

OVATION OF THE SEAS

mondo







## TIANJIN, CHINA ASIA-PACIFIC

Despite having never been on a cruise ship and not really having the craving to go on one, when the opportunity to get on board arose - even if it was just for six hours - I was rather intrigued, so I didn't let the chance slip by. mondo\*dr has already covered the first two ships in the series, Quantum of the Seas and Anthem of the Seas, and completing the trio is Ovation of the Seas, which took its maiden voyage in April this year.

### FIRST IMPRESSIONS

With its home in Tianjin, China, Ovation of the Seas has been built specifically to sail in the Chinese seas, furthering Royal Caribbean International's commitment to growing the China holiday market. Ovation joins Quantum, Mariner, Voyager and Legend to make up the largest fleet of ships for any cruise brand in China, with home ports in four cities - Shanghai, Tianjin, Hong Kong and Xiamen.

Royal Caribbean's President and CEO, Michael Bayley said: "It's wonderful to welcome Ovation of the Seas to the Royal Caribbean family of ships. We have once again introduced yet another one of the most technologically advanced cruise ships and the very first that has been built for the China market - a market we continue to demonstrate our commitment to expanding. Quantum Class has redefined the status quo, and we are excited for our

guests in China and Australia to enjoy their extraordinary vacations on board this stunner." Built by Meyer Werft in Papenburg, Germany at a cost of US\$1 billion, Ovation spans 18 decks, encompasses 168,666 gross registered tonnes, carries 4,180 guests at double occupancy and features 2,091 staterooms. And similar to its siblings that have gone before, it features first-at-sea amenities including: the North Star, an observation capsule that





gently rises more than 300ft in the air to treat guests to breathtaking panoramic views; thrilling skydiving and surfing experiences; Two70, a daily social space which transforms into a multifunctional entertainment venue in the evening; and SeaPlex, the largest indoor activity space at sea, in which activities such as basketball, roller-skating and bumper cars can take place. All of this plus 18 restaurants, the Royal Esplanade shopping mall, the Music Hall for live music and events, the Pool Deck, a solarium, a conference centre and a fully equipped fitness centre.

In addition, Ovation of the Seas offers three specifically Chinese attractions to help Chinese guests feel at home. Firstly, Fan Bingbing, the internationally-acclaimed Chinese actress has been appointed Godmother of the ship. Secondly, in a unique collaboration with China's Forbidden City Imperial Palace Museum, Ovation offers displays of historical relics from the Forbidden City and feature invited experts to hold talks about the Imperial Palace in Beijing. And finally, there is also a

giant 33ft 'Mama and Baby' art installation, depicting a mother panda and her cub, reaching out to one another as a symbol of good luck - pandas are considered national treasures in China. Signage is also written in English and Mandarin, and the decoration is slightly different, tailored more towards the Chinese market. Some retail stores have also been replaced, and fast food restaurant, Johnny Rockets has been substituted by Kung Fu Panda Noodles.

Once again, not straying far from the previous two ships in the series - which is completely normal for projects such as this - system integrator, Amptown System Company (ASC) took on the entertainment technology feat installing more than 40 entertainment spaces. Planning and realising the Quantum series has changed the operating infrastructure of the company, it created a well-established team of ASC audiovisual engineers, sound and lighting designers, network specialists, all of whom work closely with the Royal Caribbean architects and technical team under the

leadership of Royal Caribbean's Superintendent SLVR & Architectural Lighting, Christopher Vlassopoulos. And a guided tour by the man himself was most definitely the best way to experience a cruise ship for the first time.

#### CLIMB ABOARD

Getting on board the cruise ship - which was docked at Southampton, UK during my visit - was as official as you'd expect. I had to hand in my passport to obtain a badge that would allow me access. This was followed by a double lot of security checks and meeting my guide for the day, Christopher, the moment I stepped on board - although the latter was probably more so I didn't get lost!

Even without much prior knowledge of the cruise ship industry, it's not difficult to ascertain that there is a mammoth amount of technology installed on board, however, until you see it with your own eyes and see every inch of detail that has gone into each aspect of the vessel, you'll still under estimate the task... and this is just one cruise ship.





The Quantum class cruise ships are the first vessels in the world to be equipped with full LED technology from Elation and ETC - with the small exception of a couple of Martin by Harman MAC Vipers in the Royal Theater.

At the RCI's request, ASC employed LED equivalents of most of the conventional lighting components. Because the LED lamps emit less heat, the air conditioning does not have to work as hard, which further reduces overall energy consumption on the ship. A relatively small installation depth in ceilings also requires special attention since there is rarely more than 100mm

available on board. Richard Dixon, a Marine Design Consultant from Project International, said: "We only use one-quarter of the energy of a comparable ship thanks to LED. 10 years ago comparable ships were using approximately 1mW and now we're using about 240-260kW"

Christopher actually started his career in the lighting world, after being educated in the UK, he moved to the US with the company that set up the distribution of Martin Professional in Florida. "I was selling Martin Professional products to Royal Caribbean," he said. "But then in '94 - '95, Royal Caribbean started a huge

project, Voyager of the Seas. It was the company's first larger cruise ship, going from being able to accommodate 1,000 guests up to 3,000 guests, so a big milestone. Royal Caribbean was desperate to get people in who knew what they were doing, so brought me in and I've stayed ever since."

#### FIRST STOP... ROYAL THEATER

Our first stop on the tour was the Royal Theater.

"We're a floating soundbox, and when we're selecting materials we have to choose those that are sound absorbing.

