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FRONT OF HOUSE
THE NEWS MAGAZINE FOR LIVE SOUND

JANUARY 2007 Vol. 5 No. 4

Go to Table of Contents
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Life, Death and Iron Maiden

Iron Maiden lead singer Bruce Dickinson.

Concert sound isn't usually a matter of life or death, but leave it to Iron Maiden to be the exception. The iconic metal band's recent "Matter Of Life Or Death" world tour proves that after more than 30 years they haven't slowed down a tick, and still demand a P.A. that permeates sold-out arenas with full-range output, while also upholding the first commandment of metal: Make it Loud.

"Life Or Death" kicked off stateside Iron Maiden-style, marking the first concert tour handled by the new U.S. operation of ML Executives. The long-time U.K.-based hire company, owned and directed by Gary Marks, dispatched line array technician Michael Hackman to oversee the house system during the tour's journey from the U.S. to Japan and then home to Europe, with concluding dates at Earl's Court in London. For the rest of the story, see page 16.

InfoComm Announces Intent To Set International Standards

FAIRFAX, VA — InfoComm International has announced its intent to become a recognized standards-setting body and to seek accreditation through the American National Standards Institute (ANSI). Standards will be presented for adoption by the International Standards Organization (ISO).

"Standards development is an integral part of the development of professions seeking to be recognized as legitimate and distinct," said Randal A. Lemke, Ph.D., executive director, InfoComm International. "As the AV industry works closely with industries that use standards, such as architecture, IT, *continued on page 8*

EAW Offshoring Manufacturing

Cox Confident in Ongoing Quality

[When we first got word that Jeffrey Cox, late of Cox Audio Engineering and the man most responsible for bringing line-array technology to North America (Say what you will, but Cox is the first one to look at a line array and say "Hmmm, that French dude may just be onto something here."), was joining Loud Technologies to head up the EAW brand, we really expected more communication from the land of Mackie. Cox is not one to mince words. So it was not really a surprise after FOH *reported on EAW's transfer of manufacturing operations to Asia — and the resulting uproar in our online forums when the Loud suits would not talk about it — that Cox was the one to pick up the phone and give us some real information. Much of what is here has not been published elsewhere. –ed.]*

WHITINSVILLE, MA — If you have been involved in live audio for any significant period of time, there are a few companies that you probably think of as forming the foundation of the business in the U.S. One of those "foundation" companies, Eastern Acoustic Works, better known as EAW, has joined that steady stream of U.S. manufacturing concerns packing up their domestic operations and shipping them off to Asia. Although jarring (some 100 EAW manufacturing employees have lost their jobs due to the move), this cannot be a surprise to anyone who has been following EAW news over the past few years. The company that was started by Ken Berger and Kenton Forsyth (the "KF" in all of those speaker model numbers) was acquired by Mackie in 2000, and just a few years later, in 2003, Mackie, now operating under the Loud Technology corporate umbrella, moved its manufacturing operations offshore. The greater return on investment that resulted made it all but inevitable that other Loud brands would follow Mackie to Asia.

FOH spoke with Jeffrey Cox, EAW VP, about the move, and what it would mean for the future of EAW and what customers should expect. Cox strongly stated his belief that the move would be a good one for EAW customers.

"The first thing people should understand and be confident of is that the quality of EAW products will not degrade," said Cox, noting that only actual manufacturing was moving offshore. "All of the components are exactly the same and are coming from the exact same suppliers as they always have, whether that means drivers from Italy or birch plywood from the Baltics. It's all coming from the exact *continued on page 10*

Mick Jagger's All Lips — And No Wedges

Mick Jagger has finally made the switch over to using PMs exclusively, but the rest of the band still likes their wedges. Mike Adams sat down with *FOH* before a cold Chicago show and discussed his philosophy behind mixing for both PMs and wedges, how to get 40 stereo zones on one stage — Keith likes to move, and he likes his stereo mix — and how to hear it all in his own PMs. To get the answer in his own words, check out page 24.

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January 2007, Vol. 5.4

TABLE of CONTENTS

WHAT'S HOT

Features

Columns

Departments

Feedback

Of Red Books and Bit Rates

[*Steve La Cerra's comment about avoiding sample rate conversion in last month's On The Bleeding Edge brought several responses from readers who have a, um, different point of view. This letter is the least nasty of those we received. -ed*]

I read Steve La Cerra's opinion of "sample rate and bit depth" and think it is a little to "anecdotal."

I am an "old roadie," and a mastering engineer and think that recording at the highest practical resolution is worth the trouble.

Steve's opinion is very basic and a little out of date.

In my life I get to chat with lots of mastering engineers, and they all want the highest resolution available.

Sincerely,
Greg Lukens

Steve La Cerra responds:

I can understand and agree with the argument that recording at 44.1 kHz/16-bit is not the *best* resolution for digital audio. Personally, I'd rather record at higher rates. However, the fact remains that the "red book" CD standard is currently 44.1/16 and is not likely to change anytime soon. You may argue that DVD-A and DTS Audio provide higher resolution (which they do), but unfortunately those are not mainstream audio formats. Most of our work ends up on CD at 44.1/16. Does that mean that you should not attempt to make the best possible recordings? Of course not, but my experience has demonstrated that sample rate conversion is to be avoided whenever possible. It results in audible artifacts that do not exist in the source recording. You can try this on your own by recording a 30-second snip of audio, converting the file and listening to the results, which can easily be heard.

Corrections

We hate it when we make mistakes, and especially hate it when said mistake involves someone's name. But we screwed the pooch last month and printed Widespread Panic FOH guy Chris Rabold as Chris Raboid. Luckily, he had a sense of humor about it. After we apologized he wrote back:

Totally understandable my friend, I've spent my whole life getting people to either spell or pronounce my name right.
Later.
Christine Rainbow (circa first grade)

Our official apologies to Christine, er, Chris RABOLD.

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IT'S USUALLY THE LITTLE THINGS THAT COUNT

By Bill**Evans**

We have trod upon this ground before, but I keep seeing things that make me remember that it is not usually the big expensive whatever that sends a show south. It is usually something small that just got overlooked. Here are a few recent examples.

The first was a bonehead move on my part. I was playing out and trying to get a good audio recording of the gig for demo purposes, and do so without having to ask the house sound guy to change anything he was used to doing or use any unfamiliar gear. A lot of thought and wiring went into building a rack that could feed the house, provide our PM mix (which actually freed up the house guy who had been running mains and two monitor mixes from a side-of-stage position) and feed an Alesis HD24. Got it all done, but failed to really think through the internal routing of the mixer until — of course — I was driving home from the gig. So I ended up with a pretty unusable recording. At least I know how to do it right for next time. I think. Ask me when I get home from that one.

The second example was a sound company whose owner reads *FOH* who called and told me about a gig where they were having issues with the high-mid line array but not the subs. His crew assumed that the problem must be the brand new, very expensive cable looms for the array and spent several hours troubleshooting that area only to find…nothing. The owner asked if the drive rack had been checked and was assured it had. It turns out that most of the drive rack had been checked — but not the custom I/O panel, where a $4 XLR connector had one conductor disconnected, and that screwed everything.

Finally, and this has little — OK, nothing — to do with audio, but it is just too good to pass up.

Around the corner from my house is a fairly exclusive gated golf course community that has 20 or 30 big palm trees out front. The last two Christmas seasons they have decorated them the same way, much to the delight of those of us whose minds are perpetually gutter-ridden. You know how at the top of a palm tree between the trunk and the fronds there is an area where the old, dead fronds have fallen or been cut off, leaving a kind of brown knob? Well, this particular variety of palm has a very pronounced and rounded "knob" under the fronds. (Some of you can no doubt already see where this is headed. Heh. Headed.)

They light those palm trees with what is called "net" lighting. Not a strand of lights, but a net that wraps around the trunk. They use a white light net on the trunk and a red net for the knob. There are no lights actually in the fronds themselves, and there lies the "little thing" problem here.

Another similar setup a few miles away does have a few strands of lights in the fronds, and it looks OK. Even if you miss those strands at first glance, these palms have a "knob" that is far less pronounced, and if you mistake them for anything, it would be a bunch of upright giant wooden matchsticks.

But at our gated enclave, it's the other kind of tree and no lights in the fronds. Well, as you approach the area on a very dark street it is very easy to miss the fronds entirely, in which case what you see is, well, a forest of phalluses. Tall ones, thin ones, thick ones, short ones, curved ones — something for every taste. But make no mistake, these do not look like palm trees in the dark. In fact, after seeing them lit up for two years, it is hard not to see the same forest in the daylight. A few strands of lights in the fronds would have made their intentions much more clear. Or maybe this is the effect they were after. You never know with squints.

Besides the already stated "it's the little things that can make or break ya" idea, there are two things to keep in mind here. First, this may be the only time in history that a sound guy has issued a call for more lighting and, finally, never trust the details to a lighting designer.

Hope your holidays were busy and good and you are ready for a rockin' 2007. Let's have fun out there…

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UNLV Builds New Student Union with Community Loudspeakers

LAS VEGAS — The 28,000-member student body of the University of Nevada, Las Vegas eagerly awaited the opening of its new Moyer Student Union this fall. The new 135,000 square foot facility is an upgrade of the rather small student union of the past. The new building includes a dining court, TV lounge, office space and rooms for studying and socializing, as well as a 300-seat movie theatre, with Community's I/O5 and Solutions loudspeakers used throughout.

The main areas and food court are served by music and paging systems centered around Community's compact, two-way, indoor/outdoor I/O5. To ensure consistent coverage, speakers are spaced moderately throughout the corridors with one I/O5 every six to 10 feet on alternating sides.

The Student Union's new movie theatre, with high definition projection on a 20-foot by 11-foot foot screen, features audio from Community's high sensitivity Solutions Series loudspeakers including the full-range SLS960 horn-loaded loudspeaker system and SBS25 subwoofer. Time-aligning the subwoofers to the main speakers, with a minimal amount of EQ to compensate for the somewhat flat contour of the room, allows the SLS and SBS systems to perform to their full potential.

The UNLV student union movie theatre, with Community loudspeakers.

Founder, Chairman of Outline Audio Dies

Guido Noselli, founder and chairman of Outline.

BRESCIA, ITALY — Guido Noselli, founder and chairman of Italian pro audio manufacturer Outline, died Friday, December 1, 2006.

After living as a musician, including a stint with the Araldi band, Noselli founded Outline in 1973. Since that time, Outline has become an international provider of live sound reinforcement.

According to a statement released by Outline, "He is no longer physically with us, but will live on in his teaching, his example and the criticism — inevitable, but always correct — which he lovingly dispensed for his whole life."

Guido Noselli was 60 years old.

Rhode Island Theatre Refits, Reopens

WOONSOCKET, RI — The Grand Hall of the historic Stadium Theatre in Woonsocket, RI recently received a new sound reinforcement system featuring a selection of EAW components, including AX Series full-range loudspeakers, EAW Commercial CAZ Series power amplifiers and an MX8750 digital signal processor. The system also includes a Mackie Onyx 4880 house mixing console.

After being shuttered for more than 20 years, the Stadium Theatre Foundation raised the necessary funds, resulting in the 2001 grand re-opening of the venue, which has been completely restored. Currently, the Stadium Theatre hosts more than 90 events a year, ranging from full-scale concerts to theatrical productions to lectures.

Earlier this year, the foundation sought a sound reinforcement system to replace the previous system serving the Grand Hall, a shoebox-shaped room with approximately 1,100 seats split between the main floor, balcony and side boxes. The system development team included Stadium Theatre tech director Dan Peloquin and Providence-based sound/production company ATR/Treehouse, as well as Mary Cook, Scott Jordan and Joe Fustolo of the EAW Application Support Group (ASG).

The team formulated a new house system with main left and right loudspeaker clusters made up of single EAW AX396 full-range loudspeakers (with a 90-degree by 60-degree coverage pattern) above two EAW AX122 dual 12-inch loaded subwoofers that feature a trapezoidal cabinet. The clusters are flown with a hardware solution provided by rigging specialists Polar Focus.

The system's new Mackie Onyx 4880 console located at the house mix position.

The new system also offers another single AX396 center loudspeaker to provide voice/spoken word reinforcement, mounted horizontally. In addition, four EAW UB12S compact loudspeakers were also specified to provide frontfill to the first few seating rows.

All loudspeakers are driven by EAW power amplifiers rack-mounted in a remote upper floor room adjacent to the stage area, including seven model CAZ2500 amplifiers dedicated to the house loudspeakers (bi-amp mode) and subwoofers (bridged mono). A single CAZ1400 amplifier, also in bridged mono mode, powers the four UB12 frontfill loudspeakers.

An EAW MX8750 digital signal processor joins the amps in the rack. Four output channels of the eight-channel unit are dedicated to left and right full-range loudspeakers (two channels each), and two more channels provide mono-summed output to the center loudspeaker. Another mono-sum output feeds the subwoofers.

The system's Mackie Onyx 4880 console, centrally located on the main floor at the house mix position, was selected for a variety of reasons, with ease of use and channel count topping the list. The Mackie board also offered a price that fit the budget requirements for the project.

Given the extreme differences in expertise on the part of its users from night to night, the console also had to be operator friendly, while still meeting rider expectations. "In general, this system is very easy to operate," concludes Peloquin.

Bigger Talent, Bigger Speakers for Club

LIBERTYVILLE, IL — Creative Soundz (Mount Prospect, Ill.) recently brought big sound to the small town of Libertyville, Ill. with the help of EV's new XLD line array system.

For years, Austin's Saloon has attracted many regional acts with the promise of sold-out crowds as hungry for rock as they are for Austin's famous hamburgers. Now, with the opening of Austin's new increased-capacity live room, the level of entertainment has accelerated to attract not only regional artists, but also national talent. Since a production equipment update was necessary, Austin's sought out Creative Soundz to design and install a new audio system. After working closely with Electro-Voice to address Austin's projected requirements, Creative Soundz arrived at the EV XLD as a solution.

The new rig, comprised of six flown XLD boxes and three ground-stacked QRx 218 subs per side, was put to task right off the bat for a double bill featuring southern rockers par excellence Jimmie Van Zant and Jackyl. Greg Schenk, of Creative Soundz, designed and installed the system with John Orzel, president of Creative Soundz.

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Go to Table of Contents
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Megadeth Moves Monster Air

BERKELEY, CA — On Megadeth's "Gigantour 2," Thunder Audio used Meyer Sound's MILO curvilinear array loudspeaker. Piloted by FOH engineer Nigel Paul, the system used 32 MILO cabinets, divided into four clusters of eight each. Frontfill came from four UPJ-1P compact VariO loudspeakers, with groundstacked 700-HP subwoofers filling the low-end requirements. System engineer Keith Jex used MAPP Online Pro acoustical prediction software to figure out configurations for each venue, and he monitors the system with Meyer Sound's RMS remote management system.

InfoComm Announces Intent to Set International Standards

continued from front cover

telecommunications and more, it has become obvious that AV standards are necessary to grow the profession to the next level. InfoComm has already assembled a substantial body of knowledge through the development of its courses and Best Practices manuals, which makes becoming an ANSI Standards-Setting organization a logical next step."

The AV standards InfoComm intends to develop will focus on the physical measurements of systems performance, such as sound pressure levels and contrast ratios. The emphasis will be on system performance, not on individual product or technology standards. With these standards, designers can specify the output performance of systems and subsystems for customers, so that when the facility is put in use, system performance can be verified against these standards.

InfoComm will be establishing a Standards Committee, and Joe Bocchiaro, CTS-D, CTS-I, has accepted the position as Director of the InfoComm Performance Standards program.

Pearl Jam Become Converts to VENUE

FOH engineer Greg Nelson and the VENUE.

DALY CITY, CA — Pearl Jam has converted to Digidesign's VENUE live sound environment. The band has had a busy year, commencing with the release of their eighth studio album, *Pearl Jam*, in May, with the single "World Wide Suicide," and the band is also on a worldwide tour, playing large festivals (including the iconic Leeds and Reading Festivals in the UK) and dates throughout South America, Mexico, Canada, the U.S., Europe and Australia through the end of December 2006.

FOH engineer Greg Nelson worked with Rat Sound Systems — sound providers who supply audio systems for many tours in the U.S., Canada and Europe — to integrate VENUE into the Pearl Jam tour after seeing the system in action with U2 and Tom Petty.

Says Nelson, "I really got excited after we did some dates with Tom Petty and Robert Scovill [*FOH engineer and Digidesign's live sound market manager –ed.*] let me play around with his D-Show console and its wide array of processing. It was simple to learn and very easy to use — I had 90 percent of the console figured out after about 20 minutes during a run-through one day. I played with it for about half a day, then did a show."

"VENUE has made a noticeable difference in my mix," Nelson says. He attributes this difference to the multitude of tools available in the console, and also praises the system's reliability on a rigourous touring schedule. During one particular stretch of outdoor shows, the heat was intense, yet VENUE remained cool. "The first shows I did with VENUE were at the Gorge in Washington," recalls Nelson. "It was 110 degrees the first day and 116 degrees the second, and the board performed fine. It didn't even get hot! It has traveled to Europe and braved the roads of the old Eastern bloc and had no problems."

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Dirk Durham
Front of House Engineer for Toby Keith

The Toby Keith Big Throw Down II tour audio crew; L-R: Ryan Reynoso, Monitor tech; Russell Fischer, System Engineer; Dirk Durham, FOH engineer; Earl Neal, Monitor Engineer; John Brawner, System Tech.

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Heavy Metal Haven Hosts Rapper

HELSINKI, FINLAND — 50 Cent performed two nights, in front of 17,000 fans, at Helsinki's largest venue, the Hartwall Arena. Helsinki might be the capital of Finland, and Finland might be Europe's heavy metal HQ, but that didn't stop 17,000 excited Finnish rap and hip-hop fans. Since 50 Cent was not on tour, the Hartwall concerts were a one-off event, so his production used local services, calling upon Akun Tehdas, Finland's leading equipment rental provider, to supply all 50 Cent's sound requirements. "This was a typical large scale event for us," said Timo Liski of Akun Tehdas.

The company had just taken delivery of their brand new J-Series line array system from d&b audiotechnik in Germany. Having already attended their J-Series training in the real world environment of Stuttgart's Martin Schleyer Halle, Liski was keen to show Finnish audiences what it could do.

"This was a concert of very high sound levels," he began, "especially in the low end. We rigged just eight J-SUBs a side to provide the kind of powerful low end this type of act needs. I must confess at first I thought we should put in some d&b B2 subwoofers as well, but when you stack the J-SUBs four high it takes them down to 30 Hz, so there was really no need. There was definitely enough energy, -3dB to the main rig, and the engineer, Bill Barnett, said he had lots of headroom."

Barnett concurred. "Yeah, with 50 Cent there's a lot of 808 bass sound in there. Normally I find I have to pull 50 Hz or thereabouts, and I don't recall having to do that in Helsinki. In fact, low end was really good, it was rattling anything that was loose. I saw empty Coke cans jumping around."

So what was it like using a foreign P.A. company? "It was very much situation normal for me. Akun Tehdas were no different from any other professional audio rental company; they did a great job."

