

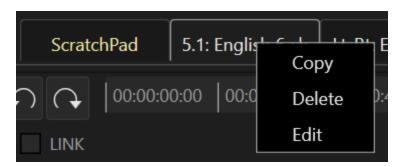


Once the config overlaps the one to be replaced, release the mouse button and the config will be moved.

# Copy, Delete, or Edit an Audio Configuration

There are times when it is necessary to modify an audio configuration in order to change one aspect of it, for example its language.

## To Copy an Audio Configuration



Right click on the desired audio configuration tab and select Copy.

The Audio Configuration dialog appears.

The "Language" field will be empty anticipating the modification, however you can edit any aspect of the dialog. Click Save

## To Delete an Audio Configuration

Right click on the desired audio configuration tab and select Delete. A message box appears. Click the Yes or No response button

## To Edit an Audio Configuration

Right click on the desired audio configuration and select Edit. The Audio Configuration dialog appears. Make edits as required and then click Save.

# **Sync Loss Indicators**

If video and audio files were synchronized in the Sync tool, and the synchronization between them is affected in the Edit Tool, a "sync loss indicator" is drawn in red on the affected tracks.

In all cases the indicator will suggest the trim action to resync the tracks.

For example, if a +10 frame trim is executed at the head of a video segment causing a loss of sync, the indicator will be as follows:

Executing the suggested trim on the audio track(s) will resync the affected tracks.

# **Effects and Transitions**

Adding Effects in the Edit Tool is similar to adding dissolves in the Color Tool.

In the EFX Palette be sure Fade is chosen in the Effect Dropdown field. NOTE: In V5.6 only Fades are supported with more to be added in future releases.

## Working With Fades

In compositions, you can add a Fade In or Fade Out to your clip.

#### To Create a Fade In:

- Navigate to the frame where you wish to <u>begin</u> the fade (usually the first frame of a segment)
- 2. Click the Add Effect button or press the P key
- 3. Navigate to the desired Out point for your fade (for a 16 frame fade-in enter +15, which will include the first frame for a total of 16)
  - a. Click the Mark Effect Out button or press the ] key
  - b. To lengthen or shorten the fade, adjust the Mark Effect Out

#### To Create a Fade Out:

- 1. Navigate to the frame where you wish to **end** the fade (usually the last frame of a segment).
- 2. Click the Add Effect button or press the P key.
- 3. Navigate to the desired In point for your fade (for a 24 frame fade out enter -23, which will include the last frame for a total of 24)
  - a. Click the Mark Effect Out button or press the ] key.
  - b. To lengthen or shorten the fade, adjust the Mark Effect In









## **Effect Symbols**



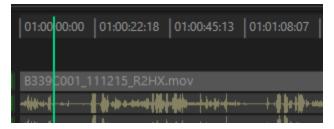
Fades In and Out are displayed as two blue diagonal lines beginning and ending at the center of the track respectively. Color Dissolves are white diagonal lines beginning at the top of the track and ending at the bottom.

## **To Delete an Effect**

Go to the beginning or anywhere in the effect and press Ctrl+P

$\mathbb{R}$	P Ctrl+P	Add Effect (Fade In or Out only in this version) Delete Effect						
R	[ Shift+[	Mark IN or modify the in point of the effect Go to Previous Effect						
⊠ľ	] Shift+]	Mark OUT or modify the out point of the effect Go to Next Effect						

## Navigating the Timeline



In addition to playing or jogging forward/reverse and jumping between breaks, you can use the Timecode Bar to scrub the timeline. Click anywhere on the Timecode Bar at the top of the timeline and the playhead will jump to that location. Drag up or downstream to scrub.

#### Searching a Timecode



You can enter a timecode directly into the composition Timecode Position Field. Just start typing on the number pad and press enter to jump to the timecode location. Use the . (dot) key to enter leading or following OOs.

## **Moving by Timecode or Frames**



To navigate by moving by timecode or frames use the + or - keys on the number pad. Pressing the plus or minus key once enters a timecode value. Pressing the plus or minus buttons twice enters a value in frames. Press enter and the cursor will jump by the input value.

## Jumping Edit by Edit

01:00:03:2	1	01:00:05:19	01:00:07:18			01:
	A669C001_0416				C064(	003
	0159027.WAV A	1		0159027	.WAV	/ A1
	0159027.WAV A	42		0159027	.WAV	/ A2
	0159027.WAV A	13		0159027	.wav	/ A3

When focus is on the composition, the **E** and **R** or **UP** and **Down** arrow keys will jump to the next or previous edit points based on which tracks are enabled.

If the Media Player is focused on a clips bin, pressing Shift+S or Shift+F will initially switch focus to the composition. Subsequent presses will move in the desired direction edit by edit regardless of which tracks are enabled.

## Showing Source Timecode in the Composition

01:00:05:19	01:00:07:18
1616.mov	01:00:14:20
A1	14:57:58:05
A2	14:57:58:05
A3	14:57:58:05

To show/hide the timecode of source media contained in the composition, place the playhead at the desired position and press F8 or right-click and choose "Show Source Timecodes" in the Context Menu. When showing, pressing play will hide the timecodes.

# **Zooming the Timeline**

There are several methods to zoom in or out of the timeline.

1. At the bottom of the UI there is a control bar that zooms in out of the timeline.



- 2. Hovering the mouse cursor over the timeline and scrolling the mouse wheel up or down will zoom in and out of the timeline based on the location of the mouse cursor.
- 3. Pressing Shift while scrolling the mouse wheel up or down will alter the height of the tracks.
- 4. Pressing Ctrl and scrolling the mouse wheel up or down will scroll the timeline up or downstream.
- 5. Pressing Shift and + or on the keyboard will zoom in and out respectively.
- 6. Pressing Ctrl+Shift and will fit the entire timeline in the composition window.

Double clicking anywhere on the Timeline Thumb/Slider located at the bottom of the screen will also fit the entire timeline in the composition window.

# Matchframes

Using the Matchframe functions in Cortex are extremely helpful in finding specific corresponding source media used in the composition and vice versa. It can also be used to "trim" the head and tail of shots as opposed to using the graphical trim functions (explained earlier in <u>Trim Types</u>). The Matchframe command can be invoked by pressing the M key or clicking the Matchframe button in the EFX Palette.

# 

For this section, the keyboard shortcuts will be referenced.

## Simple Matchframe

With the composition focused and the Media Player sitting on the desired frame you wish to match, press M. This finds the corresponding source clip/frame and loads it in the Source Media Player. Conversely, if a clip has been used in the composition and the Matchframe command is invoked while focused on the source clip, the corresponding matchframe will be loaded in Composition Media Player.

#### NOTE: A simple matchframe leaves the timecode registers unchanged,

## Lengthening the Tail of a Shot

To lengthen a shot while located at the last frame of a shot, press Shift+M. This will load the matching timecode values <u>plus</u> one frame into both the source and composition Mark In registers, leaving the Mark Out registers empty and ready for input. Focus is initially placed on the Source Media Player. After an out point is entered, an Overwrite or Insert edit can be performed.

Note: When inserting Black, you can use the Shift+H command on any and all tracks. It will automatically use the Black Level assigned when the composition was created. Set a Mark in and Out on the timeline, enable the tracks required and press Shift+H.

## Lengthening the Head of a Shot as an Overwrite

To lengthen a shot as an overwrite edit while located at the first frame of a shot, press Ctrl+M. This will load the matching timecode values <u>minus</u> one frame into both the source and composition Mark Out registers, leaving the Mark In registers empty and ready for input. Focus is initially placed on the Source Media Player. After an In point is entered, an <u>Overwrite</u> edit can be performed.

#### Lengthening the Head of a Shot as an Insert

To lengthen a shot as an insert edit while located at the first frame of a shot, press Ctrl+Shift+M. This will load the matching timecode values <u>minus</u> one frame into both the source Mark Out and composition Mark In registers, leaving the other registers empty and ready for input. Focus is initially placed on the Source Media Player. After an additional mark is entered, an <u>Insert</u> edit can be performed.

#### **Reversing a Jump Cut**

To undo a jump cut, locate the composition timeline cursor at the jump cut. Then press Shift+M or Ctrl+M. The new marks present a marked range that will repair the jump cut. Then click the Insert button.



Run-throughs now appear on the timeline indicating an edit has been made where the adjacent timecodes are continuous. Run-throughs can be cleared individually by placing the timeline cursor on an edit point with a Run-through and pressing Ctrl+, (comma) or Ctrl+clicking the Add Edit button. To clear them all at once and with the timeline cursor located anywhere on the timeline you can:

- 1. Press Ctrl+Shift+,
- 2. Press Ctrl+Shift+Click the Add Edit button



3. Right click on the timeline and select "Clear run through edits" from the Context Menu.

# **Edit Function Keys**

	Trim Types					
Gap/Overwrite Trim	Left Click & Drag	One sided trim				
Ripple Trim	Ctrl+Left Click & Drag	One sided trim with ripple				
Rolling Trim	Shift+Left Click & Drag	Two sided trim				
Slide Trim	Alt+Left Click & Drag	Click near center of segment				
Slip Trim	Shift+Alt+Left Click & Drag	Click near center of segment				
	Selecting Segments					
Select a single segment	Left Click					
Select additional segments	Shift+Left Click	Selects contiguous segments				
Select additional segments	Ctrl+Left Click	For non-contiguous segments				
Select current & upstream segments	Shift+Alt+Click					
Select current & downstream segments	Ctrl+Alt+Click					
Lasso Segments	From the Neutral Bar Lasso and Drag downward					
	Repositioning Segments					
Reposition in Gap mode	Left Click & Drag to location	Segment overwrites and leaves a gap				
Reposition with Ripple mode	Ctrl+Left Click & Drag to location	Segment Bifurcates overlapping segment area				
	Deleting Segments					
Delete a segment with Gap	Left Click and click Lift or press the Delete key	Deletes the segment and leaves a gap				
Delete a segment with Ripple	Left Click and click Extract or press Ctrl+Delete	Deletes the segment and ripples downstream segments				

# The QA Tool

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#### The QA Tool provides modules for:

- 1. Dead Pixel Detection and Correction
- 2. Graphical Data Analysis for:
  - a. Video Levels
  - b. Bit Rate
  - c. Audio Levels
  - d. Dead Pixels
- 3. Video Scopes
  - a. Waveform with various scales
  - b. Vectorscope
  - c. Gamut Display
- 4. Audio Meters
  - a. VU
  - b. Loudness
- 5. System performance monitoring
- 6. IMF Photron Validation
- 7. Dolby Vision<sup>™</sup> Metadata Validation.

