ELECTROSONIC

ISSUE NO. 18

WORLD

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ELECTROSONIC WORLD 18

WELCOME

Welcome to the 18th Edition of ELECTROSONIC WORLD, the biennial publication which provides a record of some of the many aspects of Electrosonic. This 2015 edition arrives a year after the company celebrated its 50th anniversary, an occasion which allowed some reflection on "the way things were" in both a technology and a business sense. Phenomenal progress in technology has been accompanied by a complete change in how businesses operate.

While Electrosonic can be rightly proud of past achievements, it is not in its nature to stand still. This issue reports on the opening of a number of new offices in response to customer demand, demonstrating the company's policy of "following the customer" in the sense of being where the customer needs Electrosonic's services. What is less obvious is work being done to help ensure that the company is able to "lead the customer" in respect of technology application. Such work includes, but is not limited to, a big emphasis on business development initiatives, staff professional development and the expansion of the apprentice program.

This issue of ELECTROSONIC WORLD carries several stories with a "collaboration" theme, and others that illustrate the application of new technologies, such as high resolution LED displays. While Electrosonic keeps abreast with such progress, it remains committed to ensuring that customers are equipped with the most appropriate technology for any project.

CELEBRATING 50 YEARS

March 3, 2014, was the 50th anniversary of the founding of Electrosonic. To mark the occasion, and to preserve something of the history of the company over a period when the AV "industry" came of age, a book "Electrosonic – 50 years on the Audio-Visual Front Line" was published by the company.

This book is both a remarkable record and an indispensable read for anyone with an interest in the history of audio-visual technology.

LIGHTING & SOUND INTERNATIONAL

RECOGNITION

In 2014 Electrosonic was recognized by industry awards on both sides of the Atlantic. In the USA, the influential trade magazine Commercial Integrator named Electrosonic "Integrator of the Year." In the UK, Electrosonic was presented with a special award at the annual AV Awards (run by AV Magazine) for its "Outstanding Contribution to the Industry."

Jim Bowie (CEO of the Electrosonic Group) graces the front cover of "Commercial Integrator."

Clive Couldwell (left), Editor of AV Magazine, Sarah Joyce (Vice President EMEA, Electrosonic) and Bob Simpson (Founding Director, Electrosonic) at the 2014 AV Awards.

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New Offices

Electrosonic has recently announced the opening of new offices in the San Francisco Bay Area of California, in Aberdeen, Scotland, and in Newquay, England.

The Bay Area office is located in Livermore and features 3,000 square feet of office and warehouse space. The location enhances operational efficiencies for clients in the region, delivering on Electrosonic's reputation for superior service and quick response to customer service calls.

Over the last few years, Electrosonic has steadily increased the number of its Bay Area clients. The new office will support them and keep pace with their evolving needs. It is a full-service office providing Bay Area businesses with complete solutions, including audio-visual design consulting, systems integration and operational support.

Electrosonic has worked extensively in the Aberdeen area for several years. The new office in Cults, just outside Aberdeen City Centre, is to support its growing business in the city and the region. The office is in a great location to serve Electrosonic's growing business in the oil & gas sector, as well as other new clients in the region for whom it is a requirement that their supplier has tangible local resources.

The new Aberdeen office provides local service and workshop facilities, stores, and a fabrication space. Electrosonic's existing Scotland office in Edinburgh continues to offer a full set of services and has recently been refurbished.

Electrosonic's facility in Cornwall was in the countryside near holiday camping grounds. Its premises were somewhat unconventional and, following the end of the lease, it is moving to a new business unit that is more appropriate to the work carried out. It provides extensive warehouse and fabrication facilities in addition to a new engineering office to serve new and existing clients.

Photographs:
- The Livermore office in the San Francisco Bay Area (top)
- The Aberdeen office (bottom)

Technology Days, Fusion Events & Collaboration Demo

Business Development at Electrosonic takes many forms. While participation in major trade shows such as IAAPA, InfoComm and ISE is essential, it mainly cements existing relationships rather than develops new ones. It also does not help customers who don't have the time or inclination to attend these events.

Electrosonic is developing a range of activities that "bring the technology to the customer" and which allow potential customers to experience new technology in a relaxed and unpressured way. In the UK it has for some time run "Technology Days." These are private exhibitions where selected manufacturers show their wares, and where each visitor has an Electrosonic "host" to take them around to ensure that they see items that are relevant to them. These events have been held at Hawley Mill, Electrosonic's EMEA headquarters, and at other locations in the UK.

In the USA, a somewhat different approach is being taken, exemplified by its first "Fusion Event" which took place in New York in December 2014. Here, over 200 media, technology, and design professionals within the New York metropolitan area attended a technology showcase held at, and in partnership with, the LED LAB in TriBeCa. The word "Fusion" is defined as "a blending of emerging media and technology with the unique architectural qualities of a space." Electrosonic's media partner for this event was Second Story who helped create a fun and immersive experience by designing a touch table that interacted with the media on the LED screens around the room.

"Collaboration" has become something of a buzz word; however the serious harnessing of technology which makes it a reality for multi-site, multi-image source applications requires specialist experience. Such systems have been adopted by industry leaders within the Energy, Government, Defense, Manufacturing, Medical, Retail and Education/Training fields amongst others, so it is logical that Electrosonic now has a complete 3D Collaboration facility installed in its Hawley Mill (UK) demonstration room.

Photographs
- The New York "Fusion Event" in December 2014
- The new collaboration demonstration installation at Hawley Mill
- Electrosonic Technology Day at Hawley Mill, September 2014

Skylight Studios

While Electrosonic is proud of its big museum and theme park projects, it is equally pleased with the large number of smaller-scale projects efficiently delivered to its regular corporate clients, most of whom prefer that such work is carried out under non-disclosure agreements.

A typical project which can be reported is that of providing the primary audio and video systems at the Skylight Studios in Los Angeles, a new 5,000 sq ft (465 sq m) multimedia studio and retail gallery. The project is representative of corporate work in that it required a high standard of engineering, close cooperation with building contractors and other service providers, and a very tight installation schedule to meet the opening date.

The Annenberg Space for Photography exhibits digital and print photography by both emerging talent and some of the world's most renowned photographers. The new Skylight Studios, located across the park, provides an enhanced lecture space through the latest AV equipment, a concert-quality audio system and HD broadcast capabilities. The venue also accommodates photography workshops and special events.

Electrosonic delivered a range of services to Skylight Studios, including audio and video system engineering, design, rack fabrication, systems integration, installation, commissioning and programming.

To meet the video needs of the new space, Electrosonic mounted Christie projectors in Tempest housings to minimize the noise of their operation. Samsung flatscreen monitors were installed for viewing in the guests' green room and in back-of-house areas. On the audio side, Electrosonic provided background music distribution to the retail area and restrooms, and background music plus the performance audio feed from the main sound system to the green room.

Electrosonic also equipped the Skylight Studios' back-of-house studio control room for presentation and broadcast operations. That space features an operations desk with mixing console, lighting console, confidence monitors, control touch panels and an edit bay for on-the-fly production of broadcast, webcast and social media events.

Photographs:
- Exterior of the Skylight Studios
- The lecture and presentation space
- The studio control room

MANAGED SERVICES FOR aggreko

Aggreko plc, the world's largest temporary power generation company and a major supplier of temperature control equipment, has a three year global Managed Service contract and several UK-based AV maintenance agreements with Electrosonic.

Headquartered in Glasgow, Scotland, Aggreko required a scalable and cost-effective Video Network Operations Center (VNOC) solution to encourage greater uptake of its video conferencing service.

The Aggreko video conferencing estate is managed by Electrosonic's VNOCs based in Dartford and Canary Wharf in the UK and Burbank in the USA. Electrosonic provides a proactive 24/7 managed service for both Polycom video conferencing infrastructure and endpoint devices. Initially Electrosonic was asked to support several office locations on the American continent, but over time this has been expanded to support the client's global presence in over 40 locations.

Due to the nature of Aggreko's business and its commitment to protecting the environment, it has a heavy reliance on being able to manage its locations through a remote support model. The close partnership between Aggreko and Electrosonic allowed the development of a unique set of remote services which helped Aggreko achieve its environmental policies whilst significantly reducing its overall management fee.

As Aggreko grew, it required more video conference endpoints. Electrosonic created a sustainable service model which allowed Aggreko to keep the cost of adding more video conference endpoints to a minimum.

Electrosonic's VNOC makes video conferencing easy to use. Backed by a team of audio/video experts and professional customer support staff, its managed services are designed to ensure the best possible video experience and maximum uptime. To ensure all elements in the video conferencing ecosystem are able to perform optimally, Electrosonic provides customer facing services backed by behind-the-scenes monitoring and management.

The Electrosonic VNOC at Canary Wharf, London

THE SERVICES

The services provided to Aggreko cover a wide range, including:

- 24x7 end point monitoring and management
- Infrastructure monitoring and management
- Provision of concierge video conferencing, meeting scheduling and launching service
- Conferencing services (video call scheduling, operator meet-and-greet, quality monitoring)
- Preventative maintenance of video conferencing rooms
- Help desk support to include a globally positioned Service Operations Center (SOC) to respond to customer questions
- Select locations supported with a comprehensive off-site maintenance package
- End user training and documentation
- Reporting

Electrosonic in the North Sea

Electrosonic has been supporting the energy industry for many years, particularly in the Aberdeen area of Scotland. Recently it has invested in strengthening this support in a number of ways.

These have included having staff trained for working on production platforms, the running of "Technology Days" in Aberdeen that bring the latest AV and collaboration technologies right to the clients' doorsteps, and the opening of a support office in Aberdeen (complementing its Edinburgh office) to provide rapid response support for installations in the area.

Most people would assume that the industry would already be using the latest in communication equipment, video conferencing and so on. However, they would be only partially correct; the industry is now quite "old" and some of the infrastructure introduces limitations. For example on a production platform, the original cabling cannot be replaced without enormous expense, and until recently, communication channels to the platforms had limited bandwidth, and megabit capacity for digital video was simply not available.

A number of factors have led to a much greater use of AV and collaboration technologies in recent years.
In summary:

- A major priority now is to reduce the need for flights to the platforms. This can be achieved if both platform and shore-based staff are effectively "in the same room" sharing data and images.
- A greater proportion of the platforms now have good digital connections (typically fiber) which have sufficient capacity to carry the required video and data traffic.
- "Old" CCTV based on compressed standard definition video, often at slow frame rates, was simply not fit for its intended purpose. The arrival of High Definition video with smooth motion presentation has transformed users' attitudes to the use of video links. People who used to be suspicious about what they perceived as a "big brother" medium now wonder how they managed without it.

In practice the oil and gas companies use AV in many different ways, sometimes because they are at different stages of updating their facilities, and sometimes because of different corporate cultures. It is noticeable that some have rigid corporate rules, possibly dictated from Houston, Calgary, Stavanger, London or The Hague, while others actively encourage their Aberdeen sites to experiment with new approaches to collaboration.

In respect of the shore-based installations, many of the applications are the same as those for "conventional" corporate AV. Thus lobby and public area displays, meeting room facilities, and corporate video conferencing systems follow normal practice. It is those aspects which are related to the operation of the remote platforms where differences arise and which are of special interest.

