Sound DECISIONS

InPark Magazine sat down with John Miceli, President of TechnoMedia to discuss the popularity of on-ride audio and the renaissance it is creating for the ride experience.

InPark Magazine. Is on-ride audio a new technology?
John Miceli: Yes and no. On dark rides and slow show-type rides it has been the norm for years. On high-speed roller coasters with no bus bar or constant power source, it has been a science project to bring a variety of technologies together in a very unique way to deliver this experience.

IPM: Why is on-ride audio becoming so popular now?
JM: It's time for this type of idea to become the norm. It's actually overdue... Anyone who has ridden The Mummy or The Adventures of Spider-Man knows that the audio adds more than 50% to the experience. That 50% of experiential enhancement cost a fraction of the project's budget... Clients like Universal Studios and Hard Rock Park have recognized the importance of elevating the guest experience on rides and the value of doing it with audio.

IPM: What technological advancements were necessary for on-ride audio to become accessible to park operators?
JM: So many actually... We had to work with military grade manufacturing firms to establish the power system design. We had to work with mass transit specialists to create the interface between the land based power source and the non-connected moving vehicles. We needed to work with world-class audio technology manufacturing firms to create amplification that works on 24volts and outputs high levels of ultra clean audio power in a very small and lightweight bullet-proof package. We had to study and research speaker positioning, in seat structure enclosure tuning and resonant frequency management to cancel noise and increase audio quality without reaching unsafe levels. Then we had to package this into custom designs or add on packages so virtually every type of ride and high speed coaster could enjoy the benefit of this added technology - even if it was a retrofit to a 20 year old coaster.

IPM: Can you describe the creative process of selecting audio for a particular ride?
JM: We make most of the decisions with regard to how we are going to deliver the desired experience our client is seeking. Many times the client knows they want audio and knows the show they are going to deliver, but we are left to figure out the how and then deliver it as a reliable end product. Our creative process begins at the point of bidding the project. From the very first day, our team discusses the project from the perspective of the show operator when the ride is open. We see the end experience goals from day one and build the bridge between the challenge of the RFP to the reliable and easy-to-operate end product we have to deliver. That starts us in the direction of research and design.

IPM: I know weight can be a concern with the additional equipment, can you give me an example of the limitations placed on you for a certain ride and how you worked around that?
JM: This has been a huge challenge and sometime a very difficult one to overcome. We are tasked with delivering a high fidelity audio experience with specifications that rival car show award-winning systems with a weight limit of 30lbs per vehicle and there is nowhere to put anything on the ride. We always figure it out, but it's a very collaborative effort

with the ride manufacturer as we work through every single detail of the design and integration of audiovisual systems and the ride systems. They have to co-exist. Companies like Chance, Vekoma and B&M have embraced this new idea with open arms and are making the right types of permanent alterations to their ride systems to accommodate on-ride audio.

IPM: How do you see video becoming a part of the coaster riding experience?
JM: It's already there, but I see more designs taking advantage of it in the future. One proprietary design we have created puts the rider in many different visual environments using the coaster experience merely for the g force, vibration and speed felt by the rider as they travel in some other world altogether. This is just the tip of the iceberg for what is possible.

IPM: What projects are you working on now that you can tell us about?
JM: We just finished the Hollywood Dream Coaster for Universal Japan that has a very custom private listening pod for each seat. The main reason for this is that each rider gets to select their own audio experience. They can choose from 6 audio tracks, which means their ride could be totally different from the person next to them. That was a science project from day one, but one we were eager to take on. We designed the system so that each seat had its own digital audio player, amplifier and control (control was supplied by Birket Engineering). We had studied this type of approach for about a year and took the opportunity Universal presented as a vehicle to see that design approach come to life.

IPM: Can older rides be retro-fitted?
JM: Yes, we can retro just about any ride with audio. Some are relatively easy and some very difficult, but always possible.

IPM: What is the next step for on-ride audio?
JM: Small and better. Higher fidelity and multi-dimensional (like Spider-Man), visual technologies interlaced with the ride and the audio. With what we are doing for Hard Rock Park, it's all about music so you have to imagine it's going to be over-the-top good!

IPM: With the advanced technology required, is on-ride audio more maintenance-intensive?
JM: Absolutely! The environment can be brutal on many levels and components that have not been properly manufactured to the high standards required could fail. Since housing these systems on rides can be a huge challenge they are often in places that are hard to get to. We take all of that into account when designing to mitigate the challenges with a focus on fast access to hardware and quick replacement of failed devices. Again, we have been working on this for a long time so we know how to prep hardware to last, how to mount it for fast access and long life.

