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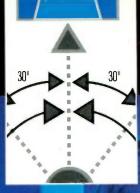
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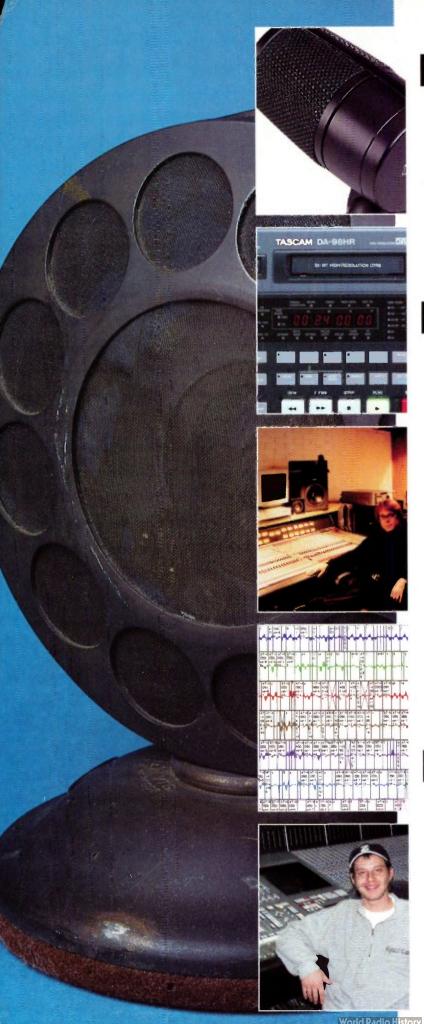
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2500 NOTES

Thank you for the review of the API 2500 [January 2001]. I would like to touch upon a few things about the unit. When designing it, I talked to many engineers about the importance of certain features. One comment I got was that the ability to monitor the sidechain input wasn't that important if the unit itself didn't alter the signal with an equalizer or a filter. I chose to not offer this feature because of that.

Regarding the possibility of a heat problem, we tested the unit with the top and bottom completely sealed and insulated for a week without any rise in temperature. There are small vents along the rear of all of the API rack units for this reason. There's minimal circuitry in the 2500, and the majority of the heat is generated by the VCAs, of which we use four in parallel for each channel. I wouldn't be concerned with installing the 2500 in a tight rack, as even additional heat from other units won't effect it much. Of course, you don't want to put anything directly over tube devices....

One final thing about the dual control of the unit: The 2500 is actually two completely isolated compressors, even when linked at 100%. The reason for this is to avoid summing the left and right sidechain together and using one channel for the controls, which is quite common in most stereo units available today. In a stereo field, you have two channels that have a fairly equal average loudness, which tends to keep the field balanced. When you compress this image, as long as there's a relative balance between the channels, the image tends to stay centered. When a loud signal comes out of one channel more than the other, and the

"WHAT'S WRONG WITH A LITTLE EYE CANDY IN A MAGAZINE FULL OF UGLY OLD GUYS?"

-JC, VIA EMAIL

channels are hard-linked, the image shifts because the average level of one channel is compared against the other. The louder signal is then the reference voltage that turns the other channel down as much as it turns its own channel down. The image shifts toward the channel that's louder. By adjusting the linking percentage, you can find a point that doesn't cause the image to shift. I find that 50% linking works guite well.

By the way, two or more of these units with our patent-pending variable linking used front-to-back also works quite well for 5.1 work.

Paul Wolff
Director of Engineering, API
The ATI Group

ENOUGH ALREADY

The emails and letters continue to pour in regarding EMTEC's Media Goddess ad; we'll wrap up the controversy with some of our favorite excerpts....

These guys have *got* to be kidding about being upset over the EMTEC ad. I didn't realize that monasteries had recording studios

—Frostyra

I have to say, "hat's off to their ad agency" because it's obviously a great ad to draw this much controversy. Like Madonna said, "It's not what you know about me, it's that you know me!"

-Steffon Hamulak

I have a complaint: If these guys are getting pornography in their issues, why am I not getting any in mine? Take the tapes out of her hands and put them at her side...and it still wouldn't be pornography. Not particularly appropriate, but wonderful to look at (for some of us).

-Fred Godsmark

I must say I was highly offended by one of the advertisements in your December 2000 issue. In the Cool Edit Pro ad on page 125 you showed 16 clothes-less stick figures, of which only one was censored. This is appalling. I am very fortunate to have a diverse clientele, some of which are stick people. Thanks to your poor judgement, I can no longer display this magazine in my control room for fear my stick-clients might read it while mixing.

—Ricci Adams

And the final word:

What's wrong with a little eye candy in a magazine full of ugly old guys?

-JC

JUST SAY NO

Just read the November 2000 "Guest Room Warrior" regarding sound-alike songs and stolen music. I went through it, too. During the mid-'90s, I was the production director for a prominent Top-40 radio station in Pennsylvania. My predecessor once showed the sales force how easy it was to do L-minus-R vocal elimination from hit songs, offering endless possibilities for commercial jingles and usage. And they ran with it. When he left and I arrived, I told them what they were doing wasn't kosher and that I wouldn't go along with it. They weren't happy with this newfound knowledge or my position on the matter.

For all I know, this station is continuing its practice of zapping hits and laying down new lyrics for commercial use. If I knew ASCAP, BMI, or the Harry Fox Agency doled out finder's fees to report such practice, I'd have turned those clowns in long ago.

Al Peterson via email

BUSTEDI

Eagle-eyed readers pointed out several errors in recent articles (some did so in a nicer way than others....)

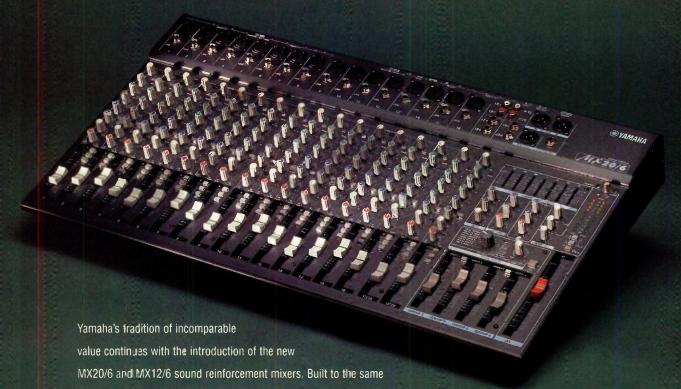
In the November 2000 article on Craig Leon, it should be noted that Leon produced Dwight Twilley, not Dwight Tilley.

Several readers point out that in our Avalon 2022 review [December 2000] we missed listing several other mic preamps that have featured adjustable input impedance, including the JoeMeek VC-7, Universal Audio 2610, and Bryston BMP2. Others notified us that Audio Ease's River-Run plug-in [also December 2000] isn't the first to support granular synthesis; Cycling '74's Pluggo predates it.

And there are two corrections for the MBHO MBNM648 MicroPhile that ran in the January 2001 issue. First, the mics are pictured at a 90° angle from the Schneider Disc, while the mics are supposed to be mounted at about 35°. Second, the company's Web site was listed incorrectly. The correct address is **www.**

mbho.de





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they're just \$949 and \$649 MSRP, respectively. Pretty impressive! Once again, Yamaha gives you more for less.





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CIRCLE 38 ON FREE INFO CARD

World Radio History

DULL MIXES

What makes mixes sound dull? Compression? EQ? Effects? Panning?

-awolfe

Dull mixes can result from multiple causes. I've found that that two things generally happen when combining lots of tracks to make one cohesive mix:

- 1. Room tone and wolf frequencies build up as you add instruments. This is usually around 315 Hz. First choice would be to take out 1 or 2 dB at the offending frequency on each instrument. It may not be exactly 315, and it helps to take out at a slightly different frequency on each instrument. If the song is already mixed, try cutting 2 dB at 315 with a Q of 2.5.
- 2. The high frequencies from one instrument mask the high frequencies from another instrument. You can add 1 dB at around 10 kHz to each instrument or add 1dB at 10 kHz to the entire mix. I would rather do it to each instrument, and again I would pick a slightly different frequency close to 10k for each instrument

Remember that if one track, such as the drum overheads, has been recorded with screaming high end, you may not have to goose 10k on everything. Listen. But lean toward the suggestions above for a less cloudy mix.

-Roger Nichols

Roger, is 315 Hz something you typically scoop out of the kick? Also, do you find when you're mastering projects that 315 Hz tends to be something that you slightly cut, no matter where the project was tracked and mixed?

-ajcamlet

Yes. It seems that 315 is some magical number that instantly cleans up everything. But don't remove too much, because "the music is in the midrange." You have to use your ears and decide when enough is enough.

-Roger Nichols

MIKING TIMBALES

I play percussion with a straight-up Latin (salsa, merengue, etc.) group. We're heading into the studio soon and I need some advice on how to mic timbales. Since I'm acutely aware of "loud bells and bright drums," should I try a ribbon mic scheme? What about positioning?

-nradina

I like to mic timbales with either Coles 4038's (if they need to sound "natural"), 4011's (if they need to cut through a lot of stuff) or SM57's (if they need to sound "gritty"). Most often I place the mics close to each other, down the middle of the drums, pointing out. Generally, for that dance hall sound I'll count on hip room mics.

-George Massenburg

I did timbales recently with a Royer R-121, logo side toward the "higher" of the two. It worked like a charm. My next favorite is a pair of Beyer 201's. They work nicely, especially in a good sounding room with a little room mic mixed in.

-Fletcher

A C-24 approximately 2.5 feet above the timbales pointing more-or-less straight down (mic perpendicular to the floor) sounds killer

-maarvold

On a recent Latin project where I had to record many timbale sessions, the winner set up was a pair of Earthworks QTC1's, one at each side of the two drums pointing in just as you would record a snare. A center AKG C451/CK5 as an overhead was mixed in, too. It worked well in a situation where those timbales had to cut aggresively.

-Overdrive

OPEN UP THOSE MIXES

I seem to take up all the space in my mixes; they become almost a mono mix — in your face, but not with enough depth. I also seem to get too much mid in my mixes. What



Have a question you'd like answered? Visit Roger Nichols, George Massenburg, Ed Cherney, Al Kooper, and David Frangioni online at www.egmag.com.

advice do you have for creating open, airy, breathing mixes with a solid, smooth low end? —fast_traxx

This should not be a big problem, and instead of giving you a whole load of information, let's just start with the first thing first. Number one, turn off all reverbs and effects, pull all EQs, compressers, and stereo bus inserts, etc. I would bet the farm that most of the EQ you are using is additive, pilling it on at 2k, 3k, 4k, etc. Well, don't do that! The thing to practice doing — and it takes discipline — is to cut, cut, cut when using EQ, and push up the fader. It seems like the easiest thing is to boost 3k and make something apparently louder, but all you're doing is backing yourself into a corner.

Next, stay away from the solo switches and try to EQ and balance the song with most of the elements up. Try dipping 150 to 300 Hz out of the kick drum, and try doing the same to the overheads. Perhaps dip some 800 Hz out of the snare, carve out a space for the bass to live, leave some room for the guitars (pan them off to the sides), and leave space for the vocals. Don't try to muscle the balances (at least not yet), but use finesse — clear out space instead of trying to overfill the bucket.

-Ed Cherney

I have heard this over and over and usually try to abide by this good advice. But what exactly is the difference between cutting EQ and raising the fader and adding the other frequencies *around* the one you typically cut and lowering the fader?

-alphajerk

By boosting, you're adding a considerable amount of phase shift — way more than when you're cutting frequencies. Also, people tend to boost where they hear the most change, e.g., upper midrange, so they tend to add level in the midrange, and as they try to get the next element to speak, they add more midrange on top of that midrange. As a result, they end up getting a program that is very peaky in those frequency ranges, and by the time they try to fit a vocal on top of all that, they end up having to crank up even more 3-5 kHz. Then, try to add some overall compression to hold it all together, and the detector is going to be acting only on the vocals, and certainly the guitars — all of which



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ON THE BOARDS

makes it very difficult to open up the top and get a pleasing shape on the overall program.

—Ed Cherney

Subtractive EQ is even more important in live sound. You get much more headroom, low frequency impact, and less feedback by cutting frequencies first. In addition, by cutting let's say 300 Hz from a kick drum, you get a similar tone to boosting at 100 Hz (shelving) and 2k (shelving), with far less phase shift and a much tighter bottom end.

—TinderArts

Say I want some more high end in my overheads. Should I just run a lowcut filter and raise levels, as opposed to lifting the highs with a shelf?

And one more question: In this mix I'm doing now, I lose the kick almost completely. The bass sounds really good, and is very distinguishable as well. Should I sculpt out some of it to make way for the kick? I hate to lose its low end, but I see no other way. (Let me add that the bassist isn't merely riding the kick; there's a lot going on, but it's not overplaying — the parts are perfect for the songs.) Or, should I stick a compressor on the bass keyed off the kick to clear it out when the kick hits? I'm a bit worried about too much pumping in and out.

-alphajerk

Shelving some top on your overheads does work — just be sure you aren't overdoing it.

As to the kick drum not speaking, the first thing I would do is check the phase of the kick against the overheads, the room, etc. It sounds like your kick may be out of phase with the rest of the kit, which is pretty common. If it is in phase, try multing the kick to another channel, gate it, compress it (slow attack, fast release, with the compessor first in the chain, then the gate, and then the EQ), EQ most of the low mids out of it, get it to snap by adding some 5, 6, and/or 7k, and peak the fundamental (40, 50, 60 Hz). Then push it up just enough to get it to speak against the bass — that way, you have all of the dynamics, and the thwack.

—Ed Cherney

OLD SCHOOL BLUES ON A BUDGET

Some friends of mine have this great traditional blues band (drums, electric guitar, bass, and singer/harmonica player). They're into Muddy Waters and the like. I've offered to produce a demo for them, and they'd like it to have that "old" sound. Here's the question: How did they track it back then? Big room or small room, dead or ambient, separation with headphones or bleeding festival? How do you place the players with the amps? In a circle? As in a live setup? Do I use gobos? Do I close mic everything or use just a few room mics? Do I use one drum overhead? Do I mic the kick? Are eight tracks enough for the whole deal? Do I use ribbons or omnis? Sadly, I won't have access to an analog recording device (I'll probably rent a DA-88) or tube pres and will only be able to rent a good pair or so of mics, the rest being the usual '57s and so on. I'll have as much time as I want for the mixing and tweaking, but I'm more concerned about the tracking end of things. Any tips would be greatly appreciated.

_emile

First off, all those records were recorded mono onto an analog machine. There was no post-mixing; the mixing was done as the song was recorded. In the late '40s, one or two room mics were used, with another mic on the featured soloist. I would definitely not mic the kick drum — that didn't happen until the '60s.

Slap-back tape echo is in order, with only one repeat. I actually played on sessions in the late '50s, but was too young to notice what mics were being used. I would record mono with slap-back, especially on the snare, vocal, and harp. I'd use two mics for the drums: One over the snare, and one facing the kit about 2-3 feet away. I'd room mic the guitar, bass, and harp amps, from a distance of 4 to 8 feet. *Mic placement is everything.* The mic that faces the kit should be positioned to get a full blend of the kit, including the bass drum.

Some of the original studios were offices during the day and studios at night. Others were radio stations and, occasionally, ballrooms. For a four-piece, the ideal room would have a little space to it to spread things out a bit, but not too much. For homework, listen to the early Muddy Waters and Howling Wolf records on Chess; they'll tell you reams more than I can type

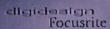
—Al Kooper

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THE DETAILS: Inspired by the Sequential Circuits Prophet VS, Vectron incorporates a set of wavetables that are equivalent to the VS factory wavetable set. As with the VS, the oscillator mix or other adjustable parameters are varied dynamically and in real time via a two-dimensional "vector" multi-point envelope or other internal and external modulation sources.

CONTACT: Creamware at 604-435-0540 or visit www.creamware.com. EQ free lit. #107.



PRODUCT VIEWS



THE PRODUCT: Mackie D8B Version 3.0
THE BASICS: Software upgrade

THE DETAILS: Got a Digital 8-Bus? You can make it a whole lot more powerful — for free — by paying a quick visit to the Mackie website and downloading the new version 3.0 software. The upgrade adds third-party plug-in support, improved signal routing, fader crosspatching, smoother sounding compression and gating, additional mix automation functions, enhanced

PRODUCT VIEWS





THE PRODUCT: IZ RADAR 48

THE BASICS: 48-track hard disk recorder THE DETAILS: How many tracks are too many? Depends on who you ask, but iZ is definitely upping the ante for dedicated hard disk recorders with the release of RADAR 48, which, as its name implies, provides 48 separate tracks. Operating under the real-time BeOS software platform, its enhanced V-24+ recording engine supports sample rates of up to 192 kHz, with all the same great sound, features, and reliability that have made RADAR famous.

CONTACT: iZ at 714-577-8230 or visit www.izcorp.com. EQ free lit. #108.