One example is the management of logistics related to platform operation. Here, there is a 24/7 need to know what is going on in respect of transport to and from the rigs, to manage the related transport operations, and to be fully aware of external conditions such as weather and the activities of other operators. These tasks benefit from "control room" type displays, although companies differ in how they are presented, and as to whether they exist in isolation or as part of a multi-discipline operations space.

One company uses a four-screen array to display information related to its helicopter movements. It shows schedules, real time data and images and supporting information. The array has another set of screens mounted back-to-back, and these display information related to boat movements. While the teams responsible for air and sea movements operate independently, they are co-located.

Video conferencing setups vary enormously. There is still a place for conventional installations based on formal meetings and the boardroom table, now invariably with twin screens. Here, great attention is paid to audio performance, and the application is communication with other offices and, sometimes, with production platforms.

However, systems used for actual operations are much more likely to use a collaboration format, suitable for "long hours" and for participants to be running multiple applications on their computers.

While some companies take a "traditional" approach, in that meeting room and collaboration spaces are clearly defined, others are now being more adventurous. This has come about because of a realization that communication can be both continuous and spontaneous. One manager told Electrosonic that his company does not yet know what the optimum arrangement is, and, because of the continual movement of staff (to and from rigs, for example), hardly knows how many people may be in the operations space at any time.

For this reason, the company's initial installation allows for a lot of flexibility. The whole floor seems to be full of micro-meeting spaces where colleagues can set up spontaneous meetings with groups of various sizes, and with participants from any location. Large screens installed throughout the area convey up-to-date supporting information. The company expects to refine the layout as it learns how, and by whom, the systems are used in practice.

With installations of this kind, Electrosonic has not only installed the complex shore-based facility, but has also delivered and installed the "far end" equipment on the production platforms.

Photographs clockwise from left:
- A video wall in the public area of an energy company is an example of a "conventional" application of AV in the industry.
- A typical conference room style video conferencing installation in Aberdeen.
- The same company uses a quite different format for collaborative working, with more information being displayed, and more image sources.
- Clients can choose to have Electrosonic staff located on site. One such site provides a small control room from which the Electrosonic technician can monitor all AV equipment in the building.

AmorePacific Beautiful Life

All photos courtesy of BRC

Photographs
- **One of the exhibition galleries.**
- **At the end of the 270° show, the front wall moves to reveal the next exhibit.**
- **In this interactive exhibit, visitors take a photo of themselves and then choose a magazine. The magazine, with the visitor's photo on the front cover, is e-mailed to her home. At the end of the tour the photo also appears in the final media theater, along with those of other visitors on the tour.**

The "Gift of Beauty" 270° show

TECHNOLOGY

Background music throughout the Story Garden is sourced from an Alcorn McBride 8-TraXX player routed through a QSC Core 3000 DSP system. Loudspeakers are mainly from JBL.

LCDs are from Samsung, and projectors are from both Barco (projectiondesign) and Christie. Single video displays are fed from BrightSign players, but where synchronized multi-screen operation is required, 7thSense servers are used. A Medialon show control system, installed in a central control room, provides overall system control.

TEAM

In many projects, Electrosonic appoints sub-contractors to provide local support or to carry out specialist tasks. In the case of the AmorePacific Beautiful Life Story Garden, local company PDK assisted the on-site installation, and Miami-based Smart Monkeys, Inc. carried out the show control programming.

For Electrosonic, it was, once again, a privilege to work with BRC Imagination Arts, an association that now goes back nearly 20 years.

The AmorePacific Beautiful Life Center in Osan, Korea, has reinvented the factory tour and brand center with the Story Garden, an interactive multisensory and multimedia experience, involving sight, sound, touch and scent. BRC Imagination Arts was responsible for the design and production of the experience, which was recognized as an "Outstanding Corporate Brand-Land" at the 2015 THEA Awards. Electrosonic was contracted to BRC to carry out the initial audio-visual design and then provide AV support for the Story Garden on the cosmetic company's expansive campus.

AmorePacific was founded in 1945 in the kitchen of the founder's mother, and has grown to become a global corporation with 30 cosmetic, personal care and health care brands. In ten scenes on three levels, the Story Garden traces this story and reflects the company's commitment to nature and plant-based ingredients. Tours were initially by invitation only but public tours are now available.

Electrosonic supplied various AV systems for the Story Garden. There are two theater spaces, four galleries with video elements and background music, and ten with background music only. Seven Operator Control Consoles (OCCs) are distributed throughout the exhibit for tour guides to operate as they lead visitors through the experience.

The most spectacular show is in the "Gift of Beauty" gallery where ten projectors present a 270° panorama, enveloping visitors on three sides with imagery. The accompanying soundtrack comes from a six-channel, 15-loudspeaker surround sound system.

The galleries and theaters have themes such as "Beauty Transforms Our World," "The Gift of Inspiration – Openness," "The Gift of Expression," and "The Gift of Inspiration – Innovation." Each uses an appropriate combination of scenic and audio-visual elements. The guides interact with the visitors to emphasize the human story.

IEMS@LAX

The creative use of video displays in an architectural environment is rapidly becoming widespread. One of the most exciting examples can be seen at the Tom Bradley International Terminal at Los Angeles International Airport, where 12,000 sq ft (1,115 sq m) of LED displays are installed as part of its IEMS (Integrated Environmental Media System).

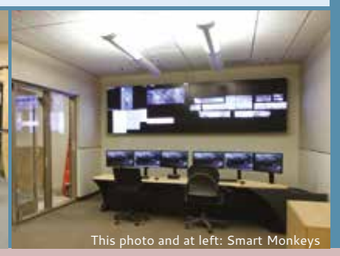
Electrosonic was responsible for the overall systems integration and the detailed engineering of the source and control system.

The IEMS at LAX is designed to entertain and inform passengers, and to create a revenue stream for the airport. It consists of seven display elements, all designed to be an integral part of the space. A massive Welcome Wall greets arriving passengers, and a somewhat smaller Bon Voyage wall is a farewell to departing passengers.

Most striking are the displays in the Grand Hall of the Departures area. Story Board is a 120-foot (36.5-meter) wide array of multiple LED screens that tells a story or evokes a destination. Time Tower is complementary to Story Board, but with an emphasis on time, including many clock variations all showing the correct local time. Destination Board is a 75-foot (23-meter) wide departure display, augmented with images of the destinations of currently departing passengers. Leading off the Grand Hall, the North and South Concourse Portals lead to the gates and each feature 10 columns of six 55-inch LCDs stacked vertically. These show images themed to match currently departing flights.

Electrosonic was an important member of the team that realized the IEMS, and was contracted directly to the end client Los Angeles World Airports.

This photo and at left: Moment Factory



This photo and at left: Smart Monkeys

All photos this page: Moment Factory

THE TEAM

The Project Director, MRA International, directed the conceptualization and execution of the IEMS. The design of the displays was by Sardi Design. The building architects, Fentress Architects, ensured the displays fitted seamlessly into the building. The initial four hours of content was developed by Moment Factory and Digital Kitchen. Smart Monkeys was the technical consultant responsible for the conceptual system design, the user interface and scheduling software.

The displays were fabricated and installed by Daktronics. Electrosonic completed the engineering and installation of the source and control systems. The system went live in September 2013, and for the first eight months of operation, Electrosonic provided the operations staff to run the system.

Photographs left to right (page 12):

- The Story Board display is sited above the shops in the Grand Hall.
- The Time Tower and to its right is the Destination Board.
- The IEMS source and control racks. They were engineered and built at Electrosonic's Burbank, CA facility.
- The IEMS control room is manned 24/7.

Top:

- The four-sided 72-foot (22-meter) high "Time Tower" is clad in high resolution LED, showing amusing time related content.
- The "Welcome Wall" is a massive 80-foot (24-meter) high display seen by arriving passengers.
- The North and South Concourse Portal displays use multiple LCDs.

Barclays

GLOBAL COMMAND CENTRE

View along the front of the Command Centre showing the three video walls

One of the two Incident Rooms. The center and left screens are for video conferencing, and the right screen is an interactive touch-screen.

On December 8, 2014, Chancellor of the Exchequer and local MP for the Tatton constituency, George Osborne, opened the new Barclays Global Command Centre at Radbroke Hall. The Centre features large video wall overview displays and dedicated collaboration spaces. Detailed AV systems design, and the complete AV systems integration and installation, were carried out by Electrosonic.

Radbroke Hall, near Knutsford in Cheshire (UK) is the site of Barclays' Technology Centre, a long established campus employing 3,500 people. Not surprisingly, the Centre is in a state of continuous development in response to changes in customer needs and the technology required to meet them. Its latest development is a new Global Command Centre. While at first sight this appears IT-centric, Barclays emphasizes that technology is subservient to the main objective which is excellent customer service delivered in a way which provides an equally excellent customer experience.

Physically, the Command Centre consists of a large open area with many workstations and three overview displays. The largest of these is a video wall made up from a 3×9 array of 46-inch LCDs. It is flanked by two smaller video walls made up from 2×5 arrays. At the back of the space are two glass enclosed "Incident Rooms."

It could be said that the main task of the Global Command Centre is dealing with "incidents," and indeed, the Centre deals with hundreds of thousands of these, predominantly concerned with individual customers. These are dealt with by individual operators, but every now again there is a "major incident" requiring a team approach to solving the problem that has arisen. The team of up to a dozen people works in one of the Incident Rooms. These are equipped with a twin-screen video conferencing facility using 55-inch LCDs augmented by a third 55-inch LCD, which has a touch screen overlay.

In addition to these main facilities, there is a third meeting room used for meetings that are not necessarily part of the active operations. This is fitted with a twin screen video conferencing facility based on 55-inch LCDs. The three meeting rooms are all equipped with comprehensive room control.

Next to the main operations area there is a breakout space. This includes two booths equipped with simple video conference facilities that are for informal use, and a relaxation area fitted with a large LCD sourced by a Microsoft Xbox Kinect.

Images for the main displays are from diverse sources. These include locally sited computers or servers providing live data over various networks. Video images include IPTV, video conferencing images, and live links to other Barclays Command Centres sited around the world, for example in Pune (India) and Singapore.

The Radbroke Global Command Centre is set up to operate 24/7. In fact, there are only certain aspects of its operation that need 24/7 availability. Other aspects are referred to as "follow the sun," where activity follows the longtitude of the site, enabling Barclays to provide a worldwide continuous service.

Continue on page 16...

Photographs (small) left to right:
- Long view of the Command Centre. One of the glass enclosed Incident Rooms on the left.
- The display and games console in the breakout area.
- The third meeting room with twin screen display.

Continued from page 15...

THE TECHNOLOGY

Electrosonic carried out the detailed design of the AV systems, working closely with Barclays. Some equipment choices were determined by Barclays' policy and/or by compatibility issues, but in all cases, equipment was selected to be optimal for the job, and of a kind for which Electrosonic could ensure long term support.

The architecture of the video wall displays is based on the use of Crestron DigitalMedia matrix switchers, sited in central racks, the outputs of which feed Crestron DigitalMedia scalers sited next to the LCDs. This arrangement gives complete flexibility, a simple means of achieving video wall "tiling," capacity for expansion or changes, and eliminates any cable length problems. The central racks also accommodate the main sources, such as PCs (free issued by Barclays) which provide multiple DVI outputs, Cabletime Digital Media decoders, Cisco codecs, etc.

LCDs used in the video walls and meeting rooms are from NEC, and all use LED illumination. The two interactive displays in the Situation Rooms are equipped with infrared multi-touch overlays from U-Touch.