"There is a lot of extra consideration that goes into the design of a cruise ship," continued Christopher. But selecting the right products is also key, as they have to be durable, reliable and capable of being in operation 24/7. The main PA loudspeakers in the Royal Theater belong to Meyer Sound and the system comprises 20 Meyer Sound M'elodie ultra compact high-power curvilinear array loudspeakers and four Meyer Sound 700 HP ultra high-power subwoofers, split equally left and right of the stage. A further five compact Meyer Sound Mina curvilinear array cabinets make up the central cluster. Delays are courtesy of 12 Meyer Sound UPM1 ultra compact wide-coverage loudspeakers, while 40 Meyer Sound UPJunior loudspeakers have been installed as surround speakers and another delay line. Completing the loudspeaker inventory are seven Meyer Sound UP-4XP ultra compact loudspeakers installed for front fill. As with any Meyer Sound PA system, processing is taken care of by the company's proprietary loudspeaker management system. Three Galileo 616 systems are in place for a broad range of control options. "For any manufacturer to get into the cruise ship business, it has to work harder than usual," said Christopher. "We've been working with Meyer Sound for a number of years. They help

## TECHNICAL INFORMATION

### ROYAL THEATER

#### SOUND

20 x Meyer Sound M'elodie curvilinear array loudspeaker; 4 x Meyer Sound 700 HP subwoofer; 5 x Meyer Sound Mina curvilinear array cabinet; 12 x Meyer Sound UPM-1P loudspeaker; 40 x Meyer Sound UPJunior loudspeaker; 7 x Meyer Sound UP-4XP loudspeaker; 3 x Meyer Sound Galileo 616 loudspeaker management system; 1 x DiGiCo SD5 mixing console; 1 x DiGiCo SD-Rack; 2 x DiGiCo SD-Mini Racks; 1 x Riedel MediaNet real-time media network; 1 x Riedel Artist digital matrix intercom system; 1 x Riedel Acrobat wireless intercom system; Shure UHF-R Series receivers, pocket transmitters, and microphones; 4 x Genelec 8030A monitor

#### LIGHTING & VISUAL

144 x Elation EPV20 LED panel; 1 x Christie HD10K-M lateral projector; 1 x Barco DP2K digital cinema projector; 1 x coolux Pandoras Box Quad Server LT; 1 x coolux Pandoras Box Manager LT; 1 x coolux Widget Designer ULT; Elation Platinum Wash ZFX Pro moving heads; Elation Satura Spot LED Pro moving heads; Elation Platinum Beam 5R Extreme moving heads; Elation Platinum Spot LED Pro II moving heads; Elation Platinum Spot 35R Pro moving heads; Martin Professional MAC Viper Performance moving heads; Martin Professional Viper Wash DX moving heads; Martin Professional Atomic 300 DMX strobes; ETC Source Four LED Series 2 Tungsten HD fixtures; ETC Series 2 Lustr fixtures; ETC Series 1 Lustr+ fixture; 26 x ETC Desire D40 Lustr+ fixture; LeMaitre MVS hazers; 1 x High End Systems HOG 4 Full Boar lighting console; 1 x High End Systems HOG 4 Playback Wing; 2 x Luminex Ethernet-DMX8 Art-Net hub; 10 x Luminex DMX512-A 2.10 DMX hub





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## INSIDER INSIGHTS

**NAME:** Christopher Vlassopoulos

**JOB TITLE:** Superintendent SLVR & Architectural Lighting for Royal Caribbean International & Celebrity Cruises

**LIKES ABOUT TECHNOLOGY:** Makes me look good generally but specifically in my role at RCCL.

**DISLIKES ABOUT TECHNOLOGY:** Occasionally moves too quickly for outfitting cruise ships.

**THE NEXT BIG THING IN TECHNOLOGY WORLD:** I have to say it as I pioneered it on our ships for entertainment - robotics!

us because they too have a great deal of experience, they assist with the design and although there is a lot of effort and resources involved, they give us an excellent and a reliable service because they know the importance of designing a cruise ship product properly.” To satisfy the need for a flexible infrastructure, 250 connection points are located around the Royal Theater, achieved with the help of an analogue Ghielmetti Patchbay. This routes input signals to a DiGiCo SD-Rack and two SD-Mini Racks, connected via an optical multicore to a DiGiCo SD5. Located at the FOH position, the SD5 is used to mix both FOH and monitors, the FOH sound being mixed in 5.1. The system can handle 448 audio channels at 96kHz, with the SD5 also offering three redundant BNC-MADI ports, eight analogue I/O and eight AES/EBU (mono) I/O, it is ideally suited to mixing a broad spectrum of events.

Sound Designer, Hendrik Maaßen, said: “The premium SD5 console and its fully integrated sound periphery correspond perfectly with the demanding requirements of the Royal Caribbean show specialists, who developed a wide range of different day and night entertainment for the Royal Theater.” As a system integrator with a comprehensive project experience in the maritime business ASC offers the complete range of media technology and services. With its core competence in theatre and musical sound reinforcement ASC realised a concept tailored to the idea of Royal Caribbean and on par with large stages onshore. Depending on the sailing schedule of any given ship, the shows in the theatre will