Note: Dead Pixel Detection is available in all versions of Cortex. In the DIT editions only source clips can be detected. In the Enterprise, Dailies, and QC editions, source clips and compositions can be detected. Dead Pixel <u>Correction</u> is only available in the Enterprise edition.

# The Dead Pixel Module

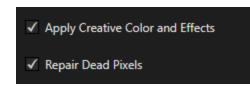
The Dead Pixel module provides the ability to detect and correct dead pixels found in picture media. Dead Pixels, sometimes referred to as "Stuck" pixels, are caused by defective spots of the camera image sensor. In digital cameras, defective pixels fail to *sense* light levels correctly, whereas defective pixels in LCDs fail to *reproduce* light levels correctly.

LINK V1	01:00:00:00 01:00:01:14 01:00:03:05 01:00:04:19 0	1:00:06:10 01:00:06:01 01:00:09:15 01:00:11: flak_dpd_nab.056400.dpx	06 01:00:12:20 01:00:14:11	01:00:16:02 01:00:17:16 01: Iflak dpd nab.086400.dox	00:19:07 01:00:20:21				7 01:00:27:08		01:00:30:13 01:00:32:		
DEAD PIXEL		Detect Cancel Reset	Accept Reject			TOTAL: 14	RED: 8	GREEN: 3	BLUE: 2	WHITE: 1	BELOW THRESHOLD: 0	SHOW:	
GRAPHS	K ENABLE ROI					-	Channel Red	Severity V 100.0	Persistence 88.5		Y Status 5 40		CANDIDATES ACCEPTED
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PERFORMANCE	279		- 0	CANDIDATE	PREVIEW	4		94.4 93.3	80.0 75.0	3 637 2 871			IMPORTED
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The Dead Pixel module can detect single-take camera files or compositions that contain edited material. As of version 5.6, Cortex can correct a third party detection with the importation of .csv files. For detection, we recommend using the highest quality version of the media in order to ensure the greatest level of accuracy.

## **Preparing Deliverables for Dead Pixel Correction**

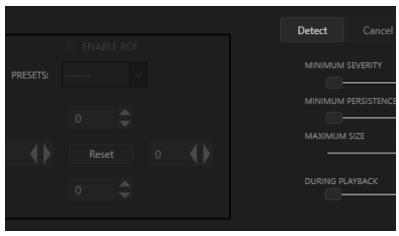
The Dead Pixel module uses the Preview deliverable color pipeline for its analysis and, therefore, must have the deliverable properties "Apply Creative Color and Effects" and "Repair Dead Pixels" enabled. The other deliverables should <u>disable</u> Apply Creative Color and Effects but leave Repair Dead Pixels enabled as explained below.



When detecting ungraded camera or HDR clips, it is recommended to increase the saturation of the clips prior to detection using the ColorTool. This enhances the detection process and increases the contrast of the dead pixels.

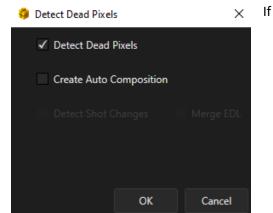
Preparing the Deliverables as instructed allows changes to saturation without ultimately affecting the image when rendering the Deliverables of choice.

## **Detecting a Single Camera Clip**

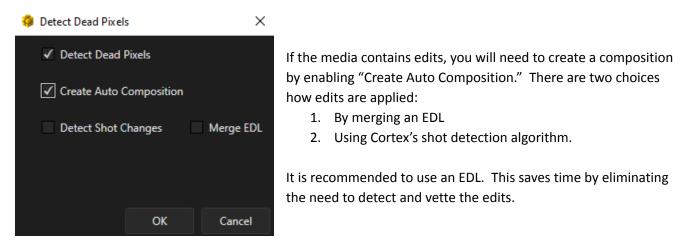


the selected clip is a single camera file, ensure that "Detect Dead Pixels" is checked and then click "OK."

To initiate a detection, select the intended media and click the Detect button, found just below the Master Clips Bin.



## **Detecting Edited Media**



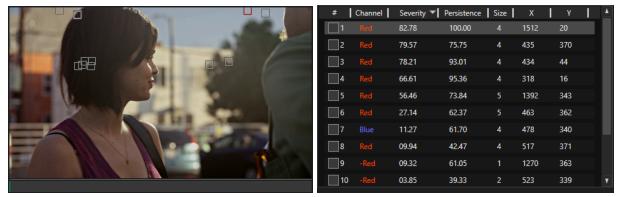
If you enable "Merge EDL," an explorer window will open. Navigate to and select the corresponding EDL. Once selected, the media will appear on a new composition timeline with the cuts in place.

If you click "Detect Shot Changes," the media is placed onto the timeline and the edit points appear as the shot detection progresses.

In either case, during pixel and/or shot detection, green progress bars appear above each shot on the timeline. Cortex detects all the shots in the composition simultaneously and refreshes every 30 seconds allowing work to begin while the detection continues in the background.

## **The Detection Workflow**

As the detection progresses, Cortex generates a Dead Pixel List of "Candidates" for each shot. They are displayed in the Media Player contained in boxes.



"Candidates" are pixels that Cortex has determined are likely dead. All pixels in the list are initially assigned Candidate status.

In the Dead Pixel List, pixels are displayed in rows with values or scores for their Color channel, Severity (or contrast), and Persistence (the visibility of the candidate in the shot), Size, X/Y coordinates, and Status.

In the Media Player, dead pixel candidates are displayed as boxes comprising two parts. a core and border.

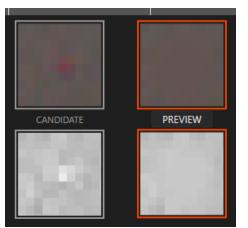
The core reflects the color channel of the dead pixel candidate as follows:

Red	-Red					
Green	-Green					
Blue	-Blue					
White	-White					

#### The border represents the status of the pixel:

Color	Status
Grey	Candidate
White	Accepted
Black	Rejected
Same color as the core	During Preview

## **Selecting a Pixel**



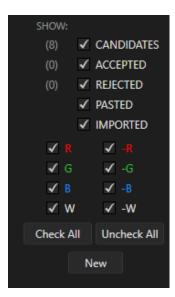
Pixels can be selected by left or right-clicking the center of the box or on the list item.

The selected pixel is displayed in two sets of magnified boxes. The left set of boxes shows the pixel defect before the fix. The top box is displayed in full RGB color. The bottom box is a black & white display of the pixel's affected color channel.

The right set of windows shows the pixel candidate after the Cortex fix.

The Dead Pixel List can be filtered in several ways:

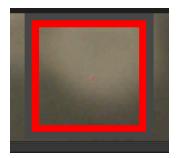
Checkboxes along the side of the UI can filter out pixels based upon their status (Candidate, Accepted, Rejected, Pasted or Imported). They can also be filtered from the list based on their color channel.



MINIMUM SEVERITY	
	0
MINIMUM PERSISTENCE	
	0
MAXIMUM SIZE	
	10

Using the sliders, Pixels can be filtered based on user-defined Minimum Severity and Persistence, and Maximum Size.

The number of pixels detected can potentially number 100 per shot. The filter sliders help eliminate pixels with low scores that are not visible to the eye and, therefore, are hidden to lessen screen clutter.



The mouse wheel is used to zoom in on the Media Player. Scrolling up zooms in, down zooms out. Holding Shift while scrolling, focuses the zoom on the selected pixel. Double clicking on the Media Player returns the display to the full frame view.

Repeatedly pressing the T key or clicking the PREVIEW button toggles a preview of the fix before and after.

## **Segment Play**



The "Segment Play" button instructs Cortex to only play up to the end of the current segment, rather than move into subsequent segments. You can select this play mode by clicking the button or by pressing Ctrl+Shift+C. The current segment will be colored orange indicating Segment Play is active.

Segment Play mode is helpful when trying to determine the status of a pixel since it limits the cursor to the current shot, preventing the cursor from moving to the next shot where another pixel would be automatically selected. You can, however, still jump to the beginning of the next and previous shots using the corresponding navigation functions.

## **Assigning Status**

As stated, every detected pixel defect is assigned a default status of "Candidate". The user determines which candidates will be Accepted, Rejected, Copied/Pasted, Imported, or left as a Candidate.

Accepted pixels are added to the database for rendering the repairs. Rejected pixels are filtered from the render. Pixels that are Pasted inherit the status of the copied pixels.

## **Automatic Status Rippling**

#### By x/y coordinates

Since dead pixels are an inherent camera sensor defect, they tend to repeat throughout a composition of edited content based on repetition of camera use. With this in mind, when a status is assigned to a pixel, Cortex ripples through the timeline and automatically assigns the same status to pixels with matching x/y coordinates. This expedites the approval process, saving time in the manual operation of dead pixel detection.

#### By Tapename

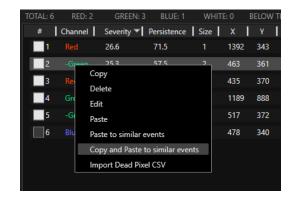
#	Track	Dead Pixel	Tapename	Picture
1	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
2	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
3	V1	Complete	A002_C001	flak_dpd_nab.086400.dpx
4	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
5	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
6	V1	Complete	A001_C001	flak_dpd_nab.086400.dpx
7	V1	Complete	B003_A001	flak_dpd_nab.086400.dpx
8	V1	Complete	B003_A001	flak_dpd_nab.086400.dpx
9	V1	Complete	C001_C001	flak_dpd_nab.086400.dpx
10	V1	Complete	C002_C001	flak_dpd_nab.086400.dpx
11	V1	Complete	C003_C001	flak_dpd_nab.086400.dpx

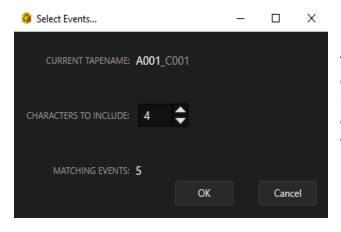
During the course of the workflow, the user may observe a Candidate present in one shot, however, missing from a similar shot captured by the same camera.

If an EDL was merged to the composition, the "Tapename" column can identify the camera source for each event in the composition. Another method of automating status assignment is to use the Copy and Paste to Similar Events function.

