

Single Slice: Ozzy Osbourne's Smash Hit "Gets Me Through"

# PRO AUDIO REVIEW

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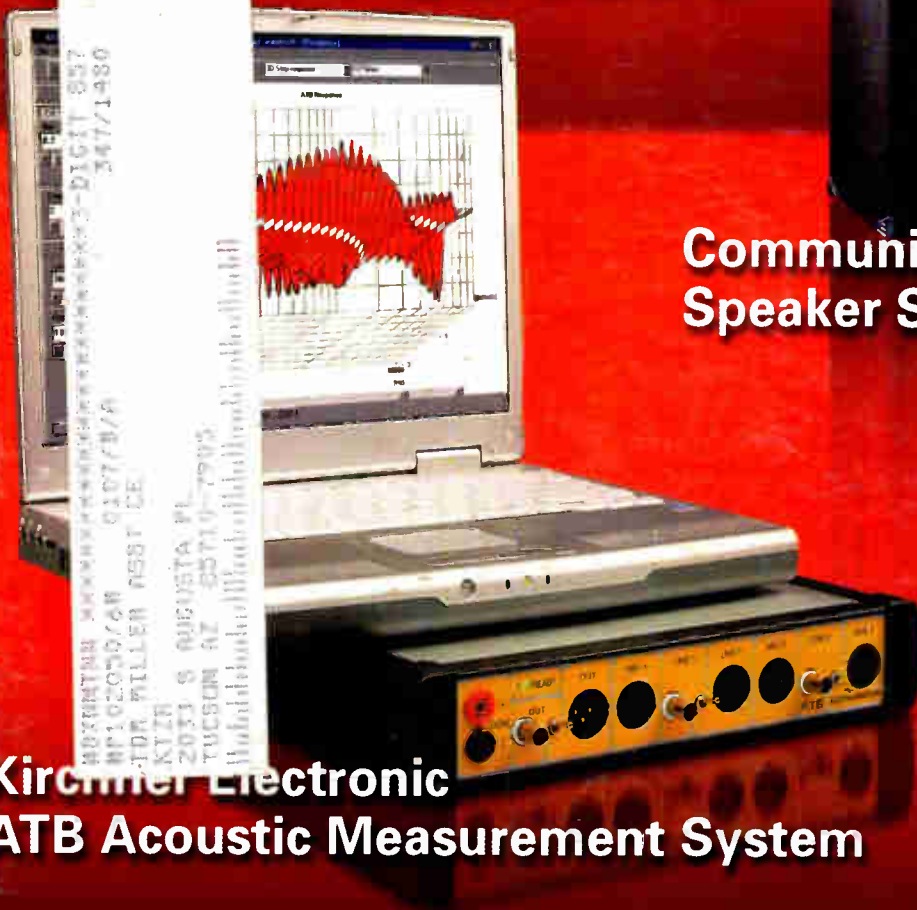
December 2001



## Test Gear & Converters



Community XLT 500  
Speaker Series



Kirchner Electronic  
ATB Acoustic Measurement System



2001  
Reviewer's  
Picks

- *Grace Design Model 101 Mic Preamp*
- *Ear Q Technologies Hearing Analyzer System*
- *Converters and Test Equipment Buyers Guide*

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*editor's  
view*

## New Deal



*by Stephen Murphy*

The availability of compact and affordable recording gear capable of making high-quality recordings has enabled studios to be placed just about anywhere there is space. This same availability has also made it much easier for interested beginners to get into recording.

For better or worse, today's newcomers often start out learning on comparable or, in some cases, identical gear to that found in commercial studios. Once-impenetrable barriers have eroded—or the floodgates have opened, depending on how you look at it.

### Perspectives

This column marks the start of a series of articles and product reviews in which, with the help of industry specialists and our own expert contributors, we will look at issues related to this overall trend. Emphasis will be placed on improving acoustics in existing spaces, and avoiding the pitfalls and unrealistic expectations that can plague the uninitiated.

Equally important in covering this trend is addressing how existing commercial facilities can cope, and even benefit from the proliferation of independent/personal studios.

As studio owners, we have all been affected by the new availability of relatively inexpensive quality recording gear. For instance, these days many people with a fixed recording budget are actually opting to purchase their own equipment rather than spend the money at a studio. While the increase of personal studios poses a real threat to commercial, tax-burdened facilities, it is not productive to be bitter or deny its existence.

Instead of writing it off, address the threat head on by building cooperative, productive relationships between new "satellite" project studios and your facility/resident experts. In time, this approach results in an increase in networking, better word of mouth, and most importantly, involvement in recording projects that otherwise would bypass your studio completely. This is a strategy I actively

pursued at my commercial studio, and was one of the elements that contributed to continued success throughout a decade of profound changes in the industry.

### Better treatment

These days, more and more professional audio projects are produced in smaller studios built into existing (and typically rectangular) rooms. The word "built" isn't even appropriate in many cases when the biggest "acoustic" decision made is, "Where should I put the computer desk?"

While pro audio gear has changed tremendously over the years, physics has not. Unfortunately, in many new project studios, the focus is entirely on acquiring more equipment. Very little, if any, is done to address common acoustic problems.

The good news is help is available: many kits are available that have been specifically designed to tackle the most common acoustic problems associated with rectangular rooms. Companies such as Acoustics First, illbruck, Primacoustic, Acoustic Solutions and RPG carry a range kits, and most are happy to provide advice as well. These kits include a variety of professionally specified surface treatments, assuring the end user a greater potential for success over haphazardly blanketing the walls with one type of foam, which can frequently make matters worse.

Studio designer John Storyk (Walters-Storyk Design Group), in talking to PAR for an upcoming article, agrees. "It's the old 'let's just pad the walls' solution. The problem is that padding only addresses certain frequencies - generally high frequencies - so you end up with a room that's very unbalanced, and with lots of problems in the low-end response. Although, don't get me wrong, surface treatments are important, but most of the time that's all people do."

He summarizes, "There will always be thrown-together spaces, and a little bit of understanding of the acoustic principles involved can go a long way."

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# out of the box

## Pendulum Audio Quartet Recording Channel



**P**endulum Audio's Quartet gets its name from the four stages that comprise the unit, preamp, EQ, compressor and de-esser. The mic/DI preamp stage features 48V phantom power, phase reverse, 20 dB pad, switchable 75/150 Hz low-cut filter and a front panel 1/4-inch DI input. The three-band EQ has a sweepable mid along with high and low-shelving filters. The compressor stage built on Pendulum's OCL-2 opto-compressor offers threshold, ratio, attack, release and output controls. The de-esser has threshold, frequency and depth controls. Bypasses are available for all three processing stages. The whole signal path for the Quartet is Class A tube. Price: \$2,995.

Contact: Pendulum Audio at 908-665-9333; or circle **Reader Service 18**.

## Nady Audio SRM Series Mixers

**T**he SRM Series mixers are another part of Nady Audio's expanded audio offerings. The SRMs are rackmountable and come in 6, 8, 12 and 14-channel models. Standard on each is a three-band EQ, top-mounted I/O and a low-cut filter on the mic pres. SRMs are relatively small in format and footprint and are aimed for general duties in most every audio market - studio, live and contracting. Prices: SRM-6 - \$189; SRM-8 - \$269; SRM-12X - \$379; SRM-14X - \$419.



Contact: Nady Audio at 510-652-2411; or circle **Reader Service 19**.

## Westlake Lc4.75 Monitors

**T**hinking small, Westlake's new Lc4.75 are the smallest (and lightest) Westies ever. Designed for small control rooms, production rooms, trucks and the like, the Lc4.75 sports a 4" woofer and a .75" tweeter but offer a frequency response, 60 Hz - 18 kHz, that would be more applicable to a larger speaker. Optional speaker muffs can be had for \$85 per pair. Price: \$899 per pair or they can be had individually for putting together 5.1 systems at \$449 each.



Contact: Westlake Audio at 805-499-3686; or circle **Reader Service 20**.

## Novatech Instruments Model 2908A Bench Top Signal Generator

**O**fficially labeled Model 2908A 100 MHz Quadrature Direct Digital Synthesizer Bench Top Signal Generator, the Model 2908A from



Novatech Instruments features a resolution of one microhertz. Other features include simultaneous cosine/sine and AC/MOS/TTL outputs up to 100 MHz. Modes include frequency sweep, FSK, BPSK, chirp, single tone. Other goodies include an external clock input and Windows software for use with a PC via an RS232 port. Price: \$895.

Contact: Novatech Instruments at 206-301-8986; or circle **Reader Service 21**.

## Hafler TA Series Amplifiers

**H**afler's TA series of multi-application power amplifiers consists of the TA1100 and TA1600 units.

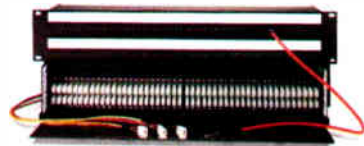


Both units identical except for power output. Features and specs include two-channel, heat sink-cooling, soft start, clipping, short circuit and thermal protection. The power circuitry is based on Hafler's proprietary trans\*ana design. Output is 100W at eight ohms for the TA1100 and 150W at eight ohms for the TA1600. Prices: TA1100 - \$249, TA1600 - \$379.

Contact: Hafler at 888-423-5371 or circle **Reader Service 22**.

## Audio Accessories SHORTI Quick-Switch Patchbay

**A**udio Accessories new Quick-Switch SHORTI line of modular patchbays offers a variety of options for audio engineers. The SHORTIs come in 48 and 26-point sizes with TRS, mini and TT as plug formats. Small three-pin EDAC connectors are used in the interior. Normalling (full, half or none) can be controlled per pair.



Contact: Audio Accessories at 603-446-3335; or circle **Reader Service 24**.

**CORRECTION:** In the November Out of the Box, one of the QSC Compositelite speakers was mislabeled in the pricing section. The ACE 570, not ACE 750 is \$1,035. The description of the speaker was correct in the text.



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# Kirchner Electronic ATB Precision Acoustic Measurement System

by Bascom H. King

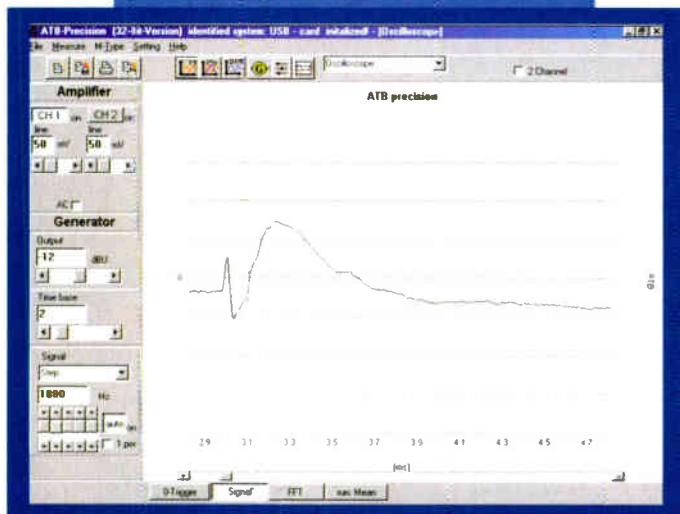


Figure 1: Oscilloscope mode — step response of a loudspeaker

## At a Glance

### Applications:

Electronic and loudspeaker testing

### Key Features:

Large variety of testing modes; 3D Step Response mode; easy interface with computer

### Price:

Basic ATB measurement program with ISA card version: \$2,000; USB version: \$2,750; factory direct orders discounted 15 percent

### Contact:

Audio International in Germany at 011-49-69-503570; [www.kirchner-elektronik.com](http://www.kirchner-elektronik.com); or circle Reader Service 43.



The ATB Precision Acoustic Measurement System from Kirchner Elektronik is a fascinating new entry in the field of PC-based systems. It features a unique set of measurement functions and is available in two physical formats. One is a PCI plug-in card for desktop computers (\$2,000); the other is a separate standalone box connected to a host computer via a USB cable (\$2,750).

## Features

Computer requirements are modest — a minimum of a 486 with 32 MB RAM and a free PCI slot on a PC running Windows 95/98/NT (or Windows Me and 2000 with a Pentium processor and more RAM.) The unit reviewed here is the USB version. I used a Sony PCG-F420 laptop to run the ATB Precision program.

Divided into three sections, the front panel provides the system's main I/O access. From left to right are signal output from BNC, XLR, and dual banana female connectors, and two input channels each with BNC and XLR connectors. Each section has a two-way toggle switch to change between the BNC and XLR connectors.

The rear panel sports an input connector for the external wallwart power supply, the USB connector, a female DB9 connector and a pair of dual banana female connectors. These latter connectors are wired in parallel with the pair on the front panel and are activated and driven from an internal power amplifier in the impedance measuring function.

## In use

A number of different measurements are possible with the standard version of ATB. Selection of the various measurement modes is via the main M-Type menu item or the drop-down list box over the main display area of the program screen. These include: Oscilloscope, Analog Measure, FFT Measure, Waterfall (Decay), Distortion, Thiele-Small, MLS and Polar. Most of these main measurement modes have sub functions unique to the particular mode. A description of the various measurement modes follows.

In the oscilloscope mode, a number of useful generator signal-testing waveform types are available. Included are: sine, triangle, rectangle, impulse, envelope, step, IMD and KMC. As the name implies, the oscilloscope mode displays measured waveforms in amplitude vs. time manner.

In addition to viewing the acquired waveforms, this mode also has an FFT subfunction for viewing the spectrum of the acquired waveform. An example of the program screen in the oscilloscope mode is shown in Figure 1. As can be seen, the screen is divided into generator and amplifier (measurement) sections at the left, menu and toolbars at the top and main display section occupying the rest of the display

continued on page 12

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Here are a few of the innovative software developers who offer support for the US-428. Cakewalk, Sonar and more virtual synth support coming soon. See the TASCAM web site for the latest info.

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Kirchner continued from page 10

area. The step response of a measured loudspeaker is shown displayed. The arrangement shown is typical of the other measurement modes.

The analog measure mode has the following sub functions: Magnitude, Impedance, SPL, Phase (Acoustic), Phase (Electrical), Magnitude and Phase (Acoustic), Magnitude and Phase (Electrical), Impedance and Phase, and SPL and Phase. The test signal in this mode is essentially like a swept sine wave but changes in discrete frequency steps. The step size is adjustable, as is the frequency range and degree of smoothing on the displayed results.

Measurements made in the FFT measure mode are done in a unique manner whereby the measurement band is broken up into as many as four bands with a different test signal for each band. When the measurement is made on a loudspeaker for example, one hears four discrete kinds of sounds one after the other. And let me tell you, it does sound strange! This helps to give more consistent display resolution on a logarithmic frequency scale (FFTs are usually displayed on a linear frequency scale) over the whole frequency range.

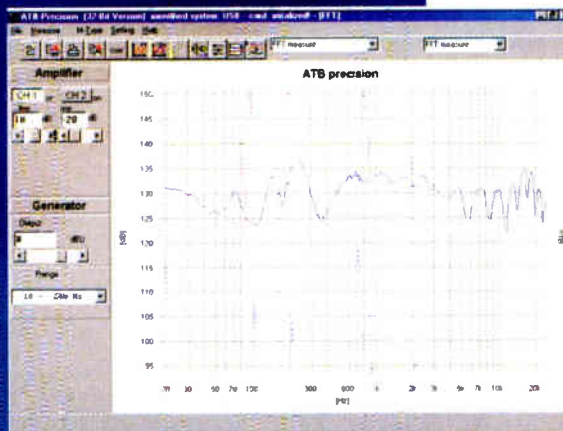
Numerous measurement bandwidths from 5 to 390 Hz in one band all the way up to the maximum bandwidth of 18 to 24 kHz in four bands are selectable in a drop-down list box. In this mode, as in all the measurement modes, signal generator output level and measurement input sensitivity level are adjustable. An example of a speaker response using this method is shown in **Figure 2**.

The Decay measurement mode is similar in function and display to an MLSSA waterfall measurement. In the case of the ATB, however, the test signal is a series of five-cycle, raised cosine pulses at different frequencies. The normalization of the Z, or time axis, in terms of various test frequency periods instead of being displayed in the usual constant time, is unique in my experience. This makes each burst envelope appear to be the same size in the display rather than becoming smaller as the frequency increases. An example of the test signal is shown in **Figure 3**.

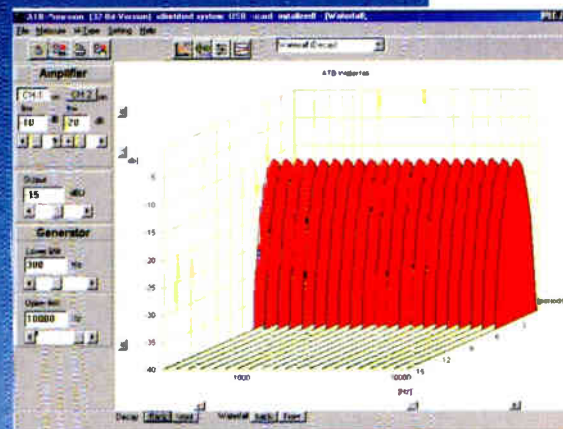
When a measurement is completed, the display is in the Decay mode. The result of a measurement made on a speaker is illustrated in **Figure 4**. When the Waterfall/back button is pressed, the final result is the familiar waterfall type presentation (not shown).

When the Distortion measurement mode is selected, the ATB will either plot THD or the second and third harmonics in percent as a function of frequency. The vertical scale is linear with full-scale sensitivities of 1 to 100 percent. At maximum sensitivity, distortions below 0.1% are easily seen. A choice of smoothing from 0 to 20 can be applied to the displayed results.

It is possible to measure the Thiele-Small parameters of a driver unit when in the Thiele-Small mode. The ATB system allows for either the driver-mounted-in-the-box or added-mass methods of calculating the parameters in conjunction with the free air measurement. As with other systems, the ATB does this by measuring impedance curves of the driver in free air and with the driver mounted in a known volume test enclosure, or with a known weight added to the driver in free air. In addition to the impedance measuring function, the ATB



**Figure 2: FFT mode — frequency response of a loudspeaker**



**Figure 3: Decay mode — test signal, viewed back to front**

provides a means for measuring the DC resistance of the driver, a necessary value for computing the Thiele-Small parameters.

ATB's MLS mode permits measurement of the impulse response of the device under test. Unlike most other MLS measuring gear that can FFT the impulse response into a magnitude and phase response, the ATB program just gets and displays the impulse response data and allows exporting it as an MLS file for use in an external program that will operate on the data.

The last item on the measurement menu of the standard ATB software is a polar measurement and plotting function. Data is plotted in the usual polar form where the radius represents amplitude and the angle represents the angle of the speaker relative to reference straight on axis orientation. Selectable is either half or full-circle plotting, number of sectors in the plot and a turntable number of milliseconds/degree number for coordinating the measurement speed with speaker turntable rotation speed.

