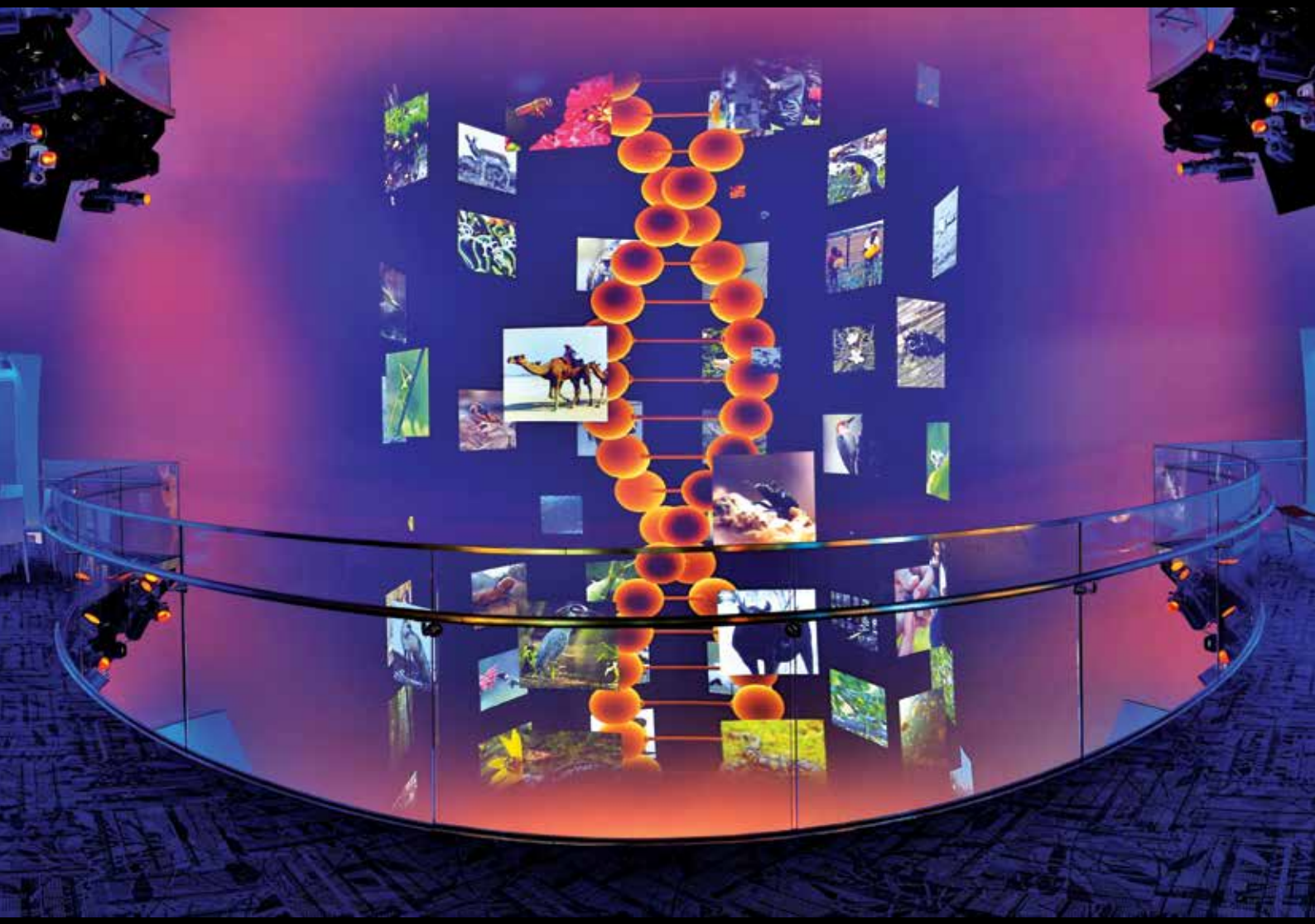
ELECTROSONIC

ISSUE NO. 17

WORLD



GLOBAL IMAGES

SECU DAILY PLANET AT THE NORTH CAROLINA MUSEUM OF NATURAL SCIENCES – See Page 24

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ELECTROSONIC WORLD 17

WELCOME

to the 17th Edition of ELECTROSONIC WORLD. The "occasional publication" from Electrosonic that reviews some of the many projects undertaken by the company over the past couple of years.

It is unfortunately the case that a single publication cannot give a wholly balanced picture of the company's business since the majority of corporate customers, and a handful of entertainment customers, do not allow information about their projects to be published. Nonetheless the sheer variety of the projects, both in terms of geography and technology, described in this issue will give a good idea of the company's broad experience and capabilities.

ELECTROSONIC WORLD No 16 described how Electrosonic had withdrawn from its product business, and had invested heavily in expanding its presence in its core markets. These remain broadly "Corporate Solutions", "Entertainment" and "Control Rooms". However, the acquisition of Global Immersion, described on Page 4, has introduced a new market for Electrosonic, which, while sharing many aspects of technology and expertise with existing markets, requires dedicated market knowledge and some unique capabilities. Thus Electrosonic, through its Global Immersion division, is now serving the needs of Giant Screen Cinemas and Planetariums.

This edition of ELECTROSONIC WORLD is being published less than a year before Electrosonic celebrates its 50th Anniversary – the company was founded in March 1964. Obviously this will be an occasion of some jollity and nostalgia, but it will also be a good time to review how Electrosonic has evolved and reacted to the great changes in technology that have taken place over the years, and what lessons there may be for its future development.

ROBERT SIMPSON
EDITOR

WFOE IN CHINA

Electrosonic has had a representative office in China for several years. It was an essential resource when Electrosonic was undertaking several projects at EXPO 2010 (as reported in ELECTROSONIC WORLD No 16). However, it was not able to trade in China – all invoicing had to be in foreign currencies, and involved much bureaucracy.

In 2012, Electrosonic's Shanghai office was designated a Wholly Foreign Owned Enterprise (WFOE), an officially registered limited liability corporation. This important step forward allows Electrosonic to continue to pursue new business opportunities in China as a legally licensed design consulting and systems integration company, able to invoice in local currency, while maintaining full control of business operations.

Electrosonic's China operations conducts business under the new legal name, Electrosonic Audio-Visual Technology (Shanghai) Co., Ltd. It is currently working with major owner-operators, and design and production companies, as well as developing partnerships with local suppliers, fabricators and installers. Electrosonic also maintains a Hong Kong office for support and production.

WINNING WAYS

Industry awards are of different kinds; they may recognize individual projects, or companies, or particular creative skills. Electrosonic is pleased to be associated with some award winning projects, but always recognizes that it is a team member, and that credit is also due to many others. The feature on the THEA Awards, on Page 46, makes this point.

The AV Awards, run in the UK by AV Magazine, are recognized as rigorously judged awards and Electrosonic is proud to have won many of these awards since their inception in 1999. A typical year was 2012 when Electrosonic won two awards. One was a project based award for "Consumer Installation of the Year" – the European Parliament's Visitors' Centre (which as a project also won the prestigious Sinus Award) described on Page 40.

However, the second award for "Integrator of the Year" recognized Electrosonic as a company, independent of particular projects. The award recognized both the variety of the work undertaken by the company, and the way it has developed the business in the face of changing market conditions.

CONTENTS





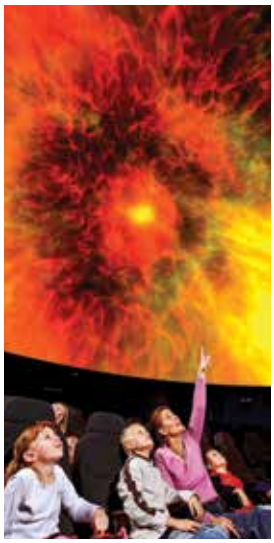



The INTECH Planetarium

GLOBAL IMMERSION

JOINS ELECTROSONIC

In December 2012, Electrosonic announced its acquisition of Global Immersion, a leader in the design and integration of high performance digital immersive theater attractions. Global Immersion will continue to serve the planetarium, institutional theater and giant screen markets. The acquisition positions Electrosonic as the only company to offer digital immersive solutions across the theme park, museum, giant screen cinema and planetarium markets.



The 4D Theater at Our Dynamic Earth, Edinburgh.

On completing the acquisition, Jim Bowie, President of Electrosonic Group, said, "This is a significant strategic move for both companies, and I am excited by the prospects presented by the acquisition. As a single operation, we will service an even broader range of markets, bringing further innovation and an expanded offering to our customers. Our goal to attract and develop the best industry talent has been one of the drivers of the acquisition. Together we will lead by consolidating our strengths and delivering the best visual systems in the world."

At the same time, Martin Howe, CEO of Global Immersion, commented, "I am delighted with this transaction with Electrosonic. It allows us to further expand our activities and develop our product and service offering, opening up new doors and bringing with it many synergies. The planetarium and giant screen markets are undergoing significant change as the digital revolution pace quickens. Electrosonic offers a range of benefits that our customers can immediately enjoy. Its international reach and broad technical expertise and capacity mean that we can more cost-effectively service a wider range of customers in more locations, while building upon our shared reputation for quality, performance and support."

One of Global Immersion's customers is the INTECH Science Centre, near Winchester. This has the largest digital planetarium in the UK. Its 16.5m (54ft) dome seats 176 people and has a 360° × 165° field of view. It is fitted with a Global Immersion Fidelity Bright™ Planetarium system (see Page 50).

NEW SERVICES NEED

VNOCs

HARTHAM PARK, CORSHAM
Electrosonic's principal managed services operation is based in a splendid "stately home". This is where the main VNOC is sited and where worldwide videoconferencing connections are set up and monitored. In addition to supporting outside clients, it also manages Electrosonic's own conferencing requirements.

In March 2012, Electrosonic opened a new resource, a VNOC or Video Network Operations Center. This was to support a growing demand for "managed services". Such services are needed by clients with many locations and are designed to ensure that both video and audio conferencing operate efficiently around the world. Such centers can also monitor individual items of equipment.

The first VNOC is located in Corsham, near Bristol, UK. It offers a range of services, primarily concerned with video conferencing, that are complementary to those offered by Electrosonic's service operation based at Hawley Mill, Dartford. This opened its own "SOC" or Service Operations Center in 2011, which is currently being upgraded.

A second UK-based VNOC was opened in early 2013 to support financial services clients in the Canary Wharf area of London. It runs in tandem with Corsham, but also provides tailored remote assistance to Canary Wharf and City clients.

Electrosonic completed the installation of its third VNOC at the corporate headquarters in Los Angeles, California, also in early 2013. The VNOC provides up-to-the-minute status on clients' AV and IT infrastructure.

Electrosonic has developed the tools to monitor and manage a wide array of projectors, conferencing equipment, visual displays, servers, computers, switchers and networking products. Alongside the Dartford Service Operations Centre in the UK, the Los Angeles VNOC enhances Electrosonic's global service coverage with round-the-clock support in the new connected world.

[Above]
Monitoring screens at the Corsham VNOC.
The new VNOC at Electrosonic's corporate headquarters in Los Angeles, CA.
The VNOC at Cannon Workshops, Electrosonic's Canary Wharf base.
The Service Operations Centre at Hawley Mill, Electrosonic's headquarters for EMEA.

SERVICES PROVIDED BY CORSHAM VNOC
Multiway Video Conference Hosting
ISDN Gateway Services
Audio Bridging
Remote Monitoring & Management for AV & Video Conferencing Equipment
Reporting
SMART Bridgit Hosting & Connectivity
Cloud-Based Interconnectivity to VC Systems (eg. Skype)
Offsite Client Managed Services
Active Maintenance on Endpoints & Infrastructure
Software Upgrades
Design & Project Management

8K in Salford

The University of Salford's unique digital learning, teaching and research space opened in October 2011 at MediaCityUK, the major development in Salford Quays, Manchester. The highlight of its public entrance is a high resolution display system made up from 120 Christie MicroTiles™, able to display images of 9600 × 3840 resolution.

The entrance area of the new building is known as "The Egg" and is described as "a publicly accessible digital interactive showcase for visitors and students." The idea is that it is a flexible space where resources can be deployed in different ways. The original technical design for the space was prepared by The Centre for Virtual Environments at the University of Salford, and Electrosonic was awarded the contract to engineer and install the complete system.

The MicroTiles are a central feature of The Egg. They were initially installed as a 15×8 array; however since then, they have been re-deployed to achieve project-specific layouts. It was a requirement that the video wall display should be free-standing on the raised floor and not require any structural fixings to the building. This necessitated the construction of a support frame, and here Electrosonic enlisted Long & Co. of Dartford to do the structural engineering.

Here the MicroTiles have been used to set up a number of free standing displays.

When first installed, the MicroTiles formed one big display.

The display system under factory test.

The presentation area.

A touch table.

THE PRESENTATION AREA

The Presentation Area is an enclosed space that can be used for meetings, presentations and research projects. The room layout can be changed, but there is a large front projection screen that is permanently installed, served by a Christie DHD800 projector. This can be sourced from any compatible source device in the control room, or from a presenter's computer.

THE CONTROL ROOM

A separate control room houses all source, control and routing equipment. Six racks accommodate the equipment; three were installed by the University (one for active network equipment, one for structured cabling and one for additional equipment required for research projects).

The other three racks were installed by Electrosonic, and were fully wired and tested at Electrosonic's Hawley Mill factory prior to delivery.

THE TOUCH TABLES

Within the main space, there are ten interactive touch tables for use by students and the general public. Here Electrosonic was required to deliver working systems complete with initial content. The interactive software was produced under sub-contract by Stardotstar, a Manchester-based content producer.