With the pixel you intend to copy selected, right-click on the Media Player or in the List view and choose, "Copy and paste to similar events."







The Select Events Dialog Box opens. Using the up and down buttons, choose how many characters are included in the search criteria for matching camera rolls. For example, if 4 characters are included, Cortex will paste the pixel record to all events captured in the camera roll.

## **Copying and Pasting a Pixel Record**

If needed, a pixel record can be copied from one shot and pasted to another. Right click on the pixel record and choose "Copy" from the context menu. Navigate to the shot you wish to paste in and then right-click and choose paste. The pasted pixel has the identical status to the copied pixel.

## **Deleting a Pixel Record**

To delete a pixel record, right-click on it and choose Delete from the context menu.

#### **Editing a Pixel Record**

At times it might be necessary to edit the metadata, such as its x and y coordinates. Right click on the pixel and choose Edit from the context menu. Modify the property and click Okay.

## **Copying and Pasting Dead Pixel Records to New Media**

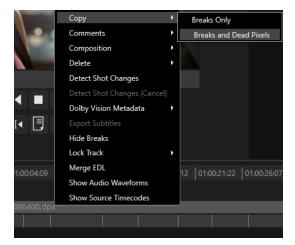
In the event that you have media that matches a composition that has already been detected, Cortex allows for copying the original Dead Pixel Detection to the newly imported media. For example, if detection has been processed on a Color Master, and it is required to commit those decisions to the Assembly Master, Cortex provides the ability to do so using the Edit and QA tools.

*Note:* The media needs to match cut for cut and is pixel accurate in both resolution and aspect ratio to the original media.



In the Edit Tool, import the new media. Add a video layer to the existing composition and edit the new media to V2.

Be sure that the media was cut in accurately by toggling the green Monitor button next to V2, turning the layer off and on to reveal V1.



With the new media on the timeline, right-click and choose "Copy/Breaks and Dead Pixels" from the context menu. The dead pixel detection and breaks from V1 to V2 are copied.

Once complete, rendering can begin for the new media.

## Importing A Dead Pixel CSV Provided by a Third Party QC

In the case where third party QC departments have run detection, either using Cortex or another application, Cortex can import a properly formatted .csv file that directs the software to the x/y coordinates of the detected pixels. Once the file is imported, Cortex can then render the corrections to the required deliverables.

Note: The .csv file needs to be properly formatted and will only work if the media is pixel accurate in resolution to the original detected media.

	А	В	С	D
1	File_Name	Х	Y	RecordStartTimecode
2	80213572 - Demo: Season 1: Pilot - 101	272	1469	00:00:00:15
3	80213572 - Demo: Season 1: Pilot - 101	272	1468	00:00:01:07
4	80213572 - Demo: Season 1: Pilot - 101	304	1224	00:00:02:23
5	80213572 - Demo: Season 1: Pilot - 101	272	1468	00:00:04:17
6	80213572 - Demo: Season 1: Pilot - 101	272	1469	00:00:04:17
7	80213572 - Demo: Season 1: Pilot - 101	272	1469	00:00:07:02
8	80213572 - Demo: Season 1: Pilot - 101	272	1469	00:00:07:02
9	80213572 - Demo: Season 1: Pilot - 101	304	1224	00:00:09:12
10	80213572 - Demo: Season 1: Pilot - 101	523	772	00:00:13:22
11	80213572 - Demo: Season 1: Pilot - 101	523	772	00:00:13:22
12	80213572 - Demo: Season 1: Pilot - 101	516	632	00:00:18:11
13	80213572 - Demo: Season 1: Pilot - 101	516	632	00:00:21:11
14	80213572 - Demo: Season 1: Pilot - 101	3284	608	00:00:24:22

For 3rd party .csv files, the file structure must follow this example

Using the original media that rendered the media used by the QC company to generate its report, create a composition that starts and ends at the exact same timecode or, if an existing composition exists on V1, consider placing the same clip on V2 and copying the breaks if present. This will isolate the imported pixel detections onto V2 and later allow rendering only the affected shots.

Add	•	00:00:21:22 00:00:26:07
Black	•	
Clear Run Through Edits		
Сору	•	Breaks Only
Comments	·	Breaks and Dead Pixels

In the Edit Tool, add the media to V2, right-click on the timeline and choose "Copy/Breaks Only" from the context menu.

The breaks from V1 are copied to V2. If no cuts are present on the timeline, the import dialog provides the option to detect the shot changes surrounding the reported timecode.

🧔 Imp	ort Dead Pixel CSV			-	-		×					
CSV FILE	C:\Users\larry.	hernoff\De	sktop\P	ixel_Erro	rs_(							
EPISODE 80213572 🔶 Demo: Season 1: Pilot - 101												
ENABLE RE-MAPPING												
D	ELIVERABLE QC FRAI	ME SIZE:										
DELIVER	ABLE EXTRACTION M											
ORIGIN	IAL DETECTION FRAI	WIDTH										
ORIGINAL DETECTION FRAME SIZE: 1920 1080 ✓ LOCATE EVENTS USING SHOT DETECTION												
#	Start	End		x			<b>A</b>					
1	00:00:00:15	00:00:00	D:15	272	1	469						
2	00:00:01:07	00:00:01	1:07	272	1	468						
3	00:00:02:23	00:00:02	2:23	304	1	224						
4	00:00:04:17	00:00:04	4:17	272	1	468						
5	00:00:04:17	00:00:04	4:17	272	1	469						
6	00:00:07:02	00:00:07	7:02	272	1	469						
7	00:00:07:02	00:00:07	7:02	272	1	469						
8	00:00:09:12	00:00:09	9:12	304	1	224						
9	00:00:13:22	00:00:13	3:22	523	7	72						
10	00:00:13:22	00:00:13	3:22	523	7	72	V					
				Start		Ca	ncel					

Click the Import button or right-click in the Dead Pixel List and choose "(Import) Dead Pixel CSV" from the context menu. The Import Dead Pixel CSV dialogue window opens. Navigate to and select the provided .csv file.

Once the .csv file is opened, Cortex will load a list of dead pixels with the Start and End timecodes as well as x/y coordinates.

If the list was generated using the properly formatted 3rd party .csv, the start and end timecodes will be identical. If the list was generated by Cortex and breaks were located on the timeline, the timecodes will be from the start of a shot to its end.

If no breaks are present on the composition timeline, enable the "LOCATE EVENTS USING SHOT DETECTION" check box.

If no remapping of the x/y coordinates are required, click "Start" to initiate the import process. If the edit breaks were already present, the import will be almost instantaneous. If Shot Detection is required, more time is needed.

Once complete, the timeline will populate yellow lines above the segments where pixels have been imported. If shot detection was used, the edit breaks will also appear.

0:22:07 (	00:00:2 <mark>3</mark> :22	00:00:25:12	00:00:27:02	00:00:28	:17  00	:00:30:0	7 00:00:31:21
TOTAL: 2	RED: 0	GREEN: 0	BLUE: 0	WHIT	E: 2 E	BELOW T	HRESHOLD: 0
#	Channel	Severity 🔻	Persistence	Size	X I	Y	Status
1	White	100.0	100.0	1	1469	272	Imported
2	White	100.0	100.0	1	1468	272	Imported

Above each segment is either a green or yellow line. The yellow lines indicate shots that have imported pixels versus green lines that indicate pixels detected by Cortex.

#### **Filtering Events with Imported Pixels**

Imported Pixels are automatically assigned Accepted status. To render only the shots that contain the newly imported pixels, while focused on the composition, enable the Filter Events checkbox and click the DP button. This will present the events that only contain Accepted dead pixels.



## Remapping X/Y Coordinates

🏮 Impo	ort Dead Pixel CSV			_	-			×				
CSV FILE	C:\Users\larry.ch	ernoff\De	sktop\Pi	xel_Erroi	rs_							
EPISODE 80213572 Demo: Season 1: Pilot - 101												
✓ ENABLE RE-MAPPING												
WIDTH HEIGHT												
Di	LIVERABLE QC FRAM	E (175)	3840			60						
		- 3126	5040		-	00						
DELIVERABLE EXTRACTION METHOD: Letterbox/Pillarbox Y												
	AL DETECTION FRAM	e size:	4096		21	60						
✓ LOC	ATE EVENTS USING	SHOT DET	ECTION									
	Start	End		Х				4				
	00:00:00:15	00:00:00	):15	272		1469						
	00:00:01:07	00:00:0	1:07	272		1468						
	00:00:02:23	00:00:02	2:23	304		1224						
4	00:00:04:17	00:00:04	4:17	272		1468						
	00:00:04:17	00:00:04	4:17	272		1469						
6	00:00:07:02	00:00:01	7:02	272		1469						
	00:00:07:02	00:00:07	7:02	272		1469						
8	00:00:09:12	00:00:09	9:12	304		1224						
9	00:00:13:22	00:00:13	3:22	523		772						
10	00:00:13:22	00:00:13	3:22	523		772		T				
				Start		С	ance	I				

If the frame size of the media used to generate the x/y coordinates of the imported list differs from the frames size of the media in the composition used for the original detection then the imported x/y coordinates will need to be remapped. For example, a Master DPX frame size of 4096x2160 was used in a composition to generate a 3840x2160 IMF that was QC'ed by a third party. The QC generates a list of x/y coordinates that require correction but, of course, the original Master DPX files require new coordinates that map properly to their frame size.

#### Steps to Remapping x/y Coordinates

- 1. Enable the RE-MAPPING checkbox
- 2. Enter the frame size of the media used by the QC house
- 3. Enter the type of extraction method used to create the QC media
- 4. Enter the frame size of the media in the original composition

The coordinates will be remapped upon import.

#### **Manually Creating a New Pixel**

At times it might be necessary to create a dead pixel that Cortex does not detect but is reported by QC. To create a new Pixel record, click the New button.

J R	<b>√</b> - <b>R</b>	🏮 Create Dead Pix	el				×
✓ G	✓ -G	x 212	ү <b>794</b>	colo Re	OR CHANNEL	SIZE	
✓ B	✓ -B		154		u V	<u> </u>	
√ W	✓ -W	✓ ENABLE RE-M	APPING				
Check All	Uncheck All	DELIVERABLE	QC FRAME SIZE:	WIDTH 3840	HEIGHT 2160		
N	lew 🔶	DELIVERABLE EXTRA	CTION METHOD:	Letterbox	/Pillarbox	<b>~</b>	
		ORIGINAL DETECTI	ON FRAME SIZE:	width 4096	HEIGHT		
					ОК	Cancel	

A dialog box will open. Enter the x/y coordinates, a color channel (which can be any color in this case) and a size, which can be left at 1 if unknown. The created pixel will automatically be given Accepted status.