Available for the ATB from Dynamic Measurements at extra charge over the basic ATB program cost is a program called 3D Step-Response. This fascinating and

continued on page 14 ▶

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READER SERVICE NUMBER 13

Kirchner continued from page 12

unique program generates a test signal that is made up of a one-half or full cycle of a sine wave that is stepped over a range of frequencies. The display is a 3D representation of the device under test's response to the test signal — a contour plot of the system's tone burst response if you will.

Like the ATB Decay display, the 3D Step-Response time axis is represented in terms of periods of the test frequency so that each frequency appears as the same physical size in the display. An example of this test signal is shown in **Figure 5**. In the figure, the display is set for a back-to-front presentation. An example of a speaker measurement using the 3D Step-Response program is illustrated in **Figure 6**. Needless to say, the results do not look anything like the test signal!

A large amount of the difference between the response in **Figure 6** and the test signal is due to the frequency-dependent phase shift that the speaker under test exhibits. This manifests as a transient tail in the response after the initial half cycle of the test signal, and in the curving effect of where the peaks are in the figure. The effects of transient and phase distortion can be seen in other, more conventional measurements like MLSSA, TEF, square pulse, and sine wave sweeps, etc.—but not as dramatically in a single display as with this unique test.

In the lower left-hand corner of the program window, an analyze button can be pressed to open a new window and display a 2D view of the response at frequencies selectable by a slide bar control. An FFT function is also present in this window enabling one to get a spectrum of the particular selected 2D plot.

The documentation I received with the ATB system left a bit to be desired in terms of clarity, accuracy and understandability in that it was a first version translation from German.

It took me a while to understand that the 3D Step-Response program was separate and had to be installed in the main ATB program by inserting a license code number in the "Help > About" window. Further, much to my surprise, the license number would disappear randomly from the *atb\_prec.ini* file and the 3D Step-Response program would not run.

When I would edit the *atb\_prec.ini* file and put it back in, the program would run until the next time it somehow decided to disappear. (Kirchner says these issues have been corrected in the latest release) Other than this, the system performed reliably and consistently.

## Product Points

**Kirchner Electronic**  
**ATB Precision Acoustic Measurement**

### Plus

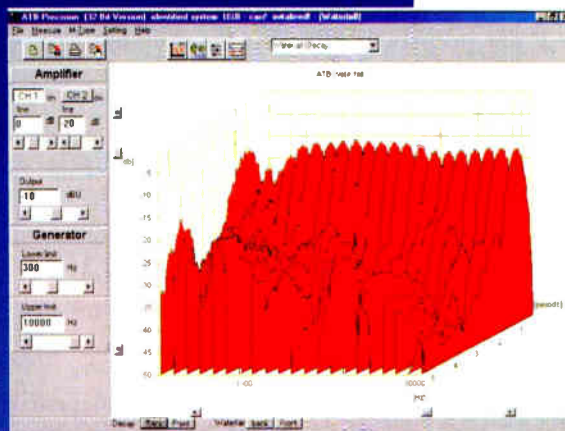
- Versatile multimode testing
- Easy portable use with laptop PC

### Minus

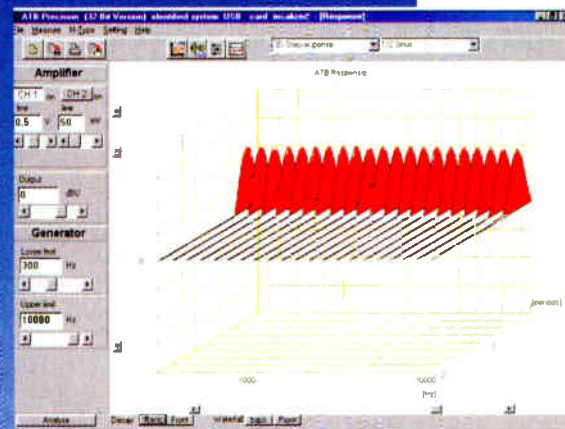
- MLS mode doesn't process into magnitude and phase

### The Score

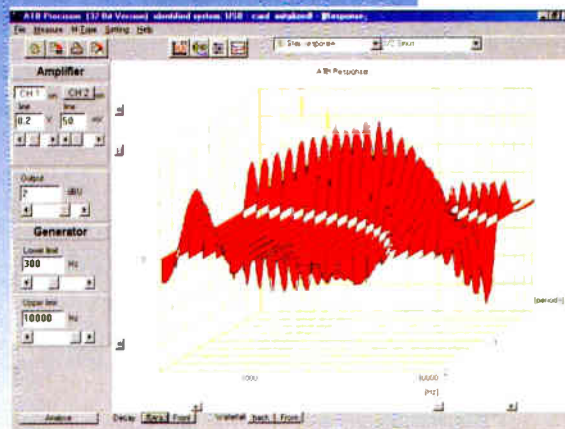
Speed, functionality and a variety of measurement modes combine to make the ATB Precision a useful, powerful and highly desirable measurement tool.



**Figure 4: Decay mode — test data for a loudspeaker**



**Figure 5: 3D Step-Response mode — test signal viewed back to front**



**Figure 6: 3D Step-Response mode — test data for a loudspeaker**

## Summary

I found the ATP Precision measurement system a useful and versatile testing device that should prove of considerable interest to loudspeaker researchers, manufacturers and reviewers — anyone with a serious interest in learning about loudspeaker behavior.

*Bascom H. King is a member of the IEEE and AES and a frequent bench test contributor to Pro Audio Review.*

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# Community XLT500 Series Speakers

by Andrew Roberts

Recognizing the popularity of their XLT speakers, Community created the XLT500 series of enclosures that, with enhanced features and modest prices, are sure to attract a wider market base. The XLT500s feature lighter weight, higher sensitivity, greater power handling, and a lower price point than their XLT brethren. These design changes make these new cabinets attractive to a wide range of users in sound reinforcement and related fields.

## Features

I received a total of eight cabinets for review: a pair each of XLT500 and XLT525 mid/high enclosures, and a pair each of XLT509 and XLT415 subwoofers. The

XLT500 is a trapezoidal cabinet that is 26.9 inches high, 20.3 inches wide, 18.2 inches deep and weighs a mere 50 pounds. It features a 15-inch woofer and 90 x 40 degree horn attached to a 1-inch HF driver that has a non-metallic diaphragm. The system has an internal crossover (2 kHz) and a three-stage protection circuit. Like all the enclosures in this series, this protection circuit features two three-color (red/yellow/ green) indicators located on the front and the rear of the cabinet. The XLT500 has a claimed frequency



response of 70 Hz to 15 kHz (+/- 3.5 dB) and a power handling capability of 400 watts continuous (4 ohms). The enclosure has both Neutrik Speakon and 1/4-inch inputs.

The XLT525 is a three-way trapezoidal  
continued on page 18



Bill Schneec, Grammy Award winning engineer,  
Owner of Schneec Studio, North Hollywood, CA.

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*"The KSM44 has amazing presence on vocals. It's a great all-around condenser mic."*  
-Eddie Kramer (Jimi Hendrix, Led Zeppelin, Kiss, the Beatles. ...)

*"I found the KSM44 to have an excellent natural quality with good presence and a nice open top end. This mic is so smooth in the midrange, even a banjo sounded good!"*  
-Joe Chiccarelli (Beck, U2, Elton John. ...)

*"I tested the KSM44 on vocals, bass, guitar, and drums, and haven't stopped using it since. It's hard to describe, but there is an immediacy to the KSM44 that is very appealing - sort of like a dynamic mic, but more elegant."*  
-Brad Wood (Smashing Pumpkins, Liz Phair, Better Than Ezra. ...)

**For a mic with  
such low self-noise,  
it sure creates a lot of buzz.**

*"The KSM44 is the quietest microphone I have ever used, and one of the best sounding too."*  
-Tom Jung (Pro Audio Review, DMP Records. ...)

*"As I compared the KSM44 to a mic I consider to be an old favorite, my ear immediately chose the KSM44. Shure has a fantastic studio mic that I can use for critical recordings - it's going to become a standard, very fast."*  
-Bil VornDick (Alison Krauss, Bela Fleck, Mark O'Connor. ...)

*"My first impressions of the KSM44 were warm, round, full - dare I say it? Fat!"*  
-Bob Ross (Recording Magazine)

*"The KSM44 is a remarkable achievement. I am especially impressed with the versatility of this microphone and have yet to find its limits."*  
-Steve Albini (Nirvana, Page and Plant, PJ Harvey. ...)

*"I was given the KSM44 prototype early-on, not knowing its intended purpose - so I tried it on everything. Guess what, it worked on everything!"*  
-Chuck Ainlay (Trisha Yearwood, Mark Knopfler, George Strait. ...)



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Community continued from page 16

cabinet with two 15-inch woofers, a 6.5-inch Ferrofluid-cooled mid-frequency cone and a 90 X 40 degree horn. Obviously, the

The XLT500 has a pleasing sonic signature with crisp highs and ample low/mid representation.

XLT525 needs a larger cabinet to accommodate the additional components. It mea-

sures 42 inches high, 20.3 inches wide and 18.2 inches deep, while weighing in at 80 pounds. The enclosure has crossover points of 500 Hz and 2.5 kHz with a frequency response of 60 Hz to 15 kHz (+/-5 dB) and a power handling capability of 600 watts continuous (4 ohms). It also has Speakon and 1/4-inch inputs.

The subwoofer cabinets I received were the XLT509 and the XLT415. The XLT415 is not really part of the 500 series, but it is often paired with the larger 500 series tops. The XLT415 has four horn-loaded 15-inch speakers in a cabinet that measures 33.9 inches high, 27 inches wide and 43 inches deep, while weighing 181 pounds. It has a published frequency response of 40 Hz to 250 Hz and a power handling capability of 600 watts continuous (4 ohms). The XLT509 has two front-loaded 15-inch speakers in its trapezoidal cabinet. The cabinet measures 34 inches high, 20.3 inches wide and 18.2 inches deep with a weight of 70 pounds. It has a stated frequency response of 40 Hz to 250 Hz and is claimed to handle 400 watts continuous (4 ohms).

## At a Glance

### Applications:

Live sound, installations

### Key Features:

Lightweight range of live sound mid/high cabinets and subwoofers; enhanced power handling; IntelliSense protection circuit and PowerMeter LEDs; 1/4-inch and Neutrik Speakon inputs.

### Price:

XLT500 (single 15-inch with horn/1-inch tweeter, \$779); XLT525 (double 15-inch, three-way, \$999); XLT509 (dual 15-inch sub, \$999); XLT415 (quad 15-inch sub \$1,400). Also available (not reviewed): XLT530 (single 15-inch, three-way \$949), XLT505 (single 15-inch monitor with horn \$789), XLT502 (single 12-inch multi-angle enclosure with horn).

### Contact:

Community at 610-876-3400; [www.loudspeakers.net](http://www.loudspeakers.net); or circle Reader Service 44.

## Shades of blue.



### S-phone Four Channel Headphone Amplifier

It's simply the most versatile and flexible four-channel headphone amplifier you can own. Each channel incorporates independent Level control, Two-Band EQ and a Stereo Aux Input. Listeners can also mix in more of their own signal for "More Me." Plus, the amplifier will power all *twelve* headphone outs.

The **S-phone**, like the entire Samson S Class range, represents a new perspective on audio processing tools.

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**In Use**

I used the XLT509 (dual 15-inch sub, \$999) and the XLT500 (single 15-inch with horn/1-inch tweeter, \$779) together on a variety of jobs. These two cabinets work very well in tandem. They are lightweight and can be joined by a short pole that fits in the top of the sub. I found the XLT509 sub to be surprisingly robust considering its light weight. It had no problems generating chest pounding thump in rooms of small to moderate size. Steve Milner, one of my engineers, and I marveled at how much bottom emanates from this cabinet, which I could carry with one hand.

The XLT500 has a pleasing sonic signature. It has crisp highs and ample low/mid representation. It is a speaker that is not fatiguing to listen to for extended periods. This feature is a bit of a double-edged sword though. When mixing an eight-piece jazz group in the atrium of the National Air & Space Museum, I was very pleased with the pleasant, articulate sound of the 500/509 combination. Vocals and drum overheads were clean and crisp while the kick drum and the upright bass were well represented too.

However, at a different venue with a rock band, I found the 500s to sound a bit thin when it came to cutting through the din of a reverberant environment. This problem was somewhat mitigated by a little tweaking on the house EQ. Despite this difficulty, the 500/509 combo was a joy to use and handled everything that my overpowered amps could throw at them. In fact, I never saw the red LED in the IntelliSense PowerMeter display come on.

I had a chance to use the XLT525 (double 15-inch, three-way, \$999) and the XLT415 sub (\$1,400) in one of Washington D.C.'s larger ballrooms with a crowd of about 700 people. We placed the 415s on the floor next to the

stage and were able to raise the 525s up to a reasonable height. Had we needed more height, the 525s are equipped with three rigging points for flying them. The event was for a group of lawyers from around the country and they had a rock band as the final fling of the evening. I must admit that I was somewhat skeptical about the ability of these cabinets to address such a large crowd. During the band's sound check, my skepticism was laid to rest. The 415s, powered by robust QSC amps, delivered very impressive thump throughout the room. The 525s were surprising as well. Even when the crowd swelled later in the evening, things remained clear and intelligible at impressive distances.

**Summary**

The XLT 500 series speakers are a good choice for a wide variety sound reinforcement purposes, given their minimal weight and modest pricing. The XLT415 sub is particularly impressive. The 500 series speakers offer crisp, intelligible highs, robust lows and they weigh next to nothing...well, much less than other cabinets in this class. These speakers are a good bet for in house audio, installs, musicians and smaller sound companies.

*Andrew Roberts, a regular contributor to Pro Audio Review, is a sound reinforcement and recording engineer.*

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LF CNTR RT LS RS SUB

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**Product Points**

**Community XLT500 Series Speakers**

**Plus**

- Lightweight
- Affordable
- Good sounding

**Minus**

- none

**The Score**

Versatile lightweight speaker series at a reasonable price.

# Waves Native Gold Bundle at 96 kHz (Part II)

by Dr. Frederick J. Bashour



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In Part I, I visited the equalization and dynamics plug-ins from the 32 "units" that the Waves Gold Bundle CD installed in my Mac/MOTU Digital Performer DAW system. I finish up here by testing the reverb, effects and stereo mastering plug-ins at 96 kHz and to see how they stack up.

As with the plug-ins previously detailed, some of the units the Waves installer put in my system were certified as "96 kHz-ready," while others were not. I found no obvious sonic problems with any of the plug-ins — certified or not.

## Reverb plug-ins

TrueVerb combines two separate modules — an Early Reflections simulator and a Reverb — to produce a high-quality, natural-sounding room effect. The user can define the room size, its decay time and frequency response, and uniquely, the distance to the sound source. TrueVerb was designed for the multichannel mixing environment, as it does not seem to change the original signal's stereo image or alter the perceived level balance of the mix.

Some of the fascinating controls featured in its well-designed interface are distance control, distance and reverb controls, linked distance and reverb mode, editable time and frequency-response displays, as well as space dimensional and variation controls.

A single stereo iteration of TrueVerb added a hefty 45 percent of additional CPU overhead to a Mark of the Unicorn (MOTU) system at 96 kHz, and didn't sound bad at all. When compared (at the lower sample rates) with Renaissance Reverberator, however, there was no contest — I preferred the latter hands down.

As with the other members of Waves' Renaissance processor collection, Renaissance Reverberator is easy to use as it presents just a few straightforward con-



## At a Glance

### Applications:

Studio, mastering, post production, multimedia

### Key Features:

Numerous high-quality iterations of all the standard plug-in types (reverb, EQ, compression, limiting, de-essing); also many not-so-standard ones such as delay, dither/noise shaping, stereo image adjustment, analysis, and metering; additionally, many other true sound design effect applications such as flanging, motion and direction steering. For Mac and Windows.

### Price:

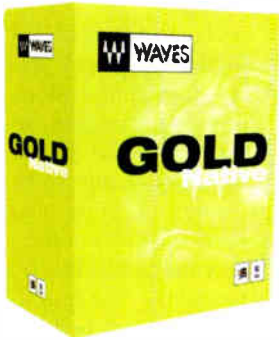
\$1,300

### Contact:

Waves at 865-546-6115;  
[www.waves.com](http://www.waves.com); or circle Reader Service 45.

controls and an elegant interface. It features rich reverb tails, as well as an early reflection system that provides increased density and texture.

Unfortunately, this plug-in is the biggest "CPU hog" of the group I'm reviewing this month. It added about 65 percent to my



processor meter — at 44.1 kHz (considerably more than TrueVerb added at 96 kHz!) — and sounds truly smooth and amazingly lush. I simply could not run it

at all on a 300 MHz PowerBook at 96 kHz, which was a bummer because I really loved its elegant interface and smooth sound. It is the closest-sounding reverb plug-in I have ever heard to the fat, warm, mellow presentation produced by my old Lexicon 300L hardware unit.

### Stereo mastering plug-ins

AudioTrack is Waves' original channel insert with four-band EQ, compressor and gate — all in one space-saving window — and is now 88.2/96kHz-ready. This plug-in

is ideal for multimedia producers, voiceover engineers and project studios, as it proved a quite efficient performer on my system, adding only 19 percent extra CPU overhead at 96 kHz. AudioTrack's EQ is a true, fully parametric four-band EQ, with bell, shelf and high-pass/low-pass filters, all said to be taken from the design of Waves' ParaGraphic Q10 equalizer (profiled in Part I). Its compressor has the typical four adjustments and includes facilities for tweaking expander ratios, as well as a nifty Autogain feature. The noise gate section sounds good and is easy to use.

AudioTrack sounds nice and works efficiently at 96 kHz; it may be all many users ever need. I don't know how the Waves engineers managed to simultaneously keep its sound quality up and CPU usage down — usually these two items are mutually exclusive!

S1 Stereo Imager is a great set of tools for remastering stereo mixes by enhancing and altering the stereo effect. It features true Blumlein shuffling, MS/L-R processing,

four unique stereo image tools, and is certified as 88.2/96 kHz-ready. Waves' accurate math helps it retain mono compatibility and avoid phasiness effects.

S1 uses a psychoacoustic "shuffling" process to produce a spatial enhancement effect. Its Width control alters the apparent size of stereo images, while Rotation alters level balance without affecting center channel sound positioning. The Width effect is uncannily like what I get by manipulating the angle between capsules in a stereo microphone and Rotation emulates rotating the mic.

You can also swap polarity and reverse stereo channels, as well as monitor the stereo effect through left/right or M/S metering. S1's components' added-CPU-load scores at 96 kHz were pretty reasonable: S1 Shuffler: 18 percent; Imager (which omits the shuffling and bass trim controls): 16 percent; MS Matrix: 14 percent.

