



megapixel[™]
Eurovision 2024

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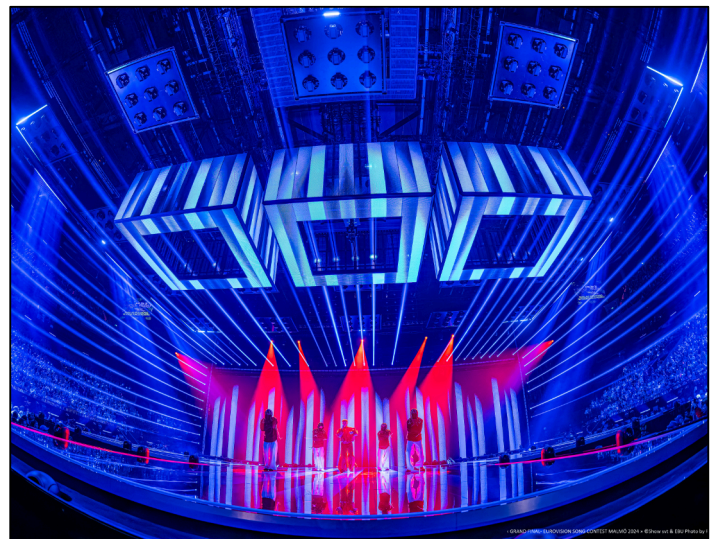
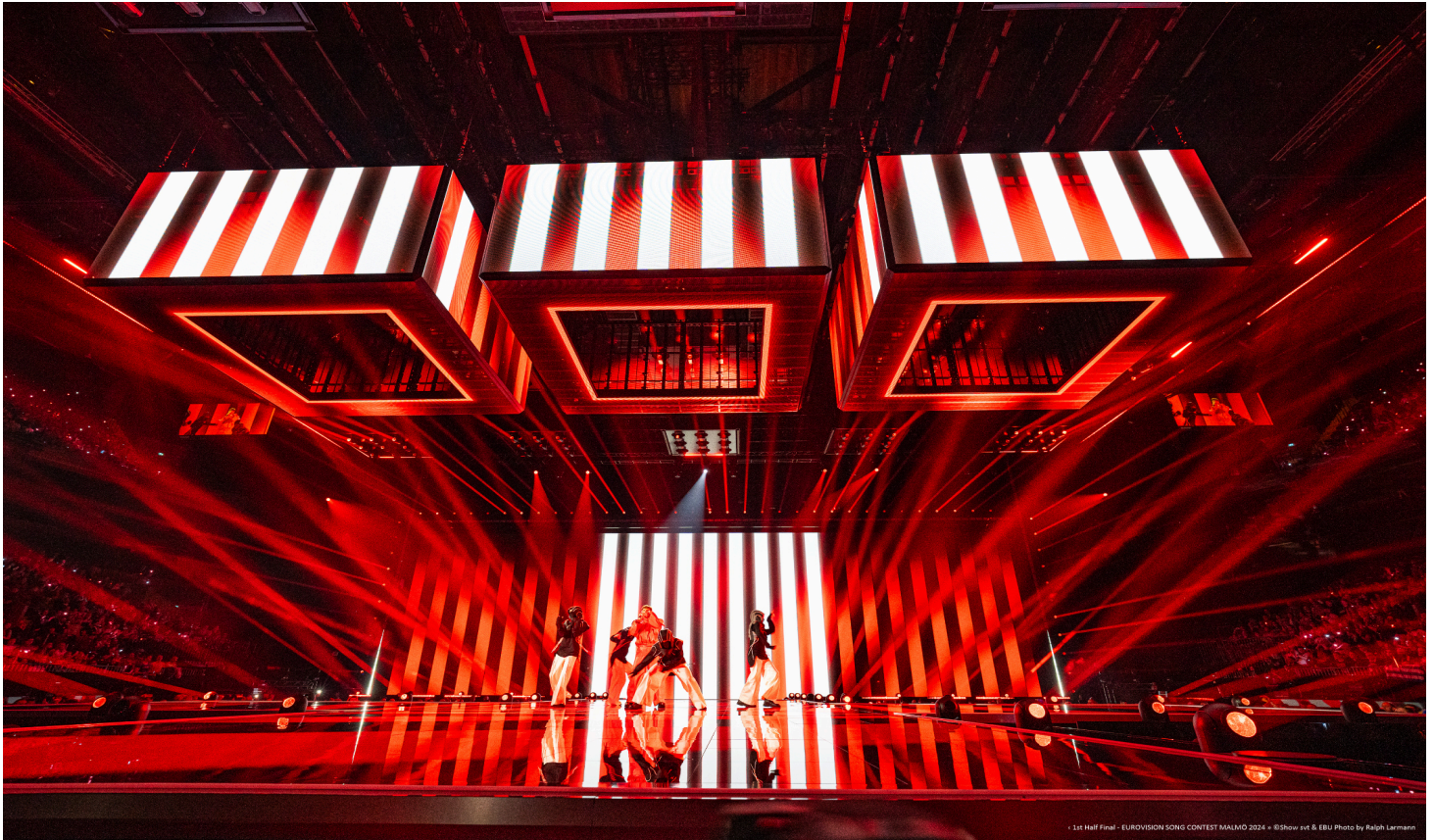
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Gallery

