

CASE STUDIES

Auditoriums

Unite Your Audience
The Martin Audio Experience



Martin Audio

At Martin Audio we believe that uniting audiences with exciting sound creates shared memories that sear into the consciousness delivering more successful tours, events and repeatedly packed venues.

We achieve this by an obsessive attention to detail on the professional sound system's acoustic performance, frequently challenging convention and involving a sophisticated mix of design, research, mathematical modelling and software engineering, to deliver dynamic, full-frequency sound right across the audience.

With over fifty years of live sound and installation expertise to our name, Martin Audio offers a wide range of premium professional loudspeakers so customers can be assured of selecting the right system for their chosen application, whether it's a small scale installation or a festival for over 150,000 people.



Auditoriums

Auditoriums, by their very nature rely upon a rich variety of usage and the importance of intelligible speech and music that envelops the audience, front to back, is critical to their success. Martin Audio has utilised a range of systems to deliver this experience around the world.



Lisner Auditorium, Washington DC



“ WE THINK IT’S FANTASTIC AND SO DO ALL THE USERS WHO HAVE COME IN SINCE THE INSTALLATION.

Lisner Auditorium, Washington DC

A fixture in Washington DC live entertainment since the Second World War, George Washington University’s Lisner Auditorium has hosted an eclectic mix of performers from Ingrid Bergman to Pink Floyd, along with leading world music artists, local opera and symphony companies and celebrated political dignitaries over the years.

But without a significant upgrade for many years, the university recently decided to overhaul the venerable auditorium with special emphasis on the sound systems in a bid to make the venue more competitive in terms of attracting high-profile talent. Selecting Martin Audio’s new MLA Compact system was a natural choice because its technology is definitely state-of-the-art.

The 1500-seat venue was the perfect size for the system, with eight MLA Compacts per side with a centre array of six DSX subs under the stage.

Since the upgrade, Lisner has presented a series of popular and well-attended world music concerts by artists such as the Brazilian singer-songwriter Gilberto Gil and Acoustic Africa, as well as the sold-out debate between Fox’s Bill O’Reilly and the Daily Show’s Jon Stewart.

Eric Annis, Production Manager and Technical Director for Lisner, was enthusiastic about the new MLA Compact, “We think it’s fantastic and so do all the users who have come in since the installation. We’ve had several televised events in a row and maintaining the sightlines within the auditorium is wonderful. The shows have run the gamut from loud electrical music to a single mic bluegrass band, and the MLA Compact system has proved to be equally articulate and clear.”

WPM Solves Acoustic Problems at Shibata Civic Cultural Center

Located in the central part of Shibata City, Niigata Prefecture, Shibata Civic Cultural Center was opened in 1980. Designed by architect Shozo Uchii, it has various facilities based on culture and art, including a large, 916-capacity hall, a practice room and conference room.

This Spring, the hall's sound system was renovated, and Martin Audio's Wavefront Precision Mini (WPM), which recently won a Queen's Award for Enterprise in Innovation, was the system of choice. Mr. Ikeura from Niigata Shomei Giken, the electrical contracting company who undertook the management of the contract, explained the rationale

"We have been taking care of Shibata Civic Cultural Center for many years, so we knew the problems they suffered from, and what was required for the operation. I believed WPM to be the perfect solution to resolve those issues. We were aware that the WPM optimisation system would deliver the same sound characteristics throughout all audience areas, and that we could control the reflections, which affect performers and musicians onstage. Of course, I tested this with the actual products in a venue, and the result was exactly as we expected, so it was an easy decision to proceed."

The venue itself is a semi-circular-shaped hall with upper balcony seats. In total, 20 WPM elements were installed for the side columns and proscenium, with Blackline X8 for infill. These are driven by Martin Audio iK42 amplification, with all signals to the amplifier delivered using a Dante audio network. In addition, the installers specified Martin Audio Blackline X12 for stage monitors and XD12 for side fills, making it sufficiently flexible for any application.

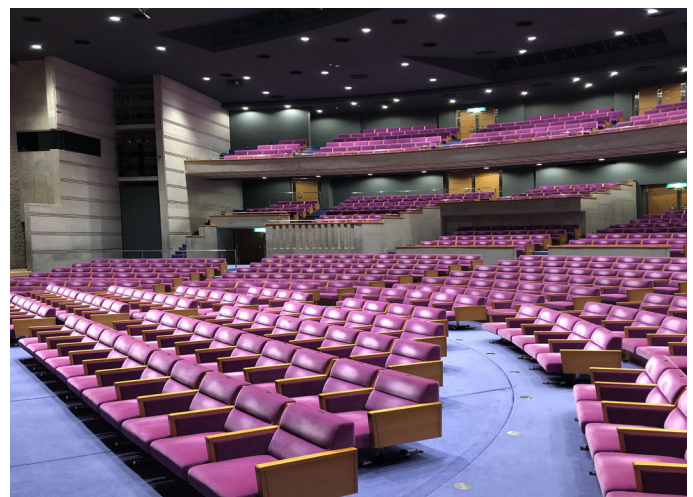
Mr. Inomata from Niigata Shomei Giken, who is in charge of sound operation in the hall, commented, "This audience area has quite a unique shape, and you can see the stage from wide angles, almost 180 degrees. On the other hand, it is generally difficult to create consistent sound in a venue of this shape."

In particular, the venue suffers acoustic problems caused by reflections to the stage, he continued. "Up to now, I had given up solving this problem because it was outside the range of adjustment. However, WPM is a different story, as it can clearly handle these issues. Yamaha Sound System took responsibility for tuning the system and everyone is 100% satisfied with the consistency of the sound field—it is now totally the same audio experience in all seats.

"The sound characteristic is similar everywhere in the auditorium, as WPM is deployed for both proscenium and as side columns. To combine the system depends on the performance, and the ability to control between loud volume and a much smaller sound. With WPM we can provide top-class sound quality to audiences at all events."



“ WITH WPM WE CAN PROVIDE TOP-CLASS SOUND QUALITY TO AUDIENCES AT ALL EVENTS. ”



TORUS The Perfect Solution for Tsukuba's Capio Hall



“ YOU CAN ADJUST THE ANGLE OF THE TORUS WAVEGUIDE EVEN WITH GRILLS ATTACHED AND THIS FLEXIBILITY IS SUCH AN ADVANTAGE IN SITUATIONS LIKE THIS”

Tsukuba Capio Hall, Japan

The Tsukuba Capio complex in Japan's Tsukuba city, Ibaragi, incorporates indoor sports halls, theatres and meeting rooms, while Tsukuba itself is renowned for being a scientific city of the future city. Opened in July 1996, Capio Hall has provided an authentic atmosphere for theatre and dance, with its distinctive seat arrangement and high-quality stage facilities.

Capio Hall recently underwent a major sound system overhaul, and new rigs were introduced, including the new Martin Audio TORUS as the main PA.

Nobuhito Endo, technical manager of rental company Sigma Communications, who support the theatre, set out the reason for the upgrade and his choice of TORUS.

“Originally, the proscenium centre loudspeakers were exposed, and a cluster of several point-source systems was flown from the grid. Naturally, we considered utilising a line array replacement but found a problem. While the hall wasn't very deep, the three-storey horseshoe layout of the auditorium was vertically too great for the coverage angles.

“It was quite clear that a considerable number of line array cabinets would be needed if we wanted to provide complete vertical area coverage from its highest point, without converging on the frame of the stage.”

It's then that the Constant Curvature array solution came to mind. In venues with high ceilings but requiring short throw Martin Audio's new TORUS rig offers a practical solution. Full-blown line arrays would be impractical and cost-prohibitive for a 15- to 30-metre depth hall. However, a point source solution such as this would provide sufficient coverage and SPL. As a constant curvature array

TORUS is designed to completely compensate all the gaps by combining optimised coverage, perfect SPL and cost efficiency.

During the renovation process a vertical array comprising four cabinets—two each of the T1215 and T1230, offering 15° and 30° vertical dispersion respectively—were deployed in grids at the proscenium to cover the vertical 90°, angled to deliver the sound from the third floor to the front seat of the first floor. Furthermore, a Martin Audio XD12, supplemented by SX118 subwoofer, was specified for the side column and powered by iK42 DSP amplifiers. For infills and balcony seats, six Blackline X8 were deployed.

Takahisa Ota, who was responsible for the tuning of the system, said, “Originally, we planned a front wide / back narrow dispersion pattern, but as we adjusted this while listening to the sound, we discovered that specifying everything to a horizontal 90 degrees would give a better coverage. In that way, the proscenium could cover 80% of the venue. We adjusted the delays and SPL of the Blackline X8s so that they were blended to the proscenium, to cover the remaining tiny area. You can adjust the angle of the TORUS waveguide even with grills attached and this flexibility is such an advantage in situations like this.”