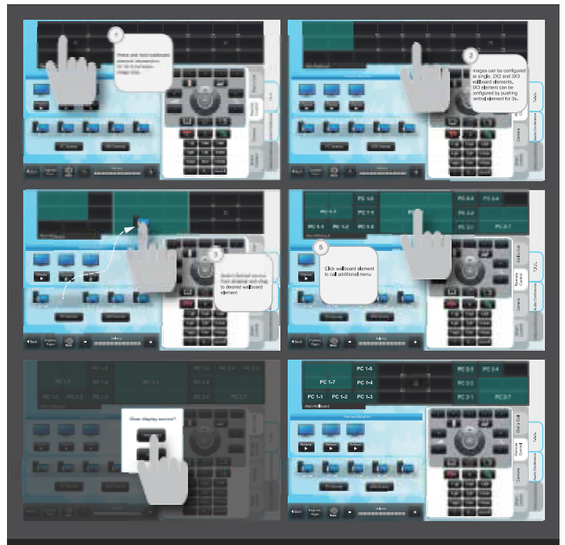
The meeting rooms are all equipped with Crestron room control, a Crestron presentation switcher, Polycom "Sound Structure" automatic mixing and echo cancellation, and Cisco video conferencing codecs. The latter include "Speaker Track," a facility where a microphone array directs the video camera to the person who is speaking.

PROGRAMMING

An easily underestimated task when installing systems of this complexity is that of programming the system. The complete flexibility, and massive array of image sources, of the video wall systems can actually make it more difficult to define how they can provide the information needed by the operating staff in the most effective way. Electrosonic's project team worked closely with the actual users of the system to develop appropriate macro commands to create display layouts appropriate for different situations.

To avoid wasted effort, Electrosonic produced "storyboards" of how the displays could be configured and operated. These showed how configuration macros could be updated, and how different configurations could be recalled. Only when approval for the concepts had been given was the writing of the actual computer code undertaken.

Barclays has every reason to be proud of its new Global Command Centre, and Electrosonic is pleased to have been a member of the team which created it.



One of the "storyboard" proposals as to how the video wall displays would be operated in practice

Photographs left:

- Another view of one of the Incident Rooms. The green vertical feature is an LED strip that acts as a "traffic light." Green indicates that the room is free and no major incident is in progress. A change to amber or red indicates incidents of increasing severity.
- The informal meeting booths in the breakout area.

Photos are credited to and © Barclays.

Entrance to PG&E's Fresno DCC

DISTRIBUTION NETWORK CONTROL AT PG&E

The Pacific Gas and Electric Company (PG&E) provides natural gas and electricity to the northern two thirds of California. Electrosonic has provided extensive audio-visual support for PG&E's new Fresno, California, Distribution Control Center (DCC). The 24,000 square-foot facility is the first of three new distribution network control centers which will control PG&E's 140,000-circuit-mile electric distribution system that delivers electricity to homes and businesses. It uses the latest in Smart Grid technology, designed to provide operators with a greater insight into the grid. A new Distribution Management System incorporates advanced electronic mapping and SmartMeter™ data to help operators pinpoint power outages.

The Fresno center features a mixture of operations and management areas. Following current trends in collaborative working, operators work in teams and have access to data from any other operator in the center or at any other PG&E DCC facility. They can also tap into a diverse array of video sources, ranging from high resolution graphics to the local weather channel. The approach requires real time information to be visually available to operators in a much larger format than ever before.

To achieve this enhanced functionality, and to support 24/7 operation, Electrosonic installed a number of 3x2 video walls in the operations areas. These use Mitsubishi 70-inch 1080p rear projection video cubes with LED illumination. Each video wall is flanked by two Samsung MD55C displays for additional content display, and loudspeakers sited above the video wall are used for directional audio. Each display is controlled by a Jupiter Systems Fusion Catalyst processor, and sourced by servers with redundant back-up, running Jupiter Canvas management software designed for visualization and collaboration at the enterprise level.

Electrosonic provided the first line of service training to technicians based on site and also provides ongoing service and maintenance support for the Fresno Center.

Photographs (left):

- One of the video walls based on rear projection cubes.
- The video wall source racks contain computer and video sources and a Jupiter Systems Fusion Catalyst processor.

NATIONAL SEPTEMBER 11

MEMORIAL & MUSEUM

Photo by Amy Dreher

The National September 11 Memorial & Museum opened in the spring of 2014 in the footprints of the World Trade Center in Lower Manhattan. Electrosonic engineered the audio-visual systems for the museum, which offers a unique and moving visitor experience. Twenty six equipment racks located throughout the space support 100 AV installations.

The Museum is an educational and historical institution which honors victims of both the 9/11 terrorist attacks and the 1993 bombing, while examining 9/11 and its continued global significance.

There are three principal exhibition areas. The memorial exhibition features the Wall of Faces, which displays photo portraits of the nearly 3,000 victims of the attacks, and interactive tables to learn more about them. The historical exhibition uses artifacts, photographs, and media to recount the events of September 11, background leading to the events, and their continuing implications. The vast Foundation Hall houses the exposed side of the slurry wall and the 36-foot high Last Column.

Several exhibits required especially complex media systems. The first exhibit visitors see as they enter the galleries is We Remember, which features recollections of people around the world as September 11, 2001, dawned. Six large, vertical screens are staggered down a 60-foot ramp; a portion of a world map is projected on each of the six screens, such that, at the top of the ramp it appears to be one cohesive map. Projectors with mirror mounts display the content, while 16 ceiling-mounted loudspeakers recount, in multiple languages, where people were on that fateful day.

Rebirth is based on time-lapse documentary footage captured on the site by filmmaker Jim Whitaker over the last 13 years, from the clean-up of the pit to today's rebuild. Seven projectors display the 11-minute video on three walls that surround visitors.

Photographs (right), clockwise from top left:

- The Pavilion, the above-ground entrance to the Museum. (Photo by Jeffrey Tanenhaus)
- Entrance to the memorial exhibition. Eight touch tables enable visitors to scroll through the Wall of Faces or search for loved ones and access biographies and photos. (Photo by Jin Lee)
- The historical exhibition. (Photo by Jin Lee)
- The Rebirth exhibit was mocked up in Electrosonic's Burbank facility.
- Electrosonic also provided a full AV system for the multi-purpose Pavilion auditorium and four education classrooms.

THE TEAM AND TECHNOLOGY

The architect for the museum building was Davis Brody Bond, LLP. The museum is accessed by an entry pavilion designed by Snøhetta. Creative direction was provided by the museum itself, with principal exhibit design by Thinc Design, supported by Layman Design who were responsible for the historical exhibition. The vital role of media designer was undertaken by Local Projects, with additional content provided by Infusion and Project Rebirth.

Exhibit fabrication was by Design & Production and Hadley Exhibits. PPI Consulting was the audio-visual systems designer for the museum and education center. Arup was the designer for the Pavilion Auditorium. AV systems integration was by Electrosonic.

Around 70% of the exhibits requiring AV support were mocked up at the fabricators' premises in Washington, DC and Buffalo, NY, or in Electrosonic's own facility in Burbank, CA. Electrosonic's office in New York helped ensure local support over the several year project duration, and now Electrosonic has permanent staff on site to ensure the highest standard of AV performance.

Key equipment components in the museum include Sharp, Christie and Digital Projection projectors, Alcorn McBride audio playback, Vista Group SoundStik audio stations, Atlas and Dakota loudspeakers, Dataton WATCHOUT video playback, Adtec signage players, Boland, Sharp and Samsung LCD displays, 3M touch screens, Dell computers, Extron fiber optic and twisted pair extenders and Medialon system control.

The vast Foundation Hall features the exposed slurry wall which retains the Hudson River and the evocative Last Column with touch screens that show details of the signatures and mementos on the column. (Photo by Jin Lee)

Part of the Summer Olympics area, showing three of the four big screen images.

The Olympic Museum

The Olympic Museum in Lausanne, Switzerland, re-opened to the public in December 2013 after a two-year renovation. The leaflet promoting The Olympic Museum speaks of "an innovative museum layout covering more than 3000 sq m (32,000 sq ft) that takes you on a multidimensional journey across the Olympic Universe... With over 1000 objects and 150 screens the experience awaiting you is totally immersive, highly detailed and incredibly vibrant."

Metaphor of London prepared the masterplan for the new and greatly enlarged exhibition, and Mather & Co of Wilmslow did the detailed design, which makes extensive use of AV and interactive techniques. Electrosonic designed the AV system under subcontract to Centre Screen of Manchester, the media producer, and carried out the system engineering and integration under a separate subcontract to Paragon Creative of York, the exhibition fit-out contractor.
The museum is on four levels. The top level houses the TOM Café, with views over Lake Geneva. The three lower exhibition levels each cover a different aspect of the Olympic Games.

Level 1: The Olympic World

Visitors enter the museum on Level 0 and walk up a spiral ramp to Level 1, the top part of which features ghostly images of the Olympic Torch Relay. These are projected onto a curtain of flexible vertical rods made from silicone rubber. Visitors then enter the main exhibition which starts with a magnificent panorama, "Welcome to Olympia," showing the origins of The Olympic Games in Ancient Greece and the first of several panoramic projection shows.

Other exhibits which make striking use of AV on Level 1 include the "Olympic Torch," the "Historical Timeline" and the "Best of Opening Ceremonies." The Torch exhibit includes the actual torches, interpreted by six 22-inch touch screens, and a projected image showing the lighting of the Olympic flame shown on a screen viewed by both front and back projection. Flames are projected onto the floor as part of the exhibition lighting which was designed by Sutton Vane Associates. The Timeline exhibit uses five projectors to produce one long image in the form of a "library," with each volume relating to a specific Olympic Games. In front of the display, there are five small podiums which allow visitors to "open up" a specific year and see a compilation of contemporary images. The spectacular opening ceremonies of the Olympic Games get a substantial showing in a three-projector panorama, which is the "Finale" of Level 1.

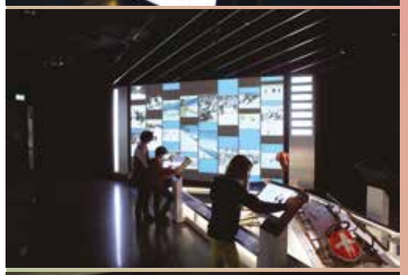
Level 0: The Olympic Games

This is divided into sections covering the Summer Games, the Winter Games, the Paralympics and the Youth Olympics. Each area is well supported by interactive displays which give detailed information, eight surround screens and relevant artifacts such as sports clothing and sports equipment.

The Games exhibit areas are sited around a central space which houses the "Big Show" on this level. Called "Inside the Race," it is a fast moving panorama show (five edge blended projectors) which envelops the audience. While it includes highlights from many Olympic Games, it also explores the athletes' experience and attributes, with such themes as "pain" and "determination."

Level -1: The Olympic Spirit

Visitors are welcomed by a display themed on aeroplane boarding passes and suitcases, which emphasizes how the Olympic Village can appear anywhere in the world. Many topics are covered by the exhibits on this level, most with AV interactive support. They include "Fairness," "Science and Technology," and "Body, Will and Mind." An exhibit called "Words of Olympians" allows visitors to "meet" athletes and hear what they have to say. This is achieved by the provision of 20 AV stations with 22-inch LCDs playing continuous programs. Audio is delivered by handset, and seating is provided.



