

AES Boston Section Newsletter

AUDIO ENGINEERING SOCIETY

JANUARY 1999

In This Issue

• Bob Ludwig speaks about high-resolution mastering, beginning on Page 1. This two-part series will continue next month with observations on loudness and artistic choices.

• Tom Wethern and Alex Case comment on the 105th AES Convention in San Francisco. See Page 2 for their summary of our October meeting.

• Reservations are recommended for the joint BAES/ASA meeting at Faneuil Hall with the Boston Classical Orchestra on **January 10**. See Page 4 for details.

Looking Ahead

• David Griesinger will lead meeting on **Feb. 9**.

Ludwig on mastering: Keynote presentation from Parsons Expo

The November 11, 1998 meeting of the BAES coincided with the final event at Parsons Audio's Expo 98. Mastering engineer Bob Ludwig spoke with Mark Parsons and fielded audience questions in a wide-ranging, two-hour presentation. Excerpts follow, as edited by Michael Fleming and Mark Parsons.

BL: "I'm always trying to get what I think is the best sound. From a mastering engineer's point of view, it's easier to do your job if you have a high-resolution monitoring system in a high-resolution environment, because the speaker and the environment it's in have a marriage that never has a divorce—they're always together. We built what we tried at the time to make the acoustically most perfect room possible.... I've found that by having a high-resolution speaker it makes your artistic choices a lot easier because you're hearing it about as high definition as anybody on the planet is going hear it. Thus the choices that you make tend to sound good on all other systems. That might come as a surprise. You might think that, well, maybe it would only sound good [here]. I think it's true that as you listen to more and more of the high-end speakers, the closer and more neutral they all start sounding."

"A lot of times, there's a certain well known small speaker that a lot of people use. We have a pair of those, and I'll put it up so I can hear what the artist thought it sounded like. That speaker seems to put more reverb there than is actually there, because it's enhanced around 4k. And it has a certain thump that certain people like."

"I [also] use Grado Signature headphones, Stax Lambda, and a lot of Sennheiser 580's—you can wear them all day long. Using a Grado or other high-end headphone amp makes a tremendous difference. It can even make a Sony Walkman headphone sound like something that costs

\$300."

Question from audience: "As a mastering engineer, what format would you choose to receive as a mix master?"

BL: "I would think it would be either a Nagra or a Genex 88.2 done on a Pacific Microsonics." "The last Eric Clapton project came in on a 96k Nagra. Loreena McKennit's last two albums were recorded 96k on the Nagra. The Gypsy Kings: 96k. We just did Jewel, which was recorded 88.2...."

Audience: "Last year at this point you mentioned that you really wouldn't mind seeing a half-inch analog master."

BL: "Oh, that's like the air that I breathe. It doesn't even show up for me. Always."

Audience: "What format allows you to do the most?"

BL: "The thing that's best is to have that 88.2, 24-bit tape and a well-recorded analog tape on a really good analog machine like an ATR. Very often I'll go back and forth between the two of them."

"What really excites me is that now there's going to be the 24-bit multitrack. I can't wait until it's 96k, 24-bit. That's when it's really going to make a big difference to me."

"There are two edges to this question. One thing that's great is the fact that artists can for the first time really divorce themselves from professional recording studios, in the recording part of it. Natalie Merchant's last record was done in her house by her boyfriend, who was not that big an engineer. But they ended up making a spectacular record because they got a professional guy, Jim Scott, to mix the thing out in California. She was able not to worry about the time in the studio—the clock on the wall—and she

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Notes from '98 Convention

By TOM WETHERN

Once again we audio engineering types gathered to discuss the state of the art. Since this year is divisible by two, it was the West Coast's turn to host. Although there were no clearly revolutionary technologies or products introduced at the Moscone Convention Center, a number of areas in our field saw advances of various forms. Your humble chair and vice-chair reported their observations at the 15 October BAES meeting.

One topic of much discussion was the IEEE 1394 protocol, also known as Firewire™. With several different bit- and sample-rates in the studio environment, music instrumentation (MI) design engineers would certainly welcome a universally accepted platform for passing around audio data. The 1394 standard looks to be a good candidate, due to large bandwidth and increasingly reasonable cost to implement.

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Bob Moses of PAVO Inc. presented a thorough summary of the different established protocols for 1394, along with a roadmap for future development. Since 1394 is a serial bus, there was a general call to maintain the S400, or 400 Mbps, standard industry wide so as not to slow down the data stream. Even higher data rates, as well as longer maximum cable lengths, are also in development. That much-hyped term "Convergence" is also used by some in conjunction with 1394, as they envision that it may serve as the common link between musical instrumentation gear, consumer electronics and computer hardware.

Of course, multichannel production received attention in a number of papers and a workshop. Questions on how to place microphones in recording, how to configure the studio to monitor these multiple channels, whether to plan for diffuse or direct-radiating surround speakers and what speaker placement works best were all debated, if not resolved. Maybe one day there will actually be a DVD audio standard....

