**Customer Story: Cromorama**

**Cromorama Simplifies Color Management and Quality Control for Live Productions**

**with the ORION-CONVERT™ Pipeline and AJA ColorBox**

Well-executed productions come off seamlessly to audiences, regardless of the delivery format, but their underpinning is complex. Today, crews often work with a host of high dynamic range (HDR) and standard dynamic range (SDR) cameras and equipment, each with its own color science. Achieving a consistent look often requires crews to be able to color match production cameras and easily convert between SDR and HDR standards.

However, broadcasters can still encounter quality control (QC) issues, where the feed they output looks “off” and adjustments must be made. European HDR and color management consultancy firm and software developer [Cromorama](https://www.cromorama.io/) is streamlining this process with its [ORION-CONVERT™](https://www.orion-convert.com/) color pipeline, which is built into AJA’s [ColorBox](https://www.aja.com/products/colorbox) and [OG-ColorBox](https://www.aja.com/products/og-colorbox) color management and conversion solutions. Cromorama’s aim is to make color management more accessible for clients like the Union of European Football Associations (UEFA) while also supporting QC demands.

**ORION-CONVERT’s backstory**

Cromorama CEO and CTO Pablo Garcia developed ORION-CONVERT™ with a vision to give professionals more creative and technical control over color management capabilities. He didn’t want them to worry as much about the math, especially as lighting conditions change. To this end, his team designs all Cromorama software with the philosophy that clients should be able to easily adapt.

“We’re a company that’s all about improving color iteration, and the ORION-CONVERT™ algorithm originated out of a need we saw amongst clients,” Garcia explained. “Before Cromorama, there wasn’t an easy way to execute high quality conversions between HDR and SDR with the level of control we wanted. This gap in the toolset was especially noticeable when we were preparing for a major 2020 international sporting event on behalf of a client, so we envisioned a piece of code and started fine tuning it.”

That effort, said Garcia, led to the development of ORION-CONVERT™, an intuitive engine with a unique two-stage compression process for full color management from display to display, SDR to/from HLG and PQ. The Cromorama team regularly deploys the software to serve clients globally, as it provides film production, broadcast, and research and development (R&D) services; it’s also a core technology behind NBCU LUTs. They see ORION-CONVERT™, AJA ColorBox, and AJA OG-ColorBox breaking down color management barriers.

“The color management learning curve used to be steep, especially in broadcast, but we’ve reached an inflection point. ORION-CONVERT™ in AJA ColorBox and OG-ColorBox, a platform that’s well targeted to live production demands, provides more control over SDR and HDR transforms, so it’s easier to adapt to various scenarios in the field,” Garcia noted. “Both hardware solutions are also so valuable for QC purposes because I know I can trust them. If a broadcaster encounters an issue with their feed, I can run it through a ColorBox or OG-ColorBox and quickly uncover the issue with the original signal so they can fix it.”

**A closer look at the technology behind a major live sports championship production**

Since its founding over four years ago, Cromorama has worked closely with sports organizations, providing HDR and color management consultancy services. When its team began preparations in 2022 to support the UEFA Euro 2024 championship production, they benchmark tested a wide range of HDR production gear to achieve the desired visual outcome. Tests included solutions like AJA ColorBox and FS-HDR, as well as camera and graphics kit from other manufacturers. By the end of the process, UEFA had certified ColorBox as an approved production device.

Cromorama extensively leveraged the solution throughout the tournament venues for color conversion, QC, and testing needs. As QC Supervisor, Garcia oversaw two QC operators and the whole tournament production. He was quickly notified if any broadcasters encountered signal issues, such as picture quality or artifacts, and troubleshooted to identify the issue. This entailed passing their signal through a ColorBox on his desk, identifying the approved conversion path, analyzing whether there were artifacts, and finding the source of the problem in the chain.

“I know that with ColorBox, the LUT is technically correct, so if there’s an issue, it’s often with the signal itself or a problem the broadcaster’s in-house gear has created, and ColorBox helps me figure that out. Coupled with ORION-CONVERT, it’s THE standard for color conversion,” Garcia explained.

He added, “ColorBox was a natural fit for a project like this because it’s such an intuitive device that makes color management and QC simpler and more accessible. With ColorBox, you can easily complete SDR and HDR transforms and make adjustments. When we’re working with clients, ColorBox also has such a fast protocol, especially when combined with tools like our [Ennio Desktop application](https://www.cromorama.io/products/ennio-software), which is great. I can see it processing video in near-real time, and the dynamic LUT mode in ColorBox is bonkers fast! I’m also excited to test out the latest ColorBox ACES implementation.”

**Charting the journey ahead**

Since ORION-CONVERT’s rollout, Cromorama has continued to advance its technology with ease-of-use top of mind so that users don’t have to be color scientists or specialists to figure out how to use it. Some of its latest innovations include an [ORION-CONVERT™ plugin](https://www.cromorama.io/products/orion-convert-nle-plugin) for a popular creative application that’s used for nonlinear editing in television production, as well as Ennio, a color management orchestration desktop application.

Looking ahead, the company plans to continue this tradition of innovation, especially as demand for HDR production continues to grow. “Producing in HDR will always ensure the best quality output, and as far as the audience impact, it’s all about the wow factor. HDR provides a cleaner, more natural look and feel that’s as close to an in-person stadium or experience as you can get without stereoscopic 3D. Pair that visual quality with Dolby Atmos immersive audio, and it gives audiences this incredible sense of depth. And, as virtual reality technology evolves, combine it with HDR HFR (high frame rate) content, and you’ve achieved a look that’s even more true to life, which will certainly be a game changer. These are all things we’re watching as we continue to advance our technology,” Garcia concluded.

[Check out this video for more background into the ORION-CONVERT™ Pipeline in AJA ColorBox](https://www.youtube.com/watch?v=GyiwCQUI0SI).

**About AJA ColorBox**  
[AJA ColorBox](http://www.aja.com/colorbox) is a powerful video processing device designed to perform algorithmic and LUT-based color transformations and offers advanced-level color management with AJA Color Pipeline, as well as several color transform approaches including Colorfront, ORION-CONVERT, BBC HLG LUTs, NBCU LUTs, and ACES. Featuring 12G-SDI in/out and HDMI 2.0 out and ultra-low latency, ColorBox is capable of up to 4K/UltraHD 60p 10-bit YCbCr 4:2:2 and 30p 12-bit RGB 4:4:4 output, perfect for live production, on-set production, and post-production. ColorBox’s browser-based user interface makes it simple to adjust color processing settings, whether connecting directly via Ethernet or via a third-party Wi-Fi adapter.

**About AJA Video Systems**   
Since 1993, AJA Video Systems has been a leading manufacturer of cutting-edge technology for the broadcast, cinema, proAV, and post production markets. The company develops a range of powerful, flexible video interface and conversion technologies, digital video recording solutions, and color management, streaming, and remote production tools. All AJA products are designed and manufactured at our facilities in Grass Valley, California, and sold through an extensive sales channel of resellers and systems integrators around the world. For further information, please see our website at [www.aja.com](http://www.aja.com/).

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