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## WELCOME!

I hope you enjoyed last month's Newsletter featuring the Monster AVL 300-Home Theatre And Lighting Controller and the Web Exclusive Disc reviews. This month's edition contains the final piece in John Dunlavy's seven-part archived loudspeaker design series articles. These articles are just as relevant today as they were when they originally appeared in the print magazine. If you missed any of the articles in the series, see Newsletters 9 through this one or see *Widescreen Review's* Back Issues 58 through 64.

We'll be back from CEDIA when September's Newsletter goes out, and I'm sure we'll have plenty of exciting news to report to you. Until then...



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

## NOW AVAILABLE ON NEWSSTANDS

Issue 123, September 2007 of *Widescreen Review*:

- The 15th Anniversary Issue: Celebrating 15 Years Of Widescreen Review
- "Pixel Magic" Systems Crystallo II® By Greg Rogers
- "Furman Sound IT-Reference 20i" By Doug Blackburn
- "Xbox 360 HD DVD Player" By Mike Marks
- "Runco On Runco's Future Direction" By Gary Reber
- "Six Myths Of The High-Definition Age" By Alen Koebel
- "Display Technologies — Part IV: Flat Panel LCD" By Lancelot Braithwaite
- Over 40 Blu-ray Disc, HD DVD, and DVD picture and sound quality reviews
- And more...

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By John Dunlavy





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# Coming Soon...

## To A Retailer Near You

Danny Richelieu



Hitachi P60X901

**Hitachi** has introduced their new line of plasma televisions, all of which have a native 1080 lines of vertical resolution. Six models have been announced: the 60-inch **P60X901** (\$8,000; 1920 x 1080); the 55-inch **P55H401** (\$3,000; 1280 x 1080); the 55-inch **P55T501** (\$3,300; 1280 x 1080); the 50-inch **P50X901** (\$4,300; 1920 x 1080); the 50-inch **P50S601** (\$3,500; 1920 x 1080); and the 50-inch **P50V701** (\$4,000; 1920 x 1080). Three of

the models (those with an X or V in their product names) include Hitachi's new Reel60™ processing, which will eliminate the perceived "judder" that can be seen in 24 frames per second (fps) film-based material that goes through 3-2 pulldown to 60fps. By interpolating between frames, they are able to create a more fluid-looking image even during motion. Four of the six models are available now, with the P55H401 and P55T501 being released in September.

Hitachi

800 HITACHI

av.hitachi.com

**Panamax** has expanded its **MAX® In-Wall™** series with three new products—the **Powerkit-Pro**, the **Power-Pro**, and the **Dual Signal Bay**. The MAX In-Wall Powerkit-Pro is

said to provide a noise-free, code-compliant extension of Panamax filtration and protection to remotely located devices, providing a safer, more attractive alternative to running extension cords from the component rack to something like a display by way of signal line modules built into the outlet receptacles. The Power-Pro can utilize any branch circuit to deliver safe power to remote areas by way of two AC outlets with Level 1 EMI/RFI noise filtration, thermal fusing, overvoltage protection, and catastrophic surge circuitry. The Dual Signal Bay connects signal lines from source device to display within walls, accommodating two blank module inserts with pass-through plugs or two in-wall signal-protection modules in the size of many two-gang outlet brackets. The unit features full metal housing and an enlarged faceplate to accommodate oversized wall cutouts and a 14-AWG solid-wire connection for bonding/grounding to in-wall AC units. The MAX In-Wall Powerkit-Pro is available for \$300, the Power-Pro is selling for \$100, and the Dual Signal Bay is available for \$30.

Panamax

800 472 5555

www.panamax.com



Panamax MAX In-Wall Powerkit-Pro

**Meridian Audio** has introduced the **G95** DVD Surround Receiver, which combines a 5.1-channel amplifier with a preamplifier and DVD/CD player for a fully integrated home theatre controller. In addition to the five channels of 100-watt amplification, the G95 also includes HDMI outputs and onboard scaling to deliver DVDs at up to 1080p resolution, and Meridian says it will also scale up to 1080i through its component output. The G95 uses an all-metal chassis and matches Meridian's trademark black-and-silver design. The G95 is available now for \$8,500 and comes with a proprietary MSR+ tabletop system remote controller.