PAZ is Waves' real time analyzer that features 52 or 68 bands, with RMS or peak meter-

continued on page 22

**MODEL 101**  
microphone preamplifier

Presenting the model 101, a single serving of the critically acclaimed **Grace Design** microphone preamplifier circuit. This compact, affordable module is designed to transform plain project studio tracks into stellar, high-fidelity recordings.

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\* 10-60dB gain with 10dB trim control \* extended gain ribbon mic input available  
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Regardless of budget, the Model 101 is an invaluable tool for any recording setup. With an integrated high impedance ¼ inch input, the model 101 is the ultimate DAW input tool.

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Waves continued from page 21

ing and variable integration time, and includes a stereo position display for evaluating the spread of the source. PAZ uses wavelet math (as opposed to FFTs) to provide users with optimal graphic accuracy. Individual bands update independently for the fastest response and consequently increased accuracy and resolution. This is the hippest stereo display I have yet seen on my Mac.

The Stereo Position Display shows how energy is spread in the stereo field — including antiphase information — through an intuitive real time vector display. This meter is different from a standard phase meter and effectively helps the user visualize the stereo image's energy distribution parameters.

PAZ's CPU load scores on my system at 96 kHz were Analyser: 26 percent; Frequency: 25 percent; Meters: 24 percent; and Position: 25 percent.

## Effects plug-ins

MaxxBass is a fascinating psychoacoustic processor that adds harmonics to trick the ear into perceiving low frequencies, which are not actually present in the output signal. It is officially certified for high-sample-rate use, and a stereo iteration added 14 percent to Digital Performer's CPU workload.

Working sort of like DeEsser, only backward, MaxxBass splits the input signal into two parts, with the crossover frequency control determining the split point. High frequencies are merely passed to the output while the bass signal enters the processor, which then creates a specific series of harmonics of those low frequencies, duplicating the dynamics and loudness of the original bass. One then simply mixes the MaxxBass Harmonics and the Original Bass sound — in any proportion — at the output, along with the high-pass signal.

SuperTap is a six-tap delay plug-in that can be used to produce a broad range of multitap delay effects, including analog and tape delay emulation, chorusing, rhythmic looping; it also includes modulator and feedback sections, provides up to six seconds of mono or true stereo delay and is 88.2/96 kHz certified. Each tap includes independent Q10-style filtering, rotation (stereo panning), gain and precision time control. The global LFO modulation and its two feedback modes expand its possibilities.



Waves' Rotation control on the feedback section can make each repetition progressively shift through (and outside) the entire stereo image. The user can set either the tempo or pattern using the Tap Pad and set delays using standard note values or milliseconds. Precision Ampex 440 head spacing delays at both 7.5 and 15 ips are only two of the killer factory presets ('Slap Elvis' is another cool one). SuperTap is installed as two and six-tap delays; 96 kHz CPU loads ranged from 28 percent to 40 percent, depending on the number of voices used.

MetaFlanger produces vintage tape flanging, phaser emulation and special effects — like a flanger on steroids. The Waves interface makes it possible to create gentle choruses, sharp phasing effects and a variety of true dual-delay flanging sounds quickly. The wet signal includes FIR filters so one can flange or phase just part of the signal.

MetaFlanger also features phase inversions at all key points, as well as extensive factory presets of vintage emulations such as models from Mutron, MXR and the old Faces' tune, *Itchycoo Park*. I congratulate Waves for producing a veritable treatise on flanging and modulation theory as part of the thick printed manual on the six effects in the Gold Bundle. Added CPU overhead at 96 kHz weighed in at only 14 percent.

MondoMod is a fascinating plug-in containing a combination of linked modulators — AM (tremolo), FM (vibrato) and Rotation (stereo panning) — for gently wandering guitar, solo panning or bizarre destructive effects. A single LFO drives all modulators with independent phase offsets between the modulator signals. At 96 kHz, my CPU was just coasting along at 15 percent total — my Digital Performer's stereo Studio plus a stereo iteration MondoMod.

UltraPitch is a formant-corrected pitch

shifter with six voices, and is installed as three units: single, triple and six-voice shifters. All pitch shifting is done with optional formant-correction to avoid that old chipmunk effect or for excellent gender bending. Each voice has independent stereo panning and delay, plus an Animator delay randomizer. The user can set the pitch shift by musical intervals (with five cent resolution); the formant mapping can be fully manual or one can use the presets, which emulate instrumental formant responses. UltraPitch can be used to create huge and thick stereo chorusing, doubling, parallel harmonies and excellent vocal slap/spread effects.

Enigma combines a complex notch filter system, short delay feedback loops and modulation. It can also be thought of as a complex phaser/flanger with a reverb/feedback network as modified by complex filtering and modulation circuits. Enigma produced only an 18 percent CPU hit at 96 kHz so, hey, you've got no reason not to try out some of its many effects on your next project. Keep your hands on the master fader — just in case — and don't forget to pack your motion sickness pills.

Waves' Doppler plug-in enables the user to create real time Doppler effects, both realistic and supernatural. Check out Jerky Tape Machine. Waves' Doppler provides auto and manual triggering modes, as well as full control of air damping, panning, pitch, path curve, gain, start/stop points and reverb tail. It takes a pretty hefty CPU hit at 96 kHz, however — 53 percent added to DP's performance meter.

## Summary

I had a ball playing with Waves' Gold Bundle's effects and mastering plug-ins, and can already predict how I am going to use many of them in my future engineering work. Waves is to be congratulated on the depth of its Gold Bundle plug-ins, their high overall sound quality — especially at 96 kHz — and the wonderfully informative style of their manuals. If you buy only one plug-in bundle, this should be high on your list.

Contact Waves at 865-546-6115; [www.waves.com](http://www.waves.com); or circle **Reader Service 45**.

*Dr. Fred Bashour is a jazz pianist, church organist, classical music producer/engineer, intermittent college professor, consultant to university music libraries on the digital storage of course listening materials and a Pro Audio Review contributor.*



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World Radio History

# EMM Labs ADC8 & DAC8 DSD/ PCM Converters

by Tom Jung

**A**s the model numbers might imply, the ADC8 is an eight-channel A-to-D converter while the DAC8 is an eight-channel D-to-A converter. What makes these converters unique is that both are designed to work in either the 1-bit DSD world or in the more well-known PCM domain.

## Features

Starting with the ADC8, the eight analog inputs are balanced on XLR connectors with front panel, 15-turn input trim pots that range from +14 dBm to +24 dB. Analog clip indicators are provided for all eight channels. PCM outputs are AES/EBU 24-bit with stereo pairs on four XLR connectors. PCM sample rates are 44.1, 48, 88.2 or 96 kHz. The DSD outputs can be taken from either ST glass fiber optic or BNC connectors in the SDIF-2 or 3 (Sony

continued on page 25 ▶



## At a Glance

### Applications:

Studio, mastering, post production

### Key Features:

PCM or DSD A-to-D and D-to-A; Balanced analog in and out; ST fiber optic and BNC for DSD; AES/EBU XLR for PCM

### Price:

ADC8: \$6,500; DAC8: \$6,500.

### Contact:

EMMLabs at (403) 225-4161; [www.emmlabs.com](http://www.emmlabs.com); or circle Reader Service 46

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READER SERVICE NUMBER 65



EMM Labs continued from page 24  
(Digital Interface) format.

DSD uses one ST optical for clock and a separate ST for all eight data channels, making it possible to connect all inputs to a Sony Sonoma DSD recorder/workstation with just one pair of fiber optic cables, and of course an additional pair for the D-to-A side. A total of nine BNC coax cables are required for the eight data channels plus clock. The DSD data stream output is at  $64 f_s$ , which is 2.8224 MHz/sec. ( $64 \times 44.1$  kHz). Normally the ADC8 provides the master clock for an original DSD recording session using the Sonoma system; however, an external clock input is available on BNC.

The ADC8 can also be used as a D-to-D format converter with the ability to convert from DSD to PCM or from DSD BNC to DSD optical. These conversion capabilities can be very handy.

A power factor-corrected phase-locked switchmode power supply isolates the ADC8 from AC power contamination while making sure it does not pollute the AC line itself. This supply is synchronized with the clock in the ADC8 so that no beating or heterodyning is possible between the converter circuits and the PSU. Typically, in high-end audio, switching power supplies are taboo since many of them are noisy and can cause distortion and noise in the audio signal itself. In this case, EMM Labs' PSU was stringently designed to meet the performance of an equivalent bank of lead acid batteries.

The DAC8 has eight balanced outputs on XLR connectors with trim pots covering an output range of +14 dB to +24 dB. The output impedance is 50 ohms. Digital input formats are DSD on BNC or ST optical selectable via a front panel switch.

The eight PCM inputs are on four XLR connectors. Base sample rates of 44.1 kHz or 48 kHz and can be increased to 88.2 kHz or 96 kHz by simply changing the  $1 f_s$  switch to  $2 f_s$ . The DAC8 has an internal clock or it can be clocked from PCM input XLR #1 (channels 1 and 2). DSD clock input can be either BNC or ST optical. Because the DAC8 has such a low-jitter, rock-solid internal clock, I have found it desirable to make the DAC the master clock, and lock the source to it in certain situations. A front panel blue LED illuminates when the DAC is locked.

Format conversion from 24-bit PCM to DSD is possible at either 44.1 kHz or 88.2 kHz. DSD optical ST can be converted to DSD on BNC connectors as well.

### In use/summary

I have used the ADC8 and the DAC8 on my

last three record projects and have never had such an overall satisfying recording experience. The ST optical connections were used to interface with the Sony Sonoma DSD workstation, which served as the recorder and editor.

These converters are so transparent and accurate that they have changed the way I work. I find that fewer microphones are needed to get satisfactory results. No more than seven microphones were used on any of these recordings and that was for a six-chan-

nel surround recording!

Not only do these converters work well in DSD, but I can safely say these are the best sounding, most accurate PCM converters I have heard. I attribute this to EMM Labs' totally balanced, differential analog design, extremely low jitter and the switchmode power supply.

Tom Jung is PAR's technical consultant. For more information recordings mentioned in this review, see [www.dmpreconls.com](http://www.dmpreconls.com).

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READER SERVICE NUMBER 16

# B2 Technologies XtraHand Soldering Helper

by Bob Kovacs

There is no substitute for the right tools and, like any other electronics nut, I'm always looking for something to make my life easier on the workbench. The B2 Technologies XtraHand is a soldering helper that holds XLR, RCA and phone connectors so you don't chase them around the workbench with your soldering iron.

## FEATURES

The XtraHand is a 2-inch square tube that is about four inches long. The tube is made from 1/4-inch thick aluminum, making it heavy enough to provide a good anchor for connectors while still light enough to throw in a toolbox.



On one side of the black-anodized tube are various holes and studs, into which you insert the most popular audio connectors. The XtraHand then holds the connector as you solder the wires. One of the holes doubles as the support point for both 1/8-inch and RCA connectors. The two XLR supports — one each



## At a Glance

### Applications:

Test/maintenance

### Key Features:

Supports XLR, 1/4-inch, RCA and 1/8-inch connectors

### Price:

\$29.95

### Contact:

B2 Technologies at 612-895-5091; or circle **Reader Service 28**.

for male and female connectors — have large, easily visible numbers next to them to indicate the connector's pin numbers.

## IN USE

The XtraHand couldn't be simpler to use, even without a manual. The little jig firmly holds XLR connectors without twisting and the large numbers are perfect for my aging baby boomer eyes. The two small round holes, however, don't prevent twisting of RCA and phone connectors as you try to solder them.

A feature missing from the XtraHand is a clamp to hold the cable. This is usually not a problem with phone and RCA connectors, as these have small holes in the terminals that hold wires in place.

However, every XLR connector that I've ever worked with has nothing to hold the wire in place as you solder it. Soldering XLR connectors usually means that you need a friend, significant other or a clamp to hold the cable just right, while you tack in that first wire.

## SUMMARY

The XtraHand does the trick for phone connectors and provides some useful help for XLR connectors. It's less useful for some common varieties of RCA connectors. And don't forget that you still will have to figure out a way to support the wires as you solder them.

*Bob Kovacs is the technology editor for PAR's sister publication, TV Technology.*



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READER SERVICE NUMBER 66

# Surround Setup: Checkpoint Sound Alignment System

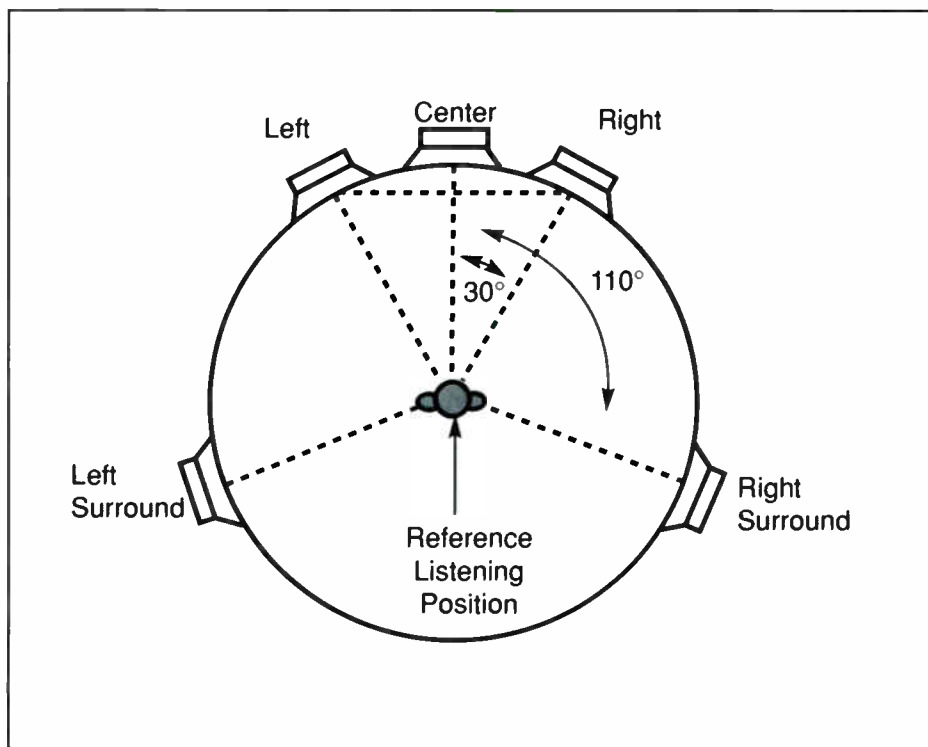


by Tom Jung

I think it is safe to say that surround sound is here to stay, unlike the quadraphonic days when the LP was unable to deal with any more than two channels. Three competing quad formats (none of which worked very well) attempted to

simply would not support multichannel.

The proposed quad set up had a speaker in each corner of the room, which turned out not to be a very good place to put even one speaker much less four. Corner placements make many speakers



The ITU Standard with five identical speakers, each equidistant from the listener

cram four channels on an analog disc, but only succeeded in destroying each other, sending the consumer away thinking that any more than two channels was unnecessary. While there was nothing wrong with the idea of multichannel for either movies or music, the delivery format of that time

sound boomy, due to the fact that the floor and two adjacent wall boundaries reinforce certain low frequencies in unpredictable and unflattering ways.

DVD video has produced a critical mass of home theater audio systems with its 5.1

continued on page 28

## WHAT'S your pleasure?



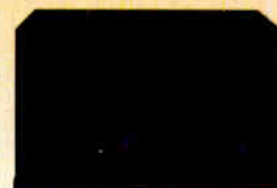
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The High End continued from page 27

configuration: left front, center, right front, left surround, right surround and LFE (.1 or subwoofer). This is the most common speaker arrangement and works quite well for movie soundtracks and music. However, in a residential environment it not always possible to get five speakers set up in the intended arrangement.

Unfortunately, some five-channel systems have three or more different types of speakers comprised of left and right front, a center channel — which often times is a horizontal two-way sitting on top of the TV — with the surround channels sometimes bidirectionally mounted on the sidewalls. In dedicated rooms where speakers can be set up in more ideal locations for home theater or entertainment systems, they have the potential to sound great and provide lots of entertainment bang for the buck.

On the pro side, speaker placement is more precise and almost always uses the same type of speakers. The International Telecommunications Union (ITU) standard for five speakers defines the angles

## Setting up an accurate surround monitoring system is a must.

from the listener as 30 degrees each for left and right front, and 110 degrees for left and right surround, with zero degrees as center. All speakers are supposed to be at the same distance from the listening position. This setup seems to be the most popular among engineers, but I can tell you from experience that getting all the angles correct can be a real pain using a just a protractor.

### Checkpoint to the rescue

Checkpoint is a company that makes precision laser alignment tools for the construction industry. Since the prolifera-

tion of home theater systems, SA-S (Sound Alignment Systems) was formed as a division of Checkpoint to meet the needs of home entertainment system setup. A series of laser alignment tools and accessories are available as a kit or in parts depending on the needs of the end user.

The Pro Tech 2.05 kit is a must for sound system installers with tools to accurately position in-wall speakers, video projection and free-standing speaker systems. The 2.05 includes three separate laser systems. The P-770, the core component utilized in SA-S work, is basically a level with an internally mounted laser tool. This device can slide into a rotary base with a protractor and can mount on a tripod. For me this is the most useful tool as it can be placed in the sweet spot and project the laser precisely to the proposed speaker location. SA-S specs the accuracy to within a 1/4-inch at 100 feet. Other laser tools can be used to mount magnetically on the front surface of a speaker for precision aiming at the listening position.

## 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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World Radio History



### VT-1

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READER SERVICE NUMBER 31



Checkpoint SA-S Sound Alignment System

The LG-120 line generator projects a visual laser line depicting the sound projection from a speaker to which it is attached. This is helpful in determining what the speaker is looking at in the room as far as reflective surfaces. And the Inco-Matic is a laser tool that has a built-in inclinometer with an LCD readout displaying either degrees of angle or percentages. All of the laser tools and accessories are beautifully made and attractively finished.

Angle layout guides and layout plot sheets are included so that system setup can be documented and repeated if the set up is not permanent.

A tool to measure the distance from the speaker to the listener is the only missing link. It seems a bit primitive to get out the old tape measure after using all these nifty laser tools. I mentioned this to the SA-S folks and they told me there is a laser distance measuring device in the works for such a purpose that will be called the Distron and should be available in early 2002. I will keep you posted on this. I find that distance from the listener to the source to be one of the most important elements in any speaker setup. Glen Phoenix of Westlake showed me years ago how as little as a half-inch difference between speaker/listener distances can mess with the ability of even a two-channel, high-resolution system to focus properly.

In my own surround work I have been using the basic ITU setup but with a sixth full-range height channel instead of an LFE channel. I feel that a dedicated channel for low frequencies is fine for movies but is of little use to me for music, so why waste the channel? The SACD Scarlet Book spec provides for six full-bandwidth (100 kHz) channels plus two more for stereo, and that is just the high-resolution or DSD layer!