IPM: How easy is it to change the audio once the system is installed and operational? Is it something that could be done regularly and easily?
JM: We design our systems to make it easy to update media. Since we have produced media in-house for attractions since 1989 we understand the need to allow media to be able to be refreshed and updated with ease. We have many ways to accomplish this depending on the needs and design. Rides can be designed with a central location to port to all players in a multi-player configuration or with a single player source. Most will communicate through Ethernet, wired or wireless.

IPM: How has on-ride audio transformed the ride experience??
JM: On-board audio gives guests a soundtrack that can now evoke emotions other than what simply comes naturally. We have tested coasters with everything from Jazz to Techno-pop and with each type of musical experience the ride feels completely different. We are working on several new rides for the Hard Rock Park in Myrtle Beach and they all have very specific themes that are being scored into the experience with frame accurate composition. That, along with the super high fidelity delivery systems, will make the park's coasters stand out in that regional park market. • • •

ANIMATRONICS for ENTERTAINMENT, AEROSPACE, THERAPY and PROSTHETICS

by Garner Holt

Animatronics is a combination of art and technology. Because animatronics borrow from many other industries, animation companies must keep up with latest available developments in pneumatics, hydraulics, computer engineering, and materials technologies. There have been some recent displays of high level animatronics used in diverse applications using hardware and software developed by other industries.

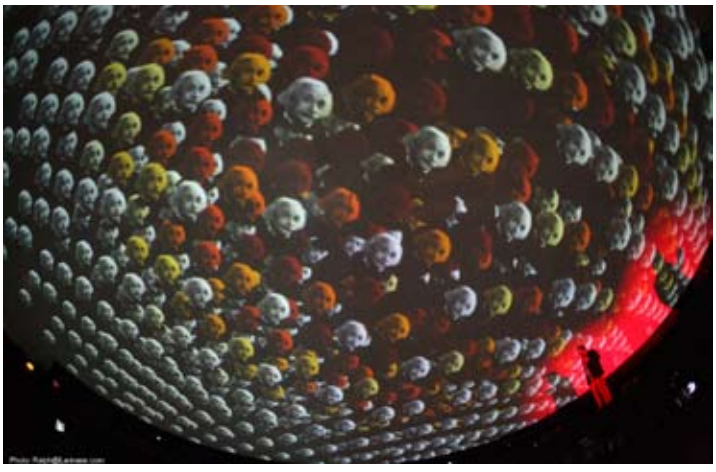
Technologies borrowed from the defense industry make projects such as Legends of Mythica possible. This water spectacular at Tokyo Disney Seas features four 30-ft mythical, animated characters. Each figure is mounted on a self- contained barge containing its own computer which controls the hydraulic system, audio, communications and special effects. The figures use servo valves, developed by Bosch Rexroth AG for the aerospace industry. This remarkable technology allows for incredibly smooth movements in these giant figures.

The technology exchange between animatronics and other industries goes both ways. For example, we are seeing a trend in the use of animatronics in defense simulation and medicine. Several U.S. animatronics companies are involved in projects in development by the U.S. military and the Department of Homeland Security.

Recently, our company was asked to create animatronic characters for Neuronetics, Inc. to demonstrate Transcranial Magnetic Stimulation (TMS) Therapy. The company had just received U.S. FDA approval for their TMS system which uses electrical stimulation to treat severe depression. The object of the animatronic figure was to teach doctors how to use the product. An interesting effect of the treatment is the body's reaction to the stimulation. When the electro-magnetic transducer is properly positioned on the patient's skull, it causes various specific muscle movements in the right hand. The figure was created in such a way that when the correct brain area was stimulated, the silicone cortex would illuminate, and the corresponding reactions in the hand would mimic that of a live patient.