Meridian Audio G95

Meridian Audio

404 344 7111

www.meridian-audio.com

**Sencore** has announced the **OTC1000 ColorPro** optical tri-stimulus colorimeter. The OTC1000 is accurate down to 0.01 foot-Lamberts (fL) and includes a new user interface with advanced features, including the new Ambi-Block™ technology for more accurate display system measurements even under less-than-ideal lighting conditions. The OTC1000 is said to take continuous constant-rate (under one-second) measurements, even at 0.01 fL light levels. The included CP6000 software includes ambient light cancellation (for accurately calibrating displays for any ambient light condition), and a video generator control, as well as an expanded database for capturing "as is" information and expanded reporting functions and features. The OTC1000 is available now for \$7,000 with the USB cable, software, and a hard case. An optional heavy-duty-mounting tripod is also available.



Sencore OTC1000 ColorPro

Sencore

800 SENCORE

www.sencore.com



Gefen HDMI CAT-5 MS Extreme

**Gefen** has introduced their **HDMI CAT-5 MS Extreme**, which allows 1080p HDMI signals to be transmitted up to 150 feet via CAT-5 cabling (it can go up to 300 feet for 1080i). The HDMI CAT-5 MS Extreme is engineered to withstand CAT-5 cable skew variations and extraneous equipment noise, and the plug-and-play solution is said to deliver the signal with no loss or

delays. The system is comprised of small sender and receiver units, both separately powered, and will deliver both the video and audio. The HDMI CAT-5 MS Extreme works with HDCP-protected content, but may not work with the new features provided by HDMI version 1.3. It is available now for \$550.

Gefen

800 545 6900

www.gefen.com



# The Studio Scoop

Rumors, Reports, & Ramblings

Tricia Spears

You might wonder why my name is headlining this article instead of Jack's. Well, he decided that the drive was just a little too far for him, so he has taken another job closer to home. He just couldn't handle the 60-mile commute each way, each day, any longer. I don't know what's wrong with him. Anyhow, he's still working for the mag from home, but the "Scoop" is no longer part of his job description. His instructions to me—make it funny, my fans loved my humor. I can't keep up with his humor, but here's this month's scoop.

## Disney

With several studios in the fight for the right—screen rights, that is—for the U.K. best-seller *The Dangerous Book For Boys*, Disney was the big winner. The book consists of short chapters on subjects ranging from famous historical battles to knot-tying techniques, coin tricks, astronomy, and how to hunt and cook a rabbit. Hmm...definitely must be a guy thing.

## DreamWorks

Billionaire and co-founder of Microsoft®, Paul Allen, is stepping down from the board and selling the majority of his stake in DreamWorks Animation SKG, Inc.

The company, best known for its *Shrek* films, said Allen's investment-vehicle, Vulcan, Inc., would sell 10 to 12 million of his shares in a registered public offering. In addition, DreamWorks Animation said it would repurchase \$150 million of his stock, or about five-million shares. It is reported that Allen will likely bring in around \$500 million in the deals. Geez, poor guy, I wonder what he's going to do now.

## MGM

I heard that MGM is developing a straight-to-DVD revisiting of the cult classic *Bill & Ted's Excellent Adventure*. Although the deal is still being worked out, writers Gabe Grifoni and Suzanne Francis have already turned in an outline for an updated version of life with the two San Dimas

dudes. It'll be interesting to see if they can make it work. A couple of attempts at a spin-off TV series—one animated and one live action—didn't do so well and left fans of the original most-excellent film feeling betrayed.

## Sony Pictures Home Entertainment

With its release on October 30, 2007, *Spider-Man 3* will spin its web in six different versions—two of which are Blu-ray Disc sets. As Sony Pictures' highest-profile Blu-ray Disc release to date, *Spidey* will be offered as a two-disc edition and as part of a *Spider-Man High-Definition Trilogy* compilation package. The trilogy will contain all three installments of the *Spider-Man* franchise, with the debut of all three films on the Blu-ray Disc format.

The same day, the standard-definition DVD *Spider-Man 3* will be released as a single-disc edition, a two-disc special edition, and as the trilogy compilation. Sony will also release *Spider-Man 3* for the PlayStation® Portable.