The Hartwall is relatively small by arena standards. "We rigged 10 J8s and two J12s a side," said Liski. "The out-fill was nine Q1s at a 45º angle to stage, then four Q7s as a near fill along front stage. The Arena is quite tight vertically, it is just 21 meters to the back of the hall, but it is very steep. The predictive software for line array configuration proved perfect and the coverage was remarkably uniform. Bill provides a very solid mix with vocals firmly placed. Energy is high; I measured a steady 103/104 dBA (Slow) with +4 to +5 dB on the peaks."


Engineer Bill Barnett mixing the 50 Cent Helsinki concert.

"This system was especially good for getting the vocals in the mix," concluded Barnett.

EAW Offshoring Manufacturing

continued from front cover

same factories. The only change is that now the components are being shipped to China for assembly. We have our own Loud staff on the ground in China watching every process and assembly to confirm for ourselves that it's right. The factory is state-of- the-art. This isn't some rustic, dirt road facility. It's mind-boggling!"

Cox was especially adamant about any metalwork or rigging components. "Any parts that relate to rigging are and will continue to be made in the U.S. I've spent 30 years in this industry, and I know how important those parts are."

Cox also said that plans to make this move had been in the works for much of 2006. EAW is keeping engineering, product development, prototyping and some build-to-order capability at the Massachusetts HQ. The upper-level engineering staff in the U.S. and Cox are all personally signing off on every process behind the building of every model coming out of Asia. That group includes top EAW engineers Kenton Forsythe, David Gunness and Jeff Rocha as well as Cox.

"When you consider that every single speaker product has to be recreated from our CAD database precisely and exactly, and three samples of each have to be sent to Whitinsville for our careful scrutiny and evaluation, including sonic mapping and analysis, and each one has to be signed off by five of us right down to how the polyfill insulation is stapled, how deep the countersinks are, or how much "splatter" per square inch the paint finish has, you'd begin to understand just how seriously we take this."

According to Cox, another benefit of the move is the expanded prototyping capability at the Whitinsville facility. "From now on we have a dedicated crew of manufacturing staff that are responsible for two crucial functions of EAW; Prototype development and Custom BTO Product manufacturing. This is where our ability to be fast on our feet in development and specialty Custom work will really be enhanced." Cox went on to say, "We are taking the best of the tools from the manufacturing floor and moving them into the main building where they will be used in our world-class shop. There are so many products and ideas that we're pushing through the system right now, that it's terrific to have this dedicated setup at our disposal and not sharing with production."

Cox also revealed a new capability that this move will provide to EAW, one that has gotten lost in the noise and that has not been reported elsewhere. Part of Loud's move to Asia and a more global focus has meant the loading of huge warehousing facilities in Europe, Asia and the U.S. The benefit, in addition to the obvious saving in manufacturing costs to joining the larger Loud model, is that EAW will be able to warehouse large numbers of cabinets at several locations around the globe, which should result in the ability to ship product much faster, and in many cases immediately, upon order.

"If we get an order for 32 KF760s, or 32 730s, or 32 SB1000s, or any mainstay product, we'll be able to ask, 'would you like those in your warehouse the day after tomorrow??' That is something that we have never been able to do before and a claim that, I believe, no one else in the industry can make." Cox noted.

Cox closed with a request for audio customers: "Do you think, even in our most irrational mind, we'd even consider making a decision and move as formidable and substantial as this without carefully considering every single bit of minutia and looking at every aspect and potential, without considering how it could potentially negatively impact our customers and us? Do you think we're freakin' crazy? This is huge, and it's being handled as huge. This is a massively competitive business, and we want every advantage in our court. And, trust me, we're not done stacking the deck."

FOH has also learned at presstime — through separate channels — that Loud senior vice president and EAW co-founder Kenneth Berger has resigned.

On The Move


Dino Virella

AKG Acoustics has taken on Dino Virella as their new national sales manager in the United States. Virella will be responsible for advising U.S. sales representatives and customers on AKG's microphone and headphone solutions.


Stephen Solberg

Coffeen Fricke & Associates, Inc., in Lenexa, Kan., has added Stephen Solberg and Jill Elmers as shareholders in the company. Stephen joined CFA in 2001 as an acoustician and AV system designer. Jill joined CFA in 1993 as an AV system designer.


Jill Elmers

Digital Audio Denmark has joined Las Vegas Pro Audio, a division of TransAudio Group. Digital Audio Denmark is now part of a roster that includes ATC studio monitors, Daking electronics, Alta Moda signal processors, Enhanced Audio mic mounts, Pauly Superscreen pop-filters and SoundField surround-sound microphone systems.

Hear Technologies has appointed Marketing Concepts of Dallas, Texas as the representatives for the Hear Technologies line of pro-audio products. Marketing Concepts will cover the states of Texas, Oklahoma, Louisiana and Arkansas for Hear Technologies.


Paul Bauman

JBL Professional has appointed Paul Bauman to the position of Director, Tour Sound Product and Application Engineering. Bauman has more than 22 years of professional audio and global touring industry experience.


John Pellowe

Meyer Sound has hired live sound engineer John Pellowe in the role of consultant engineer to work closely on installations of the company's new Constellation electroacoustic architecture system.

David Bock, designer and co-founder of **Soundelux Microphones**, is acquiring the rights to the Soundelux Microphone company. This new acquisition, scheduled to be finalized in early 2007, includes the use of the Soundelux brand name, all of the microphone design and manufacturing rights, all microphone model numbers/designations and current inventory.


Ray Tantzen

Symetrix, Inc. has appointed Ray Tantzen to the position of product and training specialist/field engineer. While he will work with all of the Symetrix brands, his focus will be on the growing SymNet line of Network Audio Solutions.

SPECIAL NAMM PREVIEW

Audio-Technica AT2010 Handheld Condenser Mic

The Audio-Technica AT2010 cardioid condenser vocal microphone is designed to bring the sound of Audio-Technica's 20 Series to the stage. It features the same 16 mm low-mass diaphragm found in the critically acclaimed AT2020 side-address studio condenser, in a more rugged body. The AT2010 provides an extended flat frequency response (40-20,000 Hz) with superior transient response resulting in smooth, natural sonic characteristics. The AT2010's fixed cardioid polar pattern allows isolation of the desired sound source thereby reducing pickup of unwanted sounds from the sides and rear. The mic is able to handle extremely high SPLs (136 dB) and has a wide dynamic range (113 dB); its multi-stage grille offers excellent protection against plosives and sibilance without compromising high-frequency clarity. MSRP is $169.00 (estimated street price of $99.00). Booth 6740

Audio-Technica • 330.686.2600 • www.audio-technica.com

ISP Technologies High Definition Line HDL4215 System

ISP Technologies HDL4215 speakers are a four-way line array box. In order to achieve uniform and extended high frequency response with precise HF horn geometries, three different box types are offered, depending on the vertical coverage required and their position in the line. The HDL4215N is a 12-degree vertical near-field box, the HDL4215M is an 8-degree vertical mid-field box, and the HDL4215F is a 4-degree vertical far-field box. The boxes cross over at 750 Hz from the lower midrange cones to four special midrange compression drivers. At this lower frequency the wavelengths are longer, which reduces the path difference at 45° to less than $^1/_2$ wavelength, resulting in a less audible dip. The 3 KHz upper crossover allows use of a 1.75 diaphragm driver, which features response past 18KHz. The extremely powerful neodymium magnets in these drivers result in a sensitivity of 108 dB @1W/1M out to 18 KHz. Four of these drivers per box are used to minimize distortion and maximize output. The 12° vertical coverage of the ISP boxes means fewer boxes per side are needed. A four box line covers up to 48° vertically. Booth 6669.

ISP Technologies • 248.673.7790 • www.isptechnologies.com

Martin Audio WS218X Sub-Bass

The Martin Audio WS218X is a sub-bass system designed to provide maximum bass impact and definition for theatre sound systems, club sound reinforcement and special effects sub-bass applications. Designed for use with large scale Wavefront and Blackline systems, the WS218X features twin 1000 watt 18-inch (460mm) drivers capable of reproducing low frequencies down to 35Hz. Each driver employs a magnet structure and suspension engineered for maximum linear excursion along with high temperature four-inch (100mm) voice coils. The WS218X produces a high power output of 136dB continuous and 142dB peak. The birch ply cabinet is fitted with six pocket handles and four 4-inch (100mm) castors for easy deployment. It also features large area porting to reduce air noise. Hall P.

Martin Audio • 519.747.5853 • www.martin-audio.com

Shure UHF-R Wireless

With 2,400 selectable frequencies across a 60 MHz bandwidth, Shure UHF-R allows up to 40 preset compatible systems to be operated per band. Up to 108 systems can be put to work using multiple bands. Complementing this expanded window of operation is Shure's Advanced Track Tuning Filtering Technology, which shifts onboard RF filtering within selected frequencies to maximize both compatibility and isolation from interference. UHF-R is outfitted with automatic frequency selection with group scan, infrared automatic transmitter sync and smart menu-driven system operation facilitating quick setup times and intuitive use. Equipped with a bitmapped LCD display providing access and control to all integral system functions, the UHF-R UR2 handheld transmitter features frequency and power lockout, as does the UHF-R UR1 bodypack transmitter. Available in both single and dual-channel configurations as models UR4S and UR4D, the UHF-R wireless diversity receivers feature a flash memory capable of storing six 60-channel custom frequency groups. They are additionally AMX and Crestron compatible and facilitate USB and Ethernet network control and monitoring. Booth 7541.

Shure Inc. • 800.257.4873 • www.shure.com

QSC HPR122i Powered Loudspeaker

QSC's new HPR122i powered loudspeaker can be pole-mounted using a stand socket, or flown with the aid of nine integral M10 suspension points. Built to meet the same specifications used to create the RMX line of amplifiers, and using their circuit designs, the HPR122i power module provides a total of 500 watts, and is operable between 53 Hz and 20 kHz. Equipped with a 12-inch low frequency driver featuring a three-inch voice coil and neodymium magnet structure, the two-way enclosure features a compression driver with a 1.4-inch diaphragm coupled to a 75-degree conical horn at the high end. The module includes signal processing functions tailored to the loudspeaker system's needs. Constructed of premium birch plywood, the HPR122i enclosure features a black textured paint finish and 16-gauge perforated steel grille. Ergonomically-placed handles enhance portability, while the cabinet's nine threaded M10 inserts facilitate a wide-ranging number of suspension options. An LED power indicator is mounted on the grille that can be turned off as needed via a rear panel switch. Estimated street price is $799. Booth 6750.

QSC Audio • 800.854.4079
www.qscaudio.com

Yamaha MG Mixers

The newly redesigned MG Mixer models, MG102C, MG82CX, MG124C and MG124CX, replace the existing MG10/2, MG8/2FX, MG12/4 and MG12/4FX models, respectively. The two "CX" models continue to offer SPX-quality digital effects and the MG102C and MG82CX remain mic stand mountable. Improvements include single knob compression, monitor mix routing and upgraded components. The MG124CX (MSRP: $379), MG124C (MSRP: $299), MG82CX (MSRP: $219) and MG102C (MSRP: $149) are scheduled to ship in January 2007. They'll be in the Marquis Ballroom of the Marriot Hotel at NAMM.

Yamaha • 714.522.9011
www.yamaha.com/ca.

Americana Folk Festival

Venue:
Montgomery Bell State Park, Dickson, TN

Crew:
Sound Co/Provider: Brantley Sound Associates, Nashville, TN
FOH Engineer: Chris Demonbreun
Monitor Engineer: Ryan Schatz
Production Manager: Tony Griffy
System Techs: Josh Wallacer, Wendy Fly, Matt Heineken

Gear:
FOH
Console: Midas H3000 with Midas Venice 240 Sidecar
Speakers: 18 Adamson Y-10s, 4 Adamson Y-10 Subs, 4 EAW KF300Hs
Amps: 16 Camco Vortex 6
Processing: 5 EAW MX3600s, 1 KT DN3600, 1 KT DN360B, 1 BSS Opal FCS-966, 16 dbx 160As, 2 BSS DPR-504, 1 TC Electronic M-One, 1 TC Electronics D-Two, 1 Yamaha SPX90, 1 Lexicon PCM70
Mics: Shure, Countryman, Sennheiser, AKG
Power Distro: BSA Custom
Rigging: Adamson

MON
Console: Yamaha PM4000-M
Speakers: 12 EAW SM200iHs, 4 EAW SM15s
Amps: 16 Crown Macro-Techs
Processing: 8 BSS FDS-310s, 12 White 4650s
Power Distro: BSA Custom

Pace Centennial Concert

Venue:
Pace University Goldstein Health and Fitness Center
Pleasantville, NY

Crew:
Sound Co/Provider: United Sound, Hackensack, NJ
FOH Engineer: Ernest Bryant
Monitor Engineer: Kwame Sha
Systems Engineer: Bobby Potanka
Production Manager: Harry Schumacher
System Techs: Eric Council, Arnold Marfoglia, Kofi Sims

Gear:
FOH
Console: Midas Heritage 3000 56 ch.
Speakers: Dynacord Cobra 4 Line Array, EAW LA outer fills, Dynacord and Meyer subs
Amps: Dynacord L2400s, Crown MA2400s
Processing: Dynacord, Presonus, dbx, Yamaha, Lexicon, TC Electronics
Mics: Shure Wireless w/ Beta 87 and Beta 58 capsules, Sennheiser, AKG
Power Distro: United Sound Proprietary
Rigging: CM Loadstar

MON
Console: Midas Heritage 3000 56 ch.
Speakers: Yamaha wedges, EAW LA side fills, Shure PSM700 IEMs
Amps: Crown MA2400s
Processing: Presonus, dbx, Yamaha, Lexicon, TC Electronics
Power Distro: United Sound Proprietary

Orange County Choppers LIVE

Venue:
Riverfront Park
Nashville, TN

Crew:
Sound Co/Provider: Brantley Sound Associates
FOH Engineer: Johnny Jones
Monitor & Systems Engineer,
Production Manager: Marc Estrin
System Techs: Eric Vogel, Dave Payne

Gear:
FOH
Console: 1 Midas H3000 , 1 Midas Venice 32ch
Speakers: 32 Adamson y-10s, 4 Adamson y-10subs , 6 EAW KF300H,8 EAW KF940 Supersub, 4 EAW KF1000
Amps: 40 - Camco Vortex 6
Processing: 8 EAW MX8600
Mics: 16 Shure UHF-R
Power Distro: Brantley Sound Custom
Rigging: CM

MON
Console: Yamaha PM4000m , Midas Venice 32
Speakers: 12 EAW sm15, 6 EAW sm200, 2 EAW KF850j/sb850 Sidefills, 6 Senn E300 IEM
Amps: 18 Crown Macro Tech 24x6 , MacroTech 2400, 3600, 5000
Sidefill Rack
Processing: BSS
Mics: Various Shure
Power Distro: Brantley Sound Custom

Jay-Z Seven Cities in 17 Hours

Venue:
Pier 54, New York, New York

Crew:
Sound Co/Provider: Atomic Pro Audio
FOH Engineer: Bryan "Hot Dog" Tate
Monitor Engineer: Bob Lewis
Systems Engineer: Keith "Buzzy Buzzell"
Production Manager: Jennifer Hellman
System Techs: Evan McElhinney

Gear:
FOH
Console: Midas Heritage 3000
Speakers: 24 Adamson Y-10 Line Array, 6 Adamson T-21 Subs
Amps: QSC PL-2
Processing: XTA dp 226, Yamaha, TC, Eventide, Lexicon, Drawmer, dbx, Klark Teknik
Mics: Sennheiser Wireless, Shure
Power Distro: Motion Labs
Rigging: CM Lodestar

MON
Console: Midas XL-250
Speakers: McCauley SM95, SA-218, SA-212
Amps: QSC PL-2
Processing: White EQ, dbx 260
Mics: Sennheiser Wireless, Shure
Power Distro: Motion Labs
Rigging: CM Lodestar

NASCAR Bush/Craftsman Truck Awards w/Robert Randolph and Josh Kelly

Venue:
Disney World, Orlando, FL

Crew:
Sound Co/Provider: Spectrum Productions Atlanta
FOH Engineer: Dean Pelton
Monitor Engineer: Russell Kreeger
Systems Engineer: Jim Boylston
Production Manager: Mike DiPalma

Gear:
FOH
Console: Yamaha M7CL, DiGiCo D5
Speakers: 14 EAW KF300
Amps: Crown MT5000
Processing: EAW
Mics: Shure Beta 58 UHF

MON
Console: PM5D
Speakers: 12 EV Force I
Amps: QSC PL
Processing: XTA
Mics: Shure, Sennheiser, AKG

Music as A Weapon (3) Tour

Crew:
Sound Co/Provider: Maryland Sound International
FOH Engineer: Scott "Skitch" Canady
Monitor Engineer: Rob Lightner
Systems Engineer: Chris Lightcap
Production Manager: Geoff Perren
Tour Manager: Todd "T-Rod" Goldstein
System Techs: Chris Hall

Gear:
FOH
Console: Yamaha PM5D
Speakers: JBL VerTec
Amps: Crown
Processing: Lake
Mics: Shure

MON
Console: Yamaha PM5D
Speakers: MSI Custom Monitor System
Amps: Crown

To get your event listed in Showtime, visit www.fohonline.com/showtime

Wings of Desire

A new way of incorporating sound design takes wing in this inter-continental production.

By Bryan**Reesman**

This month, we go way Off-Broadway to the American Repertory Theater in Cambridge, Mass., and their co-production with Toneelgroep Amsterdam of *Wings of Desire*, a play based upon the famous Wim Wenders film about an angel (Damiel) who seeks to become human so that he can spend his life with a beautiful trapeze artist (Marion). The show uses a lot of sound, from an audio montage of the inner thoughts of citizens to an occasionally noisy two-piece group (guitar, bass, vocals), to help recreate the world of the epic film, and trapeze artist Mam Smith elegantly performs with silks to poetic effect.

ART's resident sound designer, David Remedios, a music major in college who has spent 13 years at the ART, acted as sound supervisor for this show, traveling to Amsterdam to see how the original Dutch production was done before it came to Boston. He recently designed *The Island of Slaves* for the ART, preceded by *Orpheus X* at the company's Arrow Street space, both directed by their artistic director, Robert Woodruff. He often techs two shows at once, and even does outside work when time allows. Recent credits include *The Scottish Play* (La Jolla Playhouse), *Leap* (Cincinnati Playhouse in the Park), *Dressed Up! Wigged Out!* (original music and sound, Boston Playwrights Theatre) and productions for Emerson Stage, Boston Theatre Works and Vineyard Playhouse.

Q FOH: Was ART's version of the show pretty much the same as the one in Amsterdam, or were changes made?

A David Remedios: No, there were changes. Specifically there was some recasting done, and then the biggest structural change was the ending. The biggest recasting that happened was Bernie White, who plays Damiel in the ART production, played Cassiel in Amsterdam, and a Dutch actor played Damiel there. But it was always known that they were going to switch roles. Then they cast Mark Rosenthal as Cassiel locally. In Amsterdam, Marion came out at the end of the pop concert reprise and sat at a table with Damiel, and basically did the final speech just sitting there at a cafe table, and it ended, whereas director Ola Mafaalani re-explored it here. Bernie was game to get on the silks, so they came up with this ending that is quite beautiful in the way it shows the consummation of the relationship. Damiel and Marion perform a pas de deux on the trapeze silk. I feel it has more closure here than it did in Amsterdam.