Mr. Endo concluded, “Capio Hall has to meet the requirements of various types of public events. Recently, students' dance presentations have been taking place frequently, and consequently a higher level of sound pressure has been required. In this application, TORUS and the subwoofers have enough headroom to cope, and I am extremely satisfied with the choice of the new sound system.”

CupOJoy Selects WPS for Permanent Sound Installation



CupOJoy, Green Bay, Wisconsin

CCCP conducts full AV integration at Green Bay music venue, run by volunteers

Some 33 years after it was founded, the 550-seat CupOJoy live music venue in Green Bay, Wisconsin, has taken delivery of its first permanently installed sound system in the larger space within the two-auditorium venue to which it relocated two years ago (having successively occupied two previous locations).

Part of a complete audio-visual fit-out masterminded by local system integrators CCCP (Camera Corner), a cutting-edge Martin Audio Wavefront Precision WPS line array was specified after careful evaluation against other leading brands.

Since the facility—whose mission is to be a family-friendly venue, offering ‘music that inspires’—is a non-profit organisation run by volunteers, the two-year fund-raising programme, leading up to the investment, required an outcome that would please operators and donors alike. And the WPS has certainly delivered.

As CupOJoy’s Technical Director, Mark Berg, put it, “When we fired up the PA for the first time before the launch event I was flabbergasted by the quality of the sound, and [CupOJoy director], Jan Oettinger, said she was moved to tears. After the benefit concert two days later, multiple people came up, including one of our donors, stating that it sounded ‘amazing’.”

As this is the first sound system installed in the main space, in view of the size and scope of the room, it presented a major challenge, confirmed Oettinger.

Reviewing the process that had led to this deployment, she explained that three potential vendors had been interviewed. “When we compared the different proposals, we felt Martin Audio offered the expediency of delivery, was rider friendly and provided better value for money.”

CCCP had been more transparent than the others, she said “and laid it right out there. They also took us to another venue where they had installed WPM [Martin Audio’s smaller format line array] so we could hear the sound.” And that became the deal maker.

CCCP had previously worked with Martin Audio point source systems for a couple of years with the WPM installation marking their first Martin Audio line array experience. They too offered several alternative, rider friendly brands for evaluation prior to the Martin Audio solution being adopted. But the operators were in no doubt. “We had done our own research, both online and talking to FOH engineers we know, and received a lot of positive feedback,” continued Jan Oettinger, who has been at CupOJoy virtually since the beginning.

“Besides, having experienced other sound systems in the room with touring artists’ own production we felt like the Martin Audio sound was superior to anything we had heard in the room previously.”

CCCP's Steve Littlepage was tech head and system designer. He detailed two WPS line array hangs, seven elements per side, driven in single box resolution from two Martin Audio iKON iK81 amplifiers (with channel 8 of each iK81 used to drive DD6 front fills). These are set either at the edge of the stage, or operate on a thrust with a different system preset. Four SX218 subwoofers, driven by the iK42, are flown in an end-fire configuration and aligned with the arrays.

Mark Berg pointed out further advantages of reduced real estate in having the iKON multi-channel, process-controlled amps. "It means we can run the entire system off just three amps instead of many more required in the rack with the other two systems [we reviewed]. It was one of the main selling points of the system."

But given present supply problems, the fact that all this ordinance was delivered to site for the opening benefit concert, said Littlepage, had been due to the efforts of Martin Audio's Martha Callaghan. "She was amazing—she went above and beyond to get everything to us in time."



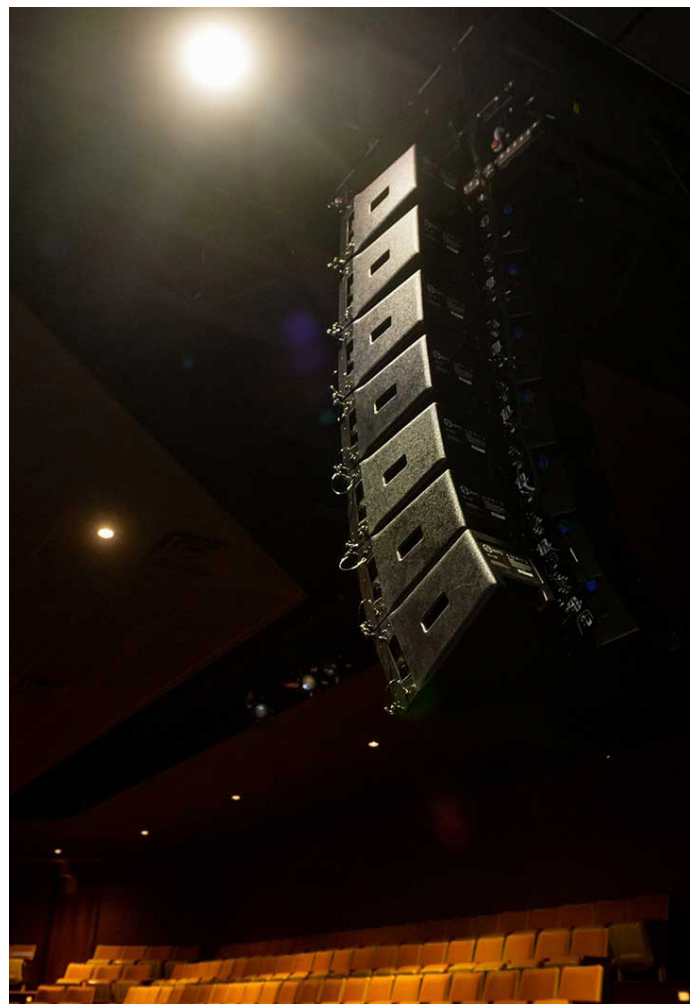
“ ANYONE THAT’S ALREADY HEARD [WPS] LOVES IT. I CAN’T IMAGINE ANYONE NOT BEING ENAMOURD.

In terms of system set-up and optimisation, the CCCP engineer said this couldn't have been easier using Martin Audio's DISPLAY 2 and 3 software (for 3D modelling of the space). This was backed up by EASE plots, which lined up perfectly with Martin Audio's modelling, he said.

As part of the requirement, CCCP also provided new projector, screen and PTZ cameras, and created a flexible infrastructure for touring productions to patch into the system with their control. Crucially, this will also be networked to CupOJoy's smaller 200-cap venue across the hall, where an appropriate PA is installed. A Q-SYS backbone provides system flexibility between Performance mode for concerts and a Presentation mode via touch panel or iPad app, for corporate events.

Reflecting on the installation, Mark Berg summarises as follows: "Anyone that's already heard [WPS] loves it. I can't imagine anyone not being enamoured."

This sentiment is endorsed by Jan Oettinger. In conclusion she says, "The new sound system means the world to us and will make a huge difference to our programming, as I can now plan bigger. When [acts] walk into the room now, they know they can leave their production on the bus!"



MLA Mini Chosen for Oslo Uni's Famous Aula

A Martin Audio MLA Mini Multi-cellular Loudspeaker Array has been installed at the University of Oslo (UiO) flagship auditorium - replacing the previous PA system.

The integration was carried out by Atendi AS, Martin Audio's pan-Scandinavian distributors, and the installation itself is in the Aula, the University's famous ceremonial hall, known for its festive events, concerts and art. In fact from 1947 until 1989 it hosted the Nobel Peace Prize, but when that auditorium gradually became too small, the ceremony was moved to the Oslo City Hall.

The Aula's connection with Nobel today revolves around the Nobel Lecture, which is frequently presented there, while many other civic dignitaries also give lectures. In addition, the Aula is used for a number of high profile events such as the Oslo Opera Festival, as well as classical concerts ranging from the Norwegian Radio Orchestra 70th year jubilee concerts to small jazz concerts.

According to Øystein Wierli, Head of Audio Sales at Atendi, this is the conclusion of a long-running journey, which began nearly two years ago. During the bidding process six speaker brands were invited to conduct demos, with Atendi successfully auditioning the award-winning Martin Audio MLA Mini at the end of September 2015.

COWI Norway was the specialist consulting company, and Geir Kristoffersen, Head of Section Acoustics, Noise, Vibrations, Electroacoustics, Stage and AV, produced system specifications in collaboration with the technical crew at UiO and colleagues at COWI.