Digital audio amplification is also getting a lot of attention, primarily from manufacturers hoping to push their silicon. But real advances are being made. As the noise floor continues to drop in many manifestations, digital amplifiers may soon be of a quality comparable to traditional analog amplifier designs. And due to the high efficiency (hence lower power consumption and less heat generation), we may see more and more products amplify the audio signal in the digital domain.

Perhaps the most captivating paper presentation came from F. Joseph Pompei of the MIT Media Lab on "The Use of Airborne Ultrasonics for Generating Audible Sound Beams." Pompei's technique uses a parametric array of transducers to generate a very directional beam of radiated sound. While he openly acknowledged that the current technology produces limited low frequency output and relatively high distortion, Mr. Pompei ended his paper with a compelling demonstration of his prototype. He aimed the array at various points in the room, and the perceived sound (footsteps, birdcalls, broken glass) seemed to radiate from these reflected locations and not the source itself.

Something old and something new, something FET and something tube...

By ALEX CASE

The spotlight at the recent AES Convention in San Francisco (September 26-29, 1998) was clearly focused on so much digital gear: new and improved digital consoles, ever more capable digital audio workstations, innovative digital interface standards and countless digital effects wonderboxes. But some analog efforts persist. Transformers are still finding their way into equipment, and a few renegade manufacturers are still going to the trouble and expense of keeping some analog circuits discrete.

Modern day noise floors are being combined with old-fashioned high audio standards at prices that are in fact admirable. The console market ranging from \$10,000 high quality bargains to \$1,000,000 superstars still exists, thank you very much. The \$100,000 to \$300,000 large format console is still kicking—discrete components, large knobs and very wide bandwidth. Manufacturers aren't going to sell thousands of them per year, but they are making them anyway.

Plugged into the mike preamps of these sweet consoles is an ever-growing set of microphone possibilities. The large diaphragm condenser microphone under \$1,000 is perhaps the most crowded single segment in the pro audio market. All the established microphone manufacturers have a presence here. And some young upstarts—new microphone manufacturers—are creating outstanding products that will keep the old guard honest.

Tube microphone versions are also available for a small premium (from a couple hundred to a couple thousand dollars more). It is a trend consistent with the consoles mentioned above: redesign old products using modern day components yet remain true to some time-proven aesthetics. The results tickle the ears.

The outputs of these consoles will still find a welcome friend: the analog tape machine. Who'd have thought? For multichannel mixes, the half-inch, two-track analog machine matures into the two-inch, eight-track machine. Fans of continuous, analog waveforms rejoice...and buy, buy, buy.

“The only universal bad habit is using DATs for mastering.”

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could do her vocals a billion times if she wanted to. That's the advantage of doing things with home gear: time. That's a huge, huge benefit.”

“Every engineer should have a big toolbox at his disposal, and do whatever is appropriate for the project. If you're mixing a grunge project, or a lot of projects I can think of, a digital console may not be the best thing. But, talking to people like Mariah Carey, Michael Bolton, Celine Dion, lots of artists where the music has a lot of spatial aspect to it and is very natural sounding, the digital consoles are awesome, just awesome! The analog consoles can't come close.”

“The crosstalk that's in an analog console just goes away when you switch to digital. The thing that people complain about with bad digital—lack of reverb and everything like that—it's the opposite in the console world where you're using professional specifications [with] consoles going out to 48 bits internally. The reverb is way better, in my opinion, in a digital console.”

“When you get to some of the lesser, cheaper consoles, you have to start watching out more carefully about what's going on, because the signal processing may not be as much like an Oxford or something like that. But a good engineer running one of those things can get spectacular results with them, I must say. Frank Filipetti doing that James Taylor record on an 02R....”

“The only universal bad habit [brought by clients to Gateway] is using DATs for mastering. Almost everybody's got at least 20-bit converters now. They're very easy to find....” “The whole concept of having something with that dynamic range and dithering it down to 16 bits in order to give it to me so that my consoles will bring it back out to 24 [bits] just seems idiotic. The proof is in the pudding. When a tape comes in 24-bit, if you A-B it with a DAT, the resolution always sounds better, the echoes sound better. It sounds more analog, if you will.”

“What do I like to send to the pressing plants? The real answer to that is we don't

get a choice. We send out whatever the record company orders. But we're glad to see when they ask us to send out a good old PCM-1630. The reason for that is that it has a computer analyzer that can verify that it has no errors, that it has no concealments of the data. More than that, it can't be double-speed glass mastered, because it's off a video deck. The DDP is good as well. The thing I don't care for is sending CD-R's to the plant.”

“One thing I always say is, “Never turn your back on digital.” (Laughter.) The fact that it worked a hundred times in a row is no guarantee that it will work the hundred-and-first. That's why computer verification is very necessary, or listening to it.”

“You have to use your ears. Get the highest resolution you can, which for a lot of people means great headphones. Very carefully listen to the originals, listen to the copies, make sure that nothing's getting lost.”

(Watch for more excerpts next month. You'll also find Expo material at www.paudio.com.)