THE PRODUCT: Sennheiser RS Series
THE BASICS: Wireless headphones
THE DETAILS: If you're into monitoring on
the move, you'll want to check out the

new RS Series of wireless headphones from Sennheiser. All models feature a lightweight design, uninterrupted audio transmission through walls and ceilings, and unlimited users on a single transmitter. The RS40, 60 and 80 provide "on-hook charging," so you can recharge the battery simply by placing the headset on the base transmitter. The flagship RS60 even in-

cludes switchable surround sound, utilizing SRS Labs' headphone enhancement technology.

CONTACT: Sennheiser USA at 860-434-9190 or visit **www.**

sennheiserusa.com. *EQ* free lit. #109

THE PRODUCT: Steinberg Cubase VST 5.0 for Mac

THE BASICS: DAW software

THE DETAILS: VST 5.0 is the latest update for the line of Cubase software packages for the MacOS. Optimized for the Power Mac G4 Velocity Engine, this latest release boasts speedier audio processing and a slew of new features, including TrueTape Mode (which utilizes Steinberg's Magneto tape saturation technology), precision MIDI timing, a 70 MB GM-compatible virtual Universal Sound Module, a new MIDI track mixer, and a redesigned FX-Rack that offers a host of new control elements.

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Ele Edit Transport (Beron Very Belt)

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Basic Corrections

Basic Corrections)

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Basi

24-bit, 96-kHz Audio A-to-D Sonverter

THE PRODUCT: Emagic ES1 TDM
THE BASICS: TDM software synth plug-in
THE DETAILS: Offering everything that made
analog synthesizers so famous — rich
sounding oscillators, fat filters, flexible

modulation possibilities, and extremely fast envelopes — the ES1 TDM plug-in provides subtractive synthesis with that "classic" analog sound. It integrates seamlessly with Logic's internal digital mixer, providing sample-accurate timing and access to all other plug-ins, effects, and automation. ES1 TDM works with Mac-OS Logic Audio Platinum 4.5 (or higher) and Digidesign Pro Tools TDM-based systems. CONTACT: Emagic at 905-649-6336 or visit www.emagic.de. EQ free lit. #111.

THE PRODUCT: Sounds Logical Wave-Warp 2.0

THE BASICS: Native audio processor for Windows 95/98/NT

THE DETAILS: For the user who demands complete audio control, WaveWarp 2.0 provides over 260 real-time DSP components, including filters, delays, mixers, de-noisers, spectral transformers, signal generators, reverbs, phasers, flangers, chorus, modulators, and dynamic range controllers with seamless DirectX integration to most popular audio editors and sequencers. Support is provided for live audio input and playback via all Windowscompatible soundcards, and various onscreen displays such as oscilloscopes and spectrum analyzers are also included. CONTACT: Sounds Logical at 31-71-514-5430 or visit www.soundslogical. com. EQ free lit. #112

THE PRODUCT: Sonic Sense AD2K+
THE BASICS: Portable 24-bit/96 kHz A/D
converter

THE DETAILS: Out in the field with your DAT recorder? Complement it with this new lightweight, portable A/D converter. Front-panel controls allow you to set input sensitivity,

sample rate (up to 96 kHz), and word length (up to 24-bit); there are even adjustable post-conversion digital meters. Balanced analog inputs are provided, and four digital signals can be output simultaneously in AES/EBU or S/PDIF forat.

CONTACT: Sonic Sense at 877-324-4463 or visit

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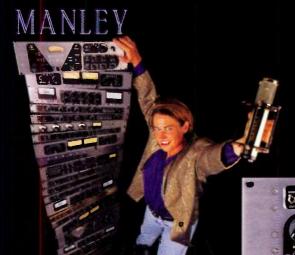
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By Steve La Cerra and Howard Massey

Live From Winter NAMM 2001

Greetings from room 6514 in the semi-luxurious Anaheim Hilton hotel! As we type this (around noon on January 21), the 2001 edition of the Winter NAMM (National Association of Music Merchants) tradeshow is in full swing across the street at the cavernous Anaheim Convention Center.

If there's one thing that we can say about the 2001 Winter NAMM show, it's that there were a lot of new products being shown by manufacturers. Spanning categories from software plug-ins and virtual instruments to hard disk recorders and signal processors, there was plenty of eye-catching gear for us to lust after. But in addition to the sheer quantity of new items, we also witnessed a number of trends in the audio marketplace such as:

- A move toward higher-end professionally featured integrated hard disk recorder/digital mixer products, such as the **Akai DPS24**, **Fostex D2424**, **Roland VS-2480**, and **Korg D24** and **D1600**. Enhanced graphic editing, higher bit-resolution, and increased sample rates join the increased track count these devices provide.
- Lots of new control surfaces, including **Digidesign's Comtrol 24** (a lower-cost alternative to Pro Control that includes 16 Focusrite mic preamps), **Steinberg Houstom, MIDIMan Surface One,** and **Emagic** and **Mackie's** announcement of a series of dedicated controllers for use with Logic.
- The first wave of FireWire ports appearing on products. Yamaha's various mLAN products are now joined by **Crest's FB-88** 8-channel computer audio interface, **Apogee's** AMBUS FireWire card for their AD8000 and other converters, **MOTU's 328** audio interface. In addition, **MIDIMan** announced that they will be implementing FireWire in future products.

• The maturation of digital signal processing. Delays and reverbs? Old hat. Equalization and dynamics processing? Yesterday's news. The hot story from NAMM is real-time pitch and time compression (as exemplified by incredible new software products such as Celemony Software's Melodyne and Ableton's Live) and autotuning (Antares' new Auto-Tune 3, which now works with stereo files and offers 96k support).

Another new DSP introduction was the physical modeling vocal processes (such as the breath/rasp/growl and intelligent vibrato functions) contained in the **TC-Helicon VoiceCraft** expansion card for the VoicePrism.

- The introduction of proprietary DSP cards by manufacturers other than the usual suspects (*i.e.*, Digidesign, Ensoniq, Lexicon). On this front, there were new PCI cards from **Universal Audio** and **TC Works**, and the **Waves Y56K** card for the Yamaha AW4416, allowing you to get enhanced DSP mileage from existing native software and workstations.
- The "one-finger orchestra" concept, as exemplified by Korg's new Karma synth (which also adds onthe-fly control over rhythmic complexity, harmony, and melodic repeat of phrases and grooves) as well as new guitar and keyboard products from Yamaha and Roland.

Other new products of note included the **Alesis HD24**, a 24-bit, 24-track hard disk recorder with ADAT sync capability and a projected list price of only \$2,499. Alesis also introduced the **proLinear 820** DSP Studio Monitor, a biamped two-way studio monitor with onboard DSP for customizing frequency response.

Phonic unveiled the world's first low-cost 5.1

► continued on page ISO



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By Steve La Cerra

Kurzweil KSP 8

Kurzweil is well-established for their production of first-rate synths, samplers, and keyboards, so it's interesting to note that one of their latest introductions is a digital multi-effects processor. The company's new KSP 8 is an eight-channel, rackmount signal processor designed to produce some very interesting and unique effects. The KSP 8 is intended for pro and project studio applications requiring high-quality DSP with extensive real-time control. A descendant of the KDFX (Kurzweil Digital FX) system used in their hugely successful K2500 and K2600 synthesizers, the KSP 8 includes all of the high-quality algorithms from the KDFX, plus adds surround reverbs as well as other new effects. A word length of 24-bits is maintained from input to output; sample rates may be internally set to 44.1 or 48 kHz, or the KSP 8 can lock to an external clock.

Housed in a two-space chassis, the KSP 8 interfaces to the outside world via a series of analog and digital I/O's. A "stock" KSP 8 includes four balanced analog inputs and outputs, plus an AES/EBU digital I/O for a total of six I/O channels. These I/O's can be used simultaneously to process six discrete signals. Each input has a dedicated EQ. A rear-panel option slot allows the KSP 8 to be expanded through the addition of an expansion card. Available interface cards include

an additional four-channel analog I/O, an eight-channel lightpipe I/O, eight-channel TDIF I/O, and eight-channel AES/EBU I/O. Expansion cards may be userinstalled. When fully loaded, the KSP 8 has the ability to process eight separate signals selected from 14 possible sources. A front-panel Smart Card slot

allows storage of user program data; operating system updates may be loaded into Flash ROM via this slot, or via rear-panel MIDI connections.

Kurzweil's engineers have developed an extensive complement of DSP algorithms for the KSP 8 including reverb, room simulation, flanger, chorus, distortion, aliasing and chaos generators, rotary speakers, cabinet simulators, audio enhancers, a variety of EQ's and filters, and "Lazerverb." Lazerverb might best be described as a series of tunable multi-tap delays that are further processed with a set of complex comb filters; each comb filter provides adjustable response peaks as well as adjustable filter peak spacing. Tempo-based effects such as phasers, flangers, panners, filter sweeps, and delays may all be synced to an external MIDI clock or to the internal clock. Kurzweil is currently expanding their DSP library to include new algorithms specifically written for surround processing. As you'd expect, the algorithms provide control over a large number of parameters, plus MIDI controllers may be mapped to specific parameters.

A key difference in the KSP 8 from "traditional" DSP is the internal bus structure and routing capability of the KSP 8. Eight internal buses are provided for processing. Each bus can carry a chain of multiple effects, providing eight separate multi-effect chains simultaneously. Individual effects may be chained in any order on any bus. The KSP 8's operating system allows user configuration of routing, so any hardware input maybe routed to any of the internal buses. Conversely, any of the internal buses may be routed to any of the hardware outputs.

Front-panel features of the KSP 8 include a 240 x 64 backlit display, an alpha knob, soft buttons, multi-stage metering, and switches for navigation of the operating system. Kurzweil is currently developing a remote controller for the KSP 8; the RSP 8 will provide control over all KSP 8 functions, and is expected to be available soon after the release of the KSP 8.

WHAT IS IT? Eight-channel digital multi-effects processor WHO NEEDS IT? Anyone who requires high-quality effects with extensive MIDI control capability

WHY IS IT A BIG DEAL? As of this writing, the KSP 8 is the only effects device capable of processing eight discrete channels

SHIPPING: May 2001 SUGGESTED RETAIL PRICE: TBA

CONTACT: For more information contact Kurzweil at 253-589-3200 or visit **www.youngchang.com/kurzweil**. *EQ* free lit. #116.

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Chris Brooke

EQ questions an up-and-coming engineer who's starting to make his mark on the music business.

Apprenticing was once the standard way of rising through the recording world's ranks, but with the rise of the project studio, the system is starting to disappear. This month's Rising Star, however, is one of the lucky few fortunate enough to be learning from one of the true masters of the trade — the legendary Humberto Gatica.

Chris Brooke grew up in Washington D.C., and after being bitten by the recording bug in high school, began taking engineering courses at Omega, a local studio. From there, he traveled to L.A. to study at Loyola Marymount University, eventually scoring a bachelor's degree in Communications, with an emphasis in recording arts. After graduation, Chris landed a job at L.A.'s Westlake Audio as an assistant engineer, where he met Gatica. Soon afterward, Gatica took him on as a fulltime assistant, giving Brooke a once-in-a-lifetime opportunity to work with artists such as Celine Dion and Carole King.

EQ: How did you land your current gig?

Chris Brooke: I started working with Humberto while I was an assistant at Westlake. We were doing a Celine Dion album and he asked if I would like to continue working with him when he went to New York to finish the project. We've been working together ever since.

How did you get started in engineering?

I got started in engineering when I was in high school. I had been playing guitar since I was 12 and began playing with friends. We always wanted to hear how we sounded, so we'd set up in my parents' living room and record on different tape decks. Ever since then, I've been enthusiastic about the recording and production of music. When I went to college I was production director for KXLU in Los Angeles. There were always live bands coming up to the station and I engineered almost all of the shows over a three-year period. That was a real learning experience in guerilla recording technique!

What are your career goals?

To produce, mix, and make great music with talented, creative people. I believe the accomplishment of those goals will come from hard work and teamwork. If your vision is the same as the people you work with, you're bound to do things right.

Who are your heroes in engineering and record production?
George Martin, Mutt Lange, Andy Wallace, and Butch Vig, to name a few.
What are your favorite current recordings, and why?

- Madonna's Music she always brings something new to the table.
- Art Official Intelligence: Mosaic Thump by De La Soul amazingly creative and funny.
 - Sade's Lovers Rock great grooves and she sounds great.

If you were stranded on a desert island, what five pieces of studio gear would you want with you?

A Telefunken 251, a Boulder mic pre, an MCI JH24, a Neve 2254 compressor, and KRK E8 monitors.

What's the coolest recording technique you've discovered? Not to mic things so close — let the instruments breathe.

WEBLINK

Email Chris at brookechristopher@hotmail.com.

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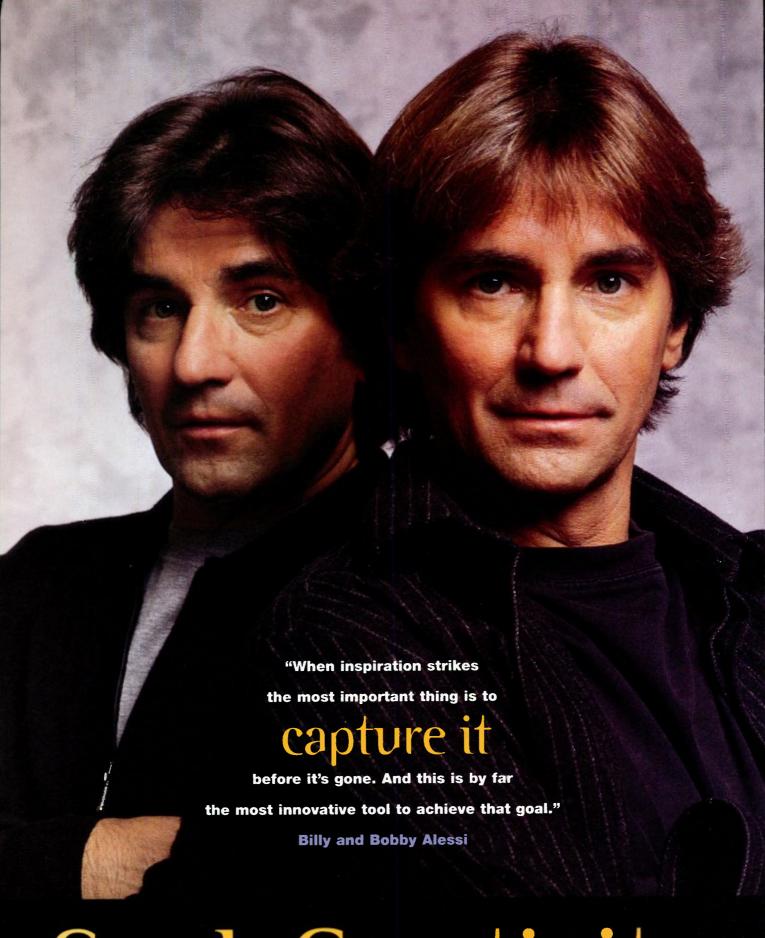








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Seattle On Parade Eas Room with a VU pays a special visit to six of Seattle's project facilities



FLORA AVENUE STUDIO

KEY CREW: Tucker Martine

CREDITS: Bill Frisell, Wayne Horvitz, Modest Mouse, Sick Bees, Land of the Loops, Mount Analog, Julian Priester, Sam Rivers, Hughscore, Farmer Not So John, Eyvind Kang, Danny Barnes, Robin Holcomb CONSOLE Neotek Series IIIC

MONITORS: ProAc Studio 100, Yamaha NS10M, Event PS5

RECORDERS: MCI JH-16 2-inch 16-track with AL3 remote, Otari MX-5050 1/2-inch 8-track. MX5050 1/4-inch 2-track: Panasonic SV3700. TASCAM DA-30

OUTBOARD 66AR: Urei 1176, Empirical Labs Distressor EL-8, TL Audio EQ1, C1; SansAmp PSA-1, dbx 160, 263x (de-esser), 120XP Subharmonic Synthesizer; Lexicon PCM81. Symetrix 564E gates [4], Shure Level-Loc. JoeMeek C2 Stereo Compressor, FMR Audio RNC Compressor, Altec 1612A compressor. Apogee Rosetta A/D converters

EFFECTS: Roland Space Echo, Yamaha SPX90, Furman Spring Reverb, TC Electronic M2000, EMT 140 Plate Reverb, tons of funky pedals including the Electro-Harmonix 16-second delay ("the Holy Grail of all pedals!") MCS: Royer R-121, Neumann U 87 (Klause Heyne modified), KM 184; AKG C414, D12E: Shure SM57, Beta 87, SM81, SH55 "Elvis." Green Bullet; Sennheiser MD421, Beverdynamic M500, Sony C500, Audio Technica ATM125, Pro37; Altec 639, Coles 4038 MIC PREAMPS: Neve 1081, Telefunken V72, TL Audio, Focusrite Tone Factory, Neotek Series

SYNTHS AND KEYBOARDS: Estey portable pump organ, upright piano, Lowry organ with wahwah and beats, Yamaha DX-7, CS-15 analog synth; several Casio keyboards

COMPUTERS: Apple Macintosh G4/400 MHz with 320 MB of RAM and 13 GB hard drives [2] SOFTWARE: Digidesign Pro Tools LE

DAW EQUIPMENT: Digidesign 001

S IN SEC.