There is also tremendous potential in prosthetics. For several years, Garner Holt Productions has been working with national laboratories to develop a better product. Right now, health insurance coverage (at least in the U.S). for artificial limbs is minimal so products available to the typical amputee are crude. Two factors are changing the situation: the Iraq war and the dramatic increase in diabetes. These young victims are beginning to demand more functional, lifelike prosthetics. An international team led by the Johns Hopkins University Applied Physics Laboratory, has received a grant to develop a fully integrated prosthetic arm that can be controlled naturally, provide sensory feedback and allows for eight degrees of freedom- far beyond the current supply of prosthetic limbs. As the research continues, we expect to see the resulting technological advances appear in animatronics. • • •

Garner Holt is President and Creative Executive of Garner Holt Productions, Inc. Since he started the company in his parent's garage over 30 years ago, it has grown to over 50,000 square feet and employs 55 engineers, designers, and technicians. The company is an internationally recognized leader in the design and manufacture of show and ride systems, animatronic figures and special effects. Garner has received numerous awards for business and innovations in technology. In 2006, he was presented with the Technology Entrepreneur Award by the Center for Entrepreneurship.



FULL-DOME VIDEO re-INVENTS the PLANETARIUM

by Mike Bruno

It's like wearing headphones on your eyeballs! is how one visitor described his recent trip to see "Black Holes: the Other Side of Infinity," a new full-dome video program at the Oregon Museum of Science & Industry (OMSI) – hardly how most of us grownups remember childhood visits to the local planetarium. It used to be that we went just a couple of times during our lives – first as students, then perhaps as parents or grandparents. All that has changed as planetariums attract new audiences with exciting technologies borrowed from the simulation and virtual reality industries.

OMSI was an early adopter of full-dome video technology. Using the latest digital video, audio and computing tricks, full-dome immerses the viewer in a giant image projected on the inside of a dome screen, creating what virtual reality folks call a "sense of presence," i.e. the feeling of being in a real environment. Full-dome imagery puts the audience in the picture in much the same way as the popular Omnimax® (a.k.a. Imax® Dome) film format. But today's full-dome systems don't just play movies (although they can, through video playback). They are state-of-the-art astronomical simulators: the digital equivalent of the classical star projector, with image generation capabilities, and the ability to navigate 3D databases (planets, distant galaxies and more) in real-time, with the click of a mouse.

The first permanent full-dome planetarium system was an Evans & Sutherland StarRider® (the latest generation of the E&S system is now called Digistar 3), launched in 1999 at Chicago's Adler Planetarium and followed a year later by the reopening of the retooled Hayden Planetarium at the American Museum of Natural History, in New York City. Since then, nearly 300 full-dome theaters, large and small, have sprung up around the globe – quite a feat considering it took the large-format film industry more than 30 years to build a similar size network. Full-dome theater growth is robust, thanks to relatively low purchase and operating costs, an existing market of aging white-elephant planetariums waiting to be rejuvenated, ease of use and "bang for the buck."

Emerging technical standards make it possible for a visitor to a small SciDome® digital planetarium in the mountains of North Carolina to see the same high-end show that is playing in a major big-city planetarium – unthinkable just a few years ago. More than 60 full-dome movies are already available to support the full-dome planetarium community's growing appetite for programming, with more on the way. While most favor astronomy and space science themes, there's also demand for shows about earth science, biology, chemistry, history, climate change and more.

The National Science Foundation, a traditional sponsor of Imax science and nature films, has recently funded several full-dome productions, which bodes well for the industry. The pending availability of a low-cost, high-resolution (4k x 4k) digital movie camera will jump-start a whole new genre of full-dome programming, which until now has been largely computer generated. A continual stream of quality, reasonably priced content on a variety of subjects– whether licensed or produced in-house - is critical if science museum and planetarium users are to create sustainable businesses – and full-dome video technology is capable of supporting that.

We are starting to see the medium expand into other areas: commercial uses of full-dome technology in special-venue entertainment, art installations, trade shows and elsewhere. Some examples include an immersive domed projection environment displaying eye-popping interstitials overhead at the performance lounge in the Hollywood Casino at Penn National Racecourse (an E&S Spitz project); a dome display system for New York City's Roseland Ballroom in which the video can be manipulated in real-time (the Elumenati); a temporary dome installation in Berlin for "C: the Speed of Light," a 21st century opera by Phase-7 celebrating the life of Albert Einstein; and an inspirational movie for a visitor's center at Volkswagen's Autostadt, projected on a dome within a dome.

Applications like these will continue to drive the technology forward in new and interesting directions. Look for more full-dome installations in the future as well as continuing technical improvements, ever-better image quality and higher resolution displays. Full-dome video enables the operators of dome theaters to delight visitors and to deliver their message in a unique, memorable way. • • •

Mike Bruno (mbruno@spitzinc.com) is Creative Media Director at E&S Spitz, where he is responsible for production, licensing and distribution of original full-dome show content to digital dome theaters worldwide.

