



WELCOME!

And a Happy New Year to all of you! With the ringing in of the new year, a huge DVD-giveaway contest finished (congratulations to all 135 winners, by the way), and the huge event that CES is, we've all been busy getting ready to bring you the latest and greatest in home theatre. This issue of the newsletter brings you the hot news from the studios, after the big Warner Bros. announcement at CES, some new equipment announcements from CES (with more to be featured in detail inside the print issues), and a fantastic archive article from David Weinberg titled, "Why Don't Theatres Sound Better?"

We just lowered our regular subscription rates after such high demand this season, so check them out at the end of the newsletter and online. Now you can give your friend that gift subscription he or she wants at the new low price (it's not too late)! So enjoy this newsletter and the wrap-up of the HDMI article series in Issue 128, and I'll see you on Valentine's Day.

Gary Reber
Editor-In-Chief, *Widescreen Review*

NOW AVAILABLE ON NEWSSTANDS

Issue 128, February 2008 of *Widescreen Review*:

- "Sanyo PLV-Z2000 Video Projector" By Bill Cushman
- "Onkyo® TX-SR875 A/V Receiver" By Doug Blackburn
- "Samsung HL-T5089S DLP HDTV" By Mike Marks
- "Display Technologies Part VI: OLED, SED, And Wrap-up" By Lancelot Braithwaite
- Our HDMI series of articles written by Michael Weizer, Accell; Rob Fleck, Belkin International, Inc.; Bill Fornino, Ethereal Home Theater; David Coleman, Honeywell; Jano Banks, Radiant; and David Salz, Wireworld.
- Over 40 Blu-ray Disc, HD DVD, and DVD picture and sound quality reviews
- And more...

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Recent News

Here are some of the recent headlines that have made it to the News section of WidescreenReview.com, which is now updated daily as our Web staff finds worthy home theatre-related stories and press releases. Visit WidescreenReview.com throughout the day to find out what's going on in the world of Home Theatre.

Apple Debuts Movie Rental Service For iTunes (MarketWatch)

"Apple, Inc. debuted a new movie rental service for its popular iTunes online music and movie store. During a keynote address at the annual Macworld trade show, Apple CEO Steve Jobs announced that customers can rent newly released movies to watch over their computers, iPods, or iPhones for \$3.99 for a 30-day period..."

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Samsung To Spend \$853 Million To Boost LCD Output (Reuters)

"Samsung Electronics Co., Ltd (005930.KS: Quote, Profile, Research), the world's top maker of large LCD screens, said on Wednesday it would spend 800 billion won (\$853 million) to boost output from its TV panel production lines.

"The money will go to its two 'seventh-generation' domestic production lines, which mostly make panels for large flat-screen televisions, a Samsung spokesman said..."

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Digeo Lays Off Half Its Staff, Names New Leader (Seattle Post-Intelligencer)

"Kirkland's Digeo, Inc., a contender in the crowded market for digital video recorders, was compelled to lay off half its workers and to appoint a new chief executive because it overextended itself," the outgoing CEO said.

The eight-year-old company cut about 73 people Tuesday, most of them in marketing, administrative, and support positions, leaving a work force of about 80..."

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Syntax-Brilliant Signs LCD Panel Supply Agreement With Sharp Electronics

"Syntax-Brilliant Corporation, a leading manufacturer and marketer of LCD HDTVs, digital cameras, and microdisplay entertainment products, announced today that it has signed an LCD panel supply agreement with Sharp Electronics Corporation..."

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Toshiba Deploys New HD DVD Marketing Initiatives Based On Strong Fourth Quarter Unit Sales

"Toshiba America Consumer Products announced that it is stepping up its successful marketing campaign for HD DVD as it experienced record-breaking unit sales in the fourth quarter of 2007. Major initiatives, including joint advertising campaigns with studios and extended pricing strategies, will begin in mid-January and are designed to spotlight the superior benefits of HD DVD as well as the benefits HD DVD brings to a consumer's current DVD library by upconverting standard DVDs via the HDMI™ output to near high-definition picture quality."

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DISH Network To Expand HD Line-Up In 2008

"DISH Network® announced plans to increase its national HD channel count from 76 to 100 in 2008. The company also plans to add local HD channels in 65 new markets, bringing its HD local market total to 100.

"The addition of new HD national and local channels is a testament to DISH Network's unwavering focus on providing the best HD offerings," said Eric Sahl, senior vice president of Programming for DISH Network..."

