

Datastream

A Call For Large-Format Theater Standards

■ *Quality Consistency Is The Only Way These Venues Can Become Alternatives To 'The Movies'*

The engineers in our office can never understand why sound seems to take a back seat in the entertainment industry. The acoustic treatment of a space and the audio/video systems seem to be one of the first things cut from the budget.

In recent years, we have witnessed the rise of voluntary standards in the commercial cinema industry with systems such as Dolby ES, THX, SDDS, and DTS. This ensures that blockbuster films like *Star Wars - Episode One - The*

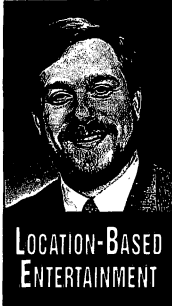
Phantom Menace are heard as they were intended everywhere they are shown. Consumers recognize the heightened experience that comes with high-quality sound and have begun seeking it out. These voluntary standards raise the bar for that segment of the industry. Isn't it about time for individual segments of the themed entertainment industry to evaluate how sound impacts the experience of their guests?

For example, let's consider the large-format film industry. For years a leader in image and sound, there is no internal or external measuring stick against which theater owners can measure the quality of the acoustics and sound systems in a particular theater. As a result, they are losing potential customers to other forms of entertainment.

Yes, it is true that in space no one can hear you scream. But does that fact make the experience of watching a space scene on a movie screen any less effective? Why else is there always a soundtrack for a space scene? Does the soundtrack make the thought of floating away from a spacecraft any less frightening? Shakespeare said, "We come to hear the play," and silent movies were not actually silent. The driving force of Edgar Allen Poe's "The Tell Tale Heart" is the audible heartbeat. Would *Psycho* be complete without the pulse-stopping music and "Screech, Screech, Screech" sound effect?

Globally, cultures pass on traditions and stories orally, and still today, our primary communication is via the telephone, not a videoconferencing unit. We are an aural society!

Narration and music transport us to a place or a part of the image in a scene we may not have noticed before. Music instills an emotion, be it joy, sorrow, or danger. Sound is the true third dimension that filmmakers have to work with. We would not feel the heaviness of the opening scenes of the original *Star Wars* movie (Episode 4) without the brilliant score by John Williams leading us there. The soundtrack conveys



by Steven J. Thorburn
THORBURN ASSOC. INC

the emotion, the scale, the magnitude, the magic.

Commercial cinemas have been scrambling to make sure that their theaters are equipped to handle the sound requirements for *The Phantom Menace*. Though perhaps more stressful for the theaters than they would prefer, this is the kind of standard needed throughout the entertainment industry. Less than the best just won't cut it. And you can see this in ticket sales, lines outside theaters, advertisements and reviews—quality is recognized and sought out.

So what are the specifics that make up the "standards"?

COMMERCIAL B-CHAIN AUDIO SYSTEMS

The portion of the theater that the voluntary cinema standards has focused on, now and in the past, is what is called the "B-Chain". The B-Chain of a cinema audio system begins at the sound head or a sync locked sound source. The first component in the audio chain is some form of cinema processor. In the simplest of terms this splits the sound up into multiple channels so we can have the effect of sound panning around the theater. The next item is usually the equalizer that shapes the spectrum and provides us with a consistent sound from theater to theater. The sound is then amplified and then sent to the loudspeakers. Finally you hear the sound in the room itself.

This process has not changed for many years, and in fact, the components have gotten better with time. The systems can get louder, and commercial cinema is now pushing the envelope even harder.

So with all of that said, what is the system supposed to sound like? A concert hall? A mountain top? The deep sea? A rocket launch? A race track? Outer space? A jungle? A human cell? In short, all of these spaces and more. It is our job as acoustical and sound system designers to make the room and the system as transparent as possible. This allows the environment the producer wants to achieve to come through. At the same time we must design and build systems that can take the abuse the audio production design will deliver.

So how do we know if we have done our job? For the themed entertainment industry, we don't. As stated earlier, commercial film has a number of organizations pushing quality standards and possibly a producer that will only let the film be shown in "the best sounding theaters." In fact, commercial cinema theaters have better sound than most large-format theaters! For a long time, the large-format industry could say "Come and experience the show, the image is bigger and the sound is better." Well, we can still say it's bigger.

Only with the release of *Jurassic Park* did commercial theaters have the ability to play back in full range discrete digital 5.1 sound (left, center, right, left surround, right surround, and a subwoofer). The large-format industry has been doing that plus a high center for years. But, what about the extended rear-surround channels that commercial cinema is now adding, (left side, left rear, right rear, and right side surround channels)? What about 10.2 surround that is now being discussed as the next step up. Unless something changes, the themed entertainment and large format industry will no longer be "the experience to see and hear".

We need standards and cooperation between equipment manufacturers and owners to push this envelope once again. So how do we move forward? Well, first we start with the room.