MORE FLAIR, *less* FLARE

The Evolution of Flame Effects

by Ron Griffin

I have been involved in the implementation of flame effects for permanent installations since 1990. My first major project as designer, project manager and programmer (for the All Effects Company) was the rebuilding of the Jaws attraction at Universal Studios Florida. The flame effects helped make Jaws one of the "hottest" attractions (from the guest's perspective) in the US. There was a sort of boom in mega-flame effects around then. The bigger and more spectacular, the better.

As a principal for Attraction Services Inc., I was personally involved in many huge and exciting shows such as Universal Studios' Poseidon's Fury, Twister, Sindbad, and others. In Japan, the call for huge fire features brought us the job of recreating Jaws, Backdraft, and WaterWorld in Universal's Osaka location.

The thirst for massive flame effects was not limited to the US and Japan. We supplied the "heat" on shows such as the Moteurz…Action! Stunt Show Spectacular at Disneyland Paris, and at Templo de Fuego, an exciting walk-through attraction in Barcelona. The latter took over as the "hottest" place on the guest temperature chart – literally, because we could push the temperature envelope to degrees not permissible in the US because of the conservative skin temperature index established by the National Fire Protection Association (NFPA). For this show, we created a new type of flame cannon that utilized a delayed ignition to create an explosion, as opposed to the usual "whoosh" sound you get with more typical flame cannons. It was safe, but very effective: I have video of an unnerved front row guest scrambling through the crowd and over the center railing to get to the back row as the flames erupted.

For an attraction at Blackpool Pleasure Beach in England, I proposed, and after approval by the owners, implemented a flame effect design for a flume ride that never shuts off even as the boat plows through a wall of fire at the bottom of the final drop. The riders are duly terrified - yet safe, most of them unaware of the simple physics that will push the fire away from their small boat as they plummet into the conflagration.

The desire for big fire is still there for the right place or the right show. At the Rain nightclub at the Palms hotel in Las Vegas, six individual fireballs above the dance floor are controlled in sync to the music. New types of ignition were developed by Attraction Services and they have proved to be nearly 100% reliable over five years. Anything less and the effects would just be shut down if maintenance became too extensive or expensive. Big fire is simpler, safer and more reliable than before.

A new, more modest trend is also now in full flame. We are keeping busy installing small, beautiful and contemplative designer or architectural flame features, eye-soothing rather than eye-popping - in hotels, casinos, office buildings, nightclubs and even residential locations.

In some cases they may resemble nothing more than a fireplace – but it doesn't work quite like your gas fireplace at home. The main difference is in the automatic controls or safety devices that are mandatory for many of these features. The idea of a hotel having a fireplace for which one manually opens a valve and throws in a match does not fly with most building authorities. Unattended fires in public locations sometimes require special safety devices such as intrusion curtains, or exhaust fan monitoring. Flame on water has its own set of challenges.

Everything for these smaller flame effects must be simple, reliable and cost-effective. Most hotels and casinos do not have hordes of effects technicians standing by. Our goal for many years now has been to keep making the basic systems simpler and more dependable.

I am also driven because of conservation, pollution and cost concerns to seek methods to reduce gas consumption while producing as much visible flame as possible. Fire effects produce radiant heat, and we look to keep that from adding to a building's AC load (which would increase overhead costs). This can be accomplished with carefully designed burners, and, in some cases, augmentation of the real flame with additional effects.

There's no denying the fascination and universal appeal of fire. People will make a special trip to a bar, nightclub or restaurant because of those small yet hypnotic flame shows. We have all sat and stared transfixed into a fireplace or campfire and enjoyed the effect on our mood. I believe the small fire feature is not a passing trend, but rather something that will become more prevalent and popular as all types of locations look for simple and exciting things to draw and keep attendance. Does the public fall for it? Absolutely.

On the other hand, I still like to turn on a huge gas valve, stand back and throw in a match. • • •

Ron Griffin and his wife Melissa Townsend are the principals of The Attraction Services Company Inc. (www.tascfx.com), based in Valencia, California. Ron has more than 15 years' experience with the design, construction, and programming of major fire effects and special effects. His experience with mechanical design and fabrication originates some four decades back, with his off-road and ATV racing and motion picture special effects background.