In my early height experiments, I used the sixth channel as an overhead. Even

though it worked pretty well, I found that it was dreadfully impractical, and even stupid, to think people were going to mount an overhead speaker to listen to my recordings. More recently, an elevated center surround has replaced the overhead with great results.

Having worked with quadraphonic in the '70s, I have learned from many mistakes what does not work. Setting up a good, accurate surround monitoring system is a must, and it is the first thing you do before you jump into multichannel.

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

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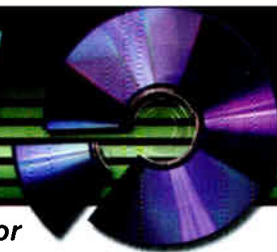
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READER SERVICE NUMBER 40



by Chuck Taylor

## Ozzy Osbourne's "Gets Me Through"

**SINGLE:** "Gets Me Through," by Ozzy Osbourne, recorded in March 2001, reached number two on Billboard's Mainstream Rock Tracks chart.

**ALBUM:** *Down To Earth* on Epic, Osbourne's first studio album in six years.

**RECORDING ENGINEER:** Mark Dearnley. Previous projects include Paul McCartney's new *Driving Rain*, Marilyn Manson, Tom Petty, Carl Perkins, AC/DC, Def Leppard, Black Sabbath.

**SONG PRODUCER:** Tim Palmer

**SONGWRITERS:** Ozzy Osbourne, Tim Palmer

**SONG MIXERS:** Tim Palmer, Mark Dearnley

**STUDIOS:** Recorded at Henson Studios, Hollywood, Calif., mixed at Scream Studios, Studio City, Calif.

**MASTERING ENGINEER:** Stephen Marcussen

**CONSOLE:** SSL J-series

**MICROPHONES:** AKG D112, AKG 451, Neumann U 47 FET

**MICROPHONE PREAMPS:** Neve 1073, GML, SSL J-Series (in console)

**PROCESSORS:** Neve & API EQs, Prism Sound Maselec MEA-2 Stereo EQ, Tube-Tech LCA 2B compressor, dbx 160 compressor/limiter, Teletronix LA 2A leveling amplifier

**RECORDER:** Digidesign Pro Tools, with Apogee Electronics AD-8000 converters

**MONITORS:** Genelec 1030As and Mackie HR824s



Engineer Mark Dearnley

## Engineer's Diary

After so many years, Mark Dearnley no longer lists on his resumé the dates of his recording projects. "I started doing this as an apprentice in London in 19-hundred-frozen-to-death," the British-born engineering veteran says with a laugh. His first major album? AC/DC's classic *Highway to Hell*. You can do the math. In the years since, Dearnley has participated first hand in the evolution of rock music, working with the likes of Tom Petty, Uriah Heep, Black Sabbath, Def Leppard, Marilyn Manson, and Hootie & the Blowfish.

Dearnley's chose to use Digidesign's Pro Tools for tracking and overdubs on *Down to Earth*, Ozzy Osbourne's first studio album in six years. "We used Pro Tools more as a recording device and as a way to manipulate various bits and pieces. We pretty much tracked straight into it." The album's mainstream rock hit, "Gets Me Through,"

started with the recording of live bass and drums, guitars, then vocals and "some serious overdubbing after that," says Dearnley.

Dearnley credits Pro Tools for bringing the most profound changes to an industry that has grown tremendously over the last couple decades. "Everything changed with the advent of Pro Tools," he says. "It's a system that's hard to leave once you get used to it. You can apply your knowledge of analog and find ways to come up with a nice hybrid. It's made it an exciting time to be in recording."

"Ozzy had a lot of involvement in the process. He has a strong image of what he doesn't like, so we got things sorted out rather quickly." In between sessions for *Down to Earth*, Dearnley engineered another high-profile project, Paul McCartney's new *Driving Rain*, making for a rather memorable 2001. "Working with Ozzy was quite an experience," he says. "We both have a rather antique sort of British humor, and he would throw out some rather superb one-liners. He's really one of the nicest guys on the planet. If he asked, I'd be straight there again"

For more information on Mark Dearnley, see [www.dearnley.com](http://www.dearnley.com).

Chuck Taylor is senior editor/single reviews editor at Billboard magazine in New York.

# Ear Q Technologies Reference Hearing Analyzer System

by Stephen Murphy

To test or not to test? That is the question nagging those of us who make our living using our ears. The real question is: how many of us would rather bury our heads in the sand than know the truth?

Weighing in on the side of the ostrich are the cost and hassle of visiting a doctor, who will most likely only test in the 125 Hz to 8 kHz "speech" range.

With the introduction of its Ear Q Reference Hearing Analyzer System (\$399), Ear Q Technologies is bringing the whole hearing range truth home (or workplace or on the road). No more excuses...

## Features

The Ear Q system is comprised of software for Win 95/98/2000/NT PCs (Mac and Pro Tools plug-in versions to come), Airphones high-isolation studio headphones and a calibrator unit. Hardware requirements are minimal, requiring a Pentium 166 MHz PC with 16 MB of RAM, a SoundBlaster AWE64 soundcard or better, and a mixer or amplifier to drive the headphones.

The small, 9-volt battery powered level calibrator has few features, all of which are



## In use

Hooking the system up (computer soundcard analog output to the headphone amp; headphone amp output into the calibration unit; calibration unit output to the headphones) was easy enough, once I rounded up the proper cables and adapters. Installation of the software was also straightforward, though a little old school (it required manually copying and pasting files from the supplied floppy diskette into a new directory you create on your hard disk).

The easy-to-use interface starts with a calibration routine that sends a 1 KHz tone from the soundcard through the headphone amp to the calibrator. The headphone amp output is then adjusted to the proper level using the three LEDs on the calibrator (yellow=under, red=over, green=calibration level). Once the level is set, stop the calibration routine, unhook the calibrator from the headphone amp and plug in the Airphones headphones. Let the tones begin!

The testing window displays a bank of 16 faders, each corresponding to a frequency within the test range of 63 Hz to 20 KHz. Starting with the left ear, the user raises each fader until the tone is clearly heard, then back down until the tone can no longer be heard, then back up slightly to the minimal audible (or hearing sensitivity) level. The same process is then repeated for the right ear.

Unlike standard hearing tests using pure tones, Ear Q uses slightly warbled tones to

continued on page 45

## At a Glance

### Applications:

Test and measurement

### Key Features:

PC software for Win 95/98/2000/NT (Mac and Pro Tools plug-in versions to come), Airphones high-isolation headphones, Ear Q Calibrator unit.

### Price:

\$399

### Contact:

Ear Q at 415 479 7339;  
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Service 32.

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READER SERVICE NUMBER 34

December 2001 PRO AUDIO REVIEW 31

# PRO AUDIO REVIEW 2001 Pick reviewer's

Each year, Pro Audio Review asks the writers and editors to choose the best audio gear they reviewed in the previous 12 months. Comprised of audio products deserving special mention, here are the PAR Reviewer's Picks for the year 2001:

## Studio/Project Studio

- ADAM S-3A Powered Ribbon Speaker (11/01)
- Aguilar Amplification DB 900 Tube Direct Box (5/01)
- Akai DPS16 Digital Personal Studio (7/01)
- Audio-Technica AT3035 Microphone (11/01)
- Carvin 6.5 Closefield Speaker (6/01)
- Blue Kiwi Multipattern Microphone (7/01)
- D.W. Fearn VT-4 LC Tube EQ (3/01)
- dbx 376 Tube Channel Strip (10/01)
- Earthworks 1024 Four-Channel Microphone Preamp (5/01)
- Genelec S30D Powered Ribbon Speaker (6/01)
- GT Electronics Vipre Mic Preamp (4/01)
- Grace Design Model 101 Mic Pre (12/01)
- iZ Technology RADAR 24 (5/01)
- Manley Labs 16X2 Tube Mixer (8/01)
- Neumann M150 Tube Microphone (4/01)
- Sennheiser MKH 800 Microphone (10/01)
- Shure KMS 44 Condenser Microphone (1/01)
- Sony DMX-R100 Digital Console (7/01)
- Soundelux ELUX 251 Tube Condenser Microphone (10/01)
- Universal Audio 1176LN Solid State Limiter (3/01)
- Westlake Lc3w12V Speaker (6/01)
- Yamaha AW 2816 Multitrack Recorder/Mixer (11/01)

"The playback through the **A.D.A.M.s** was incredible in its realism. The high end was clear and natural through the ribbon tweeter."

*John Gatski, 11/01*



**ADAM S- 3A Powered Speaker**  
(See <http://www.proaudioreview.com/par/november01/ADAM-web.shtml> for review)



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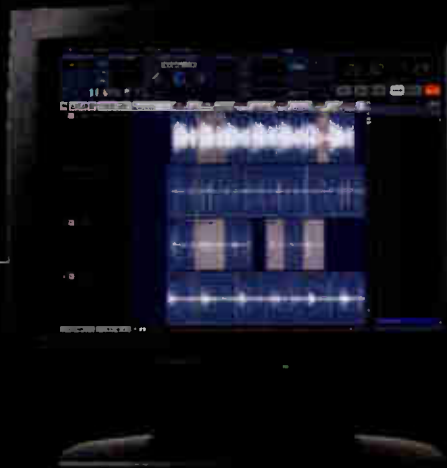
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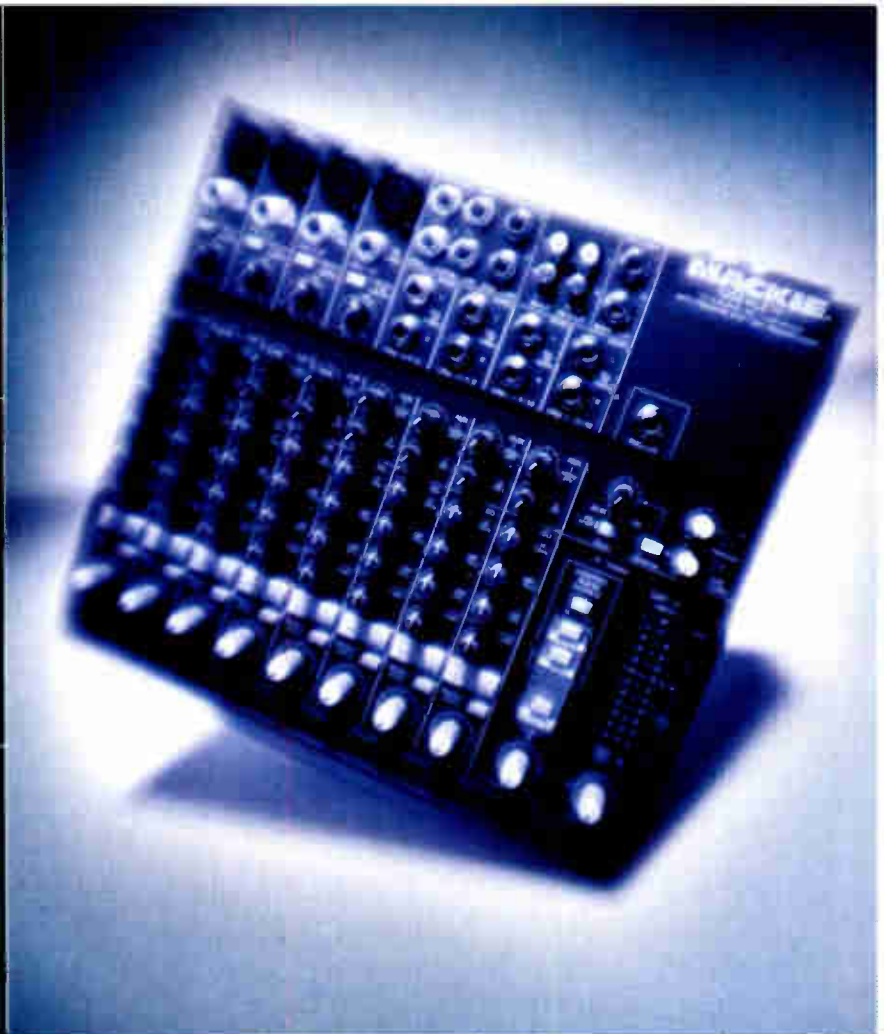
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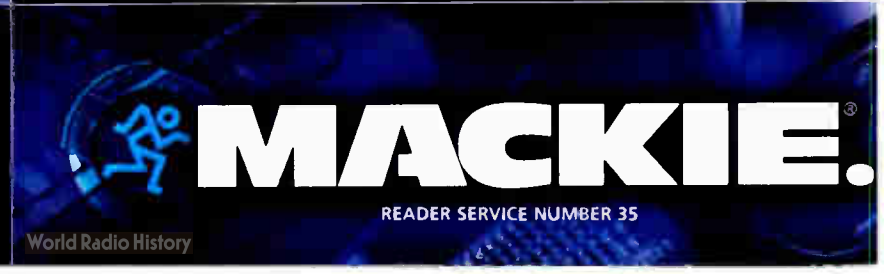
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“...the fact that there are **six channels of 250 Watts** each in a box three rack spaces high is extraordinary. This is a very versatile amplifier.”

*David O'Brien, 7/01*



### Ashly Audio 6250 Amplifier

(See <http://www.proaudioreview.com/par/july01/Ashly-web.shtml> for review)



## Live Sound/Contracting

- AKG D 440 and D 880 Emotion Series Live Microphones (9/01)
- Ashly Audio 6250 Powerflex Amplifier (7/01)
- Audix VX-10 Handheld Condenser Microphone (3/01)
- AudioControl Model 710 Multichannel Amplifier (7/01)
- BSS Audio MiniDrive FDS 336 Digital Speaker Processor (9/01)
- Community Loudspeaker XLT500 Series Speakers (12/01)
- JBL Eon 15 G2 Bi-amplified Speaker System (3/01)
- JBL Vertec Line Array System (5/01)
- Klark Teknik DN9848 Digital Crossover (3/01)
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## Location/Broadcasting

- Eventide Orville Harmonizer (4/01)
- HNB MDP500 PortaDisc Portable Mini Disc Recorder (4/01)
- Lectrosonics UT200C and UDR200C Wireless Microphone System (9/01)
- Nagra RCX-220 Handheld Digital Audio Recorder (8/01)
- Schoeps VMS 5U Microphone Preamp (9/01)



*Lectrosonics Wireless mic Systems*

“The **difference was remarkable**. Whereas the competing wireless systems showed a tendency to distort the sound of the voice, the 200C reproduced it quite clearly.”

*David O'Brien, 8/01*

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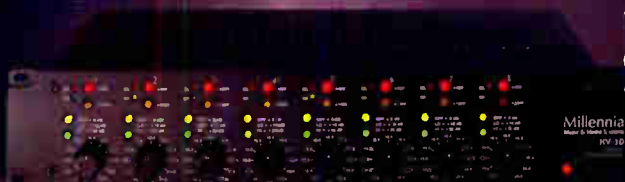
Over 130 product combinations in one chassis. Select transformer-coupled vacuum tube preamp, parametric EQ, compressor/limiter, de-esser, & DI input for a lush, rich sonic palette. Or choose transformerless, all discrete, Class A solid-state amplifiers for Millennia's trademark musical realism. Or select *any combination* of transformer, vacuum tube, or solid-state signal paths for an almost unlimited array of tonal creativity.

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Eight channels of Millennia's extraordinary microphone preamplifiers housed in a new, ruggedized chassis befitting a military envoy. The *HV-3* remains a first choice of top artists, engineers, and producers. Also available in two and four channel units.

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recording worldwide.



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*Glen O'Hara, 10/01*



Lake Technology TheaterPhone

## Mastering & Post Production

- CEDAR DNS1000 Denoiser (6/01)
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- DSP Media AV Transfer (9/01)
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- TASCAM DA-98 HR DTRS Recorder (11/01)

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*Dr. Fred Bashour, 5/01*



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- Antares Microphone Modeler AMM-1 and Plug-in (1/01)
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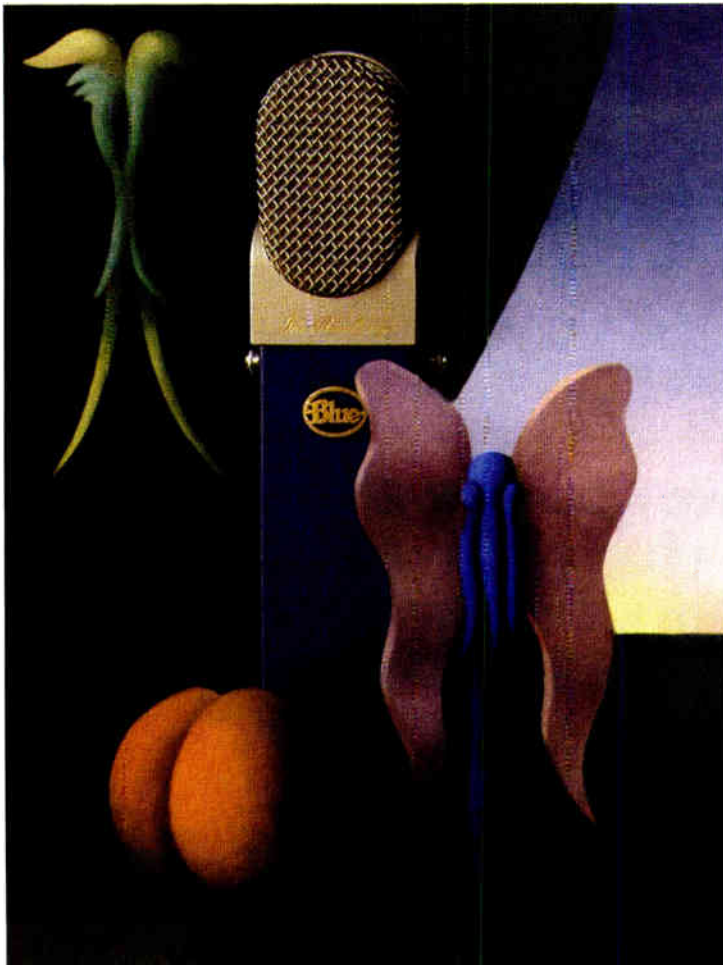
Mark of the Unicorn 1296 Audio Interface

"The construction and workmanship are impeccable, and the parts used throughout are of the highest quality."



— George Petterson, Mix Magazine

# Berry Good.



Named Microphone of the year by Electronic Musician for 1999, The Blueberry consists of a Class A discrete transformer based microphone amplifier perfectly chosen to compliment our cardioid pattern, hand built large diaphragm capsule.

First and foremost, the Blueberry has been designed to provide the commanding, intimate presence associated with the world's best (and most expensive) vintage vocal microphones. With its shimmering, detailed highs, smooth midrange, and minimized proximity effect (a bass boost inherent in all unidirectional mics), the Blueberry excels at delivering a vocal right to the front of the mix where it belongs. When processed with limiting and/or compression, as is standard practice for most pop vocals, tracks recorded with the Blueberry will be free of pumping, low frequency thumps. Acoustic guitar, hand percussion, drums, and other critical high end sources also shine in front of the Blueberry, gaining an extra measure of presence that enables the most delicate sounds to cut through a mix, even at very low levels.