The touch tables use 40-inch panels with multi-touch infra-red sensors from PQ Labs and are driven by Apple Mac mini computers that are centrally rack mounted in the control room. Extron USB over CAT5 extenders are used.

Image source equipment for the MicroTiles display (and for other experimental set-ups) includes two 7thSense Delta Media servers to source the "8K" and similar images, and five Dell PowerEdge servers to source 2K and 4K images, to provide camera interfaces and for general interactive use.

Control, routing and image processing equipment includes two Christie Spyder X20-1608 processors, three Extron DVS 304 DVI scalers for analog sources, eight Lightware DA2DVI-DL dual link DVI distribution amplifiers, and four Extron MDA 4V HD-SDI distribution amplifiers. Twenty-nine Lightware TX/RX110 DVI fiber extenders are used for signal distribution and a Medialon Showmaster ST is installed for housekeeping and "everyday" user interface.

MEDIA BRIEFING AT THE

SCOTTISH GOVERNMENT

St. Andrew's House is the headquarters building of the Scottish Government. It houses the Office of the First Minister of Scotland and several key government departments. It is also the base from which the Scottish Government communicates with the media, and an essential component of this work is the Media Briefing Centre. This has recently been completely re-equipped and refurbished, and now features the latest in communication and presentation systems. Electrosonic's Edinburgh office was the AV Systems Integrator for the project, working for the Communications Directorate of the Scottish Government.

The Media Briefing Centre consists of a number of spaces. "Media 1" is the largest; a flexible space that can accommodate a seated audience of 70, with additional space at the back of the room for TV camera crews. There is a small stage with movable furniture to allow for both individual and "panel" presentations. There is a control room at the back of the Media 1 space which can be used to control all the AV facilities within the Centre.

"Media 2" is another flexible space that can be used as an "overflow" for Media 1 or as a conventional meeting room. Both rooms are supported by a "Green Room" where the presenters can be made up and can relax before their "turn".

Audio performance is of paramount importance since all events are "on the record". It is essential that the media can acquire "clean" audio signals, that those in the Briefing Centre can hear everything with crystal clarity, and that good archive recordings can be made.

Audio routing is by two Polycom C16 Sound Structure units, with a Soundcraft CPM12 for manual control. The room is equipped with a Polycom HDX microphone array for overall pick-up and with beyerdynamic Opus 650 radio microphones. Audio recording is by a Marantz PMD580 compact flash recorder. Twenty isolated audio feeds are provided for media attendees.

The Centre does not produce finished video programs, but has the facility to record proceedings, to relay images to other spaces, and to provide visual support to presentations.

Four Vaddio WallVIEW 50 cameras are controlled by a ProductionVIEW FX camera controller in the control room. Other video inputs include two Roku BrightSign HD video players, and computer image inputs accessible through floor boxes. An Extron MGP 464 picture-in-picture processor allows the presentation of multiple images. The projector receives its images as DVI from an Extron DXP 84 DVI matrix; however to provide maximum flexibility in respect of the other displays and sources, an Extron 12×12 RGBHV matrix is also installed.

DISPLAYS

The most important display is the rear projection screen built into the stage setting. This is a DNP New Wide Angle screen that, in conjunction with the Barco RLM W8 projector behind it, gives an even, bright image that complements the well lit stage.

Media 2 is equipped with just one interactive 70-inch LCD monitor (SMART Technologies/ NEC SB8070i) which is ideal for meetings, and can also be used to relay proceedings from Media 1.

Other displays installed as part of the system include an NEC 46-inch LCD monitor in the Green Room, and preview monitors located on the stage that can only be seen by the presenters.

[Above Top]
Media 2

[Above Middle]
The discreet LED-based stage lighting of participants ensures an excellent TV image. Blacklight was Electrosonic's lighting sub-contractor.

[Left]
An Apple iPad is provided as one of the user interfaces to the AMX NI-4000 control system.

LKAB

ON THE ARCTIC CIRCLE

LKAB is the world's technical leader in supplying iron ore pellets to the global steel industry. Its rich magnetite mines are sited in the north of Sweden above the Arctic Circle. It recently opened a new research center in Koskullskulle embodying a welcome center for visitors to the nearby Malmberget mine. Electrosonic was responsible for engineering the AV facilities at the center.

The giant video wall is made up from 192 MicroTiles.

LKAB is owned by the Swedish state and has a turnover of SEK 31 billion (approximately $4.6 billion). Its iron ore mines are among the most productive in the world, and LKAB has developed highly sophisticated methods of automated mining and pellet processing that results in the "greenest" production of iron.

The new research and development center, which includes the "LKAB main entrance" or visitors' center, was completed at the same time as a new production level 1250 meters underground in the Malmberget mine called M1250. Both were opened by the King of Sweden, Carl XVI Gustaf, on June 14, 2012.

The AV system was designed and engineered by Electrosonic AB of Stockholm working to the requirements of LKAB's consultant WSP. The main presentation space seats 120 people and is dominated by a video wall made up from 192 Christie MicroTiles arranged 16 × 12, giving an overall image size of 6.5m ×3.7m (21.4ft × 12ft).

The display is fed from a Vista Spyder image processor, allowing complete flexibility in the placement of images on the display.

Inputs to the display include a Blu-ray player, a dual output computer mounted in the source system rack, a digital video tuner and facilities for connecting "visiting" sources like laptop computers. An Extron JMP 9600 JPEG2000 player presents the house show "Performance in Iron Making" that introduces LKAB, its products and its processes.

The room is fitted with an audio system based around a BSS Soundweb DSP controller, Crown amplifiers and JBL loudspeakers. Overall system control is by two AMX NI 3100 controllers. The user interface is a touch panel mounted at the lectern, augmented by an Apple iPad™ which allows control from anywhere in the center.

Next to the main presentation room, there is a "Board Room" for management meetings. This is fitted with basic AV facilities with scope for expansion as the use of the space becomes better defined. Main display is by a 2 × 2 array of NEC X551UN 55-inch LCDs with narrow mullion and LED illumination.

[Above]

When it is dark outside, the display is reflected by the back wall of the presentation room. It is visible from outside the building.

The Board Room.

Rock drilling rig in the nearby mine which is 1390m (4560ft) deep and has 600km (373 miles) of roadway within it.

The Siemens Crystal

The Crystal, based in London's Royal Victoria Dock, opened in September 2012. It is billed as "A sustainable cities initiative by Siemens which explores how we can create a better future for our cities". Inside the Crystal is the "World's largest exhibition dedicated to the future of cities", a 2,000 sq. meter (21,500 sq. feet) interactive exhibition that guides visitors through the urban infrastructure of the future. It focuses on the possibilities for sustainable mobility, building technologies, power and water supplies, and healthcare.

[Above]
The Cities zone includes the City Icon. It receives images from the central control room.

The Crystal is a £30 million investment by Siemens and is home to its global Centre of Competence – Cities, a team of multi-disciplinary urban experts. The Crystal was designed by Wilkinson Eyre, Architects. Pringle Brandon was the interior/fit out architect, and Event Communications designed and delivered the exhibition. The AV system that supports the exhibition was delivered by Electrosonic, under sub-contract to Event Communications.

Visitors entering the exhibition are directed to a mezzanine level which is entirely devoted to the theme "Forces of Change." The main feature here is an immersive "black box" theater which uses ten projectors to show a presentation that presents the three challenges, Demographic Change, Urbanization and Climate Change, in short video sequences that run continuously.

The "screen" for the show is a curved surface which covers an end wall and most of the floor. The projected images are blended and warped to fill the screen area without distortion, and the show is accompanied by a powerful multi-channel soundtrack.

[Top to Bottom, Left to Right]

The Safe and Sound zone is mainly housed in this striking structure. Flames, created by Light Emissions ArtBoard low resolution LED displays, are seen through the lettering.

The "Create your own sustainable building" exhibit in the Smart Buildings zone. A cubic structure with three 5m wide screens, each with a 40-inch LCD touchscreen.

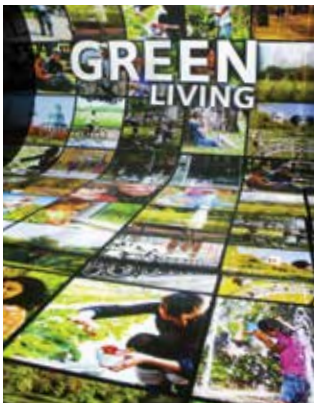
The Creating Cities zone seen from the mezzanine.

The "Forces of Change" show uses Panasonic PT-DZ6710U WUXGA DLP™ projectors sourced from 7thSense servers.

Typical touch screen display with its associated RFID tag reader. The illuminated color segments surrounding it indicate which zones the visitor has already seen.

THE EXHIBITION TEAM

Event Communications led the team that delivered the exhibition. Exhibition fabrication was by The Hub, and the all-important content for the AV and interactive exhibits was by a group of content producers that included ISO, All of Us, Clay, Squint/Opera, Spirit Link, B12 and Siemens Software. The "Forces of Change" show was produced by Event Communications itself. The "City Game" was developed by Siemens. Exhibition lighting design was by dha design. Electrosonic was the AV system designer and integrator.



The Siemens Crystal [cont'd]

From the mezzanine, visitors get a view of the main exhibition. While in principle a free circulation area, there is a mechanism to encourage visitors to see all the exhibition zones. Visitors are given a card which contains an RFID tag. This is needed to initiate most of the interactive exhibits on the lower level. The tag reader is surrounded by colored indicators showing which zones the visitor has already visited. The idea is that a "crystal" is collected for each exhibit.

Visitors can review their progress at any time, and at the end of the exhibition, in the Future Life zone, they can use their card to see a complete review of the exhibits they have seen and the "crystals" they have collected.

One of the first zones to be seen is the Creating Cities zone. It features an iconic LED display made up from Traxon LED panels, Traxon itself is an Osram (Siemens) company. Other exhibits in the zone include an "Understanding Cities" interactive display and a multi-participant "City Game" requiring four 24-inch LCD touch terminals, surmounted by four 55-inch repeater displays.

The Safe and Sound zone covers aspects of "protecting the city", such as the prevention of fire, rapid response to incidents, crowd control and so on. It is housed in a structure that itself is part of the fire prevention exhibit. Three interactive terminals allow visitors to discover the relative importance of fuel, oxygen and heat in starting fires. Their responses modify a big curved low resolution LED display showing flames.

A very interesting exhibit is "What makes this building (the Crystal) sustainable?" This shows in real time statistics, such as how much rainwater has been recycled, how many tons of CO_2 have been prevented from leaking into the atmosphere, how much heating or cooling has been achieved by the ground sourced heat pump system, and how efficiently the various solar devices are performing.

The "What makes this building sustainable?" exhibit uses two touch screen displays and an array of LED indicators displaying real time data.

A zone is devoted to carbon dioxide, with themes "Meeting the CO_2 challenge", "What are we breathing?" and "Valuable waste." A "living wall" of vegetation, is sufficiently wet that the two interactive LCD touchscreens within it have to be IP65-rated.

The Go Electric zone, not surprisingly, is mainly concerned with electricity. It concentrates on the problems of conserving, storing and distributing power both within cities and over long distances. The zone has one of the most spectacular exhibits. Its main interactive exhibit is gesture operated, and includes an impressive Tesla coil spark display.

Electricity also features heavily in the Keep Moving zone. While making polite acknowledgement to the role of the bicycle in the "Bike, Bus, Train, Tram" exhibit, most emphasis is on the role of electrically powered transport.

The finale of the exhibition is centered around a panoramic show "Enter the City of the Future", showing how cities could look and operate in the future if the ideas shown in the Crystal were to be generally applied. The presentation is given on a nine-meter curved screen by three projectors with blended and geometrically corrected images. The presence of a building support pillar necessitated the use of short throw lenses to fit the show in the available space. It is a suitably optimistic response to the "Forces of Change" show that started the visitors' tour of the Crystal.

[Above Clockwise]
The Carbon Dioxide zone.
The "Forces of Change" show.
Tesla coil exhibit in the Go Electric zone.

5 STORY LED Chandelier

at Eaton Ohio HQ

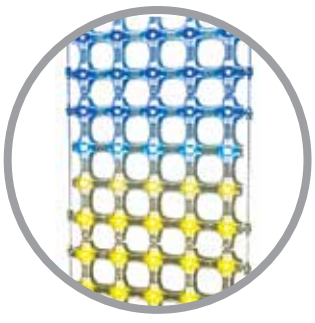
The lobby with its LED "Chandelier".

In early 2013 Eaton Corporation, a global diversified power management company, moved its operational headquarters from downtown Cleveland to Beachwood, Ohio, where its campus features a 580,000 square-foot office building, fitness facility and two miles of walking and running trails. The green headquarters, consisting of two 5-story wings flanking a 10-story tower, is designed to consume 30 percent less energy and 40 percent less water than a conventional building. The main lobby uses LED media façade technology to great effect.

The centerpiece of the Eaton lobby is a five-story chandelier made from Traxon custom Mesh RGB, wrapped into a cylinder 53 feet tall by 12 feet in diameter (17m × 4m). The LED mesh combines a woven stainless steel grid with individually-addressable LEDs to form a canvas for vivid, large-scale media. The chandelier spans five floors of balconies in the atrium and can display specific media on a pre-determined timeline or media for a particular event.