WRING: All Mogami cable with Neutrik and

Switchcraft connectors

INSTRUMENTS: Lots of great old and new drums/percussion, Silvertone electric guitar, Eyvinds Memphis Bass

GUITAR AMPLIFIERS: Fender Blues Junior, Magnatone Varsity Tube, National Dobro Amp, Smokey Amp

STUDIO NOTES: "Hopefully Flora finds a nice blend between great modern sounds and sounds with lots of coloration and character — which are often achieved by atypical gear operation," explains Tucker Martine. "An example is 'effect abuse' such as feeding effects back into themselves, just hanging on to that point where it's about to get out of hand. Also, processing of sounds to the point where the source becomes unrecognizable. Anything goes if it sounds good! The live room is Lshaped and the living room above is wired to take advantage of its high ceilings and hardwood floors. It also helps pick up the activity at Boeing field much better!"

FAVORITE GEAR: "The last thing I used that sounded cool. It changes everyday."

PRODUCTION NOTES: "Certain sounds will trigger an idea. When you get a strong vision for something, you just have to hook it up and try it. I like to keep a lot of 120-minute DATs around. When something has the slightest hint of being worthwhile, just run it to DAT for a bit. More often than not, I'll come back to it a month or two later, not even remembering how I arrived at it and say, 'Wow, that's amazing! It would be the perfect introduction to this other piece that's coming together.' So it's the constant stockpiling of sounds. Or maybe I'm producing a band, they're setting up and the gear is all set up wrong but it sounds amazing. I'll ask them to keep going for two minutes while I roll some tape."

"One thing I've found lately is that you can get some really good sounds direct. For a long time I was pretty opposed to that, except for maybe bass. But with the right sequence of pedals, slap-back delay, or a SansAmp, you can get a sound that sits in the mix like it has air around it. It's an artificial air, but it can be really cool. You can get textures out of a direct guitar that you'll never get out of an amp."

"On the production end, I like to have people overdub without hearing some of the song's defining tracks such as the rhythm section. I just give them the organ pad to play to. Then I erase all but the best moments of their performance. That's something that's been working with the act Mount Analog lately. You end up with a really interesting take on things."

SEATTLE SPOTUELT



LION DOG STUDIOS

KEY (NEW: Rick Ruskin

CREDITS: Rick Ruskin, Sherry Flanigan, Joe Weihe, "Resophonics Anonymous" (Dobro Compilation), Mike

CONSOLE: TASCAM 2600-32

MONITORS: JBL 4315, Auratone Soundcubes

RECORDERS: TASCAM DA88 [2], DA30, 25-2 (1/4-inch 2track), 7300 GSL (1/4-inch 2-track), A-300 (cas-

sette); Fostex E-16 (30ips), Sony PCM-3202

OUTBOARD WAR Klark-Teknik DN 410 parametric equalizer, TASCAM PE-20 equalizer, White 4000, 4560 equalizers: Specta Sonics 501 3-band equalizer, DBX 165A, Allison Gain Brain, Furman LC-2 com-

EFFECTS: Roland SDE-2000, SDE-1000 [2], SRV-2000; Ibanez DMD-2000 delay [2], Delta Lab Effectron,

Alesis Microverb II. Wedge

MC5: AKG C414-TLII, D224E, D202E; Sennheiser MKH405, MKH406, MKH40, MKH435/ K2U, MD421; Electro Voice RE20, RE15, CS-15, RE55; Altec M-30, M-49; Sony C-37A, C-38B; Fostex R11P, Shure 330, SM59, SM58, SM57; Milab VIP-50

WIL PREAMPS: Custom Deanne Jensen [6], Great River Electronics MP-2, Spectra Sonics 101 [6]

SYNTHS AND KEYBOARDS: E-mu Proteus Orchestra, Mirage

COMPUTERS: Pentium 166MX with 64 MB RAM

SOFTWARE: Syntrillium Cool Edit Pro POWER CONDITIONERS: Furman PL-8

MAINS: Belden, TEAC Pro-series, Hosa

INSTRUMENTS: Fischer Upright Piano, Ludwig Drums GUITAR AMPLIFIERS: Fender Princeton Reverb w/JBL K120 STUDIO NOTES: Rick Ruskin enjoys "working with good

musicians, but most of all I love to mix. By that time, the memory of any hassle in getting the track(s)

recorded is gone and it's all about the music. FAVORITE GEAR: "The combination of the Great River MP-2 preamp and the Sennheiser MKH40 mics is great — stunning sound! I use this chain almost all the time on (but not limited to) acoustic guitar, strings, drum overheads, piano, mandolin, banjo, dobro, and acoustic bass. The Great River is my first choice for preamping any mic. It's very clean and gives me a sound that's easy to mix. I usually go straight to tape from the Great River, but sometimes it will go into the console if I need to ride gain and/or use a little console EQ. I try to get the mic as far away as possible to get the true tone of the instrument. Usually this works out to somewhere close to the overall body length of instruments with strings (quitars/banjos/mandolins/acoustic basses). My piano (an old upright) usually gets miked from the inside with Flectro-Voice CS-15's plus the MKH40's out in the room to give it some dimension. I usually don't compress or use reverb to tape. I like keeping options open in that area."

PRODUCTION NOTES: "I subscribe to the 'handsome is as handsome does' philosophy and prefer 'hole in the wall' environments over fancier places to work (some of my earliest work as an artist was done in a make-shift studio at the old JBL plant in Los Angeles). I liked the basic layout here and figured that it would work well for my own and my clients' needs. Apart from removing a built-in countertop and a sliding closet door, all I needed to do was to seal the place up, treat the walls, and - because I'm near broadcast towers screen the control room. Definitely not pretty but I'm very pleased with the quality of work I'm able to turn out."



MIRROR SOUND STUDIO

KEY CREW: Ken Fordyce, Adam Kessler, Larry Youngblood

CREDITS: The Ken Reid Band, Invisible Band, Keith Jacobson, Scum Lords, Bonevard, Spatula City, N-Gage, Tribute, Arithmia, 6 Cents, Motug, Radio Star, Anchored in Faith, Calloused, Epigene, Suffergauge, Lo Rize, Thugg, Essex Porder, Fat Sally, Pyro Class Flow, Lethal Rejection (pictured above in studio) CONSOLE: Soundcraft Series 600 with 40 inputs

MONITORS: JBL 4412, Yamaha NS10M, Mackie HR824, Bag End ELF-M

AMP5: Bryston 4BST, Hafler

RECORDERS: Alesis ADAT [3] with Apogee PSX-100 and

Swissonic AD24 [2] converters

OUTBOARD GEAR: Klark Teknik DN-410, dbx 166 dual

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Dual Mode System

PARIS Pro is actually a unique fully integrated dual mode DAW that allows you to simultaneously use both hardware-based and host CPU-based tracks and DSP. This design gives you the best of both worlds by insuring that PARIS Pro's hardware core functionality is always available, while letting you decide how to tap into your CPU's unused power. And you will find more CPU power free than you thought, because PARIS Pro uses its own hardware for all the playback, mixing. FO and included effects. When you want more tracks PARIS Pro allows you to use your host CPU to add "native tracks" to your project without additional hardware.

Want more effects? PARIS Pro supports the world's largest base of third party plug-ins, VST™ and DirectX®, giving you power beyond the arsenal of studio-grade processors already running on the PARIS hardware. And don't forget that these tools cost a fraction of the price of "closed" pro audio plug-in systems.

CPU processing speed and power are increasing exponentially these days, and PARIS Pro automatically makes the most of your computer investment by intelligently incorporating every bit of your system's processing power. Nothing can beat the PARIS Pro dual mode advantage.

Expandable Architecture

PARIS Pro is a truly modular expandable system. It can be expanded to 256 real hardware tracks in minutes. No other pro audio system can be upgraded as easily. and none is capable of as many actual hardware tracks. The intelligent total modular design allows additional cards to transparently provide more real-time tracks and more DSP for all projects- new and existing. This allows moving projects among various system configurations with no loss of tracks

This same flexibility also applies to expanding your PARIS Pro I/O. Since PARIS uses a rack-mounted cage for I/O expansion, you simply install the I/O and sync modules you need into the Modular Expansion Chassis. With PARIS Pro you don't replace hardware to expand, you only add exactly what you want! No costly planned obsolescence. PARIS Pro offers you a host of professional I/O and symc modules. including 24-bit input and output modules (with full metering, trim control and ground lift), ADAT® (with 9-pin sync out), and more, allowing you to configure you

SUBMIN 1 CHANNEL 12

EO 1 ON . EO 2 ON .

system to your specific needs. The PARIS SMPTE Module provides all the professional features that you would expect- full LTC/VITC/Blackburst support, window burn, SMPTE regenerate/reclock, and front panel signal and sync-lock metering.

Post production users can even upgrade their software, offering full Quicktime® support and additional post production features for a surprisingly modest price. When you invest in PARIS Pro, you have a truly scalable

and affordable solution that will grow with you, and be supported into the future

EDS-1000X Expansion Card

6ROUP -CHANNEL & CLIP

4 dedicated hardware-based E@ modules per channel, with multimode filter control and fully sweepable frequency

oad up to 4 VST/DirectX

Up to 8 Auxiliary Sends per channel using PARIS hardware effects

and/or outboard nincessors

> Multiple channel over various fader

> > of all fader and pan postions within the

Load up to 4 Serial Effects per Aux Return Bus (up to 8) for flexible effects routing

Graphic EQ shows the composite EQ curve of each channels 4 EQ modules, and allows you to edit parameters graphically and/or numerically.





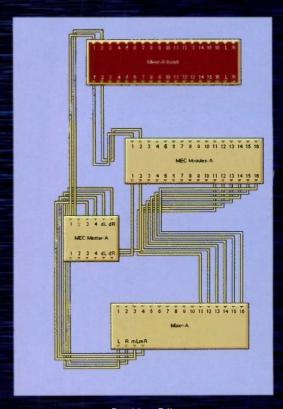
Intuitive Interface

From its inception, PARIS Pro was designed to offer professional users cutting-edge technology with the most intuitive hardware and software interfaces possible. Even the newest DAW users can be up and running in no time due to an exceptionally user friendly system design.

Every PARIS Pro System ships with a C16 Pro Interface, a physical mixing console that puts almost every operation at your fingertips without having to touch your computer's keyboard or mouse. In addition to its 16 high resolution faders, each C16 Pro also has dedicated buttons and knobs for transport control, editing, EQ (level, frequency, bandwidth), effects, solo, muting, automation, navigation, undo/redo, placing markers and much more. And PARIS Pro software is developed specifically to support the C16 Pro, so your control surface will always work seamlessly with every aspect of the overall PARIS Pro System. Want to add motorized faders from another manufacturer? No problem, PARIS Pro also supports 3rd party control surfaces! Once you've experienced the level of tactile control and integration that PARIS Pro offers, you'll never go back to mixing with a mouse!

The PARIS Pro software has been optimized so that you can work as quickly and efficiently as possible, while acting, feeling and even sounding like a top-end analog studio. Imagine the editing and creative power of a professional DAW with the feel and sound of a world-class analog console, patch bay and multi-track tape deck. The user interface is very visual, providing you with graphical depictions of your signal flow for patching signals to and from your MEC and outboard gear. And the software's overall appearance has even been specifically designed to be less fatiguing on your eyes during long sessions. You can create up to 99 custom views per window, allowing you to zoom right in on specific critical locations in your mix and then return to the exact same view with a simple button push. Switch views to quickly set up the 8 aux send busses, and then switch back to adjust 4 bands of EQ per track instantly. And with 99 levels of undo/redo (all saved permanently with the project), you can work quickly while still feeling free to experiment with your edits and mixes. Imagine not worrying about getting back to the last good point if a creative experiment goes awry.

Fading and cross-fading can be as simple as extending the edge of an object or overlapping one object with another. And when you need more control you can use the graphic cross-fade editor to see exactly what you are hearing while adjusting every parameter. PARIS Pro is so user-friendly and intuitive (and sounds so good) that many engineers who have steadfastly refused to work with audio in the digital domain have become some of the most loyal PARIS proponents.



Patchbay Editor

Choose between Standard and Freeform Mode operation. Freeform Mode allows you'to view and edit up to 999 audio tracks in one edit window.

> MIDI objects can hold data for multiple MIDI: channels and allow complete MIDI event editing.

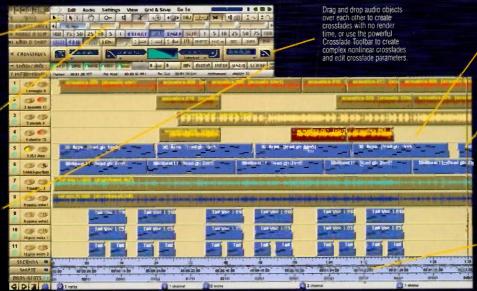
> > View Audio and MIDI objects side by side for intuitive and sample-accurate playback and editing.

View multiple time references simultaneously: standard time, SMPTE, samples and Bars & Beats

Context sensitive "Chameleon" Cursor automatically presents you with the appropriate tool based on its location.

Object Jails provide 32 separate clipboards for storing multiple Audio objects together while preserving the integrity of these objects within the project.

Time Compressor Tool allows you to drag Audio and MIDI objects to any length automatically while preserving pitch without requiring offline editing.



World Radio History

Compatible Solution

As a truly professional audio solution, PARIS Pro integrates easily into your studio environment by supporting a variety of file formats, platforms, plug-ins, MIDI sequencers and storage media. While PARIS Pro uses its own true cross platform (Mac/PC) native .PAF file format, it can also read and write .SD2 and .WAV file formats. PARIS Pro can also import and export OMF (Open Media Framework®) files, allowing you to easily work with projects created on other pro audio systems. But unlike other systems, PARIS allows you to record up to 64 individual tracks straight to off-the-shelf IDE drives, saving you the expense and complications of using "proprietary" SCSI drives. And PARIS Pro also supports the many professional MIDI sequencer programs available (i.e. VSTTM, Logic®, Performer®) in addition to offering you it's own integrated MIDI recording, editing and playback, letting you run your favorite sequencer alongside PARIS.

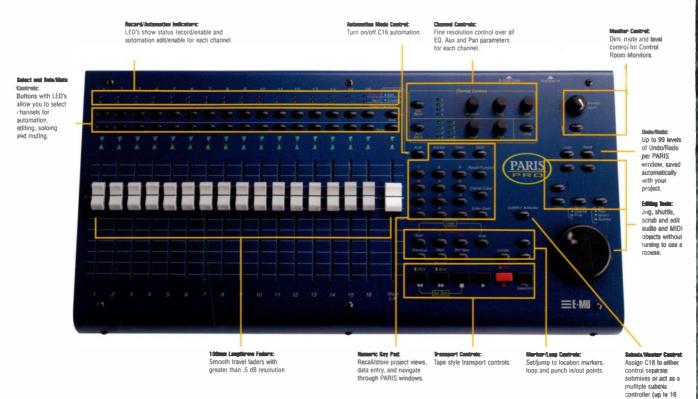
From tracking the first instrument to mixing down the final product, PARIS Pro is a state-of-the-art audio solution that fits seamlessly into your studio and delivers professional audio results. PARIS Pro was designed in response to thousands of individual feature and performance requests from the recording community, and it shows- PARIS Pro delivers audio quality and flexibility of expansion that is second-to-none. Choose PARIS Pro as your total audio solution and be secure in both your creativity and your final product's quality. Then take the money you saved and pick up those high end preamps and microphones you've been looking at— you deserve it!



MEC (Modular Expansion Chassis) Front



MEC Back w/Expansion Modules



*all specifications are subject to change

their respective holders

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submixes).