Having had experience working on concerts in the Aula some years ago, Wierli knew the task he faced. 'My first idea to solve the problematic room, with its long reverb time, was MLA Mini. The venue itself has a glass ceiling, a wooden floor and marble walls decorated with Munch paintings. This makes it acoustically very challenging.'

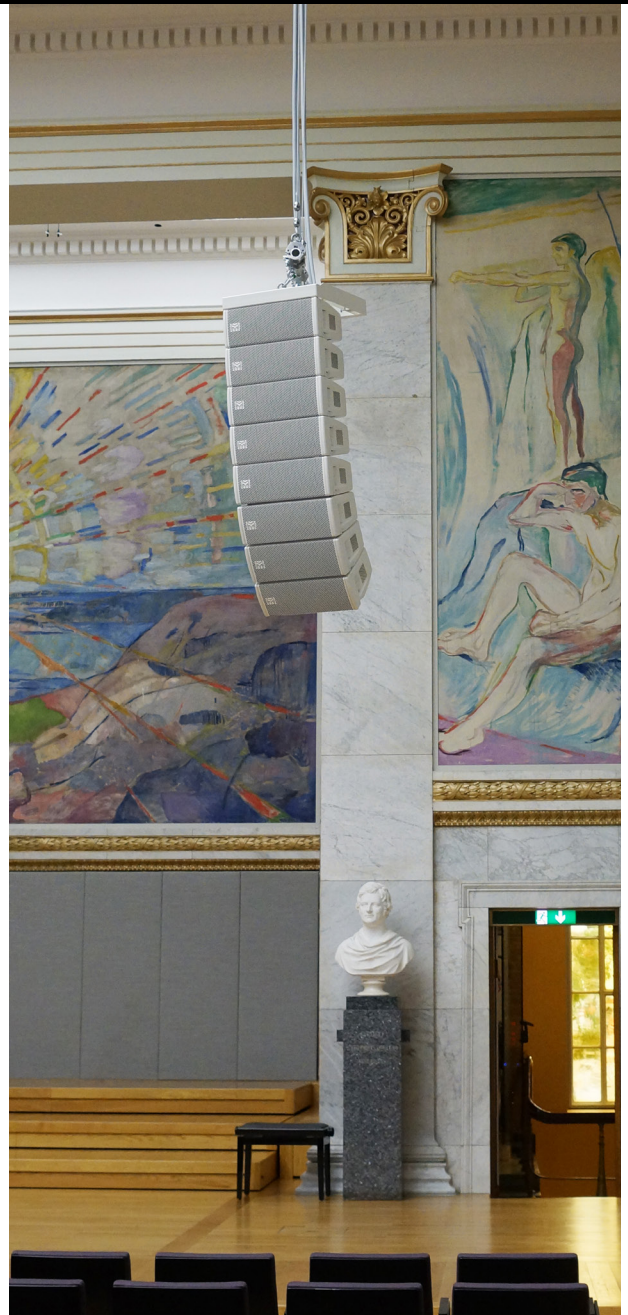
However, MLA Mini was only adopted after intense testing and measurements conducted in September last year by COWI, but consistently MLA Mini provided the system with the most even coverage.

'One of the requirements was that the PA system needed to be supplied in white in order to minimise the attention the loudspeaker system normally commands in a setting

“ MY FIRST IDEA TO SOLVE THE PROBLEMATIC ROOM, WITH ITS LONG REVERB TIME, WAS MLA MINI.



Auditorium, University of Oslo



like this,' Øystein continued, 'with consistent coverage throughout the whole venue being a further prerequisite.'

During commissioning, it was very obvious that a distinct 'slap-back' echo could be heard in the front row of seats from the upper balcony at the rear of the hall. By using MLA's unique 'Hard Avoid' feature, it was possible to reduce the energy in that part of the room, losing the distinct echo completely.

The new PA design is based around eight MLA Mini and two MSX subs each side of the stage. Atendi also installed a front fill system consisting of four DD6 speakers, a delay system comprising a further pair of DD6, with two more DD6 as floor wedges. All amps were installed in a single rack in the attic above the Aula.

The new PA rig will now be used on a daily basis, as the Aula conducts guided tours of the venue (the attraction being the Munch paintings). Hence the tour guides will also use the new MLA Mini for speech reinforcement. In

addition, the venue will also host concerts, receptions, press and media events, and so the sound system will be subjected to an arduous duty cycle.

The installation was project managed by Atendi's Lorry Kristiansen and Øystein Wierli himself, while Martin Audio's Product Support Engineer, Robin Dibble supported both the demos last year and the commissioning. 'He is a fantastic person to have on jobs like this,' Øystein enthuses, 'and the success of this project has meant that MLA Mini in white will be an ongoing available variant from Martin Audio.'

As for the Martin Audio distributors, Atendi Norway started out in 2010 as Elektrik Solutions, before changing their name at the beginning of this year. They formed a joint venture with Bico in Copenhagen, and also opened an office in Gothenburg at the beginning of this year. So the Atendi name is now consistent throughout the Nordic countries, with distribution of Martin Audio beginning in September 2015.

University Chooses Martin Audio for College Of Arts & Media

Lakeland, FL—The recently completed College of Arts & Media facility at Southeastern University benefits from a full complement of Martin Audio including an O-Line micro line array system in the auditorium along with CDD and CDD-LIVE speakers in the music and practice rooms.

MABE in Lakeland was the integrator for the project and Lead Account Manager Steve Griner explains, ‘The College of Arts & Media is a new multi-use facility, with classrooms and an auditorium on the ground floor. The Martin Audio O-Line is installed in the auditorium that serves as a large multi-purpose lecture hall used for lectures, guest speakers and music ensembles.

‘The space has a raked floor with the seating sloping down to a podium on a sunken stage below a large 16 x 9 projection screen in the center and the speakers alongside. We mounted the O-Line on the wall in a left-right configuration with eight enclosures on each side and two CSX subs flown

from the ceiling—all powered by Martin Audio amps. The original idea was for a Surround system which led us to the O-Line because we felt the University could build off those speakers and add side fills and a center channel later if we needed.’

Asked about the O-Line’s performance, Steve says, ‘We really didn’t know O-Line that well before the install but we loved the compact size, sleek, curved shape, and how the speakers fits seamlessly into the space. And, most important, the University is very happy with the system and pleasantly surprised by the impressive volume, SPL, clarity and lower frequency response from such a small box.’

Ian Fritzsche, Director of the Media Services Department for the University, confirms Griner’s comments with added perspective: ‘We think of the facility as a ‘live-learn’ building with four stories and a mezzanine including the College of Arts & Media and standard classrooms, a food



College of Arts & Media, Southeastern University

court and two levels of dorm rooms. The building is split with a walkway in the middle.

“ THE UNIVERSITY IS VERY HAPPY WITH THE SYSTEM AND PLEASANTLY SURPRISED BY THE IMPRESSIVE VOLUME, SPL, CLARITY AND LOWER FREQUENCY RESPONSE FROM SUCH A SMALL BOX.

‘The 200-seat lecture hall is the flagship space for the building,’ Ian continues, ‘but challenging in terms of finding the right speaker system because it’s bigger than a classroom and smaller than a huge auditorium so a typical line array system would be overkill in terms of being visually obtrusive and overwhelming in terms of the sound.’

‘We needed a speaker system that could easily cover anything from one professor with accompanying video or PowerPoint presentation to a theater for films and a concert space for electric bands and small acoustic ensembles. So, we had to put in a sound system that was capable of handling anything we could throw at the room.’

‘In terms of the installation, we flattened out the unique triangular pointed acoustic wall framing on either side of the projection screen so the O-Line speakers could be easily mounted on the wall. We also installed an Allen & Heath GLD-80 console with a Crestron control system for the audio so a professor can walk in and play a video without a technician. But we can also use it with an engineer and fire up additional inputs, so we have exceptional flexibility with the system. It’s very scalable for all kinds of events.’

“ THE O-LINE HAS BEEN GREAT. THE SYSTEM EASILY FILLS THE ROOM WITHOUT BEING OVERBEARING OR OBTRUSIVE. IT HAS A VERY SMALL FOOTPRINT, SO YOU HARDLY KNOW THE SPEAKERS ARE THERE UNTIL THEY’RE ON.

Martin Audio CDD and CDD-LIVE speakers are also a centerpiece of the College’s music spaces: ‘We have two CDD8s mounted in the rooms that are used for music and piano instruction and percussion practice where they need better playback quality,’ Ian points out. ‘Also, there’s a large orchestra rehearsal room with two CDD-LIVE 15s, which sound fantastic and really fill out the room.’