If remapping is required, enable the checkbox and input the corresponding metadata as explained above.

## **Rendering Corrected Dead Pixels**

Depending on the workflow requirements, the user can now choose to render a file of the entire composition or only the shots needing correction.

#### **Rendering the Whole Composition**

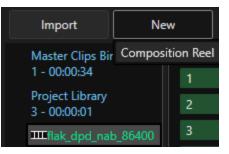
To render the entire composition, right-click on the composition name in the Sidebar and choose "Render". (Learn more here <u>Rendering a Composition</u>)

#### **Rendering Filtered Events**

By filtering, as described on the previous page, Cortex provides the ability to render only the shots that contain Accepted Dead Pixels. This can be especially useful with image sequences (i.e. dpx, tiff, exr) where the objective is to replace the frames that have been corrected.

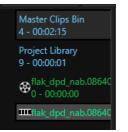
#### Create a Composition Reel

A Composition Reel is used to render specific segments of a composition versus the entire composition. Click the "New" button and choose "Composition Reel".



(Learn more here <u>Creating a Clips or Composition Reel</u>)

This prompts the Create Reel dialog box to open where the reel is named and other metadata is added. Choose "Source" in the Timecode field to preserve the original timecode of the source media and click create.



The reel is placed above the corresponding composition.

With the filtered events showing, select the shots in the list to be rendered. Right click and choose "Add Selected to Comp Reel". Rendering begins immediately as clips are added.

Import	New					✓ Filter Events	G FX	? 📭
Master Clips Bin		I	Track	Dead Pixel Tapename	Picture	Source In	Source Out	Rec
1 - 00:00:34			V1	A001	Cortex dead nixel_demo_matted.08	01:00:00:00	01:00:02:07	00:00
Project Library 3 - 00:00:01	2		V1	Add Selected to Comp Reel	ixel_demo_matted.08	01:00:02:07	01:00:03:23	00:0
nab_86400	3		V1	Add Marked Events Range to	Comp Reel Contex_ucuu_pixel_demo_matted.08	01:00:03:23	01:00:05:20	00:0
€ flak_dpd_nab_86400 0 - 00:00:00	4		V1	A001	Cortex_dead_pixel_demo_matted.08	01:00:05:20	01:00:08:08	00:0
IIIIflak_dpd_nab_86400	5		V1	A001	Cortex_dead_pixel_demo_matted.08	01:00:08:08	01:00:13:05	00:0
	6		V1	A001	Cortex_dead_pixel_demo_matted.08	01:00:13:05	01:00:16:13	00:0
	7		V1	A003	Cortex_dead_pixel_demo_matted.08	01:00:16:13	01:00:20:07	00:0

Like Clip Reels, close the reel to complete the render.

For immediate access to the rendered file, switch to the Render Monitor Tool and, in the Completed column, right-click on the completed render task and select "Open Containing Folder."

# **Dead Pixel Module Function Keys**

Left Mouse Button	Select dead pixel.
Right Mouse Button	Select dead pixel and edit/delete.
Ctrl+Shift+Left Mouse Button	Add new dead pixel at mouse cursor position.
G	Accept selected pixel(s) and ripple to all matching X/Y locations.
Shift + G	Accept visible pixel(s) in the Player for the current event only.
Ctrl + Shift + G	Accept selected pixel(s) for the current event only.
А	Reject selected pixel(s) and ripple to all matching X/Y locations.
Shift + A	Reject visible pixel(s) in the Player for the current event only.
Ctrl + Shift + A	Reject selected pixel(s) for the current event only.
0	Reset selected pixel(s) and ripple to all matching X/Y locations.
Shift + 0	Reset visible pixel(s) in the Player for the current event only.
Ctrl + Shift + 0	Reset selected pixel(s) for the current event only.
Ctrl + A	Select all events in composition.
Alt + A	Select all dead pixels in list.
Ctrl + C	Copy selected dead pixel(s).
Ctrl + V	Paste copied dead pixel(s).
Ctrl + Shift + V	Select and copy all pixels in list and paste to matching events.
1	Toggle Candidates filter
2	Toggle Accepted filter
3	Toggle Rejected filter
4	Toggle Pasted filter
5	Toggle Imported filter
6	Toggle +Red dead pixel candidates filter
7	Toggle +Green dead pixel candidates filter
8	Toggle +Blue dead pixel candidates filter

9	Toggle +White dead pixel candidates filter
Shift + 6	Toggle -Red dead pixel candidates filter
Shift + 7	Toggle -Green dead pixel candidates filter
Shift + 8	Toggle -Blue dead pixel candidates filter
Shift + 9	Toggle -White dead pixel candidates filter
Tab	Tab to Confidence and Severity value fields
Enter	Return value

# The Graphs Module

In the QA tab, Cortex provides image and audio data analysis tools with graphical reports of the results. These reports can then be distributed through PDF. You can choose to analyze media based on the following:

- Video Levels (HDR and SDR)
- Bit Rate
- Loudness
- Dead Pixels

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nu demo > t	Episode 101 >	Dolby_Vision > 20200407 ×										Hardware		Licensing		Tutorials	Help	About
Import New				Filter Ev	ents G FX		h.264	imf_netflix	prores									
	# Track	k Dead Pixel Tapename	Picture	Source In	Source Out	Recc 4	Preview											
- 00:09:11	V1	teal_1920	tea_with_alice.000000.dpx	00:00:00:00	00:04:35:11	00:00												
roject Library 2			teal_41.cml	00:00:00:00	00:00:01:21	00:00										ANALYSIS		
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			teal_41.cml	00:00:13:07	00:00:17:12	00:00											ROM SOURCE	
			teal_41.xml	00:00:17:12	00:00:23:09	00:00									START			
			teal_41.xml	00:00:23:09	00:00:28:14	00:00									00:00:0	0:00 Sta		
			teal_41.aml	00:00:28:14	00:00:32:09	00:00									END 00:04:3	5:11 En		
9			teal_41.cml teal_41.cml	00:00:32:09	00:00:35:11	00:00									SOURCE COLO		TARGET COLC	
10			teal_41.xml	00:00:33:11	00:00:40:17	00:00									P3-D65		Rec.709	
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13			teal 41.cml	00:00:49:23	00:00:52:17	00:00									ENHABLE N	EGION OF INTI	INEST	
14	4 M		teal 41.xml	00:00:52:17	00:01:05:07	00:00												INALYZE
15			teal_41.xml	00:01:05:07	00:01:14:21	00:01												
16			teal_41.xml	00:01:14:21	00:01:16:09	00:01												
			teal_41.xml	00:01:16:09	00:01:18:16	00:01		] [ Д	I		<b> </b>	00:00:00	00 0 EPS					
18			teal_41.aml	00:01:18:16	00:01:24:14	00:01			1 7 7 1									
						•				I 🔳 🕨								
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EAD PIXEL VIDEO LE			DEAD PIXELS Deliverable: pro		i I I I I I		00:01:57:17 00:	02:10:19 00:02:23:21	i					00:03:55:11 0	0:04:08:13 00	0.04:21:15 00		
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VI         VIDEO LE           SRAPHS         VIDEO LE           SCOPES         1000 -           SCOPES         1000 -           VALIDATION         0           VALIDATION         0           1/2         tes_with_akce.0000000	EVELS B		DEAD PUZES Deriverable pro	ores - Color Spaces	- SourceP3-D65 Ti	larget#3-D65			i						0.04.0813   00	Í		port Repor
V1         VIDEO LE           GRAPHS         VIDEO LE           SCOPES         1000           FORMANCE         1000           VALIDATION         1000           VALIDATION         1000           VALIDATION         1000	EVELS B			ores - Color Spaces	I - SourceP3-D65 Ti	TargetP3-D65			code values	▼ 19, 27 ▼	19, 27 19,				0.04.08:13   00	Í		port Report

## **Video Analysis**

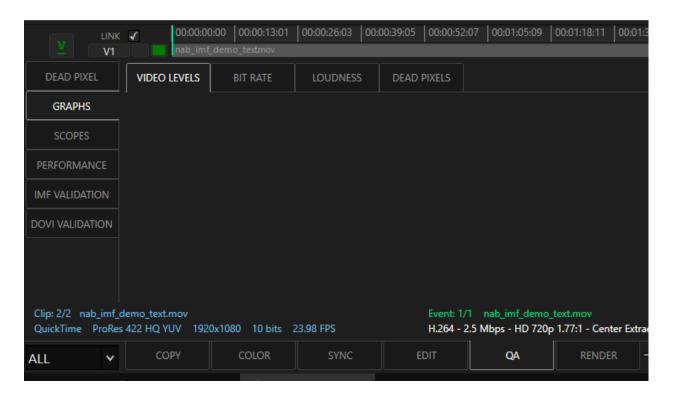
Cortex allows the user to analyze video from a composition for both SDR and HDR material. The analysis can be done straight from the source material or filtered through a color pipeline configured in a deliverable. Once analysis is complete a graphical report will be generated and displayed below the timeline where the user can choose to see:

- Video Levels
  - Code Values
  - IRE Values
  - Nits Max FLL/CLL(HDR only)
  - Nits Min/Max(HDR only)
- Bit Rate read in mbps

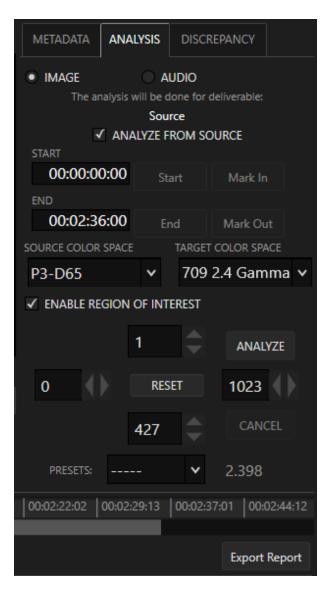
## **SDR Analysis**

To begin an analysis, a composition must be created in the Edit Tool. For a comprehensive explanation of how to create a composition in the Edit Tool, refer to <u>Creating a Composition</u>.

With media in place on the timeline, you are now ready for image analysis. Switch to the QA Tool and select the GRAPHS module.



