

Milwaukee Public Museum: IMAX adds Bowen Planetarium Systems

by Mike Grznar

Bowen Technovation recently completed two major installations at the Humphry Dome Theater at the Milwaukee Public Museum. The theater received a control system and sound processing facelift, as well as a completely new production suite. Both will give this existing facility the ability to bring exciting new experiences to their visitors with the existing IMAX technology, along with their new Digistar 3 laser projection system.

At the heart of the theater upgrade is an Astro-FXCommander system.

Bowen's GUI-based, drag and drop, control system manages all of the functions of not only the Digistar 3 system, but their existing equipment as well, including House Lighting, and Auxillary LCD projectors. Additionally, Commander is in control of the new digital sound processing units that were installed to give theater operators the ability to quickly switch between the IMAX and



Digistar sound systems, automatically implementing the optimum processing settings for both systems. Other equipment in this system includes Bowen's second generation AstroFXMCP manual control panel with motorized faders, which allows real-time updating with

their Commander system, and an advanced video switcher/scaler. This allows multiple sources to be ported to the LCD projector and the D3 system for real-time playback.

The second half of the project consisted of the installation of a full audio/video recording and editing suite. Bowen technicians installed equipment for a recording booth, as well as a 5.1 surround editing studio for creation of custom soundtracks. Bowen also supplied a render farm that is directly networked to the Digistar 3 Producer system, which allows the theater staff to view recently rendered projects right away, greatly reducing production time for new shows in development.

All of this work was done without disturbing the existing IMAX system, and because of this, the theater was down for a minimal amount of time. We encourage you to pay a visit to this fine facility if you are in the Milwaukee area. •

AstroNotes Goes All-Dome

by Brien Barr

The popular AstroNotes shows are now available for purchase in the Evans & Sutherland D3 SP, D3 CRT and D3 laser system formats.

The shows are also available in MediaGlobe; Digitalium Alpha; Definiti Twin, SkyVision, and DigitalSky; and SciDome.

These versions have been optimized for D3 and include many of the exciting, real-time astronomy features and starfields offered by the D3 systems. "It was important to Mark, Mike, and me that these are not just shows that run like videos but are truly planetarium productions

with lots of great starfield moments", according to Creative Director, Jeff Bowen.

These shows meet national science guidelines perfectly and are user-friendly, educational, and entertaining. The shows have already been greatly improved upon since the original slide projector versions with many new animated and video sequences.

All shows include newly-mixed, 5.1 surround soundtracks. The 5.1 soundtracks are also available in a narrationless version, allowing overdub of the narration into different languages. The shows are pre-rendered and pre-packaged so that you can easily load them into your system for playback.

Each show kit includes easy-to-follow

loading instructions, a complete script with visual cues, a complete timecode cue sheet for visual cues, a 5.1 soundtrack, and the actual video files for playback.



Since each show is ready to go "out of the box," they are ideal for new or upgraded planetariums that are trying to get shows up quickly.

For pricing and ordering information and description of each show, visit www.bowentechnovation.com/planetarium/alldomeshows.htm •

New BT Designed Planetarium Speakers Installed in Mianyang

by Jeff Bowen & Tony Whitlock

Last spring, a Bowen Technovation crew of three traveled to China for the first installation of the Bowen-designed, Eastern Acoustic Works-built, planetarium speakers, (see our last newsletter for more information on this product). The new 40-foot diameter planetarium is part of a new museum in Mianyang, China; a science & technology center situated in the Northern part of Chengdu Plateau of the Sichuan Province.

When the speakers first arrived at the Bowen Indianapolis office, we were excited to see (and hear) that the production units were just as nice as the prototype. We assembled the entire system in our warehouse and thoroughly put it through its paces, before shipping to site. This is a standard testing practice with Bowen, and has often saved us time on site.

When we arrived at the planetarium, we were surprised to hear that our equipment had been held up in customs and would not arrive until the next day. Being experienced overseas installers, we had scheduled in a contingency day. We did what little work we could that day, then that afternoon our Chinese hosts took us to a Tibetan temple for some sightseeing.