Asked about the O-Line’s performance, he concludes, ‘As it turns out, the O-Line has been great. The system easily fills the room without being overbearing or obtrusive. It has a very small footprint, so you hardly know the speakers are there until they’re on and their appearance blends right into the feel of the room. They have more than held their own for every event, so I’m very happy with them.’



Brauer Hall Upgraded with Martin Audio

TSI Global recently upgraded Brauer Hall, a handsome and elegant 800-seat auditorium at the Mary Institute and St. Louis Country Day School (MICDS), with a Martin Audio O-Line system.

Asked about the project, Paul Murdick, General Manager, TSI Global Companies LLC, explains: 'The school came to us because they wanted a more multifaceted sound system for background music and pep rallies instead of voice only.'

'We recommended and designed a Martin Audio solution with O-Line based on the system's compact size and unobtrusive aesthetic appearance that blends seamlessly with the hall's modern, curvilinear architecture while delivering the coverage that was required.'

'The client thought they would need under balcony fills,' Paul continues, but once we mapped it out, they were pleased to find out the additional expense of dedicated speakers wouldn't be required--which added real value to the system. Now they're getting excellent coverage in the main seating, balconies and under balconies and are very pleased.'

Describing the acoustic challenges implicit in Brauer Hall, TSI Global Audio System Designer Lee Buckalew adds, 'The auditorium is all hard surfaces and the room's shape is essentially oval or parabolic with curved front and back walls. We know that O-Line would provide consistent balcony and under balcony coverage along with a level of coherence in the reflected sounds that we would inevitably have to deal with in such a live space.'

'The under balcony section floor to ceiling measures only around 8 ft. tall at the beginning, while the balcony wraps around the back side of the room facing the stage. Also, the front rows are located roughly within six feet of the speakers, which makes it even more challenging.'

To overcome these issues, TSI set up 16 O-Line enclosures at each side of the stage. They also installed Martin Audio PSX powered subs in niches alongside the acoustic reflector at the proscenium wall.

'The previous system was powered and housed in those niches,' Lee points out, 'so we had existing line level wire and power circuits available. That eliminated the need



Auditorium, Brauer Hall



“ O-LINE IS A NIGHT AND DAY DIFFERENCE FROM WHAT THEY HAD BEFORE IN TERMS OF THE COVERAGE AND AUDIO QUALITY.

to install new speaker cable back to an amplifier room, which would have required a lot more expense and labor. In addition to bass reinforcement, the PSX has a second channel of amplification to power the O-Line arrays. It also provides full compatibility for VU-NET software and access to a full range of DSP functions as well.

‘From a coverage standpoint, the issues had been overall level balance throughout the room and intelligibility in what is an acoustically ‘live’ room. Given that we couldn’t do acoustic treatment to the space, we wanted to provide even coverage so that reflections were also phase and frequency coherent, and O-Line was a good choice for that in a very compact enclosure.’

Commenting on the client’s reaction to the upgrade, Lee sums up, ‘O-Line is a night and day difference from what they had before in terms of the coverage and audio quality. Tom Wyman, Director of Technology, and other MICDS staff are just ecstatic. Before, teachers who would come into the back of the hall couldn’t understand what was being said on stage. All of that has changed completely with Martin Audio O-Line. The system represents a truly phenomenal change.’

Photo credit: Catina Bryant



Spanish Congress



Palacio Congreso Oviedo, Spain

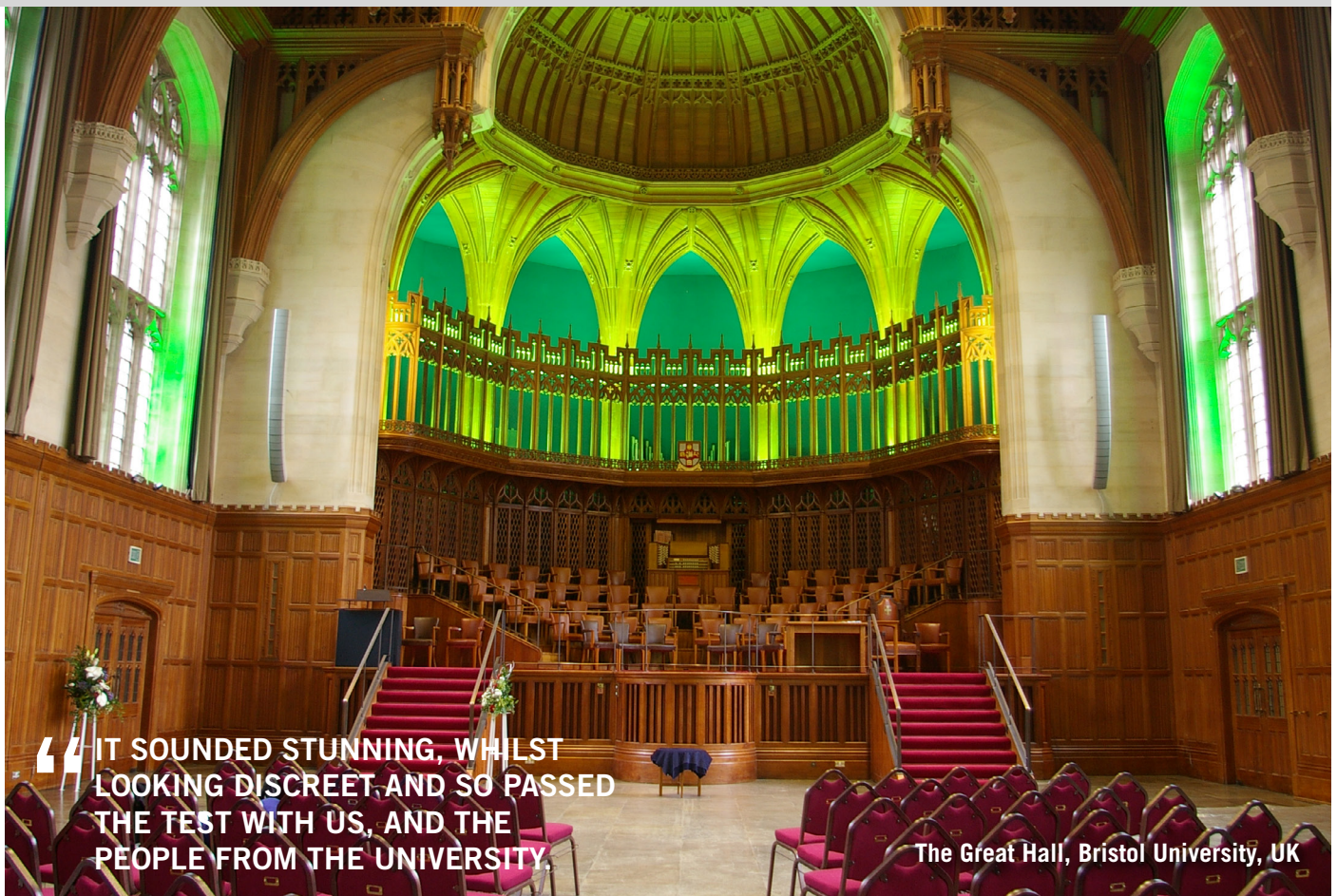
The Congress Palace (Ciudad de Oviedo), which opened in 2012 in the heart of Spain's Asturian capital, has already become a new symbol for its spectacular architecture. Designed by Valencia-born architect Santiago Calatrava, this visually stunning 2000-seat auditorium has complex geometry with high reverberation time. The choice of sound system was therefore critical — and after an extensive study of electro-acoustic systems the decision was taken to specify an O-Line® micro array system from Martin Audio.

According to Marc Rovira, product manager at Adagio Pro, the Martin Audio distributor in Spain, in order to achieve optimum intelligibility given these challenging conditions, it was logical to propose a system with a large coverage control pattern, especially in the vertical plane. Thus two hangs of 24 O-Line elements, with a 2.82m drop, have been flown on either side of the stage.

As well as providing the acoustic quality and coverage necessary, it also speaks volumes to O-Line's discreet design that perfectly suited the Congress Palace.



The Great Hall, Bristol University, UK



IT SOUNDED STUNNING, WHILST LOOKING DISCREET AND SO PASSED THE TEST WITH US, AND THE PEOPLE FROM THE UNIVERSITY.

The Great Hall, Bristol University, UK

One of the UK's most important gothic buildings commissioned a new audio infrastructure to extend its functionality within the precincts of Bristol University.

