
THORBURN ASSOCIATES INC.
Acoustic and Technology Consultants
Designing Quality Environments
eNewsletter

April 2008

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Sixteen Years and Counting

Welcome to the April 2008 eNewsletter.

Thorburn Associates celebrates its 16th anniversary on April 1. A warm thank-you to all our clients and colleagues – we couldn't have succeeded without you. Lisa, Steve, and the entire team at TA look forward to spending at least the next 16 years continuing to provide you with the best possible service at the best value.

We plan to be at the following upcoming industry events, so if you're in the neighborhood, be sure to stop by and say Hi!

- Baptist Church Building Conferences: April 8 in Garner, NC and April 10 in Statesville, NC
- California Society for Healthcare Engineering Annual Institute, April 16-18, Burlingame, CA
- AIA South Carolina Conference, April 23-26, Columbia, SC
- AIA National Convention and Design Exposition, May 15-17 in Boston, MA
- InfoCOMM 08/NSCA 08, June 14-20 in Las Vegas, NV

As you may have heard InfoCOMM and NSCA have joined forces and combined their respective conferences into one joint conference and trade show. Once again, our team members will lead over 20 hours of educational sessions at InfoCOMM/NSCA. This year's presentations are listed below:

Building the Perfect Teaching Station (Session #IS10) presented by Jim Horn.

Wed., June 18, 8:00-10:00 am

How do we define and build the perfect teaching station for college and university classrooms, seminar rooms and auditoriums? Join this session and review the elements of the evolving teaching station, share ideas with your colleagues and review the important steps in the design process to develop your perfect teaching station.

Introduction to Acoustics (Session # IW1) presented by Steve Thorburn.

Wed., June 18, 12:30-4:30 pm

Begin this hands-on introductory session by defining room acoustics terminology. Then, use what you've learned to measure background noise in various rooms within the facility, calculating and measuring the reverberation time. You'll also review the seminar room's acoustical qualities and determine the location of echoes. This session is for anyone with an interest in acoustics, required design considerations, and a desire to understand all the terms, including STC, NC, and NRC.

Advanced Acoustics (Session #IW4) presented by Steve Thorburn.

Thurs., June 19, 8:00 am-12:00 noon

Gain deeper understanding of acoustical design through the hands-on evaluation of a large board room and a 300 seat auditorium/lecture room. Explore topics including even distribution of low frequency room modes, wall constructions to control noise, absorption, and echo control. The basics of HVAC noise and vibration control will be introduced and discussed. Participants receive a workbook for future reference.

Presentation Facility Design and Integration (Session # IW6) presented by Derek Meares.

Thurs., June 19, 12:30-4:30 pm

Review the major issues to be considered in presentation facility design and integration. Learn how to determine proper sight lines and seating distances for an AV space. You will review all of the issues that should be addressed in the planning and design of a new facility, or in a major renovation of an existing facility; including integration of audio, video and lighting; acoustics; project coordination with other building trades; and ADA requirements.

AV System Integration Issues for Owners/Facility Managers (Session IS64) presented by Steve Thorburn.

Thurs., June 19, 2:30-4:30 pm

From power to pop ups, equipment cooling to human cooling, size, space, weight, power! Review the issues that you need to question during your next room fit out. Walk away with a checklist sure to drive your AV System Designer Mad! This is an introductory to intermediate course for someone new to the AV building process or for someone who has been in IT and is now saddled with the task of overseeing the fit out of the new (boardroom, video conference room, computer room, meeting room, auditorium, etc.)

How to Issue an RFQ and RFP for AV Designers and Contractors (Session #IS69) presented by Lisa Thorburn.

Fri., June 20, 8:00-10:00 am

So you want to build a new presentation facility for your church, school, office, etc.... but how do you go about it? This session will provide you with the road map of how to issue an RFQ (request for qualification) and RFP (request for proposal) for AV system designers and AV system contractors, for both design/bid/build and design/build project delivery methods. This session is a must for anybody planning on building or updating any type of AV presentation facility.

Videoconferencing from the Camera's Point of View (Session #IS75) presented by Steve Thorburn.

Fri., June 20, 10:30 am-12:00 noon

If viewers of your distance learning/videoconference event believe that your CEO's most outstanding feature is his shiny bald spot or long nose shadow; If your instructors always look like they have been out too late the night before; If your

CFO is losing credibility because he never looks the viewer in the eye...This is the course for you. Advances in technology have made it possible for any small company or educational institution to afford to use videoconferencing and/or distance learning. Many technically correct facility designs demonstrate a lack of understanding of the fundamentals of visual communication especially "Point of View" which includes: camera position, relation of presenter to distant audience, and lighting.

Acoustics in Architecture (Session #NW012) presented by Steve Thorburn.

Fri., June 20, 12:30-4:30 pm

Gain a greater understanding of the issues that should be addressed when developing the acoustical design of rooms like a large boardroom or a 300-seat auditorium/lecture room. All aspects of room acoustics will be discussed and reviewed including reverberation criteria, the even distribution of low frequency room modes, wall constructions to control noise, absorption, echo control, diffusion and more. A detailed workbook will be provided to all attendees.