Click the ANALYSIS Tab in the upper right corner of the GUI to see all the analysis options.



Enable the IMAGE radio button.

To analyze the media without any influence by deliverable configurations or color pipelines, enable ANALYZE FROM SOURCE. This ensures that LUTs or Creative Color Corrections permitted by a deliverable will be ignored.

If it is required to use a color pipeline permitted by a deliverable, leave ANALYZE FROM SOURCE disabled and select the deliverable required for the analysis. For example, if the source material has a signal in full range blacks, but an analysis with legal range blacks is wanted, select a configuration with a FULL\_to\_LEGAL lut.

The analysis will default with the in and out timecodes of the entire sequence. If only a section of the video requires analysis, mark the in and/or out range on the timeline and click the Mark In and/or Mark Out buttons to exclude the balance of the composition from the analysis.

Select the SOURCE COLOR SPACE and the TARGET COLOR SPACE. The SOURCE COLOR SPACE should always match the color space in which the material was mastered in. However, the TARGET COLOR SPACE may vary, depending on the target display for which the analysis is intended.

If the TARGET COLOR SPACE differs from the SOURCE COLOR SPACE, Cortex will provide the timecodes where the video falls outside of the gamut of the TARGET COLOR SPACE.

If the video has a matte that needs to be excluded from the analysis, click ENABLE REGION OF INTEREST. Then select from several aspect ratio presets or use the arrows to create a custom ROI. Red lines will appear on the Video Player to represent the portion of video that will be excluded.



Example of an ROI set to 2.35

Once finished filling in the parameters, click ANALYZE to initiate processing. The progres of the analysis is reported in the bottom right corner of the GUI.

tea\_with\_alice.000000 - Analyzing - 12% (819/6611)

When the analysis is complete, a graph will appear underneath the timeline.



For SDR analysis, choose to view in either IRE or CODE VALUES. As the playhead moves along the timeline min/max values for the Red, Green Blue channels as well as luminance will present themselves for the frame you're parked on.

e:Rec.709 2.4 Gamma Target:Rec.709 2.4 Ga	HDR: SCALE:	CODE VALUES	✓ 40, 1023	<b>40, 94</b> 7 33, 891	40, 941
	and the state				Additional to the second of

Above the graphs, the deliverable that was selected while running the analysis is displayed. If ANALYZE FROM SOURCE was enabled this will say NONE. The SOURCE COLOR SPACE and TARGET COLOR SPACE are also shown.

Deliverable: None - Color Spaces - Source:Rec.709 2.4 Gamma Target:Rec.709 2.4 Ga	HDR:	SCALE:	CODE VALUES	~
			IRE	
the second se		Version	CODE VALUES	
MAN CANAL PROPERTY AND A CANAL		W		

Cortex also offers a graph of the Bit Rate of your file. Select the BIT RATE tab next to the VIDEO LEVELS tab to display this graph.

DEAD PIXEL	VIDEO	LEVELS	BIT RATE	LOUDNESS	DEAD PIXELS	Cur: 133.46 Mbps	Min: 9.08 Mbps	Avg: 134.23 Mbps	Max 188.96 Mbps
GRAPHS	200 -								
SCOPES	150				N. W. <sup>D.</sup>			[]	
PERFORMANCE	150 - (sdq)		~1/	1	1111 yayı		have been all and the second second	my ph where	
IMF VALIDATION	BIT RATE (Mbps) 01 -				/	have a second		V	
DOVI VALIDATION	BIT 8 50 -				ľ				·v
	- 50 -								
	0 -								

Along with the graphical representation of the bit rate variances, Cortex provides numerical readouts of the Current, Minimum, Maximum and Average bit rate. These readouts are found directly above the graph in the Bit Rate tab.

BIT RATE	LOUDNESS	DEAD PIXELS	Cur: 133.46 Mbps	Min: 9.08 Mbps	Avg: 134.23 Mbps	Max 188.96 Mbps
	-	rm.a.)				

For a list of discrepancies found during the ANALYSIS return to the upper right corner of the GUI. Select the DISCREPANCY tab to display a list of timecodes where the signal is out of the range.

METADATA	ANALYSIS	DISCREPANO	CY
Video Leve	ls: Legal: (	54 - 940	<b>~</b>
00:00:00:00 Ex	00:00:52:00 ample Under		<b>A</b>
00:00:00:00	00:00:03:02	Out of Gamut	:
00:00:01:22 E	00:00:09:20 xample Over:	_	
00:00:03:16	00:00:03:17	Out of Gamut	:

In the Video Levels dropdown field, choose the target range of the analysis. Choices include FULL: 0-1023 or LEGAL: 64-940

The list of timecodes shows where the signal goes over or under the Video Level or Out of Gamut.

Double Click on an event in the list and the Playhead goes to the timecode on the Composition.

## **HDR Analysis**

Running an analysis on HDR material is similar to the SDR process, however, there are few more options available that are pertinent to an HDR signal.

METADATA	ANALYSIS	DISCREPANCY	
	• HDF	ł	
DISPLAY PRIMA	RIES (X, Y)	WHITE POINT (X	( Y)
P3	~	D65	~
MASTERING DI		NCE (nits) 1000	
	MAX FALL	MAX CLL	
CALC. NOW	0.000	0.000	
	Read Source	Save	

When creating a composition, be sure to select the HDR mode in the METADATA tab for the mastering parameters:

- Display Primaries
- White Point
- Min/Max Mastering Display Luminance

If the media is Dolby Vision, its metadata xml file will automatically populate these fields.

If desired, Cortex can also calculate the MaxFall and MaxCLL separate from the overall analysis.

METADATA	ANAL	YSIS	DISC	REPANCY			
IMAGE The ar	E AUDIO The analysis will be done for deliverable:						
		Sou	rce				
•	ANAI	LYZE F	ROM SC	OURCE			
START							
00:00:00	0:00	St	art	Mark In			
END							
00:02:30	5:00	Er	nd	Mark Out			
SOURCE COLOR	SPACE		TARGET	COLOR SPACE			
P3-D65		*	P3-[	D65	¥		

Like SDR video, choose the SOURCE COLOR SPACE and TARGET COLOR SPACE. Enable an ROI if needed and mark the range on the timeline intended for analysis.

Graphs will appear below the timeline once the analysis is finished. When HDR mode is enabled, Cortex expands the scale options to include NITs: FALL/CLL and NITs: MIN/MAX

HDR: 🖌 SCALE:	CODE VALUES	*	0,	0	0,	0	0,	0	0,	0
	IRE									
	CODE VALUES									
	NITS: FALL/CLL									
	NITS: MIN/MAX		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		<b>~</b>				<u>~</u> ~	<b>N</b> W

Select NITs: FALL/CLL to display the graph and values for these scales.



FALL: 60.99 MAX(248.82) CLL: 1670.68 MAX(2312.46)

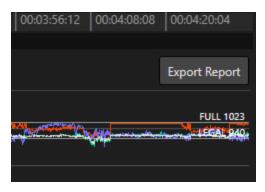
The FALL values represent the average light level of a single frame. The CLL values represent the maximum light values of a single pixel.

Both FALL and CLL have two numerical readouts. The numbers on the left represent values of the current frame. The parenthetical numbers on the right represent the maximum values of the composition. Accordingly, when you scrub through the composition, the numbers on the left will change while the numbers on the right will remain the same. You can, however, reduce the numbers on the right by lowering the threshold. This will tell Cortex to ignore the percentage light level above that threshold.

Select NITs Min/Max to display the graph and values for these scales.



The values here represent the minimum and maximum nit levels for each color channel and overall luminance of a particular frame. As you scrub through the timeline, these values will change respectively.



The user can now export PDF reports of the different graphs included in a Cortex Image Analysis. To do this, click the EXPORT REPORTS button found above the graph on the right side of the GUI.

This will prompt a dialogue box for the selection of graphs to include and thresholds to be set for the PDF report.

Click the ellipsis button next to "Path" to navigate to	
where the PDF should be saved.	

Enable the checkboxes of the graphs to include in the PDF.

Choose the range. FULL: 0-1023 or Legal: 64-940. Set the NITS LEVEL. For SDR, NITS LEVEL can be ignored as it is irrelevant to an SDR signal.

If desired, enable the Max FALL/CLL Threshold and set it using the spinbox.

Click "OK" to generate and save the PDF.

The report will include a discrepancy list for excursions above or below these thresholds.

🏮 Export	t QA Report							×	
Path	C:\temp								
Name	ctap_FTR_S	5-239_	EN_X	X_US	-G_51_	2K_SOI			
		Check	AII	Unchec	k All				
	<ul> <li>✓ Dead Pixels</li> <li>✓ 10 Bit Code Values</li> <li>✓ IRE</li> <li>✓ Bit Rate</li> <li>✓ NITS: Min/Max</li> <li>✓ NITS: FALL/CLL Audio Loudness</li> </ul>								
Code V	/alues/IRE Video	Levels:	Full:	0 - 10	)23	~			
NITS Le	evel:		Nits:	1000		*			
🗸 Inc	lude Max FALL/(	CLL Thre	shold	Label					
Max FA	LL/CLL Thresho	ld:			100 9	6 🗘			
Loudne	ess Threshold:					+/-:			
True Pe	ak Threshold:		-2 dE	BTP 🗘					
		Ok	۲	Can	icel				

## **Audio Analysis**

Cortex offers audio data analysis based on the two Loudness standards for broadcast television; EBU(European Broadcast Union) and ITU(International Telecommunications Union) Like Image analysis, this can be accomplished from any type of composition.

To start an Audio analysis, click on the QA tab and choose the GRAPHS module. Return to the upper right section of the GUI and select the ANALYSIS tab.

METADATA	ANALYSIS	DISCR	EPANCY
IMAGE The ar	• A nalysis will be d	<b>UDIO</b> lone for d	eliverable:
START	pro	res	
00:00:00	<b>0:00</b> St	art	Mark In
END			
00:02:3	9:00 Er	nd	Mark Out
MODE			
EBU			
AUDIO CHANN	ELS		
✓ A1 LF			Analyze
√ A2 LF √ A3 LF			
✓ A4 ✓ LF			
✓ A5 LF			
✓ A6 LF IMF CONFIG: 5.		h	

Click "AUDIO" to reveal the audio options in the ANALYSIS tool.