The sound design didn't change all that much. Andy Moor, the sound designer and composer for the project, had all the ideas basically tracked through. There were some changes for the local stuff — Robin Young plays the news reader (Noraly Beyer was the Dutch news reader in Holland), and the old people's inner thoughts that were originally in Dutch were re-recorded in English. Essentially, everything he did with the playback and the music was the same and just adapted to fit the structure of the piece as it developed here.

> "Having worked with European directors in the past at ART, I know that they have very strong feelings about the sound engineer essentially being another actor in the show." –David Remedios

Q The show opens with an audio montage of voices.

A They started with the recorded whispers as pre-show, and then the music starts, and you hear the public thoughts, which are the two musicians, Hadewych and Jesse, speaking offstage with these kind of non-linear thoughts. All of that was pretty much the same. Texturally, I think they were trying to capture the feeling of the angels floating over Berlin in the movie and observing the inner workings of the people in the city. The opening montage was also supposed to bring the theatre audience into the world of the piece.

Q So one of your roles at the ART is sound supervisor?

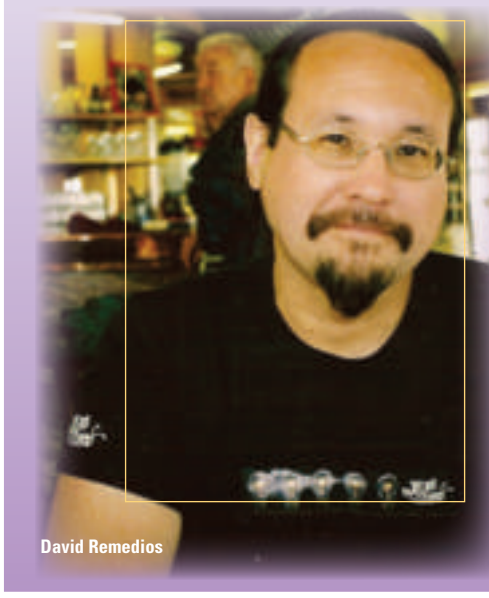
A That's one of my roles, but I'm the resident sound designer as well. My involvement with this project was one that, because this was an international co-production being developed over in Holland, we felt it important enough to have representatives from our staff go over to observe the process. I went over basically to observe how the tech came together and how Ola worked in tech so that I knew the organic context of why decisions were made, and I was there when they were made. It was really great because I could be inside the production and not be surprised when it came over. I was there as an observer. I wasn't really hands-on at all.

They do a weird thing there where they actually tech their show in a different theatre space and then truck it up to their home space in Amsterdam. Then they have a couple more days of tech, premiere it, and in this case it ran for two weeks in Amsterdam before touring regionally in the Netherlands. That's normal for them and apparently how they get their government subsidies. All their theatre groups tour their productions all over the country, and into Belgium sometimes. Most of the technicians that were involved — Peter Zwart, the audio supervisor for Toneelgroep, and Pieter Roodbeen, the production engineer — were spearheading how the sound system came together, and then I was able to consult with them to make sure that we were going to be able to reproduce what they had over here. Because my role was mostly dealing with the system, and not so much the operation, Pieter Roodbeen came over here for a few days of the tech week to basically assist my engineer in grasping what needed to be done.

The big difference in the way the show was run between here and there is that they were using a digital board to basically build a show with. I opted for an analog because I don't have much experience with digital boards, and when I observed the process over there, knowing how little time we would have in tech here as opposed to how much time they would have, I just felt that it was going to be a little hard to transfer the information. The script was a very modular being in Amsterdam, and Ola and translator Gideon Lester tried different iterations of the script, different scene orders every day, but we had tech sessions in the afternoons. The place was in a suburb of Rotterdam, an hour or so south of Amsterdam, so we would shuttle bus down there every day and have five or six hours of tech. Then we'd all shuttle back up to Amsterdam while the technicians stayed down there and worked on notes for the next day. That's not a luxury we really have here. They went with the digital board a few years ago to facilitate setting up their touring system so that they would have less lines to run, but I saw a potential hurdle in trying to reprogram a digital board with the knowledge that things would change here in a limited amount of time, so I opted for the analog mixer.

Mam Smith as Marion

Photo credit Jan Versweyveld.



David Remedios

Q Which board are you using in the Loeb Drama Center at the ART?

A Our house board is an Allen & Heath GL4000.

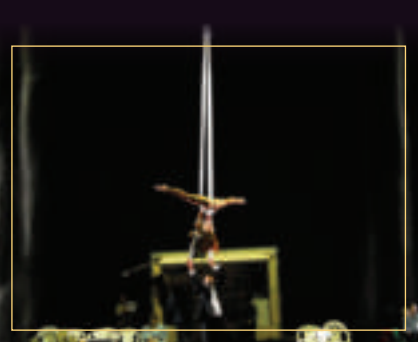
Q How many inputs are you running for the show?

A There are three CD players, so six channels of playback. There's an SPX990 for reverb. There are four wireless mics for actors and two for instruments, the guitar and bass, plus two wireless vocals for the musicians, and then there are PCC 160s on the apron to function as foldback to the stage fills for people to hear the dialogue. I think that's about it. The board, in terms of inputs, was a little overkill for the show, but that's what we have in house. It was interesting because, when I build a show, I normally use Stage Research's SFX for playback.

Having worked with European directors in the past at ART, I know that they have very strong feelings about the sound engineer essentially being another actor in the show. The ideal is for the engineer to be very well versed in the show and to basically not only take their own cues — which is standard protocol there because the stage manager really doesn't exist there; there's no central hub that's responsible for all the cueing — but ideally have the engineer in rehearsal everyday. It may or may not be

Photos by Andre Costantini

The two-piece band for *Wings of Desire* is entirely on wireless.



Mam Smith as Marion and Bernard White as Damiel.

Robin Young as a newsreader, and Bernard White as Damiel.

Bernard White as Damiel and Mam Smith as Marion.

unusual for us. Usually, as a sound designer, I'm in rehearsals for shows, but then I turn it over to the engineer at tech in terms of operating, but over there they tend to have their production engineers in rehearsal. But the system with theatre is so different there, and the way that Toneelgroep works is that they have separate technical staffs for each production that they're producing at any given time. So if they have a production in rehearsal, a production on the road and a production in their home theatre, there are dedicated staffs for each of those shows, as opposed to us, who just have our staff and run around doing double duty. So the option to have the actual production engineer in rehearsal was a luxury that we can't really entertain here.

Having said that, the engineer who's mixing the show here is someone I hired from the outside, so she was able to be in the week of pickup rehearsals before tech to get a sense of what the show was going to be about. We used the wireless in rehearsal and had what playback we had before Andy got to town to try to make sense of what the show was going to become, based upon what it was in Amsterdam.

Q Who is your live engineer for the show?

A Her name is Moira Shea, and she comes to us from a very strong background. She has 25 years of experience mixing live music and is an associate of my staff engineer, Darby Smotherman, and that's how I found out about her. Darby is not mixing *Wings* because she's currently mixing *The Onion Cellar*.

Q How did working on *Wings of Desire* compare to other recent ART shows?

A I think the challenge in this was establishing the lines of communication between the two theatre groups. In that sense, it also helped that I, the production stage manager, one of our lighting people and our technical director went over at different times because the hierarchy and infrastructure are so different. At first, we were unclear as to what their concept of, say, a production manager was and what that person's duties were. When I got there to discuss them sending their engineer over with a couple of the other technicians, I found out whom to speak to. The most challenging thing was learning the way each other worked and clarifying that. Doing it via e-mail is never clear, so actually having the face-to-face was a good thing.

When I came back to Cambridge after two weeks in Amsterdam, I felt very comfortable with my knowledge of the show and what I could convey to the other production departments, although my focus was audio. The Dutch were very gracious hosts, so I felt that there was a rapport that had been established by having some sort of representation alongside them as they were developing this. I think it was a challenge for them, too; for example, engineering scenic elements, like the sand tubes and the snack shack. For the audio people it was a challenge, and Peter, the sound supervisor there, was very instrumental in guiding the technology that was used. Why the band ended up on wireless was because Peter decided that there was too much cable on stage. That opened up what the musicians were able to do in the context of the piece, so they were no longer confined to their down left position. They were actually able to interact more in the scenes. So in that sense it was design by committee — that's not really the right term to use — but the technicians were very instrumental in that regard to shaping the piece.

Q What kind of speaker system are you using at the ART?

A In the Loeb it's primarily EAW cabinets. My LCR is EAW JFX-200s — an array of two for the center and then left/right. And in addition, for further coverage to the back of the hall, we have the very old EAW FR 253s. My subwoofers are EAW BH-500s. Then I have delay lines associated with the array on our three lighting beams. I have JF80s up there, and that's all addressed by a set of three dbx Driverack 480s, where I can set the delay times and do the EQ-ing for the zones.

Q So you're learning something with every show you do at the ART?

A Yes, and I think the challenge for me with theatre, especially because the budgets for non-profit theatre are not particularly huge, is you really have to be creative and to work with an economy of means. Sometimes the stuff I'm most proud of can be done with a very limited speaker plot, depending on the space. Actually, what we have at the Loeb or at Arrow Street is a very modest sound system, but I'm able to get the most out of our inventory.

Life, Death & Iron Maiden

Michael Hackman arms Iron Maiden to uphold the Supreme Commandment of Metal: MAKE IT LOUD.

Michael Hackman

The Iron Maiden system crew in the U.S.: (L-R) Joe Calabrese and John Roberson of Brantley Sound with Michael Hackman of ML Executives.

All Photos by Joe Calabrese

*By Keith**Clark***

Concert sound isn't usually a matter of life or death, but leave it to Iron Maiden to be the exception. The iconic metal band's recent "Matter Of Life Or Death" world tour proves that after more than 30 years, they haven't slowed down a tick and still demand a P.A. that permeates sold-out arenas with full-range output, while also upholding the first commandment of metal: Make it loud.

"Life Or Death" kicked off stateside Iron Maiden-style, marking the first concert tour handled by the new U.S. operation of ML Executives. The long-time U.K.-based hire company, owned and directed by Gary Marks (see sidebar), dispatched ace line array technician Michael Hackman to oversee the house system during the tour's journey from the U.S. to Japan and then home to Europe, with concluding dates at Earl's Court in London.

> "Each has its own quirks, but the true difference maker is sonic quality..."
>
> –Michael Hackman, on line arrays.

A decidedly veteran system tech and mix engineer, Hackman has become expert in optimizing line arrays of many stripes since his first exposure in the mid-1990s led to a fascination with the genre. "Every line array brings a little something different to the table," he explained during a tour stop at Chicago's All-State Arena, gazing out at the EAW KF760 line arrays in place for that night's show. "Each has its own quirks, but the true difference maker is sonic quality, particularly on the top end. That's where you tend to hear the most variation, and then there's the warmth of the mids, especially with rock 'n' roll. Better sound still wins the day, and then you look at the speed of the rigging scheme."

Brantley Sound of Nashville supplied the loudspeakers, amplification and system processing for the U.S. leg, with Joe Calabrese and John Roberson of the company providing expert support. ("I can't say enough about the efforts of Brantley and these two guys. They really know their business," Hackman noted in an aside.) The rig stayed fairly consistent from show to show, with front left and right arrays usually comprised of 14 (or sometimes 13) EAW KF760s and two (or sometimes three) EAW KF761 near-field modules. These are flanked by side-fill arrays of six (or sometimes seven) KF760s with two (or sometimes three) KF761s. Geometric differences presented by each arena accounted for the slight array structure variations.

"The EAW line arrays have headroom to spare, with a particular advantage being that it can get — and stay — very loud without stress. That's particularly a good match with a band of this nature," Hackman said. "The arrays can also be made to sound not so 'hi-fi,' but rather more of an appropriate extension of heavy guitar-based metal rock, and this signature is fairly easy to attain."

Following up on his point about rigging, he added, "One of the things I love about the KF760 box is that it goes up very quickly. You just roll it in, hook it up and lift it in the air. Particularly on bigger shows, where we often have to wait for everything else to go in and then wait more for fly points, the faster it goes up, the better. I also like the fact that the hardware has a fixed point-beam, so if you've got the right trim height and correct angle point, the positioning of the arrays is automatically going to be correct."

The EAW SB1000 dual-18-inch-loaded cabinets produced plenty of sub-bass energy, and were generally floor-stacked three-over-three per side for the tour. It was to have been four subs high, but the late addition of four-over-four sets of EAW KF750 three-way touring loudspeakers atop each sub stack changed that plan.

"As an old-school band, Iron Maiden likes having P.A. ground stacks as well as the flown arrays to enhance the particular P.A. 'feel' they've grown used to. It gives them an added vibe onstage that's coming from the house, particularly when they walk out on the stage thrusts," Hackman explained, adding with a smile, "It also gives the band something else to climb on top of during their shows."

Levels typically average in the 105 dB (low) range at FOH, with Hackman always very diligent about clearing up all time alignment issues before handing the system over to FOH Engineer Doug Hall. His primary tool in this effort, besides his own ears, was EAW Smaart Live measurement and analysis software, and specifically its impulse function, which allows for quicker and more precise alignment of the subs, side hangs, ground stacks and main arrays. ("With the additional ground stacks, there's a bit more than usual to align with this system," he noted.) After alignment, he then deployed Smaart as a spectrum analyzer.

Six XTA DP226 digital units handled system processing, with Hackman taking advantage of the XTA WLAN "Walkabout" to do remote equalization — generally just applying a bit of helpful EQ to specific curves and so forth. Two DP226 inputs were dedicated to each main array, with separate band-pass outputs to the mids and highs of the KF761s. "This configuration gave us more control, such as taking a bit of EQ out of the mids of the KF760s without impacting the KF761s," he explained. "We worked the parametric portion of the XTAs for this, in order to get a balance, and then applied XTA graphic EQ across the main left and right hangs, as well as the out fills for general tweaking."

FOH Engineer Hall took over from there, with lead singer Bruce Dickinson's vocals — courtesy of a Shure Beta 87C capsule on a wireless transmitter — being his primary focal point. Hall wanted plenty of levels from this mic and thus ran a healthy dose of gain, so Hackman stayed always mindful

"As an old-school band, Iron Maiden likes having P.A. ground stacks as well as the flown arrays to enhance the particular P.A. 'feel' they've grown used to. It also gives the band something else to climb on top of during their shows." –Michael Hackman

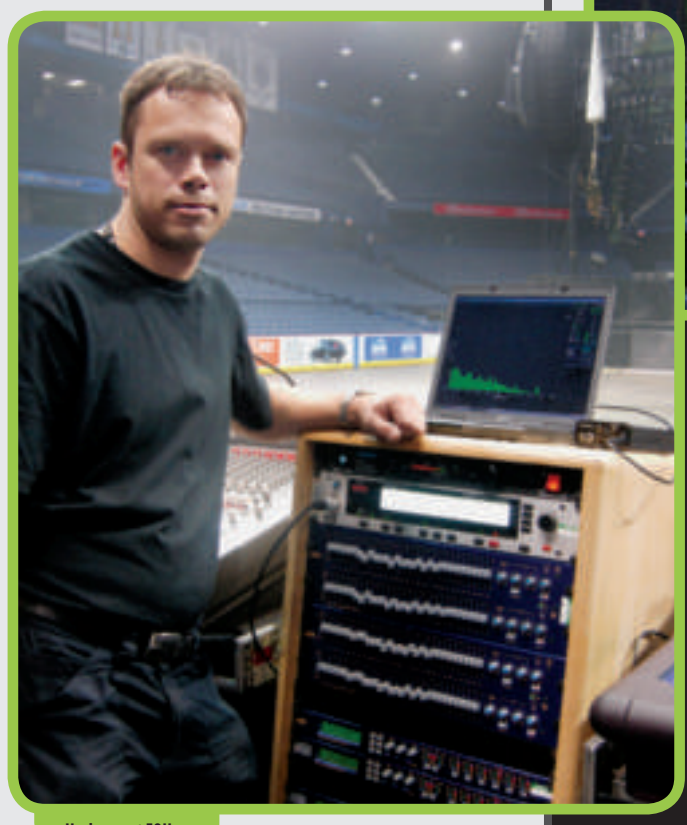
of the positioning of the house system in relation to stage ramps and thrusts to help avoid the "dreaded squeal" of feedback.

For the U.S. tour leg, Brantley Sound provided a Crown CTS Series amplification package for the line arrays and subs while Crest Pro Series powered the ground stacks. The other legs of the tour utilized Lab.Gruppen amplifiers, which is ML Executives' usual choice in driving this system. The "loud and proud" theme continued onstage, with six EAW KF850 three-way cabinets allotted three per side for vocals and another six Turbosound TMS3 cabinets (again, three per side) for band fills. Another four TMS3 cabinets (two per side) provided a feed of the house mix by Hall from his 56-channel Midas Heritage 3000 console, allowing the band to hear what's being put into the room.

Just one of the band members went with PMs, and wedges abounded: start with 10 Turbosound dual-15-inch-loaded wedges for the band; add six more EAW SM200 monitors around the top of the set; blend in two more EML dual-15-inch wedges for Dickinson, and top it off with two HK Audio wedges and dual-18-inch drum subwoofer. Monitor engineer Steve "Gonzo" Smith rode hard over this wedge extravaganza with a simple, clean monitor signal path headed by a Midas XL3-40 channel console and XL3-32 channel stretch, with several Klark-Teknik graphic equalizers as the other primary component.

"Our overall mission has been keeping all of these output sources acting as a single cohesive unit," Hackman concluded, as the crowd began streaming in for the Chicago show."It starts with quality equipment that does the job while behaving predictably, and then the addition of our experience. We've been doing some pretty large shows over the past three years with this basic house configuration, and it's served our clients quite well."

The "Life or Death" rig flies.


Hackman at FOH.


Two arrays in position.

Michael Hackman inspects his rig.


Iron Maiden take the stage.

A Short History of ML Executives

The ML Group enjoys an interesting history, with ML Executives Limited formed in the early 1970s by members of The Who. The band's business plan called for owning everything a group would need to tour, including sound and lighting systems, followspots, trucks, buses, backline equipment and staging, as well as Shepperton Studios to rehearse and record. All equipment and machines were kept in pristine condition, and when the band wasn't touring, it was rented to other artists.

The situation also enabled The Who's touring personnel to stay continuously employed — the sound engineers, lighting technicians, backline crew and bus and truck drivers would all work for ML Executives' clients. This expert personnel group would, in turn, be available when The Who started its next tour, and this was the way it worked, and worked very well, for two decades.

In 1990, the assets of ML Executives and the trading name of the company were sold to Gary Marks, who had already spent two decades mixing sound, managing productions and tour managing artists such as Ozzy Osbourne, Black Sabbath, Whitesnake, Motley Crüe, Judas Priest, Nazareth, Air Supply, The Cult, Donna Summer, Accept and Joan Armatrading, to name a few. Looking for a new challenge, and with the assistance of a dedicated team, Marks built ML Executives into one of the premier production companies in Europe.

Although still providing a broad spectrum of services, ML Executives excels in sound, with a current inventory including system components from several leading manufacturers. The ML Group also includes a corporate and special events company called ML Soundadvice, along with True Diversity, a digital console and radio microphone/IEM specialist division and a tour/production management division. The company's latest move is the opening of an ML Executives office in Miami to better serve the North American marketplace.