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The Studio Scoop

Rumors, Reports, & Ramblings

Stacey Pendry

DVD Giveaway Contest Winners Drawn

Names for our popular *Ultimate DVD Giveaway Contest* were drawn on January 7, 2008. We awarded DVDs to more than 135 winners from six different countries. Grand Prize winners have been notified via e-mail, the rest of the winners have been notified by first class mail.

A complete list of the winner's names, along with some pictures of our participants, will be posted on our Web site shortly.

We had such fantastic response to this contest; I am planning to hold another giveaway later this year. Our Newsletter subscribers will be among the first to know, as the contest will be announced there previously to being published in *Widescreen Review*. So, keep posted!

Golden Globe Winners Announced

All the glitz and glamour that is normally associated with The Golden Globe Awards ceremony was diminished to a dry, utilitarian, thirty-plus minute, news conference.

The Hollywood Foreign Press Association was unable to cut a waiver deal with the striking Writer's Guild Of America members, which would have allowed for the awards ceremony to be televised. A waiver would have also cleared the way for Screen Actors Guild members to support the ceremony rather than boycotting it, as they did. So, it is without pomp and circumstance, I bring you The Golden Globe Award winners:

MOTION PICTURE—DRAMA

Atonement

MOTION PICTURE—COMEDY OR MUSICAL

Sweeney Todd: The Demon Barber Of Fleet Street

ACTRESS—MOTION PICTURE—DRAMA

Julie Christie—Away From Her

ACTOR—MOTION PICTURE—DRAMA

Daniel Day Lewis—There Will Be Blood

ACTRESS—MOTION PICTURE—

COMEDY/MUSICAL

Marion Cotillard—La Vie En Rose

ACTOR—MOTION PICTURE—COMEDY/MUSICAL

Johnny Depp—Sweeney Todd: The Demon Barber Of Fleet Street

ANIMATED FEATURE FILM

Ratatouille

FOREIGN LANGUAGE FILM

The Diving Bell And The Butterfly—France

SUPPORTING ACTRESS—MOTION PICTURE

Cate Blanchett—I'm Not There

SUPPORTING ACTOR—MOTION PICTURE

Philip Seymour Hoffman—Charlie Wilson's War

DIRECTOR—MOTION PICTURE

Ridley Scott—American Gangster

SCREENPLAY—MOTION PICTURE

Ethan and Joel Coen—No Country For Old Men

ORIGINAL SCORE—MOTION PICTURE

Dario Marianelli—Atonement

ORIGINAL SONG—MOTION PICTURE

"Guaranteed" from Into The Wild—Music And Lyrics by Eddie Vedder

With any luck, the Academy will be able to engage the writers in negotiations, and come to a mutual agreement. The award shows just don't seem the same without all the beautiful gowns, the beautiful celebrities, and the long-winded speeches they provide. Fingers crossed, we will not be deprived the guilty pleasure of watching Joan Rivers interview all the A-listers, live from the red carpet.

In Brief

The Weinstein Co. has announced it is the second Hollywood studio to break ranks with fellow producers and pen an interim deal with the WGA (Writers Guild of America). Harvey Weinstein, co-chairman of The Weinstein Co., has told *The New York Times* the decision to make an independent deal with the writers was because "We need to get people back to work."

The deal is said to be essentially the same as United Artist's earlier independent agreement with the WGA, which included provisions for allowing the interim agreements to be superseded by any future deals made between themselves and the Alliance Of Motion Picture And Television Producers.

Two additional studios have inked similar independent interim deals, at deadline for this article. Worldwide Pants and Media

Rights Capital (MRC) both have finalized agreements with the WGA, which allows them to return to production of their projects.

Walt Disney is due to start filming the romantic comedy *Confessions Of A Shopaholic* next month in New York and Connecticut.

Hugh Dancy and Krysten Ritter are slated to join Isla Fisher in the film adaptation of Sophie Kinsella's best-selling novel series about a compulsive shopper from Manhattan, up to her neck in debt, who becomes a financial-advice columnist.

The film is to be produced by Jerry Bruckheimer, the third project in which he has worked with Dancy, and directed by P.J. Hogan.

DreamWorks has announced that they will work with IMAX®, planning to release their first three 3-D toons on the giant IMAX screen, along with the previously announced digital versions.