After the equipment arrived and had been checked for damage, we quickly began the installation. The new EAW speakers not only sounded great, but were easier to install than the product they replaced in our systems. Most importantly there is now one high frequency horn per array, so all the high frequency content is evenly distributed on all axis with no

phase distortions and cancellations anywhere in the room.

We finished the job on time and went off on our vacation we had scheduled in Beijing. We had a chance to visit the Great Wall, the Forbidden City, the Summer Palace, and more!

In the end, the client was thrilled with their new sound system and we could not have been happier with our newly-designed AstroFXAudio BWN model speakers .

We have also engineered a larger, more powerful, state of the art version for bigger domes and large-format film theaters with the first installation scheduled in a CDC 15/70 theater in Sulphur, OK USA at the new Chickasaw Nation Interpretive Center. •

specially-developed Bowen tri-color LEDs. Bowen staff has created a new version of this same tri-color LED technology, which allows purchase of a full-color 16-bit LED system for as little as \$10,000USD.

The new system is named AstroFXAurora SP. The cost reductions were accomplished in the following ways:

- There are eleven tri-color LEDs per foot with an SP system.

- Standard and Advanced strips feature fifteen tri-color LEDs (these 15 LEDs equal 45 LEDs of older technologies which use individual R, G and B LEDs).

This means the SP systems are not as bright as Standard and Advanced. Thus we recommend SP for domes at or under 30 feet in diameter.

- Standard and Advanced fixtures include specially manufactured clear polycarbonate tube housing that adds to the cost but allows the fixture to be rotated so as to provide optimized tuning/coverage on the dome. This housing also allows easy cleaning of the fixture. With SP, the tri-color LEDs and electrics are molded into a one piece epoxy strip at significant cost savings.

- SP systems provide full color mixing over one continuous ring of color around the dome.

The Advanced and Elite systems provide independent control over every 1 ft. segment of the dome circumference.

BT Develops New, Lower- Cost LED Systems

by Jeff Bowen

The AstroFXAurora Standard and Advanced LED lighting systems have become very popular due to the stunningly smooth performance of the



Standard/Advanced LED strip

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•Standard systems are easily upgradable into the Advanced and Elite systems. SP is not upgradable.

Clients who have seen SP in action have been amazed with the color, the lack of scalloping, and the smooth 16-bit dimming.

Read more about the complete line of AstroFXAurora LED products at www.bowentechnovation.com/planetarium/index.htm. Just click on the little slideshow of FXAurora in action for details. •

3D Imagery at Health Ed Center

by Mark Trotter

Throughout our company's 22-year history, Bowen Technovation has had the privilege of working on some very unique projects. One of the most unique is the Ruth Lilly Health Education Center (RLHEC) in Indianapolis. The RLHEC empowers students to make better, more informed decisions about their health and well-being. RLHEC has seven teaching theaters that deliver 35 unique, age-appropriate health education programs. RLHEC is committed to the goal of making health education fun and relevant for the nearly 90,000 people they serve each year.

We were contacted by RLHEC to help with the renovation of the Omni Theater, a multi-projection theater. The Omni Theater is one of seven teaching theaters at RLHEC where an RLHEC instructor presents health education programs utilizing life-size models, high-tech audio/visual aids, unique exhibits, and lively, interactive curricula. The theater can seat up to 60 students.

The plan to upgrade the theater included utilizing the existing space for high-defi-