DO THE MATH

GREAT STADIUM SOUND IS IN THE EQUATION

By Bradford**Thompson**

[*Editor's Note: At* FOH*, we find very few things more valuable than a combination of knowledge and passion. So, when we have a passionate, knowledgeable reader with something on his or her mind, we try to find space to print it. In the coming months, you will see more of this kind of content on the* fohonline.com *Web site and in some new electronic projects we are getting ready to unveil. In the meantime, check out what one reader has to say about stadium sound systems.*]

I love my sports, but I hate the live experience. One of the reasons for this is because I'm an audio engineer by trade, and I hate the sound in stadiums. It is always terrible, but it shouldn't be. When I do go to a game, I sit through the entire thing struggling to understand the announcer and calculating how to correct it. I can't help but repeatedly bother the person next to me with statements like, "What did he say? Do you understand what he's saying? Does the sound bother you?"

I've been designing custom speaker enclosures for 32 years, and I spent 18 years of that on the road, touring as an audio engineer with regional and national performing artists. I know what I know after years of trial and error and on-the-job experience. I don't claim to have all of the technical terms perfected.

When I started in this business, professional sound engineers were excited by the latest development in live sound engineering, the electronic crossover. We were still using a tape repeater called an Echoplex to create delay, and reverbs were spring-loaded. We all had our share of blown Phase Linear power amps and moved from Shure VocalMaster column speakers to the new JBL 4560 Perkins bins with a JBL 2441 driver and defracted lens on top. If you were really hip, you had the JBL 4550 BKA enclosures, but you had to be 6 feet 2 inches tall and weigh morethan 200 pounds to even think about loading them into a truck. They didn't have handles, either.

> I've asked myself countless times, "Why do public address systems in stadiums sound so bad?"

These days, during the week, I spend most of my time in front of a calculator or a computer, designing sound reinforcement speaker enclosures and systems.

I've asked myself countless times, "Why do public address systems in so many stadiums sound so bad?" I attribute this "Incoherent Sound Phenomenon" (ISP) to many things, most of which are not technology-based. The technology of sound is just math, so if the math is done, and done correctly, the people will be able to hear and understand clearly. Large rooms are a challenge to sound designers because of reflective surfaces, distances and the slow way that sound travels, but these challenges can be met when you know what you're doing. Think about it. The physics of sound do not change from year to year, no matter how large the room or how many people are packed into it.

ISP can be attributed partly to salespeople from major sound companies.

Over the years, I have reviewed many sound system proposals, which are based on the equipment readily available for sale, rather than the appropriate equipment for the venue. Since salespeople are usually not speaker designers, they have limited knowledge about what equipment is appropriate for a particular room. A "less is more" principle typically is not applied, meaning that if 80 of the wrong boxes aren't enough to do the job, then 120 of the same wrong boxes must be enough. At least this way, the sound company sells more product and makes more money. Right?

This is sheer laziness. Designing a new enclosure that will meet the need of the facility to deliver clear and full range audio to the audience is not brain surgery, but it does require some thought. Just do the math.

Low-Freq. Design & Understanding

If you front-load a single 15-inch woofer into its appropriate vented enclosure, and the woofer has a sensitivity of 98dB 1W/1M, assuming that the reasonable usable frequencies are 35Hz (at -9dB, and 0dB at 45Hz) with no great dips through 300Hz, you will receive 98dB 1W/1M. If you add an identical enclosure alongside this enclosure with the exact same woofer, they together deliver 101dB 1W/1M. In order to receive 104dB 1W/1M, it requires twice as many loaded enclosures, or in this case four single 15-inch vented enclosures. To receive 107dB 1W/1M, you will now need eight of these enclosures. 110dB 1W/1M requires 16 enclosures, and so on.

The cubic feet, or space, of all of these enclosures is significant. These boxes would require an area of approximately 120 inches in height, 80 inches in width and 18 inches of depth (120 inches by 80 inches of face-space).

The challenge is to design an enclosure that will deliver 110dB 1W/1M of low frequency using half of the woofers and half of the face-space. By designing a horn-loaded enclosure, one gains 3dB SPL right out of the gate. By retaining the allotted venting appropriate for this woofer, we retain the speed and recovery of the sound of the combination of the original enclosure and the 15-inch component. This is unique in a horn-loaded enclosure. Most horn-loaded enclosure designs skimp on the volume of the enclosure, but it drastically changes the sound and raises the floor of the very low frequencies.

Thompson checking levels at a gig.

A Bradford stage setup.

There is also a natural compression that exists in a horn-loaded/vented combination enclosure. This compression is created by the degree of off-axis centering of the woofers. The trick is to create a natural-sounding launch of sound from the enclosure without over-compression.

You might ask what all this has to do with stadium sound? A ton! The compression, focus, power and delivery of the enclosures required for stadium use is key. If you can't reach the audience before you hit the wall, you've lost the battle from the start. You've actually added noise to the room. This is the case of the Twin Cities Metrodome. (Note that I am not just slagging on the Metrodome. Variations of this kind of problem exists in a lot of stadiums around the world. It just happens that the Metrodome is close to me and I know it well. Hence, it is used as an example only.) The *continued on page 35*

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Hear the Power of Technology

Yamaha EMX 5016CF
Powered Mixer

By JamieRio

I think it has been as least eight years since I reviewed the first Yamaha EMX board. It was nice, but really didn't have enough features and horsepower to propel a band or sound company into the big leagues. So here I am nearly a decade later. I don't know how many versions of this mixer have been produced, but I haven't reviewed one since the first incarnation. So, let's take a look at this unit.

The Gear RT

The EMX 5016CF sports 12 mono mic/line input channels and four stereo input channel pairs. A 1000-watt (500 + 500) stereo power amp is built into the board, sending its wattage through 1/4" phone jacks or Neutrik Speakon outputs. Not one, but two SPX effects processors are featured, giving you buckets of effects possibilities. Individual compressors are present on channels one through eight. This compressor is a unique single knob device. Turn your knob to the right and you raise the compression ratio while adjusting the gain accordingly. All channels have gain knobs and 80Hz roll-off (high pass filter) buttons, but only channels one through eight have a 26dB attenuator button.

Basically, one through eight are set up for mic inputs. Only one through eight have insert jacks, and although all channels feature three bands of EQ, only the first eight channels feature a sweepable mid-range. All channels get two aux sends with pre- and post-buttons and two effects knobs for those SPX processors. Pan knobs are present along with nice large on/off buttons. Signal and peak indicator lights adorn each channel, and a PFL button sends the signal to the headphone jack. Next, we are left with the channel faders for the mono and stereo channels.

As we get to the Master section we can really see some of the Yamaha innovations. An array of output jacks using 1/4" and RCA plugs are designed to send your mixed signal to external power amps or powered speakers, recording devices or an additional mixer. There are also foot switch on/off jacks for the internal effects processors. Aux sends one and two, an XLR lamp jack and a stereo 1/4" headphone jack finish off the output cluster. So far pretty standard — the cool stuff lies ahead.

Following the jacks, we are outfitted with a nine-band digital graphic EQ controlled by a simple on/off button. The FRC (Frequency Response Correction System) is pretty cool. We can measure the sound characteristics of our environment through a pink noise generator and adjust the EQ automatically with the touch of a button. I won't get into the set-up and operation here, but let me just say it's simple and it works. There are also a bank of Vocal, Dance and Speech buttons for presets and User 1, 2 and 3 buttons for storing your own settings. There is a feedback suppressor section laid out just under the graphic EQ with auto- and manual-detect buttons. Next, a Maximize button engages a three-band compressor to the Stereo L/R bus signal, enhancing the sound and volume of the overall mix.

A phantom power switch gives you the 48 volts you need for whatever, and a power adjust switch lets you choose 500, 200 or 75watts (all stereo at 4 ohms). Power amp limiter lights let you see if you're blowing up your speakers. Here we are left with the Yamaha Speaker processing switch, or YS Processing switch. This button will kick up the bass if you don't have any subs. There are faders present for effects returns one and two, the aux sends and the stereo out. There is also a cool little mute button that mutes channels one through eight. That's pretty much what you get. Would you like to know how well it works?

The Gigs RT

The first run with the EMX mixer was at a local hotel. I had another gig, so I sent one of my best techs by the name of Walter Olney to the hotel. Walter mixed a five-piece jazz band for an audience of about two hundred. He used the Yamaha to power two passive sub boxes loaded with 15-inch speakers and two full-range boxes with two 10s and a high compression horn each. Besides the jazz band, he was running an audiovisual signal and some program music though the board. The first thing Walter reported was how clean the mixer is. "The sound quality is really transparent" were his exact words. He also commented on how nice the effects sounded, and he liked the punch that the Maximize button gave the whole mix. I figured I'd better be there for the next show, and I was.

We both set up the same system for a city event in my hometown of Sierra Madre, Calif. One of our acts was the local kids choir, and with lots of little voices I had to set my mics hot. Anyway, the feedback suppression came in very handy here, allowing me to get maximum volume with a minimum of howling. I also got a firsthand experience with the onboard SPX effects and I found them to be very pleasant and very clean.

During the course of this event I had everything from the aforementioned choir to a solo autoharp player with an attitude. And of course, I was playing programmed music via my iPod throughout the entire day. I really enjoyed working with the EMX mixer. I loved some of the features more than others, but I didn't feel let down by any single aspect of the board. I think this would be a great mixer for a band or a church's youth house — or, in my case, as a "B" system. It's super easy to set up and operate and comes with all the features you need to sound good (as long as you actually know how to mix).

What it is: An all-in-one mixing board.
Who it's for: Bands, schools, churches, sound companies
Pros: Lots of great features
Cons: Maybe a little more wattage
MSRP: $1,249.00
Web site: www.yamaha.com/ca

Peavey Kosmos V2

By BillEvans

No one talks about "spectrum enhancement" units, but plenty of pros use them. Peavey faced this dilemma when they first released the Kosmos. In addition to enhancing highs and providing the illusion of a bigger stereo spread the Peavey added a subharmonic generator to make the unit popular with DJs, and gave it settings like "Thud" and "Quake" to fit that market. When Peavey released the Kosmos Pro, they added some good features, like the ability to use it as a crossover and the use of balanced I/O, but they also added more settings with cute names, which turned a lot of pros off.

But at Summer NAMM last year, Peavey released the Kosmos V2, which addresses much of what pros did not like but kept all of the good stuff, and all at a price that is just over half of the Kosmos Pro.

The Gear RT

The Kosmos Pro is a single RU component packaged in a silver case that screams "pro audio" — the DJ friendly face of the previous model is gone. The rear panel includes an IEC jack for power, stereo ins and outs on both balanced TRS and XLR connects and a switch to put the V2 into mono mode. The last connector on the back is a subwoofer out, which is also balanced, but only on a TRS connection.

The front panel has been greatly simplified with about a third fewer controls. Starting from the left, you have a hard system bypass, then the subharmonic generator control that allows you to both dial in the amount of this effect and to engage a damping control, which "tightens" the subharmonic content.

Next are Low Freq and High Freq knobs. It is important to remember that the Kosmos is not an EQ and it adjusts frequency response through phase manipulation. The Low Freq control serves to emphasize and tighten the lows, works best when using a sub and really helps smooth things out when using the subharmonic generator. The High Freq control does not really boost the highs; it adds clarity and widens the stereo image. At high setting it can sound harsh, but used judiciously it can go a long way toward making a small system sound bigger — especially at low volumes.

Continuing to the right, we get an Output Level control with two LEDs for signal present and clip. A button next to the control knob will take the subharmonic content out of the mains and route them only to the subwoofer output. Finally, there is a subwoofer level control, with a switch to disable the crossover function.

While I like the V2, I would not suggest using its full-range option, and would urge caution if you do. A subharmonic generator requires a lot more power to get those low frequencies going, and you are really asking the speaker to work overtime to produce them. Trying to do this with a full range cabinet is something you want to be very careful with. [*Peavey's Dan Boomer says, "The full range*

ISP HDM 210 Monitors

By JamieRio

As an owner and operator of a live sound company that uses a lot of powered speaker boxes, I think I speak for most of us in this end of the biz when I say we would all like more sound pressure level in a smaller package. You know, lighter boxes with better sound, that produce more wattage and dBs. The initial idea of self-powered speaker enclosures is to get more pure amperage to the speakers. It makes a great deal of sense to have power that is matched to the speaker configuration. However, my writing efforts today are not designed to convince you of the advantages of powered speakers, only to inform you that the ISP company has taken another step forward in their evolution in this field. In other words, they are producing a new line of high definition monitors (HDM) that they claim are more ass-kicking than previous incarnations. Actually, the claim is that these new active speakers have more fidelity and resolution than many studio monitors. I will be discussing and reviewing the HDM 210 model of this particular line.

> When the front of house speakers are smooth and clear, it makes my mix sound that much better.

The Gear RT

The 210 is a three-way box with two 10-inch speakers, two 2-inch compression drivers fed into one CD horn and a 1.75 inch compression driver with a polyester diaphragm into a CD horn. The speaker components are driven by a 600 x 200 x 100 watt power amp with an electronic fourth order crossover to sort the frequencies out. The amplifier is an ISP invention, featuring their patent pending DCAT amp technology. I really have no idea how the DCAT technology works, but it basically holds power in reserve and releases it during loud transients — it makes a snare drum really pop, for example. The boxes themselves are about 31 inches high by 18 inches wide by 16 inches deep. They are made of Baltic birch plywood and covered in a black, rubberized polyurethane finish. There is a tough powder-coated grill for speaker protection, and the boxes have all the handles and feet necessary. The speakers can be mounted on poles, set up vertically or horizontally.

What it is: Powered FOH or monitor speakers
Who it's for: Sound companies, churches, bands
Pros: Powerful and clean
Cons: I don't own a pair.
MSRP: $2270.00
Web site: www.isptechnologies.com

At this point I would like to talk about the components ISP has loaded into their speaker boxes. Let's start with the dual 10-inch woofers. These speakers are loaded with lightweight, high-energy neodymium drivers rather than heavy magnets. The lightweight part is very good on its own, but the two 10s actually can handle more power and have a greater output than a single 15-inch speaker. Next we have the dual mid-range compression drivers. This design results in a better transient attack and detail than a two-way system or a three-way system using cone drivers. A lower crossover point can be used, and there is virtually no cone breakup. Lastly, we have the 1.75-inch diaphragm neodymium for our highs. In this design the smaller diaphragm has higher sensitivity and takes less energy to drive. Basically, it just sounds better. This also gives us some insight into the 900-watt three-channel power amp. ISP pumps 600 watts into the 10s and 200 watts into the mid drivers, leaving 100 watts for the highs. It all works out to some very high dB claims. So, why don't we look at the real, live sound results of my use of the HDM 210 monitors?

The Gigs RT

My first date with the monitors was at nice neighborhood church fair/carnival. I had everything from the local dance troupe to a nine-piece R&B band. At this two-day event I used the 210s as my front of house speakers. I just set them vertically on a pair of 18-inch powered subs and I was ready to rock. Before the acts showed up, I was playing programmed music through my iPod. This gave me a chance to EQ the system. Right off, the ISPs sounded like very good and powerful home speakers. I can see why the HDMs are compared to studio monitors. They have great definition and clarity. Plus, the 900 watts is so perfectly matched to the components that it feels like you've got twice as much wattage under the hood. I had no problems making the various acts (talent aside) sound good. Even the R&B band sounded very defined and separated. Granted, I know how to mix such a group. But when the front of house speakers are smooth and clear, it makes my mix sound that much better. I got the horns in the right place without squeezing out the background singers and the keyboards. The bass, drums and guitar weren't fighting each other, and there was still room for the lead vocals. Basically, I was having a really fun time. And when I do a show my personal enjoyment is way up on the list.

My next outing with the HDM 210 monitors was at a Halloween party for about 2000 people. The featured band was an Orange County '80s tribute band that was very loud. The lead singer's only request was that he hear himself far and above everything else. I figured I would try one of the 210s as a floor monitor. During the sound check I had the monitor at an ear splitting level. The lead singer was actually taking the abuse and asked if he could have a little more. I cranked it up until the drummer complained that the lead vocalist monitor was ripping off his head. The beauty of all this sound pressure was that I could still maintain great clarity and definition without diving into feedback hell. After the show began and the band had run though their first set, the lead singer asked me to turn down his monitor a bit. It is always a personal goal for me to get my stage monitors hot enough and clean enough so I never have the talent asking for more monitor volume. The HDM 210s make this goal a piece of cake.

Looking back at the two gigs and two completely different settings that I used the ISP monitors in, I can say that they are everything that ISP claims. So, if you are looking for a small and very potent front of house speaker or monitor system, you should probably listen to the ISP 210 monitors. I am sure you can find them at NAMM. By the way, they also come in 212, 112 and 115 versions.

> I dumped the EQ on the male vocal channels at about 200 Hz and tried the subharmonic again.

What It Is: Spectral enhancer/crossover/subharmonic generator
Who It's For: Anyone who needs lots and lots of bass, or to make a small system sound bigger.
Pros: Simplified, more "pro" looking interface; flexible; quiet
Cons: Be careful with that subharmonic…
How Much? $299
Web site: www.peavey.com

output is important when you use a Kosmos as a signal processor on a single channel insert. They are great on acoustic guitars, where you may have to fool with the channel EQ so you can get the guitar signal through the monitors without feedback and then add some Kosmos in to restore the thumping low end from the guitar body to the FOH mix. Of course, it's also killer on kick drums as an insert."]

The Gigs RT

The show was a very quiet series of acoustic performances in a room for about 200 people. The acts were all solo or duos with acoustic guitars and nothing else. The system consisted of a very old Soundcraft board driving a pair of Mackie 15-inch powered subs and a pair of SLS top boxes powered by a QSC PLX amp. The signal from the board went into the Kosmos V2 in stereo, and both subs got the same output signal, with the stereo outs feeding the QSC/SLS combo. The crossover function was engaged, as was the control to remove the subharmonic frequencies from the mains.

The acts were playing during a dinner and became audio wallpaper, essentially. Most people ignored them. I started dialing up the subharmonic on an acoustic guitar duo with a female lead singer and male backing singer who also did the bulk of the between-song talking. I liked what it was doing to the guitars, but it was muddying the male vocal. I dumped the EQ on the male vocal channels at about 200 Hz and tried the subharmonic again. No mud.

Feeling particularly brilliant, I dumped the lows from the female singer's guitar and — voila! — got what sounded like a third band member. With the subharmonic tracking just the lead acoustic guitar, who was doing a lot of finger picking, you would think — if you closed your eyes and just listened — that there was a bass doubling those parts.

With some creative use of the Kosmos V2, we not only made a small system at very low volume sound much bigger without getting loud, but we added a new dimension to the performance. I looked around the room and saw that people were paying less attention to their food and more to the act on stage. There are not many processors I can use to get that kind of response.

THE TECHNOLOGY TRICKLE DOWN

How High Tech Keeps Getting Lower and Lower Priced.

By David John ***Farinella***

It wasn't long ago that the best technology available was priced beyond the reach of many live sound professionals. A certain amount of price segregation makes sense, of course, but manufacturers across the board came to the realization that a customer base could be doubled, maybe tripled, by offering a series of products at a more attainable price point. The trick is to take proven technology, tweak it slightly to get to a more affordable level and keep the quality high.