Electrosonic worked with Ralph Appelbaum Associates on the design and technology choice, and was then commissioned by Eaton to deliver the Traxon equipment for the chandelier and a massive 80-foot (24m) curtain wall at the back of the lobby, also a Traxon Mesh RGB with transparent LED nodes at 62.5mm pitch. A service ring is installed surrounding the top of the chandelier which facilitated the original installation and subsequent maintenance.

Electrosonic also engineered and delivered the source and control equipment for the displays and four interactive touch tables based on 65-inch Mitsubishi LCDs with CyberTouch overlays. The overall AV system is under Medialon control. The initial content was created by Ralph Appelbaum Associates.



Close up of the Traxon Mesh RGB

The Story of

JCB

JCB, the world famous construction and agricultural equipment company, has opened a new exhibition at its world headquarters in Rocester. "The Story of JCB" is a "customer attraction" intended to play an important part in the company's campaigns to get new business. The £5 million, 2,500m^2 (25,000 sq. feet) exhibition is housed in what was the JCB Design Centre until the early 1980s. While the "stars" of the show are the JCB products of all vintages, AV support plays an important part in interpreting the exhibits.

As you enter the exhibition, a wall displays an array of agricultural implements and machinery that were the products of Bamfords Agricultural Engineers, a company whose origins went back to 1820. In front of you is a 1940s portrait of the then 21 year old Joseph Cyril Bamford alongside photos of the family.

The "Building a Brand" video presentation is framed by one of the "Dancing Diggers", a famous aspect of JCB product introductions.

Video support is used throughout the exhibition. Examples include the "Early Years" zone which has a video sequence projected on to a stack of "straw bales" alongside an exhibit of a single arm hydraulic loader. "Building a Brand" tells the story of how JCB was built up as a brand, embodying a combination of elements of the Founder's personality, the establishment of a well recognized trade mark, the increasing emphasis on the highest possible quality in product design, and the cultivation of brand loyalty.

The exhibit on engines shows both the engines and features the JCB Dieselmax car, which holds the world speed record for a diesel powered car at 350 mph. The car exhibit is backed by a panoramic screen which describes the record breaking run on the Utah salt flats. The JCB Fastrac chassis, the basis of the Fastrac range of heavy duty agricultural tractors, is suspended over a nine screen video wall that shows the completed products in action and explains the design details of the chassis itself.

AV equipment installed include Christie single-chip DLP™ projectors, NEC 46-inch LCDs, 7thSense Delta Nano and Delta Duo servers, BrightSign HD220 players, Cloud amplifiers and Tannoy loudspeakers.

THE TEAM

JCB Site Services was the building contractor and M&E consultant. The exhibition was a design and build contract led by Studio MB, exhibition fit-out was by Sharman Shaw Exhibitions Ltd, text by Simon Platt, lighting design was by Nich Smith, and Andrews Electrical was the electrical contractor.

AV content was written and co-designed by Studio MB, and produced and co-designed by ISO Design. Much of the original material came from JCB. Quadrille Media encoded the content. The AV Consultant for the project was Douglas Bolton. Electrosonic, was the AV systems integrator.

Supporting

HULT INTERNATIONAL BUSINESS SCHOOL

IN DUBAI

The Hult International Business School is representative of customers who benefit from Electrosonic's support services. Its new facility in Dubai has been equipped with the latest AV presentation equipment, supported by Electrosonic's local service operation and by remote monitoring.

One of the breakout rooms.

Presentation controls in the Hult classrooms.

Electrosonic has provided classroom AV systems for Hult campuses in London, Dubai and Boston, all to a common design.

Each system consists of a lectern based teaching and presentation position with the ability to show images from a rack-mounted PC, a laptop or an Apple iPad™. The rack PC is connected to a SMART Podium 22-inch interactive display that allows lecturers to annotate or use white boarding capabilities, which is then to be displayed via the twin NEC PA500U projectors projecting directly onto the walls.

Tannoy program loudspeakers are installed, and room control is provided by a Crestron 2 Series processor with an iPad™ touch control interface.

In Dubai, there are 20 breakout rooms for the use of students working on projects, assignments and presentations. These rooms are each equipped with a 46-inch NEC LCD, a wall mounted Extron control panel providing on/off, volume and source control, and a Spinetix digital signage player to allow distribution of content to all rooms simultaneously, or for specific functions and events.

Where possible, all equipment is network connected, and remote support is administered via direct connection to individual devices and via X-Panel for the classroom systems. Electrosonic supports the Hult campus environment not only in Dubai but also in Boston, London (two sites), and parts of the San Francisco site.

WORLD'S LARGEST GRADUATE BUSINESS SCHOOL

In 1964, Hult International Business School was established as America's first corporate university, then known as the Arthur D. Little School of Management. ADL focused on delivering a practical business education for managers.

In 2003, one of Europe's most successful entrepreneurs, Bertil Hult, supported the school to expand its teaching to not only train effective managers, but also prepare them to thrive on a global stage. He believed students must experience cultural differences and global business practices firsthand, expanding the school from its single Boston location to a global network of campuses including London, Dubai, Shanghai, and San Francisco, under the name Hult International Business School.

Hult's vision of a global business education has attracted students from around the world. Today, the school has grown to become the world's largest graduate business school.

Control Room Display

At The Hindhead Tunnels

The 1.14-mile (1.8km) long twin tunnels on the A3 main road that bypass Hindhead (UK) and the Devil's Punchbowl beauty spot were opened at the end of July 2011. The tunnels were designed for maximum safety and efficiency, and operation is monitored from a control room at the northern end. The control room features an overview display and operators' consoles that were engineered and installed by Electrosonic. Operators can monitor images from 104 cameras, and review data provided by the SCADA system that supervises the lighting, ventilation, incident detection and other support systems. Electrosonic supplied the system through main contractor Balfour Beatty Engineering Services, with Mott Macdonald as its design partner; the ultimate client was the Highways Agency advised by Atkins as its consultant.

[Top and Below]

The display can be configured to many different formats.

Tunnel portals seen from in front of the control building on a wet day!

Operation of the tunnels is supervised from a control room near the northern end of the tunnels. The Highways Agency wanted this room to operate in a similar fashion to other traffic control rooms on the major road network, but with the added requirement that data relating to non-traffic aspects of the tunnel operation be accessible at the same time, as, for example, live CCTV images.

Electrosonic proposed a solution based on the provision of ergonomic operators' consoles and an overview video wall display that could simultaneously show up to 36 live video images and four computer graphics images from the SCADA system. To help the client visualize how the control room would appear to operating staff, and to finalize how the display would operate, Electrosonic produced graphic visualizations of how the proposed system would fit in the available space.

The video wall system consists of six Planar Clarity Margay II DLP™ 50-inch 16:9 aspect ratio projection cubes arranged in a 3 × 2 array. This format ensures that the maximum amount of information can be presented in the space with its relatively low ceiling height. The use of "cubes" gives a pixel perfect, near seamless, image surface with a total resolution of 5760 × 2160 pixels, while requiring only 46cm (18 in) depth.

The display is sourced from an Extron VN-Quantum image processor which can display any required combination of images, of any size and positioned wherever required. In practice there are a number of pre-set "scenes" that optimize the display for different situations.

The graphics images reach the processor via Ethernet; video inputs are derived from a switching matrix that is part of the CCTV system. This and the SCADA (Supervisory Control and Data Acquisition) system were provided under a separate contract by P. Ducker Systems Ltd of Derby.

EMERGENCY Operations Center IN SANTA BARBARA

Electrosonic installed an extensive audio-visual system in the County of Santa Barbara's new Emergency Operations Center (EOC), which houses a number of spaces designed to help the California county maintain a constant state of readiness. Electrosonic equipped the Office of Emergency Management with presentation, video conferencing and streaming video capabilities.

[Top]
The Management Conference Room.
[Top right]
A tablet is used to control the main systems.
[Below]
The Incident Management Room, photographed during installation.

In 2012, Santa Barbara County's EOC went from a 1,600 sq. foot trailer with a projector and a small TV to a new 11,000 sq. foot building powered in part by green energy. The new EOC facilitates the sharing of information from various internal and external sources, whether it is news media, incident maps from geospatial services, live video streams from a county helicopter, or operational reports. Having critical information displayed and shared – via large display screens, flat-panel monitors or video conferencing systems – improves management decisions.

Electrosonic's role encompassed installations in the Incident Management Room, Management Conference Room, Breakout Room, Joint Information Center, Media Distribution System, Director's Office, Staff Break Room, and Lobby.

A mobile tablet device, operating on the building's secured Wi-Fi network, allows the EOC to control the majority of its systems with an intuitive user interface.

At the heart of the EOC is the Incident Management Room. It has flexible seating for 40 people and features AV presentation technologies that can meet an array of incident needs. The primary display consists of three wall-mounted front projection screens served by ceiling-mounted Mitsubishi video projectors. All source and routing/processing equipment is housed in an equipment rack in the Telecoms Room.

The Joint Information Center displays the status during an emergency to enable information officers to distribute updates to the general public. A ceiling-mounted Mitsubishi video/data projector provides the primary display, and a wall-mounted NEC flat-panel serves as a backdrop for press.

Electrosonic also supplied the Media Distribution System within the Telecoms Room. As the primary head-end for the AV system throughout the facility, it includes sources such as direct broadcast satellite, off-air antenna, cable television, DVD player, OFCI WEBEOC feeds, and video conferencing codecs. The distribution system allows any source to be viewed from any location's display or PC by using H.264 video streaming encoders/decoders. Video and audio signals are distributed from room to room and delivered to non PC-based display devices via twisted pair cabling.

Electrosonic has been contracted to provide service coverage to the new EOC that includes 4-hour response time, unlimited service calls, full equipment coverage and two preventative maintenance visits annually.

KEEPING TRAFFIC MOVING
IN SOUTHERN CALIFORNIA

Caltrans District 7's first phase of an AV system upgrade at its Los Angeles facility

Electrosonic has a long relationship with Caltrans District 7, which covers some of the busiest roads in the world. In early 2007, Electrosonic delivered an impressive display system to the Los Angeles Regional Traffic Management Center. In 2012, Electrosonic was contracted to upgrade the system by creating a brighter, more reliable video wall that takes advantage of the latest in projection technology, as part of Caltrans District 7's first phase of an AV system upgrade at its Los Angeles facility.

[Below]
The side displays can show both magnified images and multiple single images.

The video wall consists of a 12-screen center unit in a 4×3 configuration flanked by a pair of six screen 3×2 units. The center display features 80-inch diagonal screens, and the side displays use 52-inch screens.

The wear and tear of more than five years of constant operation had taken their toll on the existing rear-projection engines and had begun to degrade the facility's ability to monitor traffic, so Electrosonic replaced the video wall engines with Christie one-chip SXGA displays to take advantage of improved projector quality. Christie RPMSP-D132U displays were selected for the center screen and RPMX-D132U displays for the side screens.

The standard format of the wall has single-camera feeds on the side screens and 2×2 graphic traffic patterns on the center screen, with single-camera feeds surrounding them. Caltrans District 7 has more than 400 cameras on the highways of Los Angeles and Ventura counties. Control room staff can review camera feeds 24/7 in the facility and when there is a traffic event – road damage or an accident – they can magnify that feed onto the video wall. The video wall is integral to 24-hour traffic management.

The side projectors were installed in existing cabinets behind the video wall; the center projectors were placed in a huge metal framework previously built by Electrosonic. Caltrans District 7 has the most spacious rear-projection room that Electrosonic's project engineers have ever worked in, so in principle, replacing the engines was quite simple.

The challenge for the installation was working in conjunction with the 24/7 operation of the facility. The display had to be kept in continuous operation and projection engines were swapped out one at a time.

Video wall control is achieved using a VN-Quantum processor previously installed by Electrosonic. The Crestron touchscreen control system that operates the wall and monitors lamp life was re-programmed to accommodate the new projection engines.

Electrosonic also has an extensive service contract with Caltrans District 7, which includes complete parts and labor, unlimited telephone support, proactive preventive maintenance visits and rapid response.

Creating A CLEAR IMAGE

At Bristol Water

In late 2012, Bristol Water completely upgraded its operational control room. Electrosonic engineered the new display system, which included a video wall with associated processing equipment, a large screen display, workstation monitors and new consoles.

Bristol Water is responsible for the water supply to nearly 1.2 million people in the Bristol area. Its statistics include a region of 2,400 sq. km (926 sq. miles), over half a million individual water supplies, 6,600 km (4,100 miles) of water mains, 16 treatment works, 164 pumping stations, 14 raw water reservoirs and 139 covered storage reservoirs.

In common with similar organizations, Bristol Water's monitoring needs had developed piecemeal, and in Bristol Water's case, over a period of nearly 20 years, resulting in an inefficient workspace for the monitoring staff.

Electrosonic worked with Bristol Water's project staff to rectify the situation by providing new workstation furniture, operators' displays, and an overview display. The furniture was designed with practical ergonomics and operator welfare in mind. It has provision for two operators, each of whom has three monitor screens. The monitors are 23-inch LED edge lit LCD displays from NEC (EX231Wp), and they are all on fully adjustable mounts which the operators can individually position. The console furniture was supplied by SBFI under subcontract to Electrosonic.

The overview display consists of six 55-inch LCDs with narrow frames (NEC 551UN) arranged as a 3×2 video wall, and a separate 65-inch LCD (NEC V651). The display is supported by a free-standing structure from Thinking Space, which eliminates the need for the room wall to provide structural support.

A central rack contains support equipment; principally a Dexon video wall image processor, an Adder KVM switch, a "Freeview" satellite receiver, a Crestron room controller and an Extron audio amplifier. The rack also contains space for eight PCs which were installed by Bristol Water staff, and these constitute the main image sources for the overview display.