Photographs:
- Ghostly images projected on the ramp up to Level 1
- The "Welcome to Olympia" exhibit
- The Timeline exhibit with its five podiums
- Finding a "Best Story" in the Winter Games area
- "Bienvenue au village" spelled out with boarding cards, with suitcase videos in the foreground





Photographs (left to right):

- FDR gave his Library and Museum to the American people for operation through the National Archives.
- The portrait of FDR at the entrance
- Typical touch screen display, this one on the subject of "What caused the great depression?"
- "Foundations of a Public Life" touch table
- The Secret Map Room exhibit
- The Legacy Theater

Franklin D. Roosevelt

PRESIDENTIAL LIBRARY AND MUSEUM

The Franklin D. Roosevelt Presidential Library and Museum re-opened in 2013 after a three-year refurbishment of the original building that was built by FDR and opened by him in 1941. The new museum displays were designed by Gallagher & Associates. These incorporate extensive AV support to assist the narrative and help interpret the exhibits. Interactive AV content was by Cortina Productions with linear AV content by Monadnock Media. The AV consultant was David Rome and AV systems integration was by Electrosonic working under subcontract to the exhibit fabricator Explus.

The World in Crisis

A large portrait of FDR, flanked by two 55-inch LCDs showing contemporary film footage, dominates the entrance to the exhibition. The first section of the museum then sets the scene with an exhibit on economic hardship in America in 1932, supported by ambient audio, and a theater presentation entitled "The World in Crisis."

The theater space is surrounded by a collage of graphic images in a jagged array, symbolizing the difficulties that were affecting the world in the early 1930s; this "jagged" motif is extended into the show itself as can be seen from the photo.

The show, presented on a large screen and accompanied by 5.1 surround sound, uses newsreel footage to show how the economic crisis was affecting countries around the world, and in some cases leading to the emergence of extremists.

Throughout the museum there are many exhibits that feature 22-inch touch screens which give additional information about the exhibit and the circumstances of the time. For example, the "Promise of Change" exhibit includes an interactive display entitled "What caused the great depression?"

Nearby are two exhibits which introduce Franklin D. Roosevelt, the man. One of these, "Foundations of a Public Life," features an interactive table based on a 46-inch touch screen which operates as a giant scrapbook. The other is the "Polio Theater," based on a 55-inch LCD with stereo audio, which puts FDR's disability into contemporary perspective and shows how he was, for the most part, able to conceal it from the public.

FDR was one of the first to understand the importance of radio as a means of communicating with the general public. Two effective exhibits, one set in the New Deal era and the other in wartime, recreate the experience of listening to his "Fireside Chats." The first has a suburban kitchen setting, and the second has a dining room setting. In each case, there is a choice of FDR's original recordings, played through old radio sets of the period. Responses from the public can be heard through overhead loudspeakers

There are other theaters at intervals through the exhibition, such as "The Enduring New Deal," "Pearl Harbor," "Newsreel" and "Legacy." Depending on the content and on the space available, these either use LCDs (55 or 70-inch) or projection. An extensive exhibit on the New Deal and FDR's second term is followed by a view of FDR's private study, and then a gallery devoted to World War II. An interesting exhibit here is "FDR's Secret Map Room." Besides projected images on the wall, there are three multi-user "map tables," each equipped with a flat screen presenting the "maps" and two 1940s telephones.

The museum exhibition thus far is on the ground floor level. After the map room, visitors descend into the basement. Here the World War II story continues until FDR's untimely death. Succeeding exhibits include FDR's Oval Office Desk, with its amazing collection of objects (interpreted by a touch screen display) and a gallery devoted to Eleanor Roosevelt. Finally, the "Legacy Theater" presents an assessment of FDR's achievements.

AV TECHNOLOGY

Projection is by single chip DLP™ projectors from projectiondesign. Large LCDs are from Samsung, however, the horizontally mounted 46-inch touch screens are from Primeview. "Small" LCDs (15- and 19-inch) are from Totevision. The 22-inch touch screens are E531206 units from Elo.

All linear video is run at 1080p from BrightSign HD1020 players. Except for the ELO devices, displays are fed using CAT-6 cables and Extron DTP DVI 301 extenders.

"Show" audio is processed through a Peavey MediaMatrix DSP system and Crown 8-channel amplifiers. "Ambient audio only" exhibits use Technovision TecMP3 audio servers. The "Fireside Chats" exhibits use Gilderfluke Sd-50/8 industrial MP3 players.

Loudspeakers are mainly from the JBL "Control" range. Some exhibits use NXT flat panel technology and two theaters use Dakota focused arrays.

All exhibit AV equipment is centrally controlled using Medialon Manager.

National Civil Rights MUSEUM

The "Join the Movement" exhibit is based on a multi-touch table made up from four narrow bezel 55-inch LCDs.

Following a $27.5 million renovation, the National Civil Rights Museum in Memphis held its grand reopening in April 2014, nearly 50 years after the passage of the landmark Civil Rights Act. The renovation features new spaces, films and interactive audio and video exhibits with AV design, installation and programming by Electrosonic, who worked closely with the exhibition designers, Howard+Revis Design Services.

The museum is located at the site of the former Lorraine Motel, where Martin Luther King, Jr. was assassinated. The motel's courtyard was renovated to house five interactive Listening Posts, which consist of portrait-oriented 10-inch outdoor-rated touch screens, waterproof speakers and network-enabled video players.

The main exhibit area is packed with compelling displays conveying the struggles of the civil rights movement. "Living Under Jim Crow" features 30 portraits, which deliver testimonials when touched. "Albany Freedom Songs" is highlighted by a 6,000-lumen ceiling-mounted projector, four wall-mounted speakers in the ceiling alcove and a 10 by 7.6-foot (3 by 2.3 meter) screen wall painted with Screen Goo. A similar projector displays photos from the "Children's Crusade" on a screen made from a special film applied to a glass substrate so images can be viewed from the front or back.

The momentous "Freedom Summer of 1964" is illustrated by a 3,000-lumen ultra short-throw NEC projector mounted below and behind a rigid rear projection screen with an image size of approximately 62 by 44 inches (1.6 by 1.1 meters).

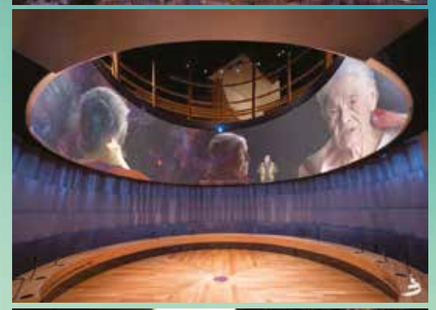
Martin Luther King, Jr. makes his famous "Mountain Top Speech" on a 55-inch monitor and four ceiling speakers. Gospel singer Mahalia Jackson is heard, her voice gradually increasing in volume as visitors enter the space between the rooms where King and his guests stayed that fateful night in Memphis.

The museum tour ends in the new Ellipsis Theater where a 6,000-lumen 16:9 ceiling-mounted Panasonic projector displays images on a 183 by 103-inch (4.6 by 2.6 meter) wall-mounted screen. One long speaker is installed under the screen along with eight ceiling speakers and two ceiling-mounted subwoofers.

1220 Exhibits was the exhibit fabricator; Cortina Productions and Second Story were the media designers and producers.

Albany Freedom Songs

Canadian Museum for Human Rights



Winnipeg's striking new Canadian Museum for Human Rights explores the universal concept of human rights with a special emphasis on Canada. Electrosonic was contracted to do the audio-visual design for the museum's eleven galleries, and subsequently the company directed the AV equipment installation working with local partner Advance Pro.

The building was designed by US architect Antoine Predock, working with Winnipeg's Architecture 49. The exhibit architect was Ralph Appelbaum and Associates, the exhibit fabricator was Kubik, Inc. and Bruce Wyman managed the media producers. The differing requirements of no less than eleven producers required considerable technical coordination by Electrosonic. The architecture presented some interesting acoustic challenges and Electrosonic worked closely with consultants SH Acoustics to ensure that sound was delivered to exactly where it was needed, and sound spill was minimized.

The museum features theaters, interactive touch screen stations and hundreds of video clips. A variety of equipment was selected to match both the exhibit design and producers' needs. Projectors are primarily from Barco, with additions from Panasonic and Viewsonic. Flat panel displays are from NEC, Samsung and ELO.

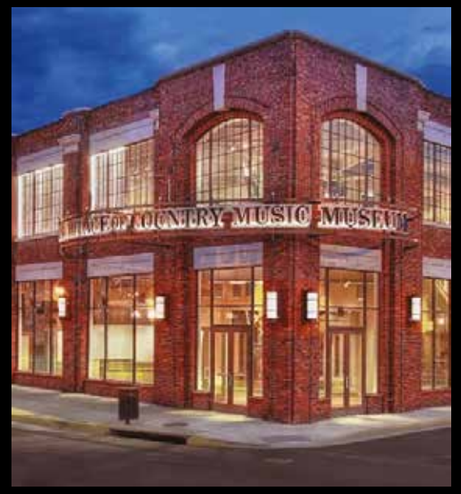
In order to best meet ADA accessibility requirements, Electrosonic developed a custom user interface, based on rubber membrane keypads and a programmable keyboard emulator. This allowed users who could not access the touch screens to navigate the content in the interactive exhibits. The keypads also included audio interfaces for the sight and hearing impaired.

Photographs (from top):

- The museum's unusual profile makes an interesting addition to the Winnipeg skyline.
- The 360° show in the "Indigenous Perspectives" Gallery uses six Barco CNWU-61B projectors sourced from a Dataton WATCHOUT system.
- A digital study table consisting of 12 MultiTouch 55-inch touch screens is based on Tactable software.
- The gallery exploring the Universal Declaration of Human Rights has four interactive stations, each with two portrait-mounted 55-inch Samsung monitors and Microsoft Kinect gesture recognition technology.

BIRTHPLACE OF
Country Music

Straddling the Virginia and Tennessee state lines, the town of Bristol opened the Birthplace of Country Music Museum, an affiliate of the Smithsonian Institution, in the Fall of 2014.



The new museum celebrates the historic 1927 Bristol Sessions, which are considered the origin of modern country music. Held by the Victor Talking Machine Company in a local hat warehouse, the sessions were made possible by the advent of portable audio recording technology, and marked the commercial debuts of the legendary Jimmie Rodgers and the Carter family.

The 24,000-square foot museum is in a vintage building that formerly housed a truck dealership. Electrosonic was brought into the project in its early stages by Washington, D.C.-based Hillmann & Carr, who produced the museum's video content and handled interactive programming. Electrosonic's Design Consulting team worked with StudioMUSarx in Philadelphia on the initial exhibit design and its Orlando office subsequently engineered the AV systems for the facility. SH Acoustics of Milford, CT was the acoustic and audio consultant to Electrosonic. Burwil was the general contractor for the museum.

Throughout the museum, interactive exhibits equipped with 32-inch ELO touch screens engage visitors in aspects of the Bristol Sessions. "Way Back Machines" enable visitors to scroll through photographs showing Bristol over the years. Four "Mixing Stations" allow them to change the mix on assorted tracks from the sessions. Two "Bristol Remastered" interactives, with Brown Innovations directional loudspeakers, showcase session tunes covered by contemporary artists. An interactive recording booth invites visitors to sing along in their own version of the famous Bristol Sessions, and "Send a Postcard" lets them choose a digital postcard design to email to family and friends.

