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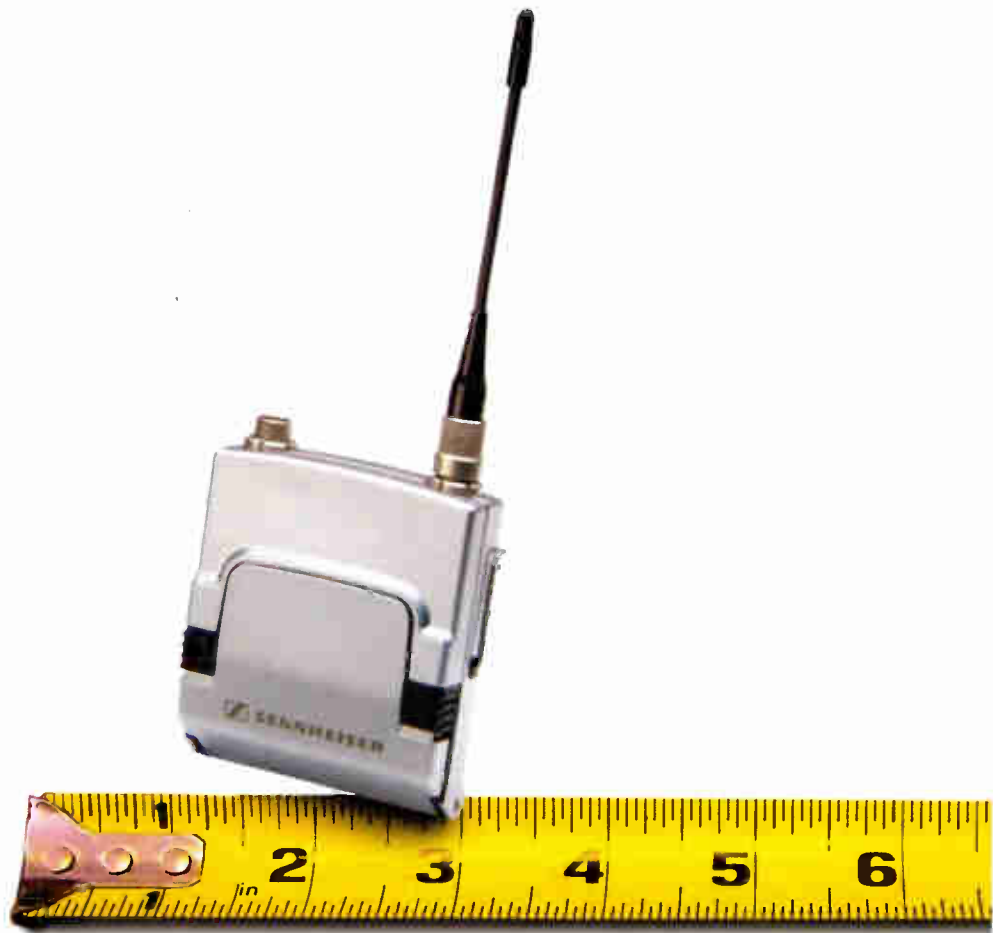
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READER SERVICE NUMBER 3

*Evaluating audio products for professionals in commercial recording, broadcast production, audio for video/film, project studios, live sound, contracting and multimedia.*

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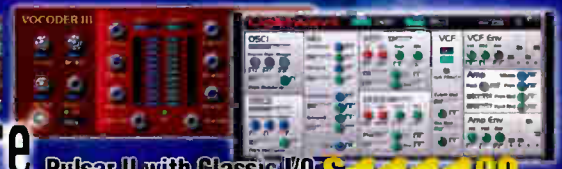
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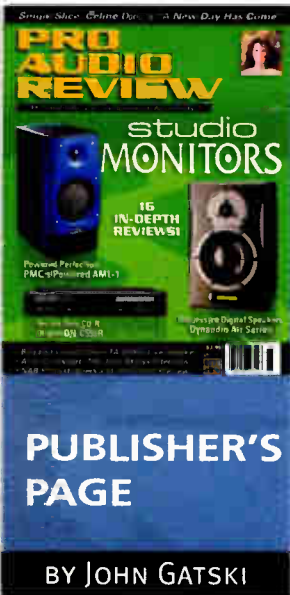
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READER SERVICE NUMBER 5



# Back in Saddle... and Without Shoes!

**R**emember me? You have not seen a column from these fingers in a while, but now I am now writing again — this time from the perch of the publisher's chair. Our illustrious editor Steve Murphy has gone back in the studio to work on outside projects, but he will continue his expert reviews and insight as our contributing studio editor. With Steve's departure from the day-to-day operation of the editorial department, I thought it would be a good time to grab the column reins again.

As our cover boldly states, this is our studio speaker issue — the sixth one since June 1996. Long time equipment editor, and now managing editor, Brett Moss has put together an outstanding array of speaker reviews that range from the state-of-the-art digital speaker system from Dynaudio Acoustics to the bang-for-the buck powered offerings from Yorkville. Throw in the always-complete Buyers Guide and a sampling of acoustics treatment reviews and product roundup — as well as an interview with acoustics expert John Storyk — and you got an issue no studio engineer should miss.

Powered speakers keep on getting better to the point that maybe someday even I will be persuaded that I don't need all those hulking amps that keep clogging up my hall way. I said maybe. I actually enjoy breaking my ankles on those cooling fins.

As previously mentioned, Nick Baily also delivers an informative interview from acoustics expert John Storyk. The crux of the interview relates to trends in room treatment for project studios. Since a lot of recording is done in state-of-the-art home and project studios these days, good sound-

ing rooms are paramount.

Now for my soapbox. I am sure many of you have flown since Sept. 11 (no doubt to one of the millions of pro audio trade shows now permeating our landscape) and have discovered the lack of randomness that results from the random searches at airports.

It never fails. I go through security, and they pull me aside. They make me remove the contents of my bag for a search and they make me take off my shoes — and sometimes with nowhere to sit.

Last flight, I joked to the security guy that it was actually a relief to take off my shoes because I was from West Virginia (and I am). He did not get the joke, and when I tried to explain the joke, he told me to put my shoes on and "go."

I went on to the gate, and as I inched forward to the ticket taker, I could see the security man finishing up with his previous random search — an 80-year old lady. Uh-oh. It is going to be close, I thought. I almost made to the tramway door, when I hear that familiar refrain, "Sir, would you mind stepping this way for a random search of your bag... and would you mind removing your shoes." Next trip, I am not wearing shoes.

Just a reminder, we love to hear from you, the readers, about our reviews, columns, buyers guides, features or any observations about what is going in the pro audio realm. Email Brett Moss or myself at [bmoss@imaspub.com](mailto:bmoss@imaspub.com) or [jgatski@aol.com](mailto:jgatski@aol.com); or fax us at 703-998-2966. And don't forget about the PAR web site, [www.proaudioreview.com](http://www.proaudioreview.com), with our second-to-none, archive listing of reviews and our current reviews-of-the-week.

*John Gatski is publisher/executive editor of Pro Audio Review.*

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Publisher, Executive Editor: John Gatski ext. 119  
e-mail: [jgatski@aol.com](mailto:jgatski@aol.com)

Associate Group Publisher: Nick Humbert  
e-mail: [n.humbert@audiomedia.ca](mailto:n.humbert@audiomedia.ca)

Managing Editor: Brett Moss ext. 143  
e-mail: [bmoss@imaspub.com](mailto:bmoss@imaspub.com)

Technical Editor: Edward J. Foster

Studio Editor: Steve Murphy  
e-mail: [smurph@smurphco.com](mailto:smurph@smurphco.com)

Technical Consultant: Tom Jung

Contributors: Bruce Bartlett,  
Dr. Frederick Bashour  
Nick Baily, Edd Forke  
Edward J. Foster, Carlos Ga  
Will James, Bob Katz  
Bascom H. King, Daniel Ku  
Carl Lindemann, Russ Long  
Glen O'Hara, Alan R. Peter  
Rich Rarey, Andrew Robert  
Alan Silverman, Mark Ulan  
J. Arif Verner, Roger Williarr  
Tom Young

Production Director: Lisa McIntosh  
Production Manager: Annette Linn  
Ad Traffic Manager: Kathy Jackson  
Publication Manager: Carolina Schierholz  
Product Showcase  
Classified Coordinator: Angela Washington  
Graphic Designer: Joaquin Araya

President/CEO: Stevan B. Dana  
VP: Camel King  
COO/Editorial Director: Marlene Lane  
Sales Director: Eric Trabb  
National Sales Manager: Alan Carter ext. 111  
West Coast Sales: Paul DaCruz 707-789-0261  
Ad Coordinator: Joanne Munroe ext. 152  
Dir. of Marketing and Circ.: Sheryl Unangst ext. 164  
Senior Circulation  
Fulfillment Mgr.: David Fisher ext. 167  
Corporate Marketing Mgr.: Amy Gutowski ext.123

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# TASCAM DM-24: The Affordable Luxury Console Is Here



Luxury usually comes with a hefty price tag. Not so with the new TASCAM DM-24 32-Channel 8-Bus Digital Mixing Console.

The DM-24's features are usually reserved for super high-end mixers. With 24-bit/Up to 96kHz digital audio, the DM-24 blows away the standards in sonic quality for affordable consoles. With its internal automation, you'll get more power at your fingertips than you would from those huge consoles in commercial facilities. With some of the finest spatial and modeling processing from TC Works™ and Antares™, you can create fully polished productions without ever going to the

rack. With incredibly flexible routing, fully parametric EQ, machine control capabilities, touch-sensitive motorized faders, and lots of audio interfaces, you can integrate the DM-24 into any studio environment.

Whether you're working with standalone hard disk recorders, DAW systems, MDMs or analog tape, the DM-24 is optimized to be the very best choice in consoles designed for 24-track recording. Ready to get everything you ever wanted (and more) in a digital console? Get the DM-24 today at your authorized TASCAM dealer.

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- 16 more channels at mixdown (total of 48)
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- Enhanced user interface
- "Keep" and "Touch" automation features now available

And there's more! Visit [www.tascam.com](http://www.tascam.com) to get all the info on v1.6, download the file and update the DM-24 via MIDI.



*The DM-24's rear panel includes AES/EBU digital I/O, S/PDIF digital I/O, MIDI In, Out and Thru jacks, ADAT Optical input and output, external footswitch connector, time code input, GPI port, word sync in, out/thru, DTRS remote port, PS-423 9-pin control port, 24-channel TDIF I/O and more. Shown here with standard interfaces. Not luxurious enough? Customize your DM-24 with two expansion ports for extra analog, TDIE, ADAT or AES/EBU modules.*

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**A Designs MP-2 Tube Microphone Preamplifier** With a face only an engineer could love comes the MP-2 from A Designs. The MP-2 is a two-channel tube-based mic preamp. Features include phase reverse, phantom power and level controls on each channel and 6N6 and EF86 tubes. Jensen transformers are utilized in a zero feedback design. Twin VU meters and a ruby glowlight harken back to 1950s. Price: \$1,499.

Contact: A Designs at 818-716-4153, [www.adesignsaudio.com](http://www.adesignsaudio.com); or circle **Reader Service 164**.



**Shure Beta 98H/C Clip-on Instrument Microphone** Shure's Beta 98H/C is an integrated clip-on cardioid-patterned condenser microphone designed for use with instruments. The microphone has a lengthy gooseneck, attached clip and an internal shock absorber for mitigating key and other mechanical noise. Other features include a locking windscreen. The mic is also available as a wireless model with a four-pin connector. Price: \$397.

Contact: Shure at 847-866-2200, [www.shure.com](http://www.shure.com); or circle **Reader Service 165**.

**Frontier Design Group Apache Lightpipe Patch Bay** The Apache from Frontier Design Group is a 12-input/12-output lightpipe optical patch bay. The Apache reclocks incoming ADAT signals. The Apache also offers 12 memory settings and MIDI I/O for linking purposes. Furthermore it can also handle two-channel S/PDIF optical signals. Price: \$799.

Contact: Frontier Design Group at 800-928-3236, [www.frontierdesign.com](http://www.frontierdesign.com); or circle **Reader Service 166**.



**Community Loudspeakers MVP40 Subwoofer** For really low-end live sound power Community Loudspeakers offers the MVP40. A hefty 18-inch woofer is the business end of this passive subwoofer. A pole mount socket eases placement of a full-range cabinet while interlocking corner protectors improve stacking. A carpeted exterior and 16-gauge steel grille add protection for the 34 x 18 x 15 inch MDF cabinet. Spec-wise the MVP40 offers 98 dB 1W/1m sensitivity and a maximum of 123 dB on output. Price: \$684.

Contact: Community Loudspeakers at 610-876-3400, [www.loudspeakers.net](http://www.loudspeakers.net); or circle **Reader Service 167**.

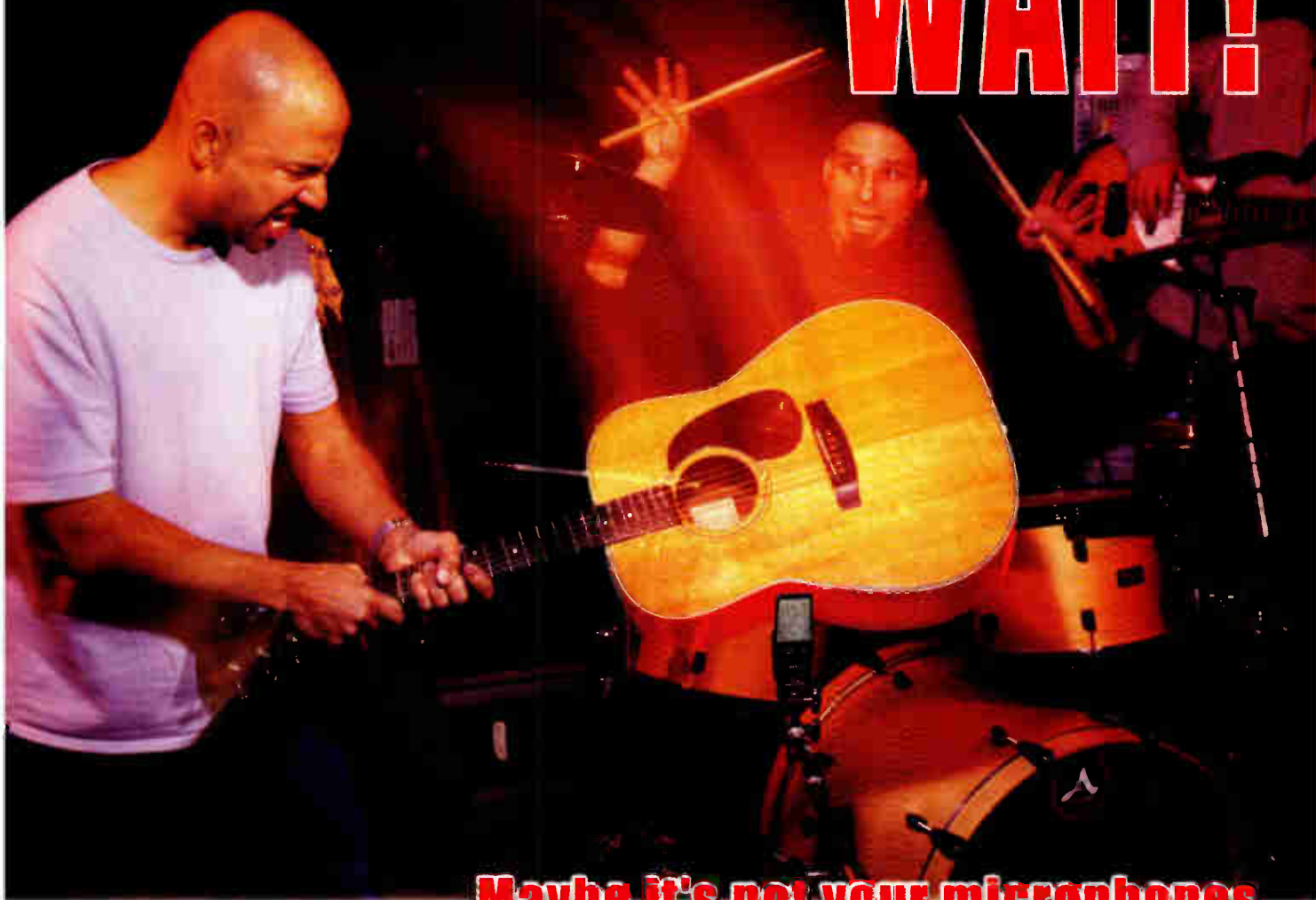
**Mogami Cable** Like a fine exotic wine found only in select locations and wine cellars, Mogami cables have long been sought but rarely acquired (and then often for a Dom Perignon price). Now Marshall Electronics is bringing the Champagne to those on a beer budget with its Mogami Gold Series. The Gold Series packages high-quality Mogami brand cabling with common connectors (XLR, 1/4-inch) and standard lengths - all in retail packaging. Prices are specific to individual retailers but Marshall is MSRPing a 25-foot length with XLR connectors at \$48.95.

Contact: Mogami/Marshall Electronics at 800-800-6608, [www.mogamicable.com](http://www.mogamicable.com); or circle **Reader Service 168**.





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READER SERVICE NUMBER 9  
World Radio History

# Dynaudio Acoustics

## AIR Series Monitors

BY GLEN O'HARA

**W**ith the AIR Series speaker system, the synergy of TC Electronic and Dynaudio Acoustics has produced a whole new concept in speaker monitoring: features never before available in any kind of monitoring system and implemented with impeccable precision.

### FEATURES

This is a comprehensive, and I mean comprehensive, monitoring system, with many configurations available. Each speaker includes onboard DSP, courtesy of TC Electronic, and two 200W amps. The speakers include the AIR 6, a two-way speaker

#### Applications:

Recording, mastering, editing, post production

#### Key Features:

**AIR 6 (6.5 inch woofer 1.1-inch tweeter) and AIR 15 (9-inch woofer), twin 200 watt internal amps, onboard DSP and user adjustments for room configuration, digital crossover, master/slave pairs, 24-bit, 96 kHz converters; AIR Base 1 (1 x 10-inch driver) AIR Base 2 (2 x 10-inch drivers), 200 watt internal amps, master/slave pairs, 24-bit 96 kHz converters; AIR Master controller and AIR Soft software for computer control**

#### Price:

**\$8,295 (as tested) for a 5.1 system with AIR Base 1 subwoofer, including remote and software.**

#### Contact:

**Dynaudio Acoustics/TC Electronic at 805-373-1828, [www.dynaudioacoustics.com](http://www.dynaudioacoustics.com), [www.tcelectronic.com](http://www.tcelectronic.com); or circle Reader Service 10.**

with 6.5-inch woofer and 1.1-inch tweeter; and the AIR 15, a two-way speaker with 10-inch woofer and 1.1-inch tweeter.

The speakers are sold in pairs or custom configurations to facilitate surround setups. The left channel speaker is the "master" speaker, which takes the digital input implements the DSP, applies the left channel data to the speaker, and outputs the right channel digital stream to the right channel "slave" speaker (which also has its own independent DSP).

Two subwoofers are available: AIR Base 1, a 10-inch subwoofer, AIR Base 2, a dual 10-inch subwoofer, also with 200W internal amps. All the subs act as slaves in the network.

The system controller includes an AIR Remote with digital "volume," "solo" and "mute" for up to six channels, and the AIR Soft software package, which includes a 9-pin serial (optional USB) cable for Mac or PC communications to the entire monitoring network. Onboard DSP includes the global volume, bass management, calibration and preset level storage and recall.

Digital input is via AES/EBU pairs to the master units. Separate word clock inputs are available via BNC connectors.

The DSP contains all functions of crossover, bass management, and EQ presets. They are executed in the digital domain, always at 88.2 kHz or 96 kHz. If you are using these sample rates, the Dynaudios clock right to them. If you are using 44.1 kHz or 48 kHz, the TC electronics upsamples to 88.2 kHz or 96 kHz: a feature that is said to allow lower latency and more precise execution of the signal.

Since the AIR Series system is designed primarily for digital input, analog connection to the speaker is available only as an A/D option at \$185 if ordered up front or at \$550 per pair as a later upgrade.

The AIR series use "master" and "slave" pairs. Because they are designed strictly for AES/EBU (sorry no S/PDIF) digital signals, the master unit receives the odd/even



AES/EBU pair, then splits the signals internally, routing the left channel to the master and the right channel to the slave monitor, using standard CAT 5 Ethernet cable with standard RJ45 connectors.

To complete the ensemble a calibration CD with every sweep tone one could possibly need for accurate interface and bass management within your acoustic space.

### IN USE

For my evaluation, I used five AIR 6 monitors and an AIR Base 1 subwoofer in 5.1 — with three AIR 6s up front and two in the back. The sub was also located in the front of the listening area. The AIR 6 is rated from 40 Hz to 20 kHz. Since the lowest bass is routed to the AIR Base subwoofers, which extends to 25 Hz, the AIR 6 handled the other portions of spectrum (though it can handle bass if a sub is not present or bass management is turned off).

With the crossover in the digital domain, the low pass and high pass signals are routed to separate D/A converters in the AIR 6. One handles D/A for the woofer, and the other handles D/A for the tweeter. Besides the high quality converters, there are additional advantages in that each D/A is seeing a much sim-

*continued on page 12* ►

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for higher continuous power in 2-ohm stereo or 4-ohm bridged applications. All deliver road-proven performance in a compact, rock-solid design. And all are backed by QSC's peerless 30-year reputation.

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<b>NEW!</b> RMX 1850HD	360W	600W	900W	1800W	\$649
RMX 2450	500W	750W	1200W	2400W	\$779

8Ω and 4Ω: 0.1% THD @ 1 kHz    2Ω: 1.0% THD @ 1 kHz

► *Dynaudio from page 10*

pler signal to pass on to the specific analog amplifier electronics.

Being in the digital domain, The AIR 6's digital crossover is said to be more precise without the phase anomalies of passive crossovers. The crossover is set at a lower-than average 1,750 Hz.

Over the years, when mixing with passive speakers that have 2 kHz or higher crossovers, I have found many tracks needing EQ in the 2,200 to 2,800 Hz range had to be handled gently because of the crossover. Too much EQ and phase problems become audibly apparent. Since the AIR Series digital crossover is below this frequency range, I found I could be more generous with the EQ.

I was really impressed by the the AIR Soft software. It allows one to "talk" to any monitor for all setup functions, including placement compensation. The choices include "against the wall" and my favorite, "on the console," which employs a reverse comb filter to "undo" the acoustic effects of top-of-the-console monitor location.

You can also select the bass management crossover point from 50 Hz to 120 Hz. I set the bass crossover at 80 Hz.

All these functions are adjustable on the front panel of any "master" unit, but can be done more comprehensively through a Mac or PC. The AIR Soft software provides high resolution graphics to show exactly what is being set.

Dynaudio supplies extensive details and instructions on room acoustics – including bass management in the AIR Series user's manual. Dynaudio includes a calibration CD with every sweep tone necessary to do a complete calibration and position the monitors/subwoofers in the best possible locations within your particular room acoustics.

I did extensive listening and playback of familiar 5.1 mixes, as well as changing the configuration to 2.1 (stereo with sub) mixes. I had one little hiccup during the beginning of the listening sessions, and it was my fault. A local client wanted to mix a 5.1 concert video, but the system seem to be locked without passing audio. After checking the manual, I found that a switch that changes the master unit to slave status was pushed in.

For most of our listening and mixing, we fed the 5.1 setup directly from one of our Digidesign Pro Tools 888 interfaces, using

the 888's AES/EBU outputs. With Protools 5.1 software, I/O configurations could be changed on the fly quite easily.

Using the Dynaudio AIR system for 5.1 mixing and critical listening, I was convinced that my facility sounded as good as any I have heard with closefield monitors. The spatial rendering of the Dynaudios was flawless. We placed stereo miked instruments from center to left, then center to right, then right front to right surround, and so on. Any adjacent pair chosen rendered a delicious spatial image.

One of my students had just completed a school recording project with a local concert pianist using five-channel miking and a traditional "over the strings" stereo pair with Neumann U89s — all linked to a TASCAM DA-88 DTRS digital cassette recorder. I played the master on a TASCAM DA-78 DTRS digital cassette recorder, patched digitally from its TDIF output fed to the Yamaha O2R mixer, then to the Dynaudio 5.3 setup from the O2R's AES/EBU outputs.

The Dynaudios revealed an almost holographic grand piano in front. I then switched to the "over the strings" stereo pair routed just to left front/right front. Again, the image was transparent, as if the Dynaudios were not there, just the piano. I could not believe I was listening to 16-bit/44.1 kHz resolution!

One final point. With analog powered monitors, I hesitate to feed them from the analog outputs of the Pro Tools 888 interface to avoid accidental full level output. The AIR Series remote, however, allows AES/EBU output at full digital levels from Pro Tools.

It has three user-adjustable preset levels at the punch of a button, in addition to a rotary level control with half dB increments. Since level adjustment is done digitally at high bit resolution, once the AIR Series monitors are level calibrated, the tracking error between all six channels is zero at any volume setting.

## SUMMARY

Anyone mixing in the digital realm should seriously consider the Dynaudio AIR speaker



system. With its all digital signal path, DSP control and excellent sonics, Dynaudio's intent was to provide mastering-quality monitoring that can be controlled by a computer workstation. In my opinion, they have done it.

*Glen O'Hara, staff 5.1 engineer at Porcupine Studios in Chandler, Ariz. also teaches digital audio and post production audio at the Conservatory of Recording Arts in Tempe, Ariz. and is a contributor to Pro Audio Review.*

## REVIEW SETUP

TASCAM DA-78, DA-88 DTRS cassette tape recorders; Yamaha O2R mixer; Digidesign Pro Tools; Digidesign 888 interface; Neumann U 89 microphone.