The image sources available in the control room are typical of the requirement in this kind of installation, making it a "textbook" case. Sources include a SCADA alarm monitoring system, a GIS (Geographical Information System), an "SMS Board", a security (CCTV) display, a "Lone worker" display and a TV news channel.

The new display installation is a good example of how Electrosonic can work closely with a customer to ensure a control room display system meets actual user requirements in an economical and practical way.

The control room before...

and after the display system and console upgrade.

The Weather Channel VIDEO WALL

When The Weather Channel wanted to upgrade the primary studio set at its Atlanta headquarters, it turned to Electrosonic to install a new video wall to replace the display the company had previously provided. The new system, consisting of 12 Christie® Entero™ LED-illuminated rear-projection display cubes, is now seen as a backdrop for on-air talent and is a vehicle for live video and map presentations.

The production suite at The Weather Channel.

In 2008, Electrosonic supplied a rear-screen projection edge-blended system with Christie projectors to support The Weather Channel. The ongoing relationship with The Weather Channel meant that when, in 2012, it was looking for a new alternative to the blended system, Electrosonic suggested Christie's LED-illuminated DLP cubes, which offer extremely long lamp life, rich color and minimum maintenance.

The video wall is a 2 × 6 array of 67-inch cubes, giving an overall image area of 26.9ft × 6.7ft (8.2m × 2m). A three-output Vista Spyder image processor drives three 1:4 distribution amplifiers. Each of the DAs, in turn, drives one of three 2 × 2 sections of the wall. The cubes have internal processing and this is used to create a single image across each 2 × 2 section.

The Vista Spyder is an ideal processor for this kind of application since it works in real time and can be operated both manually and automatically – it is a "show" processor as opposed to the more computer oriented processors used in typical control rooms.

The Christie Entero™ was the first LED based display cube introduced to the control room market. It is also ideal for some TV studio applications like The Weather Channel because of its almost invisible "mullion" of around one mm and its use of cross-display monitoring, whereby each display monitors and tracks the settings of all the other displays in the system, ensuring an overall uniform appearance.

The installation was made "interesting" by the need to do the work on a fully functioning studio set. Teamwork between The Weather Channel production staff and Electrosonic's installation crew ensured that installation was completed without disrupting on-air production.

Daily Planet

[Above]
Two of the many interactive exhibits.

A massive hemispherical structure, cantilevered onto the new Nature Research Center (NRC) wing of the North Carolina Museum of Natural Sciences, forms the "screen" for an immersive multimedia experience – the SECU Daily Planet. The 40-foot (12.2m) high screen offers a massive visual canvas to visitors on three floors. In its "Ambient" mode, it presents spectacular scenes from nature through a variety of pre-recorded video content and random imagery. In its "Presentation" mode, it serves as a backdrop to scientists making daily live presentations on topics as diverse as excavating dinosaur fossils, tracking baboons in Kenya or exploring beyond the solar system. Electrosonic engineered both the Daily Planet show system and the AV interactive exhibits throughout the new wing.

All Photos: batwin + robin

in Raleigh, NC

Electrosonic's Design Consulting team was involved throughout the five-year project from the concept to the grand opening. Over the course of the project, there were many changes in the AV world, and the systems themselves evolved. Electrosonic worked with manufacturers and strategic partners to get a good picture of what could be expected by installation time. Electrosonic also worked closely with the client, exhibit designer Andrew Merriell & Associates, content producer Batwin + Robin and interactive designer Small Design Firm.

The SECU Daily Planet is presented using six Christie WU12K-M series 3-chip DLP digital projectors. In addition, four High End Systems DL3 moving digital light engines paint images on the bands located between the three floors (opposite the main screen). SECU, the State Employees' Credit Union, was the sponsor of the exhibit.

Four Delta media servers from 7th Sense Design, specially configured for the project, feed the projectors, and in addition provide outputs for TV/radio feeds and preview/confidence monitors. The high resolution images are stored uncompressed, and are "blended" and "warped" where required. Overall show control is by Medialon. Show programming was a team effort from both 7thSense and Smart Monkeys.

In addition to meeting the AV needs of the Daily Planet theater, Electrosonic furnished AV solutions for 55 innovative experiential media exhibits in the NRC wing, including "magic tables" for specimen identification via RF tags; visitor-veterinary lab observations; a salt-water tank with touch-activated information; and a weather prediction station with live international links.

Among the principal equipment supplied by Electrosonic for these exhibits were projectiondesign and High End Systems projectors; i-Tech touchscreens; Medialon Manager show control; Innovox, Renkus-Heinz and JBL loudspeakers; QSC and Stewart audio amplifiers; and Peavey audio processing.

[Above]
Image projection in the main exhibition.
Two further scenes from the Daily Planet.

New-York Historical Society

Even history requires a fresh take sometimes, and 2011 provided just that when the venerable New-York Historical Society Museum & Library, New York City's oldest museum, completed a three-year, $70-million makeover.

Included in the scope of the project were a sweeping new 3,400 sq. foot space that combines museum admissions, orientation and a permanent exhibition; a state-of-the-art theater; and the only children's history museum and library in the city. Lee H. Skolnick Architecture + Design was the exhibit designer. Electrosonic designed, engineered and installed the AV systems required by the project.

The new entrance hall and exhibition is named the Robert H. and Clarice Smith Gallery of American History. It contains two outstanding examples of the imaginative use of interactive exhibits, both with content produced by Small Design Firm.

The "Living Painting" is a 5×2 array of 55-inch Planar LCDs; the main image is the well known painting by Johannes Oertel "Pulling Down the Statue of King George III", depicting an event that took place in New York in 1776, but actually only painted in around 1879. Interactivity is provided by a Microsoft Kinect™ camera; if you approach the dog in the picture, it turns and barks; if you join the mob, you can help pull the ropes that bring the statue tumbling down.

The "Federal Wall" carries an array of busts, portraits and paintings. In front of it, five portrait format 46-inch Samsung touchscreen LCDs are mounted in rotating housings. Here you can "steer" the display in the direction of the item of interest and then use the touch feature to obtain detailed information.

Downstairs, the DiMenna Children's History Museum features many exhibits providing interactivity. Here all the equipment is built into the exhibits themselves. Exhibit fabrication at the NYHS was by a team including Explus, Superior Exhibits, Murphy Catton and DCI.

[Top to Bottom]

The Federal Wall Exhibit uses five rotating displays which the visitor can "aim" at the object of interest.

The "Living Painting".

The final part of the "New York Story" uses a screen measuring the full 72ft (22m) width of the theater.

THE THEATER

The New-York Historical Society's 300-seat theater was completely refurbished as part of the new development. It is comprehensively equipped with facilities for all kinds of events from concerts to conferences. However, during a "normal" museum day it continuously runs a spectacular 18-minute show, "The New York Story" produced by Donna Lawrence Productions.

The show makes imaginative use of dynamic banner screens which start by using only a small part of the stage, but expand to use its full width. In fact, there are three different screen arrangements corresponding to different eras in New York's history. Necessarily the early history uses archive art and photographs, but recent history includes specially shot "4K" material.

The engineering of the motorized screens was by LA Propoint and additional set work was by Pook Diemont & Ohl (PDO) Inc. Remarkably, the projection system uses only three Christie DLP™ 3-chip projectors sourced from Extron JPEG2000 players. The massive surround sound system uses 35 loudspeakers.

Projection screen (top left) with fossil wall below.

DINOSAURS
in Los Angeles

Visitors to the 14,000 sq. feet (1300 sq. meter) Dinosaur Hall in the Natural History Museum of Los Angeles County experience the wonder of prehistoric creatures through exhibits, such as the world's only Tyrannosaurus Rex growth series of baby, juvenile and adult skeletons, and a 43-foot (13m) Fossil Wall exhibiting 100 diverse dinosaur specimens.

Exhibit design was by Evidence Design. Electrosonic was responsible for the design, engineering, fabrication, installation and programming of the Hall's audio, video and interactive displays that support the main exhibits under sub-contract to Lexington Design & Fabrication, the exhibition fabricator. Media content was by Unified Field.

When visitors walk past the Triceratops and the 68-foot (20.7m) Mamenchisaurus, they encounter a 15-foot (4.6m) wide front projection screen suspended about nine feet (2.7m) above the floor. A 3-chip DLP™ projector, and a pair of speakers located behind the screen, present a looped video describing the hunt for the prehistoric creatures called "Investigating Dinosaurs".

The mezzanine level features a number of exhibits with AV components. One display about the structure of dinosaur heads has an interactive touchscreen in its base that enables visitors to simulate dinosaur calls thanks to a compact, flat full-range speaker. A multi-touch screen, which can handle 32 simultaneous touches, is positioned alongside an exhibit of excavation tools. Its table-style configuration allows children of all ages to play a game that simulates a dinosaur excavation.

Hollywood
WAX MUSEUM

When the Hollywood Wax Museum refurbished its lobby to attract the attention of passers-by, Electrosonic was called upon to design and install a number of HD video displays to capture the interest of strollers on Hollywood Boulevard.

The displays show a montage of newly-made clips that pay homage to all genres of Hollywood movies, ranging from classic westerns and Sci-Fi spectaculars to musical extravaganzas, war films and mysteries.

Electrosonic installed two 3×3 video walls using 46-inch monitors for the back wall of the lobby, two 2×1 arrays of 46-inch monitors for the cashier's desk and a 2×1 and 3×1 array of 55-inch monitors, both in portrait mode, in the lobby. All monitors are from Samsung and video playback is from Alcorn McBride Video Binloop. Elliott Metal Fabrication consulted on the custom monitor mounts which required seismic certification.

Projection Mapping
at IAAPA

A popular event for Electrosonic's theme park, museum and visitor center customers is the annual Electrosonic Party at the IAAPA convention. Sometimes it is possible to hold the party at an attraction where Electrosonic has been an important supplier, but whatever the venue, the company tries to show something of interest.

The 2011 party was held at the Crowne Plaza Universal Hotel in Orlando, FL. The opportunity was taken to demonstrate projection mapping on a large scale, using the hotel itself as a projection surface. Special, and amusing, content was developed by Mousetrappe for the occasion, JMR provided the laser scanning service, and Christie (who has sponsored a number of Electrosonic's parties) provided the projectors. The system was engineered by Electrosonic with the help of 7thSense Design who provided the server.

BALLGOWNS AT THE V&A

"Ballgowns: British Glamour since 1950", an exhibition at the Victoria and Albert Museum in London, ran from May 2012 until January 2013 and featured more than sixty designs for social events such as private parties, royal balls, state occasions and opening nights. Mounted in the newly renovated Fashion Galleries, the exhibition, designed by Emily Pugh, was supported by giant projected images based on photography by David Hughes. Production of the video sequences was by Rollo Hollins of FletcherWilson. The projection system was engineered and installed by Electrosonic.

PROJECTION TECHNOLOGY

The projection system was based on four pairs of projectiondesign F32 WUXGA high brightness projectors, all with wide angle EN13 lenses. Two projectors were used for each image in order to achieve the required image size and aspect ratio. The projectors were housed in well ventilated housings built by MDM Props, and each received its DVI signal over "CAT5" cable.

The show was run from two 3XS workstations, each one serving four projectors, running Dataton Watchout® software. This program provided the necessary edge blending and warping of the images to map them to the alcove shape.

The whole system ran automatically from a Medialon Showmaster embedded controller.

While the "Ballgowns" exhibition only ran until early 2013, the projection system is designed for a long life and is to be used to support other exhibitions occupying the same gallery space.

BODY ADORNED

The Horniman (South East London) Museum's project to coincide with the London 2012 Olympic and Paralympic Games was "The Body Adorned: Dressing London", an exhibition that ran until January 2013 that "looks across time and cultures at the multiple relationships between dress, the body and cosmopolitan London". It featured many objects from the Museum's collection, together with specially commissioned photographic and video content. Electrosonic engineered the required AV installation, making maximum use of the museum's existing equipment pool.