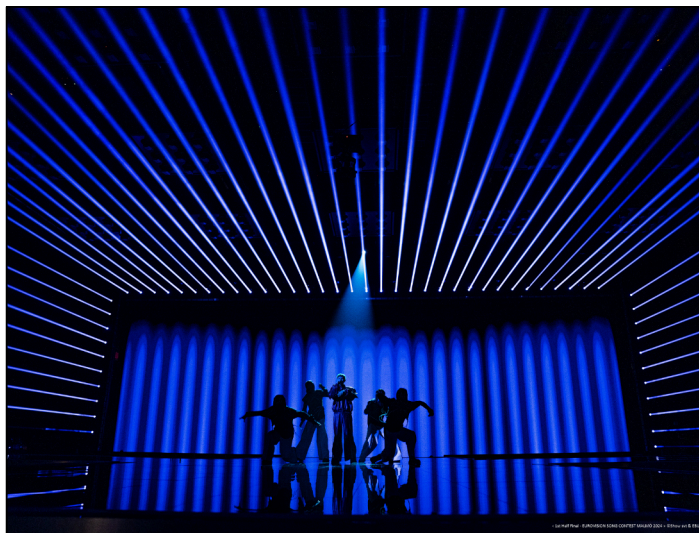
Eurovision 2024
Ralph Larmann



Gallery

Eurovision 2024

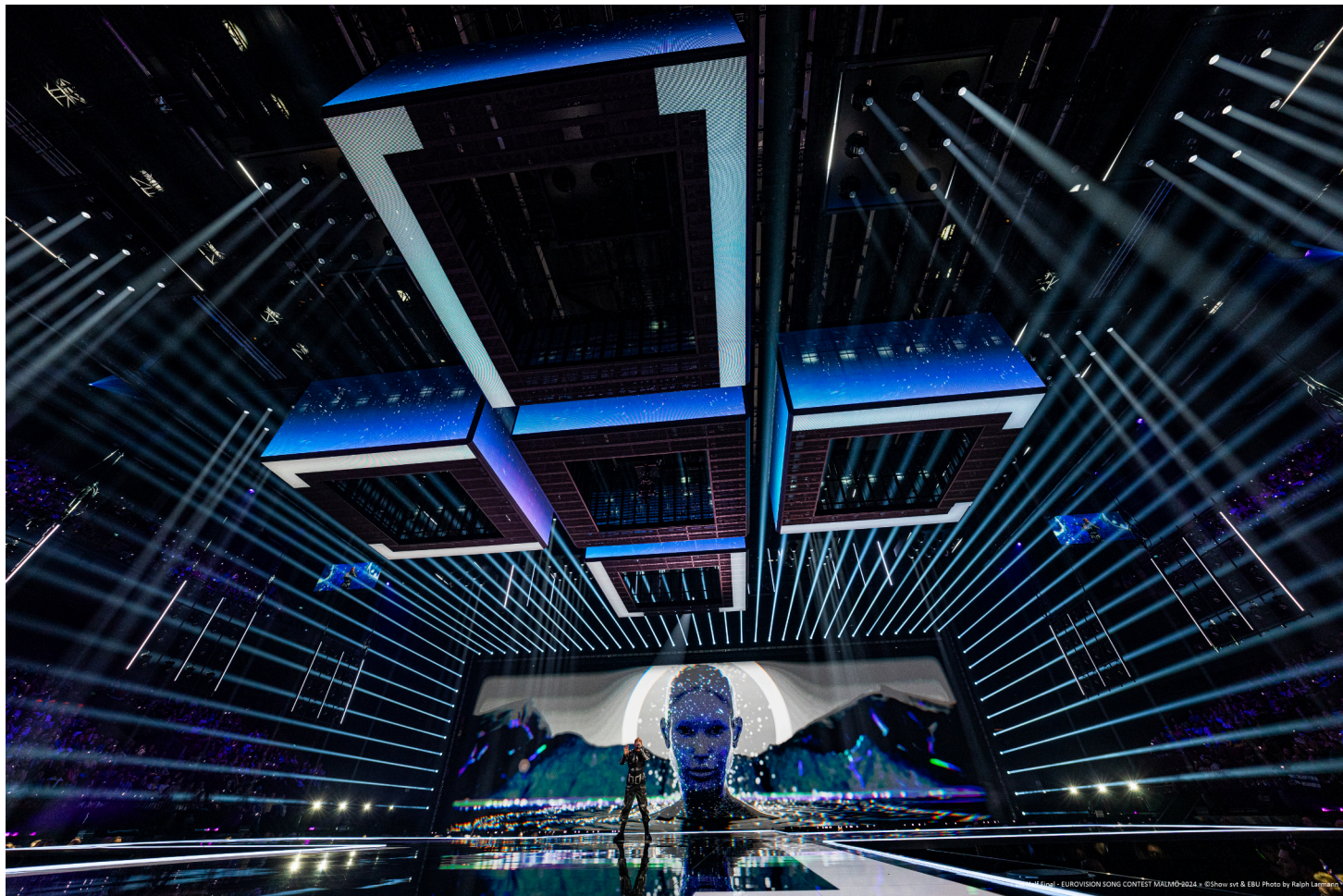
Ralph Larmann



Gallery

Eurovision 2024

Ralph Larman



About Megapixel

Megapixel is the unrivaled authority in cutting-edge professional display technology and video processing for top-tier brands, creatives and design-led homes. Led by Jeremy Hochman and Keith Harrison, our unrivaled team of engineers and designers consistently delivers the most unique and breakthrough LED solutions to market, helping our visionary clients bring their ideas to life in ways that inspire a sense of wonder and make the seemingly impossible possible. With over 200 patents and award wins from Live Design, the Emmys, and the Oscars, we endeavor to always be at the forefront of digital displays and technology for which we set the bar as the industry standard.

We are the unrivaled authority
in cutting-edge professional visual
technology and video processing
for top-tier brands.

Kit List

The following is a list of the equipment at Eurovision 2024 that this document covers:

Control

10 - Megapixel HELIOS® Processors with 100Gb ST2110

10 - Disguise GX3 Media Servers with IP VFC

45 - HELIOS compatible NETGEAR switches

3 - Arista 100GbE backbone switches

2 - Megapixel OMNIS® AV Monitoring Platforms

LED Panels (~ 1000 sqm):

680 - ROE BQ4 tiles (main wall)

540 - ROE Black Marble (floor)

460 - Vanish (cubes)

HELIOS Processor
by Megapixel



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Introduction

An estimated 163 million viewers worldwide tuned in to the 68th Eurovision Song Contest, Europe's biggest live televised music extravaganza in May. Historically, the contest's lineup has included a cavalcade of pop artists. 2024's festivities featured acts from 37 countries – with Swiss chart-topper Nemo emerging as the star of the show, and Sweden's Alcazar representing the host nation – and Sveriges Television AB (SVT) producing for the European Broadcasting Union at Malmö Arena.

The event featured startling stagecraft empowered by a new infrastructure in LED displays and lighting controls that Creative Technology (CT) Northern Europe employed using Megapixel's 100G fiber input modules and a new ST 2110 standard video distribution network. On social media, head of video Hans Cromheeke declared, "Digital magic breathes life into the tapestry of pixels" – and he remains moved by the experience. "In our audio-visual community," says Cromheeke, "we always talk about the bits and the bytes, and we love technicalities. Sometimes we forget the essential part. We are doing it with a passion. Yes, it's our job. But if you're good, then you have the passion, and you can get a little bit lyrical about it."