The Blueberry has been designed to fill the needs of the home musician and professional alike. Whatever your music, add a Blueberry to the mix and let your ears feast on the sound.

### Optional Accessories:

#### Series I Shock/Pop

*Our top-end shock mount and pop filter assembly, unique in design and great in performance*

#### Series II Shock

*For those not requiring a pop filter, our budget shock mount delivers superb performance*

#### Blueberry Microphone Cable

*High-definition audiophile mic cable*



Microphones



Dragonfly



Blueberry



Mouse



Kiwi



Cactus



Battle



Baby Battle

# Grace Design Model 101 Microphone Preamp

by Loren Alldrin

**A**lthough Grace Design has been building audio equipment for a decade now, the company has made a name for itself in recent years as a builder of high-performance (and high-dollar) mic preamps. Hoping to spread the magic into the three-digit price range, Grace recently introduced the Model 101 mic preamp.

## Features

A single-channel preamp in a half-rack-space chassis, the Grace Model 101 (\$699) is clearly targeted at home and project studio owners who have the budget for at least one channel of high-quality mic preamplification.

The transformerless Grace Model 101 offers up to 60 dB of gain from what the manual describes as a "high-resolution transimpedance gain stage." The Model 101 has the usual microphone input on the back panel, as well as rear-mounted XLR and 1/4-inch TRS out-



puts. Both actively balanced outputs can be used at the same time.

The Model 101's feature set does not stray far from the mic preamp basics, but it does add a few nice touches. The first is a high-impedance (1 M-ohm) instrument input mounted on the front panel, which is unique in that it will accept balanced sources as well as unbalanced. Instead of using a standard internal switch to engage this instrument input, the Model 101 uses a gold-contact relay.

When using the instrument input, the preamp's gain shifts from the mic range (+10 dB to +60 dB) to one more suitable for instruments (-10 dB to +40 dB). A high-gain version of the Model 101 (same price) is available for users who need even more gain. Designed primarily with ribbon microphone users in mind, this version offers an additional 10 dB of gain.

The Model 101's main gain knob is the stepped variety (5 dB increments), which makes it easy to return exactly to a previous gain setting. To the right of the gain knob is a two-color signal level LED that lights green when the output signal reaches -20 dBu and flashes red when the output hits +16 dBu. When this fast-acting LED turns red, there is still 10 dB of headroom left.

Downstream of the level LED is the preamp's output trim knob, which attenuates the output signal by up to 10 dB. This knob does not have detents, and is not exactly linear in its travel. At its halfway point (straight up), the knob is already knocking the output signal down by 8 dB.

The Model 101 has a wallwart power supply. Although wallwarts often can mean no actual power switch, Grace Design did include one on the Model 101 — always a welcome addition. Other switches include a high-pass filter at 75 Hz (12 dB/octave) and phantom power.

## In use

The front panel of the Model 101 bears a striking chrome finish, right down to the knobs and switches. To keep the knobs from being slippery and hard to operate, each knob is ringed with a thin band of rubber (like a grommet). This makes the knobs easy to turn and complements the chrome and black theme of the faceplate.

While it is an added bonus when a mic preamp looks and feels wonderful, obviously it's how the preamp sounds that really matters; turns out that in sonics as well as looks, the Model 101 shines.

The Model 101 has a detailed, open sound that brings the best out of a microphone. Its sound has a bit of an edge to it, thanks to a forward and somewhat aggressive upper-mid response. I loved

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**At a Glance**

**Applications:**

Studio, broadcast, live sound

**Key Features:**

Front-panel instrument input; high-pass filter; stepped gain and continuous trim knobs; wide bandwidth and low distortion

**Price:**

\$699

**Contact:**

Grace Design at 303-443-7454; [www.gracedesign.com](http://www.gracedesign.com); or Reader Service 48.

what it did to open up certain sounds, such as male pop vocals, finger-picked acoustic guitar and percussion. These tracks really jumped out of the mix, and required less EQ than usual.

Only in a few cases (aggressively strummed acoustic guitar being one) did I wish the sound were a little smoother. On one spoken word recording, for example, the Model 101 did not quite capture the smooth, full sound that I was after.

Sonically, the Grace Design Model 101 reminds me of one of my favorite solid state preamps, the Earthworks LAB series (although the Model 101's sound has a little more edge). The Model 101's specs are similarly stellar, with extremely low noise and distortion figures, single-digit phase shift and a flat frequency response out into the 300 kHz range. The Model 101 offers the advantage of the front panel instrument input, which also sounds great.

My only complaint with the Model 101 is that it does not have a pad. Even at the lowest microphone gain setting (10 dB), with the trim rolled all the way back, a hot condenser microphone on a drum kit or loud guitar amp can overdrive the preamp.

**Summary**

In the sonics department, the openness and clarity of the Model 101 put it on par with some of the best solid state microphone preamps money can buy. It has transparency and detail, but is in no way clinical or boring. With its up-front sound and hint of edge, this preamp would nicely balance the mellow sound of a ribbon microphone or "vintage" condenser.

At \$700 per channel of preamplifica-

tion, the Grace Design Model 101 is not exactly inexpensive. But if home or project studio owners can dig a little deeper to invest in the most important gain stage in their studio, the Grace 101 would be an excellent choice.

Loren Alldrin is *Pro Audio Review's* project studio editor and author of *The Home Studio Guide to Microphones*.

**Product Points**

**Grace Design Model 101 Microphone Preamp**

**Plus**

- Open, detailed sound
- Front panel high-impedance instrument input
- Compact chassis and cool chrome vibe

**Minus**

- No pad

**The Score**

A single-channel, affordable preamp that delivers world-class sound to home and project studios.

**40 Years of Innovation**

Vega founded  
Cupertino, CA 1960

**Debut of "VEGA-MIKE"**

Years ahead of its time, the Vega-Mike system was an FM broadcast station featuring a handheld mic combined with this stylish helmet antenna.



**Wireless system installed in church**

Vega's first wireless microphone systems installed in houses of worship date back to the Beatles. Today, customers are still singing the praise of Vega microphones and intercom systems.

**Vega wins an Emmy**

Vega receives an Emmy Award for outstanding achievement in technical and engineering development for pioneering wireless technology in broadcast.



**Q700 frequency-agile Wireless Intercom System**

Always the innovator, Vega establishes a new reference standard for wireless intercom systems — the world's first frequency-agile, 1200 channel wireless intercom system.



**UHF**

**Vega petitions FCC to open UHF band**

Vega again petitions the FCC to open the UHF television band.



**1st wireless mic system used in film production**

With the release of "Mutiny on the Bounty" starring Marlon Brando, Vega supplied the first wireless microphone system to be used in film production.



**VHF**

**Vega petitions FCC to open VHF band**

Gathering the support of major broadcasters, Vega took the lead in the FCC petition to open the high VHF television band for wireless microphones in the United States.

**Q600 Wireless Intercom System**

Vega introduces the venerable Q600 intercom, a system which has garnered rave reviews world-wide for its reliable ruggedness and wide frequency response. Sales remain strong into 2001.



**U2020 100 channel UHF Wireless System**

Vega sets the standard for frequency-agile, full duplex UHF wireless microphone systems with the introduction of the renowned U2020.

**Acquired by Vitec Group, plc.**

With a renewed commitment to innovation, Vega begins an aggressive research and development program which aims to revolutionize wireless mic and intercom systems.



# 2001

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Model 710 multi-zone amplifier

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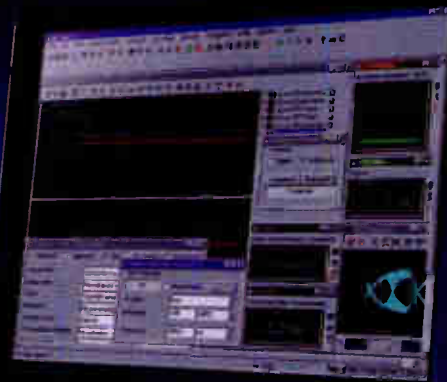
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Ear Q continued from page 31

reduce the effect of ear canal resonance at the higher frequencies. Using an accepted audiological test method, the test tones are not continuous, but instead are in short bursts (approximately 1/2 second on and 1/2 second off).

The faders can be moved in 1 dB or 5 dB steps (software selectable) using the mouse or the keyboard cursor up/down keys. Note that there can be a delay between moving the fader and hearing a change in volume in 1 dB step mode, especially if you are stepping up or down faster than the tone burst cycle.

When the testing is complete, save the results with a descriptive name (say, 'After live speed-polka death metal concert'), and click "Display Results as Audiogram." This brings up a graph with the vertical axis divided into five color bands (from 'severe' to 'normal') with the horizontal axis corresponding to each test frequency. The right and left hearing data is plotted using lines of different colors. Earlier test data (say, 'Before live speed-polka death metal concert') can be simultaneously displayed for easy comparison.

Another function of the Ear Q test system is to provide you with suggested "corrective" equalization settings for tailoring a sound system to your hearing response. The suggested EQ settings are based on algorithms derived from Etymotic Research's FIG6 formulas. Suggested EQ settings are provided for three listening levels — "soft" (65 dB), "comfortable" (80 dB) and "loud but comfortable" (95 dB).

The Ear Q system performed as expected throughout my evaluation, though I did have a few quibbles with the software interface. Minor irritants included having to consent to the software license agreement every time the program is launched, and a pop up screen that cannot be bypassed. On my wish list: I would like to see Ear Q add the ability to launch the Audiogram graph program (say, to review earlier test data) without going through the calibration and hearing test interfaces first. It would also be useful to be able to toggle on/off comparative test data overlaid on the Audiogram graph display.

## Summary

After extensive testing, I am impressed by this powerful and informative test system. I was surprised by the consistency of the test results when measured under the same conditions (e.g. 'Late night writing a review' vs. 'Late night writing editor's column').

The calibration and testing process is easy, though testing each set of 16 frequencies for both ears does get a bit tedious (I quickly found out why the manual recom-

mends spending no more than 15 seconds per frequency).

Even with some rough edges in the software, it is clear that the Ear Q Reference Hearing Analyzer System is a winner. Filling the gap between inertia and informed reality, the Ear Q system brings to your home or workplace the ability to measure baseline response and the effects of temporary situational/environmental changes in your hearing. The ability to test your hearing acuity (or

that of your most competitive colleagues!) on your own time and in your choice of locations makes this system a unique and powerful test tool.

*Stephen Murphy, who was pleased to find his hearing tests completely in the "normal range," is the editor of Pro Audio Review. As a recording engineer/producer, Steve has worked on many successful audio and video productions including a platinum-selling and Grammy-award winning recording.*

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READER SERVICE NUMBER 69

# Busy times for Cakewalk

by Brett Moss

**D**ecember (actually the months before when this was written) looks to be a busy time for Cakewalk.

Continuing the benevolence trend throughout the software world, Cakewalk ([www.cakewalk.com](http://www.cakewalk.com)) has announced SONAR 1.3, the latest upgrade to their Windows-based DAW program is out and free for download! Or \$5 for a CD.

New is an Audio Scaling feature for zooming in on audio tracks; timing extract function matching up tempo maps with MIDI and a Scissors tool for splitting audio and MIDI.

Improvements have been made to the Fade Tool and the use of envelopes in mixing.

The version 3.0 upgrade of the Luna II software for CreamWare Luna II card is now available free of charge for registered Lunies ([www.CreamWare.com](http://www.CreamWare.com)). New and improved includes ASIO drivers, Windows 2000/XP-compatibility, an improved mixer interface and expanded 5.1 surround sound functions.

And this just in from Cakewalk... VSampler DXi, a Windows-based software synth/sampler. VSampler will work as a plug-in for Cakewalk's SONAR DAW or as a plug-in for any DXi-compatible program. It supports WAV, AIFF, SoundFont files along with most Akai libraries. Performance goes up to 64 voices and includes modulation wheels, pitch bend, reverb, chorus, delay, et al - the usual DSP suspects. Price structure is, follow closely, \$49 for registered SONAR users, \$69 for other registered Cakewalkers and \$79 for the rest of the world.

Also new from Cakewalk is Guitar Tracks Pro, a notch above Cakewalk's Guitar Tracks. The Windows-based GT Pro offers basic multitrack (up to 32-track) recording, mixing and editing, DirectX compatibility along with onboard effects for a mere \$139 or free to registered Guitar Tracks users.

New from McDowell Signal Processing

([www.mcdsp.com](http://www.mcdsp.com)) is the Analog Channel plug-in. Analog Channel consists of two plug-ins for Pro Tools users, Analog Channel Emulation (AC1) and Analog Tape Emulation (AC2). AC1 is designed to take the digital edge of digital recordings by controlling the "drive, attack and release of amplifier characteristics." AC2 is a tape emulator with control of "bias," "playback speed" and "IEC1/2" equalization. Price: \$495.

**Emagic** ([www.emagic.de](http://www.emagic.de)) has a driver update for Mac-based WaveBurner Pro disc burning program on their website. The new driver adds support for a large number of FireWire and SCSI CD burners. Free!

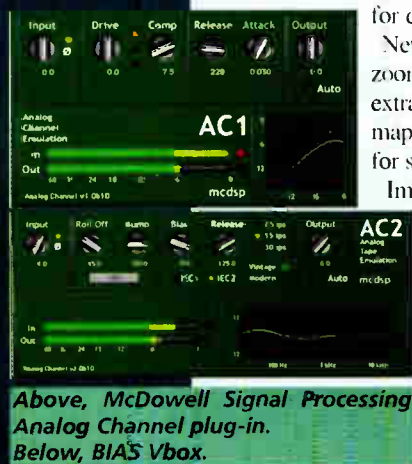
**Cycling '74** ([www.cycling74.com](http://www.cycling74.com)) has released "major" upgrades to the Max and MSP programming tools for developing audio applications for the Mac. The latest are Max 4 and MSP 2. Price: \$495 for the pair, cheaper for upgrades.

**BIAS** ([www.bias-inc.com](http://www.bias-inc.com)) has a new Mac goodie out - Vbox. Vbox is an app that lets you use VST plug-ins independent of a main application such as a DAW program, e.g. Peak, Cubase, Logic. Interesting concept. The nice folks at BIAS even throw in 25 free plug-ins for seed corn. Price: \$129.

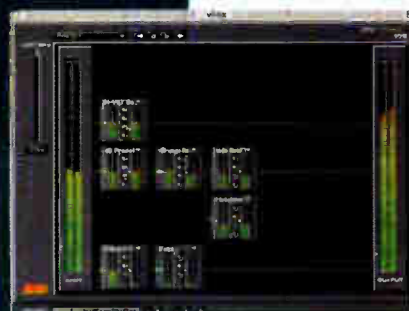
Also for the Mac, **Midiman** has Mac OS X drivers for the USB Keystation MIDI Controller Keyboards. See [www.midiman.net](http://www.midiman.net) for the upgrade.

On the international front, Sweden's **Propellerheads** ([www.propellerheads.se](http://www.propellerheads.se)) has a new sound library for the Reason sampler program. Strings is a Rex-compatible library of strings, including violin, viola, cello and harp. They were sampled in Russia. Mac and PC. Price: \$89.

From my Check Out The Little Guy file is **AIPL** - Acoustic Information Processing Lab ([www.aipl.com](http://www.aipl.com)). The name is bigger than the company. Anyway, AIPL offers several small programs and plug-ins for Windows-based systems. Coolest looks to be SpinCycle, a DirectX rotary speaker plug-in (\$49/\$79). There's also a tube emulator, WarmTone (also DirectX) (\$34/\$64) and what looks to be a WAV/MP3 recorder/ripper (\$29). AIPL does give you the shareware "Try before you buy" option.



Above, McDowell Signal Processing Analog Channel plug-in. Below, BIAS Vbox.



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**READER SERVICE NUMBER 47**  
**World Radio History**

# Converters

Not long ago, analog to digital converters and digital to analog converters were considered high-end specialized equipment. But with the increased commodity pricing of all things digital, these boxes have dropped in price while improving in performance. Today's norm, for separates or all-in-one boxes, is 24-bit, 96 kHz while many offer direct paths upwards of 192 kHz. Higher end processes such as DSD/SACD are also creeping in while bit splitting and 16-bit disappears. One can only assume that next year's boxes will be even more powerful.

## Genex GX8 Analog to Digital Converter

**Features:** Analog to digital converter; eight-channel; 16, 20, 24-bit, 44.1 kHz - 192 kHz sample rate; AES 3; bit splitting; optional DSD (192 kHz) upgrade. Price: \$3,649.



**Contact:** Genex/HHB Communications at 310-319-1111; or circle Reader Service 71.

## Genex GXD8 Digital to Analog Converter

**Features:** Digital to analog converter; eight-channel; 24-bit, 44.1 kHz - 192 kHz sample rate; AES 3; bit splitting; optional DSD (192 kHz) upgrades. Price: \$3,049.



**Contact:** Genex/HHB Communications at 310-319-1111; or circle Reader Service 72.

## dCS 905 Analog to Digital Converter

**Features:** Analog to digital converter; 16, 24-bit; 32, 44.1, 48, 88.2, 96, 176.4, 192 kHz sample rates; four anti-aliasing filters; 11 noise shapers; onboard signal generator; DSD-compatible. Price: \$7,875.



**Contact:** dCS/Independent Audio at 217-773-2424; or circle Reader Service 73

## Sonifex Redbox RB-ADDA Converter

**Features:** Combined A/D-D/A unit; two-channel; 32 - 96 kHz sample rates; 16, 24-bit; front XLR, RCA inputs. Price: \$630.



**Contact:** Sonifex/Independent Audio at 217-773-2424; or circle Reader Service 74.

## Lucid AD9624 and DA9624 Digital Audio Converters

**Features:** Separate A/D and D/A units; 24-bit; 32, 44.1, 48, 88.2, 96 kHz sample rates; AES3; word clock (on AD9624) S/PDIF; XLR, RCA, Toslink I/O; LED meters. Price: AD9624 - \$899; DA9624 - \$749.



**Contact:** Lucid at 425-742-1518; or circle Reader Service 75.

## Benchmark Media Systems 2408-96 Analog to Digital Converter

**Features:** Analog to Digital Converter; Eight-channel; 44.1, 48, 88.2, 96 kHz sample rates; 16, 20, 24-bit; 12 wordlength reduction modes; switchable LED meters; choice of I/O connectors. Price: \$4,995.



**Contact:** Benchmark Media Systems at 315-437-6300; or circle Reader Service 76.

## Manley Labs The WAVE Analog to Digital Converter

**Features:** Analog to Digital Converter; 20-bit UltraAnalog converters; four-input preamplifier; tube analog line stage; insert; return; volume control; AES, S/PDIF, optical, Toslink I/O. Price: \$7,500.