As always, it is our goal to make sure that Thorburn Associates is your single point of contact for all your Acoustic and Technology Design services. If you have an idea, question or suggestion, please drop us a note at eNews@TA-Inc.com.

Mystery Photo

Be the first to identify the [Mystery Photo](#) and receive a free gift from Thorburn Associates, plus your company name will be included in the next eNewsletter. Respond by email to mysteryphoto@TA-Inc.com.

Focus on Technology: Analog-to-Digital: The New Y2K? Part II

As you may know, February 17, 2009 is the date on which, in the US, any TV stations still operating analog (NTSC) transmitters must shut them down. Without a converter box or a television, DVD/VCR, DVD Recorder with a digital (ATSC) tuner all you will get is static.

The transition process started in earnest in 1996 when the FCC allocated additional channels to TV stations so they could bring up their digital transmission equipment and antennas while still operating their analog transmitters/antennas. Between now and February 2009 these stations will be shutting down their old analog systems so the federal government can auction off part of this spectrum for other uses.

While this has some obvious issues for home viewers the issues for professional AV systems have not been that clear. In the [previous issue](#) of this eNewsletter, we discussed situations in which systems with over-the-air tuners and antennas might be affected.

Another area that may receive some impact is in relation to wireless systems, such as wireless microphones, in-ear monitors, intercom systems, etc. All wireless systems that use radio frequencies above 700MHz will no longer be allowed to operate after the deadline. This frequency band is being auctioned off for other uses and some parts of it are being assigned to public safety use.

Most wireless systems in place today use frequency agile transmitter/receivers that allow the user to change the channel within a wide range of frequencies to find free spectrum in the area. It has become more and more difficult over the last few years as DTV stations have come on line and taken more and more channel space that previously was used by wireless systems. With the addition of the second TV channel in most areas (i.e. the digital channel that was brought up while the station kept its analog channel running until the 2/17/09 deadline) the available spectrum has gotten more and more crowded, particularly in large metro areas. The digital upgrade has also brought about the use of sub channels (additional channels that DTV stations can now transmit to broadcast multiple channels of content at the same time, i.e. channel 5, 5-1, 5-2, 5-3, etc.). All of this has made it harder for professional AV systems with lots of wireless systems to find clean channels to operate.

However, unless you have some specialty wireless equipment operating in 700MHz or higher region you should be able to work out any interference the same way it has been done for years: Adjust your equipment to use an open channel. There will be more interference than in the past, in most areas, but the equipment will still work.

The last area in which we will see change as we move to digital TV is video conferencing systems. Video conferencing systems are separate systems that transmit their encoded signals over telephone or data cabling, so they don't necessarily have to convert to digital or HD at the same time as the over-the-air broadcasters. Over the past year or so, both HDTV signals from cameras and computer-generated content have moved forward, with all of the major video conferencing manufacturers providing CODECs (i.e. coder/decoder that translates AV signals to digital signals for transport over phone lines) that support the transmission of HD content at native rates (assuming the CODEC on the other end supports HD as well). These units come at a premium price and require more bandwidth to achieve true HD signals, but since everything else in the pro AV chain is moving to digital, it is to be expected that video conferencing will follow. Keep in mind that the change to HD conferencing won't make your existing system obsolete. But the next time you upgrade your system, in a few years, HD conferencing will likely be the standard instead of the premium.

Overall, the analog to digital TV conversion will have a bigger impact on the home consumer environment than the professional AV system. But note that there will be a considerable impact on screen format. The switch will act as a catalyst to convert the traditional 4 x 3 format image to a 16 x 9 (or similar) widescreen format. Stay tuned in the coming months and we will begin to discuss the widescreen conversion and how it impacts AV systems.

Focus on Acoustics **City Noise Ordinances: Navigating a Sea of Noise**

As our population increases and expands, "noise pollution" has been increasingly recognized as a serious and growing environmental and health problem, with consequences ranging from stress and anxiety to permanent hearing loss. Thankfully, noise ordinances have been put in place to ensure a safer world for our ears to live in, but developing building and site designs that comply with these laws can leave one feeling stranded in treacherous waters.

The first anti-noise law in the United States came about with the Noise Control Act of 1972, which was a piece of federal legislation that put the power of noise regulation with the Environmental Protection Agency – that is, until funding was stopped in 1981. It was decided at that time that noise policy was best left to state and local governments. However, the vast majority of states don't have any noise ordinances, and those that do may only provide a general set of guidelines for individual municipalities to model their own sets of rules. The result? A set of widely varying noise laws that change continually from town, to town, to town...

To put this in perspective, think about highway speed limits. For some of us, keeping within the posted speed limit is difficult enough. Now imagine that you're driving down the highway, and every few miles the speed limit signs change from miles per hour, to kilometers per hour, to meters per second, to feet per minute, and so on. No problem, just a little extra math, right? Now imagine that at nighttime the speed limits get lower since it's harder to see, the speed limit varies the farther you are away from another car, and as long as you don't exceed the speed limit for 10% of the time during a one hour period you're technically not breaking the law. Not so easy anymore.