World Radio History

compressor, 160 comp/limiter; Aphex Expressor, Behringer Composer, Drawmer DS201 dual gate, Orban 621B dual parametric, Valley dual limiter/gate, Demaria Labs ADM-1000 Tube Direct Box EFFECTS: Lexicon PCM70, LXP1, MPX100; Eventide Insta-Flanger, Delta-Lab ADM1024 MICS: Sennheiser MD421, AKG C414E-BULS, D2000E, D112; CAD Equitek E-300, E-100, D90; Oc-

D2000E, D112; CAD Equitek E-300, E-100, D90; Octava O1V, Shure SM57, Electro-Voice PL80, RE20, RE15, 6560; Crown 30GPB PZM

MIC PREAMPS: Aphex Tubessence (Model 107)

5YNTHS AND KEYBOARDS: Roland MKB 300 Controller, U220, S330; Alesis D4

COMPUTERS: PII/333 MHz with 128 MB RAM, 20 GB hard drive, SEK'd ProDif Plus w/Apogee PSX-100

50FTWARE: Cakewalk Pro Audio 9.0, SEK'd Samplitude 24/96, MidiQuest 5.03, TB Systems Soft MC 3.0, PG Music Band in a Box 7.0

POWER CONDITIONERS: Furman

WIRING: Mogami

INSTRUMENTS: Fender Strats, Gibson Gold Top Les Paul, Ibanez Ragtime Special Acoustic

GUITAR AMPLIFIERS: Carvin Legacy, Fender Super Reverb, Music Man HD120

STUDIO NOTES: "The four rooms comprising the recording areas are true 'room within a room' construction and are virtually airtight," explains Ken Fordyce. "Much time and effort went into the planning and installation of a high-quality HVAC system that allows air conditioning of all rooms with little-to-no discernible noise. Now we don't have to turn off the AC when doing a delicate vocal or acoustic guitar track. Double offset glass of varying types and thickness allows maximum visibility from room to room without sacrificing isolation. The original floor plans for the new rooms were created by designer Adam Kessler of Eden Engineering (Ft Lauderdale, FL), with acoustical consultation from George Halloway at Studio Pacifica (Seattle, WA) Further modifications were suggested by room-tuner Bob Hodas. It's amazing what a bit of professional advice will do for the acoustics of a room. You'll find it's actually quite affordable."

FAYORITE GEAR: "Right now I'd say Samplitude 24/96 with the PSX-100 is a favorite, but there's a lot of really cool stuff I want to get."

PRODUCTION NOTES: "Sure we have a great facility and great gear that's constantly being upgraded, but consider this: Studio recording is the same as it's always been in the respect that great recordings are all about great performances. The idea at Mirror Sound is to help an artist perform as well as he/she's ever has in their lives, and do it in a studio setting. The result is not only a great-sounding song but a great time as well."

"We also teach an audio production class here that's eight weeks long. Class size is limited to six, which allows the students plenty of hands-on training. The classes are held once a week and cover all the basics of audio production."



PRIVATE RADIO RECORDING

KEY CREW: Patrick Gray, Jack Endino, David Dubh Black

CREDITS: Mudhoney w/ Wayne Kramer, Gloryholes, Boss Martains, Cynthia Gayneau, Hoovercain, The Spectres, Pink Chiouaoua, Betty Ford Falcons, Weary, Chinese Motorcyle, Hog Molly. Mercury 4, The Toucans Steel Drum Band, Backstabbers, Catheters, TRPLX, Ozzie Osmond, Endino's Earthworm, Carl Miller, The Day I Fell Down, Y Factor, Roht, Combover, Undisputed Heavyweight Champions, Hale Design Associates, Bottle of Smoke, Hotrod Lunatics, Old Man Smithers, Soul Miner's Daughter, John Marshall, Heavey Johnson Trio, Leatherboy, Courtney Cook, Sluggo, Loam, The Gits, Fear of Dolls, Saint Bushmills Choir, Endorfin, Flamethrower, Ample, Ventricle, Black Halos, 6FG, Joey Kline, Monkeywrench

CONSOLE: Mackie 24•8 with 24E (expander) and an Oz headphone matrix.

MONITORS: KRK 7000, Yamaha NS10M, Alesis Monitor 2, various boomboxes.

AMPS: Mackie M1400 with a custom speaker selector box RECORDERS: TASCAM MS-16 1-inch 16-track, Alesis ADAT XT20, Panasonic SV3800, SV3200 DATs OUTBOARD GEAR: TC Electronic Finalizer, TLA Tube compressor, JoeMeek EQ, Orban EQ, dbx compression [8 channels]

EFFECTS: Sony R7, Yamaha SPX90, Alesis Microverb 3, Roland PE301 Chorus

MICS: Groove Tube MD-1 [2], AKG C414 [2], D12E; RCA BK-5B, Sennheiser MD441, Nakamichi small-diaphragm condenser mics [2], Electro-Voice RE27, Shure SM57, SM58

MIC PREAMPS: Neve 1272

KEYBOARDS: Hammond Rhythm 2 with Leslie ("sort of a scaled down B3"), Roland JV-305 Groove Synth, Kurzweil PC88 weighted-key piano/MIDI controller COMPUTERS: Apple Mac G3 (for Pro Tools), Mac Quadra 840 with 228 MB RAM and Digidesign audio card. SOFTWARE: Digidesign Pro Tools LE, Sound Designer II; Adaptec Toast, Jam: Macromedia DreamWeaver WIRING: Electrical connections were wired "from the pole" by adding a new panel and 64 new outlets. Audio wiring comprises custom-made snakes. All digital runs are Monster Cable.

SEATTLE SPOTUGAT

INSTRUMENTS: Fender Telecaster, Stratocaster, Jazz Bass; Gibson ES-175T, Wicks custom archtop, Guild acoustic. Hofner Beatle bass

GUITAR AMPLIFIERS: Fender Blues Deluxe, Marshall Combo, Ampeg B2 w/ Energy 1x15, Marshall 4x12 cabinet STUDIO NOTES: Patrick Gray reveals the genesis of Private Radio Recording: "What I needed was a space large enough so that a band would feel like they could stretch out and turn up while still feeling intimate. I wanted wood floors and the ability to record 24/7. This had to be zoned 'industrial,' which means a lot of other noise in the daytime, so I had to really make sure the exterior soundproofing was solid. When I found this space in June of 1996 it was a very dirty storage room filled with years of crap; it took several days to empty it out. To make the space usable I re-framed the rear alley wall. While doing this I added a 4x6 glass-block window. There was no exterior entrance (just a loading door) so I had to pick the spot for the door, cut away the flooring, reframe under the floor to support the load when I cut the floor joists, pour a concrete pad to anchor the stairs, build the stairs, and then frame and install the exterior security door and gate. The next thing was to plumb the toilet and sink (which I contracted out as I hate doing that stuff). While this was going on I removed the old gas piping (at one point the space was a screen-printing place with a gas press). After painting, I refinished the floors back to the wood."

"At this point I was ready to start the actual construction of the rooms. I wanted to make sure I had the biggest main room possible without making the control room too small. The actual dimensions and angles were laid out on the floor and moved around until I came up with a main room, control room, entry hallway, and bathroom and small kitchen. The framing of all these took about a week. During this stage we laid out the new electrical service and then it was time to drywall. I made the main sound wall on eight-inch sills with 2x4 staggered-stud framing so that the walls wouldn't touch. Interior insulation is eight inches of rockwool, and then I did a drywall, sound board, drywall sandwich on each side of the wall."

"I have never liked the fishbowl design with the console looking through the window so I set the rooms up to use sliding glass doors as both windows and doorways. Exterior glass doors were used for this, as they are more heavy-duty and are made to block sound. Once I had this completed, I sealed up the loading door (it was a very noisy, drafty thing) and started setting up my gear. I was really under the gun to get up and running as I couldn't do sessions while also doing construction. The remodel to this point took three months. Over the next year I added three iso booths. I was lucky to find this space — you can't find or afford a good space in Seattle anymore."

FAVORITE GEAR: "I really like to mic the drums in the main room with the rugs rolled up using my Groove Tube MD-1's through the Neve 1272 mic pre's, then straight to tape. Jimmy Page would love it!"

PRODUCTION NOTES: "We just put new heads on the TASCAM MS-16, upgraded our main computer, and added the Pro Tools system. Now we can lock the analog deck to Pro Tools and/or to the ADATs so you can record to whichever format you prefer. It also enables us to send

artists back to their home ADAT studio to work on parts, bring them back and add them to the mix."



RAINSTORM RECORDING

KEY CREW: Paul Speer, Steve Carter

CREDITS: David Lanz, Queensryche, Subset, Rockenfield/Speer, Paul Revere and the Raiders, Danny O'-Keefe, Loni Rose, David Arkenstone, Tingstad and Rumbel, Himsa, Michael O'Neill, Cober, Room XIII, Michael Powers, Bobby Slayton, Will Durst, Kevin Jones, Tim Noah, Jonn Serrie, James Reynolds, Seattle Supersonics, Boeing, Nordstrom, REI

CONSOLE: DDA DMR-12 with 56 inputs and JL Cooper V/Desk automation

MONITORS: Tannoy DMT-10, Auratone

AMPS: Boulder 500

RECORDERS: MCI/Sony JH-24 2-inch 24-track analog recorder, Fostex time code DAT, Panasonic SV3700 DAT, Otari 5050 2-track

OUTBOARD GEAR: GML 8200 EQ, dbx 166x, 900 rack with 903 compressor/limiters, 902 de-essers and 905 EQs; NEI spectrum analyzer, Dolby SR [2 channels], Drawmer 201 stereo gate, DL241 stereo compressor; Symetrix 511, TC Electronic Finalizer, Aphex Expressor, Compellor, 9611; FMR Audio RNC Compressor EFFECTS: Lexicon PCM80, PCM70, LXP1; Sony R7, Roland SDE-3000 delay, dbx 120X Subharmonic Synthesizer.

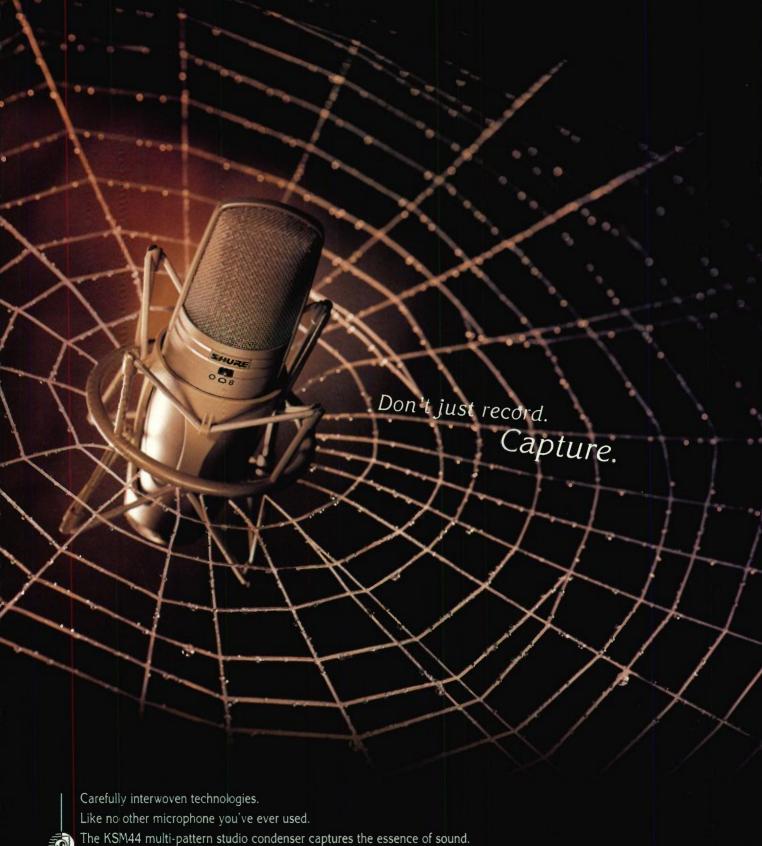
MICS: Neumann KM84, TLM 103; Sennheiser MD421, Audio-Technica AT4050, AT4041; AKG D112, Shure SM57, Countryman Omnimax, Countryman DI MIC PREAMPS: John Hardy M-1

SYNTHS AND KEYBOARDS: Sequential Circuits Prophet VS, Prophet 5; Korg Wavestation, Emu Proteus 1, Roland R8 COMPUTERS: Power Mac 9600/233 with 128 MB RAM, Seagate Cheetah 9 GB hard drives [2], AIT tape backup, and Yamaha 400 CD burner SOFTWARE: Digidesign Pro Tools 5.01, Steinberg

Cubase VST, Adobe Premiere, Line 6 Amp Farm VIDEO: Cypher Digital Shadow synchronizer, BTX time code generator; JVC BRS-611U S-VHS recorder

WIRING: Mogami

GUITAR AMPLIFIERS: Yamaha/Soldano 50-watt half-stack, Gibson Lab Series amp



Three polar patterns and an externally biased dual-diaphragm design let you record any situation with incredibly low self-noise (7 dB). Once you listen with the KSM44, you'll discover a uniqueness that makes recordings stick. To join the growing number of KSM44 enthusiasts, call 1-800-25-SHURE or visit www.shure.com.



SEVELLE SPORUGIN

STUDIO NOTES: According to Paul Speer, "The madness all started when I bought a TEAC 3340 four-track twentyfive years ago. That lead to a one-inch eight-track, which lead to a two-inch 24-track — which lead to Pro Tools, and so on! I purchased my current home 15 years ago and the studio takes up half of the square footage. In spite of being a converted carport, the recording room sounds quite nice and I've done everything from string quartets to hardcore punk in there. Though I have considered finding a commercial space for the studio, keeping it in my home offers many advantages. The low overhead is nice and as a recording artist myself, having the studio a few steps away is wonderful when inspiration strikes."

FAVORITE GEAR: "Lately it's been the Line 6 Amp Farm (running in Pro Tools), Massenburg 8200 stereo parametric EQ, and the TC Electronic Finalizer." **PRODUCTION NOTES:** I pretty much do things the way most people do, but there is one 'trick' I employ that apparently not very many others do: When mixing I patch my Massenburg stereo EQ between the console and the Finalizer (which is my A-to-D converter) before it goes back to Pro Tools for the final mix. I get the mix dialed in, listen to tracks on some CDs that I like so I can get a reality check, then do some 'mastering' EQ on the mix. The end result is a mix that is, more often than not, completely done. About the only thing needed in the final mastering stage is to tweak levels so there's continuity between cuts on the record. Even that's rare as I am very careful in setting levels as I mix."



TOASTER AUDIO STUDIO AND REMOTE RECORDING

KEY CREW: Mark Cavener, Brian Webb, Paul Campbell CREDITS: The No W.T.O. Combo (Jello Biafra, Krist Novoselic, Kim Thayil, and Gina Mainwal), Tiger Zane, Spearhead, Calobo, Liz Phair

CONSOLE: Mackie 32-channel 8. Bus console built by Mark Cavener during his formative years at Mackie Designs

MONITORS: PSB 300, JBL Control 1, THK 112SC,

Sennheiser HER2000, KLH AV-5001

RECORDERS: Alesis ADAT XT [2], Sony DTC-690 DAT, TC-270 2-track reel-to-reel

OUTBOARD: Alesis 3630 compressor, Behringer Composer Pro

EFFECTS: Lexicon LXP15, Yamaha SPX90, Roland GP-8, Behringer Virtualizer

MICS: AKG C414, Audio Technica AT4033, AT4051, ATM25; Sennheiser MD421, Electro-Voice ND/408B, Shure SM57, SM58

KEYBOARDS: Wurlitzer piano, Hammond M3, Alesis QS8, Midisoft MIDI controller

COMPUTER: Pentium III/733, 256 MB RAM, 40 GB 7200rpm harddrive, Frontier Design Group Dakota PCI SOFTWARE: Steinberg Nuendo, Cubase VST 5; Sonic Foundry Vegas, Acid; Digidesign Pro Tools 5, Emagic Logic Audio Platinum, Nemesis Gigasampler, Seer Systems Reality, Direct-X plug-ins [209], VST plug-ins [180]

VIDEO EQUIPMENT: MGI Videowave III, Sharp VLAH-50 INSTRUMENTS: Gibson Les Paul, Fender Strat, DG-6 acoustic guitar; Larrivee D-03 acoustic guitar, Ibanez Silver Series fretless bass Guitar Amps: Fender Princeton Chorus, Carvin SX100, LT Stereo 212, Peavey Studio Chorus 210, Marshall 112 STUDIO NOTES: Mark Cavener says that Toaster Audio, "started with \$400, some drawings on a napkin, and a dream to build Seattle's coolest project studio. I had two options: get a real job and save my pennies for a couple years, or take a huge leap of faith. Something inside me kept saying 'build it and they will come!' So I rented out a warehouse space in the north end with two friends and my cat Jasper, and started getting the word out. I'll never forget those days. My entire collection of studio gear was packed in the corner of the room behind a thin painter's dropcloth to keep everything clean during construction. I would record and mix everyone in the same big room where I would be eating and sleeping that night! The next morning I'd go buy \$100 worth of 2x4's or maybe a few sheets of drywall and spend the rest of the day building. That process repeated itself, one band at a time, for about two years before Toaster Audio had finally transformed into a 3,900-cubic-foot control room, a large, naturally-lit live room, and four floating isolation booths. I had no idea what I was getting myself into while hauling 3,500 pounds of concrete up the stairs one bucket at a time. I really gained a lot of respect for everyone who's ever designed and built a studio from scratch."

