

Lighting & Sound INTERNATIONAL

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Eurovision 2002



The day: May 25. The place: Tallinn, Estonia. The show: the Eurovision Song Contest.

Despite all the cynicism, this event (now unbelievably in its 47th year), still pulls in a television audience estimated at 166 million across the globe, while, just to prove its currency, the live transmission on the Eurovision Song Contest homepage logged six million hits from around the world. This is a serious undertaking . . .

The creative team started working on ideas for the production at the end of 2001 and DM Audio and Spectra+, the two companies handed the brief of co-ordinating the audio and lighting/video elements respectively, began the process of pulling this major project together. Both companies are Eurovision veterans, having been involved in the event two years previously at the Globe in Stockholm. In the talent pool were sound designer Lars Wern, lighting director Per Sundin of SVT, set designer Lir Hermelin, lighting production manager Lars-Ola Melzig of Spectra+ and Catalyst production manager Norbert Franke of catAtec, with back-up from companies such as Lang AV of Germany and Video Unlimited of Sweden.

Set designer Lir Hermelin was determined to make light and projection an integral part of the set design. Instead of using geometric forms, Hermelin and her team created an organic shape without straight lines, the focal point of which was seven moving screens ('sails'), curved like waves, which were flown above the stage. To ensure that every millimetre would be a suitable target for projection, the set was constructed from a

highly light reflective fibreglass material that would also allow for back projection.

LIGHTING

"I knew immediately that it would be a challenge," admits lighting director Per Sundin. "My main design goal was to give every song a unique look and identity, to add a second and third dimension, through colour and depth. Creating the illusion of depth is difficult, especially in close-ups, where we often get just one layer of scenery behind a singer."

However, Sundin's biggest challenge lay in identifying a way of delivering video graphics so that the images could track the seven moving sails. "What I was searching for was a powerful projection tool unlike anything that had previously existed. Fortunately, I made a call in the autumn of 2001 to a friend of mine, Pontus Lagerbielke (who became one of the three lighting operators on the show) and the first thing he said was 'I saw something interesting at the last PLASA Show.' A few days later, project manager Lars-Ola Melzig and myself were at Pinewood Studios in the UK, at High End Systems Europe's invitation, to see Catalyst." Sundin immediately recognized that Catalyst would answer all his needs.

Norbert Franke of catAtec was in charge of the Catalysts at the event. For those who have yet to see it, Catalyst is a software-driven projection system which combines the power of digital media with the creativity of

automated effects lighting. The orbital head gives a designer more tools to work with when moving projections around a room. All but one of the 15 Catalysts in the Eurovision show were fitted with orbital heads and coupled to NEC XL 8000 video projectors (another advantage of Catalyst being that any large-venue video projector can be used as the basis of the system), split equally between front and rear projection. That additional unit, a Catalyst server, provided the static background imagery for the entire set, via four Panasonic PT-D9500s, which demonstrates how powerful the server is as a stand-alone item. All the graphics for the entire performance were delivered in this way with absolutely no direct video input.

The original wish-list was for 30 units, but, as always, the spec got trimmed - to 21 units and then to 15, plus one spare, for the final count. However, this was still to be the largest application for Catalyst - and only within months of its launch. The signal output of the Catalysts (RGBHV, XGA resolution) was connected to a 16-in-16-out matrix. A switcher was operated remotely from FOH, whilst content distribution was provided via a Firewire daisy-chain, which speeded up the data transfer in comparison with networking solutions. Most of the images and video-clips were pre-produced in Sweden, and an on-site graphic and video workstation was brought in for last-minute changes.