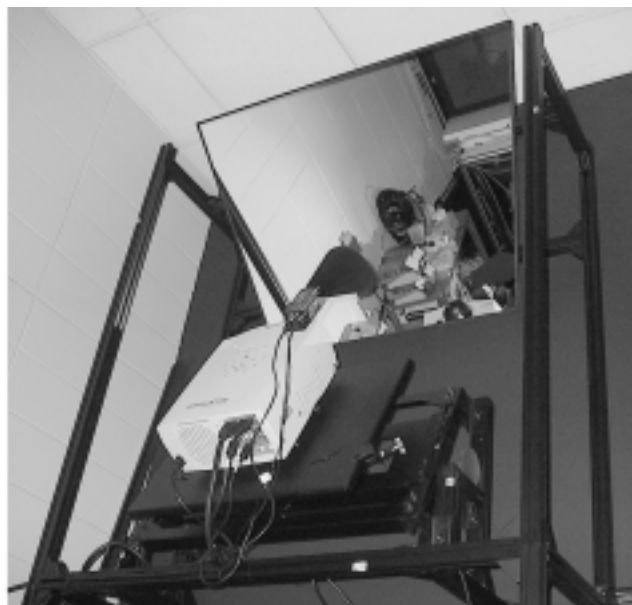
nition and stereoscopic 3D video as well as standard video. Bowen Technovation installed three rear-projection screens in the front of the room; a left, center and right screen. The 9-foot-wide, 16:9 aspect ratio, center screen serves two purposes. First, as the screen for high-definition video/computer graphics, and second, for 3D stereoscopic video. Because of these two roles, the screen material had to be carefully selected. The rear screen material had to maintain the polarization of the light from the 3D projectors as well as provide for the excellent image quality desired for the high-definition video.

After Bowen Technovation tested numerous samples of screen materials, we selected one provided by Stewart Filmscreen in California. Three projectors are used with the center screen. A 4000 lumen Christie Digital projector is used for high-definition content. For 3D stereoscopic, two 4500 lumen Christie Digital projectors are used in conjunction with polarizing filters. The projected images can be easily and instantly changed from high-definition to 3D stereoscopic during the program depending on the desired effect. Two screens on either side of the center one are used for standard definition content and computer graphics. They use another pair of the 4500 lumen projectors.

Because of the size of the room that houses the projectors, special mounts and mirrors are used to fold the light path of the projectors onto the rear projection screens.

The health education programs in the theater are directed from a graphical user interface run from a master computer. That master computer additionally provides all of the standard video, high definition video, computer graphics and 3D stereoscopic video content to the projectors. Simultaneously, the master computer sends control presets to a Bowen Technovation-provided control system that then sends out appropriate commands to all of the room lights, projectors, and projector shutters. All the instructor needs to do is press a button on a touch screen and the proper projectors and shutters are activated and multiple zones of room lighting are set to the desired level.

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Mirror for folding projector's lightpath

Putting the Technovator Back Into Technovation

by Dan Ritchie

The control and interactive crew at Bowen recently updated the Indianapolis Marion County Public Library's Infozone/Dinosphere interactive systems. The systems are located in the Dinosphere at the Children's Museum of Indianapolis. We spent some time reshaping the software control behind the scenes to create a more fluid, dynamic system for the Library's needs. We took the time to make sure the primary goal was still attained while enhancing the ability to track button pushes, and integrating the ability to see and control a live video input.

The system consists of a graphics transmission system that allows the graphics server and all the components to reside in the data closet in the Infozone Library while the touchscreen and audio speaker reside in the Kiosk over 750 feet away. Along with the sophisticated transmission system and the graphics computer, the exhibit also has a live camera feed on a pan/tilt mount that is controlled from the graphics computer. With the live camera in place, children visiting the Dinosphere can see what is happening in the Infozone Library branch and find points of interest in the library to visit later on their trip through the Children's Museum.

The goal of the kiosk was to enhance children's knowledge of dinosaurs by teaching them how to search the Library's vast collection of books using their online search engine. With the use of feedback we are able to help the visitors along this simulated Internet search path to discover the final goal: Searching for T-Rex. Achieving the goal of the search brings

about a random riddle for the kids to tell their friends. The "fossil fun" helps them to identify types of fossils and explore the possibilities of fossil identification while giving them a fun way to interact with the exhibit. The "Virtual Video Tour" guides the children through the Infozone and gives them directions to the Infozone branch from inside the museum. The video VJs in the Zone inform the visitors of the other items available check out from the library other than books.



The software has been advanced so that operators are able to track and store daily button use, which allows assessment of interactive activity and audience impact. Linked to the tracking, the kiosk is monitored by an external tracking program which can restart in case of a problem.

With the ability to collect data and monitor the system from outside the software, the enhanced version of the interactive really delivers by educating not just the visitors, but the owners as well. •

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Q: Please compare the student experiences of the previous programs presented in Omni Theater to the programs now being presented. In what ways have they improved?