**Contact:** Manley Labs at 909-627-4256; or circle Reader Service 77.

## M Audio CO3 Digital Audio Format Converter

**Features:** Format converter; 24-bit; up to 100 kHz sample rate; AES/EBU, S/PDIF, optical conversion; defeat-able SCMS; pass-through; Toslink, S/PDIF, XLR. Price: \$250.



**Contact:** M Audio/ Midiman at 626-445-2842; or circle Reader Service 78.

## Panasonic AD96 and DA96 Converters

**Features:** Separate A/D and D/A units; eight-channel; 24-bit; 96 kHz; 16, 20, 24-bit; level controls per channel; Precision Meter Circuit. Prices: \$2,195 each.

**Contact:** Panasonic at 323-436-3500; or circle Reader Service 79.





# Test and Measurement Equipment

## Audio Technologies Inc. (ATI) DM200 Digital Monitor

**Applications:** Digital signal monitoring.

**Features:** Two-channel; 32, 44.1, 48, 82.2, 96 kHz sample rates; 24-bit; LED meter; trim pots; head-phone volume control.

Price: \$599.

**Contact:** ATI at 800-959-0307; or circle **Reader Service 80**.



## Logitek Ultra-VU Meter

**Applications:** Signal measurement.

**Features:** 63-segment tricolor LED; peak hold, max hold; stereo image, phase display mode; clipping indicator; adjustable reference points; available in stereo or surround sound configurations. Price: starts at \$1,080.

**Contact:** Logitek at 800-231-5870; or circle

**Reader Service 81**.



## AudioControl Industrial IASYS

**Applications:** Room analysis, system setup, product testing, laboratory

**Features:** Signal measurement/real time analyzer; amplitude; phase, frequency analysis; fuzzy logic programming; delay, coherence, phase, equalizable spectra, limiter, crossover controls; onboard noise generators; includes measurement microphone. Price: \$3,995.

**Contact:** AudioControl Industrial at 425-775-8461; or circle **Reader Service 82**.



## Prism Media DSA-1

**Applications:** Cable, component testing.

**Features:** Handheld digital signal tester; 24-bit; AES/EBU specifications; channel status; signal measurement; jitter, sample rate measurement; DOS/Windows software; AES/EBU, S/PDIF I/O; RS232 port. Price: \$3,995.

**Contact:** Prism Media at 973-983-9577; or circle **Reader Service 83**.



## Earthworks M30 Microphone

**Applications:** Room analysis, system setup, product testing, laboratory.

**Features:**

Omnidirectional

pattern; phantom

powered; compatible

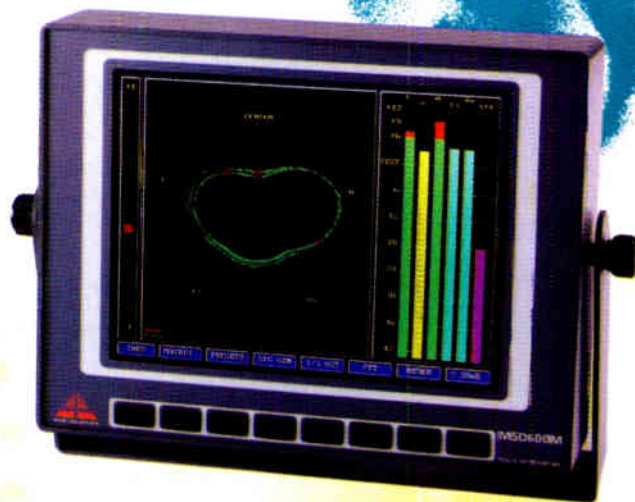
with SMAART.

MLSSA, TEF, SySID; available in matched pairs. Price: \$550 each.

**Contact:** Earthworks at 603-654-6427; or circle **Reader Service 84**.



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READER SERVICE NUMBER 4

December 2001 PRO AUDIO REVIEW 49

# Literature Gallery

## WELCOME BACK!

Welcome to the fifth installment of the *Literature Gallery*, your guide to free information and literature on a variety of products and services in the professional audio and video markets.

The Gallery is designed to be the first stop in your buying decision. The alphabetical listing by product category makes it easy for you to search by company and topic. If you are interested in more information, contact the company directly or circle the Reader Service number that accompanies each entry.

We hope you enjoy the Literature Gallery. If you are interested in participating in our next edition, please contact Mary Ann Melody at mmelody@imaspub.com, 703-998-7600, ext. 131 or Michele Inderrieden at minderrieden@imaspub.com, 301-870-9840.

## ANTENNAS

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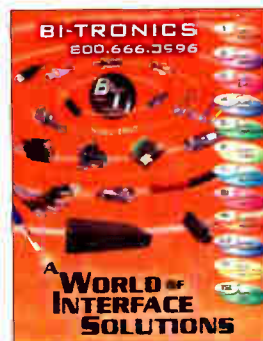


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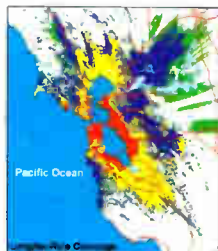
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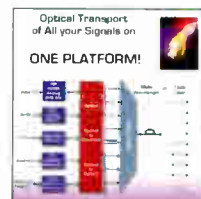
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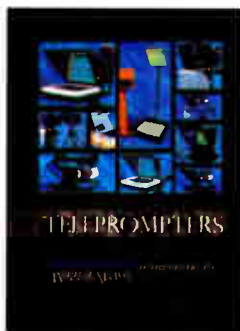
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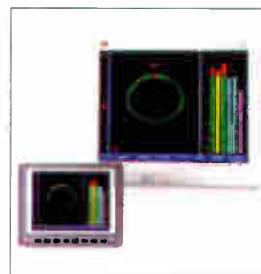
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## ◆ VIDEO EQUIPMENT ◆

The **MagicBox** Avelin is a complete turnkey system for Digital Signage and Video Messaging applications. Create and schedule pages on a Windows PC and then publish them to the dedicated player hardware to run on almost any kind of display.

Phone: 541-752-5654

FAX: 541-752-5614

Web: [www.magicboxinc.com](http://www.magicboxinc.com)

1600 SW Western, Ste. 130

Corvallis, OR 97333

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## ◆ VIDEO EQUIPMENT ◆

The Broadcast Multimedia Division of **Marshall Electronics** manufactures LCD video monitors designed to fit in a standard 19" rack with screen sizes ranging from 2.5" to 17." These rack-mounted models are only 2.5" deep, constructed out of rugged steel and aluminum. All units can tilt 90 degrees up or down while mounted in the rack.

Phone: 310-333-0606, 800-800-6608

FAX: 310-333-0688

Web: [www.LCDRacks.com](http://www.LCDRacks.com)

E-mail: [sales@mars-cam.com](mailto:sales@mars-cam.com)

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## RECORDING

**TASCAM 788**  
**8-Track Hard Disk Recording System**

- 6-track simultaneous record • 250 virtual tracks • 24-bit A/D/A converters
- 14-channel mixer • 3-band EQ
- Dual effects processor • 10 scene memories per song • S/PDIF digital out • (4) 1/4" TRS mic/line ins • RCA main and monitor outs
- (2) 1/4" aux sends and returns
- 1/4" headphone output • MIDI in/out • Optional CD burning kit
- **Non-destructive editing** with 99 levels of undo
- Jog scrubbing and Shuttle with real sound • Dedicated locate and editing buttons • Waveform display • Title edit functions
- ±6% pitch control • Built-in reverb tone




**KORG D-12**  
**12-Track Hard Disk Recording System**

- 12-tracks of uncompressed 16-bit playback or 6-tracks at 24-bit • 16 track mixer with 3-bands of EQ per channel
- Comprehensive editing and DSP functions with 99 levels of undo • 20-bit A/D/A converters • 4 analog inputs including a dedicated guitar input • 24-bit optical S/PDIF I/O • 106 REMS effects types
- 11 simultaneous realtime effects — 8 insert, 2 master and 1 master bus effects
- Powerful scene memory and realtime automation capabilities
- Internal 6GB hard drive allows up to 18.6 hours of 16 bit recording
- Optional internal CD-RW drive • 50-pin SCSI-2 connector
- Built-in auto-chromatic tuner and metronome




**YAMAHA AW4416HDC**  
**16-Track Digital Audio Workstation**

- Record, edit, mix and master to CD-R in one machine • 16 tracks of 16 or 24-bit recording with 8 virtual tracks each
- 32-bit internal signal processing
- 44 input mixer with 20 mix buses
- 16 motorized faders and full mix automation • 4-band fully parametric EQ and dynamics per channel
- 2 built-in effects processors • Optional I/O interface cards provide connectivity with all types of digital and analog gear
- 8 sampling pads provide real-time playback of samples • Internal 10GB IDE hard drive • Built-In CD-RW drive for creating audio CDs and archiving • Word Clock I/O



**Focusrite ISA 110**  
**Channel Strip**

- Rescue of a single channel strip from the legendary Focusrite Studio Series recording console
- Ultra high-end transformer-based Class A mic/line preamplification and EQ circuitry design originated by Rupert Neve, provides a warm, yet transparent sound.
- Line input included in pre-amp section with ±18dB gain control
- High and Low shelving and two separate bands of parametric EQ
- High and Low pass filters remove unwanted high or low frequency content



**TC-HELICON Voice Prism**  
**Vocal Formant Pitch Processor**

- Built-in mic preamp with 48V phantom power • 24 bit digital converters
- 4 voice banking vocal harmonies with independent gender- and humanizing controls • Lead-voice double tracking • Complete voca. processing including Compression, EQ, Delay, Tape Delay, Chorus, Flange and Reverb with Pre-Delay • Ultra-easy interface • XLR mic input, 1/4" unbalanced/TRS balanced I/O and S/PDIF stereo digital outs.
- Optional Voice Craft card adds human voice modelling DSP algorithms as well as AES/EBU and S/PDIF digital I/O




**Lexicon MPX-200**  
**24-Bit True Stereo Dual Effects Processor**

- Powered by Lexicon's proprietary Lexchip • 24-bit A/D/A converters
- 1/4" analog I/O • S/PDIF digital inputs and outputs • A newly designed digital compressor is built-in to all pre-sets • 19 rack, 1U high processor
- 240 preset, and 64 user locations with classic Lexicon reverb programs including Ambience, Plate, Chamber and Inverse as well as Tremolo, Rotary, Chorus, Flange, Pitch, Detune, 5.5 second Delay and Echo
- Dual-channel processing provides two independent effects in a variety of configurations — Dual Stereo (Parallel), Cascade, Mono Split and Dual Mono • Up to 8 adjustable parameters are available in each program
- Full controllable over MIDI • Delay times and modulation rates can lock to Tap tempo or MIDI Clock.



**SONY CD-RW66**  
**Standalone CD Recorder**

- Supports Standard CD-R, CD-RW & consumer audio discs • Built-in 32kHz - 96kHz sample rate converter • On-board DSP functions
- Parametric EQ, Limiter & Super Bit Mapping which provides near 20-bit dynamics • 24-bit A/D/A converters • CD-TEXT support (up to 23 characters per name) • AES/EBU input, optical & coaxial digital I/O and RCA analog I/O • Word Clock input
- 2x finalize • 2x duplication with 2 CD RW66s
- Full status fluorescent display • Includes wireless/wired remote



**marantz CDR-500**  
**Standalone CD Recorder / Duplicator**

- (2x) CD duplication from the internal CD player • Pre- and consumer CD-R and CD-RW compatible • CD-TEXT editing • Memory buffer
- Menu selectable SCMS copy protection • Digital and analog record level/balance control • XLR-Balanced and RCA unbalanced analog ins
- Coaxial and Optical digital ins • Unbalanced (RCA) analog and Coaxial digital outs including Coaxial loop-out for unprocessed connection to other digital equipment • IR remote control included



**MICROBOARDS DSR-1600 Series**  
**CD Duplicators**

- 16X record speed
- Compact footprint
- One-touch operation
- Disc to disc, or disc to multiple disc for higher volume requirements.
- Caching image files is done on-the-fly, to multiple writers simultaneously
- LED error detection prevents bad disc duplication
- Available With One To Eight Recorders
- Supported Formats: CD ROM Mode 1 and 2, Form 1 and 2, CD DA (Red Book Audio), CD 1, Mix Mode, Multisession & Video CD



**Panasonic WR-DA7 MKII**  
**Digital Mixer**

Streamlined Version 2.5 operating system with more than 70 new or improved features including new shortcut control features, advanced MIDI faders, new panels for LCD and LED areas, and enhanced software features, such as improved visuals and navigational controls.

**FEATURES-**

- 32 fully featured inputs and 16 auxiliary sends/returns
- 8 buses (sub-groups) can be digitally routed using a built-in patchbay for a total of 24 digital and analog I/O's
- 32-bit internal processing and 24 bit A/D/A converters yield a dynamic range 110 db
- 21-140mm Motorized Faders, Jog-Dial, Cursor keys and 10 key Keypad
- Moving fader dynamic and scene automation with instantaneous recall
- Multi-layer fader layout for controlling input channels, Aux sends and returns; and bus, as well as a fourth layer that adds user-assignable MIDI faders.
- Built-in 16-bit dithering to 23 outputs.

**Connectivity**

- 16 balanced XLR and 1/4" TRS Mic/line analog inputs with 16 pre A/D analog inserts
- AES/SPDIF (2 Ch.) digital I/O, Word Clock In/Out, MIDI In/Out, MIDI Machine Control (MMC) RS-422/485 standard
- Expandable with up to (3) 8-ch I/O cards
- Optional SMPTE/Video-sync card

- Optional Tandem card allows dual-console operation providing a total of 76 inputs
- **EQ & Dynamics-**
- Four true parametric bands of EQ on every channel and 2 bands of parametric EQ on the Aux returns
- 42 full function Compressor/Gate/Limiter or Expanders
- Delays up to 300 ms on every channel
- **Automation and Control-**
- 50 independent EQ, dynamics and channel libraries plus 50 snapshots of the entire console can be stored for instant recall.
- Four up/down/left/right cursor keys can output MIDI Machine Control commands to MDMs, sequencers and DAWs
- Dedicated undo/redo button and a built-in Talk Back mic.
- Large backlit LCD screen displays all channel parameters
- **Optional** High resolution Meter Bridge and Automation software for Mac and PC
- **Built-in Surround Mixing-**
- Equipped to mix 5.1 surround through its buses (doesn't tie up auxes) with full dynamic control of panning.

**OPTIONS-**

- WR-ADAT 8-channel ADAT digital I/O card
- WR-TDIF 8-channel TDIF digital I/O card
- WR-AESS 8-channel AES/EBU and S/PDIF digital I/O card
- WR-ADDA 8-channel A-to-D, D-to-A card
- WR-TNDM Tandem (dual-console) connection card
- WR-SMPT SMP/T and V-syn. card
- WR-MTBR Meter bridge (included)
- WR-WRRC Remote control software



**TASCAM MX-2424**  
**24-Track Hard Disk Recorder**

- Records 24 tracks of 24-bit audio at 44.1 or 48 kHz, or 12 tracks at 88.2 or 96 kHz • Up to 24 tracks can be recorded simultaneously using any combination of digital and analog I/O • 999 virtual tracks per project
- Includes antennae 9GB hard drive • Wide LVD compatible SCSI port on the back and a front 5-1/2" bay available supports an additional drive, or an approved DVD-RAM drive for back-up • Record to Mac (SCSI) or PC (WAV) formatted drives • Open TL format allows compatible software to recognize virtual tracks without having to load, reposition and trim each digital file.
- Jog/scrub wheel • MIDI In, Out, and Thru for MMC & MTC
- Built-in editing capabilities include cut, copy, paste, split and ripple or overwrite • 100 levels of undo • Supports destructive lock recording and non-destructive lock recording which continuously records new takes without erasing the previous version. • TBUS protocol can sample accurately lock up to 32 machines together • Can generate or chase SMPTE timecode or MTC • Word Clock In, Out, and Thru ports
- Includes VideoNet Java-based Graphic User Interface software

**I/O Options-**

- Optional analog and digital cards provide 24 channels of I/O each. There is one analog slot and one digital.
- IF-TD24-TDIF module
- IF-AD24-ADAT Lightpipe module
- IF-AE24-AES/EBU module
- IF-AN24-A-D, D-A I/O module with DB-25 connectors



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## RECORDING

**MOTU 828 Firewire Audio Interface**

- Total of 18 simultaneous ins and outs: 8 channels of 24-bit analog I/O with 40dB of trim (2 XLR-balanced mic preamps w/ phantom power, 6 balanced 1/4" TRS ins and 8 balanced 1/4" outs), 8 channels of ADAT optical (switchable to SPDIF optical) and RCA S/PDIF digital I/O
- ADAT SYNC input • CueMix Plus zero-latency live input monitoring w/ front-panel volume control • Connects to any FireWire-equipped windows PC or Apple Macintosh computer via standard 1394 FireWire.
- Includes an ASIO driver for compatibility with all major audio software on both computer platforms • Also includes AudioDesk audio workstation software package for the Mac

**TC | WORKS PowerCore**

The DSP-Turbo For Your Native Audio Workstation

- Crossplatform PCI card with 5 hi-end DSPs (2800 MHZ WORTH OF DSP POWER!)
- World class Reverb, Modulation FX and EQ right out of the box
- 24/96 compatible • Works with any VST/MAS-compatible application
- Works with all sound cards supported by the host software • Includes TC TOOLS/96 PLUG-INS — TC MegaReverb, TC Chorus/Delay, TC EQ SAT
- Also includes SPARK LE Mastering Software • One complete set of TC TOOLS Plug-Ins (MegaReverb, Chorus/Delay and EQ) only requires one DSP to run • Optional TC MASTER X 3+5 multiband mastering processor
- Open processing platform allows future Plug-In compatibility by 3rd party developers

**digidesign DIGI001**

Digital Audio Workstation For Mac & PC

- Completely integrated digital recording, MIDI sequencing, mixing and editing environment for the Mac/OS and Windows.
- Sample-accurate simultaneous editing of audio & MIDI
- 16 simultaneous 24 bit ins and outs with support for 44.1 and 48 kHz sample rates
- 2 XLR mic/1.4 line inputs with -26 dB pad, 18v phantom power gain knob, and HP Filter at 60Hz
- 6 1/4" TRS balanced unbalanced line ins w/ software controlled gain
- +40E balanced 1.4 inch Man outputs and balanced 1/4" monitor outs w/ front panel gain knob
- 14 unbalanced line outputs channels 3-8
- Headphone output with independent gain control knob
- 2 channel S/PDIF coaxial digital I/O and 8 channel ADAT optical I/O (switchable to 2 channel S/PDIF)
- Includes Pro Tools LE software, based on Digidesign's world renowned ProTools software, supports 24 tracks of 16 or 24-bit audio and 128 MIDI tracks
- Supports both RealTime AudioSuite (RTAS) and AudioSuite effects Plug-Ins — Bundled RTAS plug-ins include: 1 and 4-band EQ, Dynamics II-compressor, limiter, gate and expander, gate Mod Delay, short, slap, med, um, and long delays with modulation capabilities for chorus or flange effects and dither. AudioSuite plug-ins include Time Compression/Expansion, Pitch Shift, Normalize, Reverse
- All major parameters including effects processing can be fully automated