A sophisticated stage automation system, provided and operated by Visual act, allowed



From top to bottom, rehearsals with the main lighting rig; the Catalyst control room; the rig showing the Martin Line Array and the spectacular use of the projection lighting on the sails; part of the team that worked on the event.



movement and rotation between and during the acts. Each sail (fabricated by Philipson & Franck) was hung on three lines, driven by individual motors, whilst a fourth motor moved the unit along a horizontal track the width of the stage. Visual act's control system then allowed for each sail to be moved to any position along this pre-defined path. Franke explains: "The flexibility of the whole set was amazing. The visualisation of the overall design is unprecedented in a television production such as this. Though it was the first time ever that such a large number of Catalyst systems had been used in one production, with the risk that that implies, without it, the design could not have been achieved."

When it came to selecting his automated lights, Sundin was up against budget restrictions again: "My first idea was to use only High End X-Spots, because they work incredibly well as a projection tool, but as always I had budgetary problems. So I had to choose some cheaper tools-the Live Pro 1200 and Cyberlights - for beam effects."

Nevertheless, there were 22 X-Spots on the truss (Prolyte and JTE with movement from Lodestar and Chainmaster Variolift motors) for projections on the set. Of those, 12 were hanging behind the set for back projection and 10 were just in front of the back fibreglass wall, in a trough. 82 Martin MAC 600s and 86 Studio Due Live Pro 1200s, plus 104 JTE ACL banks and 10 JTE 8-Lites, were also spec'd. Meanwhile, 36 Cyberlight Lithos were mounted on the top level of the arena and used to light the audience, whilst Robert Juliat 2500W Aramis followspots were used FOH, with Corrigan and Foxies positioned throughout the arena. Four DF50 hazers and a pair of High End F-100s, all with JEM DMX fans, were pressed into service for the atmospherics and controlled by a good old 24-channel Zero 88 Sirius desk.



To programme the lighting for the show, Spectra+ had acquired three WYSIWYG 2000s and a single WYSIWYG 5000 system, supplied by ETC's Swedish dealer Svensk Film and Ljusteknik AB (SFL). The programming took place in Spectra's new WYG-studio in Stockholm and with the help of Cast Lighting's Gil Densham, Spectra's Ola Melzig and the rest of the Spectra team spent an intensive 10 days programming in Stockholm, before moving to the Tallinn site for five more days of programming.

For the event, the lights were run through three Avab Pronto consoles. Desk 1, run by Pontus Lagerbielke, handled the Catalysts and X-spots; desk 2, operated by Sören Durango, ran the MAC 600s and Studio Due Live Pros, and desk 3, with Emma Landare at the helm, looked after the Cyberlights. Three further Prontos were used for back-up, with all dimming fed through a combination of Avolites 72-way and Okero 24-way dimmers, and signals fed through transtechnik's new E-Gate Pro system.

AUDIO

Lars Wern and the team from DM Audio produced some inspired sound mapping, using a digital highway and some proprietary audio tools. The audience of 6,000 were treated to the first major European installation of the Martin Audio Wavefront Line Array (W8L), from the Stockholm-based production company - but Wern knew that priority would be given to the 100 million picking up the broadcast through the world's TV networks rather than the live audience.

Not only did the Line Array have to be trimmed above all sightlines, but Martin's LE700 and LE12J floor monitors, as well as all cable, also had to be invisible. Furthermore, all equipment had to be doubled up, so that in the event of component failure the show could go on. In the case of the Innova Son desks, all the cues had to be stored on a back-up desk running a single cue behind, so that the mix could flip seamlessly over to the auxiliary console if necessary.

This was familiar territory for DM Audio, of course, who had operated a similar formula two years earlier. With every microphone, video and audio feed split between the two OB trucks, as well as the Innova Son FOH and monitor boards, remarkably different sound mixes were generated.



What had evolved since Stockholm, however, was DM's use of CobraNet with QSC's proprietary QSCControl running through it. Wern figured that given the huge cable runs - conventionally required to service so many clustered speakers, sited above a massive grid of lighting truss - his better solution would be to use flying amp racks with short two-metre cable runs to the speakers, addressable from the desk.