Visitors to the museum enjoy five theaters, four of which were equipped by Electrosonic. The largest of them, the Orientation Theater, shows the video, "Bound to Bristol," about the musical heritage of the Bristol Sessions. The theater is equipped with an InFocus projector, Renkus-Heinz loudspeakers, Bag End subwoofers and activated sound panels by Acoustic Enhancements. The theater has Screen Goo projection surfaces on its wall and an Alcorn McBride DVM8500 is its digital video source.

The Immersion Theater focuses on making visitors part of the unbroken circle of country music and includes clips of many different artists performing "Will the Circle Be Unbroken" – from Jimmie Rodgers to Lynyrd Skynyrd. This theater has a custom Da-Lite perforated, curved screen, three blended BenQ projectors, and a Dataton WATCHOUT video source. The walls are lined with murals showing crowds of country music fans at the annual Rhythm & Roots Reunion festival in Bristol.

Photographs (left to right, clockwise):
- The Museum.
- The Immersion Theater – with room to dance!
- A thematic sculpture rises between the two floors.
- One of the "Mixing Stations."

Beyond Rubik's Cube

The colorful Rubik's Cube made its debut 40 years ago and continues to delight and intrigue puzzlers today. A new twist on the puzzle, a touring exhibition entitled "Beyond Rubik's Cube," recently opened at the Liberty Science Center in Jersey City, NJ.

The 7,000 sq ft (750 sq m) exhibition, has 24 exhibits in three exploration zones with the themes of "Invent," "Play" and "Inspire." They offer tantalizing puzzles, robotic manipulations, music, art and original artifacts, which become creative platforms for the exploration of Professor Ernő Rubik's cube and the culture it has inspired.

"Beyond Rubik's Cube" is dominated by bright colors and strong geometric shapes. Professor Rubik is quizzed about his famous puzzle in an interview seen on a 55-inch Samsung portrait monitor. Bright yellow guest stations in the Cube Symphony exhibit, designed by Unified Field, enable visitors to create their own symphonies as they rotate the cubes. A 55-inch Ideum Pro multi-touch table offers visitors the chance to tackle cube-themed games, and a 100-inch Ideum Pano multitouch table is big enough for eight or ten players to collaborate on making tessellation patterns.

The exhibition is designed to travel; after six months at Liberty Science Center, it starts a seven-year international road trip. The exhibit uses an AMX system controller with tablet control. The Liberty Science Center itself can host the entire system and can monitor, update and reconfigure exhibits remotely.

The exhibition was designed by the Science Center's own Exhibits Development Group, and fabricated by Maltbie, a Kubik company, who appointed Electrosonic to take responsibility for audio-visual design, integration and installation.

Photographs top to bottom:
- Visitors enter through a tunnel (right) where multiple Microsoft Kinect cameras and Panasonic projectors with ultra short throw 0.3 lenses generate real-time fractal images.
- On the extreme left is one of 20 Samsung tablets used both as exhibits and as instruction panels for mechanical interactives. The tablets can be remotely configured for different languages.
- A wall mosaic created from hundreds of Rubik's Cubes accompanied by a video about the mosaic artist projected on the floor.
- A giant 10 ft. tall working Rubik's Cube that can be controlled by visitors.

Photograph by Esdras Jaimes, Panama

Amazing BIOMUSEO

The amazing Biomuseo, situated on the Amador Causeway at the Pacific entrance to the Panama Canal, opened in the fall of 2014. Designed by world-renowned architect Frank Gehry, the Biomuseo is his only work in Latin America. The building was designed to tell the story of how the Isthmus of Panama rose from the sea, uniting two continents, cutting a vast ocean in two, and changed the planet's biodiversity forever.

The Biomuseo's 4,000 sq m (43,000 sq ft) contains eight permanent exhibition galleries designed by Bruce Mau Design, of which four are now open. In the early design stages of the project, Electrosonic's Design Consulting team worked with Maltbie, the exhibit fabricator for the exhibition, on the development of each gallery in respect of its AV requirements. In due course, Electrosonic was commissioned to complete the AV systems integration, fabrication, and installation. Care taken at the design stage paid off since late changes to the specification were minimal and despite the comparatively, in business terms, remote location, the installation went very smoothly. Installation services were provided by local company Audio Foto PRO.

Visitors enter the Biomuseo at the Gallery of Biodiversity where an explosion of life immediately captures their attention. On the walls, a seven-panel Samsung LCD monitor system is stacked horizontally and vertically in custom frames. A looping montage of flora and fauna, with ambient surround sound, is synchronized by a Dataton WATCHOUT system so the monitors can display breathtaking individual content or portions of a sweeping single image. A Sunrise LED ticker reminds visitors how many people currently live on the planet.

The gallery leads to the appropriately titled "Panamarama Theater," a three-story, cube-shaped projection space where ten screens, on all sides and above and below a glass ceiling and floor, immerse visitors in the natural wonders of the country's ecosystems. They watch as stunning nature cinematography shows leaf cutter ants marching under the floor, a lush jungle trail, a down-river sailing expedition, a beautiful Pacific Ocean beach and the underwater domain of whales.

None of the screens are parallel or perpendicular. They are hung at different angles and in different directions. Panasonic projectors and custom-built mirror bounce mechanisms from Elliott Metal Fabrication are used to display the images. The video presentation is driven from a 10-channel 7thSense video server and QSC audio system. A Medialon touch panel manages visitor flow and show operation.

The theater exits into "Building the Bridge," which explains how tectonic forces formed the isthmus. The gallery is dominated by three 14-foot rock formations embodying interactive exhibits on geological topics.

On the technology front, Electrosonic supplied Extron fiber optic extenders, Cisco network switching, and ATEN KVM units. Audio equipment includes Peavey NION DSP, Stewart Audio amplifiers local to exhibits, and a custom 24-channel Richmond Sound audio playback system, which offers maximum flexibility in audio distribution and playback across the entire museum.

Photographs opposite (clockwise):

- Panamarama Theater.
- The last gallery, "Worlds Collide," examines the exchange of species between North and South America when a stampede of animals began almost 3 million years ago. Life-size white models of the creatures – from otters to mammoths – fill the space. Interactive exhibits are built into the architectural structure.
- Multiple LCDs in the Gallery of Biodiversity.
- Underfloor screen.

Time Lords

AT OUR DYNAMIC EARTH

Future Energy Chicago

Overview of the Future Energy exhibit.

The Future Transportation game is presented on a polygonal table by two projectors mounted overhead.

Top photograph:
The introductory film, produced by Donna Lawrence Productions, is presented on a 20-foot (6-meter) wide oval screen by Barco 3-chip DLP™ projectors and a 7thSense server.

One of the newest permanent exhibits at the Museum of Science and Industry in Chicago is "Future Energy Chicago." It features games which challenge guests to compete in teams to make wise energy choices for a more sustainable city.

Visitors begin by rediscovering the nature of energy in the Energy Garden area, where they can transform energy from one form to another via a series of electro-mechanical devices. An introductory film presents the story of energy in our world before the visitors convert their new knowledge into action in a multi-player simulation game in which they design an energy-saving car, house, neighborhood, transportation system and city power grid.

From the outset of the project, Electrosonic worked with exhibit designers Evidence Design, interactive designers Potion Design and SH Acoustics to meet the goals of the museum within the given budget and allotted exhibit space. As a team, they set up a huge mock-up with multiple projectors and media at the museum to determine the required audio and video performance, acceptable pixel sizes and most appropriate equipment. Infrastructure planning was a major challenge with a lot of technology squeezed into a very tight space.

In the simulation area, guests form teams to play games at five different interactive stations. For example, Future Power illustrates the need for a smart mix of energy with images on a round table from three Panasonic projectors mounted overhead. Future Car invites guests to design a new vehicle by video mapping projected images onto a trio of small three-dimensional car models. All of the overhead-mounted projectors feature gesture recognition. A 24 by 8-foot scoreboard keeps track of the teams' performance; a pair of edge-blended Barco 3-chip DLP™ projectors and Tannoy loudspeakers display the scores and announce the winners.

Photographs:
- The globe presents a graphical representation of tectonic plates.
- James Hutton presents his theories on how the Earth was formed, supported by "blackboards" on either side of him.
- Charles Lyell, Ben Peach and John Horne come alive.

Our Dynamic Earth is a popular science based attraction in Edinburgh which opened in 1999. Electrosonic delivered the complete AV systems for the original exhibition. Now, following Our Dynamic Earth's biggest re-development ever, Electrosonic has helped realize the new "Scotland's Time Lords" exhibit.

James Hutton was the first to challenge old theories about the Earth's evolution, by studying the rocks and land formations around Edinburgh. He is the "star" of the first part of the exhibition, which presents him lecturing in a book lined classroom in the 18th century flanked by two large "blackboards" which illustrate his talk. These are projection screens, but James Hutton himself appears to be in the room courtesy of the Pepper's Ghost technique (his image is presented on a 63-inch LCD).

One wall of the classroom features portraits presented on 55-inch LCDs of renowned 19th and 20th century geologists Charles Lyell, Ben Peach, John Horne and Arthur Holmes (all with direct connections to Scotland), who come to life and comment on the importance of Hutton's insights.

Arthur Holmes, professor of Geology at Edinburgh University, was one of the first to understand the Earth's "mantle convection" which in turn led to the concept of plate tectonics. These form the basis of the next section of the exhibition where a suspended "Puffersphere" globe uses a projector with a special lens to project onto the internal surface of the globe presenting an animated sequence of graphic images.

The final "new" exhibit is the Deep Time Machine. This is styled as a large elevator in which visitors are transported backwards in time from the present to the "Big Bang." When the elevator doors at the entrance end close, visitors are flanked by giant images presented on the sides of the "machine." Five 55-inch LCDs are mounted on each side. At the end of the show, elevator doors open at the other end and visitors move to the existing spaceship-themed "How it all started" exhibit.

The new exhibition was designed by Edinburgh-based Studio MB, the fit-out contractor was Paragon Creative and show content was produced by ISO Design of Glasgow. Electrosonic's Edinburgh office was responsible for the design and systems integration of the audio-visual elements, under subcontract to Studio MB.

Character Stations use stacked LCDs and directional loudspeakers.

The audience is immersed in the "prepare for battle" images and accompanying 7.1 sound.

Longbows about to fire arrows through the audience in the 3D presentation.

The "Battle Game." Note the Battlemaster standing at his twin screen console and the "mood images" projected onto the surrounding walls. See also the photo on the front cover.

Bannockburn *in* 3D

The Battle of Bannockburn site, on the edge of Stirling in Scotland, is marked by a memorial rotunda and the famous statue of King Robert on his horse by Pilkington Jackson. Both were unveiled in 1964 for the 650th anniversary, and both have now been renovated for the 700th. A nearby "heritage center" has been removed, and a completely new visitor center, in a different position and befitting the 21st century, opened in the spring of 2014. It was developed by a partnership between the National Trust for Scotland and Historic Scotland, supported by the Scottish Government and the Heritage Lottery Fund.

Bright White Ltd was appointed to develop the interpretation concept, complete the exhibition design and supervise its realization. It depends on high quality projection, and Electrosonic worked with Bright White over a period of three years to design and engineer the fully automatic show presentation systems.