How To Train Your Dragon and *Monsters vs. Aliens*, both to be released in 2009, along with 2010's release, *Shrek Goes Forth*, will be presented in IMAX 3-D on the giant screen and digital 3-D on regular movie screens.

IMAX, who has recently been faced with financial troubles, welcomed the DreamWorks projects as its first multi-film 3-D pact. If all goes well with the first three releases, IMAX can count on two titles per year from DreamWorks.

The current television season has now been all but written off by network heads, and it appears that next season is in peril as well. Four major TV studios—CBS Paramount Network TV, Universal Media Studios, 20th Century Fox Television, and Warner Bros. TV, tore up dozens of writing and development deals as the force majeure ax fell on the network's producer/writers.

Even high-profile talent was not exempt from the redundancies. With such well-known producers as Hugh Jackman and Mark Johnson, producer of *The Chronicles Of Narnia*, given their walking papers, the 2008-2009 season is looking rather bleak for prospects of new and exciting programming. **WSR**

Coming Soon... To A Retailer Near You

Danny Richelieu

New Video



Philips 42PFL7603

Philips recently unveiled their new **7000 FlatTV** series of LCD displays, ranging in size from 19 to 52 inches diagonal. The new displays have a rounded edge that is surrounded by acrylic, giving it a “minimalist, emotional, and recognizable” design. The displays have no recognizable loudspeaker grills, as the sound is delivered from the back of the display and carried

ried out through the acrylic flare around the set to the front. The new series incorporates 120 Hz ClearLCD™ technology with response time dropped to two milliseconds, and their HD Digital Natural Motion™ technology eliminates the persistent juddering effects that can be noticed when 24-frame-per-second film is transferred to 60-frame-per-second video. The Motion Estimation Motion Compensation technology that is used interpolates a new frame in the 2-3 frame repetition sequence with motion adaptation to minimize artifacts. Each display in the 7000 series includes four HDMI 1.3 inputs, and three of the models include Philips' LED Ambilight™ technology (\$1,800 for the 42-inch **42PFL7603**; \$2,100 for the 47-inch **47PFL7603**; \$2,800 for the 52-inch **52PFL7603**), with a \$100 decrease in price for the non-Ambilight models of the same size (which all end in **7403** rather than 7603).

Philips

888 744 5477

www.philips.com

New Loudspeakers



Wisdom Audio Sage Series

Wisdom Audio launched their **Sage Series** of in-wall loudspeakers, which combine proprietary transducers, active bi-amplification and crossover networks, Audyssey™ MultEQ® XT software, a new mounting solution, and state-of-the-art thin film, planar magnetic drivers. The new planar magnetic transducers are said to yield a dramatic leap forward in performance, reliability, and available installation solutions, with thermal failures having been virtually eliminated. The result is more lifelike dynamics, higher maximum SPLs, and improved clarity with reduced coloration. The Sage Series loudspeakers are driven by the SC-1 System Controller, a 7.3-in, 14.3-out electronic crossover and acoustic room corrector, incorporating Audyssey MultEQ XT software with selectable memory settings for

optimizing the acoustic performance of the system for different source material. Each in-wall loudspeaker is installed using an all-metal extrusion cabinet and driver baffle and Wisdom's Uni-Grip™ technology, which, they claim, provides superior sonic performance while actually reinforcing the strength of the wall. Five loudspeaker configurations are available, ranging from 20 to 75 inches in height, with each available as in-wall, on-wall, or freestanding loudspeakers.

Wisdom Audio

775 887 8850

www.wisdomaudio.com

Polk Audio announced the introduction of the **SC85-ipr** (\$215 each) and **SC80-ipr** (\$175 each), which replace Polk's in-wall SC85 and SC80 with no increase in price. The new models do, however, add Internet Protocol (IP) connectivity for use with a NetStreams® IP-based multiroom system. The new models can still be used in a conventional installation, with loudspeaker cables connecting the loudspeakers to an amplifier, or they can be connected to a local NetStreams digital amplifier via a “Euro-style” DIN input. The SC-ipr loudspeakers are then bi-amplified and DSP-enhanced, which improves phase and frequency response, as well as lowers distortion, deepens bass, improves dynamic range, and raises maximum SPLs. The SC85-ipr is a rectangular two-way in-wall loudspeaker employing an 8-inch Dynamic Balance™ composite polymer driver and a 1-inch, aimable silk dome tweeter with a Neodymium magnet. The SC80-ipr employs the same drivers in a round, in-ceiling configuration.