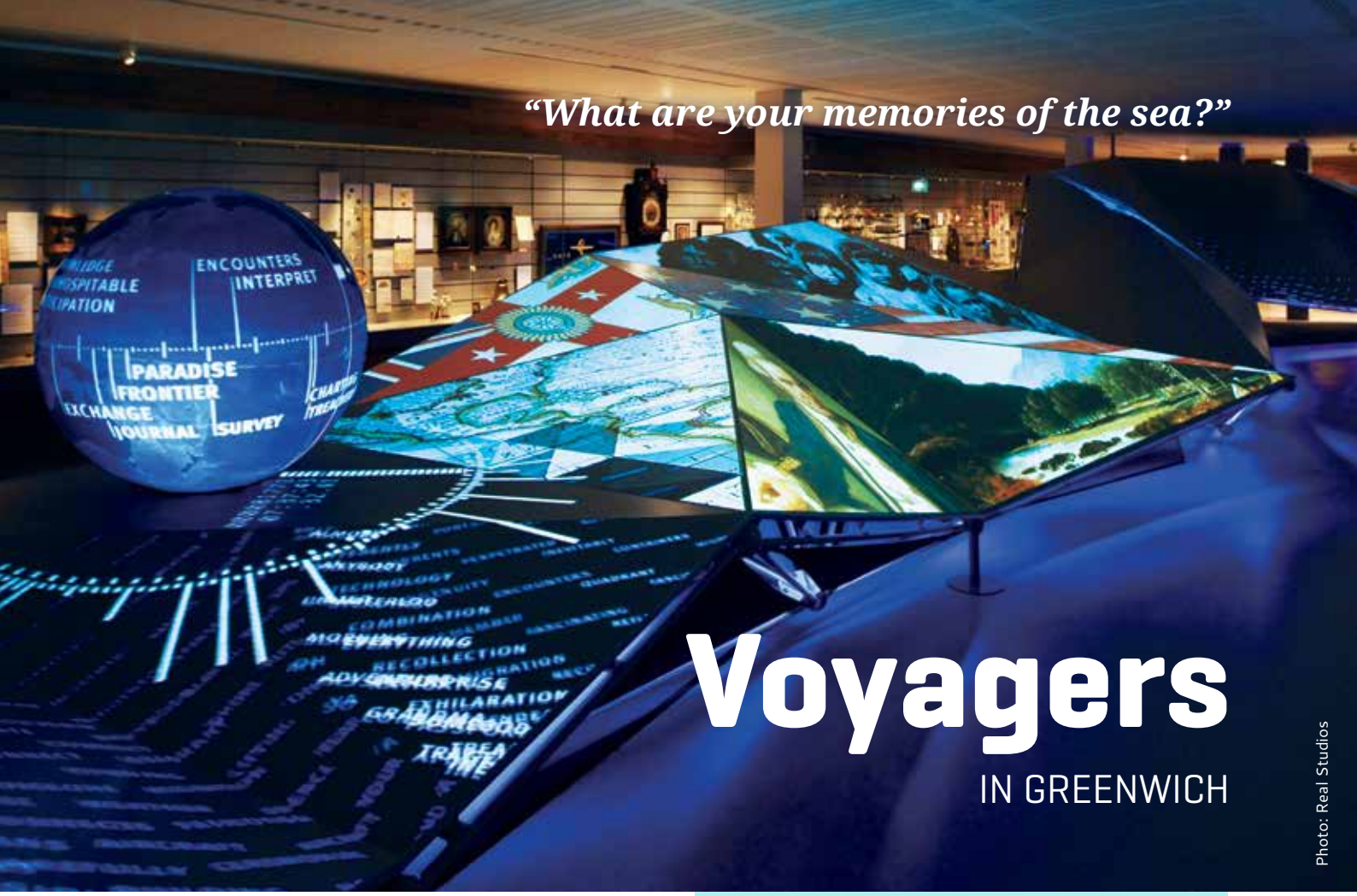
Introductory exhibit combining projected images with artifacts from the Museum's collection.

AV PRODUCTION

"The Body Adorned" presented multiple views reflecting the perspectives of the curators and a team of young collaborators. The exhibition was designed by Neil Richardson of Objectives, and used AV techniques to present new material.

A centerpiece was a specially commissioned video work by The Light Surgeons. This combined a large projected image, which was shot as if looking out through a large shop window on to a busy street, with four portrait format LCDs and associated loudspeakers. The LCDs featured individual characters who interacted with each other and the main display.

All other AV production for the interactive exhibits and screens was by Spiral Productions.



In July 2011, the National Maritime Museum (Greenwich UK) opened its £36.5m Sammy Ofer Wing, housing 'Voyagers', an exhibition gallery dedicated to helping visitors gain a richer understanding of Britain's maritime heritage. Electrosonic was selected by the museum to supply, install, commission and provide warranty for the AV hardware. The gallery was designed by Real Studios, with AV creative direction by The Light Surgeons. Bespoke software was supplied by Flightphase and The Hub was the fit-out contractor.

The first thing visitors see upon entering Voyagers is the "Wave" (see box) which dominates the gallery. Behind the Wave is a 30m (98ft) long object wall, housing over 200 artifacts; the Museum has taken the rather unusual approach of ordering them by emotion – anticipation, love, sadness, aggression, pride and joy.

The final element of Voyagers is a series of video portraits. These take the form of recorded first person accounts from ordinary and extraordinary people from all over the world – coastguards, émigrés, naval officers, school children – each with their own story. A series of columns are placed towards the exit of the gallery through which the visitors pass to leave. Eight small video monitors inset in these columns show short films of people answering questions such as: "What does the sea mean to you?", "What is your maritime story?", "What are your memories of the sea?".

The Wave

The Wave is a 25m (82ft) wave-like structure featuring video projections and a dramatic sound-scape. Seven Panasonic projectors display intensely colored patterns of images and words which appear to wash over the wave's multi-faceted surface, simulating the rise and fall of the ocean.

At one moment the Wave is dominated by two or three stand-out images from the museum's archive collections; in the next, one of a series of film and image montages pulses from right to left, each a shifting mosaic of content that illustrates a key theme from the Museum's holdings. Sometimes a bold flash of color will light the space – an impression created by many similar objects being shown at the same time. These moments are interspersed by waves of text which wash over the surface, creating a constant sense of movement. Sounds of the sea, whistling wind, crashing waves and flapping sails, mirror the movement of the Wave, giving visitors the impression they are really at sea.

A Puffersphere spherical display, powered by a Christie projector, appears to float on top of the Wave. It displays words and images, taking visitors on a visual journey into maritime history. The Wave and Puffersphere are animated in real time using openFrameworks software.

SHIPWRECK
IN SINGAPORE

Visitors to the Maritime Experiential Museum at Resorts World Sentosa, Singapore, get a close look at a shipwreck in the Typhoon Theatre, where Electrosonic provided audio-visual design, engineering, integration and installation of the audio, video and control equipment to help simulate an amazing historical journey. The company was hired by Sunray Woodcraft Construction and worked under the general guidance of museum designers Ralph Appelbaum Associates. Show content was by Super 78. Singapore-based Electronics & Engineering was Electrosonic's installation sub-contractor.

The museum was built to house the Jewel of Muscat, a reproduction Arab dhow which sailed on the Belitung route from Oman to Indonesia 1100 years ago, and some 60,000 artifacts salvaged from a shipwreck found near Java. The centerpiece of the museum is the Typhoon Theatre where visitors 'board' the Arabia-bound ship, experience the storm it encountered, and sink in the sea as the theatre floor descends. When the lights come back on, visitors find themselves in the depths, and the shipwreck surrounded by marine life.

The experience begins in the harbormaster's hut on the pier in China's Guangzhou harbor. Shutters part to reveal a rear projection screen displaying the ship's crew at work: an emissary carrying a priceless chalice wedding present which will be part of the cargo, and an astrologer making dire forecasts about the ship's fate. Electrosonic provided a Doremi Labs Nugget HD video player, a Christie DHD800 1-chip DLP projector and a pair of Renkus-Heinz ICONYX line arrays and subwoofers for this pre-show.

Visitors proceed to the Typhoon Theatre for the main show. The 15.5-meter diameter circular space seats about 150 visitors in bench seating bolted to a floor whose hydraulic lift platform is activated when the ship sinks. A curved-wall surface is the "screen" for a Sony SRX-T420 4K SXRD projector customized by Electrosonic with a fish-eye lens to fill a 180° space about six meters high. A DVS Cine4K server is the program source and a 3D Perception system handles image processing and warping. Four High End Systems DL3 moving-head projectors cover the back wall of the theatre with effects projections, creating a 360° experience.

THE AUDIO SYSTEM

A 13-channel audio system plays a key role in setting the scene and giving visitors the sensation of the storm. Five Renkus-Heinz loudspeakers are mounted on top of the screen pointing down, and another five are on the front platform angled up so sound bounces off the screen. Four more are placed on overhead catwalks to give left and right surround. A Peavey MediaMatrix DSP provides correction.

Configuring the audio was a challenge due to the shape of the space and the impossibility of placing speakers behind the screen. Electrosonic teamed with acoustic consultants Sowden and Associates to solve the problems, resulting in the acoustic treatment of the concrete space, and strategic location of the speakers to deliver the best possible surround sound.

VINDOLANDA TRUST

Tells the Story

The Vindolanda Trust (an entirely independent charity) runs both the Roman Vindolanda Fort & Museum and the Roman Army Museum, two sites a few miles apart along Hadrian's Wall (considered "the most important monument built by the Romans in Britain", and started in 122AD). Both museums have recently been expanded and re-fitted in a major project partly funded by the Heritage Lottery Fund. AV techniques are used both to help interpret artifacts and to bring Roman times to life.

At the Roman Army Museum, a soldier looks down on a projected map that shows how the Roman Empire expanded and finally contracted. Behind him a short program explains the structure of the Roman Army.

[Above]
The "Recruiting" display showing the "tent", the character display and the carefully sited bench seating.

of the Roman Era

Vindolanda justly claims to be "the most exciting archaeological site on Hadrian's Wall", and was an important fort long before the construction of the wall. Today visitors can explore the site and see "live archaeology". The country house of Chesterholm is the museum for the archaeological site and displays many of the artifacts found in the excavations, with an emphasis on items relating to daily life in Roman times.

An example of the use of AV to help interpret the archaeological collection is an exhibit on Roman coins entitled "Professional Soldiers". This explains that the soldiers were professional and were paid a regular salary in coins. Above the display of coins is a 46-inch LCD screen that shows enlarged images of individual coins and captions that name the emperor depicted on the coin.

Further LCDs (all from NEC and sourced from BrightSign players) support an exhibit on the excavation process that includes a film where participants explain what they are doing, and a major exhibit on the discovery of the Vindolanda Writing Tablets, considered one of the most important Roman finds in Britain because they give incredible insight into how people lived.

The Roman Army Museum, seven miles from Roman Vindolanda, is big enough to accommodate some large scale exhibits. In the first gallery, visitors encounter a rather impressive Roman horseman, and nearby a Roman soldier.

The soldier surveys a "map table" at his feet that graphically shows how the Roman Empire expanded, and then contracted over a period of hundreds of years. The map is projected by a compact ceiling mounted projector. Behind the soldier, a large mural illustrates the "Professional Army"; part of the mural is a projection screen where, alternating with the "Recruiting" film described next, a program on the "Structure of the Roman Army" is presented.

In the same gallery, a most effective exhibit brings to life the harsh reality of being in the Roman Army. A "field tent" becomes the place where a "Recruiting Centurion" sizes you up to see if you are fit for service. The effective presentation is achieved by carefully positioned bench seating that allows a view into the "tent" where the character seems "real" within the set – an effect achieved with a large Pepper's ghost display.

The next gallery is devoted both to Hadrian's Wall and its history, and to Hadrian himself. The "Hadrian" exhibition examines several aspects of the man, and the "Cultured Man" display includes a supporting video sequence.

[Above, Left to Right]
The "Professional Soldiers" exhibit.

Showing how the display seen at a distance draws visitors through the exhibition.

The "Diary from the Frontier" exhibit.

THE TEAM

The re-development project was an initiative of the Vindolanda Trust and was managed by the Trust's Director, Patricia Birley. The architect for the building work was Andrew Hamilton, and building construction was by Border Construction. Studio MB of Edinburgh was the exhibition designer and Sharman Shaw was the exhibit fabricator. AV media content was designed, directed, written and produced by Studio MB with software teams Iso Design and Freakworks. Electrosonic was the AV Systems Integrator for the exhibition displays, under contract to Studio MB.

NATIONAL BUILDING MUSEUM

The National Building Museum, housed in its own landmark structure, the former US Pension Bureau headquarters in Washington, D.C., is hosting a major new exhibition called "House & Home". Running through spring 2017, "House & Home", designed by Ralph Appelbaum Associates, presents an array of photos, objects, models and films, that show visitors the remarkable changes in domestic life over the centuries and what it means to be at home in America.

Electrosonic designed, fabricated, programmed and installed AV equipment for selected galleries and trained the museum staff to operate and troubleshoot the installation.

Photos: Local Projects

IMAGES

"Experience the Dwelling" is a mini-theater with bench seating showing "Welcome Home", a film projected onto two 16×9 foot screens by two Christie DHD670-E single chip DLP™ projectors. Video playback is from an Extron JMP 9600 2K player which is connected to the projectors by UTP interfaces. (Above)

The Living at Home galleries display hundreds of household goods used over the past several centuries. Six exhibit groups each feature a portrait format 32-inch LCD. The video interface, video player and an Ethernet controlled power bar are mounted under the floor at the base of the kiosk. (Left)

BROOKLYN BOTANIC GARDEN

With the opening of Brooklyn Botanic Garden's (BBG) new visitor center and gateway, visitors can now orient themselves to the garden, learn about its current blooms and plantings, and browse the event schedule via interactive exhibits installed by Electrosonic for exhibit fabricator Hadley Exhibits.

Founded in 1910, BBG is an independent, non-profit institution committed to education, science and horticultural display. Situated on 52 acres in the heart of Brooklyn, BBG is home to more than 12,000 types of plants and hosts more than 725,000 visitors annually.