Front of House - Eurovision 2024
Megapixel



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Stage Design and Production

The spectacle at Malmö incorporated a unique stage design that Eurovision veteran production designer Florian Wieder created, alongside light and streaming content designer Frederick Stormby of Stockholm's Green Wall Design. The event was conceived as a theatre-in-the-round concert with a cruciform stage. Downstage, a 1,000 square meter wall opened like a spaceship to reveal a performer greenroom behind an array of 680 ROE Black Quartz 4 panels LED panels. Singers entered across a cross-shape catwalk of 540 ROE Black Marble LED tiles. Overhanging the stage, mechanical trusses supported a reconfigurable matrix of five giant cubes containing semi-transparent ROE Vanish LED tiles. An estimated 2,000 light fixtures, 12 automated follow-spots, pyrotechnics, and laser lights added to the multi-sensory experience.

“Megapixel had been leading the way with ST 2110, so we trusted that they would deliver.”

Ola Melzig , Senior Technical Director

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Implementation of SMPTE ST 2110

Initially, SVT brought in CT and Megapixel to build on infrastructures that they had established in 2021, using Megapixel's HELIOS® LED Processing Platform at the 65th Eurovision in Rotterdam. "Eurovision Holland was the first big show I did with Megapixel," says Cromheeke. "Back then, HELIOS was new. The input was HDMI, but the backbone was all there. It was a new approach as the first completely IP-based system. Most other systems cut the streams in parts, and those parts were then picked up. HELIOS is always native, which has a lot more potential for LED."

As discussions for Eurovision 2024 evolved, Megapixel suggested combining its HELIOS processors and the OMNIS® AV Monitoring Platform with the first mega-scale rollout of ST 2110. It was a radical departure from analog control networks. "The simplest way to define ST 2110 is to look at how network technologies have developed over the last few years," explains Megapixel product support specialist Christian Dickens, who accompanied the installation onsite in Malmö. "With fiber systems pushing through more data, people realized it's possible to get video to go from 'A' to 'Z' directly, rather than going through the rest of the alphabet to get there. That comes with complications, because it's new technology, but it simplifies how systems work delivering data. With ST 2110, that defined the standard, so if a client wants 8K resolution at 60 fps, that's now a SMPTE standard."

Eurovision 2024

Ralph Larmann



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Planning and Preparation

The all-digital paradigm required re-evaluations of the technical brief and backup systems. "As head of video," says Hans Cromheeke, "you're technically responsible for what has been put on paper, what has been rented, what has been talked about, is workable and is correct. CT wanted a lot of video LED parts, and we asked together, "How can we make this sexy?" Frederick at Green Wall wanted to use LEDs a little brighter than normal, to use them more as a lighting feature, rather than just as displays. We discussed using HDMI-outs to create a matrix. That's when Megapixel suggested, 'Hey, why we don't do ST 2110?'"

Cromheeke was aware that Disguise media servers had experimented with ST 2110 working with technical and video director Stefaan 'Smasher' Desmedt for rock band U2's 18K displays in the Las Vegas Sphere. "Smasher is a friend, so I called him. He told me they tried to convert to ST 2110 but they experienced some bottlenecks. We contacted Disguise and did tests. It was conclusive: this could work. Knowing we had partners like CT, Megapixel, and Green Wall, we sensed that it was possible. We needn't be scared of it going wrong. We needed to go further. That's Eurovision. It's a big show."

Natalia Barbu - Eurovision 2024

Ralph Larmann



"We wanted to push boundaries," concurs CT on-site manager Karl Wigenius. "We started looking into doing all distribution and all signal management by ST 2110, and we realized that this was a world's first on this scale and a live event."