FAVORITE GEAR: "I was working at Mackie Designs just after their first 8. Bus consoles hit the streets. They were still a pretty small company then, and pretty cool with the idea of me buying the parts from them and building my own 32-channel, 8. Bus console. I'm really fortunate to have been given an opportunity that allowed me to not only learn it inside and out, but also to experiment with different components, which have makes this board a real one-of-a-kind. The big bonus: It sounds incredible!" PRODUCTION NOTES: "I think that everyone who records their music here really appreciates the do-it-yourself vibe of the studio. Several people have mentioned that they feel more creative here. I believe offering that kind of atmosphere is one of the most important ways that I can be of service to musicians."







Western Electric Model 600-A

MICROPHONE NAME: Western Electric Model 600-A FROM THE COLLECTION OF: Bob Paquette, The Microphone Museum, WI

YEAR OF MANUFACTURE: 1930

TYPE OF MIC: Double-button carbon POLAR PATTERN: Non-directional

FREQUENCY RESPONSE: 30 to 10.000 Hz (see notes)
OUTPUT LEVEL: 5 millivolts across a 200-ohm load for a sound pressure of 1 dyne/square centimeter
DIAPHRAGM MATERIAL: Gold-sputtered duralumin, approxi-

mately 0.002 inches thick

POWER REQUIREMENTS: External supply for DC bias (typically 6 volts)

ELECTRICAL IMPEDANCE: 200 ohms

MIC NOTES: In the early 1920's Western Electric was considered to be one of the few companies producing high-quality microphones (the first RCA ribbon microphone didn't arrive until 1931). "State-of-the-art" in those days was the double-button carbon microphone. This type of transducer was made by placing a button-sized capsule on either side of a diaphragm. The buttons are loaded with conductive carbon particles, and are DC-biased from an external power supply. When sound pressure hits the diaphragm, the diaphragm moves, creating mechanical pressure against the button. Because this action varies the density of the carbon particles inside the button, the internal resistance of the button is changed. This change of resistance is electrically representative of the audio wave captured by the diaphragm. The 600-A was the ultimate sibling of Western Electric's Model 369 microphone from the early 1920's. USER TIPS: One of the interesting idiosyncrasies of the carbon microphone is that the carbon particles can stick together, resulting in a reduction of output level, potentially making the mic unusable. This could be caused by leaving the mic in one place for a long period of time, or storing it in a high-humidity environment (the carbon particles absorb moisture and clump together). A solution for this condition is gently shaking the microphone several times to loosen up the particles! Because a carbon transducer exhibits an extremely high sensitivity (note the spec), additional amplification was unnecessary making it a natural for use in telephones. Unfortunately these transducers also tend to be noisy, limiting their effectiveness in audio recording. With "fresh" carbon, frequency response extends as high as 10,000 Hz, though a top end of 7,000 Hz is more typical.

Technical data courtesy of Arthur Garcia

MX-2424 Profile:

Rudi Ekstein of Foxfire Recording



Rudi Ekstein may not be a household name. But his studio, Foxfire Recording, has been thriving for over ten years, with over 40 hours of bookings every week. And the new cornerstone of Foxfire is the TASCAM MX-2424 24-Track 24-Bit Hard Disk Recorder.

When you can have any recording system you want, why pick the MX-2424? "After looking at other hard disk multitracks, I chose the MX-2424 based upon its incredible versatility," says Rudi. "First and foremost, the MX has fantastic sound quality that is comparable to anything I've ever heard. The ability to use 24 channels of analog and digital I/O simultaneously was another big reason for my decision. Plus, the ability to edit from the front panel, to easily set locate points and to use the auto-punch and scrub features have helped make sessions run smoother and quicker."

With audio file format and disk drive compatibility with your favorite DAW systems on Mac® and PC, easy interfacing with popular analog and digital gear and all the advantages of our world-class hard disk engine, it's easy to see why thousands of musicians, project studios and professional facilities like Foxfire have chosen the MX-2424 for their main recording system. For the complete MX-2424 story, see www.tascam.com or visit your TASCAM retailer. You never know...the next MX-2424 profile could be yours.



TEAC America, Inc., 7733 Telegraph Road, Montebello, CA 90640 323-726-0303 www.tascam.com

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The new MX-View graphic user interface software, available soon for all MX-2424 owners. Includes powerful waveform editing and much more.

TASCAM.

a whole world of recording

BONZAL

Eddie DeLena

SUSPECT: ANCESTRY: OCCUPATION: Eddie DeLena Italian

CCUPATION:

Producer, mixer, engineer

BIRTHPLACE: RESIDENCE:

Brooklyn, NY

HESIDENCE:

Pacific Palisades, L.A.

VEHICLE: DIFT: Toyota 4-Runner

IDENTIFYING MARKS:

Coffee and chocolate-covered espresso beans.

DOT DOORS

Abnormally large ears.

PET PEEVE:

L.A. Radio

SELECTED CREDITS:

Suspect has recorded/mixed Michael Jackson, Mick Jagger, Queen, Red Hot Chili Peppers, Vonda Shepard, Ronnie Wood, Black Sabbath, Joe Cocker, Bob Dylan, Devo, Kiss, etc. DeLena's productions include: Nazareth, Supersuckers, Meat Puppets, Lita Ford, and Graveyard Train.

LOC. OF PHOTOS:

Record One, L.A.

EQ: Why did you become an engineer?
Eddie Delena: My parents forced me into

it. I really wanted to become a doctor.

How did you get started, and was there a big break for you?

I started assisting at The Record Plant in 1978. My first three record projects were Ronnie Wood, Queen, and Black Sabbath. There was no turning back.

What are your main recording tools?

Vintage gear — tube mics, tube compressors, Class A Neves — and Pro Tools. The best of both worlds.

What new pieces of gear have you all hot and bothered?

RealDoll.com

What gear do you own and carry arround with you?

Pro Tools 24-bit system, Neve 1084 mic pre/EQ's, Neve 32264 and 2254 compressors, Tannoy and Quested monitors, and assorted microphones and effects.

Let's talk microphones and mic technique — any results you're especially proud of?

I was fortunate enough to learn mic technique from the old school masters. If I can offer any advice to younger engineers it would be how to get your microphones in phase with each other. If you're going to use ten mics on a drum kit and the mics are out of phase with each other, your drum sound will suck.

Speaking of drums, how do you mic a large drum kit?

You need three things to get a good drum

sound: a good drummer, a good drum kit, and a sweet-sounding room. The rest should come easy. I like to get my basic kit sound with two [AKG] C12 mics placed about a foot above the drummer's head on a 45-degree angle facing the toms. With this position I can get a full sound on the snare, toms, and cymbals — pretty much the way the drummer is hearing it. I then close-mic the drums, usually a [Shure SM]57 on the top of the snare and a [AKG] 452 facing the side of the shell. The 452 gives me the crack of the rim and the bottom snares without the papery sound of the bottom head. I usually use [Sennheiser] 421's on the toms and I experiment with a few mics on the kick drum. I would put a [AKG] D112 on the inside of the kick and listen for what works best on the outside - anything from a [Neumann] 47 FET, M7, or a Rover ribbon mic. Depending on the room I might put up a pair of [Neumann] U67's or M49's. I'll also experiment with a [Sennheiser] 441 or 57 stuck somewhere in the kit and compress the snot out of it. The most important thing, however, is getting all these mics in phase with each other, which also means double checking your phase after you start EQing or inserting any outboard gear. I usually deal with compression in the mix stage. I will send the drums to a stereo pair of compressors and add it into the mix. The [Empirical Labs] Distressors are good for a hard attack or a total crunch effect.







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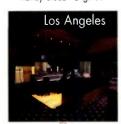
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What album are you most proud of and why?

Ronnie Wood's 1234. We mainly cut the record at Ronnie's house and at any given night famous and talented artists such as Bob Dylan, Keith Richards, Mick Jagger, Rod Stewart, etc., would show up and contribute to the record. I never had so much fun.

Studios you like?

I started at the Record Plant, so it will always seem like home base to me. I also like tracking at Ocean Studios in Burbank — it has the best vintage gear in town.

Consoles you prefer?

Vintage Neves and the SSL 9000.

Analog/digital — Where do you stand today?

I use both. I love the sound of analog gear and tape but it all ends up in the digital domain, so if you haven't embraced it yet you're just kidding yourself. You just have to understand the medium you are working with.

What is special or significant about the way you use Pro Tools?

One great thing I love about Pro Tools is sliding tracks and putting instruments in perfect phase. If you record a bass guitar direct and amp to two separate tracks, you will notice a slight delay on one of the waveforms. By sliding one of the tracks you can line up the waveforms, which will give you a much fuller low end. The same principal works for the two mics on the kick drum.

Did you ever lose anything?

My mind, but the doctors assure me it will return soon.

How come your nickname was "Buffalo" and now its "Booth"?

Eddie Buffalo was my pseudo-New York gangster name, but it wasn't available for my online e-mail name. When I was working in New York with Michael Jackson, the studio crew started joking with me á la the Saturday Night Live Mike Myers' skit saying "Eddie, your hair's like booth." It stuck with me.

What's wrong with the music industry?

The lack of nurturing an artist gets at some companies. If they don't have an instant hit they're history. The listening public ends up getting force-fed the small percentage of artists being promoted.





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The Internet is changing this system.

What music would you like played at your funeral?

Dead Can Dance.

If you could go back in time before the birth of recording, what would you like to hear?

Dinosaur mating calls.

What did you learn from Michael Jackson?

How to moonwalk.

Who were your heroes when you were getting started?

Jimmy Hendrix, Jeff Beck, Beatles, Stones, Led Zepplin, Stevie Wonder, Marvin Gaye, Sly & The Family Stone, The Clash, David Bowie, T-Rex, Al Green, and James Brown.

Who do you respect and admire today?

U2, Radiohead, Fiona Apple, and Moby.

Is there anyone in the world you would like to produce and record?

U2, Radiohead, Fiona Apple, and Moby. What is your strangest charac-

What is your strangest chara teristic as a human being?

I leave the house through the window instead of the door. I think it's because I was a C-section birth.

How would you like to be remembered in history?

As the guy who made Tommy Lee envious.

What was your most ridiculous experience in a recording studio?

Distorting everything in the mix for fun only to find that the client loved it.

Who do you think you were in past lives?

Same guy, different era.

What animal do you identify with? The dog, it has sensitive hearing.

Who is the most amazing artist you've worked with?

Michael Jackson.

What makes a great producer?

A person that understands music and psychology equally.

Have you ever witnessed a miracle?

When my son Maxwell was born, I could of sworn he looked at me and said "Waaassssuuuppp!"

What is the biggest mistake of your life?

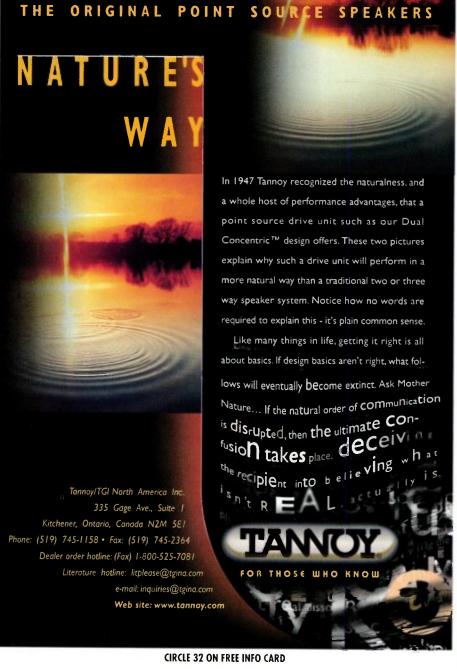
Making a left turn into a one-way street, the wrong way, right into a police car.

Any advice for getting a good start in the music business?

Forget about the business. If you do what you love and you happen to make a living from it as well, you've won.

Resolutions for the New Year?

The Anti-Resolution — enjoy each moment a little more and stop overly concerning myself with future events.







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CIRCLE 26 ON FREE INFO CARD

Choosing the Right Vocal Mic

by Lynn Fuston

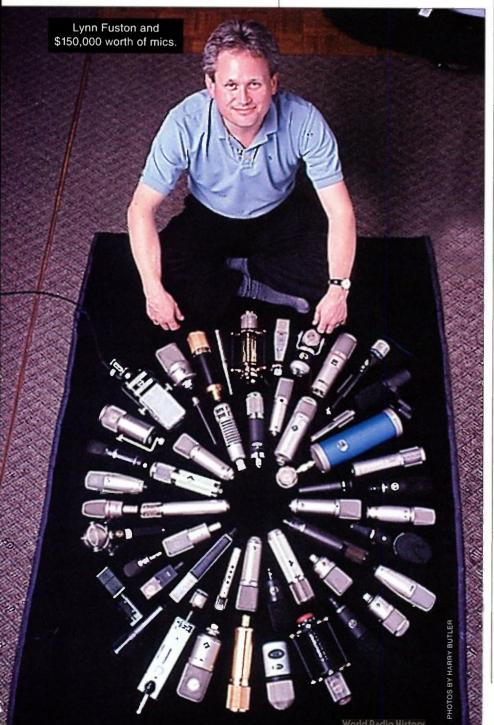
The pairing of a microphone and a vocalist is very much like a marriage. Sometimes it can be great, sometimes not so great.

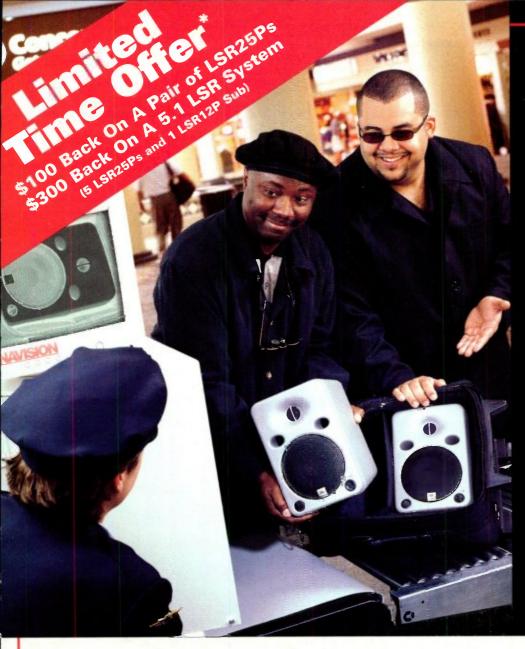
Since most people prefer the former and not the latter, I'll share with you my experiences about how to accomplish a perfect fit, a harmonious union that will allow you to capture the best sounding vocal using the microphones that are available to you.

Whenever I select a microphone for lead vocals, I always line up the available mics news-conference-style. I'll have between four and eight mics set up in row and audition them in rapid-fire succession. This allows me to hear the options and make the best sonic choice in a minimum amount of time. I know others do it differently, but this technique, developed over the course of 20 years of vocal recording for artists such as Amy Grant, Russ Taff, Kathy Troccoli, DC Talk, and 4 Him, works for me.

Some Helpful Hints

- Have all the mics on stands, with all cabling and power supplies connected and turned on, and set them at the right height for the singer. I typically start with the mic just below nose level because most singers I've worked with lean their head back when they sing. Make sure all the diaphragms are in the same vertical and horizontal plane, so that as the singer moves from mic to mic, the distance to each mic's diaphragm will stay consistent. This is very important when evaluating mics.
- Have a pop filter set up on each mic or one on a separate boom arm that can be moved from mic to mic. Even if you don't need them for plosives, the filters will serve as a positioning reference for the singer, so they'll be a consistent distance from mic to mic.
- Run each mic into equivalent amplification paths. Adjacent channels on the console will work, or if you have multiple identical channels of outboard preamps, then you can use them. Just make sure that all the preamps are the same. Otherwise you'll negate the comparison of the mics. When using outboard preamps, I typically run them back to faders on the console to simplify level-matching.
- Match the levels of the mics. This importance of this step cannot be over-emphasized because in an A-B comparison where the levels aren't accurately matched, typically the louder contender will win. So, if the levels aren't closely matched, then you'll





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and indisputable fact: the LSR25P consistently outperforms any other monitor in its class. As a result, it's gaining popularity in all critical monitoring applications, from digital workstations and near field stereo to 5.1 mixing. In fact, the LSR25P is as comfortable on the road as it is on the meter bridge.

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also features 150 watts of linear power as well as purpose-built transducers with JBL's most current thinking and designs. This last point has earned the entire LSR family of monitors continual critical acclaim for more than three years.

CIRCLE 27 ON FREE INFO CARD

One last point: Sammy Peralta's new CD **On the One** featuring Lenny White was mixed entirely with LSR monitors.



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MIC SELECTION

probably choose the loudest mic rather than the one that truly sounds the best. I typically use a metronome or some steady state signal placed equidistant from each microphone to get the levels matched within a dB or so. If you have one, use the peak-hold function on a digital meter to help calibrate the levels.

All of these previous steps should happen before the producer or singer arrives in order to make the auditioning as swift and painless as possible. This is important: If you can audition the mics quickly and not drag down the session, I've found that producers are willing to exchange the sonic benefits for the loss of singing time. If you use the interminable method of setting up one mic and listening, then setting up another mic and listening, and so on, you may not get a second chance.