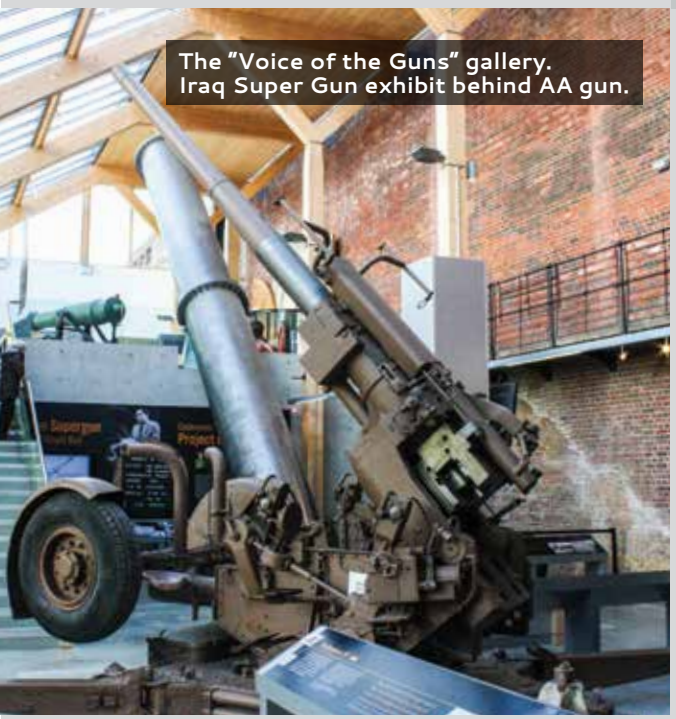
INTERACTIVITY

Visitors are welcomed by a BBG map presented on three narrow mullion 55-inch LCDs (Samsung UD55A). Nearby a 46-inch portrait format LCD presents information about "Today's Events". Both are supported by interactive PCs that provide links to further information. (Left)

A traditional form of interactivity is provided by "peek-a-boo" exhibits (above). Here photo panels can be lifted to reveal further information, and some of them are equipped with six-inch LCDs fed by Technovision solid state MPEG video players. The programs are triggered by magnetic switches in the hinge mechanism.

BIG GUNS AT FORT NELSON

Fort Nelson, overlooking Portsmouth Harbour, is home to the Royal Armouries collection of artillery and historic cannon. In 2011, it underwent a £3.5 million development and Hayley Sharpe was appointed designer for the museum. Electrosonic installed the AV systems that support the exhibits.



The "Voice of the Guns" gallery. Iraq Super Gun exhibit behind AA gun.

One exhibit based on late Victorian times shows a black and white photograph of a recruiting sergeant in a gilt frame. At intervals he comes to life, in full color giving a severe pep talk urging you to join the army and to "step forward and take the Queen's shilling".

Two interactive exhibits are in the form of "map tables". They are based on projected images, and offer a choice of topics related to the two main subjects "How was the fort built?" and "Why was the fort built?"

The new gallery, "The Voice of the Guns", showcases the collection's most famous exhibits. These include the Great Turkish Bombard from 1464 and two anti-aircraft guns used to defend the South Coast. Several exhibits include LCD screens that provide supporting video material.

The most infamous exhibit is devoted to the Iraqi Super Gun. This was originally intended to be 156m long (26 sections each of 6m) with a 1m bore. The barrel sections were exported to Iraq as "chemical pressure vessels", and most were destroyed after the first Iraq war. However the last few were intercepted by HM Customs, and two of them are on display at Fort Nelson.

HITLER LETTER AT THE MUSEUM OF TOLERANCE

One of the most important documents of the Second World War, an early letter written by Adolf Hitler, was recently acquired by the Museum of Tolerance in Los Angeles.

Written in September 1919, it is the only document signed by Hitler linking him to the elimination of the Jewish people. In it Hitler calls for "an anti-Semitism based on reason...[whose]... final aim, however, must be the uncompromising removal of the Jews altogether". It was found by an American GI in Nuremberg in 1945. Rabbi Marvin Hier, founder and dean of the Simon Wiesenthal Center, called the letter "the most significant ever acquired" by the Center.

In an exhibit designed by the Yazdani Studio of Cannon Design, the letter is housed in a glass display case alongside a 65-inch Mitsubishi LED CyberTouch touchscreen. Visitors can view content created by Cortina Productions allowing them to virtually interact with the letter, reading it in the original German or translated into English. A graphic image of a magnifying glass enlarges portions of the letter for easier inspection. Visitors can also access milestones in the history of the Third Reich, news articles, maps and still photos, plus video clips about the acquisition of the letter in 2011.

Two visitors at a time can access the exhibit, but there is also a docent mode for presentations to groups. Electrosonic designed and installed the interactive system.

DOVER CASTLE'S **SECRET TUNNELS**

The tunnels were begun in 1797 and their official use continued until 1984.

English Heritage has completed a major investment at Dover Castle within the network of Secret Wartime Tunnels that lie in the chalk cliffs under the castle itself. Opened to visitors on 10 June 2011, "Operation Dynamo: Rescue from Dunkirk" combines original news-reels and recordings, two years of painstaking research, testimonies from veterans of both the beaches and the tunnels, and state-of-the-art special effects to deliver a vivid account of what Sir Winston Churchill called a "miracle of deliverance".

The main attraction is run as a "pulsed" show, with parties of up to 30 people accumulating in the "War Begins" waiting area. Every nine minutes, a Sergeant Majorly voice enjoins the group to move on to the "War Begins Cinema".

This space is themed as an underground briefing room complete with mock 16mm projector and blackboard. Of course the film is actually shown electronically, and describes the events leading to war. The "blackboard" turns out to be an LCD panel covered in black gauze which is used to give French and German subtitles to the presentation.

Visitors leave the cinema and move into the "Battle of France" presentation space. This is themed as an underground war room. Visitors can sit on perimeter seating or stand to watch the show. It describes the battles in France

that led up to the need for evacuation. Two walls of the space show archive footage from the battle, and animated graphics are projected onto a low table in the center of the room. These reinforce the commentary by illustrating, for example, the balance of forces and the troop movements.

The highlight of the visit is in "Rescue from Dunkirk (Casemate Z)" where the events of May 26 to June 4, 1940 are presented in dramatic fashion. The casemate is a tunnel space 60 meters long, and the story of the evacuation is narrated by Kenneth Cranham, accompanied by the voices of veterans of the time. Giant images run the length of the space, augmented by spectacular lighting effects. The images require a total of 23 projectors, and are computer controlled to ensure synchronization, and to warp and blend the separate projected images into one long image.

Some of the projected sequences are particularly effective. Against a huge background of ships and small boats, fighter planes seem to zoom down the entire length of the tunnel. In another sequence silhouette photography gives an eerie feeling that the people who were planning the evacuation from within the tunnels are still present.

THE TEAM

The prime mover behind the Secret Tunnels project was, obviously, English Heritage. The Designer and Producer of the new experience was Kvorning Design & Communication of Denmark. Kier was the main contractor for all the associated building works.

The Kvorning team included: COWI and the Light Bureau as lighting designers, Stouenborg as audio designer and producer, Kvorning itself and Homerun as media producers, and MDM as provider of special effects and setwork.

Electrosonic had a pivotal role throughout the project. At the design stage, it worked with Kvorning to validate the design ideas, and to work up AV and control design in sufficient detail to allow reliable budgeting. CAD techniques were used to model the projection optics. Subsequently, Electrosonic was awarded the AV system and show control integration contract.

The silhouette images in the main show are particularly effective.

The "War Begins" Cinema.

The "Battle of France" Show.

Back to Nature

AT MOHONK PRESERVE

Mohonk Preserve in the Shawangunk Mountains, New York state's largest nonprofit nature preserve, marked its 50th anniversary with a renovation of its green design, award-winning Visitor Center tucked cozily into the woods. Lee H. Skolnick Architecture + Design Partnership was responsible for the architecture, interiors, graphic design and exhibit design of the Visitor Center project.

Electrosonic engineered the AV displays which were designed to ensure that visitors made the best use of their time.

With over 8,000 acres of mountain ridges, fields, streams, ponds and other unique and beautiful places, Mohonk Preserve is dedicated to protecting the Shawangunk Mountains by inspiring people to care for, enjoy and explore the natural world. Visitors can bike, hike, climb, ride horses, run, ski and snowshoe in the Preserve.

The Visitor Center is a stone and wood structure set on over 40 acres, including the J & S Grafton Sensory Trail, LaVerne Thompson Nature Trail and Children's Forest. Its main floor is an open room with large windows that overlook the Preserve and provide a backdrop for a three-dimensional topographical map that gives bird's-eye views of trails and major points of interest. Electrosonic added four 32-inch ELO interactive touchscreens to the map. Visitors can access details and photos about the trails and attractions via the touchscreens. Content was created by the Preserve in collaboration with Richard Lewis Media Group.

At the entry is the "Nature Notebook," made up of two 46-inch Samsung LCD screens hung in portrait mode. One side is a Welcome Information Station, which features weather updates and daily information on trail conditions and upcoming events. The other offers visitors a chance to leave observations and questions with a keyboard and mouse, which is displayed like a Twitter feed. The Preserve posts seasonal nature observations as prompts.

The 10-minute introduction show, produced by Richard Lewis Media Group, is shown on a 26ft (8m) wide panoramic screen with a pronounced curve. The show is projected by four projectiondesign F12 projectors running from Dataton WATCHOUT, which also does the required blending and warping.

The show can be started by visitors; between shows, the screen shows an attractor loop of beautiful photographs.

[Above]
Visitor Orientation Theater.

[Above Left to Right]
The Nature Notebook displays.

The touchscreens installed alongside the topographical display.

AJAX EXPERIENCE

The Ajax Experience opened in September 2011 right in the middle of Amsterdam. While especially aimed at Ajax fans, it is for all who love, or would like to learn more about football. Its location on the Rembrandtplein makes it easily accessible to the thousands of tourists who visit Amsterdam. The Ajax Experience visitors' centre was designed and produced by gsmprjct° of Montreal. Exhibition fit-out was by Fiction Factory. Electrosonic was the audio-visual systems integrator.

T.I.P.S

For many visitors, the highlight is the opportunity to participate in interactive exhibits that reveal the attributes of great football players. The emphasis is on Technique, Insight, Personality and Speed, otherwise known as "T.I.P.S".

The TIPS Personality exhibit is a graphics panel and the Insight exhibit is a multi-touch table. However, both TIPS Speed and TIPS Technique require the visitor to do some real kicking. They do this inside glass "boxes" which ensure the ball does not escape, but allow spectators to see what is going on.

These two exhibits involve projection on the floor and camera tracking of the ball. Content and software for these exhibits were by Kiss the Frog. (All other linear and interactive content was produced by gsmprjct°.)

Visitors arrive at the Ajax Experience at street level and enter the exhibition by a short flight of steps within the "Hall of History", a graphic display augmented by a 2×2 video wall based on four 46-inch LCD panels. An appropriate soundtrack plays throughout the area to set the mood.

One of the main themes of the exhibition is "From Children to Champions", a unique feature of Ajax whereby intense training helps to transform simply talented players to top footballers and international heroes. So the journey through the Ajax Experience starts with the youth training program and ends with the world of the football elite.

The first exhibit that visitors see is a film "Well of Talent" that shows how young players become Ajax's Juniors.

Visitors then enter a large space which combines several elements: "museum" exhibits, linear films and interactive exhibits where visitors can try their football skills. The "museum" element consists of memorabilia, trophies and significant club artifacts.

The climax of the Experience is a visit to the locker room, where the manager gives a pep talk, followed by a walk into the stadium through the players' tunnel. Here a multi-screen show evokes all the excitement of the match.

Two of the three glass "boxes" housing the TIPS Technique interactive exhibits. The footballs can be clearly seen. Graphic panels explain to onlookers what is going on.

EUROPEAN PARLIAMENT

VISITORS' CENTRE

The Parlamentarium, the new visitors' centre of the European Parliament, opened in Brussels in October 2011. It is the first ever exhibition to be fully accessible in 23 languages. Electrosonic was contracted directly to the European Parliament to engineer and install the main exhibition audio-visual hardware to meet the performance requirements of the exhibition's designer, Atelier Brückner of Stuttgart. The overall system includes two 360° theaters, nearly 100 LCD panels of various sizes, a novel "voxel" display using 13,000 LED globes, 140 computers, multi-channel audio, 40km of signal cables and 18 equipment racks.

Visitors enter the Parlamentarium through a "tunnel" featuring a "soundscape" of all 23 languages of the EU. On leaving the tunnel, visitors are issued a "Multi-media Guide", essential to enjoying the exhibition. The guides and supporting infrastructure were supplied by NOUS of Austria and include RFID technology to provide interactivity with exhibits. Visitors choose the language they want at issue, and from then on, the guide operates in the visitor's language (in text and audio). The RFID feature ensures that exhibits operate in the visitor's language.

The first part of the exhibition explains the post-World War II conditions that led to the beginning of the European Union, using contemporary photographs augmented by audio and by information on the media guides. There follow exhibits that show how the EU was enlarged, illustrated both by graphic displays, and 40-inch LCD touch screens in table format that describe the treaties that led to the EU as it is today.

The next part shows aspects of today's EU Parliament. A "calendar" exhibit uses a sliding LCD to show the parliament's annual schedule week by week, and an "MEP wall" shows every Member of the European Parliament. Associated with it is an LCD that gives a "video portrait" of an individual MEP. Three "Polling Booths" allow visitors to "vote" on current issues. They can see how their vote compares with both those of other visitors and of parliament itself. An overhead LED display shows the poll results.

"A Parliament for Europe" is the "big show". A 360° presentation gives a feel for the semi-circular layout of the EU Parliament in Strasbourg. Visitors can listen to debates, see votes being taken and be guided through the legislative process. The show has two presenters to explain what is going on; they speak in English, but the 22 other languages can be heard as simultaneous translations on the media guides. The 12-minute show uses 14 projectors, and has a total screen area of 150 sq. meters (1600 sq. feet). It runs automatically with an interval between shows, during which visitors can access information about the MEPs using one of the 36 19-inch touchscreens set into the desks.

The "Europe in Daily Life" exhibit is a more relaxed affair than "Parliament". The screen arrangement is identical, but the layout is different. In the centre of the space are 22 easy chairs, each with an associated touchscreen. Here, 54 Europeans (two from each of the 27 countries) tell how the EU and its policies have had an impact on their lives, businesses and prospects. Films shown on the touchscreens are chosen by the visitors; the film on the 360° screen shows scenes relevant to all participants.