Visitors pick up their pre-booked tickets at the shop at the entrance and are given in return a pair of 3D glasses to wear inside the experience. A major feature of the center is the "Battle Room" where you can either play or observe a 40-minute Battle Game or watch a 10-minute Battle Show. Battle Room activity can be observed as part of the main tour, but if you want to participate in a game or show, you have to book a time.

The exhibition is divided into "Prologue," "Prepare for Battle," "Character Stations," "The Battle Room" and "Epilogue." The "Prologue" is presented in the style of a puppet theater. It introduces some of the main characters and the circumstances which led up to the battle. Visitors then move to the largest exhibition area "Prepare for Battle." Four large screens surround the space and present a continuous sequence of spectacular life-size 3D images.

The show on the big screens tells multiple stories. Iconic moments from the battle, such as when Robert the Bruce encounters Sir Henry de Bohun on the first day, are shown, but the main emphasis is on the two sides preparing for battle. This allows demonstrations of different weapons to be given – all part of a process to prepare visitors for their participation in the Battle Game. One sequence has arrows from longbows being shot across the space – a particularly effective use of 3D.

The films shown in "Prepare for Battle" and in the Character Stations were all developed by expert 3D modelers at the Centre for Digital Documentation and Visualisation (CDDV), a partnership between the Glasgow School of Art's Digital Design Studios and Historic Scotland, with final direction by Centre Screen Productions. Although the films were computer generated, all live action was based on real people and real action, using both laser scan and motion capture techniques. The fight choreography was by the Clanranald Trust for Scotland.

The Prologue, Epilogue and main show are all based on 3D projection. After evaluating options, it was decided that the most cost-effective method, and the least complex from the point of view of both the visitor and the operation of the center, was to use polarizing glasses to resolve the 3D image. These are card-mounted and are given to visitors to be kept as souvenirs. Each projection screen is equipped with two projectors with appropriate filters, and the screens themselves are part of the exhibition structure painted with a special matte white screen paint which preserves polarization. The system uses linear polarization which was found to give the best results when tested on full size mock-ups of the exhibits at the Glasgow School of Art.

THE BATTLE GAME

Every visit culminates in the chance to lead a division of medieval soldiers from Robert the Bruce and Edward II's armies in the dramatic Battle Game, taking command of the knights and soldiers who fought in 1314. Who wins the battle of Bannockburn? The visitor decides, as they put their wits against their fellow visitors on a virtual battlefield.

Visitors are allocated an army division which appears on a massive 3D map. At the visitors' call, archers attack, shiltrons stand strong, cavalry advance, all with the aim of destroying the opposing army, protecting their King, and on Edward II's side, relieving Stirling Castle.

The Battle Game, developed by games specialist D3T, is based on a relief representation of the battle terrain on which is projected both the terrain details and all the troop movements that take place during the battle. There can be up to 30 participants, but the game itself is controlled by the Battlemaster who is on hand to flesh out historical details, and throw in tips and advice before declaring the successful side, summarizing the results of the action with an overview of how the battle played out in 1314, and revealing the 21st-century version of the landscape and locations of conflict.

The AV system at the center was designed by Electrosonic's Design Consulting team; it was engineered and installed by Electrosonic's Edinburgh office, with rack building at Electrosonic's Dartford office.

360° Projection at Stonehenge

The long-awaited new visitors' center at Stonehenge opened on December 18, 2013. It is part of the Stonehenge Environmental Improvements Project, English Heritage's largest ever capital investment project made possible by a £10 million grant from the Heritage Lottery Fund, and substantial gifts from the Garfield Weston Foundation, the Linbury Trust and the Wolfson Foundation. It makes dramatic use of high resolution projection to introduce the stones. Electrosonic was responsible for the AV systems design and integration.

"Standing in the Stones"

The visitor center is 1.5 miles from Stonehenge itself and sits in a hollow such that it is invisible from the monument. Visitors can view the exhibition both before and after a visit to the stones themselves, which is reached by a shuttle with timed ticketing.

The center consists of two "pods," one containing the café, shop and education space, and the other containing the exhibition. A canopy spans both, and the space between the two is the location of the ticket office. In the same open area, an "Info Wall" has three large LCDs that give current information about English Heritage and its neighboring sites.

Visitors then enter the exhibition part of the building, and first enjoy a 360-degree virtual experience that lets them "stand in the stones" before they enter the gallery. This three-minute film, based on state-of-the-art laser scan images of the stone circle, transports viewers back in time through the millennia, and enables them to experience the summer and winter solstices.

"Standing in the Stones" uses six Panasonic PT-DZ770 single chip DLP™ projectors with 1920 by 1200 resolution and nominal 7000-lumen light output. These are sourced from a 7thSense Delta server via Atlona extenders. The audio chain includes a BSS BLU 100 DSP, four Crown CTs600 amplifiers and seven Tannoy Di5 loudspeakers augmented by a ceiling mounted sub-bass loudspeaker.

An exhibit like "Standing in the Stones," central to the success of the center, requires great care in execution. An important part of its development was the ability to preview it in a full-scale mock-up at Electrosonic's Hawley Mill facility. This procedure both helped the producers check the content at full size, and ensured that the client, English Heritage, could be confident in the outcome, and aware of audience circulation issues.

Visitors move from the "Standing in the Stones" experience into an exhibition area. Here they can see original objects used in Stonehenge's construction, and objects connected with Neolithic and Bronze Age men and women, their lives, their rituals and daily struggles.

There are three AV elements in the exhibition. Within each of five display cases, a 15.6-inch LCD provides supporting information. The "Meaning" section includes four portrait format 32-inch LCDs showing a linear program on the subject of the "Meaning of Stonehenge." The largest AV element is "Landscape," a giant image projected onto a wall screen, which relates the present landscape of the area to how it evolved over the millennia. "Landscape" uses three Panasonic PT-DX610ELK single chip DLP™ projectors with XGA resolution and nominal 6500-lumen output sourced from a 7thSense Delta server via Atlona extenders.

The other "pod," containing the café and the shop, also has an education space which is equipped with appropriate room control and AV facilities.

The new Stonehenge visitor center is a great success, to which AV techniques have made a significant contribution.

Photographs, clockwise from top left (page 34):
- Visitor center blends into the landscape (Photo from English Heritage)
- Info Wall with Sharp 60-inch LCDs in Armagard housings (Photo from English Heritage)
- Display cases in the foreground and the "Landscape" display in the background
- One of the solstice sequences
- Full scale mock-up of "Standing in the Stones" at Electrosonic

THE TEAM

The architect of the center was Denton Corker Marshall, and the exhibition designer was Haley Sharpe Design. "Standing in the Stones" was produced by Centre Screen Productions, assisted by Studio Liddell and with a sound track by Peter Key.

The content for the "Meaning" displays, the LCDs within the display cases, and for the ticket office audio guide was produced by ISO Design, and the "Landscape" content was produced by Squint Opera. The "Info Wall" content is managed by English Heritage.

Haley Sharpe Design managed the production of the exhibition, with The Hub as exhibition fit-out contractor and Goppion the supplier of the display cases. Electrosonic engineered the AV system under a direct contract with English Heritage.

Space Shuttle Atlantis

Electrosonic first worked at the Kennedy Space Center in 1984, engineering a multimedia presentation system for the Orientation Center. Since then, it has worked on several major exhibits there, including the Saturn V Apollo Theater. The most recent project was in 2013 when Space Shuttle Atlantis℠ opened. This exhibition tells the story of the Space Shuttle program that ran from 1981 – 2011, with the real shuttle Atlantis as the principal exhibit.

IN DELAWARE'S WORDS:

> *The $100 million attraction allows guests to get nose to nose with Atlantis, which flew in space 33 times and still bears the scars, scorch marks and space dust of its last mission. Atlantis is dramatically displayed as only astronauts have seen it before, tilted on its side at a 43.21-degree angle and seeming to float in space with its payload bay doors open and its robotic Canadarm extended, as if it has just undocked from the International Space Station (ISS).*

The Kennedy Space Center Visitor Complex is run by Delaware North Companies Parks & Resorts. This company commissioned PGAV Destinations to design the new attraction. Electrosonic's Design Consulting team was first contracted to PGAV to develop the AV systems design, and Electrosonic was later contracted direct to Delaware to carry out the systems integration.

Around 60 exhibits in the attraction have an AV element, and media content for these was prepared by a top ranking team of producers including Mousetrappe, Cortina Productions, Unified Field and Design Island.

Visitors ascend the entry ramp and enter a holding area where they begin learning about the history of the space program while an LED countdown clock shows the time remaining before the start of the main multimedia pre-show. This spectacular pre-show gives historical context to the upcoming exhibits, the role that Atlantis played in the Space Shuttle Program and how the program has paved the way for NASA's next generation of manned space flight. In the pre-show theater, four projectiondesign F35 2560 × 1600 video projectors are edge blended in a 2 by 2 configuration for the main screen's immersive experiences. Sixteen projectiondesign F32 1400 × 1050 video projectors, edge blended in groups of four, add video content to four arches. The visual effect is reminiscent of the Sydney Opera House, and is an excellent example of the technique of projection mapping.

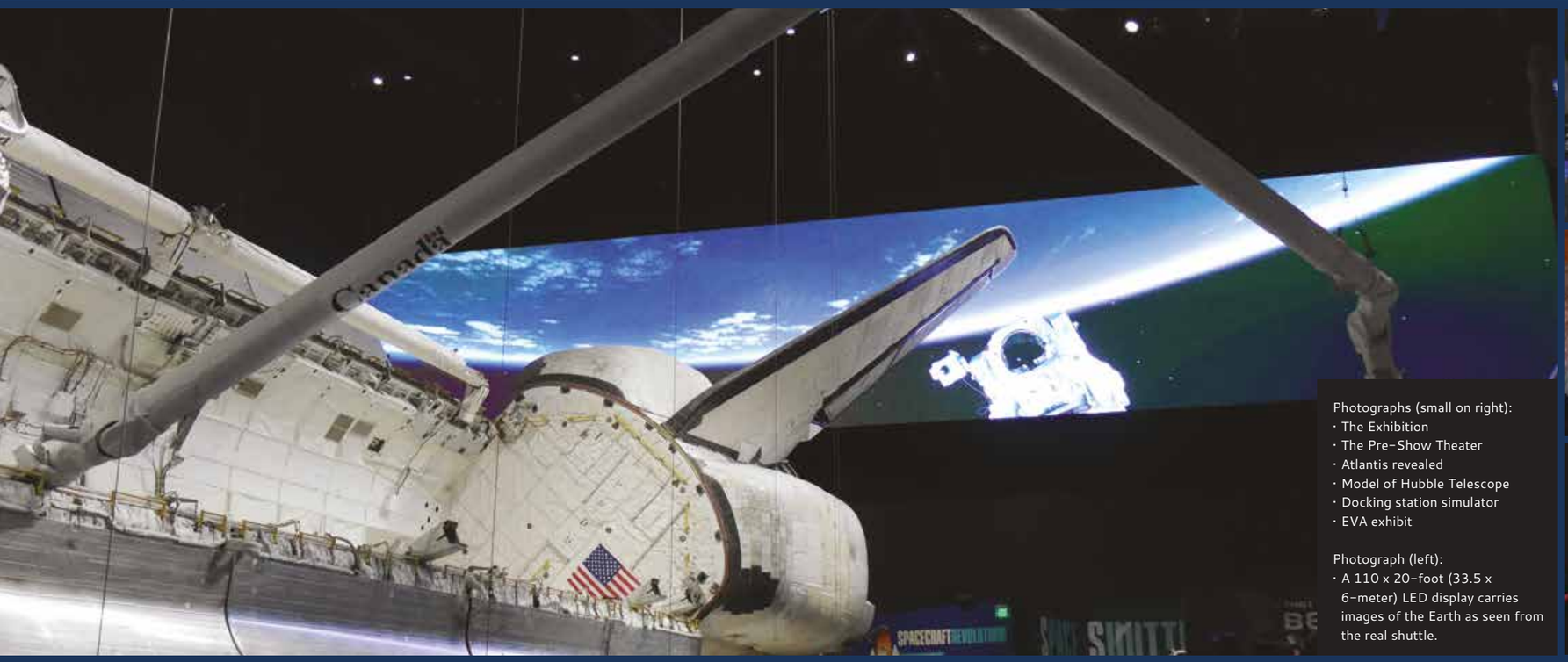
As the show comes to an end, the main screen becomes a gauze through which Atlantis can be discerned; the gauze disappears and the audience walks out through the screen opening straight in to the nose of Atlantis.