Example: It's common knowledge that the Yamaha PM5D is rich with features culled from Yamaha's PM1D. Realizing that there was a market for a lower priced alternative, the company designed the M7CL (in 32 or 48 channel versions) and then the LS9 (16 or 32 channel versions).

"We feel like we've taken the technology of the amazing PM1D and brought it down so that everyone can mix on a digital console now," explains Yamaha Commercial Audio Systems, Inc. product manager Daniel Craik.

The initial idea behind building both the M7 and the LS9, he adds, was to provide an intuitive desk that could be used by a staff of volunteers in the worship market. "There are a lot of gaps in people's knowledge at that level, so we wanted to make an affordable live console for that group of people," he says. "Now there are a lot of M7s out on tour as well. One guy, if he's burly enough, can carry it. There are 48 channels and four effects processors and up to 16 graphic EQs. So, for the guy that's doing regional shows, this is a dream."

> "We feel like we've taken the technology of the amazing PM1D and brought it down so that everyone can mix on a digital console now." **–Dan Craik, Yamaha Commercial Audio Systems, Inc. product manager**

According to Craik, the different consoles offer different features. The 5D, he explains, is a 96-input console, and the M7 has all of the electronics and processors from the 5D, but it's a 48-channel desk. "That cuts the cost. It's a smaller desk, and it has a different operating system. By the time we get to the M7 from the 5D, we can make it for less money because we've been there, done that," he says. "R&D is what takes the most time and has to be repaid somehow. So we can get down there because we've done it once or twice before."

Greg Mackie started his company with an eye on the compact mixer market. With a blend of clever marketing and dynamic products, Mackie became known as the company that built compact mixers with pro features at an affordable price.

"We tend to be the highest price mixer in the MI market, but we're the lowest cost option in the professional arena," reports Mackie brand director, John Boudreau. "So we have a split personality. We want our mixers and our products to be professional and cater to that market, but we still want to maintain the fun aspect of what Mackie is and cater to that MI market as well."

With that in mind, the company continues to polish stalwart products, à la the VLZ line of mixers, while building the up-market Onyx board. "We invested our R&D into a new micpre, new equalization, new general summing bus circuitry, so that we are offering a higher priced version of the VLZ where most of the MI companies were going lower cost," Boudreau explains. "Now, since we did that, we had a platform of technologies that we could go up-market with, and we actually did what was opposite of the traditional model. The Onyx four bus is a replacement for the old SR 24.4 and 32.4. They cost more; they have more features. We've been going up market with our product line."

The Onyx is not the only board that's moving up market, adds Boudreau. In fact, an upgraded VLZ3 will be launched at this year's NAMM show. The company is able to make that move, he says, because electronic component costs have dropped again.

> "The VLZ3 that is launching at NAMM is a much improved performance product because we were able to grab higher tiered components that we weren't able to use five years ago." **– Mackie Brand Director John Boudreau**

"Instead of taking the existing components that we have and making a lower price mixer, we tend to try and grab the next higher priced components that are dropping down [in price and use those]," he says. "So, for example, the VLZ3 that is launching at NAMM is a much improved performance product because we were able to grab higher tiered components that we weren't able to use five years ago. So instead of introducing a new VLZ at a lower price, we stuck to our price point and offer a greatly improved product."

> "A lot of those features were very expensive to implement. Well, you make enough of them and, all of a sudden, some of those features can make it to the masses." **– Audio-Technica Marketing Director Gary Boss**

But Mackie isn't soley focused on mixers.

"I think the next big hit is going to be a digital mixer and snake system that is achievable for a lot more people," he says, and he wants Mackie to get there fast. "We're going to effectively achieve that goal at NAMM." According to Boudreau, "You'll be able to take a TT24 and a 32 x 32 snake box that we'll have. I'm striving for a $9,999 street price for a 32 x 32 digital mixing system that includes the surface and the snake. If that's achievable, the next closest thing that you could get to do that would be boards that are $50,000. I think the first few companies that get there are going to see the fruits of that particular market."

On the speaker side of things, a handful of companies are seeing how it's economically beneficial to offer top of the line technology in lower priced products. EAW will be taking the Gunness Focusing technology that's being installed into the NT series and rolling them into a new processor that they claim will enable the KF series to sound like studio reference monitors.

Peavey has jumped headfirst into the market with its Versarray offering. "We've come up with a package that you can put in the back of a pick-up and go," says sound reinforcement product manager Don Boomer.

According to Boomer, Versarray is based predominantly on new technology. The Neo Black Widow woofer is a neodymium dual push-pull voice coil type speaker that was developed just for this box. The ribbon drivers are new as well, and could only be used after the company figured out how to build them on an assembly line in order to be competitive on price.

Audio-Technica marketing director Gary Boss points out that taking the company's high-end technology and putting it into a more accessible product happens frequently. "Part of it is planned, and part of it is out of necessity," he states.

The first example that Boss points to is the evolution that took place with the Artist Elite 2500, a dual element cardioid instrument mic used by many in kick drums. The microphone was priced at $500, but Boss admits that not many people were going to drop that much money on a kick drum microphone. "We decided to knock off our own product and make it a little more affordable," he reports. "So we came out with the ATM250DE, which shares the dual element principal, but now we brought it out at about a $300 street price.

"Now we were starting to get closer to the price of a single regular microphone for a kick drum," he continues. "We have something that we knew from working with our engineers in some of the biggest tours and brought it down to a level where a guy with a B or C level touring rig or a drummer himself might want to pick up something like this."

This type of move has been happening for some time, Boss says, even in the wireless market. "Wireless has always been one of the sketchy, iffy, black arts sorts of things, and the real high-end stuff performed super well," he explains, "and we're going back a while now, but some of the lower cost stuff was a bit sketchy." Once Audio-Technica had worked out the high-end system, the company was able to apply features like diversity and tone lock squelch into more affordable packages.

"I think wireless has benefited the most because with the high-end units, you don't have an option for failure," he says. "The problem was that a lot of those features were very expensive to implement. Well, you make enough of them, and all of a sudden, some of those features can make it to the masses. So we were able to translate a lot of our higher end features into what we would call professional wireless, like our 2000 or 3000 series."

After all, price point can't be the only factor on new gear, Boss explains. "It's very attractive to see a low price on goods and go out and purchase it, but if we want to sell that same person down the road another product, they better have a positive experience; I don't care if it's a $100 product or a $700 product."

Although he doesn't sound concerned, Boss points out, "There's the joke out there that a lot of people don't voice, but it's talked about in manufacturing circles, that there's kind of like this race to the bottom." While that might be alarming to manufacturers, it should be music to the ears of users.

Tony Loves his Radial DI

"...my bass comes through extremely clean, very quiet, and with a smooth transparent low end. I use my Radial DI for everything."
~Tony Levin
(Peter Gabriel, King Crimson)

- Will Lee
- Vanessa Williams
- Tragically Hip
- Tony Levin
- The Rolling Stones
- The Who
- Styx
- Steve Stevens
- Steve Miller
- Sony Broadcast
- Sheryl Crow
- Shakira
- Seal
- Sarah McLachlan
- Santana
- Robert Scovill
- Robert Randolph
- Rod Stewart
- Randy Travis
- Razorlight
- Radiohead
- Prince
- Peter Gabriel
- Paul Simon
- Pat Methany
- Nine Inch Nails
- Nickelback
- Michael Wagener
- Metallica
- Matchbox 20
- Maroon 5
- Mark Howard
- Mark Egan
- Marilyn Manson
- Marcus Miller
- Linkin Park
- Klondike Sound
- Khaliq Glover
- Kenny Loggins
- kd Lang
- Journey
- Joni Mitchell
- John Patitucci
- John Mayer
- Joe Walsh Band
- Jewel
- Jethro Tull
- Janet Jackson
- House of Blues
- Herbie Hancock
- Grand Old Opry
- Goo Goo Dolls
- Garbage
- Franz Ferdinand
- Flectones
- Faith Hill
- Dwight Yoakam
- Dixie Dregs
- Destiny's Child
- David Rideau
- Dave Matthews
- Dave Bottrill
- Daniel Lanois
- Clair Brothers
- Cirque de Soleil
- Chuck Rainey
- Chick Corea
- Charley Pride
- Celine Dion
- Canadian Broadcast
- California Guitar Trio
- Bryan Adams
- Bruce Springsteen
- Bob Dylan
- Billy Crawham
- Billy Ray Cyrus
- Beck Harper
- Barely Naked Ladies
- Audio Analysts
- Avi DiFranco
- Allison Krauss
- Alice Cooper
- Alain Caron

*This partial list of customers has purchased, loaned or recorded using a Radial product. Customers on this list do not necessarily endorse Radial. Specifications and appearance subject to change without notice.

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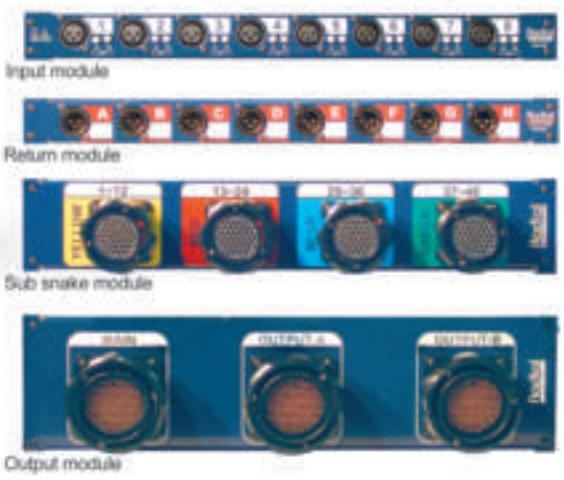

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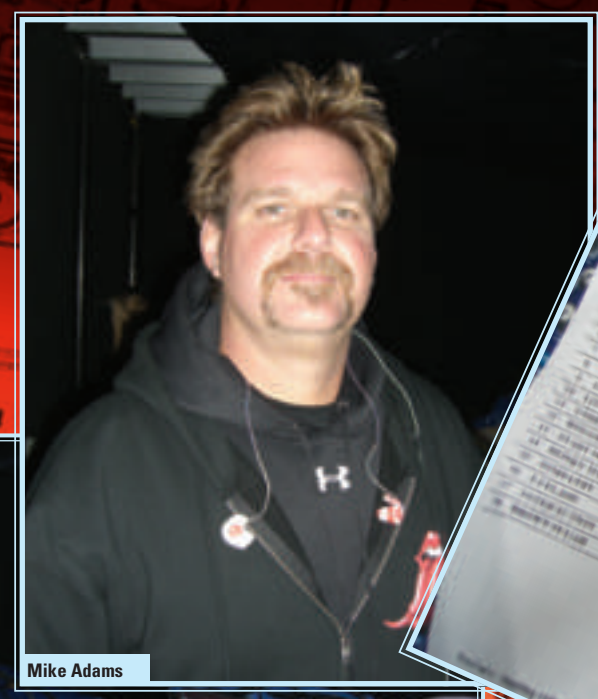
MONITORING THE BIGGER BANG

BY REVERSING THE "NORMAL" CAREER PATH, MIKE ADAMS MADE HIS BANG.

By Jack**Kontney**


Mike Adams


Mike Adams preps on his Midas Heritage 4000 before the Chicago Stones concert.

When The Rolling Stones'"A Bigger Bang" tour came to Chicago recently, we had the opportunity to visit backstage with monitor engineer Mike Adams. It was a cold and windy October evening when Jack Kontney caught up with Adams before the show.

q FOH: How did you get started as an engineer?

a Mike Adams: I count my career from when I started getting paid on a weekly basis. That was 1981. It was a band called Green Dog, out of Denver, Colorado. As far as getting started, I took the long, stupid, hard road. When I was 16, I just started hanging around, getting myself into nightclubs and finding guys that made it sound really good, and just started trading out my labor for their knowledge. By the time I was 18, I was working all over the Denver area, mixing in clubs. And now here I am.

q So you were always a mixer, never a tech? That's unusual.

a Yeah, I reversed the usual path. I knew how to mix, and really knew my way in and around a console, and yet I had no idea about so many basics. Things like, how do you hang a P.A. in the sky like that? It's kind of embarrassing.

I was lucky, though. I started working for Showco after I'd been in the business about 15 years. The first thing I learned there was that I knew absolutely nothing about logistics. But they treated me great. They knew I had deficits in knowledge, but they were willing to work with me because I had other things to bring to the party. I'll always be grateful for that.

q This is your first Rolling Stones tour. What other artists have you worked with?

a I've done monitors for Pantera, John Mayer, Guns N' Roses, Luther Vandross, Third Eye Blind, Ozzfest and Black Sabbath. Let's see, also KISS, Motley Crüe and Fear Factory. That's pretty much it. Overall, I've done a lot of metal, a lot of pop and some R&B. This is a little bit of all those things.

q What's the setup like?

a I mix the principal band members, and J. Summers mixes monitors for the singers, keyboards and horns. It's a huge stage with a lot of performers, so it really takes cooperation and teamwork to make it work.

q You have a mix of personal monitors and wedges on stage.

a Well, we need them both. In the band, Mick Jagger uses PMs, and so does bass player Darryl Jones. The other principals don't, so we have a full array of wedges across the stage. In the orchestra, Chuck Leavell uses PMs, plus Bernard Fowler and Lisa Fischer, two of the backing vocalists.

> "One day, [Mick Jagger] just looked over at me and said, 'Well, I guess it's time I start using the ears.'"
> –Mike Adams

q It's a Clair Brothers tour. Are they Clair wedges?

a Well, technically they're Clair's 12AM wedges, but they're still a Showco SRM inside, and that's a wedge I love. We have 100 wedges onstage. Anywhere you go, there's a mix coming out. I know it seems ludicrous, but in reality, it's just really good coverage.

q Mick Jagger has been on again, off again with PMs over the years. Does he use them consistently now?

a Yeah, for the whole show. In rehearsals, he had been using wedges. Then, one day, he just looked over at me and said, "Well, I guess it's time I start using the ears, because I know I'm going to be wearing them on the tour." I was told when we started that he normally wears just one. But he's been on two PMs since the first day that he put them in. Which is great, because it's so much better that way.

q What about ambience for the PMs? Do you use audience mics?

a Oh yeah. I try to create a sort of virtual situation for Mick. He prowls around like a cat, always going back and forth. So in order to make it semi-natural sounding, we've lined the front of the deck with six audience mics, and I have four more out at front of house. Everything is panned, so Mick has a nice stereo image of the band mix, but he still can hear the people in front of him. In general, I'll just pop the ambient mics into the PM mix between songs so he stays connected to his audience. On certain songs where the whole audience is singing along I'll pump that in, and it can really sound great.

q What about Keith Richards and Ronnie Wood?

a They're just not PM guys. Keith is old school. He's the musical conductor of the band, and he likes to be able to hold his guitar, make sound with it, and pull the group together that way. He wants to make sure that everyone hears that guitar change, and he wants the whole group orchestra to move with it.

q Did it change your world when Mick switched over to PMs?

a No, not for me. I wear my Sensaphonics when I mix, no matter what the artist is wearing. I know that sounds a little dangerous, but the reality of it is, if I get a good mix in my 2X-S, that mix will work in anything. It will work in anyone's earphone product, and it will sound great if I have wedges onstage.

q When controlling various PM mixes, do you then switch the inputs into your own PMs for reference?

a Sure, that's one of the reasons that I use the particular console that I do. My main console is the Midas H4000, and my sidecar is a Midas H3000. I've been using them for a while now, and I love them. One of its features is that it has a split cue, and you can cue in stereo. So I just run the cue on an A-B system, the A feed going to a cue box for local PMs, and the B system going to my live wedges. So I can listen to any mix at any time.

q What else have you got out here?

a Let's see, I'm using all Avalon 737s for Mick's compressors — one for each of his two handhelds, plus one for his headset. I'm using six Manley ELOPs — electro-optical limiters — as compressors for keyboards. And I'm using Aphex gates, some dbx products, you know, just the normal stuff for monitor world.

For wireless, I'm using all Sennheiser EW Series for the PMs, and all Shure UHF for the mics. Then I'm using the Clair Brothers helical antenna and the Clair antenna combiner for the PM stuff, to project it hundreds of miles into outer space. (laughs)

q I always have to ask: How many mixes are you running?

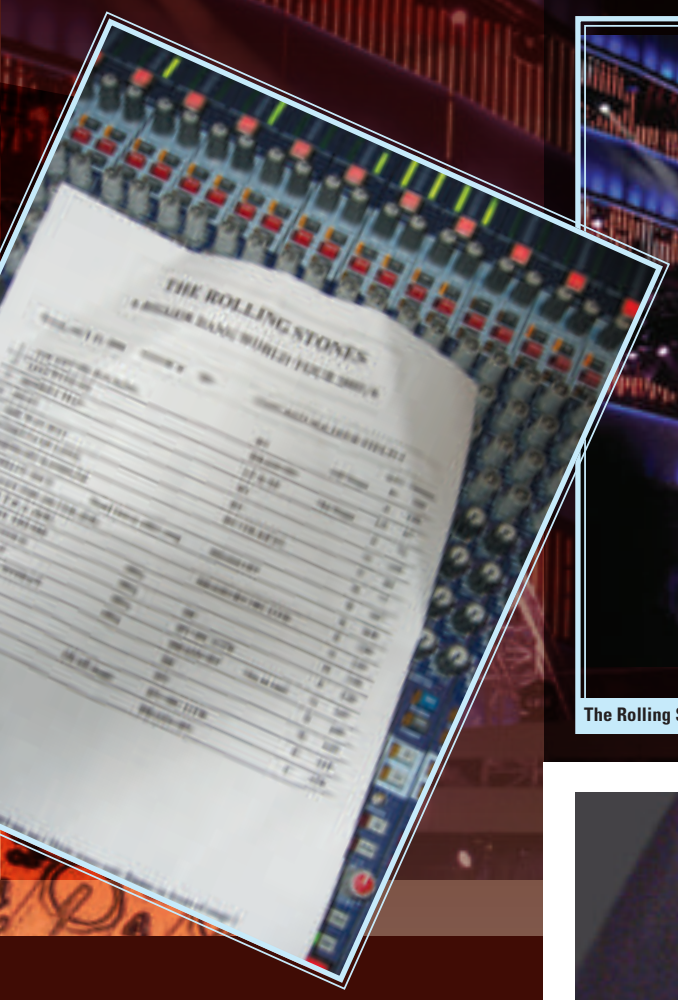
a Forty, actually. We run the wedges in stereo. There are a series of zones across the stage, and each is set up in stereo. We use four wedges left and four right to create the zone. So each zone has a stereo sweet spot for anybody who cares to be in it.

q What about time alignment?

a The thing is, these guys are always moving. So even though we are creating stereo image every 24 feet, it's all relative, you know? That's why we didn't get into a lot of delays, even though technically maybe we should because of distance. But on a stage this size — where is ground zero?

q So it's up to the artists to find the sweet spots?

a Yeah, but these guys have done it, seen it, said it all. They're cool, and they just go to where they like it the best. What's important is every night they expect it to be the way it was the night before. Then they're happy.



The Rolling Stones at a gig on their "A Bigger Bang" tour.