change. For Ovation, the current shows are The Dream and Live. Love. Legs catering to the Chinese market. The stage is lit using a combination of more than 100 moving lights and 100 theatrical profiles. Elation features heavily in the intelligent lighting line-up, products include Elation Platinum Wash ZFX Pros, Satura Spot LED Pro moving heads, Platinum Beam 5R Extremes, Platinum Spot LED Pro IIs and Platinum Spot 35R Pro moving heads. These sit alongside Martin Professional MAC Viper Performances and Viper Wash DXs. Martin Professional Atomic 300 DMX strobes and LeMaitre MVS hazers provide additional special effects for any performance that requires it. ETC Source Four LED profiles and Desire D40 Lustr+ fixtures were used on the sibling ships so have therefore proved their worth alongside the moving lights. Particularly noteworthy are the ETC Source Four Series 2 Tungsten HD and Lustr, which set a high standard in terms of brightness and colour in the Royal Theater. A High End Systems HOG 4 Full Boar lighting console and a HOG 4 Playback Wing provides control. “In the US, I think we’re one of the largest customers of HOG consoles, we have more than many rental companies because Royal Caribbean has 25 cruise ships and Ovation alone has seven Full Boar consoles, there’s that and more on every ship,” said Christopher. A total of 144 Elation EPV20 LED panels have been installed, three screens in total - one large 5.8-metre by 11.5-metre screen positioned upstage as a dynamic backdrop and smaller 5.8-metre by 1.9-metre screens positioned at each side of the stage. The LED video system modules are attached to the theatre





• **Opposite**  
Even the fitness  
centre has an  
audio system.

• **Above**  
In the solarium,  
weatherised  
loudspeakers  
were required.

fly systems, installed hanging from rails, and attached to the front of lifting platforms, allowing the total LED surface of approximately 80 sq metres with a pixel spacing of 20mm to be visible or completely invisible depending on the scenery requirements.

Content for the screens is fed through a coolux Pandoras Box Quad Server LT and a workstation equipped with the coolux Pandoras Box Manager LT and a Widget Designer ULT for show management. Furthermore, ASC fed two video signals from the Pandoras Box server into the ship-wide broadcasting system, allowing routing of the signals to the Christie HD10K-M lateral projections and the

powerful Barco DP2K digital cinema projector in the theatre. This means the projectors can be used flexibly and creatively in the shows.

#### FITNESS CENTRE

For those looking to stay in shape and combat over-indulging on holiday, our next stop would appeal. The fitness centre isn't somewhere you would consider as an obvious place for a technology installation, because the music is atmospheric rather than being at the forefront. "We provide audio wherever it's needed so not just in the obvious spaces, here in the fitness centre for example, it simply requires background music," Christopher

explained. QSC Acoustic Design ceiling-mount loudspeakers have been installed in the fitness centre, as well as all the other areas on the ship that requires background music. And on this series of ships exclusively, Christopher opted to add QSC AD-C81T ceiling subwoofers to the fitness centre system too. "In retrospect, I probably wouldn't install ceiling subwoofers again since these QSC ceiling install speakers have such good low frequency response, the subwoofers are not necessary in most applications." The QSC ceiling-mount loudspeakers have a dual purpose as they are part of the entertainment system and the PA-GA system for voice evacuation. The

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loudspeakers also come with monitoring and DSP capabilities via a Q-SYS platform, which hasn't been the case with previous generation background music systems.

In fact music on board the ship has gone through quite a transformation over the years in terms of the different mediums. "We used to use AEI tapes so we had to have a tape deck and the quality wasn't very good. We paid copyright fee but then the tapes would wear out pretty quickly. Then we moved to CDs and had the option for people to put in their own CDs, but they started to skip, so again it wasn't a great situation," Christopher continued. "But then Muzak and DMX Music in the US arrived and changed everything. The companies design playlists and you can select a genre of music depending on the space, once you've paid the copyright fee. It's a hard drive connected to the Internet, which downloads two new songs every night, so that you never hear the same song twice. We have 24 hard drives to

accommodate the music requirements on board."

#### SOLARIUM, UNDERCOVER POOL & POOL DECK

Heading out and onto the deck, we reached the solarium first, a covered area in which people can relax on sun loungers. "In spaces like this the loudspeakers need to be hidden as much as possible, which is why they ended up mounted on the columns," said Christopher. Community W2-312 weatherised loudspeakers and W2-112 subwoofers in white to blend in with the aesthetics were specified for the solarium. And it was more of the same as we moved through to the undercover pool and the Pool Deck - the latter of which is used as a multifunctional space. "These areas are difficult because of all the hard surfaces. Although, it's not only the surfaces and the weather, there are also other constraints such as budgets and we have volume limits on board too,"

"We're a floating soundbox, and when we're selecting materials we have to choose those that are sound absorbing. There is a lot of extra consideration that goes into the design of a cruise ship."

#### TECHNICAL INFORMATION

##### FITNESS CENTRE, SOLARIUM, UNDERCOVER POOL & POOL DECK

###### SOUND

QSC AcousticDesign ceiling-mount loudspeakers; 16 x QSC AD-C81T ceiling-mount subwoofer; 6 x QSC AD-S82 outdoor loudspeaker; 6 x QSC AD-S282HT outdoor loudspeaker; 3 x QSC CX902 amplifier; 1 x QSC CX1202V amplifier; 2 x QSC CX204V amplifier; 1 x QSC CX404 amplifier; 1 x QSC Core 500i DSP core; Shure UHF-R Series receivers, pocket transmitters, and microphone; 17 x Community W2-312 weatherised loudspeaker; 5 x Community W2-112 subwoofer; 3 x Yamaha 01V96VCM mixing console

###### VISUAL

1 x Daktronics DVX-1800 10mm LED screen measuring 7,049mm by 3,758mm

#### TECHNICAL INFORMATION

##### SEAPLEX

###### SOUND

8 x Meyer Sound UPQ-1P self-powered loudspeaker; 6 x Meyer Sound 600HP subwoofer; 4 x QSC AD-C81T subwoofer; 1 x QSC CX204V amplifier; 1 x QSC Core 500i DSP core; 1 x QSC TSC-3 control panel; Shure UHF-R Series receivers, pocket transmitters, and microphones; 1 x Yamaha 01V96VCM mixing console; 2 x Genelec 8030A monitor

###### LIGHTING & VISUAL

60 x Elation EPV6SMD panel; 1 x coolux Widget Designer ULT; 1 x coolux Workstation computer; 47 x Elation Design Wash LED Zoom moving head; 14 x Elation Platinum Spot LED Pro II moving head; 1 x High End Systems HOG 4 Road Hog console; 1 x Visual Production B-Station controller; 3 x Luminex DMX512-A 2.10 DMX hub





• Above  
The SeaPlex is a multipurpose space, which is used all hours of the day.