It's even more complicated than that. In addition to the fact that local noise ordinances vary between municipalities, some of these laws were written decades ago, some have been revised to address more modern issues and methodology, some are very vague and open to interpretation, and some are more detailed than they really need to be. Between all of the legal-speak and acoustical terminology, navigating these ordinances can be a difficult task. For a deeper look into the terminology and practicality behind noise ordinances, check out the "Environmental Acoustics" article from our [May 2005 eNewsletter](#) or give us a call.

Product Viewpoint: For Small Theaters, Digital Cinema Has Benefits For Big Theaters, Stick with Film (for now)

The needs of museums, educational institutions and conferencing venues differ from those of the cineplex, and digital cinema as it is right now does not always meet them. There are benefits: print cost goes away, the last run of the image is just as good as the first, a multiplex can quickly reschedule theaters based on today's ticket sales. But for theaters with screens wider than 20 feet, you pay a price in image quality. Today's DCI compliant systems (Digital Cinema Initiative, keeper of the industry standard) supply a moving picture only 1/4 to 1/10 of the picture information you could see in the typical 35mm movie house – just slightly better than really good broadcast TV.

Here's an analogy: Think back about 15 years, to the dot matrix printer. You may have had one connected to your computer. If you shelled out big bucks you could even get a color dot matrix printer. Remember what a printed page of words looked like? At around 24 dots per inch, it was readable, but nothing like the quality of text that you are reading now.

DCI compliant projectors get you 2,048 dots or pixels across your projected image, whether your screen is 20-feet or 100-feet wide. The equivalent resolution in film, depending on the physical size of the film stock (from 16mm all the way up to 70mm 15-perf) is in the range of 8,000 to 20,000 dots, or pixels, of information across the width of the screen. Going back to the printer analogy, would you buy the argument that your current high-res color laser printer should be replaced with an old dot matrix?

DCI has done a great job in setting the bar as high as possible for right now. And right now, for best results, the image size in a digital cinema auditorium should be limited to about 20-feet wide. And the best seats in the house are going to be at least 20 feet away – any closer and a critical viewer can see the dots that make up the image. This is based on my observations of numerous film and digital projection systems over the last 30 years, from projectionist to system engineer, and including my experience in the certification of large format theaters.

Why can't DCI set the bar higher right now? It's the chip. The industry's one primary chipmaker, Texas Instruments, currently only has what is called a 2K chip. This chip has 2,048 dots or pixels across it. The image on the chip is updated 15 to 60 times per second as required by the presentation – the equivalent of a 15 fps to 60 fps film frame rate. (The higher frame rates are used in some forms of 3D with glasses that shutter between left and right eye.)

Of course, the industry is working to improve image quality. Sony has a 4K system. JVC has a process that claims even higher resolution - shown last year at the National Association of Broadcasters (NAB). Some systems blend images from multiple projectors. (At least one firm claims it can blend 100 projectors together - think about the commission on that sale! Better yet, buy stock in the lamp manufacturer before you sign the deal.) Some fresh advances may be unveiled at NAB's Digital Cinema Summit in Las Vegas this April 12-13.

Getting back to today's DCI compliant projector - for the sake of easy math, let's say it has 2,000 side-to-side pixels. Project it onto an 80-foot wide giant screen. That gives 25 pixels per foot, or two dots of content for every inch of image. Put the same image on a 40-foot wide multiplex screen: 50 dots per foot or 4.2 dots per inch - better, but I still would not want to be sitting in the front row. In film terms, you would have a very grainy image. So if you want to provide an immersive experience showing the breathtaking vistas of Africa or outer space, or a visually detailed nature, history or science documentary, for now you should stick with film.

On the other hand, if you are installing or updating a small, 40- to 200-seat theater, then let's look at digital. On a screen 16-feet wide by 9-feet high, you will have about 120 pixels per foot, depending on the projection system you select. This is much better than the "grainy" 25 pixels per foot in the giant-screen example above. But note that it doesn't compete with the quality of good home theater. It is a far cry from the 480 pixels per foot that give home viewers a picture window to the world on their digital flat panels.

The advantage of a small, digital theater system with DCI compliant projectors is that it makes a great, versatile screening room with options far beyond what you get with a film projector. Content changeovers are very fast. A good laptop can drive the system. Your theater becomes a space you could rent out for corporate meetings or educational sessions, or the local ad agency. If the projector has a DVI input port, and the computer has the same output (anything sold in the last 18 months has it), the system is even more versatile. Digital cinema greatly simplifies 3D presentation, and right now 3D is hot. There are systems on the market that will allow you to change over from 3D to 2D in the time it takes to re-cue your video hard drive.

If you have a small theater that has multi-use needs or if you can produce your own show in full high-def video, then a digital projection system is what to look for.

If, however, you want or need high-quality visual resolution and color depth, these are still much more attainable in the realm of film.

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