SOUND ISOLATION

From an acoustical point of view, we need to make the room transparent. The first way we do this is to make sure that there is not an external influence on the facility/theater. Unfortunately, we usually put the theater in a busy urban area or in a rural area with lots of busses. It is the planes, trains, and automobiles that cause us the most concern with exterior noise control. Realistically, we can use tried and true construction methods. The trick is not to over-build it, which in many cases, is something that is done by some acoustical designers.

The next item we need to make sure is addressed is the mechanical noise. Large

rooms need lots of air, lots of air changes mean noisy systems, if left untreated. Projectors and compressors are also a major noise source. Both the environmental noise and the mechanical noise are measured inside of a theater by a term called Noise Criteria or NC rating. Large-format theaters are typically designed for NC 25. This is just a little quieter than that of a good first run cinema but not as quiet as a final mix room.

One interesting note is that we have not seen a theater that meets this criteria with just the projector running. There is something about that big window for that big image that lets the sound through.

ROOM ACOUSTICS

One of the most glamorous parts of our acoustical effort is the interior room acoustics. It is always fun to sit in the first meeting with a new owner and hear them say they want the room to sound like a great concert hall. The bad news is that listening to concert in a large format theater sounds pretty bad and vice-versa. Each space has its own requirements. They can both be made to look grand or cheap...it is all in the wishes of the owner. For most of our work we are looking to control low frequency reverberation or the boominess of the theater.

We also need to look for echoes. It seems that the only time, recently, we have an echo is when the 3D projection screen gets three or four extra coats of "paint" to cover up a less than perfect paint job. This fills in all the screen perforations and makes the screen function as a large reflector. Or hearing a sound from the loudspeaker that is aimed at a back door. But these all revolve around loudspeaker placement and aiming.

One of the problems with large-format theaters is that they tend to be "wider" than traditional theaters which are typically "deeper." This creates havoc with loudspeaker design and placement. From a coverage point of view there is a lot to be said for the distributed surround loudspeaker design that is used in commercial theaters. And with commercial theaters going to the extended surround channels and possible 10.2 surround systems, it is something that the large-format industry needs to consider.

But what about the type of loudspeaker? What should be used? There are several schools of thought on this issue. From a sound system design point of view, very few are really good. Large-format theaters are just so wide, this make the concept of a custom box for each loudspeaker location very appealing. However, it makes fabrication and stocking of loudspeakers more expensive—instead of runs of six or so, a loudspeaker manufacturer now has runs of

(continued on following page)



Datastream

Remember Baseball's Lowly Foul Pole

■ *An Over-Designed Low Tech System May Be Just The Answer For Your Client's Application*

This last weekend our family enjoyed a Dodger baseball game with seats near the third base line foul pole. For those of you not particularly enthralled with baseball, there are two tall upright foul poles mounted in professional baseball stadiums (one per side) to judge whether a ball hit by the batter is either a home run or a foul ball hit into the stands. Sort of a vertical dividing line.



by **John Mayberry**
EMMACO PRENTISS

I suspect that not many of us have spent much time pondering foul poles before, but somewhere during the fourth inning it struck me that this was an extraordinarily useful low-tech device, with 100 percent reliability over its entire operating life cycle involving nearly 40 years. These foul poles have always performed their job to the complete satisfaction of thousands of users, in every imaginable weather condition and often under high stress situations. I suspect the foul pole's only maintenance has been an occasional repainting. If only the equipment that our industry offers could guarantee similar performance.

More careful observation of the foul pole revealed a large number of dents in the perforated metal screening attached

to the foul pole. Each dent made was clearly the result of an enormously powerful hit. Now some hits were more enormous than others, but there was clearly a higher concentration of dents near the pole bottom. There were a few dents in the middle section, and none toward the top.

In over 30 years of use, not one single dent was created on the top twenty feet of the pole. This would imply to me that there was not a significant amount of engineering or statistical sampling involved in the design of this particular set of foul poles. Clearly the poles could have been made twenty feet shorter and accomplished all of its original expectations. Yet I doubt anyone has ever complained about the poles being too tall. Some batters may have even felt complimented.

Now, what you're probably saying is, "Okay Mayberry, what wonderfully insightful parable are you pulling now?" Well, my point is that our industry is humbled in many ways by the lowly foul pole. These babies get the job done day in and day out. Even a baseball novice can clearly understand their functionality. They get the job done without any unnecessary aggravation.

The foul pole system does not require

revised software, continual re-booting or re-compiling. It does not require an operations manual, installation manual, training class, single-line diagram, GUIs, user interfaces, detailed labeling, extensive commissioning or detailed reconfiguration. It is a simple and elegant device, devoid of unnecessary complexity and endless software, firmware, and hardware revisions. It is easily understood by all.