• Once the levels are matched, pick a typical section of the song and let the singer sing. If the song is very dynamic, then pick a sample section with soft and loud passages (verse and chorus, for example). The way a microphone responds at different levels is very significant. One mic might sound good when the

THE 3D MIC LISTENING PARTY

In November of last year, I assembled a dozen engineers, a male and a female vocalist, and 49 of the best vocal mics ever made at George Cumbee Classic Studios in Franklin, Tennessee. The mics ranged in price from \$150 to over \$20,000, and while most were current production models, several were vintage classics. The objective was to listen to all these mics in a carefully calibrated environment that would allow us to hear them side-byside and evaluate their sonic similarities and differences. Never before has such an extensive (and expensive over \$150,000 in all) collection of mics been assembled for the purpose of a listening comparison.

Each of the mics was level-calibrated by Dan Kennedy of Great River and run through the same signal path (we used Grace and Great River preamps on the male and female vocalists, respectively). The listening order was determined randomly. We weren't able to see the mics as we listened; we wrote down our impressions of each mic with no knowledge of its price or brand. After the listening tests were complete (it took six hours per acoustic source), the listeners compared notes and then the identities of the mics were revealed. It was a fascinating exercise.

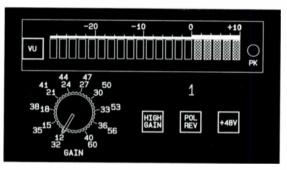
The 49 male and 49 female vocal performances were also recorded through Prism AD-2 converters to a SADiE workstation at 24-bit/88.2 kHz resolution under the watchful eye of Glenn Meadows from Masterfonics. The tracks were then edited and downsampled to 16 bits/44.1 kHz for transfer to CD. This CD is available for purchase at the 3D Audio Web site, www.3daudioinc.com. As a bonus, 3D Audio is giving away a Neumann TLM-103, Shure KSM-32, Shure KSM-44, or an ADK Area 51 tube mic to lucky CD purchasers. You could also win a Great River preamp or a BLUE microphone cable.

But even if you don't want to purchase the CD, you can see pictures of this enormous and historic collection of microphones at the site, as well as read more about the listening party.

—Lynn Fuston

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Normally we don't name competitors in our ads. But in this case, Mix Magazine published the other nominees for the 1999 TEC Award for Outstanding Technical Achievement in Small Format Consoles: Allen & Heath's GS-3000, Digidesign's ProControl, Panasonic's WR-DA7, Spirit's Digital 328 and Yamaha's 01V. Thanks to all who helped us win this prestigious award.



MIC SELECTION

singer is soft and bad when the singer is loud, so be sure to listen to both types of passages. Record each mic onto a separate track and move through all the mics quickly.

Usually the producer and engineer will know which mic they prefer, though they may not agree. Recording the performances allows you to go back and double check your assessment. It also enables the singer to come into the control room and hear the comparison for his or herself. This allows the singer to hear what the producer is hearing and be part of the decision-making process. It also allows them to hear how good their voice is sounding. If the singer is happy with what you're putting on tape or disk and likes what they're hearing, you've overcome a large emotional hurdle that allows them to sing more freely and be more creative. In my experience, this aspect of picking the right mic can't be underestimated. It's an emotional boost for a singer who might otherwise feel intimidated or insecure.

· Once everyone is happy with the microphone choice, you can pick the

preamp, compressor, equalizer, or other signal path components. In my experience, if the mic selection is executed



If there's a microphone heaven, it looks a lot like this

properly, other processing may be entirely unnecessary; I frequently cut vocals without EQ, compression, or any other processing at all.

How do you know wen you have the right mic? The right mic should do three things: accent the best characteristics of

the singer's voice, de-emphasize any problems the singer has, such as sibilance, dentures, lisps, raspiness, etc., and hopefully, become transparent when the singer sings. I know I've found the right mic when I can listen to a performance and lose myself in the singing without thinking about technical considerations. When you have the right marriage of mic to voice, it's truly a magical thing.

Microphones are like people. Some bring out the best in others. Some bring out the worst. Sometimes they can surprise you. Sometimes one you think will work lets you down. One you think you know may surprise you. They each have different characteristics that work best in different applications. The only sure way I've found to find the best mic for each recording is through continual experimentation and education - listening to a variety of mics on different sources. That way you can be assured you have found the best possible marriage.

Lynn Fuston started in a studio with one microphone, which made mic selection very easy. Today, he owns 3D Audio and enjoys having more options.



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Calibrating a 5.1 System

By Bobby Owsinski

Although most facilities have long recognized the need for speaker calibration and "room voicing" while running in stereo, the need for some form of alignment is now even more critical in surround mixing with five speakers and a subwoofer to contend with. But, of all the things regarding surround monitor systems, calibration is perhaps one of the most misunderstood, or at the very least, the most controversial.

Talk to several engineers and you'll find that each has a different idea of how to calibrate their system; some calibrating their subwoofers (where all the misconceptions lie) 10 dB above reference

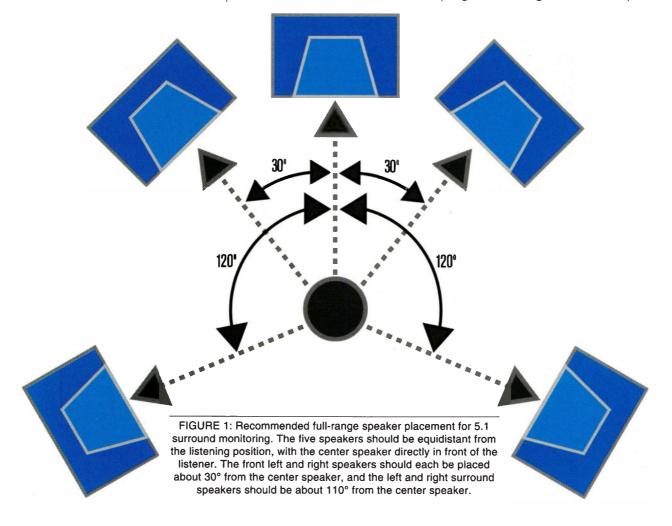
level of the main system, some 6 dB below, others 4 dB above. Although this might make calibration seemingly fall into the realm of voodoo or black magic, there's actually more in common with these figures than meets the eye (or ear). It's just the way of looking at basically the same thing that's different. As I describe the most generally accepted method for surround calibration, you'll also see how all these figures relate to each other.

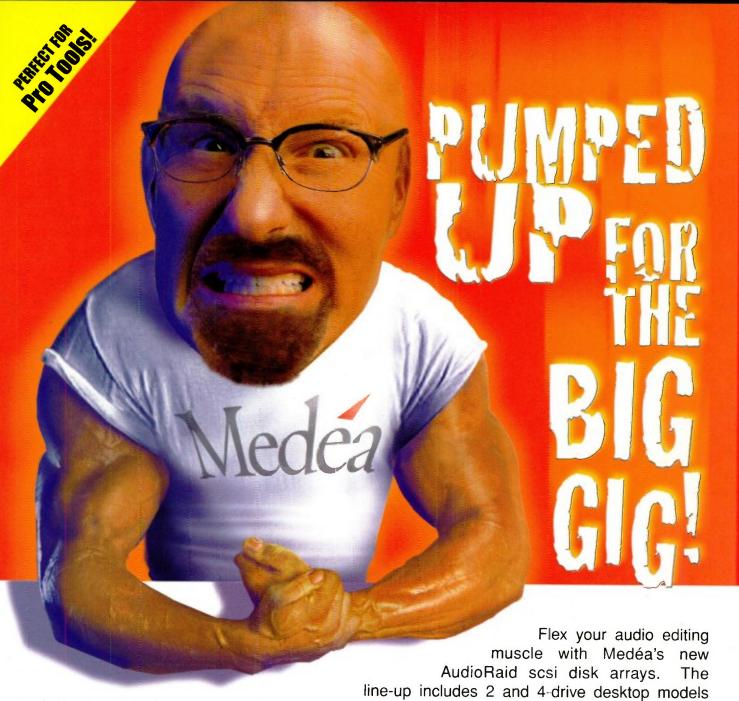
Keep in mind that we're not talking about room voicing here (that's for another article). We're only concerned with simple level alignment of the surround loudspeakers so your work will translate well to the outside world.

Reference Level

The first thing we have to do is determine the reference level for the five main speakers. The type of program that a studio mixes generally decides the reference level, which may or may not be critical. On a film mix, for instance, the level is set at 85 dB SPL and rarely changes in order to maintain consistency between reels and because the film will play back in the theater at (hopefully) that same standardized level. It's a standard that never varies.

A music mixer, however, will work at a variety of levels starting at a moderate level (of perhaps 85 dB), boosting to 95 dB for a quick check of the low end, then getting the remaining balances at a quiet





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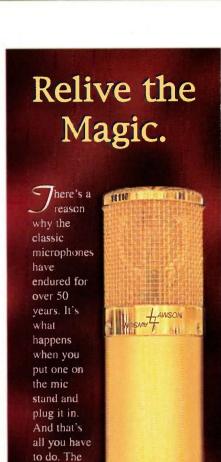
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CHART I: COMMON SPEAKER REFERENCE LEVELS

72-75 dB. There's no standardized reference level because the level that the mixer chooses is arbitrary and variable, and it's the same for the listener.

Television, on the other hand, usually uses 79 dB SPL as a reference since the quieter level translates better to the home. If TV sound is mixed at a higher level (such as 85 dB), then the dialog is frequently lost when it's turned back down to a normal listening level. The accompanying chart lists the recommended reference level for each of the five full-range speakers for various program types.

Placement First

The Subwoofer: Before any calibration can take place, it's important to find the proper place in the room for the subwoofer. Ideally. this is where the sub has the smoothest response and is least affected by standing waves. The best way to find this position is to place the sub at the listening position while sending it pink noise, then walk around the room until you find the place where the bass response is the loudest. This should be the ideal place for the sub, although it's sometimes not a convenient spot. Therefore, the next best place would be either in a corner or against a wall. Keep in mind that although we want the highest level, we really want that level to be the same at all frequencies that the sub reproduces. To have just one frequency resonate louder than all the others doesn't do us much good, so you'll have to be patient and try some positioning adjustments until you get it in the ballpark. It's also very important that the subwoofer is in proper acoustic phase at the crossover point, so that should be checked by switching the polarity (which can be done on most subwoofers) to the position that results in the most low end.

The Main Speakers: The five main speakers should all be set on the same vertical height. Then, with the center speaker directly in front, the left and right speakers should be positioned 30 degrees away from center toed in at about a 60-degree angle aiming for a spot about six inches behind the mixer's (or listener's) head. This angle can be reduced to 45 degrees or so and still provide satisfactory results. The surround speakers should be positioned 110 degrees

off center, which puts them to the sides and somewhat behind the listener. This is not only what often happens in typical homes, but has proved to be a good way to achieve a desirable front-to-back soundfield. If the surrounds are too far to the rear, the listener finds himself lost somewhere between two separate soundfields, rather than wrapped inside of one cohesive field.

As far as distance, simply get out your tape measure and set all five speakers the same distance from the listening position. While this works best for music it won't translate well to a theater where the speakers are on the side walls. But if you're mixing a movie then you're probably on a dubbing stage where the speakers are already set.

Calibration Basics

What you need: There are two ways to set the reference level of the main speakers, by using a spectrum analyzer or with a sound pressure level meter. A Real Time Analyzer is more accurate, but you can get by just fine with even an inexpensive SPL meter such as a (believe it or not) Radio Shack model. Radio Shack makes two meters; one analog (about \$35) and one digital (about \$60). The cheaper analog meter is actually the more accurate of the two since it can read in much smaller increments than the digital one. Another excellent device would be the Terrasonde Audio Toolbox, which has a very precise SPL meter as well as both an RTA and a pink noise source. Whichever SPL meter you use, make sure that it's set for a C-weighting on the slow scale.

You'll also need a pink noise source of some type. Many test devices and surround controllers (such as the Martinsound Multimaxx) have a pink noise source built in, but you can also get it from a variety of test discs or from the surround test tape available from TMH Labs (www.TMHlabs.com).

How to do it: Send pink noise to the center speaker. Start by sitting in your normal mixing position, holding the SPL meter at chest level with the microphone facing up at an angle of approximately 45 degrees at the center speaker. Keep the meter at arm's length to prevent any audio from reflecting against your body. Adjust the trim controls on either the speaker, monitor controller, or bass manager

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SURROUND SPEAKER CALIBRATION

until the channel reaches the desired reference level. When calibration of the center is complete, switch to the left channel but keep the meter aimed at the center speaker as you take readings. Repeat for the right channel.

When taking the SPL readings for the left or right surround speakers, keep the meter at the same angle and position as you did for the front speakers, but turn it 90 degrees from the center speaker toward the wall closest to the speaker you're measuring.

Remember: Although this may be obvious, it still should be stated for clarity.

You're only measuring one speaker at a time! All the others must be muted.

Calibrating The Submoofer With A Bass Manager

Setting up the subwoofer is the hardest, most misunderstood part of surround calibration and that's because most people don't understand bass management to begin with. First of all, keep in mind that there are two signals being sent to the sub; everything below 80 Hz or so from the main speakers, and a separate feed from the LFE

channel. To complicate matters, the LFE channel has 10 dB more gain/headroom. This means that in order to properly calibrate the sub, we have to take two measurements. First, let's assume that we're using the standard reference level of 85 dB. Let's set the sub level first.

- While sending pink noise to one of the main speakers, unplug the input cable from that speaker. You should now just hear sound from the sub.
- Adjust the subwoofer level control until it's about 6 dB *less* than the main speaker, or 79 dB if the reference level is 85. The reason why it's 6 dB less is because there are fewer frequency bands in the sub range (which extends from about 25 to 80 Hz).

Now let's set the LFE level: Sending pink noise and listening to only the LFE channel, set the LFE level so it reads about 4 dB hotter than the main speaker, or 89 dB if the reference level is 85. Notice that there's a 10 dB difference between the sub level and the LFE level. This accounts for the 10 dB of gain/headroom for the LFE.

When setting either the sub or LFE, the meter may jump around considerably—that's normal since the SPL meter is just reading the peak of the loudest frequency band. Get it to where the average swing is in ballpark and you're pretty much there.

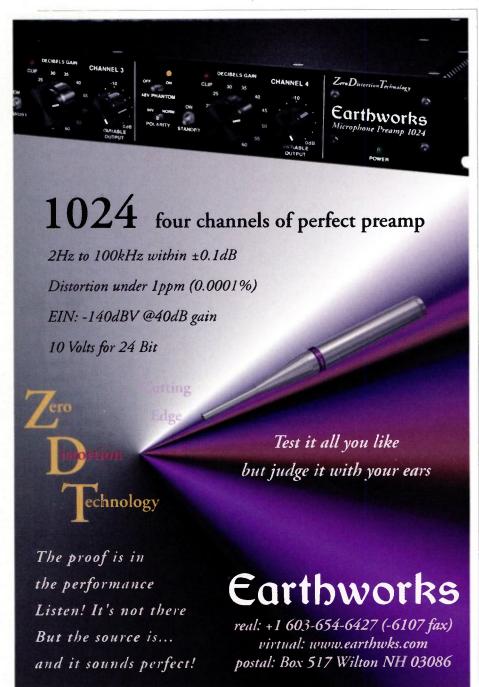
Calibrating The Subwoofer With No Bass Manager

If you're not using a bass manager then you should be! Why have a subwoofer if you can't take full advantage of it? A bass manager allows your main system response to extend down to 25 Hz or so and enables you to hear some things like rumble, thumps, glitches, and extended bass content that you might miss without it. Remember, the people at home are using bass management (since it's built-in to every receiver) and they might be hearing the things you aren't as a result.

Okay, so you're either philosophically opposed or you just don't have a Bass Manager. No problem. The subwoofer level should be set exactly like the LFE channel (because that's the only signal it's getting) described above.

That's all there is to it. Once you've done it a couple of times it will go quickly and easily and ensure that what you hearing will translate to the rest of the surround world.

Bobby Owsinski is a surround mixer and DVD producer, and the author of *The Mixing Engineer's Handbook* and *The Mastering Engineer's Handbook*.