## Product Points

### DYNAUDIO AIR SERIES

#### Plus

- mastering quality monitors.
- high quality D/A converters
- room acoustic adjustments in DSP
- bass management/LFE options
- controllable by workstation

#### Minus

- \$8,000+ grand plus price tag for full system (but equal quality separates could cost you more).

#### The Score

A top-end digital speaker system that offers full control of its setup right out of the workstation.



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READER SERVICE NUMBER 13  
World Radio History

# PMC AML-1 Powered Monitors

BY RUSS LONG

It has been nearly five years since mastering expert Hank Williams of Nashville's Mastermix invited me to listen to his PMC TB1 monitors. I immediately purchased a pair and have remained a PMC (Professional Monitor Company) devotee ever since. The TB1s have a nice smooth top end, a full rich middle and a tight punchy bottom end. They are nonfatiguing, and most importantly, I do my best work when I am listening to them.

Now entering its second decade in existence, U.K.-based PMC, distributed in North America by Bryston, has released its first compact active monitor, the AML-1 (\$5,200 per pair). This new monitor promises to have all of the merits of the PMC tried-and-true transmission line designs, including minimal distortion and accurate low-end response. Additional benefits include extended bottom end (down to 33 Hz), neutral yet dynamic performance, consistent balance at different volume levels, higher SPLs without distortion or compression and lower coloration than comparable speakers.

## FEATURES

From the custom drive units to the OS-Con capacitors utilized in the key areas of the speaker's power amplifiers and crossovers, every component in the AML-1 is high-quality. The 15.8-inch high by 7.9-inch wide by 12.4-inch deep speaker's low frequencies are reproduced by a six-inch carbon fiber and Nomex flat piston bass driver. A 1.2-inch silk soft dome driver reproduces the high frequencies. A low-noise active crossover integrates the two drivers. A 100W (continuous) [RMS] LF amp and 80W (continuous) [RMS] HF amp provide more than adequate power for the boxes. Both the amplifier and the crossover designs are licensed from Bryston. The 35.25-pound AML-1 boasts a usable

frequency response of 33 Hz - 22 kHz.

The AML-1's various user controls are located in a compartment on the top of each loudspeaker. The 3 dB LF rolloff can be activated at 50 Hz, 80 Hz or 160 Hz. The 50 Hz LF tilt has a 500 Hz knee and can be set at -12 dB, -9 dB, -6 dB, -3 dB or +3 dB. The 10 kHz HF tilt has a 1 kHz knee and can be set at -5 dB, -2.5 dB or +2.5 dB. An EQ in/out button activates the equalizer circuit and a corresponding LED glows either red or green depending on the status of the switch.

The AML-1 is available in blue/black (as shown) or the less visually aggressive gray/black. Other colors are available on request.

## IN USE

The AML-1s included documentation explains that the speakers require a "running in" time of at least seven days before optimum performance is reached. My demonstration pair had already been used for a previous review so they were past their burn-in period and they sounded great right out of the box.

I spent substantial time listening to several extremely familiar recordings. I was shocked when I heard small details (reverb trails, panning nuances, breaths, etc.) that I never realized existed. The longer I listened to the AML-1s the more I fell in love with their performance.

In my mind, there are two primary factors that define a good pair of studio monitors. Firstly, they should have an honest sound. Great recordings should sound great but poor recordings should not. My complaint with a large percentage of today's monitors is that they hype the sound and give a false impression that the program material sounds better than it truly does. When I am listening at home, I want everything to sound good, but when I am working in the studio, I want to know the difference. Secondly, good monitors should be nonfatiguing. On occa-



## Fast Facts

### Applications:

Studio, post production

### Key Features:

Two-way, six-inch carbon fiber/Nomex woofer, 1.2-inch silk dome tweeter, Bryston biamplification

### Price:

\$5,200 per pair

### Contact:

PMC/Bryston at 800-849-2914, [www.pmc-speakers.com](http://www.pmc-speakers.com); or circle Reader Service 12.

sion, I need to be able to monitor for 14 or 15 hours a day, and I cannot afford to feel fried and burned out at hour eight. Listening fatigue is primarily a result of distortion (both speaker and amplifier); the higher the distortion, the higher the fatigue (at full output, the AML-1's have <0.009 percent distortion). The AML-1s are clearly a winner in both of these areas.

My first opportunity to work with the AML-1s was in mixing three songs for producer Brent Milligan. I immediately felt comfortable mixing on the monitors. I found their accuracy to be stunning, especially on

*continued on page 16* ►



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# Hosa Technology PBP-362 Modular Lightpipe Patch Bay

BY ANDREW ROBERTS

In this age of digital studios, it is not uncommon to find several different pieces of equipment that utilize the lightpipe audio stream in a facility. With computer interfaces, digital consoles and, of course, ADATs incorporating the ADAT optical standard, the need for a patch system should seem obvious. With the introduction of the PBP-362 patch bay, Hosa Technology has "seen the light at the end of the cable," so to speak.

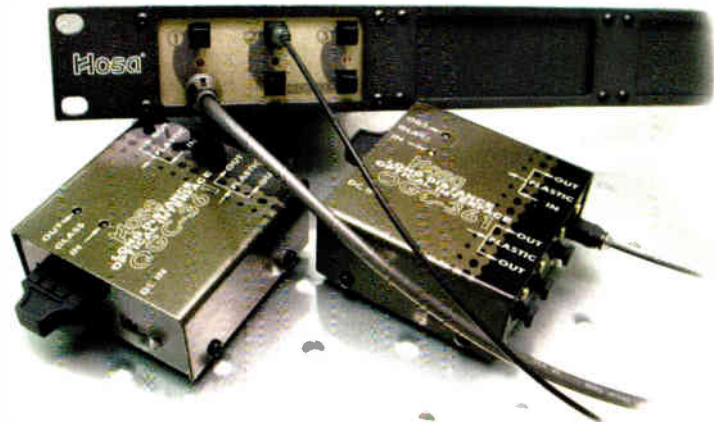
## FEATURES

The PBP-362 (\$325) is a one rack-space, modular, multifunction patch bay system that processes ADAT lightpipe signals. The chassis can accommodate four separate modules. Each module has three pairs of lightpipe jacks, front and rear. The unit comes shipped from the factory with just one module, giving it the capability to handle 24 channels of audio. Additional modules (MFO-363, \$250) can be added as the need arises. There is also a splitter module available (MSP-364, \$85).

The MFO modules come configured for half-normalizing operation but they may be reconfigured for non-normalizing or straight-

through function by repositioning a jumper on the module's circuit board. In half-normalled operation, the top rear jack serves as the input from a source while the bottom rear and top front jacks act as outputs of that source signal. If you insert an additional source into the bottom front jack (unused in half-normalled mode), it creates two straight-through paths. The same can be accomplished by moving the module's jumper to bridge pins two and three instead of one and two (factory setting).

It should be noted that Hosa recommends not using the PBP-362 like a traditional *continued on page 28* ▶



## Fast Facts

**Applications:**  
Studio, broadcast, post production, multimedia

**Key Features:**  
Lightpipe through and split capability

**Price:**  
\$325 with one module

**Contact:**  
Hosa Technology at 714-736-9270, [www.hosatech.com](http://www.hosatech.com); or circle Reader Service 16.

## ▶ PMC from page 14

the bottom end. Their clarity and detail is mind blowing.

My only complaint with the monitors is their lack of a power indicator LED on the front of the speaker. I am a firm believer that if the piece of gear can be

## REVIEW SETUP

Alesis MasterLink, iZ Technology RADAR 24 hard disk recorders; Digidesign Pro Tools MixPLUS digital audio workstation; Mogami cabling.

turned on and off, you should be able to determine its status at a glance. The AML-1s are the only active monitors I have encountered that do not include this feature.

## SUMMARY

After two weeks of recording and mixing on the AML-1s, I am sold. At \$5,200 per pair, the PMC AML-1s are expensive, but there is no doubt in my mind that they are worth the price. If money is no option, the PMC AML-1s should be at the top of every studio and engineers must-have equipment list.

## Product Points

### PMC AML-1 POWERED MONITORS

#### Plus

- Wide frequency response
- Extremely accurate
- Nonfatiguing

#### Minus

- Expensive (but worth it)
- No power indicator

#### The Score

If your goal is the highest possible quality with no regard to price, then the PMC AML-1 is the right speaker for you.



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- 8 Digital effects
- \$649.00

### EMX68S

- Dual 400W amps
- 6 XLR inputs
- Two 7-Band EQs
- 16 SPX digital effects
- \$799.00

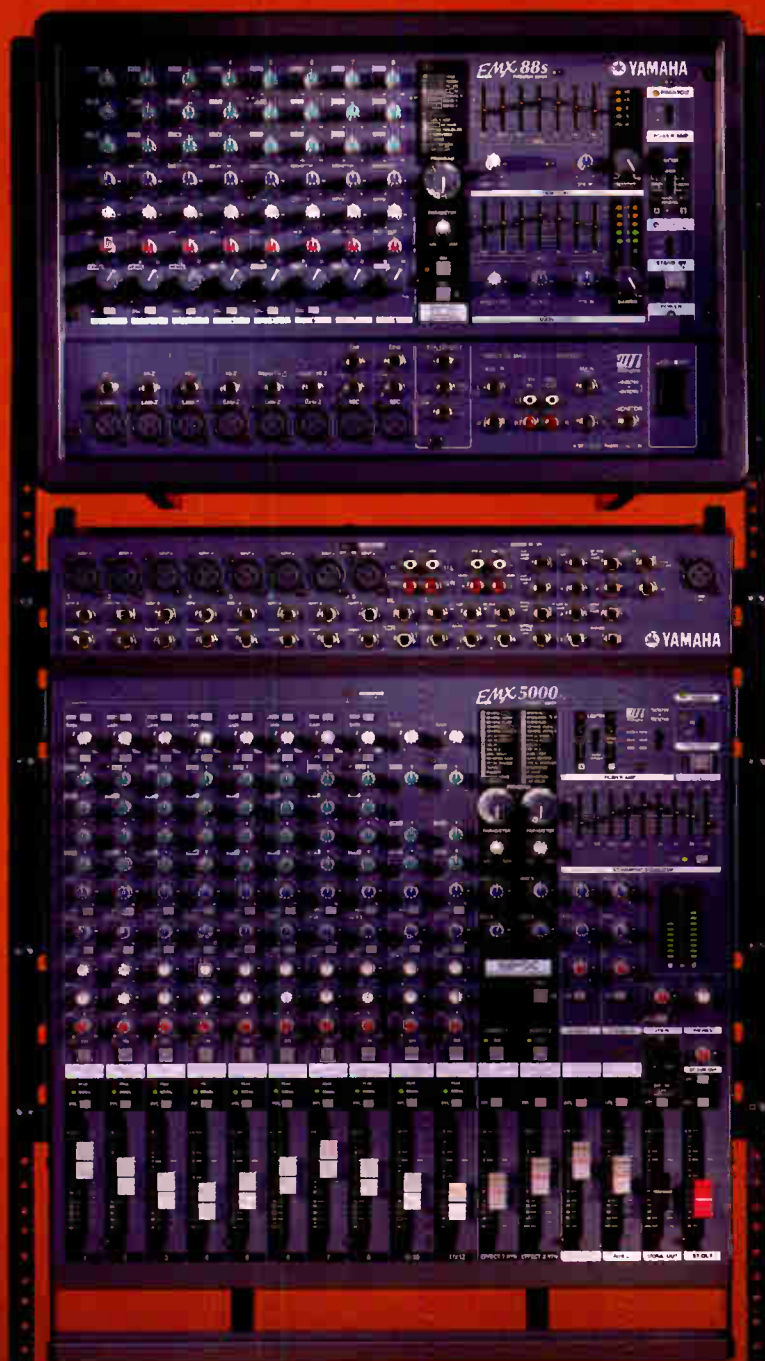
### EMX88S

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- 8 XLR inputs
- Two 7-Band EQs
- 16 SPX digital effects
- \$899.00

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\*EMX5000-20 is not rack-mountable. All prices subject to change without notice.



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### EMX5000-20

- Dual 500W amps
- 20 inputs
- 9-Band EQ
- 32 SPX digital effects
- LF crossover for subs
- \$1,299.00



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YSP (Yamaha Speaker Processing) circuitry, built into every new EMX model, enhances the performance of Club Series speakers, Yamaha's renowned sound reinforcement workhorses.

# Yorkville YSM1p Powered Two-way Monitor

On the Bench Page 22

BY BRUCE BARTLETT

Canadian-based Yorkville has gained esteem for its line of passive close-field monitors, and with good reason: they provide accurate sound reproduction at a reasonable price. Based on the popular YSM1i, the YSM1p is Yorkville's first powered monitor. This sophisticated system works quite well, yet is affordable to home studios at \$640/pair list, \$449 street.

In business since 1963, Yorkville developed the first portable PA speaker enclosure and the first wedge-style floor monitor. The company offers mixing consoles, PA speakers and studio monitors.

## FEATURES

Each YSM1p speaker cabinet is finished in textured charcoal-gray vinyl, and is attractively styled with curved beveled edges. Cabinet walls are made of 3/4-inch MDF board with a 3/4-inch thick MDF baffle cov-

**Another unexpected feature is a pair of tone controls... I think that the tone controls are not only a handy feature, but are essential for accurate reproduction.**

ered in PVC. Damping inside the cabinet is said to prevent unwanted bass resonances.

Drivers include a shielded, ported 6.5-inch woofer with a foam surround, and a shielded 1-inch silk dome tweeter that is ferrofluid cooled.

On the front is the woofer port and two LEDs: a gorgeous blue power LED and a red clip LED. Piggybacked on the rear of the cabinet is the power amplifier and crossover. This biamped system provides 85 watts peak to the woofer and 30 watts to the tweeter. The amplifier chassis rings when tapped and might benefit from some anti-vibration coating.

Also on the back are an AC power connector, power switch, input trim knob (-6 dB to +9 dB) and a combi XLR/phone input. The phone jack can take a balanced or unbalanced line-level signal, although it is only labeled "balanced."

Unusual for this price range is a built-in limiter enabled by an on/off button on the back. This limiting safeguards the tweeter from burnout and an overcurrent limiter protects the woofer from overexcursion. When a signal reaches the limiter threshold, the red clip LED lights on the front baffle. The amplifier also has thermal protection that removes signal from the amp if it overheats, then resets automatically.

Another unexpected feature is a pair of tone controls set by a DIP switch on the rear. These controls compensate for the acoustics of the environment around the speaker. The low-frequency switches, labeled "Low Frequency Efficiency Factor," adjust the response for speaker placement in full space, half-space or quarter-space. The "High frequency Reflection Optimization" switches compensate for varying amounts of high-frequency absorption in the listening room. I think that this tone control is not only a handy feature, but is essential for accurate reproduction.

In my review sample, the high-frequency DIP switch settings did not match the graphics on the back of the speaker or their description in the manual. A switch setting that should have reduced the highs (according to the label) actually boosted them, and vice versa. Yorkville told me that the labeling is



## Fast Facts

**Applications:**  
Studio

**Key Features:**  
6.5" woofer; 1" silk dome tweeter; onboard amp; tone controls

**Price:**  
\$640 per pair

**Contact:**  
Yorkville Sound Inc. at 716-297-2920, [www.yorkville.com](http://www.yorkville.com), or circle Reader Service 18.

corrected on the production models.

According to the manufacturer, high-frequency power is 20 W continuous at 0.1 percent THD, and low-frequency power is 65 watts continuous. At lower levels, distortion is under 0.05 percent. Frequency response is rated at 40 Hz to 20 kHz +/- 3 dB with a 2.5 kHz crossover frequency. Each unit measures 16.4 x 9.6 x 11.2 inches and weighs 25 pounds.

## IN USE

Before making any measurements, I auditioned the Yorkville YSM1p monitors in a closefield setup. They were about three feet apart and three feet from me, toed in on

*continued on page 22* ▶

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## Single Slice

BY CHUCK TAYLOR

# Celine Dion's "A New Day Has Come"

**SINGLE:** "A New Day Has Come"

**ALBUM:** *A New Day Has Come* (Epic Records)

**DATE RECORDED:** October 2001

**ENGINEER:** Humberto Gatica

**PREVIOUS PROJECTS:** All Celine Dion releases since 1990, Barbra Streisand, Michael Jackson, Ricky Martin, Chicago, Lionel Richie, Brandy, Christina Aguilera.

**SINGLE SONGWRITERS:** Aldo Nova, Stephan Moccia

**SINGLE PRODUCERS:** Walter Afanasieff, Aldo Nova, with radio remix produced by Ric Wake

**MASTERING ENGINEER:** Vlado Muller

**STUDIO:** Vocal recorded at Studio Piccolo, Montreal; instrumental track recorded at Walter Afanasieff's Wallyworld Studios, San Rafael, Calif.

**INSTRUMENTS:** Keyboards, bass, drum, rhythm programming, electric and acoustic guitars, cello

**CONSOLE:** A highly customized unit primarily comprised of Neve components

**RECORDER:** Sony 48-track DASH

**MONITORS:** Genelec 1032 with subwoofer (in the studio and at Dion's home)

**MICROPHONES:** Modified Telefunken 251s (vocal)

**MICROPHONE PREAMPS:** A completely customized mic preamp designed by engineer Eduardo Fayet that Gatica has used since he worked on the recording of "We Are the World" by USA for Africa in 1985.

**PROCESSORS:** Neve 1032 compressor



## Engineer's Diary

To say that Celine Dion and engineer Humberto Gatica have an established a relationship is an understatement. "I've probably recorded 300 or 400 songs with her," says the Grammy-winning engineer and producer, who has worked with the best-selling singer on every album since 1990. "A New Day Has Come" is Dion's 11th No. 1 adult contemporary hit.



Humberto Gatica with Celine Dion

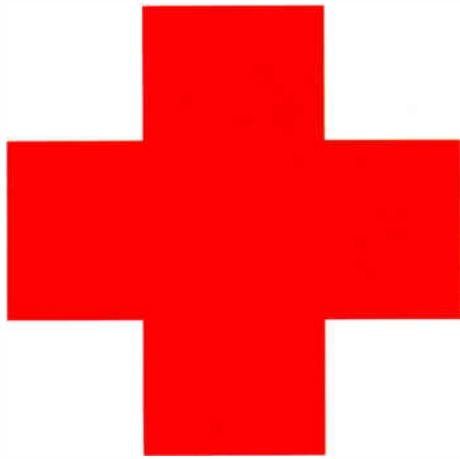
"I'm very proud to be the one who gives her a sense of assurance in the studio. Through the years, we've developed such a good repore that I think she's able to relax about the recording of her vocals," Gatica says. That bond is at least, in part, fostered by Dion's reliance on Gatica's choice of gear. The singer uses only a customized Telefunken 251 microphone to record; likewise, she monitors her voice over Genelec 1032 speakers, both in the studio and when finalizing a mix from home.

"She very much knows what she wants to hear in each performance. She's very focused, and is an unbelievable professional," Gatica stresses. When recording, Gatica usually has levels and equalization set on the all fronts before Dion arrives. He is intimately familiar with the way she wants things to sound, both on tape and in her headset.

"She usually does about eight takes of a song," Gatica adds. "She has this mindblowing ability to retain an incredible amount of information and then deliver all of your requests in the next take. And then she's finished and ready to move on to the next song." According to Gatica, Dion has been known to nail three songs in one session.

**Chuck Taylor is senior editor of *Billboard* magazine in New York.**

*Chuck Taylor, a regular contributor to Pro Audio Review, is senior editor at Billboard magazine in New York.*

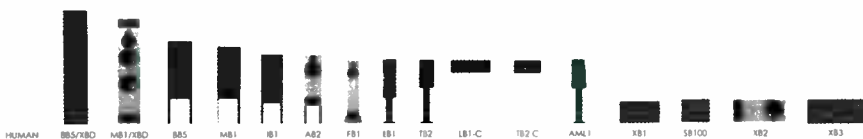


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## Yorkville Sound YSM1p Powered Two-way Monitor Speaker

Measurements of the Yorkville YSM1p are impressive. **Figure 1** shows the anechoic frequency response in open space. The tweeter tone control was set to flat, while the woofer tone control was set for full-space response. The response is 43 Hz to 20 kHz  $\pm 3$  dB, very close to the published spec. There is a minor emphasis around 2 and 4 kHz that might contribute to the slightly "hard" or "forward" sound heard on piano in the listening test.

At 30 degrees off axis (not shown), the high frequencies drooped only about 3 dB at 10 kHz and 6 dB at 15 kHz. So the YSM1p provides a wide sweet spot.

**Figure 2** shows the range of the tone controls. This response curve includes room reflections and does not indicate the response of the speaker itself.

In **Figure 3** we see the Energy Time Curve. The direct-sound spike is fairly sharp, with delayed sounds about 18 dB down. This is good performance.

Finally, **Figure 4** shows the THD vs. frequency at 90 dB SPL, 1 meter. It is very good, being below audibility from 50 Hz up.

—Bruce Bartlett

### ► Yorkville from page 18

stands behind my mixing console. In my studio, the speakers sounded best with the

low-frequency switches set to half-space and the high-frequency switches set for minimum output.

Here are my impressions of various CDs and my own mixes:

Drums: Clear with good impact.

Cymbals: Very smooth and sweet; the entire frequency range is there. Very well defined. Cymbals become slightly aggressive if the tone switch is set to flat or boost.

Piano: Mostly uncolored but with an occasional "hard" or "forward" quality. Full, clear and detailed.

Bass: Full but not tubby. Uniform loudness of notes. Some doubling is audible at the lowest frequencies.

Acoustic guitar: Very nice! Well defined. Not "tizzy" on the high end.

Vocal: Natural. Smooth-recorded vocals sound smooth; sibilant vocals sound sibilant.

Sax: Mostly natural but slightly hard in the upper mids.

Electric guitar: Not too puffy in the mid-bass, and good "bite" in the upper mids.

Orchestra: Fairly accurate timbres overall, but not quite as lovely or "liquid" as some other speakers.

My own mixes done on Vergence Pro A20 monitors sound similar on the Yorkvilles. Compared to the A20s, which cost \$2,000 a pair, the Yorkvilles have slightly less resolution, a little less deep bass and a bit more upper mids. But the YSM1p's sound very close to the A20s, which are over three times the price!

Overall, the YSM1p has a wide-range, neutral tonal balance. Imaging and depth are very good, as is the resolution of reverb. The speakers can get extremely loud before clipping occurs. In fact, the limiter kicked in only at unusually high levels, and I never heard it working at normal volume.

### SUMMARY

Yorkville's description of the YSM1p matches what I heard and measured: "Crisp, clean, loud, flat and accurate." It is truly impressive for its price. If my high-end monitor system were to fail, I could substitute the YSM1p and feel right at home.

*Bruce Bartlett, a regular Pro Audio Review contributor, is a technical writer, a recording engineer and an audio journalist.*

## Bench Measurement

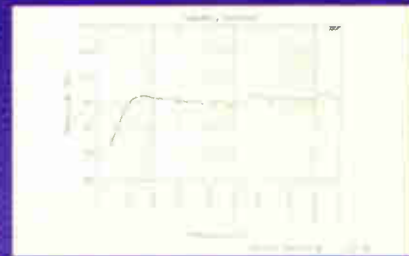


Fig. 1: Anechoic frequency response in open space



Fig. 2: Range of tone controls (including room reflections)



Fig. 3: Energy Time Curve (ETC)

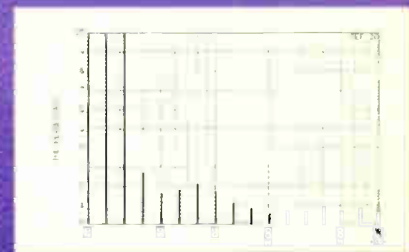


Fig. 4: THD vs. frequency @ 90 dB 1W/1m

## Product Points

### YORKVILLE SOUND YSM1P POWERED TWO- WAY MONITOR SPEAKER

#### Plus

- Accurate, neutral tonal balance for the price
- Useful tone controls and driver protection
- Outstanding value

#### Minus

- Slight upper-mid emphasis

#### The Score

Considering the sound quality, these relatively inexpensive mid-sized monitors are an outstanding value.