With its two balconies, The Great Hall of the Wills Memorial Building can seat up to 900 people for plenary lectures and 270 for banqueting. Hosting a vast range of functions and events, including Christmas carols, organ recitals, graduation day ceremonies, VIP and academic lectures — as well as third party rental providing an additional revenue stream, it therefore required a versatile sound system.

The entire integration at Wills Memorial Building was undertaken by locally-based contractors, Sounds Commercial, and was constructed around two 24-box hangs of Martin Audio's O-Line micro line array.

O-Line is a versatile, micro line array designed for installation in a wide variety of architectural environments. Its modular approach and scalability extend its use from foreground applications to sound reinforcement in large acoustic spaces. Intelligent software enables an array to be configured to deliver sound precisely over any vertical angle to fit the venue profile, without spilling onto surfaces where sound is not required. Additionally, elimination of high-frequency side lobes gives O-Line the advantage over currently available DSP-steered columns, making it suitable for high quality music reproduction as well as speech in large reverberant spaces.

Perfect criteria then for a high vaulted space such The Great Hall, surrounded as it is by the academic teaching spaces of Bristol University.

“What we were looking for was clarity, evenness of coverage and directivity because it's all teaching space around here and so containment was important; there were also the aesthetic concerns. We just fed the system with a CD and radio mics — it sounded stunning, whilst looking discreet and so passed the test with us, and the people from the university”, said Sounds Commercial's project manager, Blake Gifford,

A biamped solution was recommended, with the entire system run from Martin Audio's four-channel MA6.8Q. By splitting the system into biamp mode Sounds Commercial were able to provide increased punch at the back — with 3dB boost for the top eight boxes, firing at the balcony. Given the high directivity of the line array no delay system was necessary.

In addition to O-Line, two Martin AQ28's face back from the stage pillars to provide performance monitoring, while a further pair of AQ6's provide booth monitoring up in the control room.

“We have been fortunate in that there hasn't been any kind of acoustic treatment necessary,” summarise the Sounds Commercial project team. “In fact very little processing has been necessary.”

Gab Provide Heriot-Watt Lecture Theatres with MLA Mini & O-Line

Scottish-based GAB Audio Engineers called on all of their three decades' experience when recently equipping Heriot-Watt University (HWU) with a variety of flagship solutions from the Martin Audio portfolio.

The sound requirements were part of a major refurbishment of two lecture spaces - James Watt 1 (JW1) and James Watt 2 (JW2) - which form part of the University conference centre. Discussions with Martin Audio began at the ISE Expo in Amsterdam, back in 2016.

Stated GAB Director, Jim Bryan, 'Our relationship with Martin Audio started in the mid-90s when we were looking for high quality loudspeakers for our hire stock. We invested in Wavefront, then soon started to install EM series, Blackline, AQ series and most recently CDD in our church systems. It was therefore logical to turn to Martin Audio again to meet these requirements.'

In fact, GAB, which was originally set up in 1984 to specialise in a range of hire and installation services, principally for Houses of Worship and Local Authorities, had been introduced to Heriot-Watt by Martin Audio Account Manager, Richard Van Nairn after they had seen the Scottish integrators referenced on the Martin Audio website.

Martin Audio's Product Support Engineer, Robin Dibble, duly met with GAB and the University AV team on site, and produced modelling of the rooms' response using Martin Audio software. 'Having heard the systems previously, HWU Technical Supervisor, Neil Macintyre, was happy to place an order for the installation,' confirmed Jim Bryan.

'Consequently, we specified left and right hangs of four MLA Mini, each flown below an MSX subwoofer and power-plant for JW1 and two O-Line hangs of eight elements



Heriot Watt University Lecture Theatre



with a ceiling mounted CSX112 sub for JW2.’ Power was provided by Martin Audio MA5.0Q and MA2.0 amplifiers.

This met the requirement for high quality sound reinforcement, in both spaces. JW1, the larger room, is used for conferences and various live events as well as lectures. The room has retractable tiered seating, so the ability of MLA Mini to have preset coverage and EQ settings for the changing coverage patterns between flat and tiered,

“ THE MLA MINI HAS SOLVED THE COVERAGE PROBLEMS PREVIOUSLY EXPERIENCED, PARTICULARLY WHEN THE ROOM WAS BEING USED FOR LARGE SCALE FORMAL DINNERS, AND NOW PROVIDES EXCELLENT AUDIBILITY FOR LECTURES TO THE BACK OF THE TIERED SEATING.

allied to its exceptional sound quality and small size, made it the ideal choice, according to Jim Bryan.

‘The hangs were carefully located, somewhat wider than usual, to avoid interfering with the projection lines required

for the 14m screen. The hangs had a 14 degree toe-in to ensure good horizontal coverage and still provide a hard avoid area at the Lecturer Control desk.’

For JW2, which is mainly speech based, O-Line was ideal, he concluded, ‘as the sleek modern lines blended well with the modern teaching layout of collaborative learning desks spread throughout the space.’

The installation was carried out at the end of the overall refurbishment phase, as flying points were provided from the ceiling void, and cabling could be accessed from above. In each room, audio is provided from the AV systems and is largely automated via touch panel. In JW1 a digital mixing desk takes control for larger live events.

In conclusion, Jim Bryan states, ‘The MLA Mini has solved the coverage problems previously experienced, particularly when the room was being used for large scale formal dinners, and now provides excellent audibility for lectures to the back of the tiered seating.’

Final tuning was carried out by Robin Dibble, GAB and the HWU staff, who are said to be extremely pleased with the result.

O-Line Meets Pure AV's University Challenge



**“ WE LOVE THE SYSTEM
FOR ITS VERSATILITY**

University of Cumbria

System integrators Pure Audio Visual have been achieving increasing success with Martin Audio's discreet O-Line micro array systems in university lecture and room multi-purpose facilities as its reputation spreads.

Pure AV Systems Specialist Colin Hasted has helped this award-winning system open up a vibrant new channel for a product that has traditionally been more prevalent in the HoW sector.

“Since receiving budget approvals, universities in the north west, in particular, have gone for this in a big way — adopting O-Line through example,” he says. “O-Line has proved ideal for awkward, multi-purpose spaces with difficult acoustics, where a discreet solution is required. As a result, we have O-Line in well over half of the north west universities and all the Liverpool universities — with more to come!

“This solution stresses the importance of the audio component in AV integrations which have historically been dominated by video. At times when multi-media / high impact learning is so prevalent, clearly distributed audio, as demonstrated by O-Line, helps to boost concentration and remove any fatigue.”

Situated at the University of Cumbria, the Energus events/conference venue in Workington is the place where Pure

AV's O-Line journey began around five years ago. Pure AV were approached to provide a complete AV solution for their state of the art training facility in Lillyhall. “It was a lecture theatre in a circular/cylindrical room with a horrendous acoustic,” Colin Hasted remembers.

“Prior to Pure AV's involvement, the client's expectations for their centrepiece auditorium was mono pendant speakers — since the auditorium was round, and the roof rose steeply from the rear of the room. Space was also an issue as any standard speakers would be extremely close to the presenter area. “

Using the Martin Audio O-Line software, Pure AV demonstrated that good quality FOH reinforcement could be achieved without excessive spill — both into the ceiling void and presenter area by precisely controlling the directivity.

They specified an eight-element O-Line array each side of the projection screen in traditional theatre format, along with Martin Audio AQ5's and AQ112 single 12in sub. “This gave them full 5.1 surround sound, something the client didn't think achievable.”

Word spread fast and other educational establishments were quick to follow. Immediately impressed with the Energus install had been Redcar & Cleveland College, where their

performance space and conference room was soon boasting a similar pair of eight-cell O-Line hangs, a perfect dynamic solution for a multi-functioning space.

At the 264-capacity Main Arts Lecture Theatre (MALT) at Bangor University Pure AV designed an L/C/R O-Line set-up with a central hang of four elements flanked by two six-box hangs having demonstrated that the system could provide even coverage and excellent intelligibility, obviating the need for a separate vocal PA system. With some low-end reinforcement the system was sufficiently dynamic to make light work of even the most demanding surround sound content.

But Universities have differing uses for their multipurpose spaces. Lancaster University (LICA), for instance, is a performance arts facility that posed new challenges. The building is entirely built from wood and thus had reverberation issues. Specifying the O-Line system meant that the audio could be accurately aimed to limit any hard reflections from the back wall. As this is mainly a drama space, speech intelligibility, especially from head and lapel mics, was paramount and care was needed to place the sound away from the stage and firmly in the audience.

Also situated at Lancaster University, the Bowland Lecture Theatre/Cinema is another multi-purpose space requiring excellent speech intelligibility and even content playback for its role as a lecture theatre; but once lectures are finished for the day the room converts to a student cinema. Again, two eight-element hangs of O-Line, with a little low end reinforcement, met all the requirements perfectly.