• Opposite  
The North Star was inspired by the glass cabinets of the London Eye.

he continued. “It’s one of the areas where ASC stepped in with its many years of experience and strong involvement. We have the equipment to install but it’s about knowing the constraints in terms of the sea movements, the reverberation effects, sea water conditions, sound isolation and how many loudspeakers can be installed in the space. By working together as a team we get the benefits of ASC specially manufacturing vibration-damped mounts for the loudspeakers. If the architects had their way there would be no loudspeakers at all!”

The audio set-up in these areas are configured as distributed systems, which is best suited to the requirements of the

space, whether that be a band performance in the undercover pool area or an event or movie night on the Pool Deck. “The boys in blue - the cleaners - use pressure washers in these areas and they just wash everything down, a light, a loudspeaker, they don’t care, so this system had to be robust,” said Chris.

For movie nights on the Pool Deck, a Daktronics DVX-1800 10mm LED screen measuring 7,049mm by 3,758mm has been installed and for the first time it’s been mounted bow to stern rather than port to starboard. The outdoor pool is slightly smaller than on the other ships because the undercover pool takes up some space that is usually used, hence the reason for the new mounting position. Christopher added: “The screen is very expensive but you get what you pay for. It’s on all the time and we’d like to get six to seven years out of it. We’ve put this product on a lot of other ships so we have a relationship with Daktronics, so we know the level of support we receive and the ease of maintenance.”

#### SEAPLEX

Moving through to the SeaPlex, a multifunctional space that is the largest indoor entertainment and leisure venue at sea. A lot of cruise ships are favouring these multipurpose venues now because space is at a premium. SeaPlex centres around a large sports pitch that can be used for bumper cars, basketball, five-a-side football or even a trapeze school and at night it’s used as a dancefloor. Plus around the periphery, there is ping-pong, fuse ball and Xbox 360 consoles. It’s a

space that is used every hour of the day and so the technology installed had to take all of that into consideration.

Eight Meyer Sound UPQ-1P self-powered loudspeakers have been mounted on the pillars that sit around the sports pitch and these are complemented by six Meyer Sound 600HP subwoofers that are primarily used in the evening when the SeaPlex becomes a party venue.

The wireless equipment provided in the SeaPlex is provided by the UHF-R Series from Shure. “We wanted to be able to offer some headroom in the sound system for certain events and charters. For example when Atlantis charter a cruise, they turn the system right up past the ceiling limit because it’s all their guests on board and there could be up to 2,000 people partying in the SeaPlex on that charter. So we designed the system with extra headroom on purpose, it’s not just about day-to-day operation.”

An Elation LED screen comprising 60 EPV6SMD panels is housed at one end of the pitch, the size is unusual but with the help of the coolux WidgetDesigner the software enabled the programming of two 16:9 screens. More Elation fixtures are mounted in the ceiling behind metal grills that have been put in place as safety measures. LED was once again important throughout this space as the fixtures are in use all the time and if they had been incandescent lamps, there would require regular lamp replacements. “That’s the single biggest improvement for us, floating and not having to buy and store spares. As we’ve been operating a couple of weeks, we’d be into lamp changing time now.

## TECHNICAL INFORMATION

### ESPLANADE

#### SOUND

21 x Meyer Sound UPJ-1P loudspeaker; 28 x Meyer Sound MM4; 7 x Meyer Sound MM10 subwoofer; 1 x DiGiCo SD11 console; 1 x DiGiCo D-Rack; 1 x QSC CX204V amplifier; 1 x QSC CX302V amplifier; 5 x QSC CX702 amplifier; 1 x QSC Core 500i DSP core; 1 x QSC TSC-3 control panel; Shure UHF-R Series receivers, pocket transmitters, and microphones; 1 x Riedel Artist digital matrix intercom system; 2 x Genelec 8030A monitor

#### LIGHTING & VISUAL

12 x Elation Platinum Spot LED Pro moving head; 14 x Elation Design Wash LED Zoom moving head; 4 x ETC Source Four Lustr+ Series 2 LED profile spot; 1 x High End Systems HOG 4 Road Hog console; 1 x Luminex Ethernet-DMX8 Art-Net-hub; 3 x Luminex DMX512-A 2.10 DMX hub





*"For all its complexity, the ASC entertainment network is very stable and definitely a perfect choice for any application involving signal transmission and distribution."*

We'd have done all the programming for at least three weeks before passengers came on board with constant lights on, lights off. So, yes, technology has helped enormously," said Chris.

Elation fixtures in the SeaPlex include Design Wash LED Zoom moving heads and Platinum Spot LED Pro II. Control is via another High End Systems console, this time a HOG 4 Road Hog when a full-on lighting show is required. Although for simpler control, an eight-way touch panel is in place with presets for every scenario, so whichever member of staff is coordinating the current activity can also control the ambiance by selecting the appropriate setting. It's possible to adjust the parameters within the modes, too, if necessary.