In most compositions, the Audio analysis will be done based on the deliverable configuration selected before the analysis. The audio configuration inside the deliverable will instruct Cortex as to how the channels are mapped.

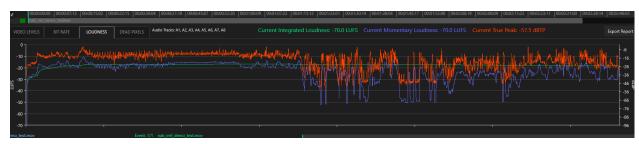
In an IMF composition, select from one of the saved Audio Configurations or the Scratchpad.

In the MODE drop down menu, choose which Broadcast Standard Cortex should use to analyze.

Click "LFE" next to the channel number where the LFE (Low Frequency Effects) has been placed. Cortex will ignore this channel in the analysis.

Click "Analyze." Follow the progress in the bottom right corner of the GUI.

Once Complete, the graph will appear below the timeline.



Cortex provides numerical readouts for the channels selected for analysis. The readouts are given in LUFS or LKFS, depending on the Broadcast standard chosen, and Decibels for the True Peak. Scrubbing through the timeline will change these values respectively. The three standards reported are the following:



- 1. Current Integrated Loudness(LUFS or LKFS)
- 2. Current Momentary Loudness(LUFS or LKFS)
- 3. Current True Peak(dBTP)

To reveal loudness excursions, select the DISCREPANCY tab next to the ANALYSIS tab.

METADATA	ANALYSIS	DISCREPANCY	
Loudness 1	hreshold:		
-	23 LKFS 🇘	+/-: 2 🗘	
True Peak 1	Threshold:	-2 dBTP 🌻	
00:00:03:04 Example:	00:00:23:04 00:00:15:09	Over Threshold CML: -10.9 LKFS	
00:00:05:07 Example:	00:02:39:00 00:00:57:05	Over Threshold CIL: -16.8 LKFS	
00:00:23:11 Example:	00:00:23:21 00:00:23:13	Over Threshold CML: -18.8 LKFS	
00:00:24:04 Example:	00:00:24:18 00:00:24:09	Over Threshold CML: -19.1 LKFS	
00:00:24:21 Example:	00:00:26:18 00:00:25:04	Over Threshold CML: -17.3 LKFS	
00:00:26:21 Example:	00:00:30:08 00:00:29:18	Over Threshold CML: -16.4 LKFS	
00:00:30:11 Example:	00:01:00:08 00:00:55:08	Over Threshold CML: -14.8 LKFS	
00:01:00:10 Example:	00:01:12:07 00:01:04:12	Over Threshold CML: -14.2 LKFS	
00:01:12:10	00:01:13:19	Over Threshold	

Set the loudness and true peak thresholds. These values will vary depending on the broadcast company or streaming platform and will be provided by them.

The Loudness Threshold comes with a target value and +/range of what is acceptable from that target.

The True Peak Threshold is a single value and any excursion beyond it will be reported as a discrepancy.

Double click on an event in the list and the playhead goes to the timecode on the composition.

Click "Export Report" to generate a PDF of this graph.

🏮 Export	t QA Report					×
Path						
Name	Comp01					
		Check /	All	Uncheck All		
		IRI Bit NI NI				
Code V	alues/IRE Vide	o Levels:				
NITS Le	vel:					
Max FA	LL/CLL Thresh	old:		10	0 % 🗘	
Loudne	ss Threshold:			-23 LKFS	5 🗘 +/-:	2 🗘
True Pe	ak Threshold:		-2 d	BTP 🗘		
		ОК		Cancel		

Select a path to place the PDF on the Cortex system.

Enable "Audio Loudness" to allow the audio options for the paperwork. This will activate the loudness and true peak thresholds.

For these fields, fill in the standards provided by the broadcast company.

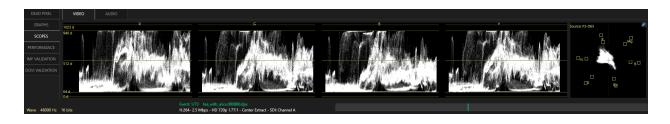
Click "OK" to save the document to the determined path.

# **Scopes Module**

As part of its QA toolset, Cortex provides several types of video and audio scopes. The video scopes read HDR and SDR signals as well as the full range of gamut options, including ACES support. The audio scopes include a VU Meter as well as a loudness scope.

## **Video Scopes**

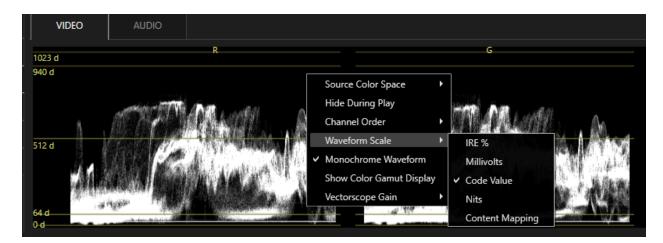
Select the Video tab in the SCOPES module to reveal the Video Scopes.



The waveform scale reads the signal in RGB as well as luminance represented by Y. The Scope on the right can be viewed as either a vector scope or gamut display.

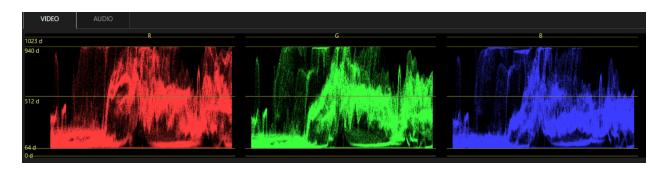
## Waveform Scope

Right click on the waveform and choose Waveform Scale to reveal the reticle options for the scope. Choose from the following options:



- 1. IRE %
- 2. Millivolts
- 3. Code Values (reticles include Full and SMTPE range)
- 4. Nits(For HDR signals only)

Uncheck the Monochrome Waveform to view the Channels in their respective colors



Vector and Gamut Display Scopes

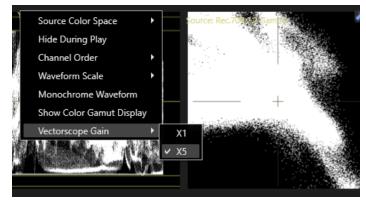
versa.

To switch from the Gamut Display to the Vectoscope, right-click and select Show Vectorscope

Source Color Space	Y Source: P3-D65	2
Target Color Space	Source Color Space   rec601	
Hide During Play	Hide During Play rec709	
Channel Order	Channel Order   P3D55	
Waveform Scale	Waveform Scale P3D60	
Monochrome Waveform	Monochrome Waveform v P3D65	□в□
Show Vectorscope	Show Color Gamut Display P3DCI	
Highlight Gamut Errors	Vectorscope Gain	
When the Gamut Display is	ACES	
on, the option will change to Show Vectorscope and vice		

With the vectorscope now active, choose the Source Color Space. The signal will move along with the reticles to reflect the color space.

To magnify the vectorscope right-click and select Vector Gain and choose x5.

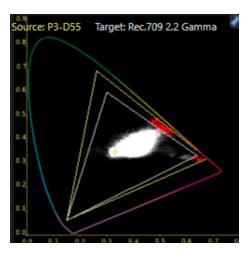


To show the Gamut Display. right-click and select Show Gamut Display. When the Gamut Display is active, options for Target Color Space and Highlight Gamut Errors are added.



Adding the Target Color Space allows the Gamut Display to expose where the signal falls out of the gamut for the different display primaires.

The Source Color Space will always match the color space in which the media was mastered in.



The Target Color Space will vary depending on the display the media will be viewed on.

When the signal falls out of the gamut of the Target Color Space, the excursions will be highlighted in red on the Gamut Display Scope. Right click and select "Highlight Gamut Errors" to display the excursions as a Zebra pattern in the Media Player.



## **Audio Scopes**

Select the Audio Tab in the SCOPES module to display the Audio Scopes.

DEAD PIXEL		AUDIO	ScratchPad	Lt-Rt: English 2 ch		
GRAPHS	0 <b>–</b> -3 <b>–</b> -6 <b>–</b> -9 <b>–</b>	Ξ	LOUDNESS		VU	-5
SCOPES	-18-	_				-15 -20
PERFORMANCE	-23 <b></b> -27 <b></b>	Ξ	Momentary: -37.6 LUFS Short Term: -36.6 LUFS			-25 -30 -35
IMF VALIDATION	-36-		Integrated: -39.4 LUFS			-40 -45
DOVI VALIDATION	-45-	-	Max Momentary: -30.8 LUFS Max Short Term: -36.6 LUFS			-50 -55 -60
	-54 <b>-</b>	-	Max True Peak: -19.9 dB			
			MODE			A1 A2

On the left is the Loudness meter and the right a VU meter. The VU meter displays the number of channels included in the selected Deliverable.

In a composition, the ScratchPad and a drop down of all the saved audio configurations appear above the scopes. From there, select the audio configuration to meter.

## **Performance Module**

In the Performance Module, Cortex provides live readouts and meters of the system performance.

			00:00:00:00					0:01:05:09									00:03:03:0
<u>v</u>	M		tea with alic	e 00000 dov													
			itea_with_and	elooooolupx											_		
DEAD PIXE			Playback Speed	d: 23.98 FP		8 FPS mSec)								RENDERING	5 PERFORMANC		
GRAPHS					(41.7	moce)			sec): 0.86		dwidth (MBps):	212.52					
SCOPES												CPU		Reading I			
PERFORMAN	CE						Read		sec): 0.86					De		PS) :	
IMF VALIDATI									sec): 5.94								
															oding Speed (F		
DOVI VALIDAT	ION		Video Bitrate: 1708.6 Mbps Min: Mbps Max: Mbps											Writing Speed (FPS) :			
															g Bandwidth (F		
														which	g bandwidth (r		
Smpte Black																	
								Preview - Don't Resize - SDI: Channel B									

On the left is the playback speed. A healthy system will show green bars during playback. Red bars indicate a bottleneck in one of 4 areas:

- 1. Disk Reading Time
- 2. Decoding Time
- 3. Read and Decode time
- 4. CPU or GPU processing time

The numerical readouts to the right of the graph express the values in milliseconds. These graphs and readouts can assist in diagnosing system problems and hardware related issues.