"We've lined the front of the deck with six audience mics, and I have four more out at front of house."
–Mike Adams

So that's what we give them.

q What kind of levels are you running?

a Directly at the source of each wedge, we have 116 dB SPL. If you pull back from the wedge about five feet, where your head might be, I believe it's around 104 or 105. So it's loud, but I don't think it's ridiculous.

q How loud are your PM users listening?

a I think they were clocking about 83 decibels on average when we checked. Very reasonable, obviously much safer.

q What about hearing safety? Do you work on that aspect of things?

a Yeah, it's definitely a consideration. I try to make the people I work for aware of it, and it generally pays off. When I present PMs to an artist for the first time, that's something I try to explain. I tell them, "It's going to be so clean and so clear that you're going to hear everything. You're probably going to go, 'it's not loud enough.' But with the isolation these give, you just don't need to have it that loud anymore." It's a mindset.

q How does the artist dynamic work in that situation?

a Nowadays, if you're working with an established artist, chances are they're already wearing PMs. But if not, I always suggest they give them a try. It's a small investment for such a useful tool.

q Anything else?

a Yeah, remind me never to mix an outdoor show in Chicago this time of year! What were they thinking when they booked this?!

DIGITAL MIXING CONSOLES

By Bill Evans

One of these days we'll get it right. We usually do an updated look at digital consoles in the January issue of *FOH* and last year (Or was it the year before? They're all kind of running together…) we tried to do something called "Digital Consoles for the Rest of Us" and to focus on products that you could afford even if you were not doing national tours and high-profile corporates. But, as we quickly learned, there just weren't any to be found in the price range we set.

So this year, we tried again. We set the price limit a bit higher and announced a look at digital consoles under $80K. So what happens? At first, it all looked good as we found that nearly every company that made a digital desk had at least one model under that price point. Success, right?

Then we got a call from a manufacturer who does not make a model under that price point. (Hold on, hold on, I'm really not caving to our corporate overlords. . .) While this manufacturer is one of just two or three who did not make an affordable desk, they made a good point. At this time, the digital landscape has changed so much that there are only a few models above that price point. Why leave them out when we are only talking about a small amount of space? Does that actually serve the reader?

It's a good point, but we did not want to be comparing a desk that lists for around $50K with one that carries a price tag six times that. So, a compromise. Below you will find not one, but two charts. The first is just the desks under that $80K mark, and the second only the ones above that. It is interesting to note that the $80K call still appears to be a good one. When you look at the charts, you will see that there is not a gradual slope up in price above $80K but rather a very sharp spike. It is not a few thousand dollars that separate the affordable from the luxury models; it is a few tens of thousands at the least.

One other side note: When you start with a price limitation and ask marketing types for input they will do cartwheels to make their product fit under the limit. It's not their fault, they appear to have been born that way. Which leads to the "stripped syndorome." Like when you go to buy a car listed at a certain price only to find out that it does not include some items you think it ought to. ("Oh, you wanted a transmission with the car? That's extra.") Just keep that in mind when looking at the "Under $80K" chart.

With the continued downward price pressure in this segment, next year watch for three charts: the high ticket jobs, the mid-market and the entry level — which I am guessing will look more like an "under $20K" group. Either that or you will be able to get one free when you fill up your gas tank at participating stations…

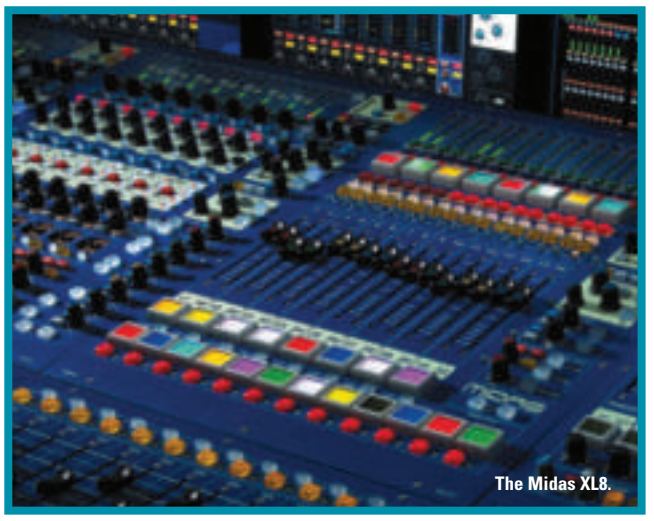
Under $80,000

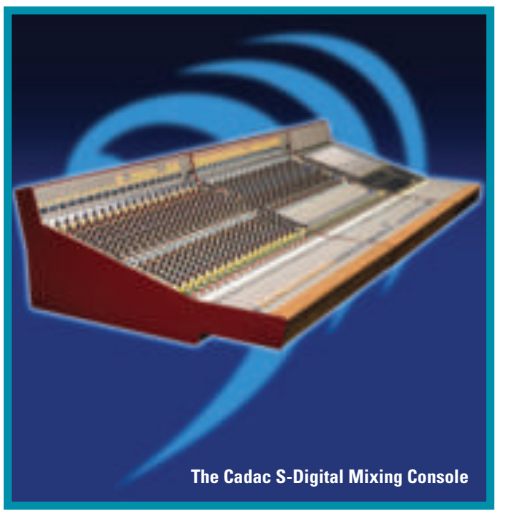
Company Name	Model/Frame Sizes	Outputs	Input Location	Control Surface Config.	Preamp Gain range	External Inserts	Metering	Channel EQ
Allen&Heath ilive-digital.com	iLive 28-36-44	32 Out	On Stage box, inputs also available on control surface	Up to 44 faders	+10 to +65dg (pad out) -15 to +40 (pad in)	Yes	Full	4 band fully parametric
Cadac Electronics plc www.cadac-sound.com	16 channels modular	16 Out	On unit or stage box	Banks of 16	+10dB to +60dB	No	Inputs/Outputs on software, and on RM16 remote unit	4 band parametric, high and low pass filters
DiGiCo www.digico.org	D1: 25 faders D5: 41 faders	36 Aux and Subgroup busses and 8 matrix busses.	Remote racks - up to 56 inputs and outputs per rack, up to 4 racks per console	16 or 24 input faders, grouped in sections of 8 with 6 user-definable fader banks per section	-20dB to +60dB	Yes. On every channel and every output.	30-segment LED meterbridge.	4 band fully parametric 2-Hz-20kHz EQ with dedicated high and low pass filters
Digidesign www.digidesign.com	VENUE: Up to 128 channels banked on up to 56 faders	Up to 96 on stage, additional 28 on local rack at mix position	Up to 96 mic pres on stage; 30 additional inputs on local rack at mix position	Varies with configuration, from 8 to 56 faders, with four banks	+10 dB to +60 dB in 0.1 dB steps, full recallable	Yes	Input and output, with multiple clip points per path and user-defined threshold	4 band fully parametric, digital or analog emulation modes, separate HPF, plus plug-ins
Innovason USA, Inc. www.innovason.com	Sy48 (48 Fader Frame)	40 Busses (Up to 144 physical outputs)	Mixing = 72. Up to 144 physical inputs local & remote (Remote via Coax, Fiber or Ethersound Cat5)	Up To 48 (all faders freely assignable as I/P (mon-stereo), O/P, Group, Aux, Matrix, Monitoring and Masters.	-27 to + 63dB	16 Discrete Line IN x 16 Discrete Line OUT	48 LED ladders (All Faders/Busses)	4 band parametric on I/P, 8 Band Parametric on Outputs + 16 additional floating processes. (32-band graphic soon)
Yamaha Commercial Audio Systems, Inc. www.yamaha.com/ca	Yamaha LS9-16, LS9-32	LS9-16 1-8, LS9-32 1-16	32 and 64 in console	100mm motorized	-62 +10db	Additional 1 or 2 16 or 32 channels of processing power ready to receive audio via the Mini-YGDAI expansion slots	Virtual	GEQ and effect rack offers easy access to built-in graphic equalization
	M7CL-48 and 32	1-16 Omni, 2 AES/EBU	Console	100mm motorized	-62 +10db	3	Optional	On board graphic, 31 bands
	PM5D, PM5D-RH: 130 inputs	Matrix 1-8, Mix Out 1-24, Insert Out 1-48	On console 48 XLR manual mix pres, PM5D-RH 48 XLR, recallable mic pres	1-48, stereo 1-4	-62 +10db	4 mini YGDAI	Yes	12 GEQs, 4 band each ch.

$80,000 and Up

Company Name	Model/Frame Sizes	Outputs	Input Location	Control Surface Config.	Preamp Gain range	External Inserts	Metering	Channel EQ
Cadac Electronics plc www.cadac-sound.com	S-Digital: Min configuration is 1 x input frame (72 inputs, can control up to 144), 1 x output (up to 72 busses), 1 x Central Control Module	66 mix busses and 3 stereo listens = 72	Stage box	18 x 4 banks in min configuration	10-60dB	Yes	Yes	4-band parametric, swept high and low pass filters
Euphonix www.euphonix.com	From 8 Faders upwards	48 mix, 48 group, 24 aux	Stage box	From 8 upwards	-12 dB to 72 dB in 0.5 dB increments	Yes	High res TFT displays plus stereo metering next to each fader	4 band fully parametric
Gamble DCX Consoles www.gambleboards.com	DCX-40: 40 DCX-60: 60 channels	Master Out, Mono Out, 8 stereo matrices, 16 stereo auxes, center bus	On console	40 (DCX-40) or 60 (DCX-60), 8 stereo subs	Up to +65 dB	Yes	Peak/Average per channel, sub, etc.	4 band, -40 dB cut on low-mid/hi-mid w/graph
Midas www.midasconsoles.com	XL8: (96) input control channels + (16) mic/line returns. The board can address up to (400) XLR inputs, (720) input and output XLRs max	51 main outputs, 120 additional pool outputs for directs, inserts, multing, etc.	Either	(24) phyical input control channels in (3) bays of (8) (96) input control channels total	From -22.5 to +65dB analog gain split 3 ways (separate analog pre for FOH, Monitors, and Recording) -20 to + 20 digital gain trim on each digital console split (2)	Yes, on all inputs, aux sends, matrix, main, and mono outputs with automatic delay compensation ensuring frame accurancy and phase coherence on all channels input to output regardless of the number of inserts	Channel level, gate and compression on all inputs	Properly interpolated (4) band parametric with (3) types of shelving on bands 1 and 4
Soundcraft www.soundcraftdigital.com	Vi6: 64	64 Stage & 32 local	Stage & local	32 per bank	65 dB	Yes	LED Bargraph	4 band fully parametric
Yamaha www.yamaha.com/proaudio	PM1D: 48 or 96	48 Mix outputs, 24 matrix outs	Outboard					4 Bands of EQ per channel


The Digidesign VENUE at work in Koshien Stadium, Hyogo, Japan.


The Midas XL8.


The Cadac S-Digital Mixing Console

	Channel Dynamics	Onboard FX	Plug-ins	Digital Interface	Oh, Crap! (in case of power loss…)	Internal PSU	Dimensions	Weight	Price
	Gate limiter, comp, de-esser	Reverbs and Delays	No	EtherSound	Full audio control if using back up PC	Yes and external back up	3.5 feet long, 2.3 feet deep, 1.14 feet high	94lbs	From $49,999.00
	Gate, compressor, delay	None	No	MADI direct from the mic pres, otherwise analogue	Possible to switch to back-up computer	Yes	6U 19" rack	13Kg	$28,800.00
	Compressor / Limiter and gate with sidechain EQ	6 digital FX processors, reverb, modulation effects, delay, dynamics and 12 x 28-band graphic eq's. 32 processing channels (16 on D1) provide 510ms delay, 6-band parametric EQ and a comp/lim which can be applied to any input or buss.	N/A	MADI, Optocore (standard on D5, optional on D1). Other options include Ethersound & Aviom.	Audio continues uninterrupted during reboot with no loss of control.	Dual hot-swappable PSU's supplied as standard on surface and racks	D1 (WxDxH, mm): 1128 x 864 x 458 D5: 1484 x 868 x 497	D1: 91.5Kg/D5: 125Kg (weights quoted with dual PSUs)	D1: from $55,188 D5: from $69,950
	Compressor/Limiter and Expander/Gate, plus plug-ins	Digidesign ReVibe and Reverb One, Bomb Factory vintage EQ and dynamics emulations, TrooTrace Audio Analysis Bundle, Focusrite EQ and Compressor	Over 100 TDM plug-ins from Digidesign and third parties such as Sony Oxford, Waves, TC Electronic, Eventide, McDSP, Serato, Troodon Technologies, Cranesong, URS	AES/EBU	No loss of audio. DSP backup mode provides full control of faders, mutes, VCA, Mains, banking and metering.	Yes, fully redundant, auto-switching w/ user notification in event of failure	D-Show Main & Sidecar (HxWxD): 13.7" x 78.3" x 35.5". D-Show Profile (HxWxD): 7.29" x 45.27" x 31.1"	D-Show Main & Sidecar: 194 lbs D-Show Profile: 90 lbs	D-Show Main & Sidecar System: $69,995. D-Show Profile System $54,985
	Comp / Gate / Limiter	Soon	Soon (Waves & VB Audio)	64 chan Ethersound, AES and Midi	40 sec reboot (audio will pass)	Yes (auto redundant external available)	45" x 29 x 8.5"	106 lbs	Packages Starting at $63k
	Onboard	Yes	Yes	Yes		Yes LS9-32: 170 W, 110-240 V, 50/60 Hz LS9-16: 95 W, 110-240 V, 50/60 HzLS9-16: 95 W, 110-240 V, 50/60 Hz	LS9-32: 884 x 220 x 500, LS9-16: 480 x 220 x 500	LS9-32: 19.4kg, LS9-16: 12kg	LS9-32$10,999 and LS-9 16 $5,999
	On board	Built-in	Yes	AES/EBU, Ethernet		Yes	M7CL-32: 1,060 x 286 x 701, M7CL-48: 1,274 x 286 x 701	M7CL-32: 42kg, M7CL-48: 50kg	32-$19,999 and 48-$24,999
	110 typ. DA Converter (STEREO A, B OUT)	500-scenes of total recall. Plus you have the equivalent of several racks full of first-rate processing gear onboard (56 Gates, 92 Comps, 97 Delays, 12 GEQs and 8 units of SPX2000 class multi effects).	Yes	2 AES/EBU, 1 Coaxial, CobraNet			W x D x H (mm) 1551 x 950 x 283	PM5D: 98 kg PM5D-RH: 97 kg	PM5D $49,800 PM5D-RH $67,000

	Channel Dynamics	Onboard FX	Plug-ins	Digital Interface	Oh, Crap! (in case of power loss…)	Internal PSU	Dimensions	Weight	Price
	Gate, compressor, limiter	Delay	TBC		Full redundancy of DSP, control surface and PSU, plus additional back-up second computer	No, external	Control surface = 2088mm wide	TBC	approx. $400,000
	Compressor and expander/gate	Dynamics and EQ		MADI internal, AES/EBU, SDI, Analog XLR, ADAT Optical, SPDIF	Distributed Processing so individual units can fail without interruping program. 100% failover availble for DSP and Audio Patchbay as an option.	Dual Power Supplies for all main units	Depends on system	Depends on system	From US$140,000
	Compressor/Gate	No	Through insert	TCP/IP	Mix file saves every three minutes.	Yes	35" H x 60" W x 28" D	200 lbs	$180,000 (DCX-40) or $240,000 (DCX-60)
	(4) styles - Corrective, Adaptive, Creative, Vintage	Yes - (16) stereo effects	Managed thru control of external computer	AES 50, AES 3	No single component failure can cause loss of audio. All components including cabling are redundant with automatic switchover. System will continue in last cue for up to ten minutes while out of contact with control center surface. Reboot of individual bays on surface or entire surface cause no loss of audio. Loss of screens cause no loss of control. All bays have separate PS. All bays can take control from any other bay, etc.	Five in control surface.	Control surface is 73.82" wide, 41.51" deep, 16.57" high	354 lbs	MSRP $340,000.00
	Gate/limiter/compression 2 de-esser	8 stereo Lexicon	No	MADI, AES/EBU	None	No	37.8" H x 71.7" W x 19.3" D, Local Rack: 37.4" H x 23.6" W x 26.4" D Stagebox: 37.4" H x 23.6" W x 26.4" D	Control Surface: 286 lbs., Local Rack: 110 lbs., Stagebox: 88 lbs.	$92,000.00
	6 per channel						13.9" H x 38.6" D x 75" W	260 lbs.	$110,000

Parallel Universes

By Dan**Daley**

"The parallels between live sound and installed sound are pretty apparent."
- Al Siniscal

"Sector overlap" is the somewhat clinical term for what happens when technology creates a convergence between areas of expertise. For instance, going back a few decades for a more dramatic instance, what happened when you converged a pilot and a physicist is you got an astronaut.

An area of nascent convergence at the moment is in the domains of live event audio and fixed installation media. The taxonomy would seem to place them on one side of the aisle or the other: live sound moves around a lot and installed sound doesn't. But definitions can be deceiving. In fact, the overlap between the skill sets, both technical and business, in live touring sound and installed sound have more in common now than a decade ago, and in the process have actually diverged from music recording.

"One of the main things that have joined the two sectors is that they are both computer-controlled," says Ken Porter, owner of Spectrum Sound in Nashville, which plays in both arenas. He adds, "Music isn't so much computer-controlled as it is computer-dominated. It's an interesting distinction."

It is. Music recording, by contrast, has gone down a very different evolutionary path than live sound or installed audio. The "democratization" of music is a synonym for an increasingly diluted gene pool that understands its own black box-encased technology less than it did 10 years ago. Live sound and installed sound, on the other hand, share an upwardly mobile technology curve.

This is why companies like Sound Image, Clair and PRG, with core businesses in live sound, have put substantial efforts into establishing contracting divisions in recent years, and not into constructing recording studios. (John McBride, the Clair Bros. franchise in Nashville and owner of the Hearst Castle-like Blackbird Studios there, is, I contend, the exception that proves the rule.)

The technology and technical expertise overlaps are pretty straightforward. Spaces are no longer looked at solely as singular entities; the concept of multiple zones is pervasive in both disciplines. It might be because live sound also attracts the kind of mind that one finds often in installed media. "I'd say that in my experience, I've seen more people with academic electrical engineering backgrounds in both live sound and installation," says Al Siniscal, a sound designer and electrical engineer at A1 Entertainment Services, and who still does stints as a live sound mixer now and then. "Everyone who gets into audio usually loves music, but the ones who go into live sound and installation work tend, I think, to have the more engineering-oriented mentality and better business chops."

Siniscal suggests that "what feels good in a theatre will probably feel good in an office," meaning that the ability to translate the technology into the real world takes place closer to that real world than, say, making a record in a more insulated environment like a recording studio. "Today's fixed installation situations encompass a lot more music than they used to, and people have higher expectations of how that music should sound, even if it's just background music," he adds. "When you think about it, the parallels between live sound and installed sound are pretty apparent."

The same goes for the economics of both businesses. Both have become capital-intensive in a way music recording once was but no longer is. That and the fact that both live sound and installation are businesses where as much revenue is made from follow-on work as from the original project means that a more evolved business sense is necessary.