# BETA

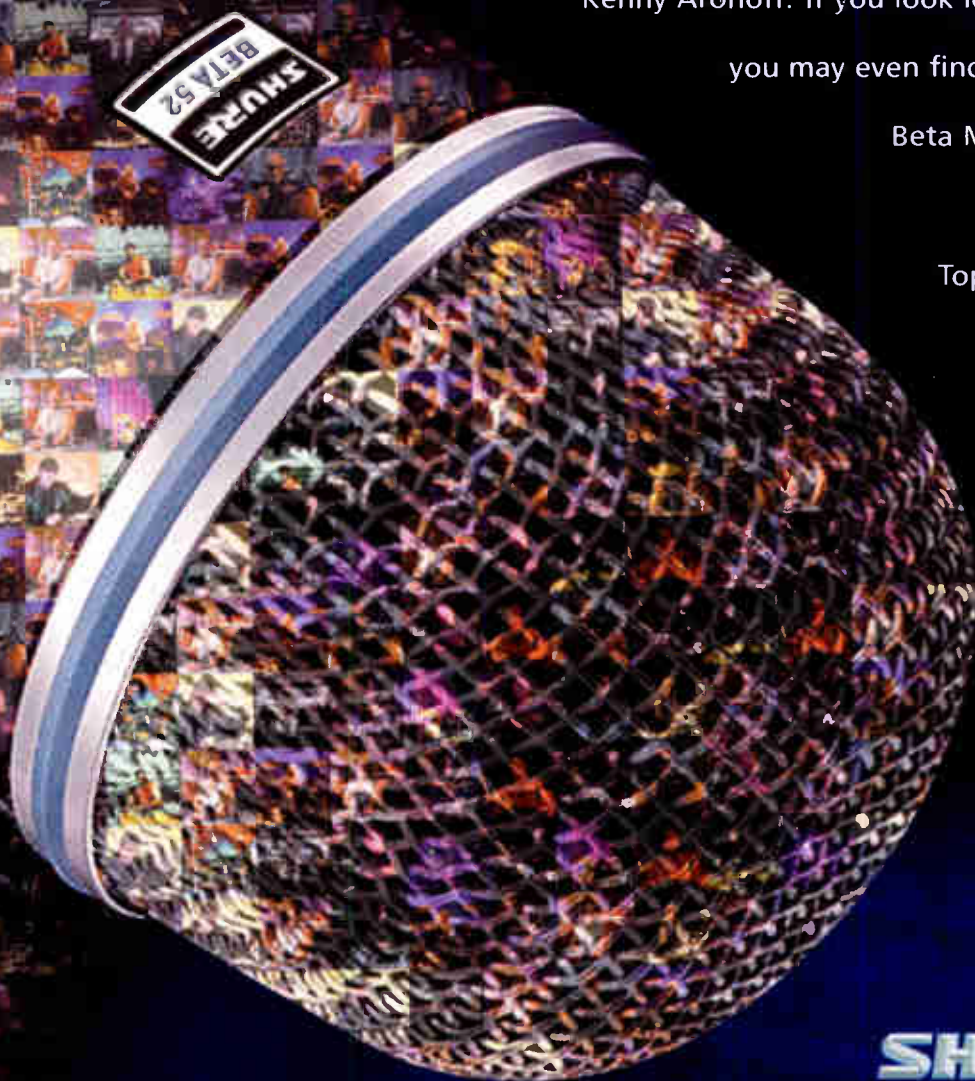
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# Denon DN-C550R CD Recorder Combi-Deck

BY NICK BAILY

The initial trickle of standalone CD burners has turned into a flood, and joining this crowded field is the Denon DN-C550R CD player/recorder. With well thought-out features, quality construction and a reasonable price, this professional grade device is a welcome addition.

## FEATURES

The CD550R (\$899) is a standalone dual-well CD player and recorder that occupies two rack spaces. The left well is for playback only, while the right well handles both recording and playback. Each can operate independently from the other, and the front panel contains two sets of transport controls. All display functions are handled by the amply sized LED display, which contains several status indicators, and eight-segment dual level meters with peak indicators.

At the center of the unit is a soft knob for input of information and setting levels, which when pressed momentarily becomes an "enter" key, making for speedy menu navigation and selection. Other buttons allow the user to enter menu and recording modes, select display and dubbing options, and enter CD text data. The front panel is also equipped with a 1/4-inch headphone jack with level control. A well-designed remote duplicates nearly all front panel functions, with a switch toggling between the wells for transport control, and the jog wheel duties handled by multipurpose buttons.

The unit can record both to standard CD-R as well as CD-RW media, which though still not recognized by most consumer players, is becoming increasingly ubiquitous in home computers. In a very nice touch, the playback deck is equipped with an HDCD decoder, making dubs and output from high-definition CDs possible. However, analog conversion and recording into the HDCD format is not supported.



Inputs and outputs are comprehensive and complete, with balanced analog inputs on XLR jacks, line level RCA inputs and individual outputs for each well, and both optical and coaxial digital I/O, again with discrete outputs included, for automatic direct conversion of 32 kHz and 48 kHz sources. Alternate bit depths and 96 kHz are not supported. SCMS protection is included but defeatable.

## IN USE

As with most stereo recorders it is just a matter of connecting your inputs and outputs. The dual-well construction initially presents a slight dilemma, as each well has a discrete set of outputs in every format, which can eat up an extra set of inputs on your monitoring device. On the whole, however, this is a good thing, as it is an indication that you are really getting two full-function devices that are tightly integrated at the touch of a button.

Each of the wells can be almost completely separated from a functional standpoint, so much so that you can be recording from an external source while simultaneously playing back something completely unrelated on the playback deck.

For dubbing however, the decks work well together. I found the process of copying whole recordings or assembling mixes from multiple CDs to be nearly effortless.

I was also glad that by reverting to playback mode after each recording, the unit is very forgiving to the impatient or distracted (rare qualities in studio engineers, I know). I never found myself in Burn mode by accident

## Fast Facts

### Applications:

Installation, studio, broadcast, post production, DJ/sound reinforcement.

### Key Features:

Dual-well CD player/recorder; dubbing and independent operation; support of HDCD, CD-RW and CD-Text standards; rackmountable.

Price: \$899

Contact: Denon at 973-396-0810, [www.denon.com](http://www.denon.com), or circle Reader Service 24.

when auditioning source material – a cut above several other standalone CD burners I have used recently.

Recording from external sources is similarly easy, and the various modes make for flexible operation. For most recording of quick demos and rough mixes the manual mode is efficient. It is functionally identical to running off a cassette tape – save for the need to occasionally tap the record button to increment track IDs.

I took the time to archive some old DAT mixes and alternates I had been meaning to catalog on CD, which was a set-it-and-forget-it pleasure with the automatic track IDs working fine. Transferring ID times is not accurate to the millisecond, so for tightly regimented source material incrementing IDs manually may be preferable. Analog recording was no problem – setting levels and

*continued on page 25* ►



selecting the source is straightforward.

The balanced inputs are clean, quiet and most welcome, as they have often been woefully absent on units in this price range (e.g. HHB CD-R830, reviewed in *PAR* 7/01). This makes the unit a great addition to a club's house system or a live engineer's rack in addition to its obvious studio uses, especially given its ability to credibly do double duty as a separate player and recorder.

There are many advanced features included in the CD550R, most well implemented. During manual recording, automatic digital fade ins and outs can be added, with the fade times user-adjustable. The remote control is an asset as well, covering all functions on the front panel, and adding some speed with the numeric keypad. When using CD-RWs some rudimentary editing tasks are possible, and on unfinalized CD-Rs, tracks can be left out of the TOC, in the event of unwanted takes or mistakes.

Playback options and features are also extensive, perhaps a legacy of Denon's long history with professional and DJ-oriented CD players. For instance, users can set a quick pair of locate points for continuous looping. Another option includes relay play for sequential play of both decks.

### REVIEW SETUP

Mackie, TASCAM and Yamaha consoles and EMU/Ensoniq PARIS Pro 3.0 workstation; TASCAM DA-30 DAT; Alesis Monitor 1 and Yamaha NS-10 Monitors; Neutrik connectors; Hafler and Adcom amplification.

## Product Points

### DENON DN-C5550R

#### Plus

- Flexible and extensive feature set
- Quality workmanship and sound
- HDCD decoding

#### Minus

- No HDCD encoding

#### The Score

A very well-designed and flexible solution for CD recording and playback.

### SUMMARY

In general, the design seems to have been optimized toward maximum flexibility, as evidenced by the discrete dual architecture, numerous recording and playback features, and many user-adjustable parameters. What makes the CD550R a cut above is the way these advanced features are all at your fingertips without getting in the way.

For most users, the major use will be for basic recording and playback, at which the unit excels. For the prospective purchaser it is

always a challenge to anticipate all possible uses and setups, and it is comforting to know that this design is likely up to whatever task gets thrown its way.

Sonic quality is professional-level, the switchgear is solid and durable, and control surfaces are well laid out. At a street price of around \$700, the CD550R is a very solid value that should be a welcome addition to many recording setups.

*Nick Baily, based in NYC, is a live sound and studio engineer/producer. He also works in artist promotion and publicity.*

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# BLUE Baby Bottle Microphone

BY NICK BAILY

Latvia and California-based BLUE has rapidly become a well-respected manufacturer of high-end, high-quality microphones. Renowned for exacting manufacturing standards and irreverent and striking visual design, mics such as the solid state Kiwi (PAR 7/01) and the flagship Bottle (PAR 4/99) and Dragonfly models have made many wish lists.

With prices reaching several thousand dollars, BLUE microphones have remained out of reach for many. So needless to say, word of the new Baby Bottle turned heads with its \$649 list. Can this mic really live up to its pedigree at such a moderate price? My inquiring ears wanted to know.

## FEATURES

The Baby Bottle arrived in a cherry box and velvet pouch so luxu-

## Fast Facts

### Applications:

Studio, broadcast, location recording, live sound

### Key Features:

Cardioid condenser mic with gold and aluminum sputtered Mylar diaphragm; Class A, discrete transformerless electronics.

### Price:

\$649 list

### Contact:

BLUE at 805-370-1599, [www.bluemic.com](http://www.bluemic.com), or circle Reader Service 145.



rious I half expected to open it up and pour the contents into a snifter. Inside, however, was not fine cognac but a solidly built condenser microphone. The Baby Bottle shares the distinctive style of its big brother Bottle mic, with a cylindrical body and protruding lollipop-style grille, although at 350 grams and 222mm x 45mm in size it is much more manageable than its larger relative.

Inside the grille is a single membrane, large diaphragm, gold and aluminum-sputtered capsule. Unlike on some other BLUE mics, the capsule grille is fixed in place, and changing the mic's direction cannot be done by swiveling the capsule. The only other external landmark on the microphone's body is the standard XLR connection on the bottom, which also handles the required phantom power. The microphone comes with a standard adaptor/clip for mounting — a shockmount is not included but available as an option. Inside the body are the unit's Class A discrete electronics and transformerless output, and well, that's about it for features.

BLUE also offers a fancy new custom BLUE-emblazoned pop filter (\$149) (see picture above).

The secret to this microphone's low price is its simplicity. The pattern is fixed in a cardioid configuration, and there is no pad or rolloff available. The designers clearly worked from a "point and shoot" philosophy and saved their big guns for raw sound quality, as is apparent in the microphone's specs. Sensitivity is rated at 33.5 mV/Pa, rated impedance is 50 ohms. Self-noise is a very respectable 5.5 dBA and maximum SPL is 133 dB. Signal-to-noise ratio is listed at 87 dBA.

## IN USE

The first thing I noticed was a very healthy signal, this unit really cranks it out. Frequency response, as with several other BLUE mics, is

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► *BLUE from page 26*

not really designed to be flat, and the Baby Bottle is no exception, with a slight presence boost - centered around 2K. Nonetheless, my first impression of the sound was that it was extremely transparent, having that desired and difficult-to-define clarity that distinguishes great condenser mics. The high end was clear, but not tinny or trashy, and the low end seemed to extend for miles, with very round and defined bass tones.

I found this to be especially true on live drum tracks. The Baby Bottle captured the transients and subtleties of a live kit, so much so that when first used as a single ambient room mic with light compression, I was tempted to quit while I was ahead and just mute the close mics I had set up. Cymbals are clear and brilliant, but never overpowering, and kick drum resolute and full, but not boomy. The Baby Bottle won me over as one of the best-sounding mics I have ever heard for live drums - at any price.

The mic also excelled on vocals, although without quite so much drama. The presence peak is predictable and welcome most of the time, although there will undoubtedly be applications requiring a more flat response. Here the lack of a low-end rolloff is noticeable, as the full low-end response becomes a liability on female vocals, for example.

► *Hosa from page 16*

patch. This refers to the practice of sending an output from the bay back into another channel on the bay. Apparently, the lightpipe signal is difficult to reproduce or clone (which is what the PBP-362 does) and building a clone from a clone may produce unwanted artifacts.

Each module has three LEDs to indicate the presence of incoming signal on a lightpipe port. Power is delivered to the installed module via a wall wart type transformer (pos. tip, 7.5VDC, 1500mA). If you have additional modules, then the supplied daisy chain cable must be attached to provide power for them.

## IN USE

In setting up the PBP I installed the two additional modules that came with my review unit. This took about ten minutes with the supplied Allen wrench. The faceplate of the PBP is attractive even without all

On full-range sound sources such as acoustic guitar and piano, the Baby Bottle's transparent upper midrange and high end made for pleasing results as well, although the mic's sensitivity and presence made close-miked electric guitar a little dodgy. High-SPL distorted guitar sounded somewhat boxy and wooden, and I had better results using dynamic mics for this task. The presence was welcome, however, on spoken word projects, where the clean transients and round low end make it a natural for male voiceover or radio work.

Observed self-noise was quite low, and dynamic range was more than ample, with a very smooth response across the dynamic spectrum. The non-adjustable pickup pattern is a straight cardioid, and off-axis rejection was solid. The microphone's weight, odd size, pickup pattern, and sensitivity make it most suitable for studio applications and some live recording - I would not recommend the Baby Bottle for rugged live-sound use.

## SUMMARY

Sonically speaking, the Baby Bottle is impressive indeed, and given the cost is nothing short of exceptional. It maintains a delicate balance between warmth and clarity that will make it a go-to tool in most any engineer's arsenal, even those with many higher

four modules installed. Empty module bays are covered with a black metal plate. It should be noted that there is no chassis housing for the PBP-362. This can be a double-edged sword as it allows easy access to the circuit boards and the jumpers but it also permits dust, smoke and moisture to reach critical components in the modules. (The manufacturer insists that all critical components are safely sealed and that standard maintenance with compressed air will take care of any unsightly dust build-up - Ed.) The PBP-362 comes with port plugs for all the lightpipe terminals - a critical place to keep contaminants out of.

I evaluated the PBP-362 in my project studio, using it to direct lightpipe signals between a digital console, a computer with a MOTU 2408 interface and a pair of 20-bit ADATs. (Manufacturer suggests using an external sync/clock when using possibly conflicting equipment - Ed.)

After purchasing a few additional light-

priced microphones at the ready.

When matched with digital recording media, the Baby Bottle imparts just a hint of that highly sought "analog" sound. I would not go so far as to call it "tube-like" or extraordinarily warm, but the response is missing the tinny, unwanted sparkle common to mid-priced condensers - making tracking to a DAW a very rewarding experience. For more aggressively warm sounds, the mic meshes well with tube preamps and compressors.

The Baby Bottle has a character all its own, yet remains highly versatile in the studio. While I would hardly mind having variable patterns and switchable pads and rolloffs, the Baby Bottle does one thing and does it extremely well. With a street price in the \$500 range, this is one of the best price/quality values I have seen in pro audio, and just about anyone who makes recordings owes it to themselves to check it out.

## REVIEW SETUP

E-mu PARIS Pro 3.0 DAW; Mackie 24x4 Console; Yamaha NS-10 and Alesis Monitor 1 monitors; Adcom and Crown amplification; TASCAM 48 1/2-inch analog eight-track recorder; UREI LA-4 compressor; PreSonus Blue tube preamp; BLUE Blueberry and Whirlwind cables.

pipe cables and a ten-minute hookup, I was up and running. I recorded some overdubs for a project I am working on. The part was a guitar arpeggio that went through the console to the PBP and then into one of the ADATs. From there I dumped tracks from the ADATs to the computer, via the PBP. All this was done with no audible artifacts and no detectable difference in audio quality. While I did make sure to use the shortest cables possible, I wondered if using long cables, both in and out of the unit, would cause degradation. According to Hosa at distances greater than 27 feet one should move from plastic fiber to a Glass Fiber Single Mode cable with amp/repeater boxes, e.g. Hosa's OGC-361 (\$499).

## REVIEW SETUP

Spirit 328 digital console; Pentium III computer with MOTU 2408 interface; Alesis XT20 ADAT recorders.

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# Sennheiser HD 280 Professional Headphone

BY STEPHEN MURPHY

It is rare when, as a studio owner, a new headphone comes along that provides enough value and quality to make you consider ditching your current collection. Sennheiser's new HD 280 Professional headphone (\$199) may do just that.

## FEATURES

The Sennheiser HD 280 Professional headphones feature a closed-back, circumaural design (the ear cups totally surround the ear; supra-aural headphones sit directly on the ear) with a cushioned oval ear cup. An attached three-meter coiled cable terminates with an 1/8-inch gold-plated connector; a screw-on 1/4-inch adapter is provided.

The ear cups extend laterally, and also pivot in/outwards on Y-shaped brackets, accommodating a variety of head sizes and shapes. A pivot mechanism at the point where the Y-brackets attach to the headband allows the ear pieces to collapse inwards for storage and portability.

On the technical side, the HD 280 Pros feature dynamic, neodymium magnet-equipped transducers capable of producing a maximum SPL of 113 dB at 1 kHz/1Vrms. Nominal impedance is 64 ohms, THD is less than .1% and the stated frequency response extends beyond the human hearing range (8 Hz-25kHz, no +/- dB tolerance given).

## IN USE

In general, the HD 280s sound excellent. They are slightly weighted towards the upper-mids and above, with a tight bass and slight scoop in the "low-muds." The HD 280s provide a wide stereo field, due in part to their clear top end. This makes them perfectly suited for critical analysis and evaluating stereo field placement.

The HD 280 is no lightweight, weighing in at over ten ounces and featuring wide, heavy-duty structural components. Durability and

reliability are key in heavy-use commercial applications; after extensive use, I can confidently say the HD 280s are up to the task.

Equally impressive is the HD 280's superb ambient isolation, providing up to 32 dB of external noise rejection. As described below, I benefited from this fact from both sides of the control room glass.

As a performer, less ambient noise meant less headphone volume was needed which, in turn, reduced ear fatigue. Better hearing response and happier performers during long sessions resulted.

As an engineer, I especially appreciated the reverse benefit of the HD 280's ambient isolation and lower-than-usually-necessary headphone volumes: far less headphone bleed on the microphones!

In addition to several other brands and models of headphones, I compared the HD 280s to Sennheiser's own similarly priced Evolution EH 2270 model.

In general, the Evolutions have a slightly "rounder" response (more upper-low and low-mids, less extreme highs), resulting in a solid center with less apparent channel separation. The HD 280s were noticeably lighter in the low-mids with a wide, pristine high end that succeeds in not crossing the line into "brittle."

The biggest difference, however, is in the construction. Like any studio engineer, the common sound of performers dropping headphones on the floor after a take makes me wince; not so with the burly 280s.

On the downside, the heavier, bulkier build of the HD 280 reduces the "head is one with the headphones" feeling that lighter, smaller profile phones can impart. The width

## REVIEW SETUP

Samson S-phone headphone distribution amp; Hafler P3000 amplifiers; Shure KSM-44, Neumann U 87 and SM 69 microphones; API 251 and Drawmer 1969 mic preamps; Zaolla Silverline analog and digital cables.



of the oval ear cup also proved to be a bit narrow for a few larger-eared folks.

Also, while ease of maintenance was clearly taken into consideration (two small screws provide transducer access and solderless pins allow for quick wiring changes!), I would prefer if the HD 280 either came with a straight cord instead of the stock coiled one; or, like the Evolution model, include a 1/8-inch jack for swapping cables.

## SUMMARY

As someone who has, through the years, owned upwards of 100 pairs of headphones, it is easy cast a cynical ear towards manufacturer's claims of a breakthrough headphone product. But that is exactly what Sennheiser has produced with the HD 280.

Excellent acoustic isolation, rugged construction, ease of maintenance, good sonics and a bargain price make the Sennheiser HD 280 Pro headphone an unqualified "best buy."

*Stephen Murphy, contributing studio editor for PAR, has recorded over 300 vinyl and CD releases, including a Grammy Award-winning and a Platinum-selling album. Steve can be reached at [smurph@smurphco.com](mailto:smurph@smurphco.com).*

## Fast Facts

### Applications:

Studio, live sound, location recording, broadcast.

### Key Features:

Closed, circumaural headphones; 113 dB max SPL; -32 dB ambient rejection; two-year warranty.

Price: \$199

### Contact:

Sennheiser USA at 860-434-9190;  
[www.sennheiserusa.com](http://www.sennheiserusa.com); or  
circle Reader Service 30.

# TASCAM GigaStudio Software Sampler

BY LOREN ALLDRIN

A few years back, Nemesys unveiled some amazing new technology with its GigaSampler software. "Endless Wave" allowed a software sampler to read just the initial snippets of its samples into RAM and stream the rest from the hard drive. The all-too-familiar limit imposed on playback time by RAM was gone; GigaSampler could play back a gigabyte or more worth of samples without requiring an equivalent amount of RAM.

The industry noticed, and GigaSampler began to make its mark on the recording industry. With utilities to convert various sample types to GigaSampler format, many hard-sampling fans were ditching their hardware samplers in favor of this software solution (even if it meant — gasp! — buying a new PC). Though it did not involve purchasing a new PC, this writer retired his trusty Roland sampler in favor of GigaSampler after reviewing it.

Now owned and distributed by TASCAM, the next incarnation of the Nemesys software sampler is called GigaStudio. It goes beyond just the sampler to include a digital mixer, effects, MIDI automation, automation and other enhancements.

## FEATURES

As its name implies, GigaStudio 160 is capable of a whopping 160-voice polyphony with a capable computer. Polyphony hinges on processor speed, RAM and hard drive access/transfer speed. Though the software will run on a 266 MHz Pentium with 64 MB of RAM, TASCAM recommends an 800 MHz machine with at least 128 MB of RAM. Even the latter is a pretty modest system by today's standards. GigaStudio supports Windows 95, 98, ME, 2000 and XP.

If your MIDI interface offers four or more inputs, GigaStudio will respond to 64 MIDI  
*continued on page 32* ▶



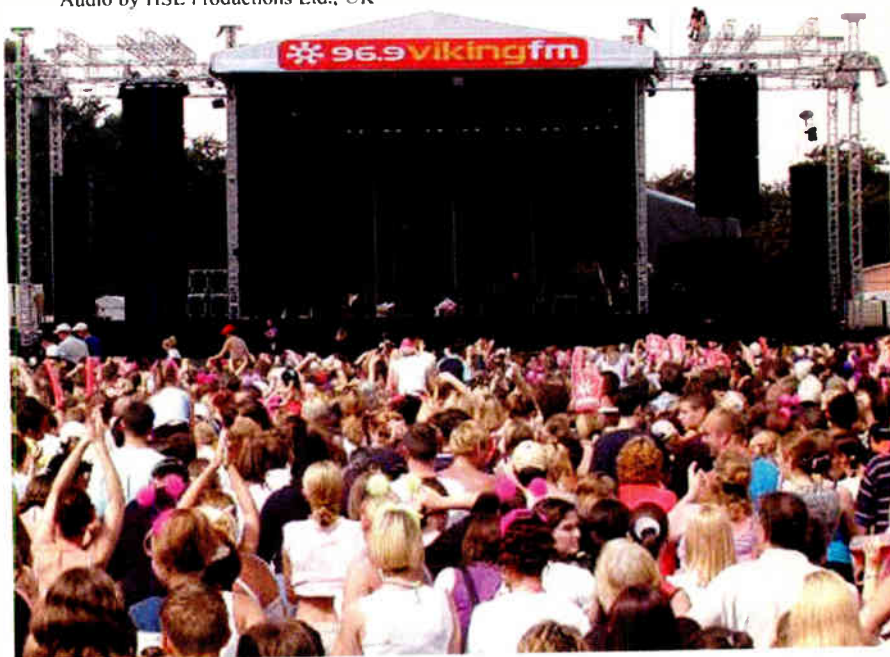
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► **TASCAM** from page 31

channels on four ports. GigaStudio will route sounds to up to 32 discrete audio outputs, and boasts 24-bit/96 kHz hardware support.

GigaStudio's four port panes arrange sounds into four banks of 16 instruments. By default, these correspond to the four MIDI input ports. Double-clicking on a GIG file from the sound list pane loads a single GigaStudio instrument into the next open slot, or you can drag a GIG file to the instrument slot of your choice. You can also save and load GSP performance files, which store all instrument assignments, digital mixer settings, effects settings, MIDI surface assignments and more.

GigaStudio's DSP Station mixer is the software's audio control center, sitting between the sampler engine and audio outputs. Each channel of the DSP Station can have four insert-style (serial) effects added, with many effects parameters controllable via MIDI automation. Each channel also offers eight sends with automated levels, which go to the mixer's eight busses (up to four serial effects each). Busses and channels alike can be assigned to any hardware output, for which DSP Station gives you a master fader and other controls.

One display area that is always visible in GigaStudio is the performance area. It shows several valuable displays to help track how well your computer is handling its job. These status meters include the number of voices currently playing, the highest number of voices used so far, amount of RAM used for sample precache and overall CPU load.

The software offers the means to quickly locate instruments and performances by keyword, thanks to its QuickSound database. QuickSound keeps track of new sounds when added to your system. Key to this capability are GigaStudio's new instrument and performance file formats, which store extra information about the instruments they contain. They also load much faster, which is a real plus. These new instruments and performances are not compatible with GigaSampler, and you have to convert older files to be used with GigaStudio (a quick process).

Also new to GigaStudio is the Distributed Wave system, which allows you to quickly stream any WAV files on your hard drive. You simply drag-and-drop WAV files onto MIDI keys to map the sounds, and GigaStudio



**GigaStudio's DSP Station**

plays them back in response to MIDI note-on messages. The Distributed Wave instrument goes through the DSP Station just like any other, allowing you to add effects. This is a quick, tidy way to trigger WAV files.

GigaStudio's instrument editor offers some nice new capabilities, including a handy Wizard for combining instruments. A crossfade editor makes it relatively easy to combine multiple instruments into one composite sound.

As with GigaSampler, GigaStudio includes 600 MB of the excellent GigaPiano piano samples. Three of the proprietary NFX effects are also bundled in, including reverb, chorus and multitap delay. If you register GigaStudio by going to the Nemesys web site, they will e-mail back the NFX four-band EQ. These effects offer zero-latency performance, automated parameters and relatively low CPU load.

S-converter, an Akai sample library translator, is included with GigaStudio. At least two other converter utilities are available from third-party companies, including Chicken Systems's Translator and Amazing Sound's CD Xtract. A-converter, also bundled with GigaStudio, makes quick work of creating and key-mapping WAV files from a Red Book audio CD.

## IN USE

When you first fire up GigaStudio, the main interface can be a little challenging to figure out. There are text menus across the top, toolbars, left-hand navigation links, tabs and numerous panes visible by default. You will spend most your time using the left-hand buttons, which cycle through the four Port pages for instrument selection, the DSP Station page, the Settings page and a few others.