**MOTU Digital Performer 3**

Digital Audio - MIDI Sequencer For Mac

- Complete virtual recording studio with fully automated mixing, effects and EQ • Unlimited audio tracks • Sample-accurate waveform editing
- 32-bit realtime effects • 64-bit MasterWorks Limiter and Multiband Compressor • POLAR window - Interactive audio loop recording
- New in DP 3 —
- Redesigned user interface based on Apple's OS X
- Apple G4 Multi-processor support • Pro Tools import/export via DigTranslator and DMF with all tracks, regions, crossfades, and time-stamps in tact • Open architecture surround compatibility with support for mono, stereo, quad, LCRS 5.1, 6.1, 7.1 and 10.2 surround formats
- VecAlignADR Automatic Dialog Replacement support

**Chau MotorMix**

Automation Desktop Motorized Fader Worksurface

- Exact 100mm long-life motion sensing motorized faders with dedicated Mute, Solo & Rack/By switches • Eight high quality rotary pots with display for control of Pan, Aux Sends, EQ, and Plug-ins • 40 x 20 Backlit LCD display with track labels, pans, send levels and plug-ins • Control levels, mutes and plug-in parameters in real-time
- Automate fader moves and mutes into your recorder • Bank select switches and the LCD display let you control an unlimited number of channels and many plug-ins in each channel • Create a custom console tailored to the way you work • Pro Tools support: up to 4 Motor Mixes for 32 channel banks • Play, Stop, Fast Forward, Record transport keys

**audio-technica AT3035**

Cardioid Condenser Microphone

- Large diaphragm provides exceptional detail
- 48dB max SPL
- 136dB dynamic range @ max SPL
- 12 dB/octave bass roll-off @ 80Hz
- 10 dB pad
- Requires 11 - 52v phantom power
- Custom shock mount provides superior isolation
- 20Hz - 20kHz frequency response
- Includes shockmount and protective pouch

**RØDE NT1000**

Cardioid Condenser Microphone

- Externally polarised 1" pressure-gradient condenser
- Ultra low noise transformerless circuitry
- > 134dB Dynamic Range
- > 140dB SPL Max SPL
- Requires 35 - 53v phantom power
- Internally shock mounted capsule
- 20Hz - 20kHz frequency response ±6dB
- Includes zippered pouch, M2 Stand Mount, 3/8" - 5/8" Thread Adaptor
- Optional SM2 shockmount

**SHURE KSM-44SL**

Multi-Pattern Condenser Mic

Premium Vocal And Instrument Microphone Built Without Compromise

- Dual 1-inch gold-plated, Mylar diaphragms
- Class A, discrete, transformerless preampifier
- Cardioid, omni and bidirectional polar patterns
- Includes ShureLock elastic-suspension shock mount and swivel mount, protective pouch and locking aluminum carrying case
- 20 Hz - 20 kHz frequency response

**Hafler TRM-6 & TRM-10**

Complete 5.1 Surround Monitoring Solution

**TRM-6 Bi-Amplified Studio Monitors**

Offering honest, consistent sound from top to bottom, the TRM-6 bi-amplified studio monitors are the ideal reference monitors for any recording environment whether tracking, mixing and mastering. Supported by Hafler's legendary amplifier technology providing a more accurate sound field, in width, height and also depth.

- 1 Tweeter, 6 Woofer
- Bi-amplified (50 W LF, 33 W HF) w/Crossover
- 55Hz - 21kHz frequency response
- Electronically and Acoustically Matched
- Magnetically shielded

**TRM-10s Active Subwoofer**

Combining Hafler's legendary amplifier technology with a proprietary woofer design, the TRM10 active subwoofer provides superb bass definition required in today's studio and surround sound environments.

- 10-inch cellulose fibre cone down firing woofer
- 200 watt low frequency amplifier
- 30Hz to 110Hz frequency response ±1dB
- 24dB/octave Linkwitz-Riley crossovers variable (40Hz to 110Hz)

**JBL LSR Series**

Linear Spatial Reference Monitors

Ideal For Surround Sound Applications

**LSR28P Near-Field Monitors**

- Bi-amplified design— 250 watts for the low frequency and 120 watts for high frequency
- 8" woofer and 1" tweeter
- XLR/1/4" combo input connectors can accommodate balanced and unbalanced signals
- 50 Hz - 20 kHz frequency response

**LSR25P Near-Field Monitors**

- Bi-amplified design— 100 watts for the low frequency and 50 watts for high frequency
- 5.25" woofer and 1" tweeter • Shielded
- XLR balanced and RCA unbalanced inputs
- Front Panel Volume and Power Controls
- Built in 80 Hz HPF for use with optional subwoofer
- 70 Hz - 20 kHz frequency response

**LSR12P Powered Subwoofer**

- Incorporates the 252F low-frequency transducer and the LSR12P Amplifier which provides 250-watts of continuous power.
- Designed to be compatible for both the LSR28P self-powered speaker system
- Multi-format compatibility with Dolby AC-3, DTS and other surround audio systems.

**YAMAHA MSP-10**

Bi-Ampified Monitor Speakers

- 40 - 40k Hz frequency response (-10dB)
- 120-watt power amplifier for the low/mid driver and a 60-watt power amplifier for the tweeter
- 8" woofer and 1" titanium-dome waveguide tweeter
- Balanced XLR inputs
- Magnetically-shielded enclosures
- Green power on and red clipping LEDs
- Master volume control for each speaker
- 3-position low and high trim switches
- Switchable low-cut filter optimizes performance when used with a subwoofer system
- Available in Black (MSP10) and Maple-Sunburst (MSP10M)
- SW10 powered sub-woofer also available

**HR-824**

Bi-Amplified Studio Monitors

- 150W LF amp, 100W HF amp
- 8.75" mineral-filled polypropylene cone woofer
- 1" aluminum dome tweeter with ferrofluid-cooled voice coil
- Every set is a "true" matched-pair with a signed certificate from Mackie designs to prove it
- Full space, half space and quarter space placement compensation
- 35Hz to 22kHz frequency response ±1.5dB
- Broad "sweet spot"
- 1/4" and balanced XLR inputs

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## SOUND REINFORCEMENT

### SONY MB-806A

#### Modular UHF Wireless Tuner Frame

Up to 6 UHF receivers in a single 19" rack space  
94 user-selectable channels per module



- 9-inch rack mount tuner frame accommodates up to 6 WRU-806A tuner modules (sold separately)
- Built-in active antenna divider allows the optional WD 820A Antenna Divider to control up to 3 tuner frames providing 18 simultaneous mics
- Six XLR-balanced output connectors plus an XLR balanced mono output
- Auto channel assignment for extra tuner modules. detects and skips unusable channels
- Built-in antenna divider with 9-watt DC power
- Mic/line output level switch
- Rear mounted antennas

#### WRT-808A Plug-In Transmitter

- Works with any dynamic mic with an XLR connector
- 94 channel frequency agile
- Runs for 4 hours on two AA batteries
- Battery level indicator and Low-Battery alarm
- Level control
- AF/Peak indicator shows condition of audio input level



#### WRT-805A Bodypack Transmitter

- Smoothly tapered body with compact lightweight design
- 94 channel frequency agile
- 6 hours of continuous operation with a single AA battery
- LCD display of channel, attenuator and accumulated hours
- Low-Battery alarm
- Accepts ECM-122BMP, ECM-44BMP and ECM-77BMP av mics



### SHURE UC Wireless Series

#### UHF Wireless System

- Over 100 fully selectable frequencies
- Available with hand-held and bodypack transmitters
- Up to 16 systems can be used simultaneously

#### UC4 UHF Receiver

- Compact, 1/2 rack design and exclusive MARCAD DIVERSITY technology
- Two 5 segment RF LED meters and 7 segment audio LED meter
- 2-band adjustable ED
- Balanced XLR and unbalanced 1/4" outputs



#### UC2 Handheld Transmitters

- Available with all of your favorite Shure mic capsules — SM58, Beta 58A, SM87 and Beta 87
- Combined power on/off and mute switch
- Adjustable audio gain control
- Internal antenna
- 8 hours battery life, 9V battery (included)



#### UC1 Bodypack Transmitter

- Tini-O-G or optional Lump connector
- Remote audio mute connector allows external audio and/or RF muting capability
- Two-position attenuator (+10 and -20dB) to accord moderate different input sources
- Available with a wide range of lavalier and headset microphones



### SENNHEISER 500 Series

#### UHF Wireless System



#### 500 Series wireless systems feature

- Sixteen switchable preset memory locations using any of 1280 available frequencies
- Up to 16 simultaneous channels
- Choice of high quality handheld, body pack or plug-on transmitters
- Battery status indicator with remote display of power levels on receiver
- Peak-hold level indicator
- Bar graph battery status indicator on the transmitter and receiver
- Low battery level LED on the transmitter
- Transmitters run for > 8 hours on a single alkaline 9V battery
- EM500 1/2 Rack True Diversity Receiver features 1 1/4" and XLR outputs, a 1/4" headphone output with level control and 2 BNC antenna inputs
- EK500 battery powered portable (camera mountable) receiver features a 1/8" main and headphone output
- SKM500 handheld transmitters are available with the MD 835 dynamic cardioid MD 845 dynamic super-cardioid or ME 865 lavalier super-cardioid microphone capsule
- SK500 bodypack transmitters are available with the ME 2 omni- or ME 4 cardioid electret lavalier microphones or the ME 3 electret super-cardioid headset microphone
- SKP500 plug-on transmitter features an XLR output connector and will provide 48V of phantom power making it compatible with your favorite dynamic or condenser microphone

### AKG C4500 BC

#### Cardioid Condenser Microphone

- Large-diaphragm condenser microphone designed for on-air radio announcers
- Front-end firing capsule for clean line of sight
- 2" to 3" working distance with minimal proximity effect
- Multi-layer pop filter between the front grille and the capsule
- Superior electro-magnetic shielding
- 120 Hz roll-off and -20 dB pre-attenuation pad
- Voice Friendly - Requires no further processing after the microphone
- Greater than 155 dB dynamic range
- Superior electro-magnetic screening
- Includes H-100 spider suspension and W 4000 cellular foam wind screen

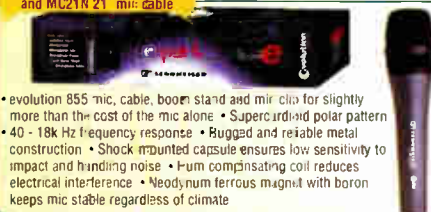


### SENNHEISER e-Pack 855

#### evolution Mic kit

Includes the PM200 mic stand and M021R 21' mic cable

- evolution 855 mic, cable, boom stand and mic clip for slightly more than the cost of the mic alone
- Supercardioid polar pattern
- 40 - 18k Hz frequency response
- Bugged and reliable metal construction
- Shock mounted capsule ensures low sensitivity to impact and handling noise
- Perm compensating coil reduces electrical interference
- Neodymium ferrous magnet with boron keeps mic stable regardless of climate



### Electro-Voice® N/D767a

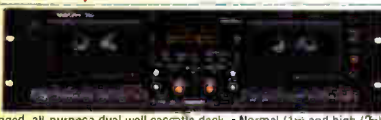
#### Supercardioid Dynamic Mic

- N/DYM (neodymium) magnet structure provides greater sensitivity and signal-to-noise ratio
- VOB (vocally optimized bass) technology reduces low-end distortion and muddiness
- Supercardioid polar pattern for superior feedback rejection and acoustic isolation
- Multistage shock mount assures low-handling noise
- Warm Grip handle for more comfortable feel
- 35 Hz to 22 kHz frequency response
- Includes stand and soft zippered "gig" bag



### TASCAM® 322

#### Independent Dual Well Cassette Deck



- Rugged, all-purpose dual well cassette deck
- Normal (1x) and high (2x) speed dubbing capability
- Headphone Output w/ Level Control
- Dolby B and C with HX Pro headroom extension
- Optical Leader Sensing for quick auto reverse
- RS-232 control port
- Electronic Tape Counter
- Independent unbalanced RCA I/O for each deck
- Optional LA-322 balancing kit and WR-7000 cascade cables
- ±10% pitch control independent for each deck
- RC-322 Wired Remote Included

### MARANTZ PMD-520

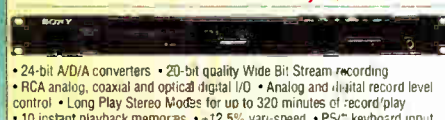
#### 3-Head Independent Dual Well Cassette Deck



- Direct tape insertion/removal
- Removable tape mechanisms
- Loop out for duplication
- Continuous record with 3 min overlap
- Auto tape calibration
- ±3% fine pitch control
- Auto rewind
- Tape stop alarm
- Record mute
- Dolby B/C & HX Pro headroom extension
- Optional wired and IR remote
- Stereo LED meters with peak hold
- Time counters with tape size selector
- Optional balanced XLR kit

### SONY MDS E10 & MDS E12

#### 1RU MiniDisc Player/Recorders



- 24-bit A/D/A converters
- 20-bit quality Wide Bit Stream recording
- RCA analog, coaxial and optical digital I/O
- Analog and digital record level control
- Long Play Stereo Modes for up to 320 minutes of record/play
- 10 instant playback memories
- ±12.5% var-speed
- PS/2 keyboard input
- Non-destructive TOC editing
- Post-record relative track level adjust
- Large fluorescent display
- Flexible editing and programming capabilities
- RAM buffer continuously stores 6 seconds of audio, even before you press RECORD
- Includes full-function remote
- MDS-E12 Adds - Balanced XLR analog I/O, RS-232C and parallel control interfaces and a Relay bus for cascading multiple units

### TASCAM® MD-350

#### 2RU MiniDisc Player/Recorder



- ATRAC v3 and LP4 (long format record mode) provides up to 320 minutes of record time on a standard 80 minute MD
- Auto Cue and Auto Ready for cusing instant start and allowing single track playing
- Unbalanced RCA and balanced XLR analog as well as optical SPDIF I/O
- Additional front panel digital input
- PC keyboard compatible PS/2 port for naming, editing and transport controls
- Pitch control
- Headphone output w/level control
- RC-32 Wireless Remote Included
- Timer Play Function
- Program and Shuffle Play Modes
- Complete TOC Editing



### MDP 500 PortaDisc

#### Professional Portable MiniDisc Recorder

- Balanced XLR mic / line inputs
- Switchable phantom power and limiting
- 6-second pre-record memory buffer
- USB interface allows real-time transfer of files to computer editing systems
- Coaxial and optical SPDIF digital I/O
- Built-in monitor speaker and back-up microphone
- Includes 8 x AA NIMH batteries, AC Adapter, 240V-240V charger, soft case, carrying strap, and HMB MD80 MiniDisc



### SONY CDP-D11

#### 1RU Professional CD Player



- RCA unbalanced and XLR balanced outputs
- Optical and coaxial S/PDIF digital outputs
- ±12.5% var-speed
- Durable chassis and transport deck for the road and installation use
- Instant start
- Flexible control interface (parallel & RS 232)
- Auto Cue and Auto Pause
- Advanced shock protection w/ 4MB D-Ram memory
- Relay play control bus
- Mark locate feature
- Dual mode remote functions: as wired or wireless IR remote and includes direct numeric entry of track numbers



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## SOUND REINFORCEMENT

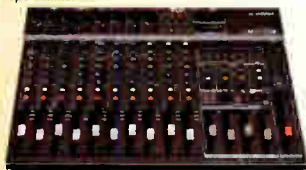
### WORLDWIDE SR32-4 VLZ Pro Sound Reinforcement Mixer



- 28 Premium XDR mic/line preamps
- 2 stereo line inputs
- 4 submix buses with 8 balanced 1/4" outputs
- 6 aux sends (2 pre, 2 post, 2 switchable pre/post)
- 3-band EQ with sweepable mids and 75Hz Low cut filter on all mono channels
- 4-band fixed EQ on stereo channels
- 16kHz Air EQ on sub buses
- Talkback section with level control, LED, and separate rear XLR input
- "Double-based" sub outs for eight track recording without repatching
- Inserts on all mono channels and subs
- AFL/PFL solo on all channels (globally switchable)
- 60mm log-taper faders for consistent fades
- Balanced XLR and 1/4" main outputs
- Additional mono XLR main out with level control
- Balanced inputs and outputs (except phones, inserts, RCAs)
- Built-in power supply
- 12V BNC Amp socket

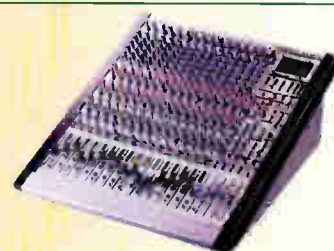
### YAMAHA MX 12/6 12 Input 6 Bus Mixing Console

Professional sound quality and versatility in a compact, lightweight, easy to transport mixer



- 8 mono mic/line inputs with balanced XLR and 1/4" connectors and switchable phantom power • Insert I/O on the first 4 channels
- 3-band EQ for each input channel with 15dB of boost and cut
- 2 stereo input channels with unbalanced 1/4" and RCA connectors
- 6 bus outputs — 4 Group outs and a stereo out
- 100mm master fader • 12 segment LED level meters
- Stereo 7-Band graphic EQ on the main outputs, with 12dB of boost and cut, provides sound shaping and feedback control for the overall mix
- Built-in digital effects with 16 different effects programs and a single parameter control
- 3 AUX sends — AUX 1 (pre-fader), AUX 2 (switchable pre/post) and an EFFECT send for the internal effects
- 1/4" headphone jack can also be used as a monitor out jack
- Balanced XLR stereo outputs and a balanced XLR MONO output with its own dedicated level control
- Extensive grounding and protection from static electricity
- RCA TAPE IN and REC OUT jacks • BNC light attachment
- Rack mountable with the optional RK124 Rack Ears.