Polk Audio SC85-ipr

Polk Audio

410 358 3600

www.polkaudio.com

New Accessories

Monster® has unveiled their fifth “speed rating” in their line of HDMI interconnects—Ultimate High Speed. Only one cable fits under the new rating, the M Series® **M1000HD**, which is designed to easily deliver uncompressed high-definition 1080p60 (and beyond) video, 12-bit color, eight full-range channels of digital audio, and integrated control. The M Series M1000HD carries Monster's Cable For Life replacement offer, allowing customers to upgrade to a new cable if their components ever surpass the performance capability of the M1000HD for free.



Monster M1000HD

Monster

877 800 8989

www.monstercable.com



Esoteric 8N Cable

Esoteric introduced its line of specialty wire and cable to the United States market, which was previously only available in Japan. Products include component interconnect in RCA/RCA-digital and XLR/XLR-digital configurations, as well as loudspeaker cables, phono cables, and AC power cables. 6N (99.9999 percent pure), 7N (99.99999 percent), and 8N

(99.999999 percent) copper are used extensively throughout the line. The 8N copper that Esoteric has procured has a less-than-0.1-parts-per-million of metallic impurities, which is maintained by using glow discharge mass spectrometry high-precision material analysis technology. The wire uses a “stress-free” annealing technology to minimize distortion of the crystalline structure of the copper.

Esoteric

323 726 0303

www.teac.com

Why Don't Theatres Sound Better

► PART 1

DAVID WEINBERG

In the July/August 1995 Issue 15 of *Widescreen Review*, editor/publisher Gary Reber reported on the Spring 1995 EIA/CEG national survey, which showed that more than two-thirds of the home theatre owners who responded preferred to watch, and listen to, movies at home versus at a theatre. A majority of the respondents to the Fall 1994 EIA/CEG survey felt that "the quality of both the picture and sound from their home theatre matched or surpassed the movie theatre's." Why is this so?

Many of the criteria for good sound in a movie theatre are the same as those for good sound in a home theatre. However, in a movie theatre, the issue is complicated by the much larger size of the audience, the need to deal with the dramatically different acoustics of the much bigger auditorium, the acoustic power required to reproduce the soundtrack at appropriate levels throughout the auditorium, the wish to provide similar sound quality over the entire seating space and the much larger sums of money involved. Movie soundtracks reproduced in large spaces require theatre sound systems to generate an enormous acoustic output.

Speaker And Amplifier Requirements

Some years ago, as part of the standardization process, the film industry adopted reference and peak level capabilities for theatre sound systems. A reference modulation level of pink noise for each film soundtrack format (optical, magnetic, digital) is defined, from which the theatre sound system is to produce a sound pressure

...fulfillin the requirements for a movie theatre is...difficult.

level of 85 dBC (Slow C-weighted). This is the reference level for each channel of the sound system, when measured in the middle of the theatre. A SPL of 85 dB is roughly equivalent to someone speaking very loudly, like a professional actor in a stage play, standing in front of you. The Left, Center, Right, and Left+Right Surround channel peak output capability is required to be 105 dBC SPL in the middle of the auditorium; the subwoofer channel peak output capability is required to be 115 dBC SPL, also in the middle of the theatre.

Peak levels with digital soundtracks are substantially higher, relative to the reference level, than with analog soundtracks, straining the performance of all but the best theatre sound systems. For example, Dolby® Digital soundtracks can produce peak levels 12 dB higher than Dolby SR® analog soundtracks, which, in turn, can deliver about 6-9 dB higher relative peak levels than Dolby A ana-

log soundtracks. Since each 3 dB is a 2-to-1 power ratio, this translates into the need for over 16 times more peak acoustic power from the theatre speakers, to reproduce the higher peak levels of digital soundtracks. The volume of a movie theatre is typically more than fifteen times larger than a home theatre. Therefore, a lot more acoustic power is needed to fill the movie theatre with similar sound pressure levels, placing far greater demands on the speakers.