Once you get comfortable with GigaStudio's interface, most functions are quite simple to implement. Locating and

## Fast Facts

**Applications:**  
Studio

**Key Features:**  
160-voice polyphony, hard disk streaming for near unlimited sample size, mixer, plug-in effects, MIDI automation, instrument editor, Red Book audio converter/mapper, record to hard disk

**Price:** \$699

**Contact:**

TASCAM at 323-726-0303,  
[www.nemesysmusic.com](http://www.nemesysmusic.com), or  
circle Reader Service 32.

loading instruments is fast and efficient with the QuickSound database search system. GigaStudio remembers all loaded sounds until you reset the sampler.

Efficient access to a large library of sounds is important, especially when you consider the wealth of instruments one large hard drive can hold. GigaStudio will also stream sampled instruments off a local area network, which will come in handy in very large production environments.

Did someone say instruments? The GigaStudio universe of sounds is growing at a rapid clip, covering the gamut from dirty loops to ultra-realistic strings and orchestra instruments. Already got a sample library? No problem. Several affordable software packages will translate most any library to GigaStudio format with minimal after-the-fact cleanup.

GigaStudio's DSP Station interface is straightforward to use, with a large volume fader and clearly labeled buttons (though I would have preferred a little more visual distinction between channel pairs).

Though it comes close to being a full-fledged digital mixer, DSP Station misses in a few areas. For starters, it offers no way to solo up effects returns for serious plug-in tweaking. Busses are for send effects only—you cannot use them for submixing instruments. You cannot apply insert plug-ins to the mixer's outputs, and output meter ballistics are so slow as to make them nearly irrelevant. The meters consistently show levels 12 to 15 dB lower than a more accurate RMS meter.

The big showstopper with GigaStudio's



DSP Station is its inability to host plug-in effects other than the four supplied with GigaStudio. Because the sampler code runs "below" Windows to reduce latency, GigaStudio works only with its own zero-latency plug-in effects. This means you cannot use any of your favorite plug-ins with GigaStudio — DirectX, VST or otherwise. I cannot speak for everyone, but I would gladly give up zero-latency performance for the ability to use the dozens of plug-ins I already own. During mixing, eliminating latency is as simple as shifting MIDI tracks back in time (something most of us do anyway).

Is the sound quality and flexibility of the NFX effects enough to make you forget the loss of your favorite plug-ins? Not likely. When it comes to bundled plug-ins, Logic Audio Platinum this is not. On the plus side, several of the NFX effects offer MIDI automation of parameters, and all boast relatively low CPU load. Unfortunately, the quality and flexibility of at least two of the NFX effects leaves something to be desired.

The NFX reverb, for example, does not offer quite enough versatility to cover all musical styles and instruments. While it does a fair job with longer reverbs, it does not deliver short reverbs with adequate density. The NFX EQ offers three bands of control, with high and low shelving filters and a variable-width mid band. The NFX Chorus and Multitap delay fare better. The chorus is nice and dense, with a good range of sounds from subtle thickening to more dramatic chorus-ing. The NFX Multi-tap delay is easily the best plug-in of the lot, offering generous control over four discrete delay taps.

I have one quibble with GigaStudio, in the area of documentation. TASCAM is following the trend toward not supplying a full manual in print form. Instead, a simple introductory manual skips the in-depth functions of the software and point users to the on-line help files instead. GigaStudio's on-line help files are neither.

## SUMMARY

Split the software's name in two, and it is apparent Nemesys was trying to mate its excellent GigaSampler software with a digital "studio." I can find little fault with the sampler side of GigaStudio. In a word, GigaStudio's sampler offers an amazing amount of sampling and editing power. It has

become a big part of many studios these days, being used on everything from back-bedroom demos to major motion picture soundtracks.

The "Studio" part of GigaStudio is not nearly as impressive as the sampler. Though it offers good automation of some effects parameters, it falls short in the areas of routing, metering and a few other nuts-and-bolts mixer functions.

Loren Alldrin's book, "The Home Studio Guide to Microphones," is available from ArtistPro.com.

## REVIEW SETUP

Micron Millennia 933 MHz computer, Windows ME, 384 MB RAM, Frontier Designs Dakota card with Tango24 interface.

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# Auralex Acoustics

## MoPad, GRAMMA and HoverDeck Isolation Products

BY STEPHEN MURPHY

The most familiar method of acoustic treatment is the use of absorptive and diffusive materials to control sound waves *within* a room. An equally important and often overlooked component of acoustic treatment is structural isolation of the room itself.

Physically decoupling the room's structural elements from each other and the outside world — usually with dense, flexible rubber — allows individual elements to absorb vibrations without passing them on adjacent surfaces.

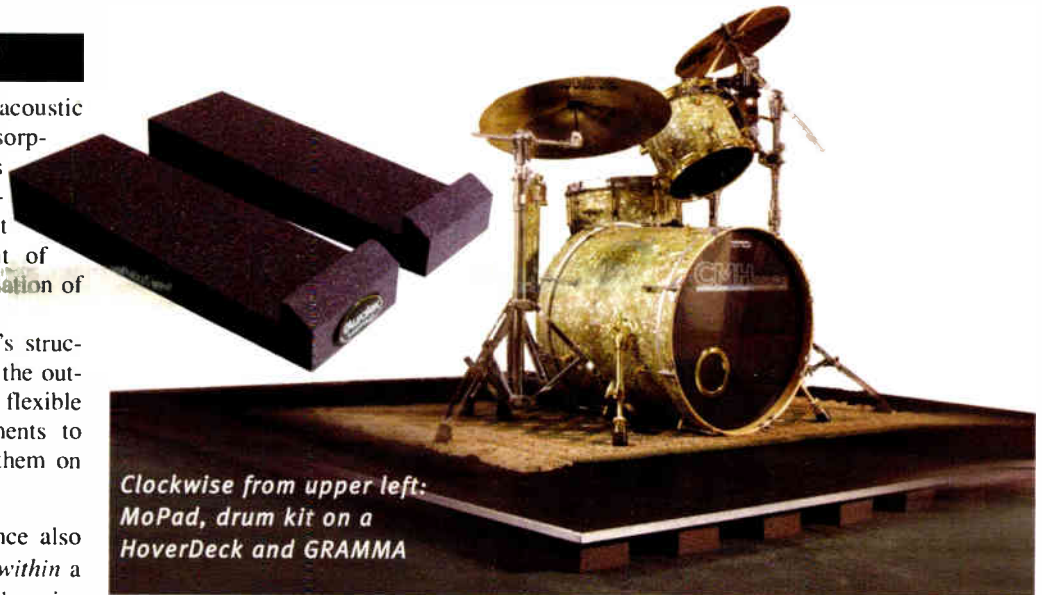
Structural vibration and resonance also occurs between proximate objects *within* a room, potentially undermining otherwise controlled acoustics. Auralex Acoustics, maker of a wide range of professional acoustic products, recently introduced three items designed to easily and effectively isolate a sound source from its immediate environment.

### MoPAD

The Auralex MoPad kit (\$29.95) is a foam wedge system designed to decouple studio monitors from that on which they rest.

The system consists of four 12-inch x 4-inch monitor isolation pads (two per speaker) and four adjustment wedges, allowing the monitors to sit flat or angled  $\pm 4$  or 8 degrees. The MoPads can accommodate typical close or midfield monitors weighing 100 pounds or less.

As I toted the MoPads from studio to studio for evaluation, I was impressed by the range of audible improvements realized. By decoupling the monitors from other objects, speakers are free to perform as originally designed. In most cases, speakers immediately sounded better. The most common improvement was a tighter, more focused bass response.



Clockwise from upper left:  
MoPad, drum kit on a  
HoverDeck and GRAMMA



In a few cases, the lack of coupled resonating objects resulted in a thinner sound. Here, the MoPads proved to be a valuable troubleshooting device, indicating a problem in speaker choice and/or the acoustical treatment of the room.

In one instance, the change was dramatic enough — far less bass and low mids — for the listener to dismiss the MoPads. This indicated (among other things) that the expensive custom workstation desk on which his monitors rested, and all other objects contained within, were resonating enough to contribute *substantially* to the overall sound.

While I don't want to tell anyone what to do with his or her studio (unless I'm being paid), a listening environment relying on unintentional structural resonance will

### Fast Facts

**Applications:**  
studio, broadcast

**Key Features:**  
Well-designed custom fittings,  
easy installation

**Prices:** MoPad kit- \$29.95;  
GRAMMA - \$59.95; HoverDeck  
- \$199

**Contact:** Auralex Acoustics at  
1-800-95WEDGE,  
[www.auralex.com](http://www.auralex.com), or circle  
Reader Service 34.

behave unpredictably. The amount and type of resonance will vary constantly with changes in coupled equipment, dampening (human contact with the desk), program material (the key of a song, for instance) and playback level.

Installing the MoPads on my two sets of closefield monitors and on my home speakers improved the performance of the speakers immediately and/or led me to make positive tweaks in the system. In all cases, the MoPads were an easy-to-implement step towards monitoring accuracy; do not rely on the resonance of others!

## GRAMMA AND HOVERDECK

Auralex also has introduced two products built to isolate larger sound sources from their immediate environment.

The Gig and Recording Amp & Monitor Modulation Attenuator, or GRAMMA, is designed to float instrument combo amps, cabinets, subwoofers, bigger studio monitors and stage monitors.

GRAMMA (\$59.95) is a 23-inch x 15-inch x 2.75-inch carpet-covered, 300-pound limit platform supported by two blocks of high-density PlatFoam. A carrying handle is mounted underneath, and a block of wedged Studiofoam sits between the PlatFoam strips to prevent self-resonance.

Like the MoPads, using the GRAMMA in a variety of situations yielded a tighter, more controlled sound. Both live and recording setups benefited from the isolation, allowing each speaker cabinet to sing without an uninvited choir of resonating freeloaders. Equally impressive, masking and muddying rumble caused by vibrations transferring to proximate mic stands was greatly reduced.

The Papa Bear of Auralex's new decoupling products is the HoverDeck kit — basically a GRAMMA on steroids. This is a DIY kit built by purchasing a box of 24 2-inch x 4-inch x 4-foot strips of Auralex high-density PlatFoam (\$199 per box). The PlatFoam is used to support an isolated 8-foot x 8-foot riser for use with drums, percussion or any other items. The kit recommends carpet-covered MDF board (though plywood can be used) for the actual deck of the riser. Auralex Tubetak adhesive and detailed instructions are included with the easy-to-build kit.

I built a 12-foot x 10-foot triangle-shaped riser to fit perfectly near the corner of my room. I used MDF board for the platform and an inexpensive WalMart faux-Oriental rug for the non-reflective/non-slip

surface. The HoverDeck works as well as the MoPads and GRAMMA in reducing rumble and cleaning up the tone of the sound source. I have been using it with great success to record everything from vocals and acoustic guitar to bass amps and percussion; an instant floating floor with infinite uses.

## SUMMARY

With the introduction of these easy-to-implement Auralex decoupling products, immediate and effective acoustic improvement is available to many home and professional studios. Though not quite a substitute for full-on floating construction, for those who cannot build from the ground up, the decoupling cavalry has arrived.

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## REVIEW SETUP

Westlake LCW8.1, Mackie HR824, Yamaha NS10m, Meyer HD-1 studio monitors; Hafler P3000 power amplifiers; Ampeg SVT Bass rig; Roland JC-120, Fender CyberTwin and Ampeg J-12R guitar amps; Zaolla Silverline cables.

# Primacoustic London Primakit Acoustic Treatment System

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**Gary Church**  
Chief Loudspeaker Engineer, HAFLER



BY STEPHEN MURPHY

**W**ith the miniaturization of professional quality recording gear comes the miniaturization of recording spaces. The prohibitive costs associated with building a studio from the ground up combined with smaller space requirements have led many to utilize existing — and typically rectangular — rooms for project and professional studios.

Unfortunately, typical home and office rooms are not ideally suited for professional audio purposes. Worse, many people pour all their resources into accumulating equipment and give acoustic matters little or no regard.

Primacoustic, a decade-old architectural and industrial acoustics design group based in Vancouver, has responded with a range of affordable acoustic treatment systems targeted towards existing-room situations.

### FEATURES

Primacoustic has designed its Primakit acoustic treatment systems to tackle the most predictable problems associated with rectangular rooms. Primakits include a collection of absorptive and diffusive products specified to provide basic broadband acoustic treatment. Although they do not address other serious acoustic issues like structural isolation, kits such as these ensure greater potential for acoustic accuracy over haphazardly applying foam everywhere — a common practice that can actually make the room's acoustics worse.

Primacoustic makes several exotically named Primakits (Rio, London, New York, Montreal) geared towards specific-use rooms including control rooms, voice over booths

*continued on page 38 >*

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► *Primacoustic from page 36*

and video post suites.

The London Primakit systems are specifically designed for use in control rooms and single-room project studios. Four different London models are available to treat a range of approximate room sizes: London-12 for 12-foot x 9-foot rooms (\$450); London-14 for 14-foot x 10-foot rooms (\$600); London-15 for 15-foot x 12-foot rooms (\$700); and London-16 for 16-foot x 12-foot rooms (\$875).

The London systems are comprised of four separate high-density, open-cell foam elements, each treating a different acoustical condition. The kits are based on the tried-and-true live-end/dead-end (LEDE) theory of studio acoustics which provides for a neutral balance of live reflective ambience and broadband absorption.

The first element in the London system, the Europa Flutter Wall, is mounted behind the speakers, forming the "dead end" of the studio. Comprised of varying foam shapes and thickness, the Europa is stated to evenly absorb frequencies 400 Hz and above and aid in reducing standing waves, slap echo and back reflections from the monitors.

The second element is the Orientique Washboard. These angled foam panels are mounted on the side walls opposite each other and are designed to reduce side-to-side flutter and "smear" as well as absorb primary reflections.

Next are the Scandia Scatter Blocks, comprised of smaller blocks of the same angled high-density foam. Intended as the "live end," the blocks are mounted in a spaced-apart fashion on the rear wall to diffuse direct reflections and standing waves.

Last are the Australis Corner Traps. These large wedges provide solid mass for bass absorption to a stated frequency of 45 Hz.

## IN USE

For review I was sent the London-16 kit, the largest of the London series. The kit arrived in seven UPS-shippable cartons and came complete with Liquid Nails adhesive

for mounting the foam.

Included in the London-16 are six Australis Corner Traps, a Europa 83 Flutter Wall (8-foot x 3-foot) for the front, four Orientique Washboards and Scandia 85 Scatter Blocks (8-foot x 5-foot) for the back wall.

The target install room was 19-foot x 11-foot and has several windows. Primacoustic notes that if your room size does not quite match the specified kit sizes, additional elements can be purchased individually.

I chose to mount most of the foam on foam core poster board and then mount the completed element on the walls using mirror channel strips. This worked well, allowing flexibility in fine tuning the room and portability should I have to move the studio.

One of the coolest features of the Primakits is its modularity. The Europa Flutter Wall, for instance, is made up of several sizes and shapes of foam strips and blocks that can be arranged in a variety of patterns.

The foam can also be lightly sprayed with latex paint to fit the decor, as I did in this installation. This worked well, but care must be taken to ensure an even look. On one wall that has a painted mural on it, the Orientique Washboards and Australis traps were painted into the design (see photo).

After installing the London kit, the acoustics of the room improved measurably. Compared to the untreated room, one of the biggest gains was a large reduction of corner bass build up. This alone served to improve

clarity and imaging by eliminating low and low-mid anomalies and masking.

Another obvious improvement was the general reduction of quick reflections that cause wash, distraction and listening fatigue; a more pleasurable listening experience in general.

I found the rear "live end" Scandia Scatter Blocks, comprised of intermittent angled foam blocks and bare wall, to be less effective in reflecting/diffusing sound than I hoped. Instead, it seems the foam absorbed more than it diffused, which is not unlikely, give it is the exact same foam used in the absorptive walls. The high frequency diffusion was significantly improved when I thickly painted the face of the individual blocks (which also helped with the bass/low-mid build up along the rear wall by adding mass and retaining the larger waveforms).

## REVIEW SETUP

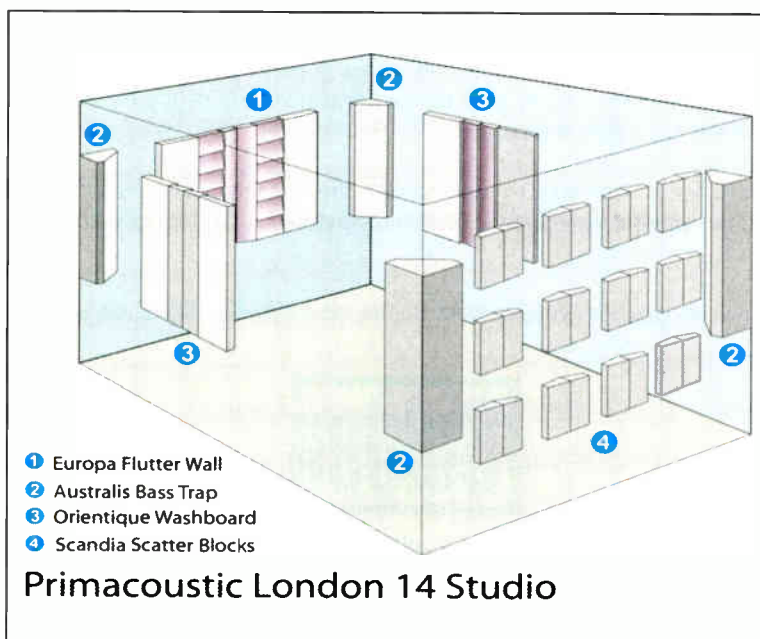
Westlake 8.1 and Mackie HR824 studio monitors; Hafler H3000 power amplifier; Digidesign Pro Tools MixPlus workstation; Zaolla Silverline analog and digital cables.

## SUMMARY

There's no substituting the results of a professionally designed and constructed studio with something that comes in a kit. Likewise, there is no comparison between an untreated home or office room (or an improperly treated room), and one that has been treated with a broadband acoustic system such as Primacoustic's Primakits. The London system installed easily, looks professional and successfully improved the existing poor acoustics of the test room.

Contact: Primacoustic at (604) 942-1001, [www.primacoustic.com](http://www.primacoustic.com), or circle **Reader Service 38**

*Stephen Murphy, contributing studio editor for PAR, has recorded over 300 vinyl and CD releases, including a Grammy Award-winning and a Platinum-selling album. Steve can be reached at [smurph@smurphco.com](mailto:smurph@smurphco.com).*



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# Looking at Acoustics

by Nick Baily

**T**he array of new product options can be intimidating to those diving into the world of acoustic treatments. From project studio owners to professional systems contractors, buyers now have more options than ever before when designing and implementing acoustic solutions.

On the higher end, **RPG Diffusor Systems** is well known for innovative and well-made products, including an extensive line of tiles and panels. The recently introduced **BASWaphon** system is already finding use in architectural installations such as the new Frank Gehry-designed Case Western Reserve building in Cleveland.

Centered around an emulsion of spherical mineral particles, **BASWaphon** is composed of mineral wool panels, which are then sealed and coated with progressively finer coats of the emulsion particles. This acoustic surface, with the look and feel of drywall, is paintable, can be used on curved surfaces, and can be stripped and reapplied if damaged by years of use. RPG has also just released the V8 version of its popular **CATT** Acoustic modeling software, for accurate design of acoustic spaces. ([www.rpginc.com](http://www.rpginc.com))

Architects and contractors have new options from **Acoustical Solutions** for wall, ceiling, and floor couplings. The **Alpha Resilient Isolation Clips (ARSIC-1)** and **Audioseal Sound Barriers (AB10NR)** aim to improve STC ratings by providing better isolation in joints, while the **Alpha Isolation Pad** provides refinements for floating floors.

([www.acousticalsolutions.com](http://www.acousticalsolutions.com))

Good news for room designers with an eye for looks is the **Designer Series Treatments (DST)** from **Auralex**. With color options ranging from charcoal, burgundy, and purple to forest green, and a variety of surface patterns, the DST line adds a new range of aesthetic options to Auralex's offerings. ([www.auralex.com](http://www.auralex.com))

**Acoustics First** also aims to balance looks and sound acoustics with the **Transfusor**, introduced at NSCA. As the name implies the **Transfusor** passes light, and is designed to fit over a standard 2-foot x 2-foot ceiling opening, providing both sound diffusion and an attractive anti-glare light fixture.

For project and home studio users, **Acoustics First** has also bundled several complementary items together in the **1014 AcustiKit**. Combining the **Art Diffusor**, **Cutting Wedge** and **Bermuda Triangle** products, the kit provides a quick way to improve the response of rooms up to 10-foot x 14-foot. ([www.acousticsfirst.com](http://www.acousticsfirst.com))

Often acoustic products look like, well, acoustic products - foam, sometimes amusingly-shaped, placed, hopefully, strategically on a wall. The **Wallmate** system from **Fabric Wallmount Systems** tries to upgrade traditional sound isolation treatments. Using a series of hinged wall-mounted metal bracket-clamps **Wallmate** allows would-be studio Martha Stewarts to stretch fabric (some will be better than others) across a wall - as if it were a tapestry or a picture. ([www.wallmate.net](http://www.wallmate.net))

Moving from diffusion treatments to sound isolation, the **Acoustilock** enclosures from **Noren Products** have been gaining

continued on page 76 >



From the top: **Art Diffusor** from **Acoustics First**; **Sorber drum shields** from **Clearsonic**; an isolation rack from **Middle Atlantic Products**; a stack of **gobos** from **Taytrix's Stack-It** line; a portable booth from **Whisper Room**.

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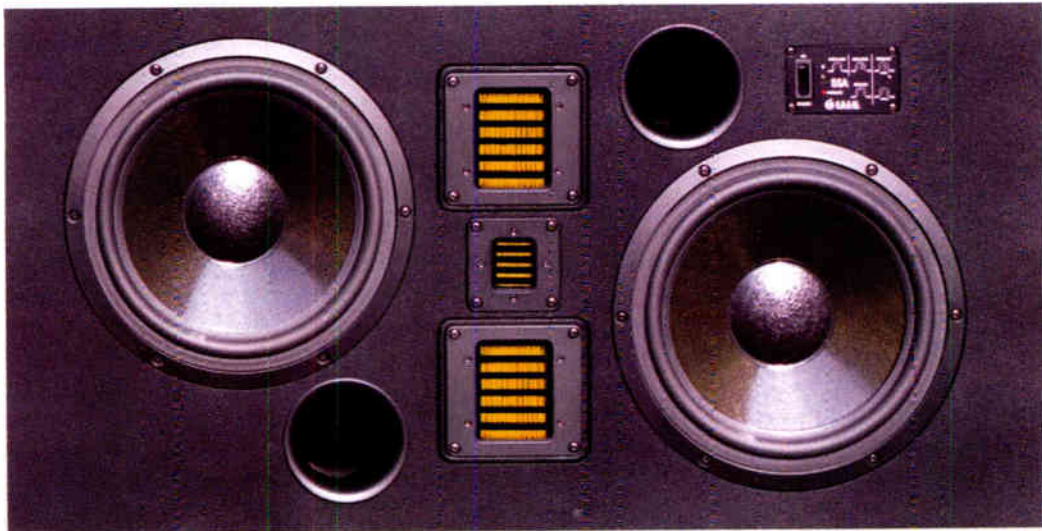


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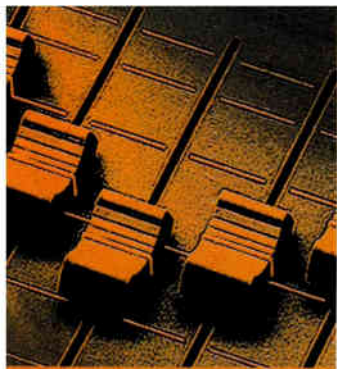
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World Radio History



THE HIGH END

BY TOM JUNG

# The Merits of Single Drivers



**O**ver the years I have reported on some of audio's finest products — tools of our trade designed to bring us no-compromise performance in capturing and reproducing audio. As I have stated previously, the area that still lags behind in terms of meeting

the challenge in high-quality reproduction is the loudspeaker, which in spite of everything I consider to be the weakest link.

I am consistently searching for a speaker system that can reproduce musical instruments accurately, while handling real-world dynamics and interfacing nicely with domestic rooms. So far, nothing I have come across seems to fill the bill. With most audio gear, pro or consumer, if you throw enough money at it, you can find a product or can have one built that does the job. However, with speakers, this does not seem to be the case. I have heard speakers that cost as much as a small house that still do not make it.

## CROSSOVER DILEMMA

I have come to the conclusion that a fundamental fault with speakers in general are with the crossovers. And more crossovers usually equate to more problems; complicated multi-way systems are often some of the worst sounding. Most crossovers are passive in design and are made up of a network of capacitors, resistors and inductors.

Not only do these networks suck up valuable power, they corrupt the audio signal by creating phase and timing errors which can be sonically devastating. Active crossovers have some advantages but still fall short in making the transition from one driver to another without phase shift or time-based distortions. The better design engineers have compensated for these distortions.

Musical instruments vary in harmonic content; that is what makes instruments that are playing the same note sound so different. Harmonically rich instruments such as muted trumpet are known to have overtones extending out to 100 kHz or more. When these instruments are reproduced with loudspeakers, several drivers and the associated crossovers manage to corrupt the delicate tonal characteristics.

## THE WISH LIST

If only we could have a full-range one-way system with no crossovers. But like everything else, there is no free lunch. Single-driver speaker systems typically have limited frequency response and are fairly high in distortion.

Since most of my work these days concerns multichannel recording projects, I have come across a few systems with small one-way satellite speakers and a subwoofer. Some of these systems are relatively inexpensive and have a fair amount of sonic value.