The audio works on a similar touch panel platform. "We have many different modes for the different activities, all of which are saved as presets in the QSC Q-SYS platform and then there are numerous Q-SYS TSC-3 touch screen panels to toggle between the presets. These things are set and forget. So basically we're doing to the same thing time and time again. Typically in the past, a technician would have to come in and set up the system and on the smaller ships it was manageable but on these larger one, it's not possible so the system has to be user friendly,"

Christopher explained. Ovation uses Q-LAN, QSC's network protocol for transport and control. "We grew with the market," said Christopher. "On board Oasis, we had a proper entertainment LAN for the first time but it was home grown, constructed by a company called TDI and we didn't really have the right switches, but we were learning. Then the market grew, and of course now you can buy the system whereas before it was a bit of an invention. It did work, but not as efficiently or as effectively as it does today."

For the shipyard, running the network over fibre and using audio protocols such as Dante was very attractive because before they were having to run big cables, so by using the Q-SYS platform the shipyard saved a significant amount of cable, and weight too. It's a massive change to go to fibre cable, but it's made life so much easier. There are five Q-SYS Core 500i processors, as well as a centralised Core 4000 for entertainment audio across the whole ship with a dedicated, redundant pair of Q-SYS Core 4000's for voice evacuation, known as PA-GA, too. Christopher explained further: "Not only to do we have what we call the 'ASC Entertainment Network' - an audio, video and control network, which besides other information transports the Q-LAN data of



**Eric Loader, Elation Professional Sales Director:**

"We began working with RCCL's design team back in 2007 when the first Oasis class ship designs started out. RCCL came to us looking for energy efficient, low maintenance and reliable solutions for various ship venues and we provided them with some of the first LED moving heads on the market back then, including our Design Spot LEDs and Elation Impression fixtures, as well as various LED strips and Pars for other areas of the vessel. Our European team, led by Marc Librecht, has worked closely with ASC and the ship yards to deliver the products. For every ship since the first Oasis, we have worked together to globally support and service RCCL and our partners along the way. Over the years, Elation products have proved not only reliable but we continue to offer more solutions to RCCL so that they are now included in all the major performance and event spaces on board the latest vessel, Ovation and newest Harmony ship, which was supplied by Videlio/HMS and features over 500 Elation LED lighting and video products. We are very pleased to say that now over a dozen RCI new-build and rebuild ships feature Elation products and we are proud to have provided an extremely reliable and energy efficient solution that has surpassed RCI's requirements and expectations."

**James Bradley, DiGiCo Technical Sales Engineer:**

"We're delighted that our involvement in the cruise industry has increased significantly in recent years. It's a very competitive market and, as entertainment is a huge part of the overall cruise ship experience, there is an expectation for quality from the cruise line's clientele; they expect to get the same experience they have when they go to a Broadway or West End show. This is a tough environment in terms of demands made on equipment. Reliability is paramount, particularly as the ships spend a long time away from port. We have a proven track record in both the theatre and live industries. In fact, our consoles have become an industry standard, which means they are instantly familiar to the engineers on board. Their compact nature is also an advantage in situations where space is limited and the session compatibility between different consoles in different locations makes it easy to move things around."

**Martin Barbour, QSC Product Manager, Installed Systems:**

"Projects like Ovation of the Seas are great examples of how the Q-SYS platform can solve a huge diversity of design challenges in a new, more modern approach to professional media processing and distribution. On this project Q-SYS is deployed as a full performance system for what is effectively a huge, floating entertainment district, as well as a fully standards compliant voice alarm system. By basing the Q-SYS on standard IT hardware, software and protocols, we can ensure that as a solution, it integrates perfectly with the ship-wide ASC Entertainment Network."

**Grégory Dapsanse, APG Marketing & Business Development Director:**

"The cruise ship industry is typically a niche market where APG is setting itself apart from the competition thanks to unconventional products and specific features - our entire range of loudspeakers comes with an anti-damp treatment as standard. Ovation of the Seas is the third cruise ship fitted with APG loudspeaker technology after Quantum of the Seas and Anthem of the Seas. Because of the drastic integration constraints and the level of sound quality required for the shows, Sound Designer, Hendrik Maassen reached out to us to work together on the loudspeaker selection and the specific work that was required in order to have a perfect sound coverage while keeping the sound system discreet. This for us at APG was an amazing experience which allowed to gain deep understanding and knowledge in such projects, which in turn allowed us to open new opportunities with audiovisual integrators in this segment. "

**John Monitto, Director of Technical Solutions for Meyer Sound:**

"Meyer Sound was once again selected as the main provider of professional loudspeaker systems for this prestigious project. The proven quality and reliability of the Meyer Sound products and support services have been a big factor in why they have been the primary supplier since the Freedom-class ships. Over the past 15 years, Meyer Sound and Royal Caribbean have developed an excellent relationship that has ultimately benefited the RCCL passenger entertainment experience. At Meyer Sound we feel fortunate to have been closely involved with the design and development of this next generation of RCCL ships. Early collaboration with the cruise line and their architects and designers is a key element in developing world-class entertainment spaces. But this is not the only project stage we're involved in. Later in the project, we work closely with the integrator, ASC to ensure that all the Meyer Sound systems are optimised to maximum performance. And last but not least we provide global support to the integrator and the cruise line after the Ovation of the Seas has entered into service. It's this holistic approach that has made our relationship with Royal Caribbean so enduring."