For SVT senior technical director Ola Melzig – a former lighting designer and member of the Association of Swedish Lighting Designers, on his sixteenth Eurovision – the ST 2110 system presented a new development in wrangling the control network. "Transitioning the video system to ST 2110 was a big deal for us, but both CT and Megapixel had been leading the way with ST 2110, so we trusted that they would deliver. Moving from a traditional copper system cut out a huge amount of switching gear and cabling, drastically reducing the size of "Video World". It also did miracles for diesel consumption because anything connected to the broadcast ran on generator power. It's protocol that a broadcast can never go to black, so you need to run on either enormous UPS (Uninterruptible Power Supply) or backup, which means generator power. So overall, the switch to ST 2110 made a big difference to power consumption and the overall green credentials of the show."

“Megapixel’s HELIOS was the furthest along in ST 2110 development. No other competitor came close.”

Karl Wigenius , CT On-site Manager

Planning began in August 2023, before the venue selection was finalized. HELIOS was selected as the primary LED processing platform. "Almost all CT-owned LED panels run on HELIOS," says Karl Wigenius. "When we started researching how we could use 2110, Megapixel's HELIOS was the furthest along in ST 2110 development. No other competitor came close. We have a good relationship with Megapixel and trust them a lot. We brought in OMNIS to surveil all the LED systems, to see what fault-finding we could do ahead of time, or to analyze fault logs. We were happily surprised at how easily it was set up, and how much data it provided. It was very useful."

Marcus & Martinus - Eurovision 2024

Ralph Larmann



ST 2110 provided scalability and new dexterity, embracing a radical new approach. "An important part of my job as a technical director for Eurovision," says Ola Melzig, "is to bring in the newest and coolest. That's important because Eurovision is always on the boundaries of technology. And we have something that a lot of shows don't have. We have time. We have a six-week on-site production. We rehearse to the border of insanity before we go live. So, we have a pretty huge spectrum where we can allow things to go wrong, so we can be bold with embracing new technologies. When Megapixel suggested 2110, and everyone on that call was so excited, I kept a straight face and started Googling. I instantly found out that this was expected to be the new standard within broadcast, with how you distribute content at extremely high speeds. While others were talking about how cool this would be, I asked, "So, we're not running any copper here?" And they said, "No!" "Oh. "And no one else has done this?" No. Okay, "And... What are the potential risks?" It turns out, a year earlier, this wasn't possible, but we were aligning perfectly with a point in history where it was realistic. It was a match made in heaven."

5MIINUST x Puuluup - Eurovision 2024

Ralph Larmann



Megapixel collaborated in the analysis of wiring diagrams to plan the layout of the control center at Malmö. "If you've seen images of the control area backstage," notes Christian Dickens, "if that wasn't run on ST 2110, that would have probably been three times the size, simply because we were moving from everything that can be delivered from network switches, rather than a field of copper. We went into a testing stage. From there, we moved into research and development on a testing stage at CT. We delivered a beta build, while they were building the system."

To plan for redundancy and safety backups, CT commissioned a surfeit of equipment, including 14 HELIOS and a double-capacity network. Dual systems provided 100 percent 'failover,' giving Megapixel processors the ability to seamlessly and automatically switch to backups as needed. In the run-up to installation, the dual system also gave Green Wall the ability to develop streaming content off-site. "We sent part of the 2110 system to Green Wall's studio in Stockholm," says Karl Wigenius. "About a month ahead of time they had a full copy of the Eurovision 2110 system to start working on the programming and sequencing of each song. We called those systems 'Red' and 'Blue.' About five days into load-in, we combined the two systems into one big, fully redundant system in Malmö."