On the right, Cortex displays RENDERING PERFORMANCE expressed in FPS(Frames per second) or MBps (Megabytes per second) in the following categories:

- 1. Reading Speed(FPS)
- 2. Reading Bandwidth (MBps)
- 3. Decode Speed(FPS)
- 4. Image Processing Speed(FPS)
- 5. Encoding speed(FPS)
- 6. Writing Speed(FPS)
- 7. Writing Bandwidth(FPS)

## **IMF Validation**

The IMF Validation module confirms that an IMF package conforms to the SMPTE standard. Using Photon, an open source validator from Netflix, the IMF Validator module confirms the presence of all required MXF, XML and CPL files, verifies elements based on hashes created during rendering, and allows the user to export a PDF report of the validation status and errors for the IMF package.

DEAD PIXEL	Validate Verify Hashes Export Report Photon Version: 4.7			
GRAPHS	File	Errors	Warnings	Status
SCOPES	PKL_7eec93f2-bc71-40f9-80d4-661651902068.xml	0	0	N/A
PERFORMANCE	larry_local_S1_episode_101_2020-04-11_IMF.tt.mxf	0	0	Hash and size match
	larry_local_S1_episode_101_2020-04-11_IMF_Lt-Rt_English.mxf	0	0	Hash and size match
	CPL_6c66bb18-fd86-49a0-a48d-db71b7e29175.xml	0	0	Hash and size match
DOVI VALIDATION	ASSETMAP.xml	0	0	N/A
	OPL_bde115bb-80ec-45de-b5b6-2629615036cf.xml	0	0	Hash and size match
	larry_local_S1_episode_101_2020-04-11_IMF.mxf	0	0	Hash and size match

#### **Steps to IMF Validation**

- 1. Select the IMF to be validated
- 2. Click the Validate button
- 3. Check the messages if any after processing
- 4. Click the Verify Hashes button
- 5. If desired, click the Export Report button

## Dolby Vision<sup>™</sup> Metadata Validation

The DOVI Validation module confirms the Dolby Vision<sup>™</sup> metadata provided in the XML by a color corrector. Using Metafier, a validator from Dolby Laboratories, the DoVi Validation verifies a list of specifications and reports on a Pass or Fail basis and alerts to warnings.

DOVI Validation can be performed on a composition prior to render or on imported delivery files such as an IMF package.

DEAD PIXEL	Validate Export Report				
GRAPHS	RevisionHistory Validation Test: PASS				
SCOPES	ColorEncoding Validation Test: PASS				
	WARNING: Level 1 is all 0s at frame 319				
PERFORMANCE	Overlapping Shots Validation Test: PASS				
IMF VALIDATION	Gap between Shots Validation Test: PASS				
	Negative Shot duration Validation Test: PASS				
DOVI VALIDATION	Per-Frame Data out-of-range Validation Test: PASS				
	Number of Shots: 72				
	Level 2 Trim Count (TargetID, Count): (1, 72)				
	Level 1 Metadata Validation Test: PASS	T			

#### **Steps to DOVI Validation**

- 1. Select the composition or file to Validate
- 2. Click the Validate button
- 3. Check the list for Pass or Fails
- 4. If Desired, click Export Report to generate a PDF of the Validation

In the example above, the Dolby Vision Metadata passes all requirements, however, reports a warning regarding "0" values in Level 1.

# Rendering and the Render Monitor Tool

Before beginning this tutorial, please review the following section: First a Few Definitions

### **Definitions Worth Repeating**

#### **Events, Segments, or Shots**

A Composition is a grouping of clips that have been organized into a timeline continuity. Clips contained in the timeline are interchangeably defined as Events, Segments, or Shots, which refer to either a whole or part of a clip. The Composition icon is placed before the composition name in the Sidebar.

#### **File per Clip**

Any Deliverable that has its "Packaging" property set to File per clip will begin rendering clips immediately upon being added to the reel. If the clip is modified while the reel is still "Open", the clip will be automatically re-rendered.

#### **File per Reel**

A few deliverable types require the whole reel rendered once it is "Closed" to ensure its complete continuity. This means that every clip intended to be in the reel has been added and that the reel is closed by the user.

#### **Clips Reel**

A Clips Reel is a collection of one or more clips intended to be transcoded to one or more Deliverables. Clips added to the reel can be assigned a Print Status.

#### **Composition Reel**

The Composition Reel is a collection of one or more composition events. All events added to the reel will be rendered.

#### **Open Reel**

An Open Reel is one where clips are still being added to it or where clips contained in it require modification. In order for a clip in a reel to be modified, the reel must be open. If the reel is closed, the clip can be "Duplicated" for modification leaving the one contained in the reel as is. Reels can be reopened if there is a need to modify a clip. Once modified, the clip will be automatically re-rendered.

#### **Closed Reel**

A Closed Reel precludes any changes to be made to any clip contained in the reel. If the reel is closed and a clip that is contained in the reel is selected, all tool modules are disabled including Marks In/Out.

## Note: The difference between rendering a Composition Reel and a Composition is that a reel is created prior to rendering in order to include individual segments added by the user to render Deliverables that have predetermined audio configurations. Rendering the Composition, without a reel, renders it based upon the whole timeline with the option to choose from audio configurations created in the composition.

# **Render Methods**

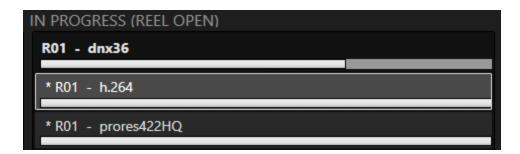
#### There are two methods of rendering files for Clips and Composition Reels and Compositions:

## **One to One Render**

One to One renders one source to one Deliverable at a time. In a multiple Cortex Enterprise workstation environment using a shared database, clips added to a reel will be distributed for rendering by Cortex to available workstations on the shared network.

## **One to Many Render**

One to Many renders one source to many Deliverables simultaneously on a single machine. When viewed in the Render Monitor Tool, each Deliverable of the Many group will have an asterisk in front of it. Clips Reels and Composition Reels are capable of One to Many Renders. For Compositions One to Many is possible but only the Deliverable Configurations can be used for audio processing; the Scratch-Track or any audio configuration created in the edit tool can not be used in a One to Many render.



There are some Deliverables that are incompatible with one to many. For example:

- 1. IMF
- 2. DCP
- 3. File Per Reel Deliverables if the deliverable is DNx op Atom.mxf The checkbox is automatically disabled

## **Creating a Clips Reel or Composition Reel**

Click the New button in the Color, Sync or Render Monitor Tools and select Clips or Composition Reel. The Edit Tool and QA Tool can only create Composition Reels.

Project Manag	er lar_demo > Episode 201 > dailies > 202003	28 🗙			
REEL NAMI	E For Clips			TIMECODE 🖌 Enforce consistency rules	
Reel_1	01			Source	~
TAPENAME	E IN ALE			FRAME RATE	
Source	File Name		×	Source	~
MAXIMUM	I LENGTH			SYNC DROP-FRAME	
01:00:0	0:00			01:00:00;00	
This reel wi DELIVERAB	ill enforce consistency of source clips format and fram HES	nerate			
	dailies ✓ dnx36 ▼ OUTPUT PATH	✓ ONE-T	O-N	ΜΑΝΥ	
	<ul> <li>✓ h.264</li> <li>✓ OUTPUT PATH</li> </ul>	✓ ONE-T	0-N	MANY	
E.	<ul> <li>✓ prores422HQ</li> <li>✓ OUTPUT PATH</li> </ul>	✓ ONE-T	0-N	MANY	
	dpd IMF_DoVi_Atmos IMF_SDR				
				✓ INCLUDE REPORTS Create Can	cel

#### Fill the fields as needed:

- Reel Name
  - Fill in the name of the reel.
  - $\circ$   $\;$  It must be unique and not a duplicate of a previously created reel.
- Enforce consistency rules
  - When enabled, this ensures that the reel will be consistent with the Project's frame rate. Cortex also ensures that the frame rate of clips added to the reel match the Project frame rate and warns that a mismatched clip cannot be added.
  - If left unchecked, Cortex allows for reels to be created that do not match the Project frame rate.
     Clips added to the reel are then rendered at the frame rate consistent with the reel's frame rate setting, which is set in the Frame Rate field dropdown menu.
- Timecode
  - $\circ$   $\;$  If "Source" is selected, the source timecode will be applied to the rendered file.
  - If "Continuous" is selected, additional fields are displayed as explained later.

#### • Tapename in ALE

- There are three choices
  - Source File Name defaults for Source timecode reels
  - Record Reel Name defaults for Continuous timecode reels
  - Source Tape Name used when a source file was derived from a videotape

#### • Frame Rate

- If the Enforce consistency rules checkbox is enabled and the Timecode field is set to "Source", the Frame Rate field is automatically set to the only choice, "Source".
- If the Enforce consistency rules checkbox is disabled, the Frame Rate field will be automatically set to the Project's frame rate, however, it can be changed to any choice allowed in the dropdown menu.

#### • Maximum Length

This is defaulted to 1 hour but can be modified. A 1 hour reel is recommended particularly for a
Deliverable that is profiled as File per Reel since all clips must be rendered at once in order to
assure the continuity of the reel. This also assures that the Deliverable can be copied or
uploaded in a timely manner so that any receiving party can begin viewing or processing as
needed.

#### • Sync Drop Frame

• This field sets the relationship between Non-Drop and Drop Frame synchronization of time. It is recommended that this field be left at 1:00:00;00 for Clips Reels.

Any warnings or instructions are placed above the Deliverables section of the Dialog Box.

#### **Continuous Timecode Reels**

REEL NAME For Clips	TIMECODE 🖌 Enforce consistency rules
Reel_101	Continuous 🗸
START	DROP-FRAME START
01:00:00:00	01:00:00;00
TAPENAME IN ALE	FRAME RATE
Record Reel Name	♥ 23.976 fps
MAXIMUM LENGTH	SYNC DROP-FRAME
01:00:00:00	01:00:00;00

The general purpose of a Continuous Timecode Reel is to create a mezzanine master file(s) for any file type that does not easily integrate into the post workflow. For example, videos created on phones, oddball cameras, or other such devices that have no timecode at all or where the format of the video needs to be harmonized to the file types of the project.

For this purpose, it is recommended that the mezzanine file be created and rendered first and then used as a source for other derivative files to be used in the post workflow.

If the "Enforce consistency rules" checkbox is enabled, the Frame Rate field will default to the Project's frame rate. When disabled, any frame rate in the field's dropdown menu can be chosen.

The "Start" field dictates the start timecode of the rendered file.