To generate the needed acoustic power (that is, to fill a large space with high sound pressure levels) requires the speakers to "move a lot of air," particularly at low frequencies. Other factors being equal, for the same sound output level, increasing the speaker's effective radiating area (the speaker cone in acoustic suspension or ported speakers, or the mouth area of a horn speaker) reduces the excursion required of the driver. This usually results in lower distortion, and in some ways simplifies the driver design. To quantify a typical situation: one 8-inch cone speaker has a total effective "piston" (or radiating) area of about 0.25 square feet. One 15-inch speaker cone has a total effective "piston" area of about 0.8 square feet. A single horn-loaded speaker such as used in the HPS-4000® sound systems has an effective low frequency radiating area of more than 10 square feet, equal to approximately twelve 15-inch drivers, or about forty 8-inch drivers. Tests have shown that horn-loaded mounting of a driver results in as much as 90 percent lower modulation distortion than an acoustic suspension mounting of the same driver, at the same sound pressure levels. While attaining adequate sound levels with low distortion in movie theatres can be accomplished with various speaker designs, it is usually easier and cheaper to do so with horn-loaded speakers.

Once the acoustic output is specified, and the efficiency of the speakers is known, the amplifier power requirement can be determined. Clearly, if the speaker is more efficient, it

General Cinema's New Framingham Theatre Complex

General Cinema has built what can only be described as a palatial facility. Construction took a mere 29 weeks from groundbreaking to selling tickets. It boasts 14 theatres, all of which are attractive, comfortable, and range in size from 161 to 447 seats, with no scrimping on screen size. Seven of these theatres have HPS-4000™ sound systems, and two others are THX®-compliant auditoriums; acoustic isolation between theatres is excellent, so the high levels of today's soundtracks don't bother other audiences. In addition, there are two Showscan theatres, each of which seats 24 in luxuriant ride simulation chairs. GC has centrally located the largest, most varied theatre concession stand I have ever seen, the layout of which has been carefully designed to comfortably and very quickly handle the desires of a very large crowd. Cappuccino, coffee and pastries are available in the theater's cafe, which is a particular favorite of those attending the art films in the dedicated international theatre. A lobby shop sells movie paraphernalia, and I hear they did big business during last summer's run of *Batman Forever* and *Pocahontas*. I was so impressed with this facility that I might pitch a tent in the parking lot the next time I'm in the area, just to enjoy the varied fare it offers.

needs less amplifier power to generate the required sound levels. A typical acoustic suspension speaker requires about 100 times the amplifier power needed by an efficient horn-loaded speaker to generate the same acoustic sound levels. It is easier to design a moderately powered amplifier to generate relatively lower distortion and noise. Thus, other factors being equal, using more efficient speakers can result in effectively cleaner sound.

All of these considerations apply to home theatre as well, but due to the substantially larger space and the need for uniform audience coverage with no "sweet spot," fulfilling the requirements for a movie theatre is much more difficult. Most of the theatre sound system speaker-amplifier combinations in use today are not capable of generating sufficient output to reproduce the peak levels of digital film soundtracks.

This is recognized to be such a wide-spread problem that one company is now touting a product which compresses (limits) the peak levels from film soundtracks to reduce the peak power and sound level output required. It is expected that this device will use a technique similar to limiters used by many FM radio stations to limit broadcast modulation levels. This will falsely restrict

sound like and what the audience would hear; audiences could expect somewhat similar quality in many different theatres and perhaps hear film sound that approaches what the director and sound engineer intended.

In the mid 1930s, industry representatives proposed the first such standards. Typical theatre speakers of the day were placed behind movie screens and monitored. Any equalization needed to provide the audience with good sound was applied during the mix. This resulted in a considerable amount of high frequency boost in the soundtrack, to compensate for losses due to: 1) the optical playback sound head, 2) the limited high frequency capabilities of the speakers, and 3) screen as well as high frequency atmospheric losses. As equipment improved, we also learned to listen more knowledgeably. The excessive distortion this high frequency boost caused became more obvious and less acceptable.

During the 1970s, Dolby Laboratories worked to increase the bandwidth and reduce the distortion of motion picture soundtracks. As part of this work, one-third octave equalization was introduced into motion picture sound systems. An adjustment tech-

edly good sound systems. As a result, in recent years the standard theatre sound system measuring techniques have become controversial.

This problem was the basis of a presentation given by John F. Allen (Founder and President of High Performance Stereo HPS, Newton Centre, Massachusetts) as part of the Theatre Equipment Association (TEA) Convention '95 in Boston. This TEA Convention session was held in General Cinema's Framingham Theatre 5, an HPS-4000-equipped, 447-seat theatre which is part of a brand new General Cinema complex in Framingham, Massachusetts. According to Mr. Allen, one of the major problems is depending on measuring techniques to adequately reflect what we hear in a movie theatre. Are there any measurement techniques which can reliably predict how the theatre system sounds?