**Rik Hoérée, Sales Director at Riedel Communications:**

"On board Ovation of the Seas, the MediorNet network including MetroN and MicroN supports flexible routing of high-quality audio and video, while the Artist and Acrobat systems enable the clear, reliable communications critical for the complex live productions that are part of the cruising experience. We're proud that Riedel solutions play these fundamental roles on Ovation of the Seas and siblings, Quantum of the Seas and Anthem of the Seas, which are three of the world's largest and most innovative passenger ships."



the QSC Q-SYS platform and ASC are able to VPN into from Hamburg, so if there are any issues, they can go into the network and make changes - we also have a large fibre network for the Riedel MediaNet, which has been a huge success and was built in by TV Tools from Helsinki. It's all fibre and it's the same story for that, traditionally the yard would have to run around eight coax cables to 20 different locations around the ship but now we're just running them on fibre."

There is redundancy back-up for the back-up and back-up, which was designed by ASC Network Project Manager, Thorsten Heuer. He said: "The three ships in the Quantum series - Quantum of the Seas,

Anthem of the Seas and Ovation of the Seas - are all of them equipped with an ASC Entertainment Network and are all currently cruising the seas of the world. For all its complexity the ASC Entertainment Network is very stable and definitely a perfect choice for any application involving signal transmission and distribution."

**FLOWRIDER, WINDJAMMER, NORTH STAR**

After visiting the flowrider and the windjammer, which are covered by the same Community weatherised loudspeakers installed on the Pool Deck, Christopher described the length of the ➤

**TECHNICAL INFORMATION**

**MUSIC HALL**

**SOUND**

8 x Meyer Sound M'elodie loudspeaker; Meyer Sound MINA loudspeakers; 6 x Meyer Sound UP4XP loudspeaker; 3 x Meyer Sound UPM-1P loudspeaker; 5 x Meyer Sound UPJunior loudspeaker; 2 x Meyer Sound Gallileo 408 loudspeaker management system; 1 x DiGiCo SD8-24 console; 1 x DiGiCo MADiRack; 1 x QSC CX204V amplifier; 1 x QSC CX302V amplifier; 3 x QSC CX902 amplifier; 1 x QSC Core 500i DSP core; Shure UHF-R Series receivers, pocket transmitters, and microphones; 2 x Genelec 8030A monitor

**LIGHTING & VISUAL**

19 x Elation Platinum Spot LED Pro II moving head; 18 x Elation Platinum Wash ZFX Pro moving head; 8 x Source Four Lustr+ Series 2 LED profile; 1 x High End Systems HOG 4 Road Hog console; 1 x Visual Production B-Station controller; 1 x Panasonic PT-RZ12KU projector; 1 x Luminex Ethernet-DMX8 Art-Net-hub; 2 x Luminex DMX512-A 2.10 DMX hub





queue for the North Star - a viewing gondola in the shape of a jewel, for which the source of inspiration were the glass cabins of the London Eye - when it is in operation. It is operational when the ship is in dock at most ports and it gives guests the opportunity to admire the ocean from a height of more than 90-metres during a 15-minute ride. A lightweight, outdoor use lighting concept was required for the capsule, another task that fell to ASC and was implemented by Lighting Designer, Philipp-Sebastian Herbst and his team, who focussed on the subject of industrial cranes and glass cabins to achieve a customised lightweight light concept. The ASC team opted for specially manufactured LED spot strobes that are able to resist wind, sun and salty sea air, products such as a Seematz searchlight as a sky beamer and aircraft navigation lights as strobes were selected for the job.

#### ROYAL ESPLANADE

Yet another area for hosting events on board Ovation is the Royal Esplanade, a shopping mall interspersed with bars and restaurants. This was actually the area of the ship that masterminded the creation of the Meyer Sound MM10 subwoofer, which was designed specifically for Christopher's requirements. He needed a subwoofer that fitted into a lamppost on board Oasis of the Seas and for Ovation he replicated the philosophy. The subwoofers are in the bottom of the columns this time, which run the entire length of the shopping mall. The Meyer Sound UPJ-1P's cover the main area and under the square speaker cupboards there are Meyer Sound MM4 cubes to cover

the balcony. "The architect did a really good job concealing the system, there are a lot of openings, which lend themselves well for loudspeaker positions. We did a design with ASC and Meyer Sound, described where we'd like to have the loudspeakers and we more or less got what we wanted. The cabinets have built-in amplification and are very durable." A DiGiCo SD11 is in charge of mixing requirements in the Royal Esplanade. The architect continued with a discreet design for the lighting too, selecting Elation Platinum Spot LED Pro moving heads and Design Wash LED

Zooms in white, which are flush mounted to the ceiling on custom-made plates with four latches that allow the fixtures to drop down for easy maintenance access. They are supplemented by white ETC Series 2 Lustr LED profile spots.

#### MUSIC HALL

Towards the end of the Esplanade, guests will come to the Music Hall. It's another multiuse space with a bar on both the upper and lower floors. It's possible to use the Music Hall as a conference space, as a stage for cooking shows, fashions

### TECHNICAL INFORMATION

#### TW070

##### SOUND

2 x KV2 ESR215 loudspeaker; 13 x APG MX1GN loudspeaker; 22 x APG DX8 loudspeaker; 4 x APG TB215S subwoofer; 6 x APG SB115 subwoofer; 3 x Lab.gruppen C20-8 amplifier; 2 x Lab.gruppen C10-8 amplifier; 8 x Powersoft K6 amplifier; 1 x DiGiCo SD8-24 console; 1 x DiGiCo MADiRack; 3 x QSC CX902 amplifier; 1 x QSC CX204V amplifier; 8 x QSC AD-S32T loudspeaker; 1 x QSC Core 500i DSP core; Shure UHF-R Series receivers, pocket transmitters, and microphones; 4 x Genelec 8030A monitor