Eurovision 2024 - Network Racks
Megapixel



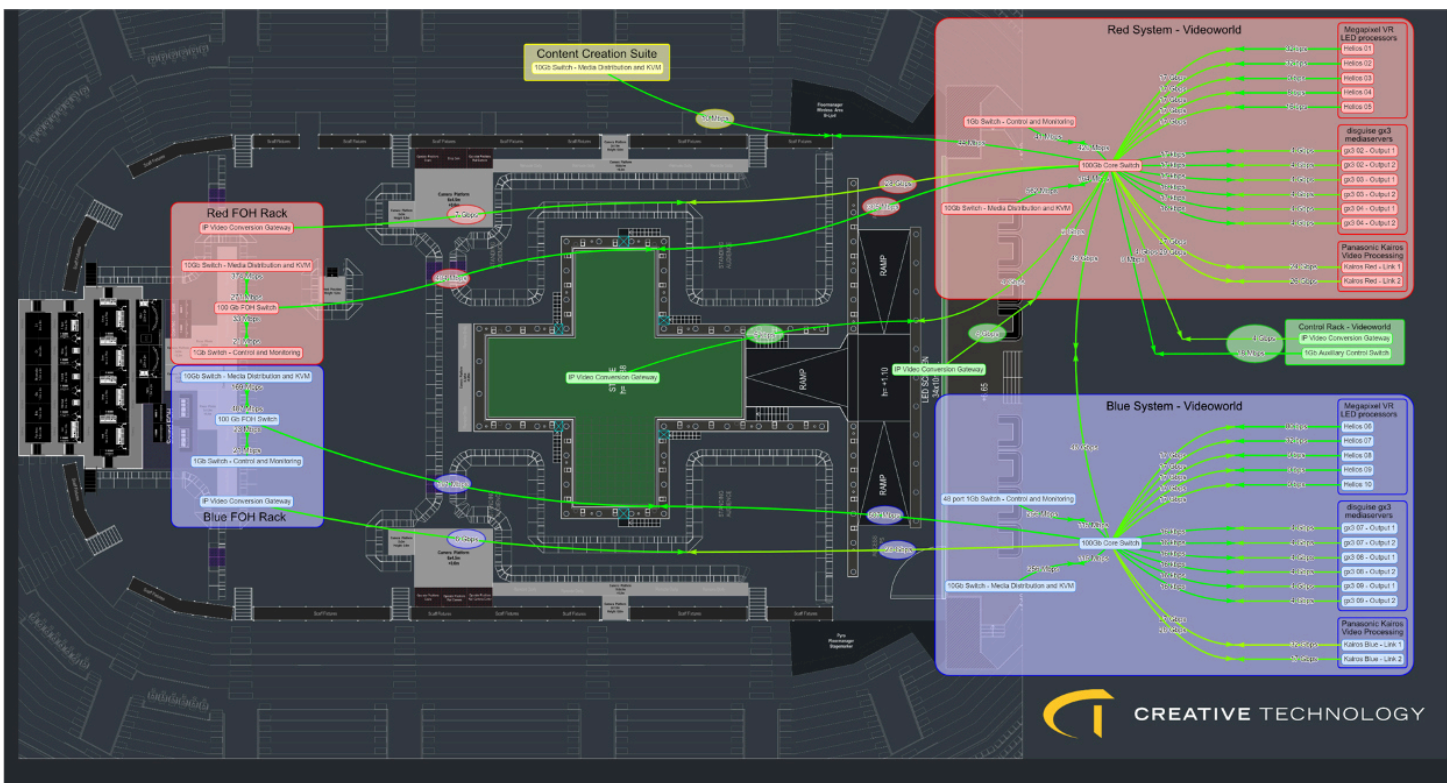
The dual circuits allowed seamless switching in controls across the HELIOS network controlling matrices of ROE LED screens. "The two processors are left/right on the LED screen and they're always working," says Hans Cromheeke. "We didn't use the internal switchover or failover. If we went from Red to Blue, we went directly, instead of input swapping, and it went fluently. KAIRO [Electrical] installed a little bit of buffer to switch from A to B, but we never had any power malfunctions. Everything was running from Day One, with very few hiccups."

“We were happily surprised at how easily it was set up.”