Verlyn Wilson: Programs at RLHEC have always been very interactive with a great deal of student participation and are known for their ability to

capture students' attention!

This year visualization has been taken to a new level. Bowen Technovation installed a new 16:9 HD Christie projector, four other LCD projectors, and new rear-projection screens creating a vastly improved viewing experience! Wide screen HD content as well as stereoscopic videos (true 3D) can now be displayed, giving students the "wow factor" when they come to RLHEC.

In addition, an AMX room control system was installed, which not only allows automatic control of the room lights via a computer interface, but also triggers the illumination of small red LED lights on the seats as students use the wireless voting keypads.

We asked a few questions about how this new technology has changed the effectiveness of the presentations to Julian Peebles, President of RLHEC and Verlyn Wilson, Director of Technology.

Q: Would you tell us about the mission of the Ruth Lilly Health education center?

Julian Peebles: The mission of the RLHEC is to provide inspiring health education through innovative presentations that promotes and reinforces healthy lifestyle choices for children and adults.

Q: How does the new technology in your center fit into that health education mission?

Julian Peebles: We emphasize that technology is an integral component of our method of teaching students with high-tech and hands-on programming. We strive to reach students through the use of technology, in a way that is not easily replicable in the classroom. Bowen Technovation has been an integral partner in helping to produce radically new visual experiences for the tens of thousands of students who visit the Center annually.

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Videoconferencing Systems & Integration

Editor's Note: In our planetarium theater design work, we are more and more often requested to include capabilities beyond those offered by a traditional planetarium theater. Some examples include distance learning and videoconferencing capabilities, which are even used in today's planetarium revenue earning. I have asked Jeff Norris to author this introduction to these technologies. -JB

by Jeff Norris

What is a videoconference?

A videoconference (also known as a videoteleconference) is a set of interactive telecommunication technologies which allow two or more locations to interact via two-way video and audio transmissions simultaneously

The core technology used in a videoteleconference (VTC) system is digital compression of audio and video streams in real time. The hardware that performs compression is called a CODEC (coder/decoder). The CODEC is the heart of the system. The main task for the CODEC is the compression of outgoing video, audio and data, the transmission of this information to the far end, and the decompression of the incoming information which is transmitted through a digital network of some kind (usually ISDN or IP).

A fundamental feature of professional VTC systems is acoustic echo cancellation (AEC). AEC detects when sounds re-enter the audio input of the VTC codec, which came from the audio output of the same system, after some time delay. If unchecked, this can lead to several problems including 1) the remote party hearing their own voice coming back at them (usually significantly delayed) 2) strong reverberation, rendering the voice chan-

nel useless as it becomes hard to understand and 3) howling created by feedback.

The other components required for a VTC system include:

- =Video input: video camera
- =Video output: video display device
- =Audio input: microphone
- =Audio output: usually loudspeakers associated with the display device
- =Data transfer: analog or digital telephone network, LAN or Internet

Additionally, with some systems you can install extra cameras and microphones and also connect a PC to the system to allow a presenter to show a computer presentation to a remote site.

There are several different ways that VTC components are integrated to create a functional VTC system.

One such way is to combine the camera and CODEC into one unit that can be placed on top of a video monitor. Audio connectivity is as simple as plugging an omni-directional microphone into the CODEC, and utilizing built-in speakers in the video monitor.



Often referred to as a Set-Top unit, the Tandberg 990MXP is an example of this type of system.

Another way is to have the components fully integrated into one package. Pictured is an example of such a system, which is geared for the single user seated at a desk or small table.



Some systems are geared for use in public space and can be integrated into museum environments for bi-directional distance learning or nature/chemistry/physics demonstrations. With simple controls, users can tap into resources such as information help desks, translation assistance, or dial in to see specific demonstrations, dino dig sites, bear cams, or telescope feeds in real time.

The Compass has a five button interface and simplified user menus which allows the user to place calls. The Utility is a beefed up version of the Compass and can be used in environments such as university campuses, and utilizes auto-dial and accepts calls when the handset is lifted.