Data ports on the QSC PowerLight PL4 and PL6 amps were interfaced with QSC CM 16 multi signal processors, while QSC's RAVE (Routing Audio Via Ethernet) signal transport system delivered the eight audio signals to the loudspeakers - Low, Mid and High, both left and right, plus the audience sidefills.

This was all achieved with Cat 5 digital cable, while the entire set-up was remotely managed from the mixer computer via QSCControl II software, running on CobraNet, which allowed individual level control of each enclosure and a complete diagnostic to be performed. "It enabled me to measure the temperature of the amps, the impedance, turn on and off in Standby and generally control all the gain settings," Lars explained. "When we were sound checking if a box appeared dead, QSCControl would indicate whether a cable was connected or not."

He added that all the switches have IP addresses - "so if one cable is broken the other will take over." The next stage will be to run the chain motors off QSCControl, while the aux switches, which can be used for utilities, offer many further possibilities.

Rane's RPM-88 10 x 10 digital matrix, programmed with delay and EQ parameters, fed the left and right main speaker systems, downfills, frontfills and extreme left and right. The outputs were summed using a special summing box, as were the signals feeding external processors, such as the TC-6000 reverb and delay units. All the other virtual dynamics were in the tiny, lightweight Innova Son digital boards.

The Wavefront 8 Line Array, Lars Wern sensed would provide the coverage he was seeking without the need for delays. "The Martin line array was in my mind for the Song Contest from the very beginning - when we were first asked by Estonian TV to become involved," he said.

"The footprint, the rigging attributes and the long throw were all important for a show like this, enabling us to cover the whole arena." DM Audio flew the 24-box line array in a configuration of four clusters of six boxes. "This produced an extremely wide sound; the stereo imaging was incredible and the effect of the reverbs fantastic."

Many line arrays, Wern believes, are susceptible to cancellation and produce a different sound across the front. "But the W8L seemed very well behaved in this respect." The W8L achieves this efficiency by combining proven driver-loading techniques with no-compromise vertically-



Left, lighting director Per Sundin of SVT; below, Lars Wern (left) and Robert Ernlund at the Innova Son FOH desk.

coupled waveguides and true constant directivity horns.

The system's compatibility with Martin's established Wavefront W8C and WSX subs also worked in its favour, as the Wavefront 8 Compacts were asked to provide nearfield, centre cluster and extreme side coverage - as well as stage sidefills for the performers.

Martin Audio's Jim Cousins attended the site in advance to advise on inter-cabinet arraying and optimising the system for the humidity. "The idea was to achieve a balanced time-aligned system between the line array, centre and side clusters, ensuring that there were no feedback problems on stage. "As the Wavefront is very smooth off axis we don't run into the feedback that other companies would typically experience," says Cousins. He also believed the all horn-loaded principle allowed them to achieve a tremendous advantage over cross-firing direct-radiating technology, delivering the same dynamic audio experience to seats in the uppermost tiers.

With W8Cs providing stalls coverage for those seated behind the Line Arrays, and the WSX subs stacked each side behind the screens, WT2s were used for extra fills and front fills were provided by WT15s concealed under the fibre glass stage mesh.

At FOH, Lars Wern and Robert Ernlund, the same team from Stockholm two years before, were running the Innova Son Sensory live desks in parallel, with a combiner box combining all the outputs, also backed up.

All 64 channels of audio are carried from the stage box to the monitor and FOH positions via two coaxial cables (while the active digital splitter can break out to the additional consoles). All memories are recallable, including preamp gains and phantom power, in a single snapshot. The patchbay is embedded in the console memories, and the patching function gives a full assignment of any bus to any output. A further benefit is that the software can be loaded onto a laptop for a full off-line programming station, allowing different shows to be compared, and stored presets to be sent by e-mail.

"What I like," said Ernlund, "is that it gives you 10 pairs of hands, allowing you to scroll from one snapshot page to the next, featuring remote automation functions with timecode." The new software will increase its flexibility further. Set on top of the desks were the three TC System 6000 Icon remote panels. "These have been fantastic," enthused Lars. "We have been updating them every rehearsal, mixing the reverb levels using four sends and an AES-EBU return."