"I apply the same old adage to audio as they do to cars: what races on Sunday sells on Monday," says Porter. The NASCAR analogy is apt, he asserts, when you think of live sound companies as racers and installation companies as dealerships. "End users will see how sound companies solve issues over the weekend at shows, and on Monday they'll come to the installation company and say, that's what I want for my house or my office. So it makes perfect sense that you'd see more live sound operators getting into installed sound and, to a lesser extent perhaps, vice versa."

In fact, the largest players in each of their respective domains have achieved a certain level of market saturation and have to look across the fence for growth opportunities. Live sound underwent significant consolidation over the last two decades, the Clair Bros./Showco deal being the leading example. Today, due to a number of factors, not least of which is a sizable slowdown in new building construction, installation contractors are beginning to see similar consolidation taking place. (The consumer market is a useful bellwether here: the acquisition of installer Magnolia by Best Buy and the launch of Circuit City's Firedog and Best Buy's Geek Squad services indicate that large forces can bring a lot of pressure to bear on the install side.)

Look for other synergies to develop between live sound and installed sound sectors in the near future. Both are growth sectors in and of themselves (recall recent columns on AEG and Live Nation). But combined they can be more than the sum of their parts.

E-mail Dan at ddaley@fohonline.com

The Other Buildings

By JamieRio

There are more possibilities for installation work at your typical house of worship than just the obvious one.

Generally speaking, when we think of house of worship installs, we envision FOH speakers, monitors, outboard gear, mics and a mixing console. That is obviously a very simplistic vision, but it does cover the basics. Well, a short time ago I discovered the "other buildings." Just about every church, temple, synagogue, etc., has additional multi-use buildings at the same location.

I got a call to give a bid on a portable sound system for the youth house of a church in Glendora, Calif. This building was a former home that the church had purchased and set up for the youth of their congregation. The youth pastor wanted a small system to be set up in the living room area with additional speakers to be installed out in the patio area. He also wanted this system to be portable so that, for various events, it could be set up out in the back yard of the house. However, the main use of this system was to provide programmed music for the youth who visited and volunteered at the house.

After looking the project over, I convinced the youth pastor and the senior pastor that two systems would be more effective and not much more expensive. One system would be a permanent install of ceiling-mounted speakers in six locations throughout the house and outdoor patio, along with a power amp, speaker selector/volume control and CD/tuner with an iPod/MP3-player port. The power amp and components would be installed in a closet in the youth house office. The second system would be a couple of powered speakers on sticks and a couple of powered monitors, along with a mixer, stands, cables and mics. I had a decent budget for the project, but it wasn't without limitations.

My install system would only consist of two speakers per room and two outdoor boxes in the patio. The design was basic, but I did want speakers with punch and some horsepower to drive them. I started in the main living room. There, I decided on two three-way ceiling speakers with an eight-inch woofer, a 2.5-inch mid-range speaker and a compression tweeter. The other four rooms got two-way ceiling speakers with six-inch woofers and a tweeter, and the patio got a pair of two-way outdoor speakers with eight-inch woofers and high compression horns. I powered the rig with a 2000-watt amp and used an analog six-station speaker selector with individual volume controls to control the speaker pairs in the various rooms. The music was sourced via a CD/tuner.

As you can see, I am not sharing with you what manufacturers I used for my install components. There are obviously buckets of companies out there making great gear. But this article is about the gig, not the gear. If you want to get some insight on equipment, you can read my gear reviews.

Once I had decided which speakers would be installed in the various rooms, it was time to install them. I have done a lot of residential installations, so this was not a big challenge. However, I know that some of you may have little or no experience with home installations. Well, it's not very difficult. In fact, I think it's a lot easier than your regular house of worship install. If you have any "how-to" questions, just go online or drop me an e-mail at jrio@fohonline.com.

The hardest part of my particular install was the fact that the ceilings in the youth house were lath and plaster, rather than the drywall that is commonly used today. I was using a rotozip tool and sacrificing one bit after another on this extra-tough ceiling. The ceiling in the living room was also sprayed with cottage cheese. So after I cut my holes, I had to remove the cheesy flock from the area where the speakers and grill trims sat in order to get a consistent seal. The rest of the install was a piece of cake. I ran wire, hooked up the components, and we were ready to rock. The fact that the ceilings in this house are made of a much harder and more rigid material than today's drywall really tightened up the bass response of the speakers. Especially in the living room. This was an unexpected treat and made all that hard work cutting the holes for the speakers more worthwhile. Now that the house system was installed, I only needed to put together the components for the portable P.A. and pick up my check.

As I mentioned earlier, the P.A. consisted of the powered speakers on a stick, two monitors and a mixer. The mixer included two graphic EQs and onboard effects. Add in the mics and cables, and I was done. Of course, I didn't just set up the gear and leave. I spent time with the various volunteers training them on how to use the systems. With each system, I created a notebook with full operation instructions, all warranty papers and component descriptions. This is my standard practice for all of my installs, but with this particular gig, I added in a couple of visits to check out the system and make certain all was well.

At the end of this project, I had some very happy clients. The youth pastor, who had his office in the youth house, just loved the install system. He could put on some music to work by and adjust the volume in his office to his taste. Or crank up the living room and leave the game room silent, or any combination of the six stations. He also liked the fact that, with all the room and patio speakers cranked up, the whole house vibrated. It's a power thing.

The moral of the story here is that there are more possibilities for installation work at your typical house of worship than just the obvious one. Every house, building or extra room can provide a location for an install. The work is right in front of you if you look for it.

Contact Jamie at jrio@fohonline.com

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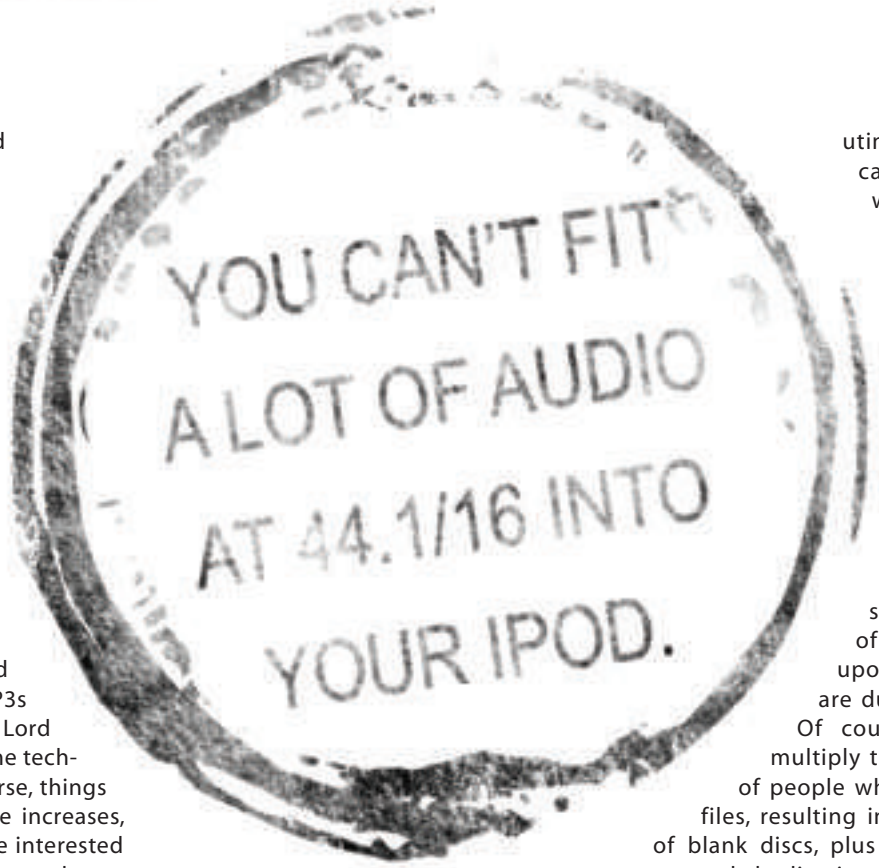
SPECIAL DELIVERY

By **Steve**LaCerra



Last month we discussed the increasing demand for live recording. This month, we take a look at how to get your raw tracks or mixes to the producer and/or band for overdubbing or approval. (Overdubbing on a live CD? I never knew there was such a thing! Tell it to the judge.) Whether you realize it or not, you have likely already participated in a form of digital audio delivery: that iPod you've got strapped to your arm is probably filled with MP3s that have been downloaded from the Internet. Granted, MP3s are relatively small files, and Lord knows the fidelity stinks, but the technological idea is there. Of course, things get complicated when file size increases, and any audio file we might be interested in has got to be huge. In other words, audio at 44.1 kHz/16-bit requires a lot of data. You can't fit a lot of audio at 44.1/16 into your iPod.

[It goes without saying that files sampled at a higher rate and bit depth — 192/64, for example — will take up even more space. Steve's statement in last month's column that 44.1/16 was the best frequency/bit depth to record at has been met with a little pushback from some FOH *readers. For further commentary on this, see the feedback letter on page 2. In the meantime, look at the numbers here as those on the smaller end of the scale. –ed.]*

After your show(s) have been recorded, the audio data will probably be living on a hard drive (plus a backup, of course). You'll have to figure out a way of distributing it so the band can listen to their work. Let's see… 30 tracks of audio at 44.1 kHz/16-bit for a 100-minute show. Do the math, and you'll come up with around 15,000 MB of data, or 15 GB. Do some more math and you realize that you'll need almost 30 CDs to hold this show or a couple of DVDs (depending upon whether they are dual or single layer). Of course, you have to multiply that by the number of people who need to get the files, resulting in a nasty boatload of blank discs, plus the time you get to spend duplicating them and sending them out. Oh joy.

Your alternative is to distribute the files using a different method, namely some sort of Internet-based delivery system. Unfortunately, AOHell (and every other ISP) is not going to let you email 15-GB files to anyone anytime soon (it takes up too much space in their system). You can deliver the information via the Internet using something known as an FTP (File Transfer Protocol) site. File Transfer Protocol allows two computers to connect using the Internet as the wire. The computer providing the data is known as the server. The computer receiving the data is known as the client. The server sort of has its ear to the ground and is always listening for a client who is requesting a connection, but it is the client who actually requests the connection by typing an FTP address into a Web browser. A smart server will then require a client name and password before allowing access to the server. Once the two are connected, files from either machine may be transferred to the other, regardless of what operating system the computers are using. Various roadblocks may be set up on the server, including some that allow the client to access only specific data or folders, so that sensitive data may be protected from unwanted snooping.

What you need to accomplish this is a computer that could remain connected to the Internet at all times, much like the server of a Web site (if the server is disconnected or turned off, then a client cannot access the information). This computer would house a hard drive containing the audio files, so any band member could download these files at any time (without bothering you at 3 a.m.). Ideally, you'd have nothing but the audio on this server, so if a Snooping Sam somehow stole your address, they would not have access to information like, say, your bank account.

Some hard drive manufacturers have recognized the need for this type of information transfer and developed something known as a LAN Disk. A LAN (Local Area Network) is a small group of computers living in one location, such as your home or studio. A LAN Disk is sort of a self-contained mini-computer that looks more like a hard drive and serves your information. Typically, the device has a built-in Web interface so that you can connect it directly to the Internet and then allow clients to access data (in our case, audio) without allowing the possibility of them sneaking around your main computer to steal valuable information. To make your life easier, a LAN Disk usually can connect to your main computer via Ethernet, enabling you to easily transfer the audio files from your computer into the LAN Disk, where they can be safely served to the remainder of the world. Typically, a LAN Disk does not care what OS you are using, so if you are on Mac OS X, your band is using Windows and the singer's grandma is using Mac OS 9, everyone can retrieve the files without a problem — all they need is Internet access. Since a LAN Disk does not care what type of data it is serving, you could also use it to share electronic photos from that last gig. To get your files onto the server, you simply go to your desktop and drag them from your main computer onto the LAN Disk. Done.

Our friends over at Digidesign have developed a sort of FTP server on steroids known as DigiDelivery, which can help serve Pro Tools files. A DigiDelivery server connects to your computer and provides you with automated delivery functions, such as sending an e-mail to each recipient notifying them that dinner is being served. The e-mail can contain a link for the download, a message from the sender and even an invoice so that the band can reimburse you for all that extra time you spent on your days off.

Now that's slick.

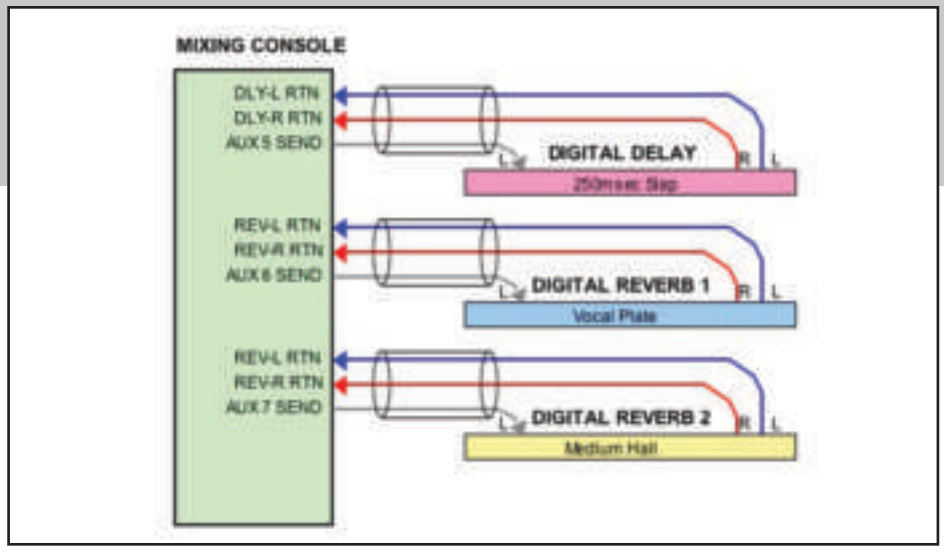
Steve La Cerra is the tour manager and Front of House engineer for Blue Oyster Cult. He can be reached via email at Woody@fohonline.com

USING **DIGITAL EFFECTS** PROCESSORS

By **Mark** Amundson

While it is much lower in the procurement priority list, procuring and using digital effects processors is still something that requires a bit of thought. For professionals, choosing the right effects processor is more than the strength of the preset list or the user interface; it is a long-term investment and a gamble that the effects purchased will continue to be popular for many years of touring usage. Take the ubiquitous Yamaha SPX-90 effects processor; while very technically obsolete, it is still found today in many club installs, and the outboard racks of many regional and touring soundcos. Ditto for the Lexicon PCM-81, Roland SDE-1000, TC Electronic 2090 and Yamaha SPX-990.

When I started doing live sound work, reverb was the hidden spring unit inside the mixing console, and delay was the cherished Effectron II that had a precious switch-selectable delay range that chose how many expensive computer memory chips to use and a fine adjust knob to vary the sample rate as a method of getting the delay time dialed in.



Typical effects set-up

Cabling to and from the Effectron II was just a couple of guitar patch cords, and noise floor was determined by how you used the 40-some dBs of dynamic range (8-bits). Thankfully, innovation moved forward, and the manufacturers started to offer better products in the digital electronics realm.

Hooking Up

Getting beyond guitar patch cords, today's effects offer fully balanced inputs and outputs with either TRS phone and/or XLR jacks. And modern effects offer stereo inputs and, usually, fairly flexible internal signal routing schemes, so that single or dual processor engines (DSP chips) can handle stereo-in/stereo-out, mono-in/stereo-out with the engines in parallel (dual effects) or serial (chained effects) configurations. While some of this flexibility is driven by usage in recording studios, some live sound engineers make the most of the configurability as well.

I consider myself a middle-of-the-road digital effects user, as I do not burn a bunch of mixing console auxiliary sends to drive all of the digital effects in stereo. Instead, I resolve to use the mono-in/stereo-out format, and let the effects processors widen the ambience of the signals routed into a simulated stereo sound field. This philosophy comes from the fact that I mix mostly in clubs, with just stereo speaker stacks, and mix most of my input channels center-panned so that nearly everyone in the venue hears the same mix of vocals and instruments. I allow my digital effects (reverb) processors to widen out the mono signals into stereo reflections or delay slaps that create a quasi-stereo mix to those patrons who can hear sounds from both speaker stacks. The figure shows my typical hook-up schematic.

Since virtually no one builds three cable assemblies of balanced mono-in/stereo-out effects signaling, I take three 15-foot TRS patch cables and loom them together using plastic spiral wrap sheathing pieces spaced in intervals throughout the length. Also, I use colored electrical tape on the cable ends to attempt unique combinations for quick patching at the mixing console.

> In the beginning, we ran our signal as hot as we could, living with the occasional brick wall distortions.

I do leave the cable assemblies connected and stowed at the effects/outboard signal processing rack so that I am not hunting for jacks in the dark bowels of the rack every gig. Obviously, my next upgrade would be to gather up the effects assemblies together in one snake with one multi-pin disconnect near the console side. I tend to resist this last upgrade, as my gear configuration tends to change enough that I would be always modifying the snake ends for these changes.

Effects Gain Structure

Back when all audio and computers were 8-bit, digital audio was trying to push the boundaries with 12- and 16-bit wide samples. The reason for this was that each bit provided a theoretical 6dB additional dynamic range. Thus, in the beginning, we ran our signal as hot as we could, living with the occasional brick wall distortions on the audio crescendos. Today, with 24-bit wide processing and very fast sampling rates on digital effects, there is little need to heat up the signal levels to use every last dB of signal range. Typically, I leave the signals in the 0 to +4dBu peak range with little fear of hearing the processor noise floor.

And when returning the digital processor mixes my stereo preamps tend to be about unity in gain. When it comes actually employing effects, I find my touch on the stereo channel fader tends to be very light with the reverbs at about -20dB to -10dB if I need a drenching hall 'verb on a slow ballad. Digital delays follow about the same philosophy, from a light "Elvis '50s slap" (200msec, two repeats) at -20dB, punching in phrase repeats at -5dB to -10dB.

Choosing Your Weapons

I get pangs of jealousy when thinking about Steve La Cerra's SPX-990 sample and pitch shift effect he uses with Blue Oyster Cult on the song "Godzilla". As mentioned in other Theory and Practice articles, my effects needs tend to be very pedestrian, with plate 'verbs, hall 'verbs and a few basic slap delays (200msec, 375msec, 500msec). Of course, the acts you work with will specify the types of effects you will need and how many on any particular song.

I recommend, after you purchase a new digital effects unit, that you force yourself to spend an hour or more with headphones and a vocal mic, and run through each factory preset patch and get to know the variety of standard effects. And after running through the presets, make an effort to alter a couple of favorites and place them into user memory locations. This way, you gain a bit of training on the effects processor, and have a shot of doing it again, if requested, to store a custom effects type for the performance.

Contact Mark at marka@fohonline.com

Ghost In the Machine

The band had just finished a 7:00 p.m. setup and sound check at a really cool club in Texas. It's a large stage with huge P.A. system, monitors, stands, mics, sound guy, etc. Most of the band took off to get a little rest before the gig while the guitar player stayed back to watch their equipment and warm-up.

So picture this: The amps are off. The place is starting to get a few people. He's in the dark back corner of the club strumming away, making no sound. Suddenly, everyone hears very loud guitar tuning over the canned house music .

Everyone starts glaring at him. He throws his hands in the air in a vain attempt to show that it's not him — too late; the tuning stopped .