The illusion of Atlantis being in space is enhanced by a giant image of the Earth behind it. It is presented on a huge LED display. Once out of the pre-show, visitors find themselves in the main exhibit space with the massive Atlantis itself. The orbiter is supported by numerous artifacts, interactive and simulation exhibits and two additional theaters. Representative examples include the International Space Station Micro Gravity Theater, which gives a realistic view of astronauts aboard the ISS. The nearby International Space Station Media Wall is a bold display featuring seven 55-inch LCD multi-touch displays in portrait format.

The EVA, or space walk, interactive exhibit has three identical systems, each operating independently. A 65-inch LCD screen is combined with a 3D depth-sensing system that allows the visitors' actions to trigger the media application.

A series of simulators involve visitors even further in the space shuttle's routines. Landing the Orbiter simulators comprise nine kiosks fitted with 26-inch displays, each connected to their own PC and small USB-powered loudspeaker. Robotic Arm and Docking Station simulators consist of twelve separate kiosks each with four 19-inch displays. Electrosonic provided interfaces for one joystick and up to eight buttons for each of the simulator kiosks.

The Hubble Close-up Movie Wall highlights the famed space telescope whose stunning images are displayed via two projectiondesign F35 video projectors with audio supplied by eight loudspeakers. A life-size model of the telescope is also on view.



Photographs (small on right):
- The Exhibition
- The Pre-Show Theater
- Atlantis revealed
- Model of Hubble Telescope
- Docking station simulator
- EVA exhibit

Photograph (left):
- A 110 x 20-foot (33.5 x 6-meter) LED display carries images of the Earth as seen from the real shuttle.


Photo: Joe Casico

Photo: Joe Casico

Sheikh Zayed

DESERT LEARNING CENTRE

Photo from SZDLC

The Sheikh Zayed Desert Learning Centre (SZDLC) is part of the redevelopment of the 40-year old Al Ain Zoo in Abu Dhabi, UAE. It is a museum and research center that explores the natural and cultural history of the Arabian deserts and deserts worldwide. The building is on the site where Sheikh Zayed launched the first breeding program for the endangered Arabian oryx.

The SZDLC was designed by Chalabi Architekten & Partner of Vienna. The building resembles a coiled snake that generates a continuous loop similar to a Moebius strip.

The museum exhibition was designed by AldrichPears Associates of Vancouver. Electrosonic was sub-contracted to Beck Interiors, the exhibition fit-out contractor, to complete the detailed design and integration of the AV systems needed for three theaters and more than 60 interactive exhibits on five floors. The systems were built and tested in the UK before shipment to Al Ain, and then installed, commissioned and programmed on site with the support of the Electrosonic office in Dubai.

The three theaters are highlights of any visit, and each is of a different design. The Immersive Theatre has three ceiling-mounted Panasonic projectors projecting onto a curved screen. The projectors are fed DVI video signals by Extron baluns from a 7thSense Delta HD server. Dolby 5.1 surround sound is from Crown amplifiers and Tannoy loudspeakers.

The Sustainable Theatre runs a five minute show on three separate screens, which form a slight curve on a raised stage. Three BrightSign media players feed Optoma projectors. Audio is delivered by a Cloud multi-channel amplifier and four Tannoy loudspeakers.

The Feature Theatre is a full-scale cinema space. A Sony 4K cinema projector displays a 13-minute show on a 55ft×28ft (16.7m × 8.5m) screen from a projection booth at the rear of the auditorium. The projector is fed from a Sony Cinema Media Block; alternative content is delivered through a Geffen HDMI switcher which can output Blu-ray and other content to the big screen. The theater has 7.1 surround sound with Crown amplifiers and JBL loudspeakers.

Interactive exhibits at the SZDLC include PC interactives, video interactives, physical interactives and audio interactives. The physical interactives were designed by aivaf, while linear and interactive AV content was created by twofour54 and New Angle.

The PC interactives address a wide array of subjects: ancient climates, fossils, archaeological digs, indigenous animals and pearl diving. The video interactives introduce visitors to a bat cave, nocturnal life in the desert, landscape diversity, avian research, oryx conservation, hunting with falcons, desert wells, and local initiatives, such as plans for Al Ain City in the year 2030.

Interactives with physical interfaces include a pearl video microscope, tectonic stations for examining fossils, Q&A stations for identifying footprints, and exhibits exploring the coastline and bat detection.

Audio interactives include a 10-minute Deserts Over Time soundscape, an exhibit that asks visitors what creature makes what sound, and a Dew Forest soundscape, which washes over them under a glass-domed roof.

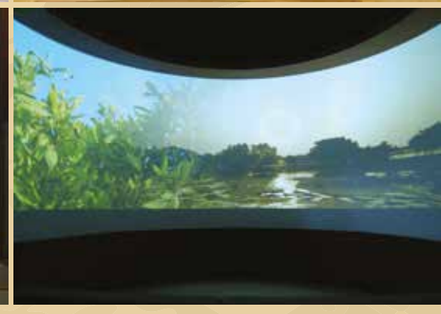
Representative equipment supplied by Electrosonic for the exhibits included 32,42,46,52 and 60-inch LCDs from NEC and Sharp; 60-inch through-glass touch foils from Paradigm, 19-inch WinMate touch screens, Dell PCs, BrightSign media players, In/Out MP3 players, Phidgets motion sensors, Dakota, KEF, Turbosound and Visaton loudspeakers, and Cloud and Dakota amplifiers.

While all of the interactive equipment is sited locally to the exhibits, there is a master AV rack housing a Crestron controller, which permits the remote start up and shut down of IP controllable devices. A Dell server has an external hard drive bay where a back up of all media can be stored.

Interactive exhibit with physical input and LCD images

Photographs (below - clockwise from left):

- Examining fossils with sliding "microscope"
- Desert soundscape
- The Arabian oryx is an inspiration for the museum
- The Feature Theatre
- Three separate screens in the Sustainable Theatre
- Panoramic screen in the Immersive Theatre



Edward M Kennedy
★ ★ ★ ★ ★ ★ Institute


Bruce T Martin Photography

Photographs:
- The Edward M. Kennedy Institute
- Rendering of the Senate Chamber as seen from the gallery
- The "People Who Made a Difference / Make a Difference" exhibit
- Senator Edward M. Kennedy's Washington office

The Edward M. Kennedy Institute for the United States Senate, located next to the JFK Presidential Library in Boston, is dedicated to educating the public about the important role of the Senate in the US government, encouraging participatory democracy, invigorating civil discourse, and inspiring the next generation of citizens and leaders to engage in the civic life of their communities. Its official opening ceremony was on March 30, 2015.

The exhibition areas of the Institute were designed by New York-based ESI Design, well known for its expertise in creating innovative visitor participation exhibits. The exhibit fabricator was the Lee Kennedy Co of Boston. Richard Lewis Media Group was responsible for AV media production and Control Group developed custom software for the Senate simulation and the 750 Google Nexus tablets issued to visitors. These allow visitors full interaction with both the exhibits and other visitors. Electrosonic was responsible for completing the AV system design and integration under sub-contract to the Lee Kennedy Co.

The exhibition makes extensive use of blended image projection and large LCDs. The architecture of the building required long cable runs, so all video distribution is by fiber-optics. Image processing equipment includes a CORIO Edge Blender from tvONE, and a high specification Spyder processor from Christie.

A highlight of the visit is the reconstruction of the Senate Chamber. This gives visitors a real sense of its importance, and allows them to participate in its procedures, with a chance to vote on current issues. The simulation of Senate procedures is enhanced by the use of three video walls, one 4×3 and two 1×3 (made up from Sharp 60-inch LCDs) and by use of the tablets which allow visitors to declare their affiliation and to vote.

Discovery Park of America

Discovery Park of America is set in a beautiful 50-acre park in Union City, Tennessee. The park includes historic buildings and attractive landscaping, but its centerpiece is Discovery Center, a 100,000-square-foot building showcasing ten exhibit galleries: Children's Exploration, Energy, Enlightenment, Military, Native Americans, Natural History, Regional History, Science/Space/Technology, and Transportation.

Discovery Park of America's mission is education: its exhibits and programs compel visitors of all ages to "see beyond" their current level of knowledge in many areas, and inspire them to reach their full potential. Discovery Park's principal benefactor is the Robert E. and Jenny D. Kirkland Foundation.

In the Native Americans gallery, a "holographic" storyteller recounts the legends and beliefs of the area's indigenous people. Electrosonic installed four 46-inch LCD monitors for the exhibit, which brings the mythical figure to life with a Pepper's Ghost effect.

AV content to exhibits is delivered primarily by 32- and 55-inch Samsung LCDs and Innovox loudspeakers. Source and control equipment is sited in an equipment room on the middle level of the center, which minimizes the length of cable runs. Overall system control is by a Medialon system.

Thinc Design was the designer of the exhibition galleries. Exhibition fit-out was by Maltbie, a Kubik company, who sub-contracted the majority of the required audio-visual installations to Electrosonic. Content for the AV-based exhibits was developed by the Richard Lewis Media Group.

Photographs (clockwise from left):
- The Discovery Center next to a 100 year old church
- Holographic exhibit
- Solar Album
- Earthquake Simulator
- Universe exhibit

Photo courtesy of SeaWorld

The independent ride vehicles.

Antarctica:
EMPIRE OF THE PENGUIN®

Electrosonic's first major AV installation for SeaWorld Orlando was for the innovative "Undersea Fantasy" theater show back in 1983. Thirty years later, SeaWorld was again leading the way in attraction innovation with the opening of Antarctica: Empire of the Penguin® in May 2013, and Electrosonic was again on hand to provide the latest in AV technology.

Photographs bottom of page 43, clockwise:

- Ice spires all around.
- At this point in the pre-show, visitors choose whether to take the "mild" or "wild" version of the main ride.
- One of the independent ride vehicles.
- Real penguins – not projected! The attraction architect was PGAV and the Scenic Contractor was Hotopp Associates.
- Part of the pre-show. The main image is back projected, and the other five are LCDs.
- Close-up with penguins.

Electrosonic joined the project at the design stage, working with SeaWorld's Corporate Director of Creative Development, Brian Morrow, and the attraction producer WOW!Works to provide the audio and video design for the entire attraction. The company then went on to carry out the equipment supply, system integration and installation.