Take a moment and stare at your own desks or any piece of hardware on your desk right now. I'm looking at brand new telephone station—just installed this week, along with dozens of other systems in a new building. I suppose that if you write a

column on telecommunications, you should be able to figure out a simple desk phone. I get most of it, but there are a couple of buttons I'm unsure of, and one that downright frightens me. It's the one little red button labeled RIS. I had no idea was RIS meant

unless I looked at it a second time and realized it was RIS. I'm presuming this means Release, as in drop someone from a conference call. I doubt I'm the only one with this confusion. No manual within miles to be seen. Truly a silly design effort not worthy of the multi-billion dollar telecom supplier from which it came.

Are we doing the same thing to your our clients? Is there a way to simplify your systems to make them a better overall product? Can the end user walk up to the system and intuitively operate it without a momentary panic setting in? Not too many years ago, changing the volume meant turning a knob, not some massive effort involving a pesky PC.

Is there a way to simplify your systems to make them a better overall product? Can the end user walk up to the system and intuitively operate it without a momentary panic setting in?

John Mayberry is vice president of engineering for Emmaco Prentiss Inc. (www.emmaco.com), a large-scale communications systems integrator in San Marino, CA. He has worked in various engineering and management capacities for Disney, NBC, Maryland Sound, AT&T and Sony. He can be contacted by e-mail at emmaco@emmaco.com.

Theater Standards

(continued from page 108)

ones. You can definitely use semi-custom boxes that are off-the-shelf if you want, but this will require more enclosures to create an array with specific coverage patterns. Or you can just build the theater and throw boxes at the problem until you have covered the whole house with sound in a non-engineered approach.

Finally we need to make this room sound good. Okay, at least like every other theater in the world. Hence the reason for SMPTE Curve X. Curve X is an EQ setting that has been handed down from theater to theater. This is one area where the large-format industry has improved. It extends the low end and the high end making the response in the room a little flatter.

The next questions is how "loud" should the system actually be? When we set up a theater for calibrated levels and go back in a few weeks it is always turned down. Louder is not necessarily better. We need to make sure we have real standards and cooperation between equip-

ment manufacturers and filmmakers to push this envelope. The vacuum of space tells us that we can not hear the scream, but we must.

What this means for the large-format cinema segment of the industry is that where they have previously been leaders, they are now playing catch up. What used to be an audio and visual experience like no other is now a visual experience like no other. If large-format theaters want to be a viable alternative to "the movies," they need to take a long hard listen to their theaters.

And for the rest of us? Even for the parts of the entertainment industry that are not mentioned above, standards need to be addressed. Only by developing standards for quality and performance can we hope to compete in these ever expanding markets.



Steven J. Thorburn, PE, is a principal with Thorburn Associates Inc., an acoustical consulting and audio/visual system engineering firm with offices in Northern and Southern California. He can be reached at SJT@TA-Inc.com, or at 510.886.7826.

PRODUCT BRIEFS

Peerless Adds Flat-Screen Monitor Mounts

MEROSE PARK, IL—Peerless Industries has announced the addition of flat screen mounts for wall and ceiling installations to the company's existing line. The mounts feature solid steel construction for strength and durability and are UL Listed. Their resistant Penta-Pin screws secure the monitor in place. Most models feature a zero to 20-degree tilt and all wall mounts feature a three position horizontal adjustment for optimized viewing. Peerless includes the necessary hardware for wood stud installations although concrete fasteners may be purchased from Peerless.

For more information on Peerless, indicate 396 on Fast Facts Card

Blonder Tongue Expands With Fiber Optics

OLD BRIDGE, NJ—Blonder Tongue Laboratories Inc. has introduced new high-performance fiber optic products. The product line additions include the "Twin Star" L-band Fiber group and the FOMC Fiber Optic Management Hardware series. Blonder Tongue has also enhanced its existing "Trailblazer" and "Retro-Linx" branded AM/VSB transmitters and receivers. The high-performance Twin Star L-band fiber distribution product group includes both Fiber Optic transmitters and receivers that are specifically designed for distribution of satellite signals via fiber optic cable. The FILR Series are L-band Fiber Optic receivers and the FILT Series are L-band Fiber Optic transmitters. These products are designed for use in the 950 to 2050 MHz frequency range with single, eight, and sixteen link optical outputs available.

For more information on Blonder Tongue, indicate 397 on Fast Facts Card

Philips Introduces Virtual Keyboards

LANCASTER, PA—The LTC 5138 series virtual keyboards from Philips Communication and Security Systems allow control of AutoDome cameras or receiver/drivers from the PC. A PC can be used in place of a keyboard for controlling AutoDome systems and Allegiant receiver/drivers allowing full access to advanced features including variable speed, auto tour, presets, and full pan/tilt/zoom operation.

For more information on Philips, indicate 398 on Fast Facts Card