The house sound tech approaches and says, "Dude, you don't need to be playing right now, otherwise this will be the last night you play here!" We try to explain the situation and it starts happening again. He quickly runs off to the house console.

No sooner does he leaves, than the club GM/bouncer runs up and threatens to kick his butt (and he easily could) if he doesn't quit disturbing the customers. Once again, we explain that it's not him. I pointed to the amps on stage, which were all off. Fortunately, it happens again with him standing there. Now he gets puzzled, and thinks we're trying to play a joke on him — he gets even more ticked-off .

The house tech runs back up while this mystery player keeps tuning his guitar over the music. I ask him a simple question, "Do you guys have a wireless system back there?" "No," he replies. He jokingly asks, "Do you guys have ghosts in your amps?" Now the "ghost" is in full tuning mode. Customers are threatening to leave.

Everyone is running around like crazy — still blaming us and threatening to kick butt! I take everyone on stage and explain: One, the guitar amps are off! Two, the "ghost" isn't heard in the stage monitors! And finally, IT'S ONLY IN THE MAIN P.A.! Then I ask again, "Are you guys running a wireless mic or something?" And I add, "Do bands play next door?" Light bulbs, followed by a heavenly chorus.

Never admitting to any wireless equipment, they sent somebody to the pool hall next door. Sure enough, next door had a guy playing a wireless on his guitar. Unknown to the house tech that I'm dealing with, a guitar wireless will talk through their wireless DJ mic. They didn't understand the two systems could talk to one another .

I felt like screaming; however, the problem was solved with a quick channel change on their wireless DJ mic. No blood was shed.

Ken Chappell

Gigs from Hell. We've all had 'em, and the good folks at *FOH* want to hear about yours. Write it up and send it to us, and we'll illustrate the most worthy. Send your nightmares to jcoakley@fohonline.com.

In The Trenches

John Ryan

ITT

Self-employed
FOH Sound Engineer/Consultant
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Services Provided:
Bi lingual, fluent in Italian and English. My main jobs lie within Italy, but I also work with international artists involved in European tours. I work with All Areas, a company that provides manpower for heavy touring and gigs.

Clients:
Nile Rodgers & Chic in Europe 2006; Nello Daniele Club Tour, Italy; Bengo Festival, Italy; Croatian Ski opening night with Kool And The Gang.

Quote:
"I'm all ears for you."

Personal Info:
Born in Italy, in Naples. American and Italian parents have contributed to my love for travelling. I've always been involved in music in some way, and it soon became my career. I'm a pretty honest team leader, and my team is always great.

Equipment:
Yamaha digital desks: PM1D, PM5DRH, M7CL. Adamson Y-Axis Line Source Array.

Don't Leave Home Without:
...me!

Ben Blomander

ITT

Owner, Engineer
PB Pro-Audio & Lighting
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Services Provided:
Audio & lighting rentals, sales & installation

Clients:
Holly Cole, Colin James, Big Wreck, Nazareth

Quote:
"Go hard, or go home."

Personal Info:
I have been in the business for 20 years and enjoyed every second.

Hobbies:
Working out, home life and playing guitar

Equipment:
Midas, EV Line Array, Shure, Neumann and Rode, QSC and Crown Power, Turbosound Monitors. Yamaha outboard and TC Electronics

Don't Leave Home Without:
LED Lights, Sharpie and Multimeter

If you'd like to see yourself featured in "In the Trenches," visit www.fohonline.com/trenches to submit your information to *FOH*, or e-mail jcoakley@fohonline.com for more information.

The $300 (x 40) Gig

By Brian **Cassell** & Paul H. **Overson**

[A few months back, we ran an article in this space detailing the infamous "$300 Gig" and what it really costs you to take it. Well, everything is relative, and recently one of our Anklebiters took a gig that, for all intents and purposes (and disregarding the low-five-figure payout), was a $300 Gig. In the end, the client got way more than he paid for, and the soundco had destroyed their relationship with the company that supplied much of the gear, pissed off a bunch of crew members and earned very little money for a full week of work. Let's take a look at what went wrong and what can be learned from it. –ed.]

Paul: A number of years ago, I started providing sound for a cowboy poetry festival in the small town of Heber City, Utah. It started out with a single stage but has grown over the years into a six-day long event (including load-in and load- out) with multiple stages, nationally-known acts and satellite events before and after the actual festival. The budget for the event has grown as well, but not at near the rate of the event itself. When I was contacted about the gig, I took it. At the price they offered, that was a mistake that I am still paying for.

The gig is fun, but very hard. It includes multiple stages over a six-day period of time. Some of the events included a kickoff steak dinner with entertainment, an old-time railroad train with entertainment on six cars, three stages with continuous entertainment for three days and a cowboy church stage for Sunday. Each of the stages requires monitors and FOH with a two-person crew to man the positions. On the continuous entertainment stages there were no scheduled breaks for food, etc. The main stage had three two-hour shows per day and sound checks in-between the shows.

I guess that the big question is: What is an Anklebiter doing with this gig? Why would I get involved in something this large?

That is what I am wondering, too. How does an Anklebiter get from our "normal" business to this level? Should we go for larger gigs? How do you plan for growth? Remember that all of this was accomplished on an Anklebiter budget. The gig paid in the low teens and yet expected a $40,000 performance from the sound company. Brian, I have informed you about this gig, what do you have to say?

Brian: This kind of show takes tons of planning and coordination, as well as a large quantity of equipment and labor. You're certainly right that this doesn't seem like the type of thing an Anklebiter would normally tackle. I think that if I was approached to provide production for this type of event, I would sub out all of the production to one or two of the regional companies in the area, and I would assume the role of production manager for the overall event. The major problem is doing it on a budget that should cover one stage for a day or two. I can't imagine pulling all of that together within such a tight budget.

It's not that I wouldn't try to do larger shows. Over the years, I've done some huge shows with multiple systems, delay towers, everything imaginable. Just not with my own gear. I think that the key to growth of a company is slow and controlled. Sure, there will be some big jumps forward. You'll know you're there each time you find yourself with a bigger contract than you've ever had before. And you're likely to stress a little when you look at your budget and place the order for the next piece of expensive equipment you need to make that show happen.

I just ordered the rest of the parts to finish building a new splitter snake. And with 56 inputs, multi-pin disconnects and a total of 400 feet of cable, it's not cheap. The cable and the stage box are already sitting in my shop, long since paid for. It's the $3,500 price tag for fan-outs and mass connectors that just about gave me a stroke. But you've got to make these investments to make money. This business is hard. It really is. I have to keep reminding myself that this cable alone will rent for around $1 per foot, and owning it will leave around $100 in my bank account each time I do a show that necessitates something more than my current 125-foot, 24-channel snake. Its just part of a slow growth process.

Maybe one day, I'll be able to step up to the plate and do a $40,000 show, but for now I'm dealing with all the ones that bring in a few hundred dollars. Occasionally, I'll have a show that pays as much as $3000; the first time a promoter said, "You can handle this," I was petrified, but I pulled it off. Next month brings a show that will pay a little over $8,000, and it's a bit of a challenge for me. But as time goes on I will be better equipped to handle incrementally larger and larger shows. Maybe one day I'll be a regional company…

Paul: The only way that the budget for the Heber gig could work is to increase it dramatically or reduce the equipment list. Let's look at how to increase the budget.

Does the promoter have the money in the gig that will allow for a larger audio budget? Are the seats selling at top dollar and are limited in number? If this is the case, then asking for more money probably won't work. The promoter, as well as the Anklebiter, does not have a money tree to pick the excess cash from. Analyze the gig and see if you are being paid what is customary in your area. If not, then you need to work on selling your service for a higher price.

The other scenario is to reduce the equipment list. Analyze each gig and see if it can be done with less gear. Do you need to consolidate monitors and house from the same position? Is it possible to use fewer cabinets and still have excellent coverage? Do you still need a stage person to change over acts if it is a multiple act gig? Can you hand the gig off to someone else and stage manage the show? Will the company that you hand it off to steal it next year and leave you out? Do you want to give your competitor some of your clients?

Brian: Well, I don't exactly want to just turn over clients to a competitor. You might as well just go work for them and take a commission on your sales. Maybe I'm lucky to have a good working relationship with a great regional company in my area. A big chunk of my workload is subcontract work I do for them, and I certainly don't make any attempt to steal their clients. I would hope that they would have the same respect for me. Of course, maybe I'm just naïve, and don't see the potential danger of handling a show that way.

Then again, there are whole companies that do big business just doing event coordination. And most of what they provide to their clients is contracted out to various production companies. I guess putting anyone else in contact with your work could be risky, but you've got to know when it's more than you can handle alone, and when it's just time to grow a little. I just don't think that growing in huge leaps and bounds overnight can be healthy for a business.

Paul: I have had local companies steal clients and also contract to send to me certain specified gear and then at the last minute change the equipment and leave me stranded. I would much rather grow gradually or contract out to a third party than to experience this type of situation. The most important single task is to create a business plan with contingencies for what we have described. Plan your work and your growth, or you will have many problems.

EMPLOYMENT

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DO THE MATH

continued from page 18

sound in that room hits everything before, or at the same time as, the audience, and the sound waves virtually stand in the center of the venue for more than 10 seconds. The source-sound from the enclosures does not reach the audience.

Also, by suspending front-loaded enclosures as they did, they eliminated the opportunity for natural coupling. This reduces the sensitivity of the enclosure by half. Now you require twice as many enclosures. (And power and amps).

Now let's talk about the client, who typically knows little or nothing about sound, and who is forced to blindly follow the advice of the salesperson. After spending millions of dollars and relaxing in the comfort of the brand name thrown at them, the sound system goes up and sounds like crap! Then, one of two things will happen. Either the client believes it must sound good because it's brand new and it's a brand name, or the client realizes it doesn't sound good, but they are is unwilling or unable to reinstall due to the expense, frustration and lack of expertise available to do so effectively. So, like the Metrodome, they just leave it in and deal with the complaints for decades. Consequently, after spending millions of dollars, the Metrodome is widely known as one of the worst sounding domes in the world.

Land of 10,000 Reflections

The installer of this system clearly didn't understand enclosures, their purpose or their design. If you'll notice, all of the low-frequency and low-mid-frequency enclosures are designed as front-loaded, meaning that the cone is mounted from the front of the cabinet, and there is no push (or directed-wave) design. The characteristic of this cabinet is that it will project 30 feet forward and drop off in its volume. The simple math is that there is nobody hanging out in the middle of the airspace of the dome to receive that sound within its effective area. Maximum effectiveness of the enclosure design exists within 30 feet of these enclosures. In layman's terms, beyond 30 feet of the cabinet, the sound then meanders around the building, trying to find a place to land. The soundwaves move at 100 degrees from the enclosure, and they continue to bounce off of reflective surfaces within this 100-degree directivity until the crowd absorbs them. Over the past few decades, we've all been dissatisfied with the audibility of this failed design. The resolution is to direct as many of the sound waves as is physically possible toward the audience, which is the absorbing surface. This is impossible with the existing enclosures.

An equally damaging part of the design of the sound system is that, while bringing the enclosures from the upper center of the dome forward towards the audience makes sense, they created an open, non-applicable reflective void in the arena. The enclosures hanging there now are not close enough to the audience to do any good, because of the reasons explained above, so while sound waves look for a place to land, they wander in the center of the dome between the back sides of the enclosures. This is where a majority of the delay in sound occurs. However, if they moved the enclosures forward to meet the audience, they would create a larger standing void in the room. The only option is to suspend all enclosures from the center of the dome and cluster them all together, called "point-source." The enclosures would require a folded-horn, long-throw design for this purpose, and positioning. Instead, they went right down the middle and caused a nightmare in audibility.

What I've reported here concerning the Metrodome sound system, the worst case that I'm aware of in the country, can be corrected. I would recommend a demonstration at the dome itself, because the dome is a specific arena, with its own specific problems. The most cost-effective way of demonstrating would be to set this demo system up on the field in the center of the dome. I would set it up inverted to its flown design on the ground. This point-source, horn-loaded or folded-horn design could then be turned on and observed over a period of about five hours, start to finish. You could then walk around the dome and hear the difference. This would be the most cost-effective way of proving that the sound problems can be resolved.

I would love to someday sit in the Metrodome and enjoy the game, hear every word and celebrate the addition of an exciting new sound design. So would the people who sit next to me when I'm there.

Bradford Thompson is a speaker designer and audio engineer based in Minneapolis, Minn. Bradford has designed and built a number of speakers, including the BE/HL-4/3200. His designs have also been bought by the likes of JBL and Klipsh.

Shows Need Labor, Too

By BakerLee

I enjoy the Holiday season as much as the next guy, but quite frankly, the high cost of present-giving has left my bankbook crawling through January, and it's doubtful if it will be off crutches until March or April. Everything is just so damn expensive that, even if I do all my shopping at Target or Best Buy, my bankbook still gets its knees broken. Well, that's life, but fortunately for all of us, the big oil companies got into the Christmas spirit and, in the name of charity, raised the price of oil by only about 25 cents a gallon for the season. Tell you what. When I go visit the relatives during the holidays, it sure gets me in the spirit to top off the tank at "Bah Humbug Oil" before I leave on my journey. I guarantee that the ghosts who visited Ebenezer Scrooge will be making the rounds next year, but that's another story, and in the words of Tiny Tim Crachit, "God bless us. Every one!"

If he were alive today, Charles Dickens might find his Ebenezer to be completely egalitarian compared to some of our present day Scrooges, but we who live in the 21st century realize and accept that, in the name of freedom, a few Scrooges are a necessary evil to combat the real evils that assail us. As we all know, "It's the economy, stoopid!" That said, I am going to share with you an article that I came across in the *New York Daily News* under the alarming headline:

"Twelve Day's Price Tag Rises To Almost 19G"

PITTSBURGH - The cost of "The Twelve Days of Christmas" is on the rise — again.

Buying each item in the song just once — from a partridge in a pear tree to 12 drummers drumming — will cost you $18,920, or 3.1% more than last year, according to PNC Financial Services Group.

The total cost of items gifted by a true love who repeats all of the songs verses costs more than ever before — $75,608 in 2005, a 3.5% increase.

While prices for the partridge, two turtle doves, three French hens, six geese and seven swans remained the same as last year, high wages made the lords a-leaping, ladies dancing and pipers piping costlier. The maids a-milking, however, make the federal minimum wage, which has been $5.15 per hour since 1997.

Each year, the Pittsburgh-based bank does a tongue-in-cheek tally of how much the swans, geese and drummers would cost if you purchased them at today's prices.

The nine ladies dancing are the costliest items on the list again at $4,759. The seven swans a-swimming cost $4,200. And a pear tree saw the biggest jump, going from $89.99 in 2005 to $129.99 this year.

The cheapest? As always, the partridge, still $15.

Cute, right? Wrong! Consider this: if you would like to hire a celebutard such as Paris Hilton to show up at an event, it would cost you $100,000–$500,000, plus a private jet to transport her valuable self to and from said event. That, and the cost of a first class hotel suite for said artist, and one realizes that in today's market, $75,000 for the "Twelve days of Christmas" almost sounds like a bargain. Dr. Phil commands $750,000–$1,000,000 to give a speech, and, believe it or not, there are apparently people who are willing to pay that price for his great pearls of wisdom. "Who are these people," you ask, "who can afford the likes of a Dr. Phil or Paris Hilton?" I'll tell you who. It's the same Scrooges who raise the price of oil during the Christmas season, or the ones who charge 30% interest on your credit card when your payment is late. Not that I blame anyone for wanting to make a buck, but what irks me is that it is the same people who frantically call me with the "Twelve Days" rider in hand and ask me to help bail them out.

"I didn't know when I booked the act that they would need sound, lights and staging," the caller might say. "I never figured production into the budget, since it was never mentioned in the song. They're asking for a 40' x 40' stage, a 120k lighting system with moving lights and a sound package with a line array system, four downstage wedges and side-fills. They also need truck and bus parking. The event is taking place next week; can you help me?"

I love a challenge almost as much as I enjoy putting together big productions, and, therefore, I have the caller send me the rider immediately. I dive into the task headfirst and put together a quote with stage, lights, sound, riggers, audio techs, stage manager, lighting director and eight stage hands all for the low price of $65,000. A fair price, considering that the production has to be set up the day before and struck the day after the event. My client calls back, apparently one nitroglycerin capsule away from a heart attack. "This is ridiculous," he sputters into the phone. "This production costs almost as much as the artist, I don't have this kind of budget, ya gotta help me out here."

"First of all," I start to scream, "I don't have to do anything for you, and you should have thought about your budget long before you decided to get into show business, you dipstick!" Though, as it always happens, the words came out of my mouth in sweet dulcet tones as I asked, "Where would you like me to cut back in my quote, sir?"

"Well, first of all, this is taking place in a hotel ballroom for only about 300 people. It's not Madison Square Garden, you know (this is a phrase I hear quite often when a client doesn't have a budget), so I just need a basic (?) sound system. Also, I just need a simple (?) lighting system, nothing too fancy (?). We can clear the chairs and tables at one end of the room so they won't need a stage, or a stage manager (?) for that matter. Regarding the stagehands and loaders, I'll be there, and I can get some guys from work to help get set up, so we can get rid of all that labor as well (???!!). Now, where's that leave us?"

"Well sir," I reply, "It appears to me that this is a fairly large production, considering that there will be all sorts of foliage, as well as swans a-swimming, geese a-laying, French hens, turtle doves, partridges, calling birds, pipers piping, drummers drumming, maids a-milking, lords a-leaping and ladies dancing, not to mention those five golden rings. In light of all this, it seems to me that you might want some professional help producing this event, but don't listen to me, it's probably better to consult with your accountant instead. Keep in mind that there is a certain order to the appearance of each of these performances, and I do assume that they need to be seen and heard properly to make this show work, but that said, if I do the show your way, who will receive the brunt of the performer's anger or the audience's rage when nobody can see or hear the show? Your accountant? Who's to blame if the lords a-leaping enter during the maids a-milking scene? Think how upsetting it might be if all the drummers start a-drumming while the geese are a-laying. No, sir, I'm sorry, but I refuse to be responsible if the show is not done correctly. Oh… and one last thing in regard to labor: At the end of the show, after all the drinking and partying is over, where might I find you and your helpers? Quite frankly, sir, I must tell you, if you don't have the budget to do this show properly, then I think I'll pass on doing the production. As a matter of fact, while we're at it, I have a feeling that the hotel bill for this entourage may come to you as quite a shock. Trust me when I tell you that I realize inflation is tough on everyone, but now you'll have to excuse me, as I need to take some real work so that I can fill my gas tank and pay my credit card bills."

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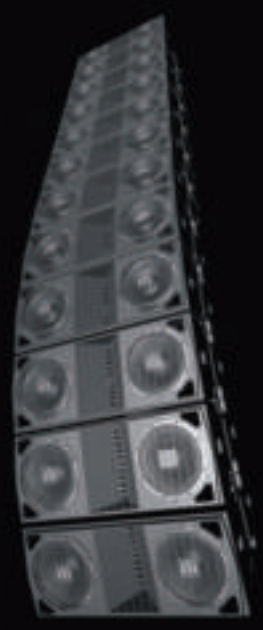
Toby Francis,
FOH Engineer, ZZ Top



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