## Universal Pictures

Did you hear the news? Super-spy Jason Bourne is back with a vengeance. *The Bourne Ultimatum* scored the best August opening on record, with an estimated \$70.2 million from 3,660 locations. Take that James Bond.

On another note, the USA channel has pulled off one of the biggest movie deals in its history for the network TV rights to *The Bourne Ultimatum*, as well as several other hot theatricals from Universal Pictures. But you'll probably want to catch the flick before it arrives on USA, as the company doesn't take title until January 1, 2010.

## Warner Home Video

Warner Home Video announced that it has sold more than 250,000 copies of the film *300* in high-definition DVD, which was released on both next-generation formats on July 31, the same day as the standard DVD.



Warner claims a market share of more than 30 percent of high-definition disc sales. The studio is one of only two majors that releases its films in both the Blu-ray Disc and HD DVD formats (Paramount Home Entertainment is the other). Warner's two-format approach has given the studio six of the ten top-selling high-definition disc releases of all time.

## The Weinstein Company

Harvey and Bob Weinstein, the brothers who run the film studio, have raised \$285 million to make movies with Asian themes, actors, and directors.

The funds will pay the full cost of making, marketing, and distributing 21 theatrical releases and ten direct-to-video films over the next six years, with The Weinstein Company having control over development, marketing, and distribution. The films will be made in Asia or will spotlight Asian themes or talent. And for you martial arts action-hero fanatics, Jackie Chan and Jet Li will star in one of the films, *The Forbidden Kingdom*.

## In Other News

The Academy of Motion Picture Arts and Sciences' Science and Technology Council announced that it has entered a three-year partnership with the Library of Congress (LOC) to preserve digital content, including movies, for future generations.

The Sci-Tech Council, made up of more than 100 leading tech experts from the motion picture industry, has been warning the industry for several years that digital content, especially raw footage shot on digital cameras, is in imminent danger of being lost forever.

No method for digital storage approaches the longevity of current film stocks, which can last more than 100 years. Film is still the preferred archival medium for movies, but trims and outs are not transferred to film, leaving those assets vulnerable.

This is certainly good news for all you movie buffs out there. **WSR**

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# Loudspeaker Accuracy

## *How To Know You Bought An Accurate Loudspeaker— Part 7*

JOHN DUNLAVY

This is the seventh and last in a series of articles on the topic "Loudspeaker Accuracy" that I have written for *Widescreen Review* as a guest editorialist. In this article, I will explore what every music and home theatre enthusiast needs to know, that is, "How To Know You Bought An Accurate Loudspeaker."

### Introduction

A lot of different opinions exist concerning what electrical and acoustical properties contribute to "true loudspeaker accuracy."

For many audiophiles, their perception and/or judgment of loudspeaker accuracy is largely related to whether the loudspeaker can reproduce music and sounds in a manner that they find "pleasing, musical, pleasurable, etc."

As a consequence, a customer asking a salesperson in many audiophile emporiums as to "which of the loudspeakers he sells is the most accurate," will often receive the reply that they are all more-or-less equally accurate—it just depends upon how you perceive "accuracy."

Hmmm!

### Defining True Loudspeaker Accuracy

To me, "true accuracy" is related to "truth," i.e., can the loudspeaker reproduce music, voices, and other complex sounds with a level of accuracy that prevents a competent listener from discerning whether they are listening to live or reproduced sound during properly conducted, direct comparisons between the two, within a listening room possessing good acoustics. This, of course, necessitates that the recording be made anechoically with a "top-quality" professional analog or DAT recorder and "instrumentation-quality" microphones. Otherwise, the acoustics of the listening room will be heard "twice," i.e., from the recording and from the playback in the same room.

However, not many audiophiles have the facilities and equipment to perform either a full set of accurate anechoic chamber measurements, nor to compare loudspeakers directly with live musical instruments within an acoustically good listening environment. At technically competent manufacturers of loudspeakers, one or more large anechoic chambers and acoustically good listening rooms permit full sets of measurements to be made, and to then compare the loudspeakers directly with live musical instruments and voices within the listening rooms.