The success continued in Liverpool where John Moores University was the recipient of twin O-Line eight-cell hangs, with further twin O-Line six-cells in two smaller spaces. Using different array sizes in the three theatres not only suited the theatre dimensions but also ensured consistent voicing across all theatres, notes Colin Hasted.

Based nearby, Liverpool's Hope University approached Pure to look at their Everton Hall. The existing set-up was a distributed system mounted high above the space. With its vaulted ceiling, the hall's distributed system was simply 'exciting' the room too much. Pure AV opted for the O-Line as they were confident that the excellent directivity of the unit could bring the room under control without the expense of sympathetic acoustic treatment. With the twin eight-cell O-Lines installed, the facility can now host everything from lectures to live performance.

At University of Manchester, Pure AV replaced the existing line array which, despite having the volume required to fill the room, didn't have the necessary directivity to tame the poor reverberant acoustics in the University Place building, with its high roof void. They designed a system for a 600-seat main room, expandable to 1000 when the overflow space is incorporated into the main space. This required greater muscularity and the L/R hangs of 12-cell O-Lines are complemented by twin six-cell O-Lines at the mid point and a further repeated delay of four elements per side at the rear to overcome the acoustics for conferencing and lectures.

At Keele University's 400-seat Westminster Theatre Pure AV specified further stacks of 12-cell O-Lines along with a Martin Screen Sub (from its cinema portfolio) which recesses into the space vacated by the pre-existing sub. Impressed with the system, Keele has now purchased a further dual eight-cell system for one of its major lecture theatres.

"As with all our installations we use SMAART system alignment, with the speaker management handled in the DSP," states Hasted. "This ensures that every system is fully optimised for each space."

Following on from the success, Pure AV moved south to the 260-seat lecture theatre at Harper Adams University in Telford with two hangs of eight-element O-Lines, cross firing to squeeze the sound under the existing balcony.

Colin Hasted says that O-Line has now become the central component in a rolling upgrade programme as Pure AV continue to establish a high-grade solution in the educational sector. "We love the system for its versatility — it's extremely good for speech and with the sub added in it gives a punchy music response. Once the system is balanced you can throw anything at it and it never sounds harsh — the clarity is hugely impressive," he says.

"The ability to either fly or wall-mount these provides extra flexibility, and of course there are no loading problems as the volume to weight ratio is stunning."

DD6 Meets Acoustic Challenges at Liverpool University



“THE CLARITY OF THE SOUND IS EXCELLENT — IT’S WAY BETTER THAN ANYTHING WE HAD EXPECTED AND EVERYONE IS IMPRESSED.”

University of Liverpool

Following a £5m refurbishment of Liverpool University’s Senate Drum building, a new teaching facility, complete with advanced AV infrastructure, has been opened under the new name of the Brett Building.

Pure Audio Visual were awarded the contract for the upgrade, and the challenge of providing consistent audio in an acoustically awkward cylindrical shaped building has been met by specifying Martin Audio’s DD6 Differential Dispersion technology enclosures.

Pure AV’s systems integration specialist Colin Hasted regularly turns to the Martin Audio catalogue for his solutions, and in this instance sensed that the best means of providing pristine audio in an aesthetically beautiful space, which will be used by senior members of the university and MBA students, were DD6’s. Since the space also needed to incorporate break out facilities, and be used as both a conference and exhibition space as well as lectures, the DD6’s needed to demonstrate versatility, as well as meet coverage requirements over wide angles and medium throw distances.

“We looked to the market for a small box solution with a controlled directivity that could be placed around the edge of the room and provide even coverage across the audience areas — and more importantly, keep that sound away from the presenter,” said Hasted. “The DD6 fitted the brief

perfectly. The differential horn technology meant that we could place the speakers so that the dispersion narrowed towards the centre of the room creating an impressively even coverage from the back row to the front.”

Colin Hasted’s rationale was further based on the limited space and ceiling height behind the presenter which immediately suggested that a distributed system was the best option. Overhead speakers were ruled out due to the artistic ceiling centrepiece — an elaborate sunburst through which daylight from the skylight above is channelled through wooden slats.

Thus seven DD6 units, each individually controlled, and processed via BSS Soundweb London BLU-101 (with Acoustic Echo Cancellation), are spaced equidistant around the room; these cover the audience area with a slight graduation in level towards the back of the room. “This, as well as the exceptional acoustic treatment provided by the main contractors [Aspect Construction], gives the illusion of solid front-on coverage,” Hasted continued. “EQ usage was minimal as the DD6 provided clear and crisp voicing straight out of the box, a speaker I would thoroughly recommend for future speech applications.”

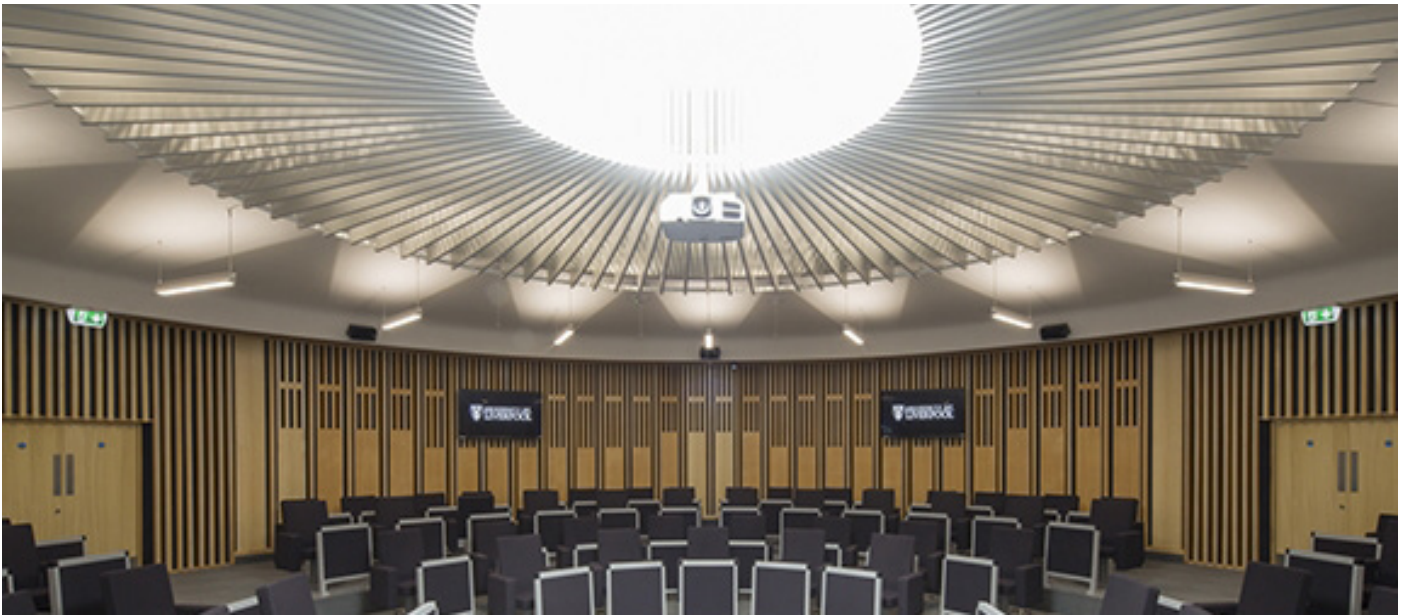
Neither was headroom an issue as the directional dispersion horns meant that a clear ‘cold spot’ around the presenter area could be defined. “The addition of readily available

speaker data for Martin Audio products also meant we could easily verify the audio design in software before procurement, adding a layer of confidence that the system would perform to expectations.”

His views were supported by Pure AV technical director, Richard Lister, who had led the response to the original tender. “Our bid was based on providing the best solution; the audio element was key to that because achieving even coverage for both voice reinforcement and programme sound was the most challenging part of the contract.”

“The Martin Audio DD6’s were perfect for the job,” he summarised, “and with each of the speakers receiving its own channel of amplification, fed from the DSP, the sound is fully optimised and the client is over the moon.”

But the final word comes from the facility’s AV manager, Gary Swift. “The clarity of the sound is excellent — it’s way better than anything we had expected and everyone is impressed. Also, we are able to run the system flat — why tinker with what is already a great loudspeaker.”