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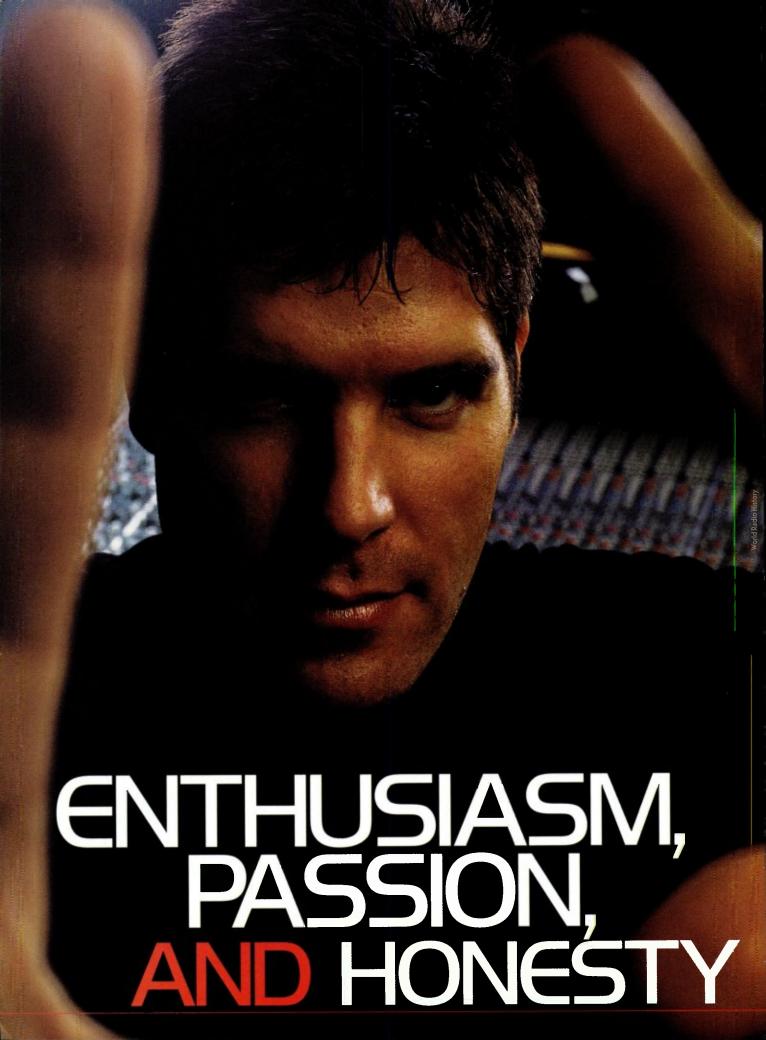
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he problem with enjoying a meteoric rise in the music industry is that it can sometimes presage a fall that's equally precipitous. Producer Matt Serletic has no worries in that regard. Though currently hot as a firecracker — he's just received a Grammy nomination for producer of the year — it's a safe bet that he'll be around for a long, long time. The reason: He's the real deal — a thinking man's producer in the Brian Eno mold, with an approach to recordmaking that's truly unique. An accomplished keyboardist, songwriter, and arranger/orchestrator, Serletic is sharply focused, insightful, and — well, there's no other way to say it — deep.

First bursting on the scene in the mid-90s with powerful debut records by Collective Soul and Matchbox Twenty, Serletic captivated the entire music industry (not to mention the listening public) with his unrelenting in-your-face production of Carlos Santana's 1999 megahit "Smooth" (off the multi-Grammy winning Supernatural album). He's also produced and arranged for a wide range of established and up-and-coming artists, including Celine Dion, Neve, and Edwin McCain, as well as Matchbox's critically acclaimed second album Mad Season. Somehow, he's even found the time to start up his own production company/record label (Melisma), where he continues to nurture new talent such as Angie Aparo and the Exies.

We met up in East Iris studios one rainy Nashville day not long ago, where he and longtime engineer David Thoener were putting the finishing touches on a new band out of Austin called Color. In this wide-ranging interview, he shares his passionate views and philosophies of life, covering everything from his early days as a hopeful adolescent to his groundbreaking work of recent vintage.

EQ: How did you get started in record production?

Matt Serletic: I started as a musician; I learned to play some musical instruments before I could walk, so that was always the basis for me. Even at an early age, I loved combining that with making tapes. I had a little cassette recorder and I'd go out into the yard and record crickets chirping and layer that over my playing piano for the soundtrack of a film project I'd be doing in class, or whatever. Tape as a way to change things was an early fascination. for me. From there, it was really just a matter of pursuing it wholeheartedly that led me into learning how to make records at a fairly early age. I was playing studio sessions when I was about twelve years old, playing keyboards and doing little TV car commercials, doing whatever local work there was in Atlanta at the time for somebody that was amazingly cheaper than anybody else — I had no idea what to charge. [Laughs.] "Twenty-five bucks? I'm there!"

I really became intrigued by the recording studio as an environment to make more lasting musical statements than you can possibly make in concert. I was fortunate enough to meet Ed Roland from Collective Soul, and from about age fourteen or so, I began playing in his band. Every summer, we'd get spec time in a studio from midnight until eight in the morning, so we would spend every night making recordings, trying to get a record deal. Later, I received scholarships to go to the University of Miami and be a fulltime music student. I was fortunate to be in an environment where the only option to make a living as a musician was to start playing merengue and salsa; there's such a large Latin population down there that there's a lot of those bands, and they look to the University of Miami for some of the better horn players. So I would go and play trombone in these bands. Man, you would get your musical and sight-reading chops together real quick! You'd literally be in the middle of a chicken coop or something, rehearsing in these strange places, junkyards, whatever, and these guys would write this music backwards, forwards, with lines drawn in Spanish and you really had to learn how to be quick-witted.

Were you doing arrangements for these bands?

Well, at first I was just playing, and it was enough to try to survive that — it was very challenging musically, especially when you're unfamiliar with the styles. Then I began doing some arrangements and we started going into the studio to make records, and since I was the only one who knew how to do things in the studio, by default I became the producer. A couple of those records were local hits, and that got me thinking, "Wow, I can do this as a liv-

MATT SERLETIC SHARES HIS INSIGHTS AND PHILOSOPHY ABOUT MAKING LASTING RECORDS

ENTHUSIASM,

PASSION, AND HONESTY

ing." That's where I really got a hunger — between Collective Soul and making those early *merengue* records, I knew what I wanted to do. It's the only job that combines all the aspects that I love about music: composing, arranging, and performing. As a producer, you constantly shift between making judgements or suggestions and actually doing those things, and it never gets stale. I love the fact that I get to dance between all of these disciplines.

How do you think the role of today's record producer has changed?

I view making records as modern orchestration in the sense that the new orchestras of the modern age are bands or electronic instruments. I'm always thinking in terms of scoring, in terms of it being an underpinning, a framework, something that's supporting the melody here and countering the melody there. It's about creating a tapestry of sound, and that's why it's great to work with engineers that have such a knowledge base — people like David Thoener, Mike Shipley, Bob Clearmountain, Noel Golden — because they're really able to hone that picture in. It's like trying to sit down and say, "Okay, the third violin in the back row is playing this note; now place it in the context of the whole orchestra." It's tricky. Some of the records we've been making have had 200 tracks, so it really takes somebody with great skill to have that kind of perspective.

Surely a big part of it is in the arrangement,

though. It's not just about knowing how to carve out frequency areas in order to fit all the instruments in.

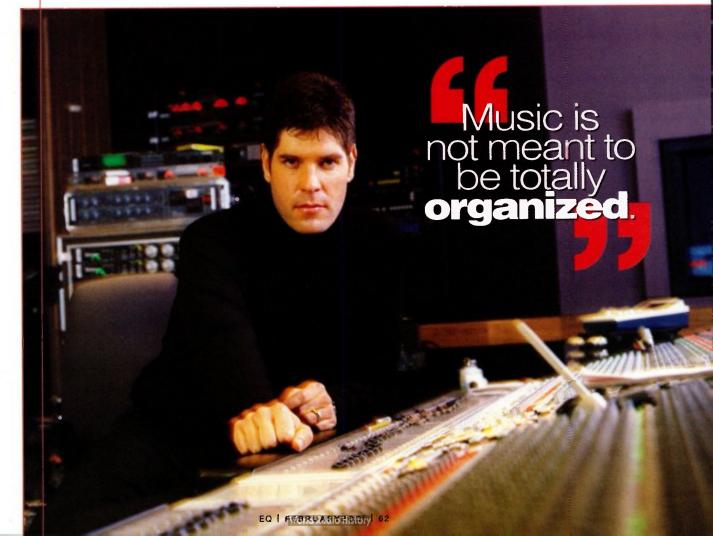
I agree. It's about working to consistently frame the melody in suitable ways. It's not enough to say, "We've got 200 tracks," as if you won a race or something. It's about what those 200 tracks are doing; if it can be said in 10 tracks, it should be said. But if there's a certain power and majesty that comes with that larger, grander landscape, then go for it.

The arrangement is important. You've got to know how to leave that space for that vocal line while always maintaining a respect for the basic melody of the song. To me, making records is just about making great songs. It comes down to a function of songwriting, and recordmaking is just an outgrowth of that process. A great song can make a great record; one has to exist before the other one can.

Though it is possible to make a bad record out of a good song — it's been done many times.

Absolutely. [Laughs.] Hopefully, I haven't done it, but I agree — you can get in the way of a song very easily. The record is really an arrangement. If it's destroying or conflicting with the melody, it can be real trouble.

You come from the George Martin school of record production in the sense that your



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ENTHUSIASM, PASSION, AND HONESTY

strengths are primarily in arranging and orchestration, as opposed to in the technical arena.

Song, to me, is great melody. There always should be a dialog between the melody and the sonic underpinning, like the reverse tape kind of stuff that the Beatles did: "Listen to the melody, now listen to this." It's a dynamic interplay between those two elements. There's always melody, even in atonal music. Even in drum loops, you hear a shifting pitch. How to create appropriate sound collages with pitch is what's great about making music.

And music is not meant to be totally organized, you know. I think it's important to have framework, but if all of a sudden a new addition grows out of it, that's what's so great about the creative process: you cannot define it. Even if you try to keep it within bounds, it works itself in other directions.

So you're saying it's important to be open to new ideas in the studio, to not have preconceptions.

I always feel like, when I'm sitting behind a board and working with an artist, I'm in a constant state of reacting, in a very neutral stance. You have to have a stillness and a receptiveness to allow whatever floating stuff is going on — both the input you're getting from the speakers and what's going on in your brain and creative soul. You throw one idea out and something comes back, and it might be something totally different than what you meant, but, wow, it could be great. You just wait for those sparks and you have to always be receptive to them. Probably one of the most frustrating yet ultimately enjoyable things about what I do is that you never have the answer — at least not until after it's happened: "Oh, that's the answer!" Because as soon as you start saying, "I know what to do," you're committing to a predetermined path. Yes, you have a knowledge base that's ever-expanding, but you're really trying to create that initial moment, always trying to make every record different.

How do you counterbalance that creative spirit against the demands of deadlines and budget?

[Laughs.] You know, the funny thing is, in some ways, the music business, fortunately, is less demanding on timelines than some other businesses. Even "we have to have this tomorrow" turns into "if you give it to us a day later, it's not the end of the world." Nobody's going to die if the music doesn't happen tomorrow, so there's a built-in flexibility. Yes, there are always constraints — budgetary, whatever — so you just have to react faster. I always find that at the end of a record, when it's really time to get it done, your mind allows itself to work that fast; it'll keep up with you. Sometimes those ideas are better because they're not mulled over so much.

Do you do a lot of preproduction work? Do you rehearse things thoroughly or do you just provide a framework and wait for great things to happen in the studio?

It goes back to the song; the song has to be right. You don't want to be sitting in the studio realizing that, wow, this song isn't really that good! [Laughs.] So whatever it takes to get that song ready, and, if you're working with a band, them being able to effectively perform it. As soon as that's done, that's when I stop. And that defines the timeline; it might be a week, it might be two days, it might literally be a month and a half.

For example, with the [first] Matchbox record, it took us awhile to get the songs together. The process probably took over two months, because we were also working to get the band feeling like a band. We were pounding out fourteen-hour rehearsal days, plus six hours a day songwriting on top of that. It was really insane, but that's an example of taking the time and waiting for the songs to come. We weren't spending tons of money — we had rented a total dive and we were completely under budget constraints. That's much preferable to saying, "Let's just get in the studio now." Because, as you said, you can make a bad record pretty easily, and that's one way to make a bad record: going in before

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you feel you have a song. But as soon as you have a song, get in there, because that creative excitement isn't going to necessarily last forever.

How did you hook up with Rob Thomas?

It goes back to that whole philosophy of letting things happen, being receptive to them. I was working in Miami making the second Collective Soul record and I was hearing a lot of a demo tape by an Orlando band called Tabitha's Secret. Rob was the principal singer and songwriter in the band, and I was immediately drawn to his voice. So I met these guys, and we really went from there. It was really about developing it from that initial point of Rob being a talented, young songwriter and finding his voice; we went through all of that process of defining an

The guitar players in the band had to split, though, so we had to find replacements. It was like the joke of the industry — we went through all these auditions, including the guy coming in with the snake around his neck, playing the most metal version you can imagine of "Three A.M." [Laughs.] You know, all the standard things you have to go through to find the right people. I put ads in Music Connection, local newspapers, everything. And then it ends up I find one of the guitar players working at Criteria Studios as the night receptionist! He was there when we were making the Collective Soul record, and I heard him the last night, when we were in crunch mode trying to finish up the album. He was just strumming and singing two studios down from us --- it was four in the morning and all the doors were open - and I was blown away, so I brought him in and the guys loved him.

But we were still looking for a lead guitar player, and it turned out that Kyle [Cook] lived a block away from me after we did all these wild things, searching all over! [Laughs.] I could have literally walked down the street and pulled him out of his house - I mean, we were shopping at the same grocery store! It was bizarre. And, to me, he so fit — the dynamic between Kyle and Rob is one of the things that make Matchbox Twenty a great band. All the great bands have the star and the foil, and Kyle is that foil to Rob.

Are you an analog guy or a digital guy?

I use both. I love the sound of Neve preamps and I'm specific enough that we keep 25 road cases full of gear with us [see Sidebar]. I've done a lot of A/B listening and tried to define what my ears hear as appropriate. I usually use a vintage front end — great pre's and great mics and all that — but I do love the creativity that comes with digital workstations, so we record to Pro Tools. For a lot of the records that I make that are a little bit dense — 100 tracks or whatever it may be --- that digital presence helps define [the sound]. There are some drawbacks to it, as far as warmth and stuff, but putting a digital source through a couple of great old analog compressors and a Pultec EQ

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MATT SERLETIC'S TRAVELING RIG

The "25 road cases" that Matt Serletic refers to in this interview are filled with trusted gear that he's amassed over the years. Here's a partial listing:

- Digidesign Pro Tools (with various plug-ins)
- Apogee AD80005E
- Avalon and Neve mic preamps
- **Empirical Labs Distressor**
- Various Neumann, AKG, Audio Technica, Shure, and Sennheiser mics
- TC Electronic G-Force
- **Echoplex**
- Roland GR-30

- Various vintage guitar pedals and amps
- Kurzweil K2500XS
- Roland JVI080
- Roland JP8080
- Access Virus
- Access Sirius
- Korg Wavestation
- Korg Trinity Rack
- Clavia Nord Lead
- Various Genelec monitors

I'll then come out of Pro Tools into a great analog console, like an SSL 9000. I've done some experimentation with this and I believe the ability to mix in Pro Tools is getting better and better all the time. but there's really something to going through that SSL. Maybe it's as simple as the high voltages physically coming into contact with the audio on every channel that gives the sound a vivacity I don't hear coming out of two chan-

all of sudden gives it what you might have gotten

workarounds for getting the analog feel in the digi-

brings, being able to try ideas instantly. You used

to say, "Let's put another amp on this," and thirty

minutes later it sounded like hell. Now it's just two

quicker; you're able to flow ideas faster and see if

they work and discard them if they don't.

nels of a converter.

seconds...and it sounds like hell! [Laughs.] It's a lot

tal domain. I love the creativity that that system

from tape compression, so I think there are

Do you mix to half-inch analog or to digital?

I mix to both in the insane hope that analog's going to sound better — it hasn't yet! The digital format I use is a Genex 8500 with a 96k converter; to me, it maintains the stereo imaging even better than good half-inch does. That's my format of choice, but I also master to half-inch. especially when we have a good machine. I drive my mastering engineer nuts trying to figure out which one is

better, but it's pretty apparent to me when a soundstage opens up. I don't use DAT, though

Is it your goal to make records that are lasting, even if they don't necessarily enjoy commercial success?

Well, I really believe that making great records equals commercial success, in the sense that, if you're recording great songs and putting exciting or intriguing performances down on tape or disk, it will engage the listener. After all, that's the fundamental principal of what the recording industry is built upon: engaging the listener enough that they're going to go out and buy it. That's a very simplistic, maybe optimistic model, but I believe if more people take that view, it's going to be a better musical world. If we can go back to

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making great albums, as opposed to a hit song and a collection of other songs to package on the album to trick the listener into buying it, it's going to be better for music. Sure, in this fast-paced world, you have to have the big, blazing billboard that says, "Hey, check it out, check it out!" But if there's something really behind the hit, people are going to gravitate to that artist for a long time to come. As recordmakers, I think it's our responsibility to make that happen consistently.

What is your definition of a great album?