### BEHRINGER Eurorack MX3242X 32/16-Channel Inline 4-Bus Mixer with 24-bit Digital Effects



- 16 Mic/Line inputs with gold-plated balanced XLR and 1/4" connectors, inserts and direct outputs • 16 line inputs with balanced 1/4" connectors
- Ultra-low noise Mic Preamps with +48V phantom power and switchable Low Cut Filter • Ultra-high quality 100 mm faders
- 4 Subgroups with pan control, solo, main mix switches and Inserts
- 4 Stereo Aux Returns with level and pan, solo and routing
- 2 pre/post and 4 post fader Aux Sends
- 24-bit stereo multi-effects processor with 32 Virtualizer presets including 16 different Reverbs, Delays, Chorus, Flanger, Pitch Shifter, Speaker Simulation and various combinations
- 4-band EQ with two sweepable Mids and I/O switch on all channels
- Mix-B section with level and pan controls, mute and source switches
- Separate Main Mix, Control Room and Headphone Outputs
- Versatile Headphone and Talkback section
- Highly accurate 5-segment Bargraph Meters on all Channels, Subgroups and Main Mix • \*9" Rack Mounting kit included

### QSC RMX Series Power Amplifiers

Model	8Ω	4Ω	2Ω
RMX 850	200	300	430
1450	290	450	700
2450	500	750	1200



- Up to 2400 watts in 2 rack spaces
- 3-year warrant, plus optional 3-year extended service contract
- High-current toroidal transformers • Independent user-defeatable clip limiters, DC arc thermal overload protection on each channel
- Selectable low-frequency filters @ 300/50 Hz • Balanced 1/4" XLR and barrier strip inputs • Binding post and Neutrik Speakon outputs
- Front mounted gain controls • Signal and Clip LED indicators

### WORLDWIDE M800 FR Series Power Amplifier

400 watts @ 2 ohms stereo  
 275 watts @ 4 ohms stereo  
 140 watts @ 8 ohms stereo



- Ultra-low-noise/low-distortion design • Fast Recovery circuitry
- Two 2nd order, 12dB/octave, low-cut filters with variable frequency from Off to 170Hz • Constant directivity horn EQ/Air EQ with variable frequency from 2k to 5kHz and on/off switch • Switchable Limiter
- XLR thru outputs, 1/4" jacks and 5-way binding post outputs
- Detented gain control: calibrated in dB & volts • Signal present and OL LEDs • Channel Status LEDs • 5-year transferrable Limited Warranty

### CROWN CE1000/2000 Power Amplifiers

Model	2Ω	4Ω	8Ω
CE 1000	560W	450W	275W
CE 2000	975W	660W	400W
	1620W	1120W	680W



- 1/4" T.R.S. XLR and barrier strip inputs
- Neutrik Speakon output connectors
- Portion fan-assisted cooling
- SST module allows customized features such as stereo crossover capabilities
- Short circuit protection
- 3-Year, No-Fault Warranty

### YAMAHA EMX-860ST 8-Channel Stereo Powered Mixer



- 8 balanced-XLR mic/1/4" line inputs with level, pan, 3-band EQ, monitor and effect sends as well as switchable phantom power for condenser mics • Channels 1 - 6 have a pad switch
- Inputs 7 and 8 allow connection of stereo devices like keyboards or drum machines • RCA tape inputs with level control, RCA record outputs and left/right 1/4" aux inputs with level control
- Separate built-in 7-band Graphic Equalizers for the main (stereo) outputs and the monitor output
- Built-in high quality digital reverb is easily adjusted and can be returned to the stereo mix as well as the monitor output
- Three separate 200-watt amplifiers - (2 for the main speakers and one for use with the monitors) provide a total of 600 watts of audio power. These amplifiers have Yamaha's patented EEEEngine technology which allows lighter weight and cooler operation. The left and right power amps can be bridged providing 400 watts of mono power for use with a single speaker
- Built-in limiters with overload LEDs protect the amplifier and connected speakers from damage • 1/4" speaker outputs
- 1/4" Monitor and Main Left & Right output jacks are provided for expandability • 1/4" effect send signal to an external effects processor.

### Electro-Voice SX100 Plus Compact 12-inch Two-Way Speaker System

- Medium-throw full-range speaker system
- Very durable structural-foam enclosure with integral handle • Stand mountable and arrayable
- Two 1/4" connectors allows paralleling of multiple speakers • High efficiency (99.5 dB 1 W/1 m)
- 12" woofer and DH2010 pure titanium compression driver • 200 watts continuous power handling (800 watts short term) • 80 - 25k Hz frequency response
- Molded-in HF horn, with 65" x 65" constant-directivity coverage increases intelligibility in noisy, reverberant rooms • Available in black or white
- Compact and lightweight (32 lb)



### WORLDWIDE SRM 450 Bi-Amplified Sound Reinforcement Monitor

- FR-Series 300W low frequency and 150W high frequency amplifiers
- 24dB/Octave Linkwitz-Riley electronic crossover
- 45Hz to 20kHz frequency response
- 300mm long-throw low frequency transducer
- High-output precision titanium compression driver
- Studio-quality maximum dispersion horn
- XLR balanced mic/line input and thru
- Level control w/ signal present and peak LEDs
- 75Hz low cut and +3dB 100Hz and 12kHz contour switches • Electronic time correction, phase alignment and equalization • Timed power down • 51lbs.



### JBL EON Power 15 G2 15-Inch Full-Range Bi-Amplified Speaker

- 300 watt LF and 100 watt HF amplifiers
- 15" neodymium Differential Drive LF driver and a 1.75" ferro-fluid cooled compression driver with a titanium diaphragm
- The Loop/Mix output allows you to daisy-chain any number of EON speakers or send a mixed signal directly to a main PA.
- Two 1/4" line inputs with independent level control for keyboards, pre-amped guitars, basses, CD players or an input from a mixer.
- Hi and Low frequency EQ controls
- 42 Hz - 17 kHz frequency response ±3 dB
- Accepts 110 - 230 VAC, 50 - 60 Hz



### WORLDWIDE SRS-1500 Active Sub Woofer

- Perfect complement to the active SRM450s
- Compact portable enclosure under 2" high
- Flat frequency response down to 40Hz
- Up to 127dB SPL • 600 watts RMS of FR Series high current amplification
- 15" cast frame RCF LF transducer with 3 inside/outside-wound, high-temperature voice coil & High Flux magnetic circuit
- Built-in electronic stereo/mono high pass crossover network
- Recessed level control and 0°-180° phase switch • 18-ply Baltic Birch enclosure
- Built-in pole mount



Buyers Guide continued from page 49

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### **Audix TR40 Test and Measurement Microphone**

**Applications:** Room analysis, system setup, product testing, laboratory.  
**Features:** Omnidirectional pattern; .25 diaphragm; prepolarized condenser element; high SPL; doubles as recording mic; stereo matched pairs available (\$559). Price: \$249.  
**Contact:** Audix at 800-966-8261; or circle **Reader Service 85**.

---

### **AEA LD2020 Stereoscope**

**Applications:** Signal monitoring.  
**Features:** LED; sensitivity controls; battery operable. Price: \$475.  
**Contact:** Audio Engineering Associates at 800-798-9127; or circle **Reader Service 86**.

---

### **Precision Audio Labs SRD-1 Sample Rate Detector**

**Applications:** Signal measurement.  
**Features:** Word clock, Superclock, slave clock sample rates; per kHz; up to 52 MHz. Price: \$149.  
**Contact:** Precision Audio Labs at 818-888-0388; or circle **Reader Service 88**.

---

### **Novatech Model 2908A 100 MHz Signal Synthesizer Module**

**Applications:** Signal generation.  
**Features:** 48-bit; sine/cosine, AC/MOS/TTL output; frequency sweep, FSK, BPSK, chirp, single tone modes; Windows software; RS232 interface. Price: \$895.  
**Contact:** Novatech Instruments at 206-363-4367; or circle **Reader Service 89**.

---

### **Dorrough Electronics TG-10A Audio Test Generator**

**Applications:** Signal generator.  
**Features:** 32 - 96 kHz sample rates; continuous tone, burst, step, parabola, split amplitude; stereo phase; onboard sample rate converter; genlock; FSK; RS232 port. Price: \$1,400.  
**Contact:** Dorrough Electronics at 818-998-2824; or circle **Reader Service 93**.

---

### **Metric Halo SpectraFuo Complete**

**Applications:** Audio analysis.  
**Features:** Mac software; standalone or plug-in; Lissajous phase scope, stereo balance meter, spectrum analyzer, oscilloscope, spectrogram, phase meter, digital level meter, correlation meter, bit matrix meter, bit scope; history meters; sweep, sine, noise signal generators. Price: \$800.  
**Contact:** Metric Halo at 845-831-8600; or circle **Reader Service 94**.

---

### **TerraSonde Audio Toolbox Plus**

**Applications:** Signal and system test and measurement.  
**Features:** Onboard microphone; RTA; SPL measurement; acoustical analysis; LTC timecode reader; polarity check; signal generator; cable tester; distortion meter; phantom power; hum canceller; S/N, frequency response measurement; battery operable. Price: \$1,799.  
**Contact:** TerraSonde at 888-433-2821; or circle **Reader Service 90**.

---

### **Channel D Mac The Scope**

**Applications:** Signal analysis.  
**Features:** Mac software; modular; onboard signal (sine, triangle, sawtooth, pulse, sweep, multiharmonic, envelope, pink noise, white noise) generator; onboard RTA; FFT vector signal analyzer; spectrogram; ASIO; 8, 16, 24, 32-bit. Price: starts at \$89.  
**Contact:** Channel D Corp. at 609-393-3600; or circle **Reader Service 95**.

---

### **MLS Instruments Pen-Strobe**

**Applications:** Signal analysis.  
**Features:** Penlight stroboscope; 2 Hz - 2 kHz; ceramic resonator; battery operated. Price: \$129.  
**Contact:** MLS Instruments at 503-671-0312; or circle **Reader Service 96**.

---

### **Videoquip DSG-1 Digital/Analog Audio Signal Generator**

**Applications:** Signal generator.  
**Features:** 32, 44.1, 48, 96 kHz sample rates; 100 Hz, 400 Hz, 1 kHz, full sweep bandwidth; status LEDs; battery operable. Price: \$750.  
**Contact:** Videoquip at 888-293-1071; or circle **Reader Service 97**.

---

### **Rhintek CARA Release 2.0**

**Applications:** Room acoustics analysis.  
**Features:** Computer Aided Room Acoustics; room design tool; Windows software; materials library; loudspeaker library performance analysis; 3D. Price: \$49.  
**Contact:** Rhintek at 800-234-4546; or circle **Reader Service 98**.

---

### **NTI Minilyzer ML1**

**Applications:** Signal analysis.  
**Features:** Handheld signal analyzer; distortion, frequency measurements; RMS/peak levels; bar graph/curve; meter/sweep modes; up to 100 ppm; LCD panel; battery powered. Price: \$399.  
**Contact:** NTI at 514-344-5220; or circle **Reader Service 100**.

---

### **DK Audio MSD600M Meter**

**Applications:** Signal measurement.  
**Features:** 2, 4, 6, 8-channel versions; Dolby Pro Logic, 4.0, 5.1, 6.1, 7.1 formats; phase meter; surround audio vectorscope; multichannel peak program meter; optional FFT spectrum analyzer. Price begins at \$4,182.  
**Contact:** DK Audio/TC Electronic 805-373-1828; or circle **Reader Service 101**.

---

### **Audio Precision Dual Domain System Two Cascade SYS-2S22A**

**Applications:** Signal analysis.  
**Features:** Windows APWIN control/interface software; separate processor; ISA interface card; 96 kHz operation; FFT spectrum analyzer; phase, frequency, distortion measurement; multitone testing; analog and digital I/O; onboard noise generators; sine, sine burst, stereo, IMD, square waves. Price: \$21,500.  
**Contact:** Audio Precision at 800-231-7350; or circle **Reader Service 50**.





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# McDonald and Yamaha on Christmas Album

by Brett Moss



Michael McDonald and Marc Harris with Yamaha's AW4416.

**O**n Michael McDonald's Christmas album McDonald and coproducer Marc Harris utilized **Yamaha's** ([www.yamaha.com](http://www.yamaha.com)) AW4416 DAW for much of the mixing, editing and processing. On McDonald's Tribute Concert album engineer/producer Ross Pallone used **TC Electronic's** ([www.tcelectronic.com](http://www.tcelectronic.com)) System 6000 digital multiprocessor extensively for reverb, surround and restoration work. Jon Secada's new Christmas album was recorded with **Audio-Technica** ([www.audio-technica.com](http://www.audio-technica.com)) mics - including AT4050, AT4051 and AT4060 microphones.

**Symetrix** ([www.symetrix.com](http://www.symetrix.com)) is celebrating its 25 years in business. And speaking of Symetrix, Cox Radio bought two dozen 628 Digital Voice Processors and eight 506E six-channel headphone amps for their new Orlando facility.

No sooner had they announced the DREAM DAW line than **Fairlight** ([www.fairlightusa.com](http://www.fairlightusa.com)) plugged a sale. CBH Ministries of Grand Rapids, MI purchased three of the DREAM Satellite workstations and a MediaLink server to boot.

**JBL** ([www.jblpro.com](http://www.jblpro.com)) has been selling and leasing VerTec line array speaker systems all over the world. Tangerine Dream used them in a rare commemorative appearance in Poland. MTV's 20th Anniversary concert used them while Neil Diamond's tour makes use of them also. At the MTV Anniversary event several **Yamaha** PM1D digital consoles provided FOH and monitor duties.

Rod Stewart's recent tour flew **Electro-Voice's** ([www.electro-voice.com](http://www.electro-voice.com)) X-Line speaker system, courtesy of Sound Image. Other equipment on the tour included EV's

P3000 amps, a **Midas** XL4 console for FOH duties and **Klark Teknik** DN9848 crossover processors.

**Apogee Sound's** ([www.apogee-sound.com](http://www.apogee-sound.com)) recent successes include 16 ALA-5 speaker arrays, 16 CA-4000 amps for power, two PLA-5 processors and two CRQ-12 EQs for Hershey Park in Pennsylvania for use in a new laser show. The Calvin Simmons Theatre in Oakland recently installed three Apogee Sound AE-5NC speakers, two AE-12 subwoofers and two D-1 digital loudspeaker controllers. And all the way over in Singapore, Apogee placed the ALA-9 line arrays, six FH-18 quad subs and 28 DA-800 amps into the TJ Livehouse nightclub.

In Las Vegas rental house, The Wave, recently added a **Turbosound** ([www.turbosound.com](http://www.turbosound.com)) Floodlight speaker system to its menu. The system consists of eight TFL-760H mid/high boxes, and eight TSW-718 subwoofers. On the other side of the continent an even heftier Floodlight system has been purchased by Craft-Work Sound, a rental house in Chesapeake, VA. That system consists of 16 TFL-760H mid/high boxes and 16 21-inch TSW-721 subs.

The Plant Studios in Sausalito, CA recently added **Prism Sound's** ([www.prismmpi.com](http://www.prismmpi.com)) new ADA-8 eight-channel digital audio converter to its rack for use with **TASCAM's** DA-98HR DTRS tape machine and a **Digidesign** Pro Tools DAW system.

In Atlanta, the Alliance Theater replaced its old house console with an **Innova SON** Compact console ([www.innovason.com](http://www.innovason.com)). Additional remodeling added six **BSS Audio** 9088 Soundweb digital sound processors/distributors ([www.bss.co.uk](http://www.bss.co.uk)).

**Peavey** ([www.peavey.com](http://www.peavey.com)) signed a deal with **Gentner** ([www.gentner.com](http://www.gentner.com)) to license Gentner's echo cancellation technology in upcoming MediaMatrix products. Outboard DAW/network storage solution companies **Medea** and **Storage Concepts** are merging. The new company will be called Medea Corporation.

## Next month in PAR

In the January 2002 issue, the newly redesigned PAR takes a look at the latest microphones, recording gear for project studios. We'll wrap up the rescheduled AES show and look forward to winter NAMM. Also not to be forgotten are our microphones and preamplifiers buyers guides. As always, look for reviews of professional audio equipment for recording studios, project studios, contractors, live sound and post production.

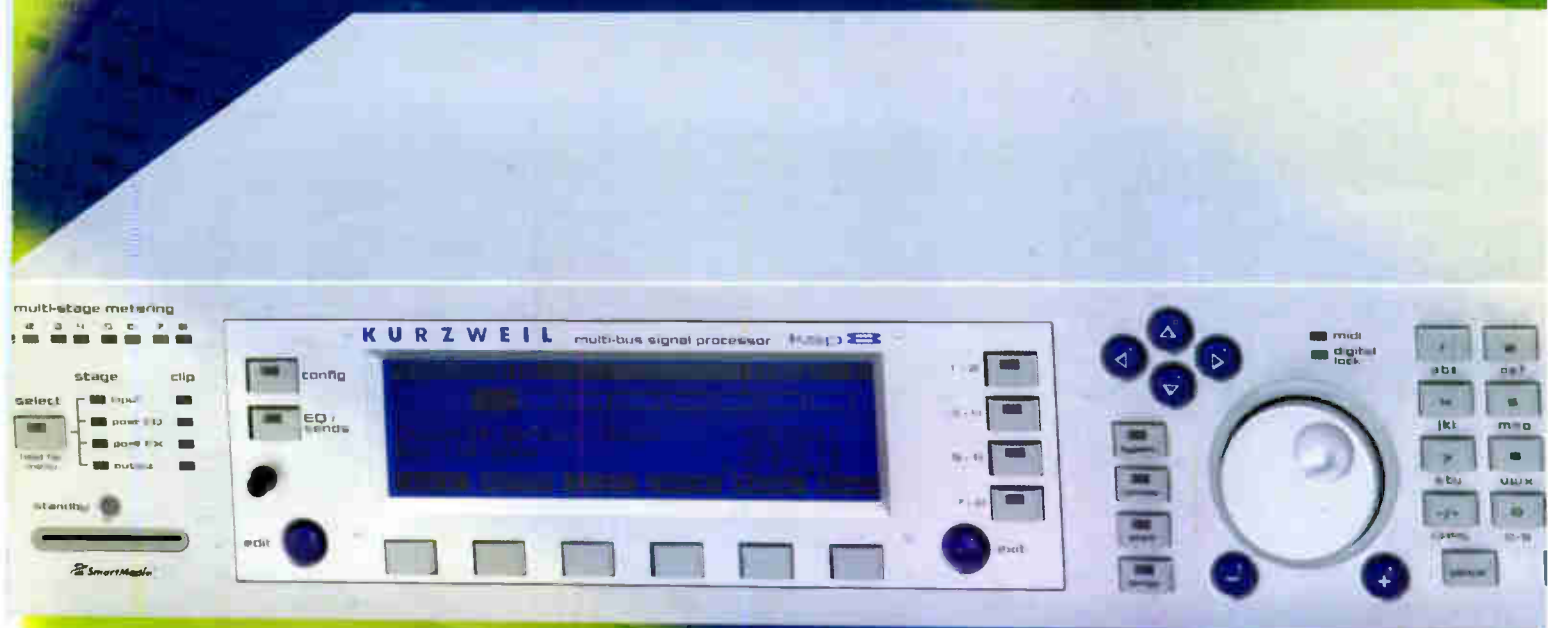
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