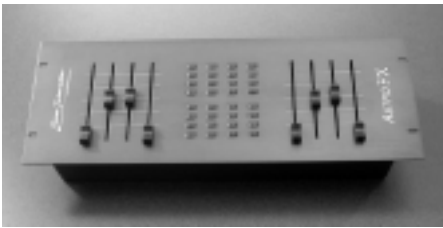
So, what do you need to consider when thinking about adding a videoconferencing/distance learning system to your facility?

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New Motorized FXCommander Manual Panel

by Michael Phillips

Bowen Technovation introduces our newest product for our AstroFX Commander Control System, the Manual Control Panel (MCP) 2.0. The MCP 2.0 features eight touch-sensitive motorized faders, 32-channel selection/function switches and integrates into any MIDI compatible system. In conjunction with the AstroFXCommander programming control software, one is able to create a myriad of simple or complex control sequences.



The touch sensitive fader knobs provide an instant selection of a multitude of functions. Just by a simple touch you can turn on lights, play a movie, soundtrack or anything that you desire to occur from within your presentation system. The 32 programmable preset push buttons are tactile switch closures that can be programmed just as simply and offer the same flexibility and functionality. A positive snap is felt when the preset button is pressed and instantly your pre-programmed function occurs flawlessly and on cue.

The motorized faders provide instantaneous feedback with real-time movement that reflects your programming or impromptu commands also enabling you to monitor specific control levels in real-time. Activate a control sequence and watch the fader move to your preset control level automatically. The fader itself is a 100mm professional grade studio fader that always has a smooth feel and

fader response.

Control has never been so easily integrated and programmed as from within our AstroFX Commander Control System which offers tremendous flexibility, dynamic control, a wide variety of control languages all in an extremely stable computer control system. Seamless integration and control features are our goals in providing a system that is easy to learn and operate for the beginner as well as the programming professional, we make it happen with this system. •

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1 - Compatibility with other systems - Any VTC system will allow you to connect with any other VTC system out there. However, the difference is that not all VTC systems will maintain their native signal quality when connected to VTC systems with lower bandwidth capability. Many systems, when connecting to systems operating at lower bandwidths, will compensate for those systems by lowering their own bandwidth to match.

2 - Camera location(s) - Many of the systems come with one camera. Many times that camera is built into the CODEC console and will be positioned at the front of the room on top of a video monitor. Other systems utilize a stand-alone camera that can be placed virtually anywhere at the front of the room. You may want to add an additional camera to enhance the VTC experience for those people at the other site(s). This would allow for either 2 cameras to be placed at the front of the room, or one camera placed at the front of the room and the other placed at the rear of the room or located just behind the VTC participants. This is especially effective if there is a moderator or featured presenter at the front of the room.

3 - Audio - The number microphones or audio sources such as audio from a PC or even audio from a DVD player will you need to integrate into the system. The fully integrated systems such as the Compass and Utility units utilize a built-in microphone and do not offer any additional audio inputs. If you want to add additional microphones or even line level audio sources to the VTC system, you will need to consider other units. The set-top systems usually allow you to plug in 2 mics and a line-level stereo signal, but larger systems allow you to connect up to three microphones, each with their own echo canceller plus the third mic input will also accept line level.

4 - Lighting - For simple systems utilizing one camera with all the participants sitting at a conference table and watching a video monitor, lighting isn't much of an issue, so using the existing office lights is probably sufficient. However, when you have a larger space such as a meeting room, classroom or planetarium, and have a moderator or featured speaker at the front of the room, existing fluorescent lights, work lights or white lights aren't going to provide sufficient lighting for videoconferencing or distance learning. Adding strategically placed theatrical type lights to illuminate the moderator or featured speaker are important as are some lights positioned to illuminate the audience members if they are participating in the videoconference or distance learning and need to be seen at the other site(s).

5 - Display Device(s) - Some of the integrated systems come with a built-in display device, while others require a display device such as a plasma or LCD flat panel display such as the Tandberg Educator MXP or a video/data projector.

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In addition, a new interactive voting HD video for use in the curriculum on conflict resolution became a part of the 3rd grade "Superbodies" program. The children utilize the wireless keypads to vote and determine the outcome of the situational video scenarios.