##### LIGHTING & VISUAL

18 x Panasonic PT-DZ21KE projector; Vistarama projection surfaces; 6 x RoboScreens; 2 x coolux Widget Designer ULT; 1 x coolux Workstation computer; 2 x coolux Pandoras Box Quad Server; 5 x coolux Pandoras Box Dual Server; 12 x Elation Platinum Wash ZFX Pro moving head; 24 x Elation Platinum Wash ZFX Pro XL moving head; 24 x Satura Spot LED Pro moving head; 6 x Elation Platinum Beam 5R Extreme moving head; 8 x Elation Platinum Spot LED Pro II moving head; 32 x ETC Selador Vivid-R Classic LED fixture; 4 x Martin by Harman MAC Viper Performance moving head; 8 x Martin by Harman Atomic 300 DMX strobe; 1 x Visual Production B-Station controller; 4x Luminex Ethernet-DMX8 Art-Net-hub; 11 x Luminex DMX512-A 2.10 DMX hub





shows, yoga classes and, of course, live music performances as well. “This venue was inspired by The House of Blues. We knew we wanted live music so needed a space for that and we knew we wanted a wooden dancefloor. This is a very popular venue,” said Christopher. Tech-wise, it is much of the same again with equipment from Meyer Sound, Elation, ETC, DiGiCo, High End Systems and coolux. Meyer Sound M  lodie and MINA cabinets make up the main PA for the Music Hall with fill provided by UP4XPs, UPM-1Ps and UPJuniors. As is usually the system is processed by three Meyer Sound Galileo 616 loudspeaker management systems. A DiGiCo SD8-24 and MADiRack is at home in the operating booth. ASC Sound Designer, Hendrik Maa  en added: “One of the reasons why I specify DiGiCo for offshore use is the excellent sound experience for the audience. The great sound is the result of its sophisticated Stealth Digital Processing technology, which inspires me a lot. There are a multitude of benefits associated with it. For instance, DiGiCo has achieved a high acceptance among a wide range of users and another benefit, which is extremely important at sea, is that DiGiCo consoles provide a high degree of operational safety for us. I appreciate the great support and good cooperation with DiGiCo.” Microphones for the Music Hall are provided courtesy of DPA, Sennheiser and Shure - the latter dominating the inventory. “We’re nearly all Shure wireless but we have to be careful with frequencies because there’s a European standard and a US standard. This ship is going to be based in China for now though, so it doesn’t matter too much.”

ASC used professional components including - receivers, pocket transmitters, and microphones - belonging to the Shure UHF-R Series to set up the wireless equipment integrated into the Music Hall. This makes it easy to set up, control, and monitor live acts using the Wireless Workbench software, and it guarantees a broad switching bandwidth and very good sound quality. Lighting is housed and directed mainly at the stage area. A collection of ETC Source Fours cater for the theatrical requirements. “There is no other light at the moment that is as close to the original Source Four,” said ASC Lighting Specialist, Philipp-Sebastian Herbst. “The Source Four LED Series 2 is the brightest LED fixture available. The tungsten version has a high CRI value, and we can achieve vibrant and saturated colours on the Lustr version. Though the LED version is not (yet) as bright as the conventional tungsten lamp, the Series 2, which was used on board the Ovation of the Seas is a big step forward to match up with the traditional version,” he continued. Elation’s Platinum Spot LED Pro IIs and Platinum Wash ZFX Pros add to the line-up, all of which are controlled via a High End Systems HOG 4 Road Hog. The visual element in the Music Hall on board Ovation is slightly different to that of its siblings, as Christopher decided to swap out the projector for the newer model. The Panasonic PT-RZ12KU features the laser light source, so there is no lamp to change in that either. “It runs HDMI over CAT5 with an extender. We also have a full video rack with tie lines down to the broadcast room, we can stream from other areas of the ship because we

have fibre everywhere so we can send stuff anyway we like,” said Christopher.

## TWO70

Our final stop on the tour was Two70, unsurprisingly, another multifunctional space. The centrepiece, with doubt has to be the visual installation comprising two spectacular creations - the Vistarama projection surfaces and the six Roboscreens, a term that is now patented. Before a show starts in the venue, the sun shields that serve as the projection surfaces are rolled down to cover the windows. This system - known as Vistarama - is then serviced by 18 Panasonic PT-DZ21KE projectors, which create imaginative scene designs on this innovative background. The technology is so sophisticated that, should maintenance work take place, the projectors automatically re-calibrate without affecting the projection mapping - using 64 light sensors that have been integrated into the window frames - to produce a seamless overall projection. Sebastian Kirsch, ASC Project Manager for visual systems worked closely together with Christopher and the Meyer Werft team supported by coolux and Moment Factory to achieve the best possible result. ASC manufactory designed and built a special, vibration damped mounting for each Panasonic projector. These allow the technical team on board to change filters and lamps in a very easy way, without changing the position of the projectors. The projectors slot back in to place, with millimetre precision. The slope, curvature and surface texture of the Vistarama projection surfaces requires the





• Above Elation and ETC fixtures make up the lighting inventory in Two70, something that is replicated throughout the ship, as are High End Systems consoles.

image content - developed by Moment Factory - to be geometrically adapted. "The result is a projection with a total resolution of 12,480 pixels by 2,280 pixels and a projection size of 36-metres by six-metres," said Sebastian. "To create this we have used the Pandoras Box media server and the Widget Designer show control software from coolux media systems. Pandoras Box provides the perfect tools for adjusting the image content in three dimensions in real time. Despite an extremely steep projection angle and the short distance between the window façade and the projectors, this so-called 'warping' process makes it seem like a single projector is projecting on a flat cinema screen."