While introducing his session, John told his audience that the inspiration for his work on this topic came from Paul Klipsch as well as from Dolby Laboratories' loan Allen and the excellent work performed over the years at Dolby Laboratories. John has found that: 1) theatre sound system equalization adjustments based on different measure-

...in recent years the standard theatre sound system measuring techniques have become controversial.

the dynamic range of the soundtrack. We can only hope that exhibitors will be interested in installing adequate sound systems rather than employing such distortion-creating devices which can only destroy the effectiveness of the presentation.

Equalizing The Theatre Sound System

During the early years of "talkies," it became apparent that everyone would be better served if there were standards for theatre sound systems. Hopefully, with standards in place, film directors and sound engineers could predict what the theatre systems would

use. A technique using pink noise and real time one-third octave analysis was recommended. As these methods became more widely used, they were incorporated into the ANSI/ SMPTE 202M standard. This standard codifies theatre sound system frequency response, plus suggests sound system setup guidelines and measuring techniques. Today, theatre sound systems around the world are set up using methods designed to conform to the ANSI/SMPTE standard.

So, why don't more theatres sound better? As if it isn't bad enough that most theatres have inadequate speakers and amplifiers, the fact is that the same movie will sound radically different even among theatres with suppos-

edly good sound systems. As a result, in recent years the standard theatre sound system measuring techniques have become controversial. This problem was the basis of a presentation given by John F. Allen (Founder and President of High Performance Stereo HPS, Newton Centre, Massachusetts) as part of the Theatre Equipment Association (TEA) Convention '95 in Boston. This TEA Convention session was held in General Cinema's Framingham Theatre 5, an HPS-4000-equipped, 447-seat theatre which is part of a brand new General Cinema complex in Framingham, Massachusetts. According to Mr. Allen, one of the major problems is depending on measuring techniques to adequately reflect what we hear in a movie theatre. Are there any measurement techniques which can reliably predict how the theatre system sounds?

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acoustic treatment he recommends, help meet these criteria, plus provide wide-bandwidth, low distortion, high efficiency, low behind-the-screen reflections, uniform through-the-screen dispersion, and tone matching of the surround sound to the screen sound.

Throughout this TEA conference session, the sound levels of all channels from film sources, regardless of A-chain configuration or B-chain equalization, were adjusted to yield the same standard levels in accord with ANSI/SMPTE 202M-1991 recommended practices. This prevented different levels from coloring the perceived results.

The presentation opened with the HPS-4000 trailer (with DTS® digital-

In preparation for this session, John did a lot of homework. Using exactly the same equipment and settings he would use during this presentation (the center channel screen speaker), John digitally recorded his voice in this theatre. He then played back that recording in this theatre, and recorded the playback twice—once with a microphone in row 3 and again with a microphone two-thirds toward the back of the hall (row 14). The primary difference in the sound from his direct recording and the playback of the row 3 recording is the reverberation the microphone picked up. The same effect is even more obvious when listening to the recording made in row 14. Because of the controlled and uniform dispersion of the screen speaker system, the voice

and recorded these settings as well. Each of these two techniques is standard industry practice and in accord with the procedures outlined in the ANSI/ SMPTE standard. In each case, the measurements were time- and space-averaged to meet the requirements and intent of the ANSI/ SMPTE standard. The resultant measurements from each of the three techniques were identical. John noted the changes made to his equalization by use of each “standard” setup technique. He then used an equalizer and an 8-channel Tascam DA-88 digital recorder to prepare a playback tape of his voice and several soundtrack segments, appropriately equalized with these changes. This enabled the audience to hear how the

...the soundtracks sounded more natural, more integrated, and more enveloping...

encoded sound), the DTS trailer, the SDDS® trailer and the Dolby Digital trailer, spliced end-to-end. All three digital decoder heads had been mounted on a single projector and calibrated to produce the same levels; the projectionist switched the correct decoder into operation on cue.