Novel manifestations of AV are experienced in the "United in Diversity" section. The "Ground of Stories" exhibit gives visitors a virtual trip through Europe. On the floor is a 210 sq. meter (2260 sq. feet) map of Europe. Within it are 90 RFID tags that identify places of interest. Visitors use one of 12 mobile displays that can be wheeled over the map to learn more. A monitor in the top of the device shows what is on the floor, using a webcam built in to its base. An RFID reader detects the tags, and the monitor displays information on the place detected.

Surrounding the exhibit is a 40m × 0.32m (131ft×1ft) "ticker tape" display, consisting of 2,540 × 20 (50,800) RGB pixels and showing a sequence of statistics and poll results. The most unusual exhibit is the overhead "voxel" (Volumetric Pixel) display. Thirteen thousand spherical LED based elements are arranged in a 3D array. The display is a mirror image map of the EU, matching the map on the floor on a smaller scale. It interprets the data presented on the ticker in color and graphical form.

THE TEAM

The €21 million Parlamentarium project was realized by a large team. Besides the European Parliament itself as client, the main team was:

LORD Cultural Resources Planning & Management Ltd developed the first concept.

Atelier Brückner of Stuttgart was the designer of the exhibition. The design team included:

- **Integral Ruedi Baur** as graphic designer.
- **LDE Belzner Holmes** as lighting designer.
- **jangled nerves** as media designer.
- **Medienprojekt p2** in co-operation with **Media-Bureau** as AV consultants.

Wycor of Belgium was the main building contractor and **Bruns BV** of Holland was the exhibition fit-out contractor.

Markenfilm Crossing GmbH of Hamburg was the media producer for the exhibition.

NOUS Wissensmanagement GmbH of Vienna was responsible for the media guide system and its associated RFID technology.

Media Farm of Norway was responsible for the concept, planning and realisation of the Role-play game, a separate part of the exhibition.

Electrosonic was AV Systems Integrator for the main exhibition.

THE TECHNOLOGY

Source equipment is mounted in racks sited in a dedicated control room. The need for continuous updating dictates that there is a dual media server system with RAID storage, networked to all machines, which can be accessed remotely by the Media Producers.

The media servers the video source and interactive computers are all from DVS (UK). The 360° shows use Dataton Watchout to provide the synchronized playout and geometrical correction.

All 40 projectors are from Panasonic; the majority are PT-D6000 ELK (XGA single chip DLP, 6500 lumen). Nearly 100 LCDs, many with touchscreen capability, are installed. 40 and 46-inch displays are from NEC; smaller displays are OEM open frame displays built into the exhibits. The mobile display "trolley" units were built by Bruns BV, and then fitted out by Electrosonic. The complete "voxel" display was developed by Atlantic Star of Latvia under sub-contract to Electrosonic.

CANADA'S SPORTS HALL OF FAME

When Canada's Sports Hall of Fame opened at Canada Olympic Park in Calgary in 2011, sports fans flocked to the new 40,000 sq. foot space that celebrates the country's impressive and inspiring sports history. The attraction offers 11 exhibit galleries representing 58 sports, and includes more than 50 interactive visitor experiences designed to captivate fans of all ages.

Engaging interactive exhibits in the Hall of Fame area. The portraits above are displayed on Sharp LCDs.

Dramatic overhead "floating" screens.

Cambridge Seven Associates (C7A) designed the new building, which houses interactives and multimedia presentations designed by Cortina Productions and Bruce's Garage. Electrosonic was the main AV systems contractor working for The Taylor Group, which provided overall exhibit project management and fabrication. Electrosonic's Design Consulting team worked with C7A and the media producers to design the AV aspects of the exhibits. Electrosonic hired Calgary AV contractor ASCCI to source the equipment in Canada, local resources for rack fabrication, and on-site installation. EOS Lightmedia of Vancouver was the lighting designer.

One of the most challenging galleries was The Ring of Canada Sports. C7A wanted the images floating overhead, but the ceiling height restricted the projector positions available. In the end, the screen surface evolved to a ring shape and used Sharp XG-P610X projectors with wide-angle lenses mounted above custom mirror assemblies to rear project onto the scrim material.

A visitor favorite is the Formula 1 car in the Ride Motion Gallery, which is backed by a curved screen displaying racing footage. Electrosonic provided a Sharp XG-P560WN running through an FPS IA-200-EX to correct for the screen's curve. Shadow Boxing in the Contact Gallery gives visitors a chance to demonstrate their pugilistic skills; participants cast their shadow on a screen where a Sharp XG-P610X projector displays the moves of their opponent.

Medialon MIP HD players and PCs are the main image sources. Cisco DMP-4400G-52-K9 Digital Media Players are used in digital signage and several exhibits, and some 3D Blu-ray players are used in action sports exhibits.

Photos this page: The Taylor Group

Improved Audio

AT KENNEDY SPACE CENTER

The Kennedy Space Center Visitor Complex in Florida recently reconfigured its entrance. Delaware North Companies Parks and Resorts which manages the daily operations of the Kennedy Space Center Visitor Complex, commissioned Electrosonic to provide the audio-visual design, infrastructure, equipment and programming for the background music, audio messaging and video signage for ticketing and guest relations services. Electrosonic worked closely with Whiting – Turner Construction who built the new entry area. Electrosonic's Design Consulting team was involved from the start of the project, serving as the AV consultant to architects PGAV.

The project was the first from Electrosonic to implement QSC's Q-Sys Digital Signal Processing (DSP) unit, a powerful yet simple solution for audio processing, control and management. The Q-Sys CORE 3000 128x128 provides multi-channel audio playback park-wide. With Q-Sys, there is no need for separate devices to play back the audio, eliminating the need for multiple CD players or solid-state audio playback machines. This minimizes the equipment footprint and eliminated an equipment room. The new configuration provides 128 channels of audio, and soundtracks are tailored to individual zones in the park by creating audio players in the software.

Q-Sys communicates over a network with Q-LAN so any device can share audio, functions or information. As the park expands and upgrades, more audio can be added just by providing a network connection.

Electrosonic installed many QSC loudspeakers, and associated amplifiers and sub-woofers, in the retail building, the entry/exit turnstile area, the self ticketing area, the welcome center and the fountain area.

Digital signage is prominent in several areas. For example, the guest services area features 32-inch high brightness, outdoor-rated LCD displays for graphics and information about tour packages and special events. In all cases displays are fed by a video player located in the equipment room via fiber with HDMI/DVI video and serial control.

THEATER AUDIO VIDEO DESIGN

IN CALIFORNIA

In late 2012, the Las Virgenes Unified School District (LVUSD) opened the doors to its two new Performing Arts Education Centers located at Calabasas High School and Agoura Hills High School in California. The two almost identical theaters were designed by renowned architect John Sergio Fisher & Associates (JSFA). Electrosonic's Design Consulting team provided the audio system design for the theaters, and also designed the theatrical intercom and video distribution systems. Electrosonic's audio-visual design was executed by AMT Systems of Santa Clarita, California.

The two state-of-the-art performance venues are used by students, artists, community members, and outside groups. Each center features a 650-seat main stage theater, a Black Box theater to be used as a teaching and performance space with accommodation for up to 100 seats, a full orchestra pit with a hydraulic lift, and professional acoustics, lighting and sound systems.

Understanding that the facility would be used by both students and visiting professional theater companies, Electrosonic designed a system that employs current digital and analog technologies without being overly complicated. This allows theater students to establish a solid foundation in their knowledge of the system, without compromising the higher functionality required by outside theater professionals.

The Yamaha M7CL-48ES audio console is used for the main stage in both locations, and the LS9-16 console is used in the black box theaters; both chosen for quality, reliability and stability and because Yamaha's digital consoles are prevalent in the theater industry worldwide. They are perfect for training newcomers to the world of audio, and at the same time are consoles that meet the needs of exacting industry professionals.

Cobranet® audio output from the consoles is sent to a Peavey MediaMatrix Nion DSP system, which then sends the signal to the amplifiers. Electrosonic specified QSC ILA line array speakers and subwoofers for stage left and right. The pit rail and stage lip areas have additional front fill speakers. The reverberation time in the theaters can be changed with variable mechanical acoustics designed by JSFA.

Electrosonic designed the intercom system using a Clear-Com Encore master station in the control booth, and wall station and headset stations in the stage area, the dressing rooms, and throughout the production space. The paging system, which also handles all paging announcements from the existing school buildings, is handled by a Peavey PageMatrix connected to the MediaMatrix.

[Above]

The main theater (photo Ciro Coelho) and the exterior of the Agoura Hills Performing Arts Education Center.

[Above]

The main theater (photo Ciro Coelho) and the exterior of the Calabasas Performing Arts Education Center.

The work completed for the LVUSD (see story, left) was preceded by two other projects where the same architect, John Sergio Fisher & Associates (JSFA) was involved, and where Electrosonic's Design Consulting team provided the AV system design. At Las Positas Community College in Livermore, CA, the project consisted of an upgrade to the college's existing theater and music classroom areas. Electrosonic provided design specifications for AV equipment and infrastructure. The installation was done by the college's technical staff and McKinney Audio Visual of San Francisco.

Another upgrade project was at Santa Barbara City College. This project consisted of an upgrade to the college's existing theater and music classroom areas. The theater redesign was done by JSFA and Electrosonic provided design specifications for AV equipment and infrastructure. The Installation was done by DMX from Austin, Texas, with support from Jensen Audio of Santa Barbara.

The 500 seat Garvin Theater at Santa Barbara City College (right, photo Ciro Coelho). The 464 seat main theater at Las Positas Community College (above, photo Timothy Griffith).

ELECTROSONIC
Design Consulting

This is a specialist team within Electrosonic that provides AV design services on an independent basis. While some projects go on to be completed by Electrosonic's Systems Integration teams, there is no obligation for this to be the case. The theater design projects described on these pages are examples – in all cases, the Electrosonic designs were realized by others.

The Electrosonic Design Consulting team provides expert advice and technical design services to owners, architects, exhibit designers and general contractors. Design consultants begin by carefully analyzing the drawings provided by the exhibit designers or architects, and design systems that will achieve the creative intent. A wide range of services are provided including equipment specifications, technology demonstrations, projection geometry studies, facility impact documentation and budgeting.

Electrosonic continuously researches and tests new and existing technologies to guide clients to the right solution for their project. It can provide technology evaluations and equipment mock-ups to test the feasibility and demonstrate the functionality of any proposed system. Major theater space projects where Electrosonic Design Consulting worked with the client to produce budgeted designs before tender include The Typhoon Theatre in Singapore (see P.31), the Nature Research Center (see P.24), the Victory Theater at the WWII Museum, and AT&T Dolphin Tales at Georgia Aquarium (see ELECTROSONIC WORLD No 16 for full descriptions of these).

The Electrosonic Design Consulting office area at the Los Angeles Headquarters.

AT&T Dolphin Tales.
Photo: Georgia Aquarium.

The Victory Theater at the National World War II Museum, New Orleans.

Canada, Disney, Universal & Warner Bros. WIN THEA AWARDS

Every year the Themed Entertainment Association presents its Thea Awards to outstanding themed attractions from around the world. These are highly respected because comparatively few of the award submissions succeed. The awards are given to the attractions themselves, not to their creators; however, the contribution of the creators is fully acknowledged in the souvenir program.

[Clockwise from Top Left]

The entrance to Transformers: The Ride-3D in Hollywood.

The entrance to the Warner Bros. Studio Tour – The Making of Harry Potter.

The entrance to Transformers: The Ride-3D in Singapore during construction.

The entrance to Radiator Springs Racers. Photo by Harshlight – wikicommons.

At the awards ceremony held in Los Angeles in April 2013, four attractions to which Electrosonic made a major contribution won Thea Awards. They were:

CANADA'S SPORTS HALL OF FAME

Calgary.
Thea Award for Outstanding Achievement – Museum.

RADIATOR SPRINGS RACERS

Disney California Adventure Theme Park.
Thea Award for Outstanding Achievement– Attraction.

TRANSFORMERS: THE RIDE-3D

Universal Studios, Hollywood. Transformers The Ride: The Ultimate 3D Battle. Universal Studios Singapore.
Thea Award for Outstanding Achievement – Attraction.

WARNER BROS

Studio Tour London – The Making of Harry Potter. Thea Award for Outstanding Achievement – Studio Tour.

Electrosonic's work at Canada's Sports Hall of Fame is described on Page 42. Unfortunately, it is not possible to describe in any detail Electrosonic's contribution to the other Thea Award-winning attractions owing to non-disclosure agreements in place.

However, in the souvenir program of the Awards event, the attractions concerned do give a full list of credits, and these credit Electrosonic as follows:

Radiator Springs Racers
Electrosonic Inc; Low Voltage Installation.

Transformers:
The Ride-3D (Hollywood and Singapore)
Electrosonic Inc: Projection.

Warner Bros. Studio Tour
– The Making of Harry Potter:
Electrosonic UK: Exhibit AV installation and programming.

Peoria's GIANT SCREEN

The GSX™ projection system in the Giant Screen Theater.

The Giant Screen Theater is a major attraction at the Peoria Riverfront Museum (Peoria, Illinois) which opened in October 2012. It was the first installation by Electrosonic's Global Immersion Division to feature its GSX™ Giant Screen Cinema System. This is unique in being able to show films in both DCI cinema format and in the emerging DIGSS giant screen formats in 2D and 3D.