"I met TC Electronic in Frankfurt and asked them if they would be interested in participating as we already had a lot of their equipment in our rental stock. We now have an individual programme set up for each song." The mapping would otherwise have taken up a lot more programming time. Eesti Telefon supplied DM Audio with an internet connection at the monitor position, giving them the facility to download e-mails and software.

Monitor engineers Lief Mattson and Mats Wennerholm probably had the tougher assignment. As had been the case at the Globe two years earlier, DM Audio's Barney Gausdal had the task of interpreting the artists' monitor mix requirements and translating them to the



foldback crew - no small feat, considering the vast choice of Sennheiser headmics, handheld mics and IEMs (with some performers clearly never having used belpacks or personal IEMs before).

Sennheiser supplied Series 5000 wireless and Series 3000 IEMs for the event. The presenters, Anneli Peebo and Marko Matvere, were rigged with two pocket transmitters and a back-up transmitter and an IEM (plus back-up). The radio mic receivers and IEM transmitters were under computer supervision, operated by Sennheiser, who remain one of the major sponsors of Eurovision.

Mattson and Wennerholm were mixing the Martin LE12J and LE700A conventional floor



Monitor engineers, Mats Wennerholm and Leif Mattson

longer orchestras and musical directors, and artists stand or fall on the skill of the engineers and the quality of their backing music DAT tape. These are fed frame-sync'ed from the Estonian TV (ETV) OB trucks, hired in from Swedish TV and Radio.

Given the variable dynamics from tape to tape, the monitor engineers have a near impossible task. With singback only, it can be difficult to provide a consistent mix because of the amount of movement around the stage and the fact that they are constantly providing mixes between wedges and IEMs. They thus configure the desk to enable the 24 acts to receive a stereo mix wherever they are.

Wern believes a better solution would be a move to multitrack, as no monitor engineer in the world could provide a monitor mix from some of the DATs presented: "It's just kick drum, boom and high hat, and it's almost impossible to pitch from," he believes. "They have this tremendous bass boost, which sounds great at home, but in a hall with five seconds of reverb it's impossible to EQ it out. With separate tracks, we could filter it out easier and create a more efficient monitor mix."

He continues: "For example, Israel had a really soft start to their song and the crowd started to

applaud straight away - so you couldn't hear the pitch. If they were given just a piano in the monitor to give them the chord, that would have helped tremendously." Whether the EBU heed this petition remains to be seen.

Summing up the show, Lars Wern felt that DM had managed to work within the context of ETV's low-level requirement - measured between 95dBa and 105dBa at the desk - to produce consistently even coverage without audio compromise. "It's essentially a TV show and so using the central cluster we were able to control the amount of feedback during voting and when the presenters were on stage. "There are two benefits of the centre cluster - to produce a very good vocal sound in the near section, and to control the level to save the TV from too much leakage. A lot of our problems disappeared when people came in as there's a lot of concrete and no acoustic treatment at the Suurhall at all." They also had to contend with added reflection from the 88 commentator boxes that have been added for the occasion! Technically, says Wern, it was the male performers - like the Belgian contestant, Sergio - who had tended to stand out.

However, Sergio didn't win - that honour fell to Latvia's Marie N with I Wanna, thereby ensuring that the ESC moves the shortest possible distance to Riga next year.

Photos: Spectra+/Tone Lyche; DM Audio.

monitors, hidden under the traps, with W8C sidefills, presenting the artists' IEM mixes in stereo pairs. They were aided by a pair of Genelec monitors, and as at the FOH station, the back-up desk ran one cue behind. Mattson had first used the Sensory desk on an opera tour last winter, and instinctively liked the recall and snapshot facilities, the overall size of the desk and the seamless programme changes.

Today, the Eurovision Song Contest exists in a playback environment, when there are no

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