O-Line Meets Pure AV's Stringent Lecture Theatre Challenges



“O-LINE HAS PROVED IDEAL FOR AWKWARD, MULTI-PURPOSE SPACES WITH DIFFICULT ACOUSTICS, WHERE A DISCREET SOLUTION IS REQUIRED.”

Keele University

System integrators Pure Audio Visual report that they have been achieving universal success with Martin Audio's discreet O-Line micro array systems, mainly in university lecture and room multi-purpose facilities.

Pure AV Systems Specialist Colin Hasted has helped this award-winning system open up a vibrant new channel for a product that has traditionally been more prevalent in the HoW sector.

“Since receiving budget approvals, universities in the north west, in particular, have gone for this in a big way — adopting O-Line through general recommendation and example. “O-Line has proved ideal for awkward, multi-purpose spaces with difficult acoustics, where a discreet solution is required,” reports Hasted. “As a result, we have now got Martin Audio into well over half of the north west universities and all of the Liverpool universities — with more to come!”

The University of Cumbria's site at the Energun building in Workington is the place where Pure AV's O-Line journey began around five years ago.

Pure AV was approached to provide a complete AV solution for their state of the art training facility in Lillyhall campus, Cumbria. “It was a lecture theatre in a circular/cylindrical room with a horrendous acoustic,” Colin Hasted remembers.

“Prior to Pure AV's involvement, the client's expectations for their centrepiece auditorium was mono pendant speakers — due to the auditorium being round with a roof that rose steeply from the rear of the room. Space was also an issue as any standard speakers would be extremely close to the presenter area.

Using the Martin Audio O-Line software, Pure AV were able to demonstrate to the client that good quality front of house sound reinforcement could be achieved without excessive spill — both into the ceiling void and the presenter area.

“We cut a diagonal slice through it and specified an eight element O-Line array each side of the projection screen in traditional theatre format, along with a Martin Audio AQ5's and AQ112 single 12in sub. This gave them full 5.1 surround sound in the space, something the client didn't think achievable.”

Word spread fast and other educational establishments that fell under the North West purchasing scheme were quick to follow.

Immediately impressed by had been Redcar & Cleveland College, where their Energun performance space and conference room was soon boasting a similar pair of eight-cell O-Line hangs — a perfect dynamic range solution for a multi-functioning space.

Other sites quickly followed. At the 264-capacity Main Arts

Lecture Theatre (MALT) at Bangor University Pure AV once again turned to O-Line to provide both vocal and sound reinforcement. They designed an L/C/R O-Line set-up with a central hang of four elements flanked by two six-box hangs having demonstrated to the client that the Martin Audio line array technology could provide even coverage and excellent intelligibility across the theatre, obviating the need for a separate vocal PA system. With some low-end reinforcement the system was sufficiently dynamic to make light work of even the most demanding surround sound content.

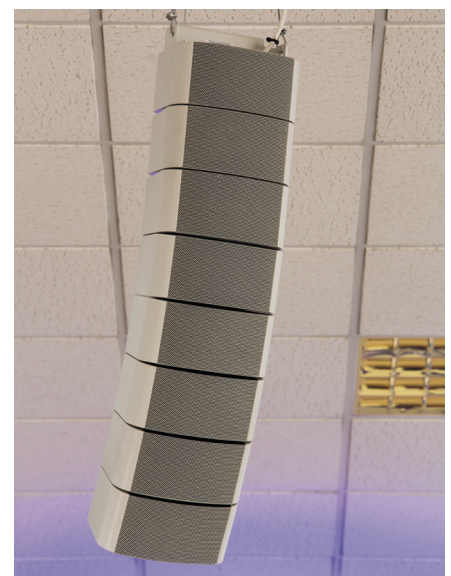
But Universities have differing uses for their multipurpose spaces. Lancaster University (LICA), for instance, is a performance arts facility that posed some interesting issues. The building is entirely built of wood and understandably had some reverberation issues. Specifying the O-Line system meant that the audio could be accurately aimed to limit any hard reflections from the back wall. As this is mainly a drama space, speech intelligibility, especially from head and lapel mics, was paramount and care was needed to place the sound away from the stage and firmly in the audience.

Also situated at Lancaster University, the Bowland Lecture Theatre/Cinema is another multi-purpose space requiring excellent speech intelligibility and even content playback for its role as a lecture theatre; but once lectures are over for the day the room is turned into the student cinema. Again, two eight-element hangs of O-Line, with a little low end reinforcement, met all the requirements perfectly.

And the success continued apace. Liverpool John Moores University was the recipient of twin O-Line eight-cell hangs, with further twin O-Line six-cells in two smaller spaces. Using different array sizes in the three theatres not only suited the theatre dimensions but also ensured consistent voicing across all theatres.

Based nearby, Liverpool's Hope University approached Pure to look at their Everton Hall. The existing set-up was a distributed system mounted high above the space, with its vaulted ceiling. The distributed system was simply exciting the room too much, says Colin Hasted. Pure AV opted for the O-Line as they were confident that the excellent directivity of the unit could bring the room under control without the expense of sympathetic acoustic treatment. With the twin eight-cell O-Line installed, the facility can host everything from lectures to live performance.

At University of Manchester, Pure AV replaced the existing line array which, although it had the volume required to fill the room, didn't have the directivity needed to tame the poor reverberant acoustics in the University Place building, with its high roof void. Instead they designed a system for the 600-seat main room, expandable to 1000 when the overflow space is incorporated into the main space. This required greater muscularity and the L/R hangs of 12-cell O-Line are complemented by twin six-cell O-Line at the midpoint and a further repeated delay of four elements per side at the rear to overcome the acoustics for conferencing and lectures.



At Keele University's 400-seat Westminster Theatre Pure AV specified further stacks of 12-cell O-Line along with a Martin Screen Sub (from its cinema portfolio) which recesses into the space vacated by the pre-existing sub. Impressed with the system, Keele has now purchased a further dual 8-cell system for one of its major lecture theatres.

In addition there is a further pair of eight O-Line hangs cross firing from the centre to project sound to the under-balconies. "As with all our installations we use SMAART system alignment, with the speaker management handled in the DSP," states Hasted. "This ensures that the systems are fully optimised."

Following on from the success with the North West Universities, Pure AV also equipped the 260-seat lecture

theatre at Harper Adams University in Telford with two hangs of eight-element O-Line, cross firing to squeeze the sound under the existing balcony.

Summing up, Colin Hasted says that thanks to O-Line, Pure AV have helped put the 'A' into 'AV' by establishing such a superior solution as O-Line in the educational sector. "We love the system for its versatility — it's extremely good for speech and with the sub added in it gives a punchy music response. Once the system is balanced you can throw anything at it and it never sounds harsh — the clarity is hugely impressive.

"It's great that you can either fly or wall-mount these, and of course there are no loading problems as the volume to weight ratio is stunning."

Essex University, UK

A Martin Audio O-Line system was recently installed in the Ivor Crewe Lecture Hall (ICLH) at Essex University. Supplied by LMC Audio and installed by Scan Audio, the micro-line array system was identified as being the perfect solution, from the word go.

The decision was rubber stamped by Tessa Rogowski, Head of Customer Services, Information Systems, at Essex University. "I first saw the product at ISE and spoke with technical staff from Martin Audio about the specific problems we have with the 1,000 seat lecture theatre — namely hard surfaces, and the fact that the only place to hang speakers was behind the microphones, causing the resultant feedback headaches."

She continued, "There was no question in my mind that this difficult problem needed to be solved once and for all. Martin Audio were the first people who actually appeared to understand my problems, and had the technology to ensure that the installation would be carried out correctly, first time."

The resulting O-Line sale of 64 elements was handled by LMC Audio London, where Technical Sales Supervisor, Sam Simon-Norris, oversaw the project.

Following an initial visit from Martin Audio's Peter Child to discuss O-Line, it quickly became obvious to him that this was the perfect system to install at the ICLH. "With fantastic sound and sleek styling, I could see that it would complement the contemporary nature of the building brilliantly," he stated.

The O-Line system will primarily be used for voice amplification in the theatre, which is used for high profile graduation ceremonies, conferences and lectures. However, a further challenge is that the theatre can also split into two self-contained 500-seat spaces when the positioning of the speakers would automatically change, since they are hung on the walls that would move during the transformation.

This was addressed by Nigel Meddemmen, Martin Audio sales support, who carried out venue predictions as an accurate 2D slice using the O-Line Software. The calculations enabled him to position the arrays to ensure best possible response and generate the required rigging, inter-module angles and equalisation. These peculiar challenges, he noted, "actually made O-Line an excellent choice."