The Drop Frame Start sets the relationship between Non-Drop and Drop frame timecode start frames.

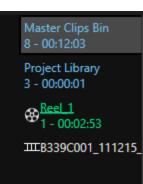
#### **Determining One to One and One to Many Renders**

DELIVER	ABLES				
<b>↓</b> √	dailies				
	✓ dnx36	✓ ONE-TO-MANY			
	<ul> <li>OUTPUT PATH</li> </ul>				
	✓ h.264				
	<ul> <li>OUTPUT PATH</li> </ul>				
	✓ prores422HQ	✓ ONE-TO-MANY			
	<ul> <li>OUTPUT PATH</li> </ul>				
• •	dpd				
	IMF_DoVi_Atmos				
Image:	IMF_SDR				
			✓ INCLUDE REPORTS	Create	Cancel

In the above example, the h.264 is excluded from the group since it was profiled as a File per Reel Deliverable. Enable the One-To-Many checkboxes as desired and decide whether you wish to "Include Reports". Press Create when ready.

Once a Reel is created, it will appear in the Sidebar with a Reel Icon.  ${}^{\textcircled{}}$ 

When the reel is active it is displayed green. For Deliverables that are profiled as File per Clip, add clips as they



are finalized by pressing the G key or clicking the Add to Clips Reel button located on the source Media Player. Rendering begins immediately.



Rendering Compositions are discussed later in Rendering a Composition

While rendering, the name and Deliverable tabs are underlined in Green.



Selecting a Deliverable tab displays the contents of the reel in the Master Clips Bin.

#### The Render Monitor Tool

Switch to the Render Monitor Tool to view the progress of the rendering. The Render Monitor Tool consists of 4 columns:

Disabled	If a deliverable is disabled, it is moved to this column					
In Progress (Reel Open)	When a reel is created, its Deliverables are first moved to this column					
In Progress (Reel Closed	After the reel is closed,	After the reel is closed, its Deliverables moves to this column				
Completed	After completion, the r	After completion, the reel is moved to the Completed column				
	PROGRESS (REEL OPEN) <b>Reel 1 - dru36</b> Reel 1 - n264 Reel 1 - prores422HQ	IN PROGRESS (REEL CLOSED)	COMPLETED Refer			
Step:         I = Encoding - One-Te-Mary - 83350011/1215/82HX - Gameti Speed 59 FPS - Average 54 FPS - Progress 19% (816/4134) - Expeed 0014 - Remaining 0121           NCCOMING SFEED						

An abbreviated render progress is also displayed in the lower right corner of every tool.

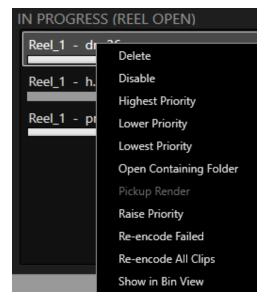
R01 - dnx36 - B339C001\_111215\_R2HX - clip 1 of 1 - 119 FPS - 71% (2934/4134)

#### **Closing a Reel**

When a reel is ready to be closed, right-click on the reel name in the Sidebar and choose "Close" from the context menu or click the "Close" button at the top of the UI above the Master Clips Bin. The reel and its Deliverables will move from the column, "In Progress (Reel Open)" to the column, "In Progress (Reel Closed)". When rendering is complete the reel will move the Completed column.

### Selecting Deliverables in the Render Monitor Tool

In any of the columns, right-click on a single or group selection of Deliverables to display a context menu.



A variety of options are available

- Delete. Three are three options
  - a. Delete the Deliverable(s) from the list but leave the directory folder(s)
  - b. Delete the Deliverable(s) from the list and its corresponding directory folder(s)
  - c. Cancel
- **Disable** disables the selected Deliverable(s) and places them in the Disabled column for later action

- Highest Priority
  - a. If One to One Raíses the selected Deliverable to the highest priority for rendering
  - b. If One to Many Raises all in the many-group regardless of which Deliverable is selected

#### • Lower Priority

- c. If One to One Lowers the selected Deliverable priority by one position for rendering
- d. If One to Many Lowers all in the many-group by one position regardless of which Deliverable is selected
- Open Containing Folder
  - a. Works the same for both One to One and One to Many rendering
  - b. If more than one Deliverable is selected, it opens all directories
- **Pickup Render** Works for any "file per frame" render (i.e. DPX) and is especially useful to insert a single shot into a previously rendered clip or composition. For example, if a single shot needs to be replaced in a composition, right-click on the Deliverable and choose Pickup Render:
  - a. A Render Composition dialog opens
  - b. If a Mark In and Mark Out exist click the Mark In and Mark Out buttons
  - c. The marks will appear in the Start and End timecode registers
  - d. Choose which video tracks from which to render in the Render Video Track dropdown menu
  - e. Enable or disable the Include Reports checkbox
  - f. Click Ok

The files are then rendered overwriting existing files.

- Raise Priority
  - a. If One to One Raises the selected Deliverable priority by one position for rendering
  - b. If One to Many Raises all in the many-group by one position regardless of which Deliverable is selected
- Re-Encode Failed
  - a. Re-encodes any failed clips for both One to One and One to Many Deliverables
- Re-Encode All Clips
  - a. Re-encodes all clips in selected Deliverable(s)
- Show in Bin View
  - a. For this option, only one Deliverable can be selected.
  - b. If more than one deliverable is selected, the option is disabled.

## **Rendering a Composition**

To Render a Composition right-click on the composition in the Sidebar and select Render.

#### The Render Composition Dialog Box

Render Composition				×
NAME				
B339C001_111215_R2HX-2020-05-12-21-06				Modify
DELIVERABLES				
a 🔳 dailies	Deliverable		MIX PASS THROUGH NO AUDIO     1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 1	10 10 20 21 22 23 24
avid_media	ScratchPad		-	10 19 20 21 22 25 24
✓ h.264				
✓ prores422HQ	COMBINE			
⊿ ■ dpd	✓ 5.1: English 6 ch Lt-Rt: English 2 ch			
	LL-KG English 2 Ch			
∠ ■ imf_hdr				
imf_hdr				
∡ ■ imf_sdr				
Same As Source				
Enable the COMBINE checkbox to combine the Co				
QUICKTIME AUDIO TRACK LABELS Override Layout				
Track 1 Unused	14:32:49:00			
Track 2 Unused Y	END 14:35:41:06	End Mark Out		
Track 3 Unused	14.55.41.00			
Track 4 Unused 🗸				
	01:00:00;00			
Track 5 Unused 🗸				
	23.976 fps			
	RENDER VIDEO TRACK			
	V1 Only	~		
	✓ INCLUDE REPORTS	PASSTHROUGH MODE		
		OVERRIDE OUTPUT PATH		
				OK Cancel

The Render Composition Dialog box consists of three basic sections: Deliverables, Audio Sources, and Audio Mixer.

Enable the Deliverables to be rendered. Each Deliverable can be rendered with one or more audio mixes found in the Audio Source section. To determine which audio mix(es) will be rendered with the Deliverable:

- 1. Click on the Deliverable
- 2. Enable the mix checkboxes to be included in the render
- 3. If there are more than one mix available, the Combine checkbox will be available.
  - To combine mixes to a single render, enable the desired Combine checkboxes.

If the Combine checkbox is left disabled, Cortex will render each mix separately to a new Deliverable file.

After choosing the Deliverable and Audio Mix(es), it is possible to modify each of the Audio Mixes using the mixer. The modification is temporary and only applies to the current render(s). Click the Modify button and adjust the mixer matrix as required.

Note: The ScratchPad audio cannot be combined with other mixes and is rendered separately.

In the following figure, the avid\_media Deliverable is selected and only the ScratchPad mix will be rendered.

NAME	
Comp01-2020-04-22-15-30	
DELIVERABLES	AUDIO SOURCE
✓ dailies	▲ ✓ ScratchPad
✓ avid_media	COMBINE
✓ h.264	5.1: English 5 ch
✓ prores422HQ	Lt-Rt: English 2 ch

In this figure, the h.264 Deliverable will be rendered twice separately, once with the ScratchPad and once with the 5.1 English mix.

NAME	
Comp01-2020-04-22-15-30	
DELIVERABLES	AUDIO SOURCE
A V dailles	▲ ✓ ScratchPad
✓ avid_media	COMBINE
✓ h.264	✓ 5.1: English 5 ch
✓ prores422HQ	Lt-Rt: English 2 ch

In this figure, the prores422HQ Deliverable will be rendered once combining the 5.1 and LtRt mixes.

NAME	
Comp01-2020-04-22-15-30	
DELIVERABLES	AUDIO SOURCE
✓ ✓ dailies	ScratchPad
✓ avid_media	COMBINE
✓ h.264	✓ ✓ 5.1: English 5 ch
✓ prores422HQ	✓ ✓ Lt-Rt: English 2 ch

By default, the Start and End timecodes of the composition are entered in the corresponding fields. If a Mark In and/or Mark Out are present on the composition, you can choose to use them as start or end times for the render by clicking their respective buttons. You can also manually enter In and Out points for rendering.

START			
01:00:00:00	Start	Mark In	
END			
01:00:33:14	End	Mark Out	
SYNC DROP FRAME AT			
01:00:00;00			
RENDER FRAME RATE			
23.976 fps			~
RENDER VIDEO TRACK			
Merge V1 V2			~
V1 Only			
V1 Only Ignore (	Saps		
V2 Only			
V2 Only Ignore (	Saps		
Merge V1 V2			

Enter the timecode for the "Sync Drop Frame At" field. Normally left at the 01:00:00;00 default. Choose the "Render Frame Rate", which defaults to the project frame rate.

If there is more than one video track in the composition, a number of options are presented in the "Render Video Track" field. Choose the one in the dropdown menu that best suits the required render.

If there are Gaps in the video track, Cortex can ignore those gaps and jump to the next filled video segment.

#### Quicktime Audio Track Labels

If required, use the dropdown menu to label the tracks contained in a rendered Quicktime file. Enable the Override Layout checkbox and choose from a comprehensive list of labels provided by Apple.





# **Cortex User Manual**

# Version 5.6

Dated April 1st, 2024

# Thank you for choosing to learn about Cortex.

For Additional information, requesting help and accessing our knowledge base, you can access MTI Film's Support resources by registering on our Forum at <u>forum.mtifilm.com</u>, which also includes the most up-to-date version of the software.

Check for the latest MTI Film CORTEX news and product info at: https://www.mtifilm.com