With a single driver satellite speaker there are no crossovers, at least in the midrange where the human ear is the most sensitive. Most speakers of this type make it down to 150 Hz or so where the subwoofer kicks in and goes down hopefully into the 30 to 40 Hz range. Crossovers in the 150 Hz range can be less objectionable and allow for easier placement of small satellite speakers.

On the down side, two or three-inch drivers are usually not very extended in the high frequencies and smooth transition from subwoofer to satellite is often less than coherent.

## CAMBRIDGE SOUNDWORKS

However, I have heard some designs that do work. One system that impressed me recently is the Cambridge Soundworks D210. Two four-inch satellite speaker cubes, each with a 3.5-inch driver, cover the frequencies fairly flat from 150 Hz out to approximately 13 kHz, where they start to roll off gradually. An eight-inch driver mounted in a down-firing, sealed enclosure subwoofer handles frequencies from 150 Hz and below extending down to the 35 Hz region. A 270W multichannel digital hybrid amplifier delivers 150W of power to a long-throw woofer while the satellites are each powered by 60W amplifiers. Two sets of stereo analog inputs are available, along with a S/PDIF digital input capable of handling up to 96 kHz at 24 bits. The system comes with a wired remote volume control, which is necessary if you feed the system with a digital input or fixed-level analog inputs. A bass control has a range from no bass (no sub) to rattling the room. I found the right setting for my listening to be just about the 10 o'clock position. The treble control is of a more conventional EQ type and also has a fair amount of range.

Listening to this system, it was refreshing to hear the critical upper midrange not corrupted by the usual crossovers. In many ways a simple low-cost system, such as the D210, is more satisfying to listen to over a period of time than the larger, more complicated systems. I am amazed at how loud this system will play and still be fairly clean. I am also surprised at how well the satellites integrate with the sub. I expected the sub's location in the room to be much more noticeable with its rather high 150 Hz crossover frequency.

Listening with an SACD player feeding the system's analog input makes you have to grin, the sound is respectable. And at \$300, the Cambridge Soundworks D210 is a clear bang-for-the-buck winner, sans crossover where it really matters.

The one-way satellites plus subwoofer have a lot of merit and when it grows to 5.1 it even makes more sense. With a bit more attention paid to component quality and higher design goals this concept has the ability to develop into something quite good and still be affordable.

Contact Cambridge Soundworks at 800-367-4434, [www.cambridgesoundworks.com](http://www.cambridgesoundworks.com).

*Tom Jung, founder of DMP Records, is Pro Audio Review's technical consultant and a regular contributor.*

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READER SERVICE NUMBER 43

# Small Room Acoustics:

## A Talk with John Storyk

by Nick Bailly

**J**ohn Storyk is one of the most recognized names in acoustic design, with over 1,200 projects dating back to his 1969 design of NYC's famed Electric Ladyland studios for Jimi Hendrix. Recent projects range from truly massive facilities such as the \$12 million Synchronsound Studios in Kuala Lumpur, Malaysia, and, in conjunction with partner Sam Berkow and Artec Consultants, the Jazz at Lincoln Center facility (currently under construction), to home studio installations such as the one recently completed at the Tribeca loft of film composer Carter Burwell ("Three Kings," "Raising Arizona," "Fargo").

**Pro Audio Review:** Do you see a move to smaller rooms and more improvised spaces in professional audio production?

**John Storyk:** Absolutely, and it's something that's been going on for quite a while. We've got a reputation for working on very large projects, which of course we do, but we have a great deal of experience in smaller rooms and home installations. It's a different kind of challenge, but the principles of good acoustic design don't change.

**PAR:** Some have said that small room acoustics are a "black art," so to speak, that the conventional formulas are imprecise as you shrink the acoustic space.

**John Storyk:** I would tend to disagree, although you bring up a good point. Small room design is not a black art. In large rooms, often what matters is reflections. Those are easier to understand and model. People have some intuition about how sound




waves reflect and refract in a big space. With smaller rooms, low frequency modal analysis becomes the real issue, and probably the most important thing you can do is to make sure that room ratios and listener/speaker positioning are as ideal as possible. (See Figure 1 - Acceptable Room Ratios)

**PAR:** The ratio of the room's height, width, and length.

**John Storyk:** Yes. I had a student call me up a couple of years ago, and he said, "I have a 20-foot x 20-foot space to use as a control room; what should I do to make it sound good?" That's of course a pretty open-ended question, but I told him: "Build a closet." He probably thought I was joking, but that would be my first move. The square room is going to have build-up, eigentones, which will cause poor frequency response at lower frequencies. (See Figures 2 and 3. - modal analysis of 20-foot x 20-foot space and revised layout).

**PAR:** Most people on a budget wouldn't even think about changing the room dimensions.

**John Storyk:** But even on a modest construction budget, it's not hard to make a simple wall, a freestanding closet — something like that — just to get the proportions right, so that the eigentones are distributed as evenly as possible across the frequency spectrum. And besides, then you've got a place to put your equipment — which makes noise — and get it out of the monitoring area. I'd say it's better to have less space if it comes with the benefit of better acoustics.

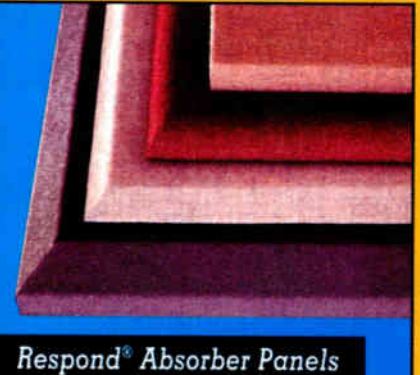


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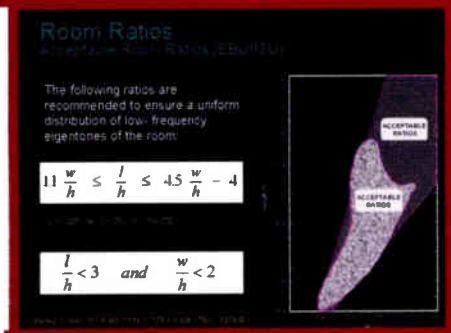


Fig. 1 The ratios of a room's height, width, and depth must conform to these formulas to ensure uniform distribution of low-frequency eigenmodes.

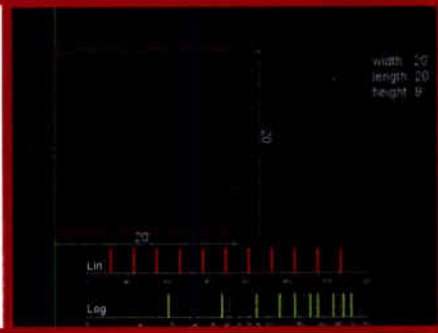


Fig. 2 Before and after low frequency modal distributions for a 20' x 20' room and a revised design. Note the improved room acoustics due to better modal distribution.



Fig. 3 Note how poor placement of nearfield monitors can lead to comb filtering due to reflections. It shows the frequency response improvements from proper placement.

**PAR:** Have you found that people tend to skimp on the space entirely and rely on the gear to give them professional-sounding audio?

**John Storyk:** One of the biggest misconceptions people have with small rooms is nearfield monitoring will solve all of your problems, that you can get right up on the speakers and you won't hear the room. But that brings up other problems, an obvious one

being that you end up with a really tiny sweet spot, so it's hard for more than one listener to monitor, and that also causes poor imaging. But regardless, the idea that you won't hear the room is a myth anyway. Early reflections from the front and side walls are going to come back at roughly 1.1 milliseconds per foot of distance, and that almost certainly means comb-filtering. Having the speakers at

ear-level is also really important. Nearfield monitors, if not properly placed with respect to the console can cause unwanted comb filters, resulting in frequency domain dips. It amazes me that more people don't simply move the nearfields back 12 – 18 inches (see Figures 4,5 and 6 – closefield monitoring positions on consoles).

*continued on page 46* ➤

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# Small Room Acoustics:

## A Talk with John Storyk

Fig. 4 Improper placement of a closefield monitor on a console top creates negative reflections

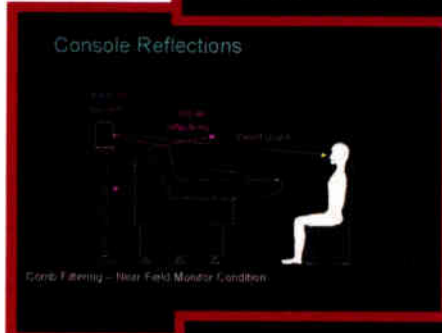
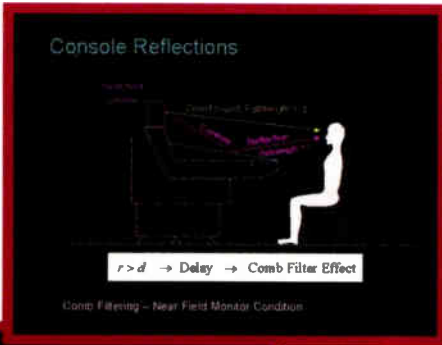


Fig. 5 Proper placement of a closefield monitor on a console top creates direct waves

Fig. 6 Frequency response comparison of monitor placement in Figures 4 and 5

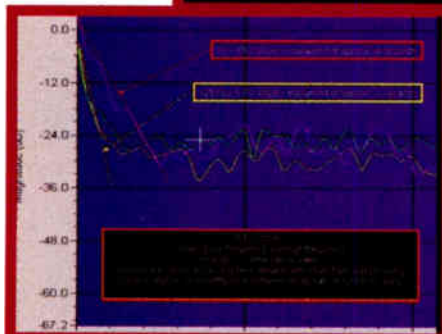
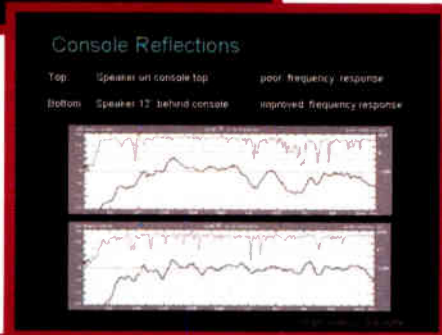


Fig. 7 These ETC curves show low frequency and high frequency energy /vs. time (decay rate). Note that this example of a small vocal booth that has only been treated with foam type wall coverings has a 100% difference decay rate at 125 Hz vs. decay rate at 1 kHz.



Control room for producer Carter Burwell's brand new Storyk-designed control room, in his Manhattan home.

► John Storyk from page 45

**PAR:** When people do decide to treat home studios acoustically, you often will see a few acoustic tiles on the wall: egg crates or the equivalent. How effective is that?

**John Storyk:** That brings up another misconception, and you do see that all the time. It's the old "let's just pad the walls" solution (sometimes called the sonex Alpha Foam syndrome). The problem is that this type of absorption only addresses certain frequencies — generally mid and high frequencies — so you end up with a room that's very unbalanced with respect to decay time; just look at the absorption coefficients for 2" Alpha Foam, particularly at 125 Hz. Don't get me wrong, there is a time and place for mid-frequency absorption, but it must be distributed in a small room in a reasonably even fashion along with low frequency control. If not, the discrepancy between low and high frequency decay times will cause worse effects than the untreated room. This is often the case in small vocal booths. (See Figure 7 - ETC Curves for a typical vocal booth with misapplied wall treatments)

Surface applied treatments for both low and high frequencies are an area that's improving rapidly, with some really great new materials from a number of companies.

**PAR:** Other big issues?

**John Storyk:** Well, we've discussed surface treatments as well as room

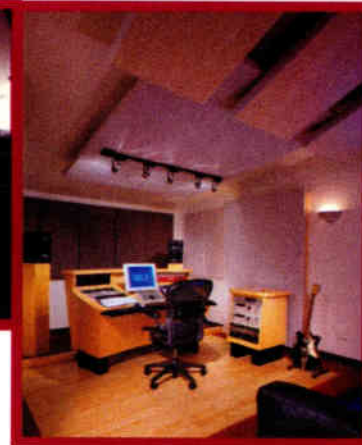
ratios — both subjects contribute to what I would refer as internal room acoustics. And, you can't forget soundproofing (or sound isolation), which is a distinct issue. Keeping out disturbing adjacent noise, assuring that the noise from the studio does not bother adjacent neighbors; dealing with internal HVAC (air conditioning) noise — these are required issues for the professional listening environment. The solutions to these "transfer acoustic" issues are well established. In general, these problems result in "room within room" construction with boundary elements being fabricated of relatively stiff construction systems.

**PAR:** Good advice; next time I need to work on a project room I'll think, "Build a closet."

**John Storyk:** Of course building closets isn't always the answer, but room proportions are crucial for small project studios. If you're going to spend lots of money on gear, then it makes sense to consider paying the same attention to acoustic design. The listening environment is a critical piece of equipment in the audio chain — possibly the most important.

**PAR:** Are you a fan of the new paradigm, of computer workstations, miniaturization, and project studios?

**John Storyk:** I assume you are referring to "desktop audio." It most definitely has its place in the audio community and is affording many people an opportunity to make music. For years large consoles, have caused studio designers to work a bit harder. We currently have two projects in progress at our office with NO consoles. But more importantly, desk-top audio is making creativity possible for more people than ever. It used to be necessary to spend \$1 million to create an audio production facility, worthy of commercial release, and now it can be done for a tenth of that. Looking at the big picture, that's revolutionary. Music was the reason I entered this career. More of it is a good thing.



Storyk's latest studio design, the Engine Room in New York City.



Hans Zimmer

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Elliot Scheiner's DM2000 Console was built and provided by Sound Construction & Supply, Inc.  
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DM2000



"The DM2000 is unlike any other console. It's packed with features and sounds spectacular, and to have 96 inputs at 24-bit/96k is incredible. The library of built-in effects is absolutely awesome; there's an enormous amount of flexibility with the internal patching and some great 5.1 effects processors. It's one of the most powerful consoles I've ever worked on."

Elliot Scheiner



"I've used the same board for over 15 years and I've never considered changing it until now. The DM2000 will replace that board."

— Jimmy Jam

Terry Lewis

James "Jimmy Jam" Harris

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All 96 inputs and 30 outputs available at 96kHz operation. Eight independent 32 bit/96kHz stereo multi-effect processors, six 31-band graphic EQs, independent compression and gating plus 4-band parametric EQ on all inputs and compressors with 4-band parametric EQ on all outputs, 24-bit/96kHz AD/DA converters with world class mic preamps.





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SPRING 2002  
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# Logan Productions: 100% Sony Wireless for Corporate Productions

Logan Productions, Inc., a business theater and video production company, recently switched completely to Sony UHF wireless products.

with the camera. The 808's work with any microphone."

Logan recently completed a live business theater event and uplink for SC Johnson. "We were using 12 wireless mics feeding



"We evaluated a number of systems from various manufacturers and consistently found that the Sony system outperformed the others" says Jim Logan. "We're in tough conditions when we're shooting, around a lot of heavy machinery and electronic interference, the difference between systems was very noticeable; the Sony systems consistently delivered a better signal with broader dynamic range."

"Whether it's a business theater event or field production we never know what conditions we're going to run into. We'd occasionally pick up interference on our old UHF system, the frequency agility of the Sony system solved that. You can set up a show anywhere, even in crowded convention halls with hundreds of exhibitors, with no fear of interference."

Logan purchased 12 WRT-805B Transmitters equipped with ECM-77 lavalier microphones, 12 WRU-806B Tuners along with 2 - MB-806A Tuner Base Units and a pair of AN-820A Antennas for extended range, two WRT-808A Plug on transmitters, and a WRR-862B Dual Diversity tuner for field production.

"The system is incredibly flexible," says Logan. "Sometimes we'll plug the 808's on the output of our mixer to feed the 862 mounted on our CineAlta™ camera. It minimizes the amount of cable we have to run and makes camera movement simple. We'll do the same thing with a shotgun and give the boom operator flexibility to move easily

both the sound reinforcement console in the house and the production console for uplink in the remote truck. We never had a dropout, hum, click or buzz - wireless is something we don't even think about anymore, the quality is consistent.

"We produced a show for John Deere that had a four week run in Florida. It was great to be able to monitor the transmitters battery conditions and signal strength right from the console. It's simple - the battery indicator on the receiver starts to flash when there's about an hour of operating time left. That means we prevent problems before they happen."

Logan recently started an equipment rental division, Oscar Rents. "We've included the Sony wireless mics in our rental inventory because we know they will be almost maintenance free. Customer response has been very positive."

Logan Productions also put together a portable presenta-

*continued on page 56*

## Sony Powered Mixers Enhance E. Michigan University Capability

Eastern Michigan University has purchased a number of Sony SRP-X351P powered mixers as an integral part of an initiative to upgrade its schools with state-of-the-art multimedia technology. The mixers, which are currently being used for a wide range of audio/video presentations, have been installed in five classrooms on the college's Ypsilanti-based campus. According to the university, with a total of 13 schools, Eastern Michigan is one of the best-known technology-oriented universities in the area, with plans, over the next two years, to add several more units to its classrooms. The systems integration was coordinated by Enticed Information Technologies, Inc. of Troy, MI.

"We selected the SRP-X351P powered mixer after successfully executing a demo in a classroom environment," reports Bob Turner, CFO at Enticed Information Technologies. "It performed beautifully, and everyone was really pleased."

"We were looking for a versatile high-end mixer that could easily switch audio and video between four or more different sources," adds Enticed systems engineer Michael Betterly. "We also needed a system that accepted microphone inputs and offered muting capability, remote monitoring, and remote control of the volume. The Sony SRP-X351P met these requirements."



Enticed systems engineer Michael Betterly (left) with E. Michigan U. Dean Michael Bretting at the media console.

Each revamped classroom is equipped with the Sony powered mixer, a ceiling-mounted LCD projector, HI-FI VCR, DVD player, and computer switcher. Each classroom is outfitted with a custom-built podium (by Betterly and his company, Custom Cabling & Network Services) to house the equipment, a visual presenter, and a computer.

## Michael Carroll Music Upgrades with R100, CDR-W66 & CDP-D11

Composer Michael Carroll has selected a Sony DMX-R100 digital console for Streak Studios, his company's new Chelsea-based music production facility. Established in 1983, Michael Carroll Music specializes in composing original or adapted music for top advertising clients.

"The R100 has a really strong reputation in the pro audio community, and after receiving a comprehensive demo from Sony rep Andy Munitz, I was sold," comments Carroll. "The console is primarily used for tracking and mixing, but I also do pre-production and post work for agencies preparing pitches, exploratory animatics or testing/focus groups."

"The sound quality is incredible," continues Carroll. "I was truly impressed by the R100's true touch-sensitive automation. It's so easy. I love that you can turn off or erase an automation command if you've written a bad move. It saves me so much time. I was also drawn to this console because of version 2.0's surround sound capability. We anticipate surround work in the not-too-distant future."

"The console's internal patch bay is fantastic," says Carroll. "Even though I've added a lot of equipment to this studio, I've actually lightened the load on my digital patcher



Composer Michael Carroll at the DMX-R100.

because the R100 takes care of most of the patching for me." Carroll also purchased a Sony CDR-W66 and two CDP-D11 CD players, and Sony's PFM-421B1 42-inch (viewable area, measured diagonally) flat plasma monitor for his new studio.



# WDIV-TV Detroit Reporter

## Uses Sony Wireless for On-the-Spot Interviews

In the fast-paced TV world of news gathering, reliability is the name of the game. For NBC affiliate WDIV-TV in Detroit, the combination of the Sony WRR-855 UHF Synthesized Tuners and the WRT-808A UHF Synthesized Transmitters has provided just that. Two years ago, the station invested in the formidable package of the Sony WRR-855 Tuners and the Sony WRT-808A Transmitters for its outside field crews. Since then, the equipment has been put into action, almost daily, as it follows reporters on a variety of on-location assignments.

The station's award-winning consumer reporter/anchor Ruth Spencer, relies on the wireless system for her popular in-the-field reports "Ruth to the Rescue."

"With the reports that I do, we're often trying to capture action as it's happening," says Spencer.

Compact and lightweight (only 11oz), the WRR-855A is a plug-in portable tuner designed for use with Sony Betacam SX<sup>®</sup> camcorders, which the station also uses. The unit's built-in LCD reveals the wireless microphone operating channel, group settings, and error messages.

"The nature of many of our reports are investigative, we're on deadline and we need a balanced story, so we're forced to confront the individual on the spot, in a candid moment," adds Spencer. "We

only have maybe a few seconds to capture the audio or we lose it. Obviously, we need audio equipment that's reliable in these, sometimes on-the-run, interviews."



only have maybe a few seconds to capture the audio or we lose it. Obviously, we need audio equipment that's reliable in these, sometimes on-the-run, interviews."

"The equipment needs to be flexible and able to withstand a sometimes rugged assignment," concludes Spencer.

Complimenting the WRR-855 is the WRT-808A, a durable plug-on transmitter which effectively converts a wired microphone into a wireless one, which work extremely well for the type of field work in which Spencer is involved. The compact body of the 808A, which provides balanced handling, also features an LED for battery indication and up to four hours of continuous operation with two AA batteries.

With a switchable RF power output, 50 mW for longer distances and 10mW for multi-channel operation, the 808A provides the gain needed for critical usage.

# Sony DMX-R1 Sailing



Carnival Cruise Lines recently purchased a Sony DMX-R100 digital console for the creation and assembly of their high-energy live Las Vegas-style revue shows.

CCL's entertainment audio supervisor Craig Palcisko reports on the R100's successful maiden voyage: "The board was shipped to Helsinki, Finland where it was set up in the main lounge (Taj Mahal) of Carnival's newest 'fun-ship,' the Pride. As it sailed across the Atlantic to the company's headquarters in Miami, the R100 was engaged in the production of our latest shows. It is the centerpiece of our portable, rolling studio."

"During pre-production, the basic stems of a show are put together on the R100," describes Preston Bircher, CCL's entertainment technical project manager. "All of our shows are based on pre-recorded show elements—basically a live show with a show tape base. The recorded

# 00

# Along for Carnival



elements duplicate some instruments and create others that are not part of our regular productions including a 10-piece big band, and orchestra."

"Craig routes everything through the R100," elaborates Bircher. "The console's digital re-patching is really intuitive, so it's simple for him to change configurations without spending 45 minutes. That really interfered with our sound checks. We also needed a reliable board. Carnival ships are built in Finland and Italy and once we set sail for America, we have no contact or possibility of getting replacement parts until we reach port. There is no room for equipment failure."

"The R100 has been working phenomenally well," Palcisko continues. "The sound quality is incredible. I love that I can run our stem mixes out of Pro Tools into  
*continued on page 56*



# Sony at NAB

## SONY INTRODUCES PC-CONTROLLED WIRELESS MICROPHONE SYSTEM

Sony Electronics is presenting the MB-8N Rack Mount Tuner Base and WRU-8N Synthesized Tuner Unit at the

control functions, and simultaneous multichannel operation capability," Foschino adds.

The MB-8N tuner base is 1U high in a 19-inch standard rack size, and capable of accepting as many as four WRU-8N tuner units. Up to four MB-8Ns can be linked to provide a maximum of 16 channels without the need for installing an antenna divider.

The MB-8N Rack Mount Tuner System and WRU-8N UHF Synthesized Tuner Unit will be available in May 2002.

## SONY INTRODUCES MZ-B100 MINIDISC BUSINESS RECORDER

Sony Electronics is introducing the MZ-B100 MiniDisc Business Recorder at NAB.

### MZ-B100 Additional Features

- Playback speed control (-20% + 10%)
- Large 3-line dot matrix LCD;
- Built-in front speaker;
- Fast search function;
- External microphone jack;
- Multiple track marks;
- One touch recording; and
- Supplied accessories: remote control, headphones, hand strap, and carrying pouch.

The unit has been designed for broadcast journalists seeking high-quality sound bites and long battery life for extended interviews. "By providing up to 14 hours of recording time and 45 hours of playback with a single "AA" Battery, the lightweight MZ-B100 represents an important addition to the journalist's arsenal of newsgathering technology," says Paul Foschino, marketing manager at Sony Electronics.

The versatile unit, which replaces the popular MZ-B50, offers a number of important innovations. These include: stereo recording with a built-in stereo flat microphone; a new, smaller size; multiple record modes - up to 320 minutes of recording time; and voice operated recording (VOR).

The MZ-B100 MiniDisc Business Recorder is targeted for a May 2002 availability at a suggested list price of \$499.95.

### MB-8N Additional Features

- Easy-to-set Channel Plan option;
- Selectable MIC/LINE level output; and
- Available AC and DC power requirements.
- The MB-8N tuner base unit has a headphone connector on the front panel and a monitor output available on a 15 pin D-sub connector on the rear panel. An LCD display indicates host name and IP address.
- The WRU-8N UHF synthesized tuner unit has LED indicators for AF level, RF level, TX battery alarm, and an LCD for indication of channel, frequency, group, and TX battery status.
- The optional PC monitor screen indicates channel, frequency, group, user name, AF level, RF level, tone squelch, noise squelch, and TX battery status.

National Association of Broadcasters convention. An expansion of Sony's 800 Series wireless microphone product lineup, the MB-8N and WRU-8N are designed especially for applications where a large number of wireless microphones are employed, i.e. broadcast program production, theater, and live PA.

"The Ethernet capability and supplied PC-controlled software of the MB-8N allow users to set up the system, monitor its status and operate its front panels with an Ethernet-capable PC," reports Paul Foschino, marketing manager at Sony Electronics. "This eliminates the need to keep the receivers in close proximity to the engineer for monitoring. With the remote PC interface, you can now mount the receivers in any desired location. The supplied GUI can display 16 to 49 channels simultaneously (three patterns of 16/25/49).

"The MB-8N and WRU-8N feature high sound quality, a wide dynamic range (116dB) and frequency response (20Hz to 20kHz), high RF reliability, versatile monitoring and con-





# 2002

Look for these new products on the show floor at the Las Vegas Convention Center.

## SONY DEBUTS WRT-8B BODYPACK TRANSMITTER

Sony Electronics is introducing the WRT-8B UHF Body-pack Transmitter at the National Association of Broadcasters convention.

