



LUMATIC LAB: ACV Converter – User Guide

Introduction

Lumatic Lab has released this update (e.o. April 26) to the ACV Converter, a browser-based tool designed to translate Adobe curve files (.ACV) into standard 3D LUTs (.CUBE) with consistent, hardware-independent results.

The application is aimed at photographers, editors and small creative teams who need a reliable way to move tonal adjustments between platforms without variation. By processing files entirely within the browser, the tool avoids reliance on GPU drivers or external services, helping ensure repeatable output across different systems.

The converter reads the binary structure of ACV files, reconstructs channel curves, and applies them to images using a controlled CPU-based pipeline. This approach prioritises accuracy and transparency over speed gains from hardware acceleration. The result is a direct conversion of curve data into LUTs that can be used across most modern editing and grading software.

Users can load an image, apply one or more ACV curves, make a simple exposure adjustment, and export a set of outputs in one step. These include a full-resolution image, resized previews, and a 33×33×33 LUT file suitable for production use. Batch processing of multiple curves is also supported.

The ACV Converter is available as a stand-alone HTML application and runs in any modern Chromium-based browser.

The tool follows a “zero-footprint” model: no installation, no logins, and no data leaving the user’s device. All processing takes place in local memory, which may appeal to organisations with privacy or security requirements.



I. Quick Start Guide

To achieve a "Lab Final" export in under 60 seconds, follow these steps:

1. **Open** the stand-alone HTML file in any modern Chromium-based browser (<https://photoedithelp.com/wp-content/uploads/2026/04/LUMATIC-LAB-ACV-CURVE-v25-9.html>)
2. **Load Source Image:** Drag a high-resolution image (JPG/PNG) anywhere into the central workspace or click "**Load Image**" in the left sidebar.
3. **Populate Curve Stack:** Drag one or multiple **.ACV** files into the sidebar or click "**Add .ACV Files.**" The names will appear in the **Curve Stack** list.
4. **Audition Curves:** Click any name in the Curve Stack to apply that curve to the image.
5. **Calibrate:** Use the **Exposure** slider in the right sidebar to fine-tune the intensity.
6. **Identity:** Enter a name in the "**NAME**" field (Asset Name).
7. **Export:** Click "**Execute Quad Export**" to download your laboratory bundle.

II. Interface Anatomy

1. The Header

The fixed 50px black band at the top contains the toolset:

- **B/W/G Swatches:** Toggle the viewport background between Black, White, and Middle Gray (#7F7F7F) to assess tonal impact against different value environments.
- **Hold: Original:** Press and hold this button to temporarily bypass all processing and view the original image.
- **Zebra:** Toggles a turquoise (#38BDF8) overlay on pixels where the Luma value falls below 1% (Black-point clipping).



2. The Sidebar (Loading)

- **Source Image:** Houses the manual load facility for devices where drag-and-drop is unavailable.
- **Curve Stack:** A scrollable list of all ingested .ACV files. Active selection is highlighted in **Fluorescent Turquoise**.
- **Bake Entire Stack:** Located at the bottom of the stack, this triggers a batch process to convert every loaded curve into an individual .CUBE LUT.

3. The Viewport (The Baseline)

The central workspace is locked to **Middle Gray (#7F7F7F)** to prevent optical color illusions. Images are rendered using the **v4.1.1 CPU Engine** for maximum stability.

4. Controls (Calibration & Export)

- **Exposure:** A linear multiplier applied at the end of the pipe. Unity Gain is set at 1.0.
- **NAME:** Defines the filename for all exported assets.
- **START AGAIN:** A global purge function that clears all buffers and resets the environment.

III. The Quad-Tier Export Protocol

The **Execute Quad Export** function generates four distinct files simultaneously:

1. **FULL:** The original resolution image with the curve and exposure applied (JPEG, 95% Quality).
2. **1200px:** A production preview resized on the long side (Social Media version).
3. **200px:** A thumbnail for archival.
4. **LUT:** A professional 33^3 **.CUBE** file. This file contains the mathematical blueprint of the curve + exposure, allowing the look to be applied in all applications that support LUTs.



IV. Tech Notes

1. Binary Forensic Parsing

Adobe .ACV files are not text-based; they are serialised binary data. The Lumatic parser performs a deep-level scan:

- **Version Check:**
- **Channel Mapping:** Identifies the number of curves present (typically Master, R, G, and B).
- **Coordinate Extraction:** Reads 16-bit integer pairs representing I/O coordinates.
- **Spline Interpolation:** ACV files only store a few control points, the tool uses a linear spline interpolation algorithm to calculate a continuous lookup table for each channel.

2. Memory Management: Immutable Buffering

To prevent "mathematical drift" or incremental data ghosting, the tool utilises an Immutable Pixel Buffer:

- Every time a slider moves or a curve is changed, the engine creates a *fresh* copy of the pristine data.
- Adjustments are never "stacked" on top of each other; they are always calculated from the raw source.

3. GPU Rendering Engine

The renderer eschews GPU acceleration (WebGL/Shaders) to ensure consistent results across all browsers and operating systems.

- **The Loop:** A standard for loop iterates through the Image Data buffer.
- **Luma Science:** All diagnostic tools (Zebra and Histogram) use Rec. 601 Luma.
- **3D LUT Serialisation:** To generate the .CUBE file, the tool samples 35,937 points in the RGB color space. Each point is passed through the active curve and exposure logic, then normalised.



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4. Operational Rigour

Following Standard v25.0, **this tool is a "Zero-Footprint" application. It requires no server-side processing and stores no user data. All processing occurs locally within the browser's RAM, ensuring total privacy and high-speed execution.**

V. Troubleshooting

- **Files Not Loading:** Ensure the image is loaded *before* the ACV files. The engine requires the dimensions of the image to initialise the processing buffers.
- **LUT Not Matching Viewport:** Ensure your "Asset" name is valid. If using the LUT in another app, ensure that application is also set to a Rec. 601 or Rec. 709.
- **Export Blocked:** Some browsers block multiple simultaneous downloads. If the Quad Export only triggers one file, look for a "Multiple Downloads" icon in your browser's address bar and select "Always Allow."

END OF GUIDE