Visitors enter a pre-show where they are introduced to the animated penguin, Puck, and his family. His is the last egg to hatch as a storm approaches. The penguins scurry to the shelter of an ice cavern. When the doors open to the ice cavern, the experience continues.

The first scenes of Puck's story are displayed on a central rear-projection screen flanked by five Samsung 70-inch LCD monitors, which give a wrap-around feel to the visuals. A Christie projector feeds the center screen, and JBL speakers hidden in the rockwork supply the audio.

Following the "walk-through" pre-show, visitors board the ride. On the batching platform, the ride operator ushers eight visitors at a time into a ride vehicle. The vehicles, a completely new development from Oceaneering, are trackless and the details of their powering, navigation and collision avoidance mechanisms are something of a trade secret.

On a Samsung 46-inch LCD monitor embedded in the scenic rock wall, Puck explains that he's grown bigger and stronger and is ready to explore the wonders of Antarctica with the visitors. Vehicles are dispatched in groups of four. The vehicles dance through the ride. They back up, turn, and go around obstacles. Depending on its position in the group, one vehicle will do something different from the others. There are many variations in the ride path, the interaction and the motion profile.

As the ride begins, visitors glimpse Puck sliding, wobbling and stumbling through the ice cave on three Mitsubishi 65-inch LCDs buried in ice spires. When they come upon a frozen waterfall, vents blast CO^2. Then a blizzard hits. Two Christie edge-blended projectors provide a long, wide view on a front projection screen as Puck and the colony struggle against the snow and wind.

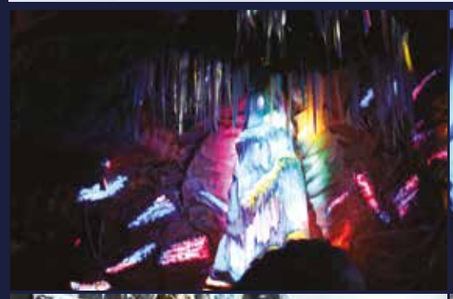
The next scene is the attraction's biggest. Having survived the blizzard, Puck is ready to dive into the sea for the first time, but danger lurks below as he has to outwit a predatory leopard seal in the water. The action plays out on a 120 by 27-foot curved screen with JBL speakers mounted behind it. A single Christie D4K35 projector (4K) with a custom lens fills the screen. The projection booth is located above and behind the ride vehicles.

The triumphant Puck bids good-bye to the visitors on a Samsung 70-inch LCD with overhead audio as the ride comes to a stop by a big glass wall overlooking the penguin habitat and providing a close-up encounter with a 200-plus-strong colony of Adélie, Gentoo, King and Rockhopper penguins in a habitat filled with wind, snow, rocks and chilly water. During the course of the ride, the visitors have transitioned to progressively cooler temperatures that have acclimatized them to the habitat's frosty 30°F (-1°C).

The main AV racks

Outside the habitat are retail and dining areas. The retail shop, called the Glacial Collection, features three Boland 24-inch LCD monitors in the store and six Samsung 46-inch LCDs behind the cash registers, displaying live action media content of penguins in Antarctica.

Overall AV control is by an Alcorn McBride V16 control system. Video playback for standard screens is by Alcorn McBride Digital Video Machines. A 7thSense server is used for the big-screen blizzard and swimming scenes. All audio playback is from a QSC Q-Sys system.



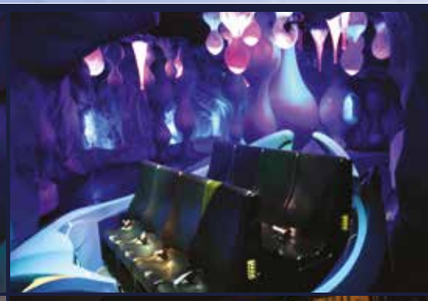


Photo courtesy of SeaWorld

DIGITAL in HAWAII

The Polynesian Cultural Center (PCC) set on 42 acres in Laie on the North Shore of Oahu, Hawaii, celebrated its 50th anniversary in 2013 with an upgrade to its theater, becoming an example of a location which has replaced its 70mm film-based attraction, which required a full time operator and costly print replacements, with an all digital automatic system. The stimulus for the change was the need to update the facility, making it more attractive to visitors, and at the same time making the venue suitable for mixed use.

Photographs:
- The entrance to Hawaiian Journey
- The theater with its 74ft screen

The exterior of the theater was transformed by Michael Lee Design (MLD) of Orem, Utah, from a gray box that had nothing Polynesian about it into an ancient volcano whose appearance blends in with the site's natural tropical surroundings.

Upon entering the theater, black-light illumination and artwork create the impression of being inside a large volcanic chamber. Once guests are seated, a new 14-minute production, "Hawaiian Journey," augmented by "4D" special effects including moving seats, takes them on a breathtaking flight through the islands as they explore the spectacular beauty of Hawaii through the eyes of the first Hawaiians.

Executive producers for the Hawaiian Journey attraction were Michael Lee (MLD) and attraction producer Pat Scanlon of PRS Associates, Inc. in Colorado Springs. "Hawaiian Journey" was written and directed by David Warner and shot by Reed Smoot. Sam Cardon composed the score.

Technifex of Valencia, California, designed the 252 motion-base special effect seats to fit into the rake of the theater. They have forward and backward motion, two headrest speakers in each seat, additional low-end speakers for vibration, and water mist and scent spray effects.

Electrosonic was the AV systems integrator responsible for installing a new digital AV system, based on a Christie 4K projector, a 7thSense 4K media server and a Strong/MDI 40 by 74-foot (12 by 22.5-meter) projection screen. Electrosonic also provided a new 7.1 surround sound system featuring JBL Cinema Series speakers and QSC amplifiers. An assistive-listening headset system allows simultaneous playback of the "Journey" film's narration in eight languages. A Medialon Show Manager system provides show control.

One of the PCC's goals was for the theater to serve as a true multi-purpose facility. Electrosonic installed AV system connections to accommodate a presenter on stage giving presentations from a laptop or iPad projected through the Christie projector. Black masking in front of the projection screen can be opened to the appropriate width for each media source.

THE MARVEL eXPERIENCE

"The Marvel Experience" is an immersive domed attraction that gives Marvel fans the opportunity to become agents of S.H.I.E.L.D. in training. Using numerous interactive exhibits, augmented reality technology and multi-person gaming, fans join Spider-Man, Hulk and Iron Man in a fight against Red Skull, M.O.D.O.K. and an army of evil Adaptoids. Produced by Hero Ventures, "The Marvel Experience" is a traveling attraction that is currently touring North America.

Electrosonic was involved with the project in two ways. Early on in the show's conception, Hero Ventures, knowing Electrosonic's experience with high-output, blended projectors and 3D systems, sought help with the technical challenges presented by projection in multiple inflatable domes, including a 60-foot dome with full 3D. Electrosonic's Design Consulting team provided projection design services for "The Marvel Experience" and Production Resource Group (PRG) went on to deliver the projection and audio systems based on Electrosonic's designs.

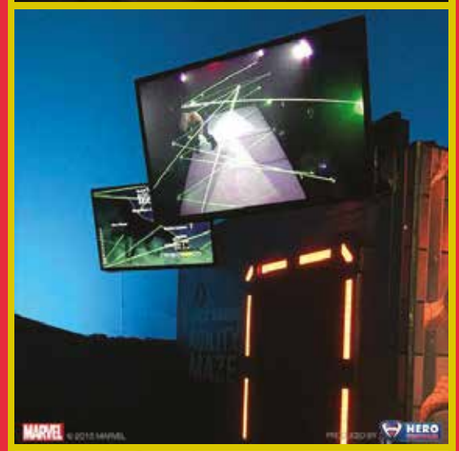
Separately Electrosonic was commissioned to engineer and deliver the AV systems associated with the interactive exhibits in "The Marvel Experience." These exhibits are sited throughout the attraction's seven domes, and systems were designed to fit inside set pieces and pack in to custom road cases to meet the demands of an attraction touring worldwide.

The Adaptoid Recovery & Containment game has six long Cybertouch tables connected by lighted ramps to an illuminated central tower like spokes to the hub of a wheel. Each table has two 55-inch Cybertouch monitors placed end to end. LED lighting controls inside the game interface make the ramp columns light up and energize the tower.

The Motion Comics Gallery features nine 32-inch Samsung monitors with touch overlay and Innovox speakers provide directional sound. Five Motion Comics kiosks each have two HP 21-inch all-in-one PCs. "Draw The Marvel Way" lets fans demonstrate their artistry at three HP 24-inch all-in-one PCs with touch screens.

Fans get to Swing with Spider-Man as they climb vertical treadmills while a pair of Christie projectors displays dizzying views of the ground 100 stories below them on the floor. Cameras under the truss snap pictures of the climb to take home.

Photographs, courtesy of Marvel Experience from top:
- "The Marvel Experience" on tour
- Entrance to the Black Widow Agility Maze
- The Adaptoid game



Thea AWARDS

The Themed Entertainment Association presents its coveted annual Thea Awards to outstanding themed attractions. The awards are given to the attractions themselves, not to their creators, but naturally the creative teams involved are proud of their contribution. Since the last issue of ELECTROSONIC WORLD, the following attractions to which Electrosonic made a significant contribution have won a Thea.

2014

Polynesian Cultural Center

Award for Outstanding Achievement: Attraction Revitalization. The project is described on page 44.

2015

National September 11 Memorial & Museum

Award for Extraordinary Cultural Achievement. This project is described on page 18.

The Story Garden at the AmorePacific Beauty Campus

Award for Outstanding Corporate Brand-land. This project is described on page 10.

Harry Potter & the Escape from Gringotts at Universal Studios Florida

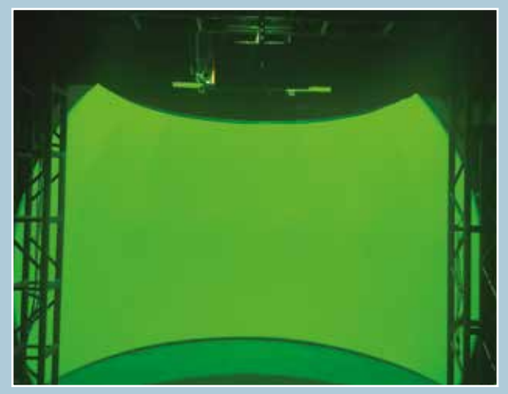
Award for Outstanding Attraction. Universal Studios acknowledged Electrosonic's major contribution at the Thea Awards event; however non-disclosure agreements in place mean that it is not possible to describe the systems designed and installed by Electrosonic here.

LASER TECHNOLOGY in Burbank

Most major entertainment projects require full scale mock-ups to prove the concept and to assist with media development; both the National September 11 Memorial & Museum (Page 18) and the Stonehenge project (Page 34) are cases in point. Sometimes tests are carried out in advance of any detailed design as feasibility studies or technology evaluations.

A recent example was to be seen in Electrosonic's Burbank facility which has a large fully blacked out studio for the purpose. This was an evaluation of the latest high resolution (4K) projector from Digital Projection which delivers 12,000 lumens and uses a laser-phosphor light source with 20,000 hour life.

The photo shows the test, designed to achieve a 13ft×9ft (4m×2.75m) 4K image on an immersive screen with 15ft (4.6m) radius of curvature. A custom optical system is used to achieve an ultra-short projection distance.



ELECTROSONIC

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