Without the appropriate measurement capabilities and engineering expertise/experience required to determine a loudspeaker's important electrical and acoustical properties, the design process becomes largely "guess work"—dependent upon the designer's personal perceptions regarding "accuracy," etc.

Thus, most audio salesrooms are full of loudspeakers with many different appearances, sizes, etc., most advertised to be "accurate"—but that sound quite different in ways not always attributable to room placement.

The bottom line is simple: two loudspeakers that sound different cannot both be equally accurate—unless room interaction is at fault—which is often the case within many poorly implemented listening rooms at audiophile dealers.

### Measurements

This is why a full set of meaningful performance specs, combined with a full set of accurate anechoic chamber measurements (made at 10 feet on-axis), and ample listening comparisons with several live musical instruments are so important for determining the true accuracy of loudspeakers.

A meaningful set of measurements should at least include frequency response (amplitude versus frequency), impulse response, step response, cumulative spectral decay (waterfall plot), and impedance versus frequency.

If such measurements are not available, and guaranteed-accurate performance

specs are missing, a serious audiophile interested in truly accurate reproduction should question why.

An accurate loudspeaker should possess an on-axis amplitude versus frequency response (without "smoothing") of  $\pm 1.5$  dB (with  $\pm 1$  dB preferred).

Likewise, an accurate loudspeaker should exhibit a near-perfect impulse response, devoid of a large overshoot and subsequent ringing. The step response should have a rapid rise in amplitude, followed by a smooth decay versus time, with few or no ripples.

The input impedance of a good loudspeaker should not drop below about 2 to 3 ohms nor rise above about 15 ohms over the audio range, and should be mostly resistive with low values of reactance.

Accurate loudspeakers should also exhibit minimal side lobes, all having intensities about 10 dB or more below the level of the on-axis radiation.

Any manufacturer who says that a full set of accurate measurements are essentially meaningless and that only listening sessions, without appropriate comparisons with live musical instruments, can determine the accuracy of loudspeakers should be held in suspicion. Indeed, both measurements and controlled listening comparisons with live musical instruments, e.g. piano, guitar, male and female voices, etc., are essential for determining the "true accuracy" of loudspeakers and the entire audio reproduction system.

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About John Dunlavy

John Dunlavy, MAES, FIREE, etc., is a well-known and highly-respected engineer and scientist with a number of patents to his credit, and 40 years at the forefront of audio innovation. John's special interest is loudspeaker accuracy, a notion he's been working on and talking about for decades. Agree or disagree with him, we can all learn something valuable about the world of audio reproduction, sitting at John's knee. That's why I've invited him to pen this Guest Editorial column for the past several months to provide us all a "short course" in acoustics and audio reproduction. I look forward (as always) to your comments.

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

## Conclusion

By Gary Reber

I believe a guaranteed accurate set of prerequisite measurements, as John Dunlavy has stated, is necessary as a point of reference. Unfortunately, there are no laws and/or regulations in the United States that require loudspeaker manufacturers to publish such, nor if published, preclude manufacturers from measurement manipulation. To be reliable, the measurements would have to be made exactly the same, in a prescribed, controlled environment using the same instruments and equipment. Thus, to a large degree, accuracy judgments tend to be based on the reputation the loudspeaker company has with respect to the accuracy of its published performance specs, as well as the accuracy of all its published measurements, etc. In the real world, such loudspeaker companies are nearly non-existent, and even if loudspeaker manufacturers published a set of measurements, the question posed is: "Are they disposed to reliable and/or consistently usable accuracy?"

I believe that any manufacturer that cannot represent and provide guaranteed accurate measurements of frequency response, impulse response, step response, waterfall response (all made anechoically at 8 to 12 feet on-axis), and impedance versus frequency should have any of their claims for accuracy questioned. While loudspeakers that do not measure accurately may sound musically good, satisfying, etc., they can never reproduce music with the audible accuracy of loudspeakers that measure truly accurate in all of the above mentioned categories.

Now, having said that, therein lies the dilemma: how does one know, beyond bringing to the listening session a lot of experience as a critical listener of both live and well-recorded acoustic music, what should determine the purchase decision?