John spoke of the ANSI/SMPTE 202M-1991 standard and the different ways industry experts typically measure the performance of these systems to obtain the specified results in the theatre. He pointed out that the three methods—the 4-microphone and 1-microphone equalization procedures done with the measurement microphone(s) placed two-thirds back into the auditorium (which is where I sat for this session), and his setup procedure with the microphone(s) in the speaker's near field (near the front of the theatre)—yield widely different perceived sound, even when the measurements say they should sound the same. All three techniques John talked about appear to meet the requirements of the ANSI/ SMPTE standard.

Although John didn't go into a detailed analysis, he demonstrated his premise with a scientifically valid technique which included the judicious use of recordings of his voice and film clips.

itself sounded only slightly altered from the original. The row three recording seemed to very slightly exaggerate sibilance, and add some reverberation. The row 14 recording seemed slightly dull compared to the original recording, with even more reverberation.

John had voiced the theatre in which the presentation was given (Theatre 5) using his own technique, which includes placing a microphone at appropriate locations in the near field (near the front of the theatre) to equalize the direct sound of the HPS-4000 sound system speakers to the specifications of the ANSI/SMPTE standard. He then listens to specific film soundtrack clips, selected to show up specific problems, and makes minor adjustments, as needed, to finalize the equalizer settings. John uses the same technique in all theatres with his sound system, and all of those I have heard seem to sound quite similar.

In another theatre John had already set up, he had the HPS-4000 sound system adjusted by an independent industry expert using a multiplexed 4-microphone averaging technique and recorded the settings. In Theatre 5, after setting up the sound system his way, John used the “moving” single microphone technique toward the back of the audito-

rium and recorded these settings as well. Each of these two techniques is standard industry practice and in accord with the procedures outlined in the ANSI/ SMPTE standard. In each case, the measurements were time- and space-averaged to meet the requirements and intent of the ANSI/ SMPTE standard. The resultant measurements from each of the three techniques were identical. John noted the changes made to his equalization by use of each “standard” setup technique. He then used an equalizer and an 8-channel Tascam DA-88 digital recorder to prepare a playback tape of his voice and several soundtrack segments, appropriately equalized with these changes. This enabled the audience to hear how the

same clip would sound with this theatre set up using each of the three techniques. The use of a prerecorded and equalized recording made the presentation easier, since it did not require any live changes to the sound system setup during the presentation, while accurately showing the effects of each setup technique.

John started with a recording of his voice and clips from *Batman Returns* (Albert and Bruce Wayne in the Batcave) and *Crimson Tide* (Gene Hackman welcoming his crew to his submarine in heavy rain, with thunder). He played each clip four times in succession—first sound (with image on the film clips) with HPS tuning, then sound only with 4-microphone tuning, sound only with 1-microphone tuning, and finally sound only with HPS tuning.

He then played back a second scene from *Crimson Tide* (a scene of the submarine in combat, with both command center action and the firing of torpedoes) three times—first sound and image with HPS tuning, then sound only with 1-microphone tuning, and finally sound only with HPS tuning.

He then played scenes from *Immortal Beloved* (Napoleon's army attacking, including cannon fire, with Beethoven renaming the “Eroica”), and

The Bodyguard (Whitney Houston and Kevin Kostner et al dealing with the press while leaving the hotel; and Ms. Houston singing)—sound and image with HPS tuning.

Occasionally, with the 4-microphone and 1-microphone setup techniques, the mix became unbalanced, with specific parts of the soundtrack standing out from the overall sound at the expense of other parts of the mix. In some cases, with these two setup techniques, I felt somewhat detached from the film, in comparison to the sound from the HPS tuning. Soundtrack details, particularly background details, tended to be less in evidence with the 4-microphone and 1-microphone setup techniques.

Overall, with the HPS theatre voicing, the soundtracks sounded more natural, more integrated and more enveloping than with either of the other two techniques. Within the limits of the mixes, the dialog was always intelligible, the sound effects—like rain, thunder, movement of equipment, a door squeaking—sounded natural. The surround channel echoes of Gene Hackman's amplified voice from surrounding buildings seemed appropriately part of the scene. The sound of the cannon firing was most impressive without seeming obviously artificial. Whitney Houston's singing voice sounded every bit as good as from a well recorded CD on a fine home hi-fi sound system, with the additional benefit of the surround effect. Music sounded quite good on the HPS-4000 sound system with HPS theatre voicing.

John essentially let what we heard explain his theme. There are some concepts of acoustics and psychoacoustics which help explain what we heard.