The latest addition to the extensive range of Sony UHF synthesized wireless microphone systems, the WRT-8B offers features that are essential to artists performing in fast-moving TV and musical theater productions.

"Extremely compact and lightweight, the unit's functionality and rugged construction make it ideal for the demanding requirements of newsgathering, documentary production and sports events," says Paul Foschino, marketing manager at Sony Electronics.

Measuring only 2.48 inches x 3.27 inches x 0.67 inches (W x H x D) and weighing a mere 4.9 ounces – including batteries, the WRT-8B's tough die-cast magnesium body houses a highly stable, low-noise transmitter providing superb audio quality. The unit operates for up to 13 hours on two AA-size alkaline batteries, at 10 mW output power. Approximately six hours of continuous operation is available at 50 mW.

Core technology of the WRT-8B is a Phase Locked Loop (PLL) frequency synthesized system which generates a highly stable carrier frequency and enables the unit to achieve its outstanding carrier stability, an essential performance factor in professional wireless microphone systems.

The WRT-8B transmits a 32kHz tone signal along with the program audio signal. This tone is recognized by the squelch circuit in

Sony wireless microphone receivers and eliminates the output of undesired signals and noise from other equipment including RF noise and popping when the transmitter is powered on or off.

The WRT-8B Body-pack Transmitter will be available in May 2002.

## SRP-X700P Additional Features

- Digital power amplifier with 200W+200W(4Ω), 150W+150W(8Ω), Max. 150W(70V Line)
- PC-based GUI-interface software (for setup/operation) is supplied
- Mounting slots built for two Sony Wireless Microphone tuners
- Inputs include: four microphone (with 48 V phantom power), two microphone/line, and one stereo line, plus four stereo and two 5.1 surround sound inputs linked to the video switcher



## SRP-X700P DIGITAL POWERED MIXER

Sony Electronics is also introducing the SRP-X700P digital powered mixer at NAB. The SRP-X700P (pictured below) is designed for a wide range of multimedia applications for sophisticated boardrooms, conference rooms, and houses of worship. The versatile unit combines a flexible mixer/router and a stereo digital power amp, with a wireless tuner frame and antenna divider (for two optional wireless mic systems), and an RGB/S-Video/composite video switcher. This 'Boardroom-in-a-Box' is easy to use and offers high-end audio and video quality in a lightweight and compact (3U-size) unit with a simple front panel layout.

The digital mixer section provides powerful DSP functions including feedback reducer, parametric EQ, low-cut filter, compressor/limiter, delay, automatic mixing, flexible signal routing, and scene memory.

The SRP-X700P features a built-in 6x1 A/V switcher including: three-RGB/component, and three-composite/S-Video inputs, and outputs to either RGB/component, composite, or S-Video. Audio inputs which follow the video source are also provided, including four stereo and two 5.1 inputs. The switcher can handle high-resolution component video signals such as 480p or 1080i, and RGB signals with bandwidths up to 150 MHz.

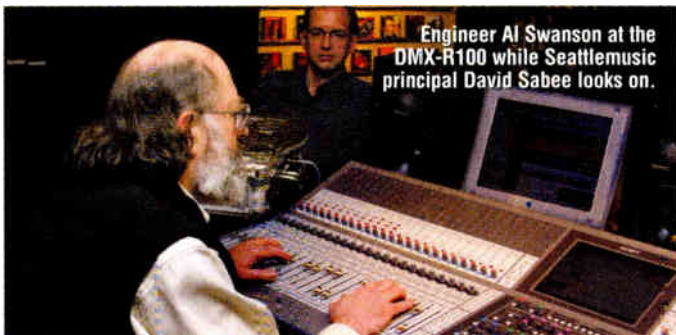
## WRT-8B Additional Features

- Switchable input level and variable attenuator;
- Easy-to-read LCD and LED indicators;
- Battery alarm indicators;
- Rugged, die-cast magnesium, case;
- Lavalier microphone capability;
- Switchable AF input and RF output levels; and
- Supplied accessories: soft case, spare battery case, microphone cable, and rewriteable ID sheet.

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## Seattlemusic Scores with Sony R100 Console

Seattlemusic, Inc., a music production company that has produced film-scoring sessions for such hit movies as *Kate & Leopold*, *The Limey*, *Mr. Holland's Opus*, and *Die Hard With a Vengeance*, recently purchased a Sony DMX-R100 digital mixing console. Company principal David



Engineer Al Swanson at the DMX-R100 while Seattlemusic principal David Sabee looks on.

Sabee reports that the new R100 will be the centerpiece of their mobile recording unit for use on remote recording and film scoring projects.

"In the seven years we've been in business, we've built a great collection of microphones, converters and outboard gear, and we wanted to complement our high-end signal chain with a small-format console

of the same caliber," says Sabee. "The R100 has a solid reputation among our colleagues, and after doing some research, we quickly realized it was the right choice for us."

Sabee reports that two days after acquiring the board, Seattlemusic used the R100 to record a 100-piece orchestra, a 24-piece choir and an organ for Busch Entertainment Corporation's 3D/4D film entitled *R.L. Stine's Haunted Lighthouse* produced by Los Angeles-based Lookout Entertainment for exhibition at Busch Gardens and SeaWorld Adventure Parks. "We actually borrowed a second R100 from our Sony rep and cascaded the boards to engineer the multitrack recording session," he describes. "The learning curve was minimal, and the sound quality was superb. For a digital mixer, the routing was really intuitive, and we were very happy with the end results." John Richards engineered the 25-minute score by composer Chris Stone.

The company also recently completed a symphonic project for a New Jersey-based freelance producer. "We recorded a full orchestra in Seattle's wonderfully acoustic St. Thomas Chapel at Bastyr University. It's one of the most beautiful spaces in the northwest," Sabee says.

Upcoming projects include a score for New Line Cinema, and the recording of all of the Seattle Symphony performances at Benaroya Hall.

### Sony DMX-R100 Sailing Along for Carnival

*continued from page 53*

the R100 and simultaneously burn master CDs, create rehearsal cassettes for the dancers, print the final show to our Tascam MX2424, and make backup ADAT tapes."

Palcisko adds that he is particularly impressed with the R100's Dynamic and Snapshot automation. The console features 99 snapshots per title, making it possible to memorize and recall the state and values of virtually all mixer functions, and offers a comprehensive dynamic automation of Faders, Cuts, Pans, EQ and Filters, Dynamics, and Aux sends. "The onboard EQ and compressors are also great," he says. "The R100 has simplified my production tasks immensely."

According to Palcisko, two new ships, *Carnival Legend* (being built in Finland) and *Carnival Conquest* (being built in Italy), are due to set sail later this year. "The board will be accumulating lots of frequent sailor miles. The R100 will be involved (from inception through completion) in the development of seven new shows this year alone.

### Logan Productions: 100% Sony Wireless for Corporate

*continued from page 49*

tion system for Sam Johnson, the recently retired CEO of SC Johnson, to show his HD presentation of "Carnuba, A Son's Memoir." He's been traveling the world with a complete set of Sony HD and audio equipment to show and talk about this film. "Mr. Johnson pays great attention to the quality of every aspect of his presentations, and I know that he is very pleased with the Sony wireless microphones" says Logan.

Richard Turner, SC Johnson's Creative Operations -VIP, says "We've been the envy of many engineers when we bring in our system and set it up. The sound is always excellent."

"The body packs are easy to work with; they are very small and unobtrusive - simple to hide and very lightweight. The durability is great too; in over a year of hard use we haven't had a failure or broken part. Our old wireless system was very fussy. We were constantly rearranging the antennas, moving the receivers, checking batteries, and worrying about the sound. Now it's easy - it really is 'Plug and Play.'"

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**SoundByte**  
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**SONY**

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- FRANK FILIPETTI, Grammy Award Winning Engineer/Producer

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- BOB LUDWIG, President of Gateway Mastering and DVD, Les Paul Award Recipient, and 9-time TEC Award Winner

"The sonic quality was astounding."

- DAVID HALL, Independent Recording Engineer, as quoted in the December 2000 issue of Pro Sound News

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- TOM JUNG, as quoted in the December 1999 issue of Pro Audio Review

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- BOBBY OWSINSKI, as quoted in the October 2000 issue of Surround Professional Magazine



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## DRE-S777



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"What a great machine!"

- ROGER NICHOLS, Grammy Award Winning Engineer/Producer, [www.eqmag.com](http://www.eqmag.com)

"The R100 packs more creative power per sample than most full size digital consoles." - BRUCE BOTNICK

# HOW DO YOU EVALUATE A DIGITAL MIXER? LISTEN.

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- JOHN NEWTON, Grammy-nominated engineer and owner of Soundmirror, Inc.

"We loved it... sonically beautiful and clean...the best small-format console ever...  
outstanding performance, execution and design."

- ROBERT MARGOULEFF and BRANT S. BILES, Proprietors of Mi Casa Multimedia Inc.

"This is the first digital console of this size that sounds this good.  
What goes in comes out. The R100 is right on the money."

- TOM LAZARUS, Engineer and owner of Classic Sound, NYC

"...pretty fantastic...rave reviews...incredible sonic integrity...and  
incredibly easy to learn and operate...a new generation of digital console."

- DENNY PURCELL, Award-winning mastering engineer, President - Georgetown Masters

"Sounds great, reliable and easy-to-use." - ALLEN SMITH, Chief Engineer, Soundtrack Boston



The DMX-R100 is changing even the experts' opinion of what to expect from a compact, affordable digital console. A full input module with a knob for every key function; selectable high sample rate operation; 5.1 surround mixing and

monitoring; and a high resolution touch screen that becomes an extension of your hands. The next thing to do is go out and hear one for yourself. In the meantime call today and we'll send you a brochure and tutorial CD-ROM.

## DMX-R100



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## InfoComm 2002 Preview

# Audio Visits Vegas



The trade show floor at InfoComm

**P**repared to be dazzled as the InfoComm show lights up the Sands Convention Center in Las Vegas, June 8 - 14. Tech guru Tom Peters will be the keynote speaker. As always there will be plenty of workshops to keep video and audio professional informed on the latest. And if you can hit the floor (exhibits are open June 12 - 14) check out the numerous pro audio vendors attending. Below is a list of most of the audio companies attending.

Acoustical Solutions  
Acoustics First  
AKG  
Altec Lansing  
Amplivox  
Anchor Audio  
ASA Cases  
Ashly Audio  
ATI  
Atlas Sound  
Audio Accessories  
Audio-Technica  
Azden  
Beyerdynamic  
BGW  
Biamp  
BiTronics  
Bittree  
Bogen  
Bose  
BSS  
Burtek  
Calzone/Anvil Cases  
Canare  
Carver  
Community  
Loudspeakers  
Countryman  
Crest  
Crown  
D-Tools  
Denon  
Digigram  
EAW  
ETA  
Fender Audio  
FSR  
Furman Sound  
Galaxy Audio  
Gefen  
Gentner  
Gepco  
Group One  
Hosa Technologies  
Intelix  
IRP  
Ivie Technologies  
Jan-AI Cases  
JBL  
Lectrosonics  
Liberty Wire and Cable  
Listen Technologies  
Mackie

Marshall Electronics  
Martin Audio  
Meyer Sound  
Microboards  
Middle Atlantic Products  
Nady Systems  
Neutrik  
OWI  
Paso Sound  
Peavey  
Phonic Ear  
Porter Case  
QSC  
Rane  
Rapco

Raxxess  
RCI Custom  
RDL  
Sabine  
Samson  
Sennheiser  
Shure  
Sony  
Sound Advance  
Soundcraft  
Sound-Craft  
Soundsphere

Stardraw  
Stewart Audio  
Superscope  
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READER SERVICE NUMBER 59

# NAB 2002 Showstoppers

BY BRETT MOSS

It wouldn't take a genius to see that at the NAB2002 show in Las Vegas (April 6 - 11, 2002) - big boards are back! And nothing attracts attention like a big new console.

Throughout the nearly two million square feet of exhibit space were over half a dozen new consoles. Clearly, powerful, often digital, desks were in.



Audio-Technica AT4040 mic

Particularly noticeable was Studer's Vista 7, a large digital desk that replaces many traditional knobs with multipurpose touchscreen interfaces. AMS Neve's Logic MMC is an upgrade to the full-featured Logic 7. Calrec



Yamaha O2R96 digital audio mixer

showed what it called an entry-level desk, the Sigma 100, though one wonders what kind of "entry-level" looks so good. Not to be left behind Euphonix debuted the Max Air, a modular board based on Euphonix's System 5-B digital board but with upgrades and a smaller footprint.

In a similar vein is the DS-3B from Soundtracs, distributed in the US by Fairlight. The 3-B is aimed at broadcasters but brings in a lot of features more typical of recording studio boards such as multiprocessors per



Studer Vista 7 digital console

channel and stretches out to 96-channels - all packaged into a 32-fader layout.

Yamaha tapped a classic in showing an upgraded O2R. The O2R96 is a 24-bit, 96 kHz version of the venerable board (along with a few new goodies). It also utilizes some features from Yamaha's relatively new (and larger) DM2000 digital desk, which many NAB visitors were seeing for the first time.

Graham-Patten's D/ESAM 8000 is the latest in the line of video-optimized digital audio consoles. Perhaps the smallest big board was Logitek's Remora, a desktop multipurpose modular control surface designed to work off of Logitek's Audio Engine



AMS Neve Logic MMC

digital routing network system.

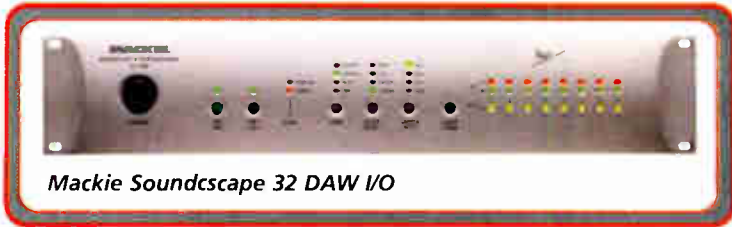
More traditional was Solid State Logic's XL 9000 K Series. Measuring more toward two-person operation, the XL 9000 is stuffed with film, video post and high-end studio features full surround monitoring, multiprocessors per channel and a DK Audio "jellyfish" meter. For itself, DK introed a rackmountable surround sound (5.1 and 7.1) metering system



Graham-Patten D/ESAM 8000 mixer

along with an SDI module upgrade for the MSD600M.

TASCAM debuted something new for them - an outboard surround monitoring controller. The DS-M7.1 Professional Digital Monitoring Controller, as its name would indicate, handles up to 7.1 surround monitor-



**Mackie Soundscape 32 DAW I/O**

ing duties for consoles not initially designed for such configurations.

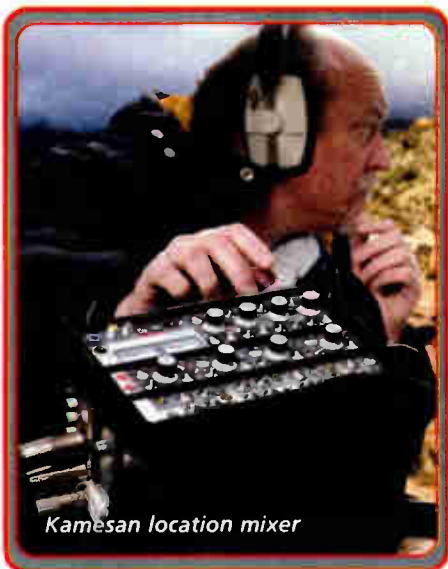
For location duty HHB announced distribution of Kamesan portable mixers. These Japanese field-style mixers are very small, yet filled with all the proper video/film field recording tools. Interestingly, Kamesan offers attachable processor modules such as



**Tannoy Ellipse monitor**

four-channel EQ/compressors and submixers for the mixers.

Attempting to fill the gap left by the discontinuation of the PORTADAT HHB introduced the PORTADRIIVE, a portable hard disk recorder for field recording. Features



**Kamesan location mixer**

rate” video and movie specs. Fostex gave many their first look at the DVD-RAM


include 24-bit, 96 kHz performance, up to eight-channels, battery operation and compatibility with most of those “odd frame

recorder, the DV40.

Fairlight showed the fruits of the recent acquisition of the “intellectual properties” of DSP Media. New was version 3 of the AV transfer multiformat digital file translator program. Also new was Fairlight’s upgrade of the V motion hard disk video recorder/editor.

On another video front, Dolby introduced *continued on page 62* ▶

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► **NAB Showstoppers from page 61**

the DP564, a multichannel audio decoder that handles Dolby Digital, Pro Logic, Pro Logic II, Surround EX, Dolby Headphone and regular PCM files.

**DIGITAL EXPANSION**

The world of DAWs continues to become - the more things change, the more they stay the same. Witness CEDAR which showed a Pro Tools compatible noise reduction processor and a software module for SADiE systems. Rocket Network was even more ambitious -

ed upgrade to one of the pioneering DAW platforms. Apogee Electronics also showed its Steinberg Nuendo/Apogee I/O bundle, Native Tools (along with a cute two-channel mic pre/A/D converter, Mini-Me).

Storage for all these digital files has become a major growth industry. Though many manufacturers showed ever-larger 100+ GB systems the main directions storage solu-

tions took for the show were smaller footprints with more flexible applications and certified compatibility with DAWs and video NLEs.

360 Systems has repackaged the DigiCart by adding Ethernet networking functions to it and created the DigiCart/E.

To aid getting audio into a digital situation, Aphex brought out an A/D-D/A converter, the two-channel Model

212. Benchmark Media had a new D/A converter. The DAC1 is supposed to be "jitterless," courtesy of proprietary UltraLock technology.

On the traditional side Audio-Technica's new AT4040 is a cardioid condenser studio mic aimed at the mid-level studio user.

Sabine showed a new wideband wireless

mic system. The SWM-5000 system takes advantage of a technology called 2.4 GHz Spread Spectrum to cram up to 50 units into a given area (which is above standard wireless spectrums). Other wireless hits were the dueling four-packs (four-unit wireless mic receiver docks) from Sennheiser (QP 3041) and Sony (MB-8N).

For real showstopability look no further than Tannoy's Ellipse studio monitor. Needless to say Tannoy had to constantly fend-off salivating audio magazine editors from the booth.

Not content to show a new disc HBB was busy showing several new DVD discs: - DVD-R, DVD-RW and DVD-RAM. Last but not least, Stardraw showed a radio broadcast-optimized version of its computer aided design (CAD) studio/network design software, Stardraw Radio (AV, studio and stage/set packages are already available).



**360 Systems DigiCart/E recorder**



**Logitek Remora console**

managing to get compatibility with Pro Tools and SADiE and TASCAM systems.

Besides updates to the Digidesign Pro Tools (Pro Tools HD), Syntrillium Cool Edit Pro (2.0) and Mackie/Soundscape (Soundscape 32 with Apogee Electronics converters) platforms, Sonic Foundry announced Sound Forge 6.0, a long-await-

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DCM4000 REAR

### DCM4000 FEATURES

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- Freq. Resp. 20 - 20k Hz. THD less than .1%
- Continuous RMS, not pulse or peak
- 2Ω stable for multiple speaker loads
- Two independent toroid power supplies - one for each 2000w amp
- XLR balanced inputs & parallel through connectors
- Speaker Twist-Loks & banana/binding posts

- Speaker Twist-Lok bridge connectors
- Indicators for bridged mode, signal & clipping
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READER SERVICE NUMBER 63

World Radio History

# Sony SRP-X351P

## A/V Mixer/Amplifier

BY DAVID O'BRIEN

Setting up a system that will deliver audio mixing with video switching can be a little challenging. With so many different components to interface (DVD player, VTR, audio/video switcher, power amp, EQ, etc.) the setup can take forever and get pretty messy. Thankfully, the nice folks at Sony have their fingers on the pulse of the end user. Their attentiveness is reflected in the feature-packed SRP-X351P (\$1,299).

### FEATURES

The SRP-X351P is an all-in-one presentation system combining four balanced XLR mic channels, two fixed stereo line input channels, a third stereo line input channel that is an "audio follows video" selector, and a 170 watts per channel stereo power amp.

At first glance the SRP-X351P looks like a rackmounted powered mixer. Seven faders control audio channel output. The first four are for mic level channels, complete with 48 volt phantom power.

Each channel is accessible through balanced XLR connectors on the rear panel. Channel 4 also has a 1/4-inch TRS input jack on the front panel. The next two faders are for two stereo line inputs accessible through four RCA connectors on the rear panel. The last fader controls the audio level coming from the onboard video selector. Directly to the right of this fader are four buttons, labeled A through D, corresponding to four sets of input connectors on the back panel.

Each set includes a stereo pair of RCA connectors for L-R audio, an RCA connector for composite video, and a 4-pin mini DIN connector for S-Video. Each channel has an input trim knob and signal present LED located directly above it.

The Mic Group knob controls the master level of a separate mic group bus that allows you to send only the mic channels to an RCA connector on the back panel. This could be

useful for making transcription tapes or sending only voice to the ceiling speakers in a PA system. Separate bass and treble and balance controls as well as a master mute switch are all included on the front panel.

The back panel exhibits two BNC antenna connectors that service two optional user installable Sony Freedom Series (WRU-806B) wireless microphone receivers. Insert points are also present on the back panel for the mic group bus and main outputs.

Connections from the power amp are made through four screw-type binding terminals.

### IN USE

I was amazed by the wealth of features included in such a compact (only three rack-spaces) and affordable package. One look at the back panel and I knew this thing was much more than your average powered mixer. I set up a small system using a Shure Beta 58 microphone, a Sonotrim omnidirectional lavalier microphone, a Sony DVD player, two VTRs, a Sony WEGA 27-inch television, and a pair of JBL LSR32 studio monitors. The setup went quickly. All of the connectors are clearly labeled and intuitively positioned. I used the S-Video connectors whenever possible.

The picture coming through the SRP-X351P from the DVD player looked as if it were coming directly from the DVD player. The same rang true for the VTR signals. Switching between them was smooth and unobtrusive even though audio signals from different video sources inherently have varying levels. Listening to the system through

my reference JBL LSR32 speakers brought to light a minor weakness.

The equalization controls were not quite effective in shaping the sound to my taste. Feedback from the lavalier microphone also became a problem. I added a stereo graphic equalizer on the master insert bus and it was

**Applications:**  
Contracting/installation,  
audio/visual presentation

**Key Features:**  
Four-channel microphone  
mixer ; three-channel stereo  
line mixer with four-channel  
video selector; 170 watts per  
channel stereo into 4 ohms.

**Price:**  
\$1,299

**Contact:**  
Sony at 800-472-7669,  
[www.sony.com/professional](http://www.sony.com/professional);  
or circle Reader Service 64.

sounding great in no time. The wireless remote was also easy to operate and worked as well as you would expect from a company like Sony. I then connected the system to a pair of Peavey SP5 loudspeakers. After some adjustment of the graphic equalizer. I had a system worthy of any small conference or training facility

*Dave O'Brien is a location boom and mixing engineer for radio, television and film productions. He is also a contracting and live sound engineer.*



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READER SERVICE NUMBER 65

World Radio History

[www.fostex.com](http://www.fostex.com)

# Sound Enhancements AccuVerb Analog Spring Reverb

BY RUSS LONG

As recording mediums continue to get quieter and quieter, the age-old problem of tape hiss has all but disappeared. Digital effects and processors come close to emulating the sound of vintage microphones, compressors and effects, yet most ears still agree that there is nothing quite like the real thing. Sound Enhancements's AccuVerb (\$1,599) analog spring reverb is the real thing.

Sound Enhancements may not be a familiar name but the company's spring reverb units are among the most recognizable in the world. Originally developed for the Hammond Organ back in the 1950s (so the sound of a large cathedral or theater could be simulated in a carpeted living room), the original spring reverb unit was four feet tall.

At that point in time, size was not an issue since all Hammond organs included a large Tone Cabinet that contained the speakers and a reverb unit. As time passed, the reverb units became smaller and smaller and by the 1960s, Leo Fender decided they would be the perfect complement to his Fender guitar amps. Today, Sound Enhancements continues to manufacture spring reverb units for Fender, Peavey, Marshall and many other

amplifier manufacturers. The Sound Enhancements product line also includes the Morley line of special effects pedals, stomp boxes and switches.

## FEATURES

The Sound Enhancements AccuVerb is a two-rack-space, 15.1 inches deep, tube-driven spring reverb. The rear panel of the 15.3-

*continued on page 68* ►



## Shades of blue.



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► *AccuVerb* from page 66

pound box is equipped with two female XLR connectors that provide audio input and two male XLR connectors that provide output. Each of the four XLR connectors has a 1/4-inch TRS jack wired in parallel (unbalanced 1/4-inch plugs can be used without damaging the unit).

The front panel is equipped with two controls for input level (Channel 1 and 2). The push-pull potentiometer knobs can be pulled to add the dry signal to the output mix. LED VU meters above each input control provide a visual reference of input level.

The Source control balances between Channel 1 and Channel 2 for the reverb input. The Length control increases the decay time to determine "room length." Pulling the length control (Pull Boost) creates a low-frequency boost.

The Width control determines the degree of separation between the two reverb outputs. Pulling the width control (Pull Bright) simulates a lower ceiling.

The Mix control determines the reverb

output level. When that control is pulled, it determines the blend between the dry and reverb signals.

Independent Channel 1 and 2 controls set the output level. LED VU meters above each output control provide a visual reference for output level. The Output Level Switch can be switched for +4 dBu operation or -10 dBV operation.

### IN USE

The *AccuVerb* manual is well written and offers several scenarios, which allows for quick setup in the most common situations.

I used the *AccuVerb* for several months and have found it to be an enchanting box. It is not for every mix, but when it works, it shines. The box's controls are a bit quirky to operate at times - some of them being subtler than I would like - but it always sounds good.