The University of Massachusetts-Lowell announces an adjunct faculty position vacancy in Sound Recording Technology.

Responsibilities include teaching Recording Technology II during the Spring semester (January-May, 1999). The 2.5 hour per week course focuses on operational technologies and audio theory. Students will have had acoustics, introductory physics, two semesters of calculus and a background in recording production and basic audio theory. They will be taking an introductory electrical engineering course simultaneously.

Please submit a letter of application outlining qualifications, interests and experience and a resume to: Dr. William D. Moylan, Coordinator, Sound Recording Technology, Department of Music, University of Massachusetts-Lowell, Lowell, MA 01854.

- Phone: (978) 934-3850.
- FAX: (978) 934-3034.
- E-mail: William_Moylan@uml.edu.

Who's who: San Francisco Convention paper presentations from New England

Timothy B. Thompson, Young Chang Research and Development Institute, Waltham, MA.

“Building an Audio Wide Area Network.”

Robert Adams, Khiem Nguyen, and Karl Sweetland, Analog Devices Inc., Wilmington, MA.

“A 112-dB SNR Oversampling DAC with Segmented Noise-Shaped Scrambling.”

Mark Moulton and David Moulton, Groton, MA.

“Codec Transparency, Listener Severity, Program Intolerance: Suggestive Relationships between Rasch Measures and Some Background Variables.”

F. Joseph Pompei, MIT Media Laboratory, Cambridge, MA.

“The Use of Airborne Ultrasonics for Generating Audible Sound Beams” and “An Efficient HRTF Model Based on Interference from Delayed Energy.”

Steve F. Temme, Listen Inc., Boston, MA. “Virtual Instruments for Audio Testing.”

Victor B. Ganjian and Douglas Preis, Tufts University, Medford, MA.

“Reproduction of Loudspeaker Listening Room Sound through Headphones: Measured Coherence Analysis, Cross-Spectra, and Digital Filter Impulse Responses.”

Eric D. Scheirer, MIT Media Laboratory, Cambridge, MA.

(with Lee Ray, Joint E-mu/Creative Technology Center, Scotts Valley, CA.) “Algorithmic and Wavetable Synthesis in the MPEG-4 Multimedia Standard.”

David Griesinger, Lexicon, Bedford, MA. “Speaker Placement, Externalization, and Envelopment in Home Listening Rooms.”

Paper Session Chairs

Robert Adams, Analog Devices Inc., Wilmington, MA.
Conversion Technology (Session D)

Bill Gardner, Wave Arts Inc., Arlington, MA.
Spatial Perception and Processing, Part I (Session I) and Part II (Session K)

**Next Meeting:
Sunday, January 10**

Live concert/recording session followed by dinner discussion

By **DICK CAMBELL**

The Boston Classical Orchestra has invited us to use its January 10 concert as an experimental surround recording session.

At least three different microphone arrays will be employed in making a multi-track recording for later mixing and pre-

sentation. David Moulton will discuss some of these techniques as part of the pre-concert lecture.

Following the program of music by Mozart, Schnittke and Haydn, we will meet with some of the BCO principal musicians over dinner to discuss the impact hall acoustics has on musical performance.

Pre-concert Lecture: 1:50 p.m.
Concert: 3:00 p.m.
Dinner meeting: 5:30 p.m.

Concert at Faneuil Hall, Boston.
Dinner at Durgin Park (in Quincy Market, adjacent to Faneuil Hall).

Please complete and mail a photocopy of this form with your check

I WOULD LIKE MAKE THE FOLLOWING RESERVATION FOR SUNDAY, JANUARY 10, 1999:

Name _____ Address _____ Phone _____

collect tickets at the door after 1:30P.M. _____

Pre-Concert Lecture at 1:50 P.M. (free with ticket) Email: _____

Concert at Faneuil Hall 3:00 P.M. Number: _____ \$ _____

Side \$13 Center \$22 Reserved \$30

Dinner Meeting at *Durgin Park* 5:30 P.M. Number _____ \$ _____

\$24 inclusive of tax and tip (cash bar) Total \$ _____

Seating
Limited to
40

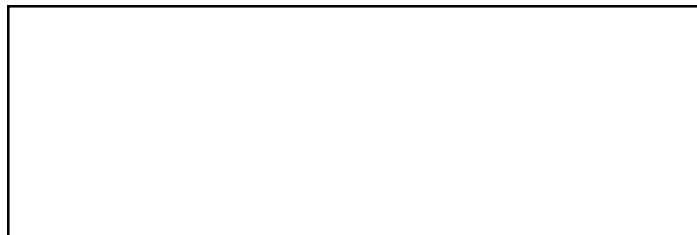
Roast Stuffed Turkey
Schrod
Vegetarian Pasta

PLEASE
 TICK

Make check payable to **GBC/ASA** and mail promptly to Rebecca Schuman, Acentech, Inc, 33 Moulton St., Cambridge, MA 02138. Absolute **deadline** for receipt is **January 5, 1999**.



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