Measurements taken near the front of the theatre tend to reflect what is coming directly from the speaker, with almost no reverberation mixed in. If a theatre sound system is set up this way, then the measured results will more closely match what we hear; this is because what we hear in the theatre environment is more dependent on the sound coming directly from the speaker to us than from that sound mixed with lateral reflections and reverberation.

As the microphones are placed fur-

ther back in the auditorium, more reverberation is mixed in with the direct sound, corrupting the measurements. This is because the frequency response of the reverberation is radically different than that of the direct sound, since the high frequencies of the reflected sound are attenuated by the longer path in air and by the high-frequency absorbent characteristics of the ceiling and walls. The more heavily weighted the measurements are toward the reverberation response, the more incorrect the results will be in comparison to what we hear.

With appropriate adjustments, the measured levels and frequency response of the screen channels and surround channels can be the same for any of these setup techniques, yet the resulting sound quality can be radically different. The difference between how microphones "hear" and how humans hear causes differences we can't yet effectively measure.

The direct sound is critically important, since humans use this sound, primarily, to characterize the source. Human hearing can easily separate much of the early lateral and ceiling reflections, as well as reverberation, from the screen channels' direct sound. As an example, most of us have experienced the sound of a speakerphone. When we talk with someone holding a telephone handset, we hear only their voice. When they use the speakerphone, we hear all the room reverberation quite prominently mixed in with the voice. If we went into the room where the other person is talking, it would be impossible for us to be consciously aware of all the reverberation we hear over that speakerphone. This is because of two factors: 1) the speakerphone's microphone cannot discriminate against sound from other directions as well as human hearing (even two or more microphones will not help), and 2) over the phone we hear the voice and the reverberation from the same direction—the telephone's earpiece. John's playback of his prerecorded voice showed the effect quite clearly.

There are some factors which are known to affect the variability of setup results in a theatre at different times. These include temperature, humidity and

barometric pressure, all of which not only affect the frequency response of the sound traveling through air, but even the absorptive and reflective frequency response of the wall and ceiling materials. The variability is usually not too obvious, since it is difficult to perform a direct A-B comparison. Thus, it is best to set up a system when these conditions are typical of those found in the theatre being voiced.

Some of these same factors also affect what we hear from home theatre sound systems, but the smaller size of the home theatre audience and different acoustics of the smaller space, plus the additional desire of some people to create a two-dimensional soundfield image (left-right/front-back; height would make it three-dimensional), change the emphasis needed for success.

Today, the 4-microphone and 1-microphone far field methods are the typical techniques used to set up theatre sound systems. The presentation John Allen gave to the Theatre Equipment Association members, and the uniformly complimentary comments theatre managers and owners get for the sound of his HPS-4000 theatre sound systems, show that serious thought must be given to his theatre voicing concepts.

John closed the session by sincerely thanking all those who helped make this session possible: John Norton (Director of Technical Services, GCC), John Townsend (Vice President Construction, GCC), Robert Sunshine (Executive Director, TEA), Dan Taylor (Vice President Marketing, Sony Cinema Products), Rex Hescocock (Theatre Manager, GCC Framingham Theatres) and staff, Barry Reardon (President, Warner Brothers Distribution), Nancy Sams (Vice President of Print Control, Warner Brothers Domestic Distribution), Kyle Davies (GCC Film Department), Buena Vista, Columbia Pictures, Sony Cinema Products, Bill Neighbors (Vice President and General Manager, DTS), Mark IV Pro Audio, WGBH, Jeff Corman (RCA Service), and projectionists—Dick Eaton, Stacey Lizotte and Andy Lizotte.

My thanks to Robert Sunshine (Executive Director, TEA) and Joan Allen (Vice President, Dolby Laboratories;

President, TEA; Chairman of these sessions) for permission to attend this TEA conference session and the follow-up panel discussion to prepare this article.

This and previous articles have addressed the movie theater "B" chain (equalizers, amplifiers, speakers, acoustics and voicing the theatre), the big three film soundtrack digital encoding systems and the digital playback "A" chain (digital film soundtrack readers and decoders). An upcoming article will move back further through the sequence

to the incredibly complex activity of putting together a film soundtrack—as part of a presentation in General Cinema's Framingham theatre with John F. Allen of High Performance Stereo and Steven Cohen, of Sony Pictures Entertainment, who demonstrate the soundtrack creation process by performing a live mix, in the theatre of pre-dubs, stems and the integrated soundtrack for a scene from "The Juror."

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