Other challenges included the use of a variety of microphones in front of the PA system — including tricky omnidirectional lavalier mics, which tend to be favoured by university lecturers — plus the insistence on wall-



Essex University



MUSIC REPRODUCTION WAS SURPRISINGLY FULL RANGE FROM SUCH A COMPACT LINE ARRAY.

Essex University

mounting the arrays as the roof structure had not been rated for a flown system.

The biggest problem posed, however, was the fact that the rear walls of the hall move — splitting the auditorium via a central removable divide when it needs to open up. A total of four O-Line arrays were specified to cover each of the two sides, and yet maintain pattern control across exactly the same area when the room is functioning as a single large space. However, the front wall in each of the two halves is hinged, and when moved backwards, would swing the outside arrays inward to leave gaps in the coverage at the sides whilst producing a troublesome coverage overlap in the centre between the two ‘inner’ arrays.

The solution was to fix the vertical coverage of the arrays but to leave a degree of play in the horizontal alignment which would normally be tightened off once commissioned to prevent any movement. An ‘angle stop’ system was therefore designed to slot behind the standard O-Line wall mount brackets, to make it easy to accurately reposition the arrays when the room configuration changes.

Summarising Sam Simon-Norris said, “Nigel’s solution for overcoming the two-zone problem was as ingenious as it was practical – utilising an additional bracket to allow the arrays to be swung from one position to another, giving optimum coverage in both modes. This really was a breakthrough for the project, and left us with no doubts that this system would be the perfect choice for the ICLH.”

For the installation itself, Simon-Norris chose long-standing LMC Audio client Scan Audio, to carry out the work. This was carried out over four days, including one day to decommission the existing large custom column speakers and a small line array.

The company’s William (Dee) Couchman commented, “The software setting provided by the design software required

only minor adjustment to produce a clear intelligible sound for this mainly speech-based reinforcement system,” he continued. “Music reproduction was surprisingly full range from such a compact line array, which blended very well with the interior of the hall.”

Nigel Meddemmen also confirmed that O-Line had proven to be an excellent choice for this application. In addition to solving the University’s sound problems he notes that O-Line is also visually unobtrusive, the curved lines and neutral grey colour helping the system to blend, and not detract from the focus of the venue ... in this case the university lecturers.

All of which is a source of great satisfaction for Tessa Rogowski. “It is exactly what I was hoping for,” she said, “... clear vocal reproduction even at the back of the hall in the seats positioned immediately in front of a significantly noisy HVAC outlet ... and there is no feedback.

“From those with experience of the previously appalling sound, this time when they entered the room, and we turned on the volume, they universally walked round the hall with silly grins on their faces. Sad though this is, we don’t get compliments, we have just stopped getting complaints — and trust me this makes it more than worthwhile.

“As for the installation process, I was most impressed. We could only give [the installation team] the smallest time frame to undertake the work — as the hall is booked at least six months in advance — and despite this all the work was completed on time.”

But the final word comes from Sam Simon-Norris. “This is just the sort of application for which O-Line was designed and feedback from the university staff suggests that it has met and exceeded the initial brief on all counts.”

Brigham Young University, Idaho



“THE O-LINE WORKS REALLY WELL FOR SPEECH INTELLIGIBILITY, WHICH IS THE MAIN CONCERN AS WELL AS REPRODUCTION OF ACOUSTIC MUSIC.”

Brigham Young University

Brigham Young University – Idaho wanted a new sound reinforcement system for its Barrus Auditorium Concert Hall and Taylor Chapel that would provide higher quality audio without being visually intrusive.

Jon Perdue, A/V Production & Broadcast Manager for the University details the challenge: “Barrus auditorium also functioned as a chapel and the original sound system lacked clarity and wasn’t up to today’s standards in terms of quality for vocals and instrument reproduction. The university had authorized us to upgrade but the music department was very concerned about hanging a conventional system in the room because they thought it would look terrible and we didn’t want to ground-stack speakers alongside the stage either.”

“I was speaking with my friend Robert Weddings at RMB Audio,” continues Perdue, “and he had been telling me about this amazing sounding and ultra-compact O-Line array from Martin Audio. He convinced me to get a demo of the system that we flew in the Taylor chapel, the other space we were upgrading, and we were all totally amazed about how good it sounded in terms of the coverage and clarity.”

Whilst its sound impressed, O-Line’s unobtrusive appearance proved to be decisive: “The array’s small size was a crucial factor for the administration, Jon points out, “plus the aesthetics of the system and the fact that it looked so good. O-Line passed with flying colours in both

rooms and they thought the clusters looked very attractive in the venue. To be honest, it was a very easy sell; I didn’t think it would be. And when they heard it, the results were jaw dropping!”

In order to cover the Barrus Auditorium, a spacious 682-seater which hosts over 110 events a year, Perdue and his crew hung 16 O-Line modules per side, each with an AQ210 sub flown alongside to support the low frequency requirements for the program material without losing any clarity.

When the stage is extended for certain events, the four bottom modules can be turned off to compensate for the first five rows. This setup has proved to be far more than adequate for the choral and orchestral groups, pianists, light jazz ensembles and acoustic music performers that appear there.

Commenting on the Barrus installation, Perdue adds, “Because it’s such a ‘live’ room, they wanted a natural-sounding system. Something that didn’t sound like it was coming from a box hanging from the ceiling and blended well and smoothly in the room. That was a huge challenge, but the fact that the O-Line boxes sound so musical and acoustically transparent was a huge plus for us.”

The Taylor Chapel is a multi-purpose venue that holds approximately 450 people with an overflow capability in three smaller rooms that can accommodate an additional



850. Two discrete eight-module O-Line hangs on either side of the rostrum cover the chapel along with two AQ210 subs under the stage.

While Barrus auditorium is ostensibly designed for sound, the Taylor Chapel is another story. “The room is very challenging,” Perdue explains. “The roof line is stepped, very high over the stage, and then drops down three feet every four feet through the rest of the room. The sides are splayed outwards and made up of floor to ceiling windows, also a problem, but the O-Line works really well for speech intelligibility, which is the main concern as well as reproduction of acoustic music.”

Summing up the impact of the audio upgrade, Jon concludes “The university is very happy with the sound and they’ve gotten no complaints about the esthetics in both rooms, a crucial factor, because they’re such a small box and so attractive. They kind of hide themselves within the room so it’s been 100% satisfaction in terms of the way they look. I’ve installed systems in churches all my life and the biggest hurdle is always the way it looks.”



Recommended Products

MLA Systems

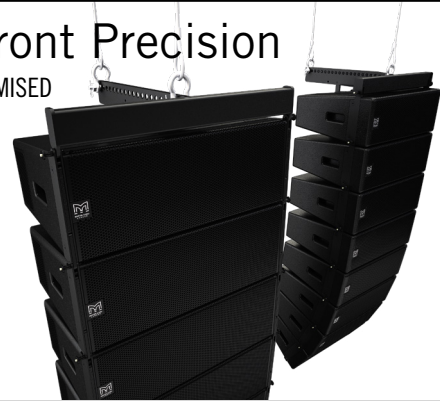
MULTI-CELLULAR
LOUDSPEAKER ARRAYS



martin-audio.com/products/series/mla-systems

Wavefront Precision

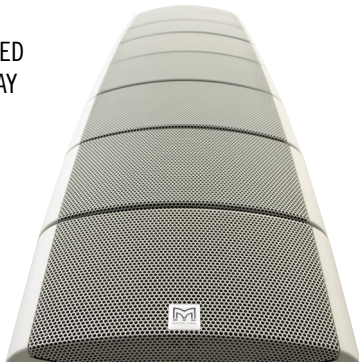
PASSIVE OPTIMISED
LINE ARRAYS



martin-audio.com/products/series/wavefront-precision

O-Line

PASSIVE OPTIMISED
MICRO LINE ARRAY



martin-audio.com/products/series/o-line

TORUS

CONSTANT CURVATURE
ARRAYS



martin-audio.com/products/series/torus

FlexPoint

PASSIVE POINT SOURCE
LOUDSPEAKERS



martin-audio.com/products/series/flexpoint

CDD

PASSIVE INDOOR
LOUDSPEAKERS & SUBS



martin-audio.com/products/series/cdd

martin-audio.com/case-studies/auditoriums

This is just a small selection from a wealth of examples from around the world that you can find out more about by visiting www.martin-audio.com

Martin Audio Ltd
Century Point, Halifax Road, High Wycombe
Buckinghamshire HP12 3SL, England

Telephone: +44 (0) 1494 535 312
Facsimile: +44 (0) 1494 438 669
Email: info@martin-audio.com

www.martin-audio.com