Julian Peebles: Since the upgrades led by Bowen Technovation have taken place, students now participate in interactive 3D and HD, multi-sensory experiences that include rumble seats and smell-a-vision.

Q: How have the students and teachers in the groups that have attended a program in Omni Theater responded to the new presentations?

Verlyn Wilson: Both students and teachers have been impressed with technological innovations and leave the theater with a "WOW" !

Q: How has the teaching staff responded to the new technology?

Verlyn Wilson: Teachers like to have the ability to respond to various unexpected needs of students, so the manual control of the room lights is an option they appreciate. Under normal circumstances, automatic control of the room lights is activated by the teacher-selected computer interface and can vary in its intensity depending on the programming.

Q: Explain the philosophy behind the various theaters at RLHEC, how different programs are presented in the various theaters, etc.

Verlyn Wilson: RLHEC has always utilized innovative teaching techniques, incorporating both a high tech multimedia approach to teaching health and wellness to preschoolers through adults, as well as non-technical interactivity. RLHEC prides itself on offering educational state-standards based health education programs, written by our qualified staff, that draw the students into the experience! Here at RLHEC we utilize cutting edge technologies that the regular teacher cannot easily duplicate in

his/her classroom and Bowen Technovation has been a significant part of this.

Q: Approximately how many visitors does RLHEC have annually?

Julian Peebles: Last year we broke the annual record with more than 94,000 program participants. This year we are projected to surpass that record with over 100,000 attendees. •

New to the Team

Name: Jon Harp

Activities: System Installation, Web Site maintenance, Graphic Design



Since starting at BT early this year. I have learned a lot about building, wiring, and installing audio components for planetarium and exhibit spaces. Having the opportunity to travel and practice these skills is a great perk of the job.

I recently helped install a sound system for a 60-foot dome planetarium in Shenyang, China. The on-site experience was priceless, but the memory that I share most often was how much fun I had with the crew.

Joining the team has been a blessing because I need a balance of creative and technical projects; and I am always given new and exciting challenges. On top of that, my coworkers are great; each one is interesting and unique, and they have all been a great help to me. By the end of my first week I knew that I was in the right place. •

...Videoconferencing continued from page 6

The size of the display is largely determined by the number participants that need to view the remote site(s), and if there is any additional content such as a spreadsheet that is originated from the remote site(s).

Although there are many things to consider when it comes to videoconferencing, the most important thing to consider is what it can provide to students or visitors.



It provides an opportunity to learn by participating in a two-way communication platform. Furthermore, teachers and lecturers from all over the world can be brought to classes in remote or otherwise isolated places.

Through videoconferencing, students and visitors can visit another part of the world to speak with others, share astronomy research ideas, visit a zoo, a museum, and so on. Small schools can even use this technology to pool resources and teach courses (such as foreign languages) which otherwise could not be offered. •

BT Web Site Renovated!

Finding information about Bowen Technovation products and services has never been easier! Visit www.bowentechnovation.com/planetarium or www.bowentechnovation.com/exhibit and see that Jeff and Brien have created a very new look, with more expanded functions, at the Bowen site. Here are some of the new changes:

Improved Menu Navigation. The blue navigation bar at the left side of the page has been replaced by a button system at the top of the page. When you roll over the buttons a drop-down menu shows other links associated with that page.

Updated Product Info. Updates for our FXCommander control systems, audio systems, and our custom BT Aurora LED lighting systems. There is even a slideshow of the Aurora systems in action.

Coming Soon! Online Tutorial/demos. This is an addition Jeff is excited about implementing. If you have forgotten how to do something with our systems, you will be able to call us for a password and view animated tutorials and videos. How to program FXCommander, create or program an FXAurora show, or FXAudio processor, or reboot a system component, etc.

Company Profile Link. Often your administration needs a company profile or history with BT staff bios for review. We now have these in hi-res pdfs downloadable at:

www.bowentechnovation.com/planetarium/CompanyProfile.htm
&
www.bowentechnovation.com/exhibit/CompanyProfile.htm

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