There is no solution, outside of government consumer protection laws, that would require loudspeaker manufacturers to accurately measure and publish specifications according to a universal set of prescribed standards and practices. Still, that is no assurance that loudspeakers that measure the same will ultimately sound the same (though I have heard different company loudspeakers that have been represented to be accurate to actually sound quite similar in character in the exact same acoustical setting.) Beyond accurate measurements is what is referred to as the art of loudspeaker design.

I would encourage audiophiles contem-

plating purchasing "accurate" loudspeakers, whether on a first-time or replacement basis, to rely on extensive listening, preferably making comparisons with "respected for performance accuracy" loudspeaker products. Loudspeaker manufacturers with a reputation for designing and producing accurate loudspeakers sell various models within their product range at distinctive price points. An accurate entry-level product should be expected to sound virtually identical to the other products in the range, subject to the limitations of frequency response extension and dynamic range (the limit at which the loudspeaker can reproduce maximum SPL without audible distortion or driver failure) that each product is designed to reproduce. You should expect that increasing cost in such a line of accurate loudspeakers will buy you greater dynamic range capability and deeper bass extension. But otherwise the sonic character of all the products in the range should be nearly identical in the critical midrange and high frequency bands.

Audiophiles need to be armed with recorded material that represents the very finest recorded quality possible, but most importantly, material that they are familiar with, particularly the male and female voice, and familiar acoustic instruments. It is very difficult to divorce the "recording quality" from live performances, unless, of course, as John Dunlavy suggests, the comparison is done in an anechoic chamber, which is an unrealistic expectation for an audiophile to experience, when surveying the field of loudspeaker offerings with a "reputation for accuracy." At best, a potential purchaser should insist on auditioning loudspeakers in the same acoustical environment, whether at a showroom or in his or her home, where the loudspeakers will ultimately be positioned.

When auditioning loudspeakers always audition in two-channel stereo, rather than in multichannel discrete. Critically assess the performance quality of the main left and right loudspeakers, and center channel loudspeaker with one of the main loudspeakers. Ideally, use all five identical loudspeakers in a multichannel discrete home theatre and/or surround music system. The center channel loudspeaker must match perfectly the sonics of the midrange and high frequency driver output of the main loudspeakers. Critically appraise the response of the surround loudspeakers with the main loudspeakers, and ideally, listen for side wall and back wall matching and imaging between surround left and main left, surround right and main right, and surround left and surround right. Ideally, the surround center back should perfectly match the sonics of the surround left and surround right loudspeakers.

When visiting specialty retailers with showrooms, always assess the listening environment conditions, particularly the acoustical environment and the positioning of the loudspeakers relative to the listening position when auditioning. You'll want to duplicate as closely as possible these conditions at each location you audition in.

Reviews can be used as guides for understanding loudspeaker design approaches, enclosure systems, diffraction approaches, driver technologies, and electronic crossover system integration, but I do not believe that reviews accompanied by measurements have thus far served as a reliable source for the measurement accuracy needed to be assured of musical truth. However, reading reviews over time can provide experience in judging what parameters the designer believes are important to the accuracy of their loudspeaker designs. Then, several designs that promise accuracy can be compared using the familiar test material that ultimately ends up being the decisive factor as to what loudspeaker you purchase.

Once you have narrowed your choices down to a couple or three loudspeaker models, convince the retailer that your final decision will be dependent on your ability to audition the loudspeakers in your home listening environment.

Loudspeakers continue to be the least accurate component in a music or home theatre system, exhibiting the greatest range of sound differences. Thus, such differences mean that no two loudspeakers can be truly and equally accurate, though more accurate loudspeakers tend to sound more similar.

The bottom line is to gain as much experience as possible to ascertain the "accuracy" of a recorded performance to the sound of the actual instruments in the performance—and to match those experiences as close as possible within your budget constraints. But remember this, just because one loudspeaker costs far greater than another, should not be reason to conclude that the more expensive loudspeaker is more "accurate" than the less expensive loudspeaker. Too often, audiophiles are swayed by appearances and the contrived or marketed stature of a loudspeaker product, rather than musical truth.

John Dunlavy has provided an invaluable service with this series of articles authored by him. He is, without question, one of the most respected and prestigious loudspeaker designers in all of history, who has always sought to attain audible accuracy in his loudspeaker designs. Thank you John, for so graciously sharing your knowledge with our readers. ■