The idea for the RoboScreens came into play about six years ago when Christopher met Casino Arts' Andy Flessas aka andyRobot. Christopher had heard about the creation and was intrigued to see it for himself, so went along to a Bon Jovi gig to see the RoboScreens in action. Christopher explained further: "I went to see the show, thought the concept was interesting and started talking to Andy, he a guy that's as eccentric as they come. I then started talking internally about it with my team. Then the Two70 room was envisaged knowing we would have two deck-high windows, so we thought the

robots and screens could go there. The design evolved and we ended up with six robots because the gantry that they're on goes up into the ceiling and when the robots go into what's known as their bedroom position, and don't even know that they are there.

"This is unlike anything else, we're getting real time telemetry from the robot about the position of the screen and from the coolux system we're able to move the screen and the video independently so we can get it to follow the screen, and it's all happening in realtime, it's unbelievable number crunching, and very clever. It's part of the show but this is essentially kinetic art."

To prove just how extraordinary the invention of the RoboScreens really is after Andy's work on the Quantum series of ships and the amount of press coverage it received, he is now employed by NASA to help them with their robotics recovery of material from asteroids. Because essentially, to get screens with robots to make the shapes and patterns that they do is the most complicated robotic project other than what they're doing for space exploration. Further recognition for the system was honoured when during Prolight+Sound 2016, ASC, Royal Caribbean and MeyerWerft were awarded a SINUS Award in the

entertainment category for the integration and management of complex projections and innovative content for the Vistarama and the dancing RoboScreens.

"We couldn't have done this without ASC's effort in the design phase, in particular for the video systems in Two70 as it was a long road to make that happen. Nobody has this set-up anywhere else, there is no venue in the world that has six RoboScreens on a beam that goes up and down - we created that. But as I said we're in the hotel business so we don't really have the right to create such things but the way we can do it is to partner with the right people and the right team - the manufacturer, the system integrator, the shipyard, the architects," said Christopher. As for the audio in Two70, it differs from the rest of the ship because after going through three different designs, an APG system was specified. "In this space there are so many things which are architecturally navel. The propulsion is directly below so we get the jelly effect - an official ship term - meaning the whole thing was moving. To combat the movement, the size of the columns had to quadruple. A lot of acoustic treatment was required too so we couldn't hear or feel the propulsion. It's a very complicated space acoustically and every time something changed we had to change the design of





• Above  
Two70 features  
Vistarama  
projection  
surfaces and six  
RoboScreens  
with visual  
content created  
by Moment  
Factory.

the sound system.”

The original decision for a classic line array concept changed because it would have interfered with sightlines too much. Instead KV2 ESR215 three-way full range loudspeakers were mounted on the pillars - one either side of the staging area - to provide the front sound system. Their slim line appearance means they are well-integrated into the architectural environment and they don't restrict visibility to the Vistarama.

The APG system comprises 13 MX1GN loudspeakers and 22 DX8 loudspeakers - all of which feature an anti-damp treatment as standard, which means they are capable of withstanding the harshest of environment. The majority of the cabinets are installed in the ceiling firing downwards to give an even coverage. The four APG TB215S subwoofers and six SB115 subwoofers are in the coffee tables on the deck, so the low energy is concentrated on the stage and surrounding seating area.


Sound Designer, Hendrik Maaßen said: “ASC asked me to be the sound designer for this amazing and challenging project. Because of the wonderful design of the venue, Royal Caribbean also wanted to use it as a lounge during the daytime, so they were looking for discreet loudspeakers, meaning they couldn't be optimally installed from a sonic point of view. Because of its amazing phase coherence and smooth conical dispersion, the APG

SMX15 coaxial loudspeakers proved to be the perfect choice for this particular application. We were able to create a high quality, evenly spread out coverage in the venue without any phase issues. When in the room, you don't really see the loudspeaker, you just feel immersed in the sound. I would like to thank APG for providing stellar professional support and expertise during the entire design phase and installation.”

The entire system is powered by three Lab.gruppen C20-8 and two Lab.gruppen C10-8 amplifiers, as well as eight Powersoft K6 amplifiers. Another DiGiCo SD8-24 and MADiRack have been installed in Two70. More Elation and ETC fixtures are at home again here, as are two High End Systems consoles, one HOG 4 Full Boar and one HOG 4 Playback Wing 4.

It's difficult to imagine the starting point on such a project, yet Christopher has done this over and over again for years now and to great success. He tried to pinpoint the initial stages: “It's a case of experience and it's a collaborative effort. Martin by Harman, Meyer Sound, Riedel, Clear-Com, SGM all those companies have someone who is appointed as a marine specialist, who deals with the cruise industry and they know what's needed. I don't have a team of technicians, it's just me, a laptop and my cellphone so we're completely dependent on vendors and manufacturers. So if they come to the table and say, we have this product, and

we know how you want it integrated and what you require from a service point of view, then we're already talking the right language.

“It is a bit of a buyer's market. So rather than us going to them, they're coming to us. It's all about relationships. If a company approaches me then I'm going to listen to what they have to say. Take the example of ASC as a system integrator. With a service provider we have the guarantee of them taking on a certain responsibility. ASC is obliged to ensure the whole system is running reliably and lives by this principle. The ASC team support us and Meyer Werft from the beginning of planning until completion of the technology installation and right through to getting the shop operational. They will go above and beyond the manufacturer's warranty to provide additional parts and extra warranty. You really have to know what you're doing to serve this industry.” Christopher's final word noted that, he is in fact not in the lighting or audio business, he's in the cruise ship business but he admitted entertainment technology plays a huge part in that. “In the 16 years that I've worked for Royal Caribbean, I've probably spent close to half a billion dollars on technology. It's all out there floating on those 25 ships, doing what it's supposed to do night-after-night, it's a 24-hour operation,” he concluded. 

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