Electric guitars are an excellent match with the *AccuVerb*. In most situations I found the box worked best with guitars when it was actually inserted in the channel. This allows the box to provide tube col-

### Fast Facts

**Applications:**  
Studio, live sound

**Key Features:**

Tube-driven spring reverb;  
input controls; +4 dBu/-10  
dBV operation

**Price:** \$1,599

**Contact:**

Sound Enhancements, Inc,  
800-284-5172, 847-639-4646,  
[www.soundenhancements.com](http://www.soundenhancements.com),  
or circle Reader Service 150.

oration to the guitar tone as well as the desired amount of reverb. The input level can be adjusted to determine how hard the tubes are hit and the output can be adjusted to maintain proper gain structure.

Horns are another fantastic match with the *AccuVerb*. The verb's smooth tail is a perfect match for the timbre of brass and woodwinds.

I did not have much luck using the *AccuVerb* with drums or percussion. The result was too bouncy or springy.

### SUMMARY

Although the *AccuVerb* essentially does only one thing, it does it really well. And it does it in a way unlike any digital box. Any studio or engineer looking for a quality reverb as well as a unique piece of gear should consider the Sound Enhancements *AccuVerb*.

### Product Points

**SOUND ENHANCEMENTS  
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**Plus**

- Dimensional reverb for certain instruments
- warm
- Minus**
- limited control of parameters
- pricey

**The Score**

Though it does not have the flexibility to act as a studio's sole reverb, the *AccuVerb* makes an excellent second or third reverberation box.

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It still worked but we do not recommend running over the SA-3051 with a truck.

- comes with calibrated microphone and manual
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# Microboards Orbit II CD Duplicator

BY GORDON BURNETT

**S**imple is beautiful! Just ask Microboards Technology, Inc. Its new Orbit II (\$2,495) CD-to-CD copier is an inexpensive CD duplication system designed for users with moderate amounts of copying tasks. A fairly complex issue from a technical point of view, but from a user's perspective, duplication does not come any simpler than this.

## IN USE

The Orbit II is just a little bigger than a typical breadbox and at first glance can be mistaken for some new-fangled breadmaker. The



unit records both from audio and data CDs to CD-Rs. It is aimed squarely at applications in desktop publishing, pro audio and software development among others. Its user-friendly operating system offers as much programmability as can be expected from a standalone

unit. Current dupe speed is up to 24X with a 40X drive to be available soon.

It sports four openings - a hopper for unrecorded discs on top of the unit, a tray for the master CD on the front and an "accept" or "reject" port on either side of the machine.

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The hopper will hold up to 50 CDs. The ultimate destination of a completed CD is dependent on an ingenious moving belt system powered by a logic-controlled motor. Accepted and rejected CDs end up in their own baskets that extend from within the unit itself. In its literature, Microboards claims reliability of up to 10,000 hours of usage.

Microboards appears to have employed

## Fast Facts

**Applications:** Studio, postproduction, educational, multimedia

**Key Features:** Simple user interface, 50-CD hopper

**Price:** \$2,495

**Contact:**  
Microboards Technology, LLC.  
at 800-646-8881,  
[www.microboards.com](http://www.microboards.com); or  
circle Reader Service 72.

the KISS (Keep It Simple, Stupid) approach to the design of the Orbit's interface. It is the essence of simplicity itself. The unit sports a one-line LCD display and a pair of "Yes" and "No" buttons. These also serve as increment/decrement buttons. The No button also allows the user access to various operating parameters while the Yes button is used to execute functions selected. Users can select between Copying Functions (Copy CD to CD, Copy and Compare, Compare CD) and System Setup with functions like Copy Speed and toggling an alarm on or off.

So how does it work? The user begins the process by stacking CD-R blanks in the hopper. Upon powering up the Orbit's LCD eagerly asks "Copy CD to CD?" Upon answering "Yes", it will then ask for the quantity of copies to be made. This is the only awkward stage in the process because the Yes key increments double-digit numbers while the No key counts up from zero to nine. This scheme takes some getting used to and it is possible to select an undesired quantity accidentally.

The tray holding the master CD then opens up. Upon hitting the Yes button again, the duplication process begins. The Orbit II appeared equally home with data and audio CDs, cheerfully spitting out finished discs every 4 minutes.

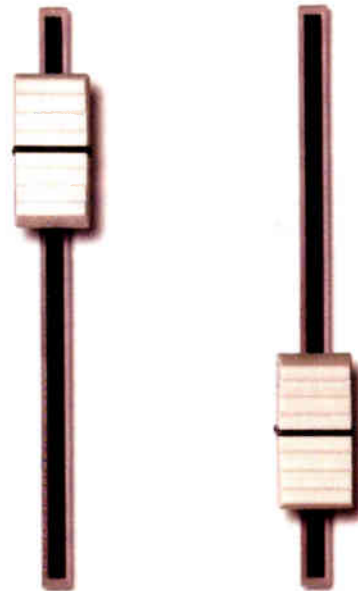
## SUMMARY

Microboards touts the unit as being "designed for the traditional office unit." Expect to see it popping up in offices that require a journeyman copier. Based on its utility and its bulletproof and disarmingly simple operation, this unit will also likely find its way into the hands of legions of small studio owners and audio profes-

sionals whose duplicating demands rarely exceed a few hundred copies every now and then. And Microboards now offers a DVD version of the unit.

*Gordon Burnett is a senior technical producer at Radio Free Asia and a media production coordinator. He is currently on sabbatical from the University of Guyana.*

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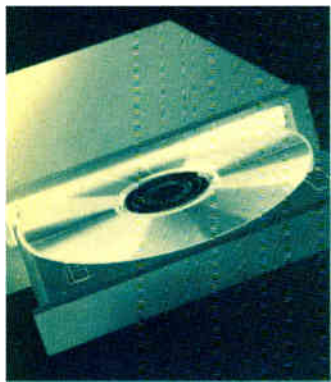
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READER SERVICE NUMBER 71



# New Sound Forge at NAB

SOFTWARE NEWS

BY BRETT MOSS

There was not a lot of new audio software at the NAB show - especially with several of the majors bypassing the show and others showing what has already been debuted - i.e. **Digidesign** Pro Tools HD. However, the proverbial blind squirrel (that would be me) occasionally

finds an acorn...

finds an acorn... **Sonic Foundry** ([www.sonicfoundry.com](http://www.sonicfoundry.com)) announced Sound Forge 6.0 (\$499 retail or \$399 download or \$149 upgrade from 5.0). New for the Windows (2000 and XP-compatible too!) platform are nondestructive editing, background rendering, increased zoom resolution (down to the sample level), improved video support tools (along with a bundled Vegas LE lite video editor), support for file sizes of up to 4GB and an improved DirectX base plug-in manager.

A bit off the beaten path is **Stardraw** ([www.stardraw.com](http://www.stardraw.com)). Stardraw has a series of computer-aided design (CAD) packages optimized for studio (recording or broadcast), facility, theater and A/V system designers. The encyclopedic Stardraw libraries contain industry specs, standards, symbols, equipment and are updated monthly. Stardraw tools are optimized system designers and contractors and include supplementary aids such as budgeting.

In other show news, across the water at Musik Messe...

**Cakewalk** ([www.cakewalk.com](http://www.cakewalk.com)) showed the new iteration of SONAR, version 2.0. New is a host of creation modules such as the Cyclone DXi sampler, ReWire format compatibility, improved MIDI functions, improved DXi compatibility and bunches of loops. The premium package includes a new drum sampler, Sonic Timeworks Mastering EQ and Compressor plug-ins. Price is \$479 for 2.0 and a free upgrade for registered users of 1.0; \$599 for the SONAR XL premium package.

And **Yamaha** ([www.yamahasyth.com](http://www.yamahasyth.com)) debuted its new open MIDI plug-in format Open Plug-in Technology (OPT). The Windows-compatible spec (2000 and XP too!) is designed to upgrade the usually clunky MIDI-based software control interfaces.

Now back to the regular news. Digidesign Pro Tools HD... And speaking of Pro Tools HD, **Waves** ([www.waves.com](http://www.waves.com)) has announced that its lineup of TDM plug-ins, including the well-known L2 Ultramaximizer and the Renaissance tools, will henceforth support the Pro Tools HD platform. **Mackie** ([www.mackie.com](http://www.mackie.com)) and Universal Audio ([www.usaudio.com](http://www.usaudio.com)) now offers Version 2.0 of the software for the UAD-1 PCI card/plug-in processor package. The FREE update includes Windows 2000/XP compatibility and two new plug-ins, the EX-1M mono channel strip and the DM-1L delay. **Apogee Electronics** ([www.apogeedigital.com](http://www.apogeedigital.com)), makers of well-respected digital audio converters (amongst other things), is now bundling Steinberg's Nuendo DAW program (and a Steinberg 96/52 PCI audio card) with its AD-16 and DA-16 converters. Price for the whole bundle: \$7,995. The Unity Session digital sampler/synthesizer bundle (\$649) from **BitHeadz** ([www.bitheadz.com](http://www.bitheadz.com)) is now Mac OS X-compatible. DVD is the theme at **Minnetonka Audio Software** ([www.minnetonkaaudio.com](http://www.minnetonkaaudio.com)) these days. SurCode MLP (\$3,495) is a Meridian Lossless Packet (MLP)-based surround encoder compatible with AC3, Dolby Digital, DTS files heading for CD or DVD. To get those files onto a disc - A-plus (\$1,995) is a Win 98/NT/2000 DVD-R/DVD-RW burning program. A bit less ambitious is discWelder STEEL, a Windows DVD-A program for burning DVD-Rs. The big enchilada is discWelder CHROME which offers menu development, MLP and DVD video support and other goodies (\$2,495). Both discWelders are Win 2000 and XP-compatible.



An early look at Sonic Foundry's Sound Forge 6.0

And from the "New Guys" file, **delaydots.com** ([www.delaydots.com](http://www.delaydots.com)). Not to be confused with the Spektral digital multiband delay program from Native Instruments, delaydots.com offers Spektral Plug-ins (\$55), a package of DirectX plug-ins including a multimultiband (4.096 to be exact) EQ. Also available is another processing package, Sound Designers (DirectX and VST) for \$55. Wander over and take a look.

Now that I've mentioned **Native Instruments** and the Spektral program, Spektral Delay is up to version 1.5. Go to [www.native-instruments.com](http://www.native-instruments.com) or [www.ni-spektral.com](http://www.ni-spektral.com) for a FREE download (for registered users, that is).

Windows XP drivers for **SEK'D** Siena and PRODIF cards are available at [www.sekd.com](http://www.sekd.com).

Have comments or software news?

email Brett Moss at:

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# Bag End TA5000-C Portable PA Speaker

On the Bench Page 76

BY BRUCE BARTLETT

**T**he Bag End TA5000-C (\$1,040 each) is a medium-size, two-way loudspeaker for portable PA and DJ systems, houses of worship, auditoriums, nightclubs, electronic drums and keyboards. It covers most of the audio range and features Time-Aligned drivers.

## FEATURES

I was impressed with the unit's road-tough construction, featuring a 3/4-inch, seven-ply poplar plywood cabinet covered with black carpet and fitted with plastic corner protectors.

On the front, the grille is 16-gauge perforated steel, coated with black vinyl. The vented cabinet has an internal volume of 3.4 cubic feet and measures 28 inches (H) x 22.5 inches (W) x 18.5 inches (D). Each side is tapered 8 degrees to form a trapezoid. Built into the cabinet is a 35mm stand adapter and two recessed handles. Since the unit weighs 70 pounds, two people may be needed to place it on a stand.

Drivers include a 15-inch cone woofer with a 2.5-inch voice coil and 80-ounce magnet, and a 1-inch exit-compression high-frequency driver with a 1.25-inch titanium diaphragm and 24-ounce magnet. The HF driver is loaded with an exponential horn. Crossover is at 1.7 kHz using a passive Time-Align equalizer type.

Because of the speaker's Time-Align design, sound from the woofer and tweeter arrive at the listener simultaneously through the crossover region — within  $\pm 25$  microseconds. The claimed result is improved transient response.

Bag End thoughtfully provided several ways to hook up the system. Two Neutrik Speakon connectors wired in parallel, two phone jacks in parallel, and a single pair of dual-banana jacks are located on the back.

Claimed specs are impressive: frequency response is 50 Hz - 19 kHz  $\pm 3$  dB in full

space, sensitivity is 101 dB 1W/1m, and impedance is 8 ohms. Dispersion is said to be 90 degrees horizontal x 40 degrees vertical (6 dB down points). Power handling is 200W continuous sine wave and 800W instantaneous peak.

Bag End offers the TA5000-C with a generous six-year warranty — the longest professional loudspeaker warranty in the industry.

## IN USE

I listened to a pair of TA5000-C speakers that were freestanding in a large room. Program material included several CDs, myself speaking into a microphone and other PA uses. Here is how the TA5000-C reproduced various instruments:

- Bass: Tight or well defined in time. Not muddy or boomy. A little thin; deep notes are weak, not weighty, but this is a typical trade-off for efficiency.
- Drums: Natural; good impact. Sharp attacks. Kick drum lacks weight and power.
- Cymbals: Crisp; extended highs on axis and up to 45 degrees either side. (This is normal for a 90-degree horn.)
- Percussion: Sweet and crisp. A bit aggressive on some CDs.
- Piano: A little thin in the bass and slightly hard in the mids, but clear.
- Acoustic guitar: Natural.
- Strings: Smooth.
- Voice: Mostly natural; slightly bright.
- Electric guitar: Plenty of aggressive edge or bite. Weak in the "body" range or fundamentals.

This is one loud, clear speaker system! Overall, the TA5000-C sounded clean, bright and clear. It has lots of highs all the



## Fast Facts

**Applications:**  
Live sound

**Key Features:**  
Two-way, 15-inch woofer, 1.25-inch titanium tweeter, horn-loaded, Time-Aligned design.

**Price:**  
\$990 each

**Contact:**  
Bag End Loudspeakers, 847-382-4550, [www.bagend.com](http://www.bagend.com); or circle Reader Service 74.

way out to its coverage angle of  $\pm 45$  degrees. It is pretty much uncolored on music, except for a little upper midrange and high-frequency emphasis, and diminished deep bass. These anomalies can be tamed with graphic EQ if desired.

This speaker complemented the sound of the SM-58 extremely well, giving a full, clean and natural sound with that microphone. Like all stage vocal mics, the SM-58 has some up-close bass boost (proximity effect), which the TA5000-C keeps under control. The speaker also adds some "air" or upper highs to the microphone. If you like the SM-58, you will love how it sounds through the TA5000-C.

*continued on page 76* ►



## THE AUDIX D-SERIES

D-1 - Slight mid-range enhancement. Excellent for snare, bongos, high-hat, flute

D-2 - The ultimate 'tom' mic. Captures lower mids with pin-point accuracy. Toms, congas, sax, percussion.

D-3 - You can mic a jet engine with the D3. Flat, accurate response. Ideal for guitar cabs, timbales, trumpet.

D-4 - Wide dynamic range with extended lows. Floor toms, kick drum, baritone sax, trombone, bass cabs.

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READER SERVICE NUMBER 75

world radio history

## Bag End TA5000-C Portable PA Speaker

► Bag End from page 74

### ON THE BENCH

The TA5000-C measurements agreed well with the listening tests. **Figure 1** shows the speaker's anechoic frequency response at 5.5 feet, on axis to the tweeter. The response is 60 Hz to 20 kHz +/- 3 dB, with minor bumps at 2 kHz and 7.5 kHz that could contribute to the speaker's bright sound. The low end rolls off below 100 Hz.

Not shown is the response at 30 degrees off axis. It is almost identical to the on-axis response, so the TA5000-C provides very uniform dispersion. In **Figure 2** we see the Energy Time Curve, which correlates with the transient response and trans-

parency. The ETC is as good as ETC's produced by several models of studio monitors. There is some delayed energy 10 dB down from the main spike, and some more about 15 dB down.

Finally, **Figure 3** displays the Total Harmonic Distortion vs. frequency at 90 dB SPL, 1 meter. THD is below audibility from 40 Hz up. That's excellent performance.

Any loudspeaker design involves a compromise between deep bass response and efficiency. Bag End emphasized the latter value in this speaker. However, it handles bass boost well and could always be complemented with a subwoofer.

### SUMMARY

The TA5000-C plays very loud and clear. It is built well and sounds especially good on and off-axis. I recommended it for people who want a full-range system that can play loud with lots of articulation.

*Bruce Bartlett, a regular Pro Audio Review contributor, is a technical writer, a recording engineer and an audio journalist.*

### REVIEW SETUP

Sony PCMR300 DAT recorder; Crown D75, Crown PL4 power amplifiers; Shure SM-58, Crown CM-200A microphones; Alesis Monitor One loudspeaker; Goldline TEF-20 sound analyzer; Crown CM-150 measurement microphone.

## Product Points

### BAG END TA5000-C PORTABLE PA SPEAKER

#### Plus

- Extremely efficient
- Uniform dispersion
- Time-Aligned drivers

#### Minus

- Weak deep bass
- Slight MF and HF emphasis

#### The Score

A full-range system that can play loud with lots of articulation.

► Acoustics from page 40

attention since their debut this fall. The ACL series is composed of enclosed equipment racks outfitted with various levels of heat transfer units for cooling and acoustic isolation of noisy gear. ([www.norenproducts.com](http://www.norenproducts.com)) Isolation solutions run from simple damping material to fans and all the way to heat transfer sinks.

Similarly, **Middle Atlantic Products** offers isolation cabinets (but without heat sinks). MAP's angle is that theirs integrate with editing workstation furniture also offered. ([www.middleatlantic.com](http://www.middleatlantic.com))

**Sound Construction**, too, offers isolation cabinets, with fans, if required. ([www.custom-consoles.com](http://www.custom-consoles.com))

**Taytrix** offers its Stack-It system of modular, stackable gobos for quick arrangement of baffles. Upon request the acoustical fillings of the gobos can be customized for specific sonic requirements. ([www.taytrix.com](http://www.taytrix.com))

Especially suited for broadcast facilities, **Whisper Room** continues to refine their line of standalone vocal booths with new sizing, and more window and door options. ([www.whisperroom.com](http://www.whisperroom.com))

**Clearsonic's** expanding line of modular

panels is quickly becoming standard equipment for many broadcast, rehearsal, and project studios, especially for live drum set applications. The clear panels come in a variety of sizes, and provide attenuation while preserving sight lines, while the Sorber panels provide absorptions. ([www.clearsonic.com](http://www.clearsonic.com))

Less noticeable but sometimes the perfect solution can be small items such as **Dana B. Goods's** Humfrees - small gaskets for isolating (electrically and mechanically) equipment from rack contact. ([www.danabgoods.com](http://www.danabgoods.com))

## Bench Measurement



Fig. 1: Anechoic frequency response

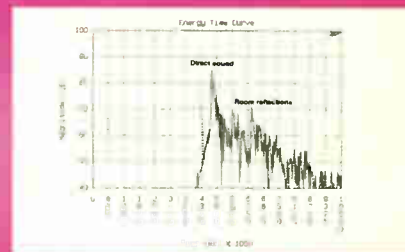


Fig. 2: Energy Time Curve

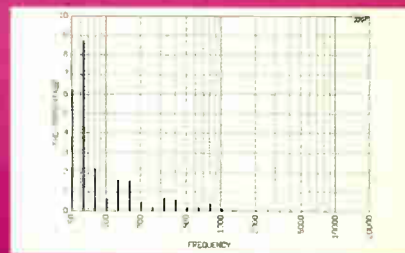


Fig. 3: THD vs. frequency @ 90 dB 1W/1m

# Summit Audio TD-100 Instrument Preamplifier

BY DAVID CHRISTOPHER

Summit Audio has spent the better part of 20 years building highly respected tube equipment for studios in need of both high-quality sound and high reliability. More recently, Summit has collaborated with Rupert Neve on the high-end Element 78 series.

Summit recently introduced the tube-based TD-100 instrument preamp. The TD-100 is designed to give your instruments the familiar warmth of Summit vacuum tube technology at an affordable entry point. Which instruments in particular? Well, that is the joy of discovery. The results of my research suggest that you might want to continue experimenting for yourself.



## FEATURES

The TD-100, which lists for \$495, is a model of simplicity in that there are only two knobs - loading (for adjusting the input impedance to the instrument you are using) and output gain.

In addition to the aforementioned knobs, the front panel also features ground lift, polarity and on/off switches, as well as a 1/4-inch input jack and a 1/4-inch direct output jack, which bypasses the preamp.

*continued on page 78* ▶

## Hear What The Hype Is All About

"The C-3 is THE HIP new guitar mic. It gives your Marshalls that phat-gut-punch we all crave. I'll never cut another record without one."

**Scott Rouse** - Producer, Grammy Nominee, Nashville, Tennessee

I have a microphone "wish list". You have allowed me to check off both the U87 with the C1 and the C12 with the T3.

**Ted Perlman** - Producer/Arranger/Composer  
Bob Dylan, Chicago, Kaci, 2gether, Young MC

One of the best vocal mics in the world is the \$300 Studio Projects C1. You can spend way more for "one of those" mics from Germany if your ego demands it, but the C1 is certainly the sonic equivalent.

**Pete Leoni** - Producer Engineer, Tech writer and reviewer



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► *Summit Audio from page 77*

The back panel features balanced 1/4-inch TRS and XLR outputs, plus a headphone out which allows the TD-100 to be used as a practice amp, or the listener to hear the TD-100's sound uncolored by any further signal chain.

The input drives a 12AX7A/ECC83 vacuum tube, while the output utilizes a discrete transistor circuit.

The half-rack TD-100 is built to Summit's high standard for rugged design, and includes an internal power supply and IEC A/C cable.

## IN USE

I first tested the TD-100's performance on bass guitar in my home studio. I pulled out my trusty old Music Man, hooked up a set of headphones directly to the unit, adjusted the input impedance and listened. The bass sounded warm and full and very useable for tracking.

Later, at another studio, I took out a junk Bradley bass that was hidden away in the closet. I had vivid memories of the lack of tone from this instrument and I decided to see if the Summit could make it sound better. It worked; after some additional experimenting with the impedance knob, I found a setting that spoke the misunderstood Bradley's language. All of a sudden, this down-trodden piece stored in the hell of disused instruments produced a

## Fast Facts

### Applications:

Live sound, studio

### Key Features:

Input impedance control, tube input stage (12AX7A), solid state headphone output.

### Price:

\$495

### Contact:

Summit Audio at 831-728-1302, [www.summitaudio.com](http://www.summitaudio.com); or circle Reader Service 151.

full, round and very usable sound. But it was back to the closet for Bradley, since the TD-100 was going with me.

Next, I tested the TD-100 on a variety of guitars. Most guitarists will tell you that a "direct only" recording of a guitar — with no amp or microphone in sight — is far from ideal, though the Summit held a few surprises.

On one recording I was able to get a good rhythm guitar track with a Stratocaster using its neck pickup and running it direct to the TD-100. Think "All Star" by Smash Mouth. On another track, adjusting the input impedance allowed me to get a more Stevie Ray Vaughan-like tone, especially when I cranked the output gain.

The TD-100's only failing as a "direct-only" box occurred while recording a solo utilizing the bridge (treble) pickup. After trying several different guitars, I found this combination to be a bit too bright to be truly useful. The TD-100 is, however, a great tool for cutting dry, direct guitar signals to tape for "re-amping" at a later time. I also successfully used the unit to record an acoustic guitar using a dual mic/direct setup and mixing to taste. The direct sound from the TD-100 added an interesting flavor to the microphone sound and helped to solidify the midrange of the guitar track. A healthy combination of both signals made it in the final mix of the project.

## SUMMARY

Summit has added a fine piece to its catalog. If you own a studio and need a reason to buy the TD-100, you need look no further than its abilities for bass tracking. It could save you and your customers' time and money finding the proper sound. Add in the preamp's ability to enhance the sound of other instruments and you have a valuable addition to your studio setup.

*David Christopher is a songwriter and producer. He has worked with artists including Eva Cassidy and Yvonne Charbonneau and is currently working on several projects while simultaneously developing a cure for baldness.*

## REVIEW SETUP

Cakewalk SONAR workstation, M Audio Delta 66 interface; Shure KSM-44 and Oktava MC-102 microphones; Mackie 1604 mixer; TASCAM DA-88 DTRS recorder; AKG K240 headphones; Fender Stratocaster, Hamer Archtop and Takemine guitars; Music Man Cutlass and Bradley basses.

Anyone who has heard it knows ...