Karl Wigenius , CT On-site Manager

Eurovision 2024 - Network Plan

Creative Technology



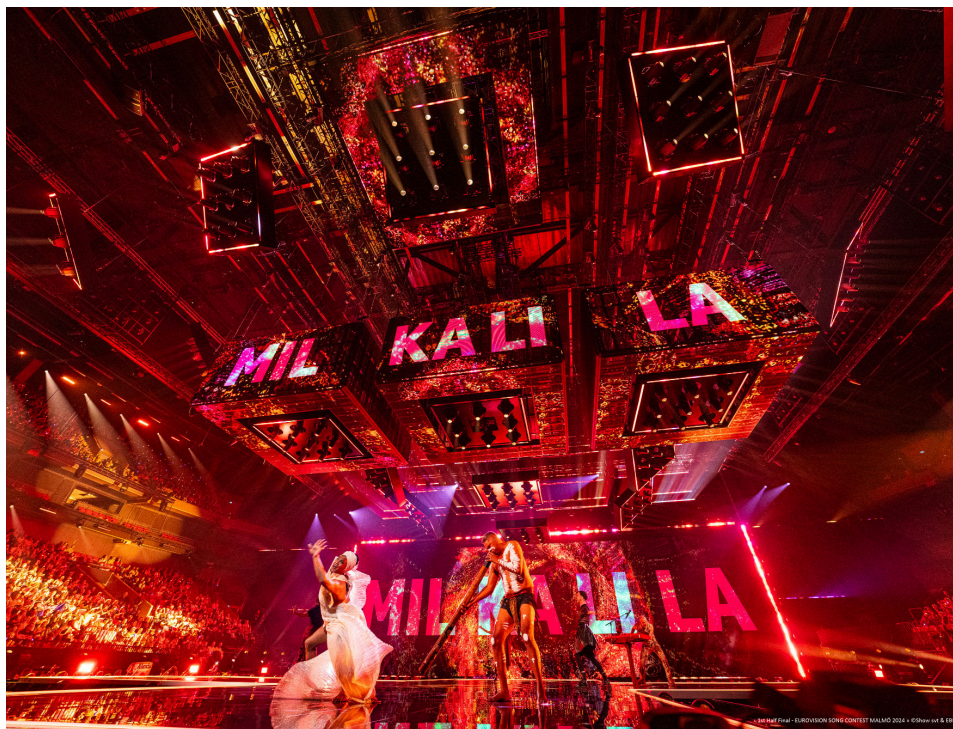
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Rehearsals and Production Process

CT first ran the system to its full capabilities on Tech Rehearsal day. Standing Rehearsal days followed where students from local music schools performed songs with choreography and lyrics, minus pyrotechnics. Delegations viewed rehearsal recordings a week before performers arrived on site. SVT then conducted four days of Production Rehearsals, and ten days of Delegation Rehearsals with openings, interval acts, and pyro. Delegates analyzed rehearsal recordings and, by March 15, finalized supporting videos, which SVT employed for final tweaks in LiveEdit software. "The lighting and camera teams were polishing all the way to broadcast," says Ola Melzig. "In LiveEdit, the automated camera-scripting platform tells the vision mixer when to cut. That runs on the same timecode as lighting, video, pyro, and automation. So, in the Viewing Room, the delegates can give a time-code reference for any changes using the same time-code as lighting and video. It's one of the major tools to get such a polished broadcast."

One Milkali - Eurovision 2024

Ralph Larmann



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Broadcast and Camera Work

For the three-day broadcast, 24 cameras captured the live show using pedestals, cranes, rails, Steadicams, and 199 CyberMotion C1 hoists. "I've heard from friends in the industry," Melzig adds. "They were blown away with the level of performance and the way we executed the show with our stage that constantly changed shapes. It was an endless toolbox for creatives."

“If that wasn’t run on ST 2110, that would have probably been three times the size.”

Christian Dickens - Product Support

1st Half Final - Eurovision 2024
Ralph Larmann



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Impact and Future Implications

The implementation of the new technology was made possible by a mutual openness and desire to experiment. "At Megapixel we have a culture of listening and understanding what our customers want, so we can deliver a seamless experience for them on-site." says Christian Dickens. "This show was all about developing workflows, and how ST 2110 can be used with success. It brought down the whole footprint and has 'green' credentials attached because you're not bringing in boxes and boxes of shipping and hundreds of miles of copper cable. It's much more economical and streamlined."

"ST 2110 is an enormous evolution," adds Hans Cromheeke. "It is another philosophy of fault finding because it's all in one box. With Red/Blue talking to each other, it's all active elements. That's a new way of thinking. And, in the future, a lot of people will need to rebrand and reschool themselves."

"2110 is a paradigm shift," agrees Karl Wigenius. "We will see it becoming more centralized, and we will see bigger and more complex systems turn to the technology as they realize this is less complicated than building a baseband system. I would compare it to the biggest thing that the video industry has seen since 4K. And I think you will see it growing rapidly. It's a game changer."

1st Half Final Start of Voting - Eurovision 2024

Ralph Larmann



Partners



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