The Peoria Riverfront Museum (PRM) is a center for art, history and science. It is affiliated to the Smithsonian Institution and it brings a powerful cultural presence to the region. It embodies both a museum and a planetarium in addition to the Giant Screen Theater.

Venues like the PRM rely on repeat visits to be viable, and to help make this happen, its theater facility must provide changing content to attract audiences. PRM is able to access high quality content that has been produced for big screen presentations in science centers, museums and attractions worldwide, but realized that if it could also show the latest Hollywood blockbusters as evening programming, it would not only help itself, but also provide a valuable amenity for the city.

However, this presents a major problem because films come in different formats (see box "Film Formats" on Page 49). Fortunately, Global Immersion's GSX™ provides a system which can automatically change formats as required, and it does this with a combination of optical, mechanical and software technologies called ImageFusion™.

The screen at PRM is 70 × 52ft (21.3 × 15.8m). It is a "silver screen" suitable for 3D, served by two Barco 4K cinema projectors each rated for 32,000 lumens light output and fitted with the custom optical system. RealD™ 3D switching filters with XL light recovery are installed to allow the use of passive glasses. The system achieves an exceptional 6-ftL screen luminance in 3D.

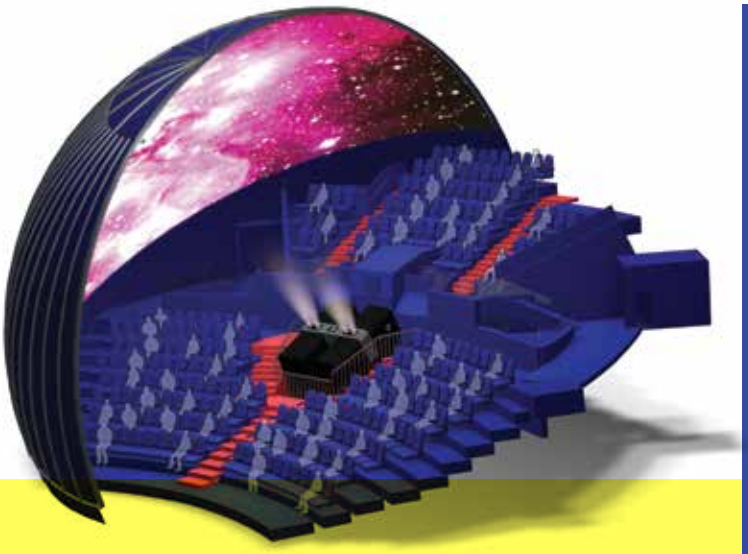
The GSX™ source system includes a Qube DCI server and two Qube 4K Integrated Media Blocks (IMB) for showing Hollywood and DCI movies, and two Global Immersion GSX™ servers for the "big screen" content. Digital audio in both cases is fed to the 14,400-watt Legacy Audio system, which was installed by PRM's main AV Systems Integrator, Zdi Inc.

Typical programming in early 2013 included the National Geographic "Sea Monsters – a Pre-historic Adventure" in 3D filling the big screen during the day, and "Les Miserables" showing in the evening.

The GSX™ projection system in the Giant Screen Theater.

GSX™ FULLDOME™
Comes to San Diego

The Reuben H. Fleet Science Center in San Diego, CA, opened 40 years ago and was famed for its "tilted dome" planetarium which also featured the first installation of the IMAX® giant screen 70mm film projection system within a dome. The theater, now called the Heikoff Dome Theater, has recently been upgraded; in 2008 it had a new "Nanoscreen™" seamless screen surface installed, and in 2012 it was equipped with an all digital projection system – Global Immersion's GSX™Fulldome™. The theater now runs both digital and film dome presentations.



The rationale for an all digital system is compelling. Most show content for planetariums and related astronomical and space shows is generated on computer, often by the very scientists who are working on the front line of astronomy research. It is therefore more practical to keep everything in the digital domain, especially when a system like GSX™ Fulldome™ can scale the content to fit the dome. The GSX™ system also looks after the blending of images from multiple projectors and any geometry correction required.

The projectors are located in the center of the theater, and Global Immersion's scope of work included the design of an insulated steel enclosure.

This enclosure, supported by the precision engineered projector mounting solution, monitors and maintains a 20°C (68°F) ambient temperature, and also provides acoustic isolation. Show playback is from eight Global Immersion servers that play out uncompressed digital images. The visualization above shows the projection concept.

[Left]
Heikoff Dome Theater, Reuben H. Fleet Science Center, showing 'Cosmic Collisions' by the American Museum of Natural History.

FILM FORMATS

Film formats are defined by the number of pixels in the display, the number of bits per pixel per color, the aspect ratio and the frame rate. Display performance is specified in respect of screen luminance, intra-frame and inter-frame contrast, primary color co-ordinates and white point.

Most films are distributed to meet the DCI (Digital Cinema Initiative) specification. The majority are in "2K" format and are shown at aspect ratios of 1.85:1 (standard) or 2.39:1 (wide screen, popularly Cinemascope®) using 1998 × 1080 and 2048 × 858 pixels, respectively. Premium installations and big screens use the "4K" format where the pixel count is 3996 × 2160 and 4096 × 1714.

The interests of owners of special venue theaters with large screens are represented by the Giant Screen Cinema Association. This association defines giant flat or curved screens as being 70ft (21.3m) or greater in width, and giant dome screens as domes of 60ft (18.3m) or greater in diameter. It is developing the DIGSS (Digital Immersive Giant Screen Specification) to ensure high standards and to facilitate content exchange.

While DIGSS follows DCI as far as is practicable, an obvious problem arises when a giant screen is required (as is often the case) to be of 4:3 aspect ratio, given that the native resolution of cinema projectors is at best 4096 × 2160.

Another problem is that venues like PRM also want to show "non film" content like High Definition video, live event relays, etc., which are likely to be in HD video format with 16:9 aspect ratio.

Global Immersion's GSX™ solves the problem giving users access to all the main formats, and delivering a true 4096 × 3072 pixel count to 4:3 screens.

Global Immersion also offers GSX™ Dome™ and GSX™ Fulldome™ to meet the needs of dome theaters. These systems typically require four 4K projectors and customization to match the particular site.

PLANETARIUM SYSTEMS IN TURKEY, COLORADO & NEW YORK

On these pages, three recent planetarium installations are described, all using the Fidelity Bright™ system, one of four high performance systems from the proprietary Fidelity™ planetarium ranges by the Global Immersion Division of Electrosonic.

SABANCI PLANETARIUM, TURKEY

The Sabanci Planetarium in the Eskisehir Science, Arts and Culture Park in Turkey opened in April 2012. It was funded by the Sabanci Foundation and Cimsa (a cement company, and subsidiary of Sabanci Holdings). Global Immersion designed and integrated the comprehensive digital fulldome and custom audio system.

The dome provides a 180° × 360° field of view, and is 14m (46ft) in diameter. It accommodates 96 visitors. The screen is an "Ultimate Seam" planetarium screen from Astro-Tec.

Projection is by a Global Immersion Fidelity Bright™ 4K system. The dome size is such that this can be achieved using only two projectors (JVC DLA-SH7NLG) with custom fulldome lenses and optical image blending. The projectors are sourced from a Global Immersion Media Server solution.

The latter includes an audio server that feeds a Peavey MediaMatrix NION digital audio processor, and in turn feeds ten Crown DSi 2000 amplifiers and two DSi 4000 amplifiers. JBL 4732 professional theater loudspeakers are used for the main channels and JBL 4642A are used for sub-bass.

Global Immersion also integrated an LED lighting system for the cove, wireless microphones for live presenters, and a theater control system with a portable color touch screen. The user interface is presented in both the Turkish and English languages.

To maximize the functionality of the planetarium, real-time Digital Universe software is installed for data visualization, allowing the system to operate as a manually controlled, presenter-led planetarium, or as a film playback dome environment. Finally, Global Immersion provided seven complete pre-recorded planetarium dome shows with long-term licenses, mostly with both English and Turkish narration. Show producers included Spitz Creative Media, Loch Ness Productions, Mirage3D, NSC Creative, the American Museum of Natural History and the Denver Museum of Nature & Science.

CRADLE OF AVIATION MUSEUM

Since 1980, the Cradle of Aviation Museum in East Garden City, New York, has stood as a popular public attraction, serving the local community and beyond with what has grown to be a collection of more than 75 air and space craft.

Located on land renowned for many historic flights, the museum collaborates with regional schools to stimulate and support interest in Science, Technology, Engineering, and Math subjects (STEM).

The museum's dome theater has housed the Leroy R. & Rose W. Grumman Giant Screen dome theater since 2002. Now, the dome has been upgraded to include a state-of-the-art digital planetarium system, and serves as a dual-purpose theater which re-opened in October 2012.

Named after its sponsors, this new JetBlue Sky Theater offers extensive functionality and a means to virtually transport visitors to any destination in the Cosmos. Global Immersion again supplied a Fidelity Bright™ system but this time the 75ft (22.9m) dome uses a six-channel configuration using projectiondesign F32 projectors.

FORT COLLINS MUSEUM OF DISCOVERY

The new Museum of Discovery in Fort Collins, Colorado, features the OtterBox Digital Dome Theater. It features mixed programming with shows like "Dynamic Earth" running alongside more astronomy oriented shows like "Cosmic Journey". Its 36-foot (11m) dome features a Spitz NanoSeam® aluminum perforated screen providing a 162° vertical field of view. The whole dome is on a 20° tilt.

This is another Global Immersion Fidelity Bright™ installation using a five-channel projector configuration (projectiondesign FL35 DLP™ LED). The use of LED illumination eliminates the need for lamp changing. In common with other current Global Immersion installations, the user interface is available both at a conventional computer screen and via an iPad™. This allows the operator complete freedom of movement throughout the facility.

[Left Top to Bottom] The Sabanci Planetarium in the Eskisehir Science, Arts and Culture Park, Turkey.

[Above Left and Center] A real Moon Lander is a key exhibit in The Cradle of Aviation Museum, on Long Island, New York.

[Above Right] The Fort Collins Museum of Discovery and control position in its OtterBox Digital Dome Theater.

THE PLANETARIUM

The "Digital Planetarium" is now practical because of the great advances in projection and computer technology in recent years.

However, the choice of technology is difficult and depends on the venue's programming, its need for high resolution and contrast, and, of course, budget. For this reason, the Global Immersion Division of Electrosonic offers a range of solutions for domes varying from 16.4ft to 98.4ft (5m to 30m) in diameter and beyond.

Resolution in a dome is best measured by "arc minutes per pixel", the lower the better. The Fidelity GO™ system is a lower cost system built around LED-projection technology for smaller theaters with resolution between 3.3 and 5.4. The most widely integrated Fidelity Bright™ system is offered with resolution from 1.6 to 2.8. At the top of the line is the 8K range of systems, or the Digital Starball™ system, which is designed to emulate the traditional opto-mechanical planetarium projector - with a resolution in the range of 1.3 to 1.7. Given the lighting conditions, this range is approaching the limit of human visual perception.

Top end systems require much greater contrast (not usually relevant to conventional projection in business or exhibit applications). Fidelity Bright™ systems typically use projectors with 8 – 10,000:1 contrast. However, Fidelity Black™ and Digital Starball™ systems have used projectors with 1,000,000:1 contrast.

Such a high contrast can best be achieved by LCOS (Liquid Crystal On Silicon) technology, and using an additional "black" modulator. Global Immersion led the way using the patented Rockwell Collins 2015HC four-panel projector to achieve the contrast required.

ELECTROSONIC

www.electrosonic.com
info@electrosonic.com

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USA

Los Angeles
3320 N San Fernando Blvd
Burbank, CA 91504
Tel: +1.818.333.3600

New York
318 West 39th Street,
9th Floor
New York, NY 10018
Tel: +1.212.206.7711

Orlando
4501 Vineland Road,
Suite 105
Orlando, FL 32811
Tel: +1.407.839.1154

Minneapolis
10320 Bren Road East
Minnetonka, MN 55343
Tel: +1.952.931.7500

United Kingdom

London – Head office
Hawley Mill, Hawley Road
Dartford, Kent DA2 7SY
Tel: +44.1322.222.211

London – Canary Wharf
Unit 99, Cannon Workshops
Hertsmere Road
London E14 4AS
Tel: +44.207.719.8107

Corsham
Hartham Park,
Corsham,
Wiltshire SN13 0RP
Tel: +44.207.005.6384

Edinburgh
107–109 Whitehouse Loan
Edinburgh EH9 1AT
Tel: +44.131.447.6211

Newquay
Lower Tregenna
Newquay
Cornwall TR8 4HS
Tel: +44.1637.875.824

Global Immersion-UK
The Barn, Hurstwood Grange
Hurstwood Lane
Haywards Heath
West Sussex RH17 7QX
Tel: +44.2033.260.153

Other Countries

Shanghai
Electrosonic Audio-Visual
Technology (Shanghai) Co., Ltd.
Suite 1003, Block A
Shanghai Universal Mansion
172 Yu Yuan Road
200040 Shanghai
China
Tel: +86.21.6249.2522

Hong Kong
Unit B, 12/F Shun Point
Commercial Building
5–11 Thomson Road
Wan Chai
Hong Kong
Tel: +852.2525.1828

Stockholm
Electrosonic AB
Gustavslundsvägen 139
167 51 Bromma
Sweden
Tel: +46.8.522.057.00

Dubai
Electrosonic LLC
PO Box 62425
Dubai
United Arab Emirates
Tel: +971.4.311.7402

For a complete list of offices visit the Electrosonic website: www.electrosonic.com