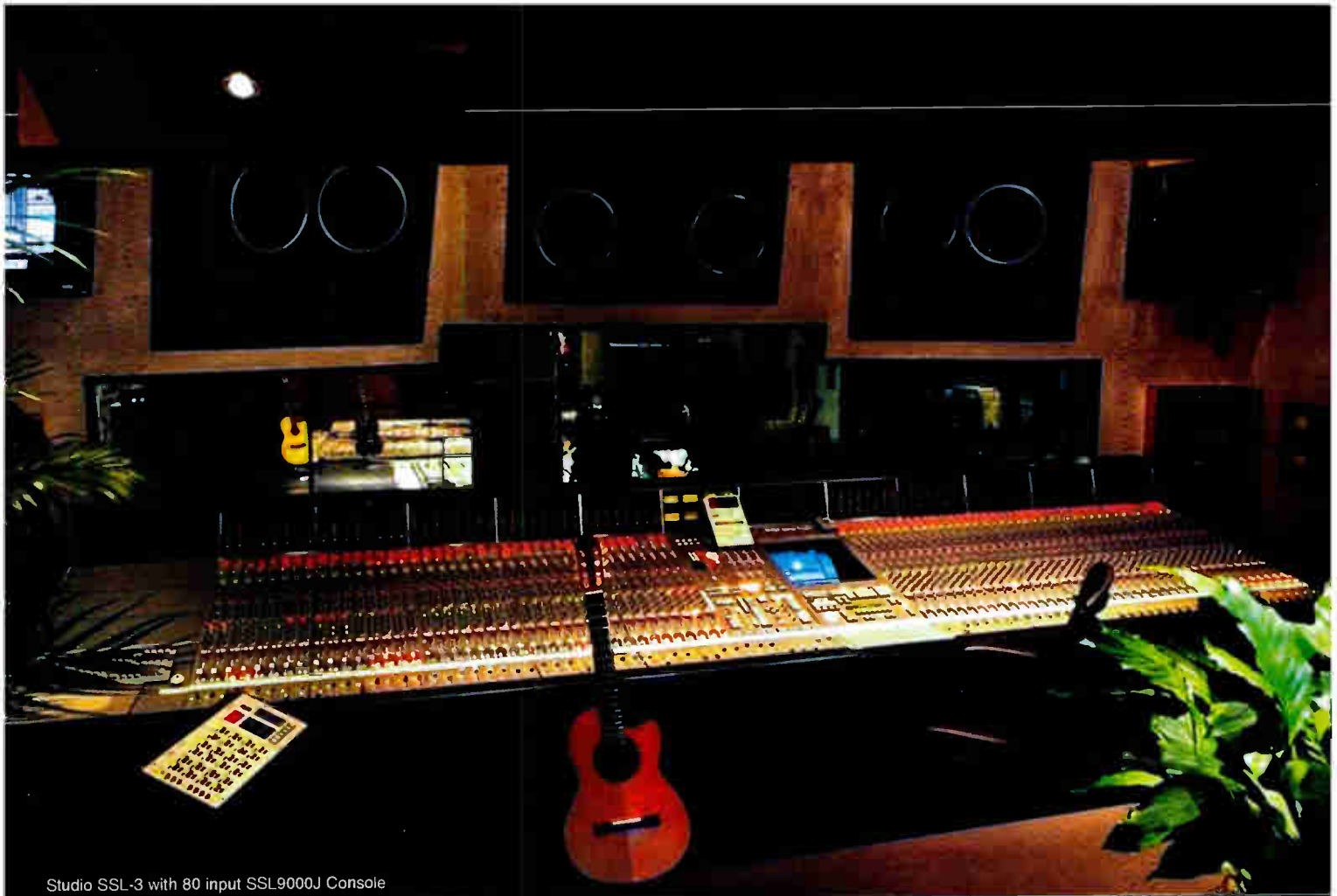
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World Radio History

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# Studio Monitors

## Tannoy Ellipse 10 Active Monitor

**Features:** Three-way; 8" dual concentric midrange/woofer; SuperTweeter; Tannoy Wideband technology; heat sink; EQ. Price: \$3,500 per pair.

**Contact:** TGI North America at 519-745-1158; or circle [Readers Service 100](#).



## Yorkville Sound YSM-1p Closefield Studio Monitor

**Features:** Two-way; 6.5" low-frequency driver; 1" silk dome ferrofluid-cooled tweeter; tone control; onboard 70W LF amp; onboard 30W HF amp. Price: \$449 each/\$640 per pair.

**Contact:** Yorkville Sound at 716-297-2920; or circle [Reader Service 109](#).



## HNB Circle 5A Active Monitor

**Features:** Two-way; 8" polymer cone with 1" aluminum voice coil; 1" ferrofluid-cooled tweeter; PolySwitch tweeter protection; two-channel onboard amp; volume control; magnetic shielding. Price: \$1,490 per pair.

**Contact:** HNB Communications USA at 310-319-1111; or circle [Reader Service 101](#).



## Legacy Audio Focus 20/20 Monitor

**Features:** Five-way; twin 12" carbon-poly woofers; 12" carbon midwoofer; twin 7" Kevlar Hexacone midbass drivers; 1.25" soft dome midrange; 4" ribbon tweeter. Price: \$6,000.

**Contact:** Legacy Audio at 800-283-4644; or circle [Reader Service 108](#).



## Yamaha MSP5 Powered Monitor

**Features:** Two-way; 5" woofer; titanium tweeter; biamplified; onboard 40W low-frequency amplifier; onboard 27W high-frequency amplifier; magnetic shielding. Price: \$319.

**Contact:** Yamaha at 714-522-9011; or circle [Reader Service 102](#).



## Westlake Audio Lc5.75 Monitor

**Features:** Two-way; 5" polypropylene woofer; .75" soft dome tweeter; shielded version available. Price: \$1,298 per pair.

**Contact:** Westlake Audio at 805-499-3686; or circle [Reader Service 107](#).



## Carvin SRS6.5A Active Studio Reference Monitor

**Features:** Two-way; 6.5" woofer; shielded; contour/flat switch; onboard 100W amp; DuraTex scratch-resistant finish. Price: \$249 each/\$449 per pair.

**Contact:** Carvin at 800-854-2235; or circle [Reader Service 103](#).



## D.A.S. Monitor 8 Speaker

**Features:** Two-way; 5" polypropylene cone; 1" soft dome tweeter; Line Quadratic Spherical waveguide. Price: \$459.

**Contact:** D.A.S. Audio at 860-434-9190; or circle [Reader Service 106](#).



## JBL LSR25P Powered Monitor

**Features:** Two-way; 5.25" woofer; titanium composite diaphragm with Elliptical Oblate Spheroidal Waveguide; onboard 100W LF amp; onboard 50W HF amp; twin amplifiers; magnetic shielding; high-pass filter; THX approved. Price: \$399.

**Contact:** JBL Professional at 818-894-8850; or circle [Reader Service 104](#).



## PMC DB1 Monitor

**Features:** Two-way; 5.5" woofer; ferrofluid-cooled aluminum tweeter; transmission line design; optional magnetic shielding; optional center channel design; optional finishes. Price: \$749.

**Contact:** PMC/Bryston at 800-632-8217; or circle [Reader Service 105](#).



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► *Buyers Guide from page 80*

**NHT Pro A-20 Monitor System**

**Features:** Controller amp/speaker combo; two-way speaker; 6.5" treated paper cone woofer; 1" aluminum dome tweeter; magnetic shielding; separate rackmountable amp with gain, proximity controls. Price: \$1,800 for amp, two speakers.

**Contact:** NHT Pro at 707-748-5949; or circle **Reader Service 120**.



**A.D.A.M. S3-A Powered Monitor**

**Features:** Two-way; twin 7" woofers; 2.8" ribbon tweeter; triamped; onboard Class AB amps; bass ports; gain controls; bass, treble controls. Price: \$3,995 per pair.

**Contact:** A.D.A.M./McCave International at 800-218-6305; or circle **Reader Service 129**.



**Hafler TRM6 Active Monitor**

**Features:** Two way 6.5" polypropylene cone woofer; 1" soft dome tweeter; biamplified; power, clip, thermal LEDs; unbalanced/balanced, mute, input sensitivity, bass shelving, treble shelving DIP switches. Price: \$1,250 per pair.

**Contact:** Hafler at 888-423-5371; or circle **Reader Service 121**.



**Miller & Kreisel MPS-2510 Main Channel Speaker**

**Features:** Two-way, twin 5.25" woofers; three 1" soft dome ferrofluid-cooled tweeters; switchable wide/narrow directivity control; biamplified; twin 150W amps onboard. Price: \$1,999.

**Contact:** Miller & Kreisel at 818-701-7010; or circle **Reader Service 128**.



**Genelec 2029A Digital Stereo Monitoring System**

**Features:** Two-way; 5" aluminum low-frequency driver; .75" magnetically shielded dome; onboard D/A converter; master/slave operation; S/PDIF connector; level control. Price: \$1,325 per pair.

**Contact:** Genelec at 508-652-0900; or circle **Reader Service 122**.



**E. M. Long NFM-6C Time Align Nearfield Monitor**

**Features:** Two-way; 5" inch coaxial driver with 1" soft dome tweeter; time-aligned. Price: \$695.

**Contact:** E.M. Long at 408-923-4450; or circle **Reader Service 127**.



**Dynaudio Acoustics BM5.1A System**

**Features:** Five BM6A powered monitors, one BX30 powered subwoofer; BM6A - 7" woofer with 3" voice coil, 1" soft dome tweeter, twin 100W amps onboard; BX30 - 12" woofer with 4" voice coil, 130W amp onboard. Price: \$9,497.

**Contact:** Dynaudio Acoustics/TC Electronic 805-373-1828; or circle **Reader Service 123**.



**Earthworks Sigma 6.2**

**Features:** Two way, 6.5" Vifa woofer; Vifa tweeter; magnetic shielding. Price: \$3,000 per matched pair.

**Contact:** Earthworks at 603-654-6427; or circle **Reader Service 126**.



**Fostex NF-1 Monitor**

**Features:** Two-way; 6.5" Hyperbolic Paraboloidal Diaphragm woofer; polyurethane film laminated cloth tweeter; magnetic shielding; biampable; biwireable terminals. Price: \$1,000.

**Contact:** Fostex at 562-921-1112; or circle **Reader Service 124**.



**FBT Jolly 3A Powered Speaker**

**Features:** Two way woofer, .75" dome tweeter; gain, tone, volume controls; onboard 60W amp; molded resin cabinet. Price: \$349.

**Contact:** FBT North America at 800-333-9383; or circle **Reader Service 125**.



**Bag End MM-8 Near Field Monitor**

**Features:** Two-way; 8" cone low frequency driver; 1.75" aluminum compression horn high-frequency driver; polarity control; EQ controls; Time-Aligned.

Price: \$1,320.

**Contact:** Bag End at 847-382-4550; or circle **Reader Service 130**.

**Event PS6 Biampified Direct Field Monitor System**

**Features:** Two-way; 6.5" polypropylene cone woofer with 1" voice coil; 1" ferrofluid-cooled silk dome tweeter; onboard 70W LF amp; onboard 30W HF amp; magnetic shielding. Price: \$699 per pair.

**Contact:** Event Electronics at 805-566-7777; or circle **Reader Service 132**.

**Behringer Truth B2031 Speaker**

**Features:** Two-way; 8.75" polycarbonate woofer; 1" ferrofluid-cooled titanium dome tweeter; biampified; 75W HF amp onboard; 150W LF amp onboard; shielded. Price: \$490 per pair.

**Contact:** Behringer USA at 425-672-0816; or circle **Reader Service 131**.

**Ambiance Acoustics HY-V Loudspeaker System**

**Features:** Five Hyper Cubes (16 4 5" paper cone drivers per cube); three two-channel outboard processors. Price: \$5,817 per system.

**Contact:** Ambiance Acoustics at 858-485-7514; or circle **Reader Service 133**.



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► *Buyers Guide from page 83*

**Dunlavy Audio SC V**

**Features:** Four-way, twin 12" carbon fiber woofers; twin 6.5" midrange drivers with rubber surround; twin 4" midrange drivers; 1" silk dome tweeter; optional finishes. Price: \$16,995.

**Contact:** Dunlavy Audio Labs at 866-386-5289; or circle [Reader Service 134](#).



**Quested VS2108 Powered Monitor**

**Features:** Two-way, 7" woofer; 1.1" soft dome tweeter; biamped; onboard 110W LF amplifier; onboard 100W high-frequency amplifier; input sensitivity switch. Price: \$1,995.

**Contact:** Quested/Trian Electronics at 608-850-3600; or circle [Reader Service 135](#).



**SP Technology Timepiece 2.0 Monitor**

**Features:** Two-way, 7" aluminum cone; 1" ferrofluid-cooled textile dome tweeter. Price: \$2,495.

**Contact:** SP Technology at 219-324-6800; or circle [Reader Service 136](#).



**SLS S8R Close Field Studio Monitor**

**Features:** Two-way, 8" woofer; 5" ribbon HF driver; optional finishes. Price: \$775.

**Contact:** SLS Loudspeakers at 417-883-4549; or circle [Reader Service 137](#).



**M Audio SP-8B Powered Monitor**

**Features:** Two-way; 8" mineral-filled polypropylene cone woofer; 1" silk ferrofluid-cooled adjustable tweeter; biamped. Price: \$599 per pair.

**Contact:** M Audio at 626-445-2842; or circle [Reader Service 138](#).



**ATC SCM 300 Active Super Linear Pro Speaker**

**Features:** Three-way twin 15 woofers; 3" soft dome midrange driver; 1.3" high-frequency driver; onboard P4 Class A amp; optional finishes. Price: \$32,250 per pair.

**Contact:** ATC/Transamerica Audio Group at 702-365-5155; or circle [Reader Service 139](#).



**ART SLM-1 Studio Monitor**

**Features:** Two-way 6.5" woofer 1" soft dome ferrofluid-cooled tweeter; magnetic shielding; bass ports; gold-plated binding posts. Price: \$299 per pair.

**Contact:** ART at 716-436-2720; or circle [Reader Service 163](#).



**Truth Audio TA-1P Monitor**

**Features:** Two-way, twin 5" woofers; 1" tweeter. Price: \$499.

**Contact:** Truth Audio/Wave Distribution at 973-728-2425; or circle [Reader Service 144](#).



**Mackie HR624 Active Monitor**

**Features:** Two-way; 6.5" mineral-filled polypropylene cone woofer; 1" aluminum ferrofluid-cooled tweeter; biamped; 100W low-frequency amplifier; 40W high-frequency amplifier; high, low-frequency limiter controls. Price: \$649.

**Contact:** Mackie Designs at 800-898-3211; or circle [Reader Service 143](#).



**Hot House ARM 265 Active Reference Monitor**

**Features:** Two-way; twin 6.5" long-throw woofers; 1" recessed soft dome waveguide tweeter; high-frequency, low-frequency controls; onboard twin 250W amps; black, red, golden oak or optional customized finishes. Price: \$6,499 per pair.

**Contact:** Hot House at 845-691-6077; or circle [Reader Service 142](#).



**Audix PH150 Speaker**

**Features:** Two-way; 5.25" polycarbonate woofer; 1" dome tweeter; high-pass filter; magnetic shielded; onboard amplifier. Price: \$479 per pair.

**Contact:** Audix at 800-966-8261; or circle [Reader Service 141](#).



**Alesis M-1 Powered Monitor**

**Features:** Two-way; 6.5" carbon woofer; 1" silk dome ferrofluid-cooled tweeter; biamped; 75W low-frequency amp; 25 W high-frequency amp; input level control. Price: \$649 per pair or \$325 each.

**Contact:** Alesis at 800-525-3747; or circle [Reader Service 140](#).

**Roland DS-90A Monitor**

**Features:** Two-way; 6.5" polypropylene cone woofer; 1" soft dome tweeter; onboard 24-bit D/A converter; biamplified; high-frequency, low-frequency trims; input level control; compatible with Roland COSM speaker modeling. Price: \$595 each.

**Contact:** Roland at 323-890-3700; or circle **Reader Service 146**.

**KRK Systems Expose E-8 Powered Monitor**

**Features:** Two-way; 8" Kevlar woofer with double spider; 1" titanium tweeter; biamped; twin onboard 140 W amplifiers; driver protection. Price: \$4,295 per pair.

**Contact:** KRK Systems at 714-841-1600; or circle **Reader Service 148**.

**Stage Accompany Master M 57 Monitor**

**Features:** Two-way; twin SA 1205M 12" woofers; SA 8535M Ribbon Compact Driver tweeter; Controlled Acoustic Dispersion tuning; biampable; compatible with Stage Accompany DDC amplifiers. Price: \$3,477.

**Contact:** Stage Accompany USA at 800-955-7474; or circle **Reader Service 147**.

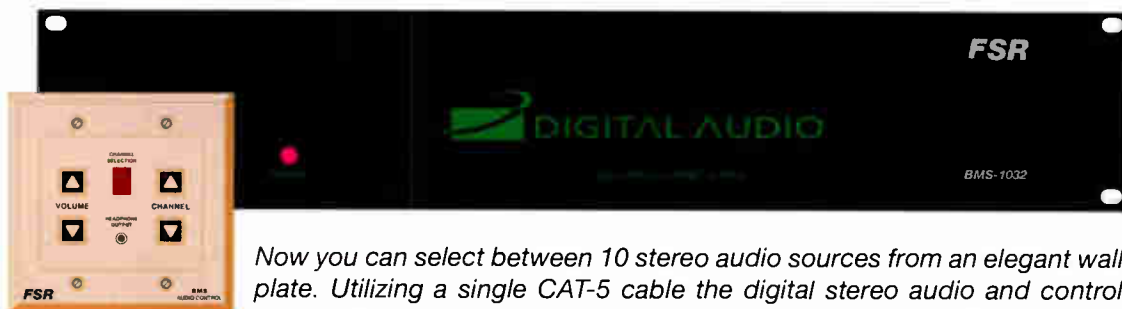
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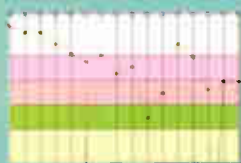
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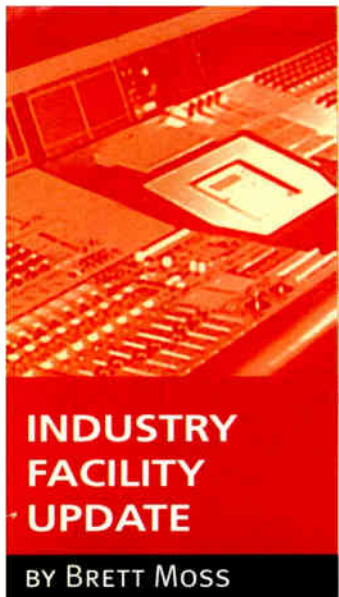
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## INDUSTRY FACILITY UPDATE

BY BRETT MOSS

# David Blackmer, 1927-2002

**O**n March 12, 2002 the professional audio community lost a pillar with the passing of **David Blackmer**. He was 75 years old. More than a one trick pony,

Blackmer was one of those few geniuses whose talents and abilities spanned industries and decades of continuous discoveries and inventions. His name will always be associated with dbx and the groundbreaking noise reduction system he developed and its subsequent applications. Later he expanded his work into microphones with his late life project, Earthworks. Along the way he worked with early radars in the Navy and later worked with the space program during the Mercury years.

Wireless mic systems continue to increase in popularity for live concert applications. Point of Grace recently used **Audio-Technica's** ATW-7373 wireless system on their tour ([www.audio-technica.com](http://www.audio-technica.com)). Natalie Merchant and her band have been outfitted with **Sennheiser** Evolution 300 wireless mic systems. Capsules favored include the e 865 condenser. They Might Be Giants is using Sennheiser Evolution E 609 wireless mics for their guitars. Erykah Badu's flutist, Dwayne Kerr is using AKG's C420 headset mic and a WMS 80 wireless bodypack transmitter ([www.sennheiserusa.com](http://www.sennheiserusa.com)).

**Shure** ([www.shure.com](http://www.shure.com)) and Sennheiser both had wireless mic systems in use at the Winter Olympics. LeAnn Rimes and the Dixie Chicks used Shure Beta 87A capsules on Shure transmitters and U4D receivers. Sennheiser placed components of the 3000 and 5000 broadcast wireless systems. More particularly SKM 3072 and SKM 5000 handheld transmitters, SK 250 and SK 5012 bodypack transmitters, EK 3041 receivers, MKE 2 lavalier mic and the QP 3041 quad receiver rack were used. In-ear monitor duties were aided by Sennheiser EK 3053 bodypack receivers.

Sennheiser has also outfitted the "world's largest bingo hall," at Foxwoods Resort and Casino in Mashantucket, Conn. with a wireless mic system. Spec'ed by Professional Wireless of Orlando Fla., a 36-channel system including SK 50 transmitters along with EM 3032-U and EM 3532-U true diversity receivers was installed.

Meanwhile in Greece, the Pallas Theater in Athens upgraded its house wireless system with 48 channels of Shure WL50T lavalier mics, U1 bodypack transmitters, U4D receivers all networked by a UA888 UHF interface.

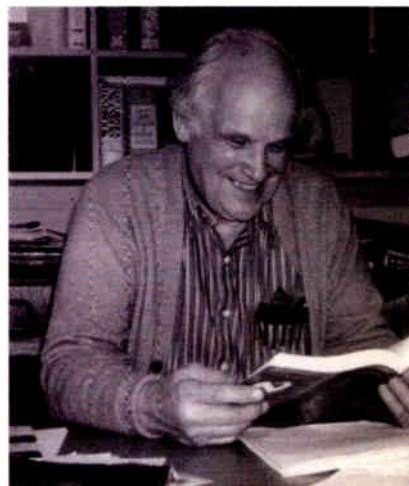
**Solid State Logic** ([www.solid-state-logic.com](http://www.solid-state-logic.com)) has been very busy as of late. Larrabee Studios in LA scooped up the first XL 9000 K megaconsole out of the box, a 72-channel model. Radio Gdansk in Poland has installed a 64-channel MT Plus into a production studio.

CCTV in Beijing has purchased a fifth Aysis Air Plus; this one for an HDTV studio under construction. Auditel, a post house in France, has acquired an Avant Plus to replace its SL 5000. In the UK producer/engineer Steve Mac has added a second SL 9000 console to his Rokstone studio. And in Japan, the first SSL desk installed there, at Onkio Haus in Tokyo, was recently replaced with an identical board, a 64-channel SL 4000.

Racking up orders for its digital consoles, **Soundtracs** ([www.soundtracs.com](http://www.soundtracs.com)) has placed new six DS-3 s into TVB in Hong Kong and one each into London's Hillside Studios, Boston's Soundtrack Boston and Wave in London. Wave also has ordered two DPC-II consoles while one has gone to Arts of Toyco studios in Munich.

**AMS Neve** ([www.ams-neve.com](http://www.ams-neve.com)) has placed two more tube-centric 88R consoles in nice homes. A 60-channel desk went to Barefoot Studios in Hollywood, replacing an original Neve 8128. In the UK Angel Studios ordered an 88R to join two other Neve consoles. AMS Neve's latest board, the Logic MMC found a home with West Productions in Burbank, Cal. And for new old "Neve" news, Stratosphere Sound in New York recently installed a refurbished Neve 8068 (by Dan Zellman). The new studio, designed by Francis Manzella, features a **Studer** 827 reel-to-reel along with a **Digidesign** Pro Tools rig. And the Headway Music Complex in Orange County Cal. recycled a 64-input 8108 Neve (with **GML** automation) from a studio up the road in LA.

Peak Audio's CobraNet network technology has signed on **Symetrix** ([www.symetrixaudio.com](http://www.symetrixaudio.com)) and **Mackie** ([www.mackie.com](http://www.mackie.com)) as its latest affiliates.



David Blackmer

### NEXT MONTH IN PAR

In the July 2002 issue, Pro Audio Review takes a look at the retro and vintage product craze - new LA-2As, the whole Neve console refit industry and the obsession with all things tube. Also not to be missed is the Power Amplifiers buyers guide. As always, look for reviews of professional audio equipment for recording studios, project studios, contractors, live sound and post production.

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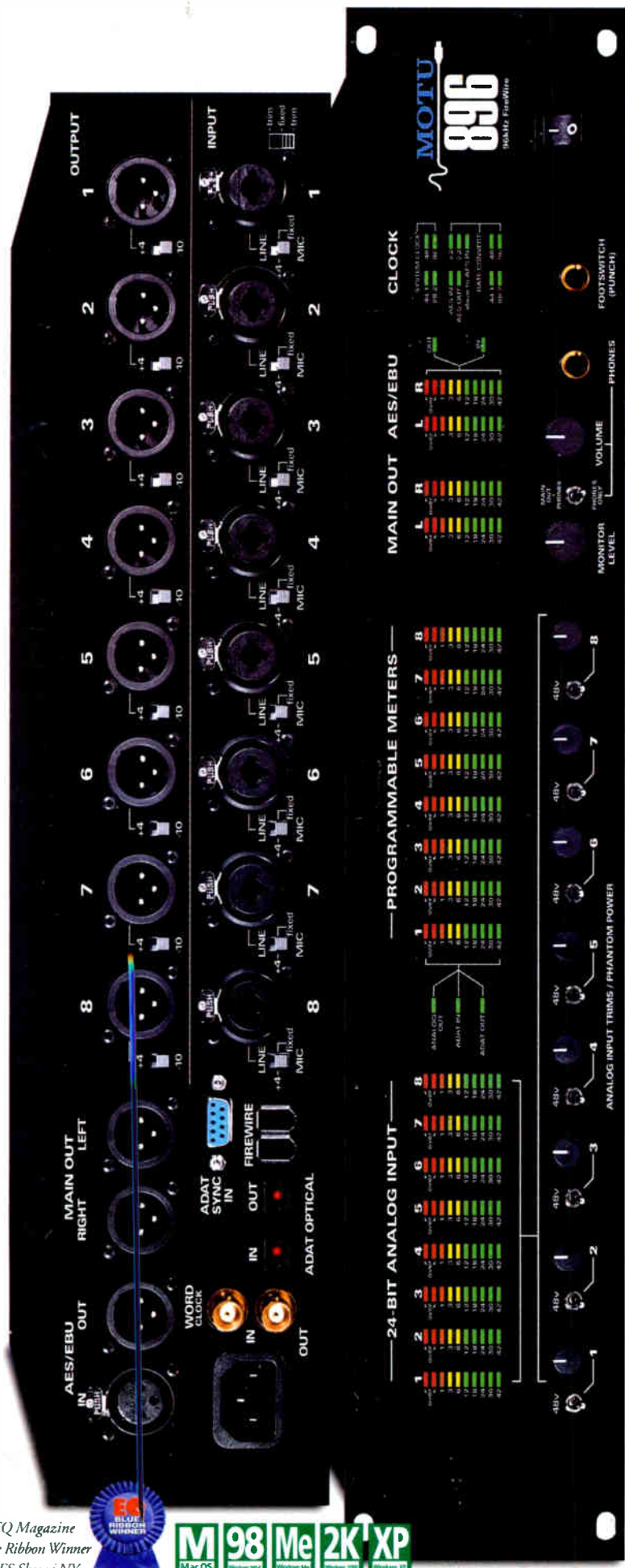
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