[Long pause.] Something of lasting intrigue. You go back to it and you're still fascinated by it, by what the artist is saving or how it sounds. On some level, it just intrigues you. [Don Henley's] Boys Of Summer, for example, is a great record to me. When I was a kid I loved it, and I still go back to it and listen now and it's still intriguing, from the vibe of the record to the vocal performance to the cool guitar licks that Mike Campbell played. Or you can take any U2 song - say "Sunday Bloody Sunday" - and behind it stood an album that unrolled itself as engaging. That song sat in that album in a way that encouraged you to roll on into the rest of the album, to really become involved. Same with The Bends by Radiohead — an amazing rock album. Or Let It Be by The Beatles, and, of course, Sgt. Pepper --- any record producer has to recognize the brilliance of Sgt. Pepper.

It's interesting that you would single out

Let It Be since most people view that as the least great of all The Beatles' albums, mainly because it was made in such dire circumstances.

Yeah, but to me that's still intriguing — the fact that it was chronicling the dire circumstances of a great bunch of creative people.

But they hated each other by the time that record was being made.

Yeah, and you can hear that — same thing with the Eagles' Hotel California. It comes down to those albums that raise the hackles on the back of your neck. I can't define it, but I just respond to certain albums that way. I also get that feeling when we're getting it right in the studio; that's the same gauge I use.

Let's talk a little about your work with Carlos Santana on "Smooth." It's perhaps the only track on Supernatural that could have appeared on any classic Santana album: it's got a modern sound and attitude. but it could easily have been on Abraxas. What did you bring to the party that allowed that to happen?

That was a combination of enthusiasm, passion. and honesty. I really respect Carlos as a musician and a spiritual person. He is somebody that embodies a lifetime of music and what all of us associated with music and the arts can hope to accomplish in their lifetime, yet still being connected to your muse, always to-

> tally passionate and committed to the music you make.

What was especially fun for me about that project was that some of the first productions I ever did were of merengue and salsa acts. I'd be the only gringo in the middle of these 4 AM sessions that were so alive — all these guys had day jobs and yet would show up at midnight. They were really amazing workingclass musicians, and that passion and that energy has always stayed with me, in terms of what music is and what it should be and how sometimes it really is the lifeblood of a people. Carlos is connected in a way to that, coming from his background, and working with jazz greats such as Miles Davis. It was really exciting to work with him and to hear his interpretation and my interpretation and Rob's interpretation of that energy. That's really what that track was about, and it was a lot of fun to do.

I think the record was a success largely because Carlos was open to receiving other people's energy, and the producer ultimately is the traffic cop, the energizer of a session. It's really about taking the



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that over the top. That's really what happened on all those tracks on *Supernatural* — the different barometers, the different apparatus for gauging Carlos' energy and the energy around the band — each producer made the difference to what direction each track went in. The energy coming from Carlos was the same, but the interpretation of it through the traffic cop, if you will, was different for each track

I sincerely believe that the glorious part of the human soul is the creative aspect of what we do. That creative energy is inherent in every person, everywhere, and, hopefully, that's what the best parts of our lives are celebrating. As we sit here now, you're thinking about things; you're proactively going beyond this conversation and pulling ideas back and forth, as I am. That energy changes, shifts suddenly at any point between two people, and certainly if another person comes into the equation; if somebody else were to sit down here now and talk to us, the whole dynamic would shift. I think there are people that are given the ability to help energize that process and to really stir it up and change it; to challenge it like you're challenging me to answer these questions. People who take on that role would be great producers, because they're gauging at all points: the low ebb of creativity, the high point, how to massage those two intervals, how to change the thoughts in the room, really. That, to me, is what doing it right is about: dancing that dance of gauging the energy that's around you, that's between people, and effectively getting it on tape in a way that's new and fresh and exciting.

Even though Carlos was this legendary guitar player whom I had such admiration for, I knew that, when he walked in the room, he needed to know that I, along with all the musicians in the room, was honest and passionate about the music we were about to make. As soon as we got that energy going — and it started with the rehearsals we did even before Rob came in that night — that set a tone for how that record was going to come out. And then it was furthered by getting all those people together and feeling that nervous energy, between Rob coming in and being a little awe-struck by Carlos, and Carlos possibly being a little nervous about working with a new team. But that energy was set up; when these guys came in, they could already feel it.

Was that night at the studio the first time Rob and Carlos had met?

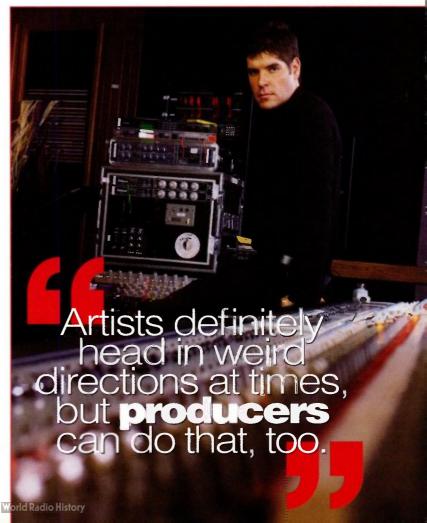
Yes. And we capitalized on that; it was really about pushing the envelope, driving everybody. I would be saying, "Come on — more!" Sometimes you have to verbalize the intangible energy in the room. It wasn't some magical psychological trick; it was really just being a lightning rod for what was already there — getting out of the way when it was necessary, and pushing when the energy was ebbing. We did the solos the next day, but it was still about retaining that energy and creating the right headspace for Carlos to walk in and play.

But let's go to the other side of the coin: How do you deal with situations where you and the artist just don't see eye to eye; for instance, if you feel that a song is not ready to be recorded?

I just don't record things that I don't feel passionate about. I always view it as looking for the key to the door. If I don't get the key to the door, I can't get into the song, I can't get into how I'm going to help make this record. Eventually, you should be able to find the key, after repeated listenings or changing things. And if there's no key, you just don't record it. I've fortunately never been in a situation where a record label has said, "You have to record this."

But how can you get an average song — one that's okay but not particularly exciting — over the hump?

You rework the song, and I build my relationships with most of the artists I work with on a song level, so we can go there and it's not an infringement of their artistic sensibility. So you try new things on a song level; maybe that improves it, maybe it doesn't. If you then get to a point where it's still not working for you, you have to really gauge the artist's intent and their attachment to the song. If it's coming from a certain place that you can understand and respect, maybe that's the key. Maybe you can try to hear it like they're hearing it and then change it to really represent what they're hearing. A lot of times I think people hear



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things — especially creative people — in this magical world that's perfect, and it's amazing to them, it's really amazing. So instead of just discarding it because you don't get it, I try to somehow understand what they're hearing. None of this is stuff is individual vision; it's very much collective vision, so I think you have to respect that aspect. If there's somebody passionate about it, then maybe they're right. If there's nobody passionate about it, you probably shouldn't record it. That's a defining issue for me.

What's the craziest creative accident that ever happened to you in the studio and made it onto a record?

[Long pause.] God, there's so many...two that come to mind are recording drums on a roof on a watershed and getting this weird, bizarre sound. Or doing guitar sounds that literally require nine people to create: "Okay, you're going to hit the Echoplex now, and you're going to turn on the delay now, and you're going to do the Morse code on the guitar while the guitar player actually holds the note." I love involving people in strange circumstances and flipping the rules, because there are so many implied rules in the studio: "This is the way you mic a drum kit; this is where you stand when you sing your vocals." A lot of those are totally time-tested and honored, mind you, so you can use them when you're not looking for anything sonically different or weird.

Some of the most fun things are when you get a roomful of people who have no idea what the recording session is about, and all of a sudden somebody's playing guiro and somebody's handclapping and somebody's screaming and you get that crowd response. We've done a few things like that, where the energy of the room is so fun. Half the time it sounds like hell when you're done, but you hear the excitement; the "good time was had by all" vibe translates on the tape.

In terms of getting a lot of people involved, do you ever mix without automation and get people playing "control room Twister"?

In the early days, yes. What I do a lot of times now is to use that same sensibility of "fly by the seat of your pants," but in the automated world. Meaning, if you're working with a mixing engineer, push him to go for it in some aggressive sense so that you get that outlandish thing, like in Rolling Stone mixes where the tambourine comes in obnoxiously loud and someone realizes it late and pulls it down. I still love that, and I try to take that approach all the way through the recording process. Like in recording vocals, where you can really work in this new medium. All this new technology allows you to have virtually endless tracks, and that allows you to push the envelope so that instead of just getting a great performance that's in tune, you can get an intriguing performance that might only work for two lines in the verse --- you know, "sing it like Bette Midler would sing it!" — just crazy stuff like that, and all of a sudden all these characters start evolving in the song that weren't

I really look for signature. That's a big word for me: looking for the signature lick, the signature sound, the signature performance — something that really helps define artistically the song, the artist, the guitar player.

Are you averse to using AutoTuning if you've

got a great performance but it's not quite in tune?

I go back and forth. When I work with a vocalist, I don't listen with an "Oh, we can fix that" mentality; I go for it. And sometimes out of tune is not the end of the world, if it's sung with passion and conviction.

Well, we were talking about Stones records before....

Sure, and they sound great. So screw it, you know? It helps define the genre of what you're working on, in a way. If it's a big rock record, not every note needs to be in tune. [Laughs.] You know, as new tools become incorporated, the sound becomes somewhat homogenized, and all the best producers have always chosen elements outside of the standard of the day to do something different. Whether it's something as simple as, "Don't pitch your vocals," or using cannon drums when everybody else is using tight snares. We are collectively responsible for shifting the medium.

When you've completed the preproduction process and you've got the songs where you want them, do you then have a sound in your head? Do you work toward a sonic goal during the recording process?

For me, it's really about hearing a world, and I hear that constantly; sometimes it drives me nuts! For example, I've been working with an amazing new singer/songwriter named Angie Aparo. When I first heard him at a club in Atlanta, I walked in and heard, not necessarily the record, but the world, the space, immediately. He was just up there with an acoustic guitar singing a song, and it wasn't even a song that ended up on the record, but I felt this sort of dark, post-industrial world. This sonic landscape imposed itself upon what I was hearing onstage, and that, to a certain degree, always happens to me. It might suddenly shift as time goes on, so you can never set it in concrete until you're making the record itself, but it is there as a goal I work toward. It's an ethereal, kind of electric buzzing in my ears that defines where the record should be, and it's different for each artist. I always hear that, and, for me, making a record is about more clearly defining that initial impression, without being predisposed to it.

Interestingly, while your records are marked by dense, sophisticated orchestrations, you tend to create the backdrops with instruments and not backing vocals.

It's funny, I would agree with that until maybe the last couple of years. There are a lot more sophisticated vocal arrangements on the new Matchbox record or on the Angie record than are probably audible. That's somewhat because of the dense instrumental arrangement. So sometimes I might do myself a disservice, but that's always a growing part of this job.

It wasn't meant as a criticism, only as an observation.

No, I think that's great, and I'm not above criticism. I absolutely think that sometimes the denseness of the arrangement may disallow you from hearing what's going on vocally. If you've got four guitar parts and you've figured out this cool countermelody in the vocal, sometimes it can get buried as a backdrop to the power of the guitars. So that's a completely valid observation, yet I would

▶ continued on page I36

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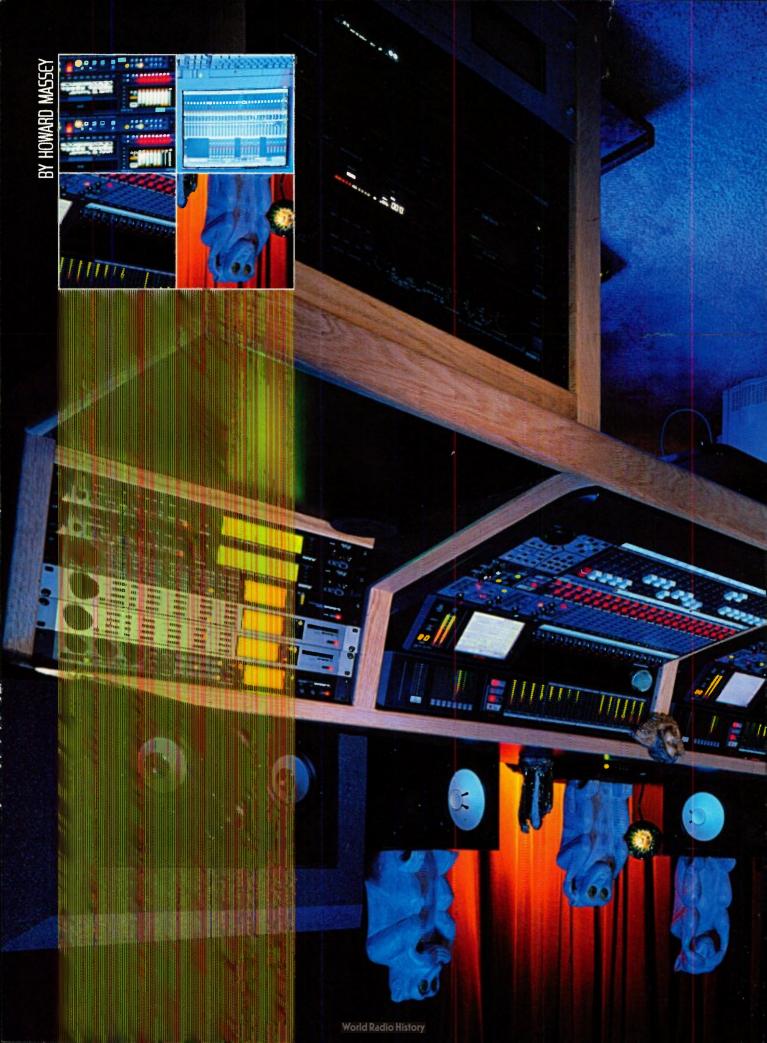


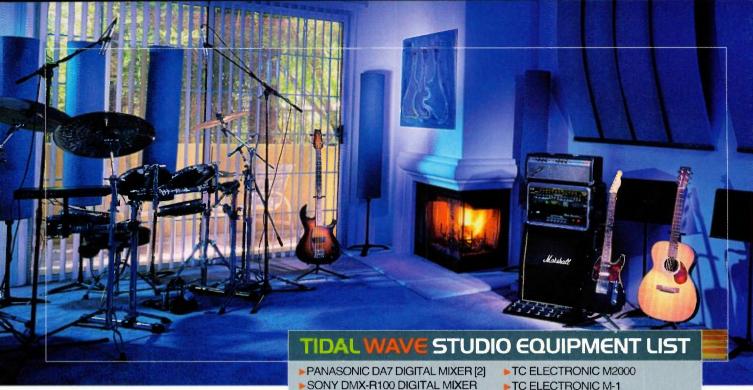




RIDING THE

GREG LADANYI BUILDS A MULTI-ROOM STUDIO IN AN APARTMENT COMPLEX





From the outside, it looks like any other apartment complex in this tony section of Los Angeles. You know the type: faux southwestern architecture, obsequious doorman, swimming pool just behind the grandiose lobby.

But behind the doors of two of the groundfloor apartments is a bold experiment in project studio design, conceived and operated by veteran engineer/producer Greg Ladanyi (Jackson Browne, Don Henley, Warren Zevon). Sure, there are lots of living spaces that house control rooms in converted bedrooms, but these two apartments - collectively known as Tidal Wave Sound — have actually been transformed into a project recording studio, with a single central control room and four acoustically diverse studio areas, capable of hosting everything from loud guitar amplifiers to string quartets. Most significantly, no structural acoustic treatment has been done whatsoever, the bedrooms and dining areas have been transformed into valid recording spaces with the creative use of various over-the-counter components made by Oregon-based Acoustic Sciences Corporation, better known as ASC.

"Greg wanted a space to feel comfortable to work in, but he also wanted to bring to light the fact that you no longer need to be in a million-dollar room to have million-dollar results," comments ASC's Arthur Noxon. "That was our goal from the start: being able to do it in the sense that anybody can do it. The side baffling on the walls are actually sections of our MixStation 'bedroom studio' package. They consist of thin, long reflector strips, along with what we call 'half-moon bays,' which are designed to provide broad-band absorption at low cost. Grea liked the look of the MixStation but was creating a much more complicated setup, so we used the parts in a creative way to dial

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in the room. He mixed and matched them to create the world that he wanted, and then added a number of our Studio Traps to act as gobos that can be moved into corners and brought out into the room to create various acoustic spaces and zones."

"The concept here," Ladanyi explains, "is to provide a very close environment where you can actually make music and not just mix it. There's no problem with doing it digital and direct, but the aspect of singing and performing has to be part of a record. Otherwise records are just too sterile and they don't have any personality."

"It's important for the artist to feel comfortable and unhurried," he continues, "and it also needs to sound good. Fortunately, the digital world has made it possible to do a lot of things in different spaces. When I did Running On Empty, which was all analog, we were dragging around 24-track machines everywhere. That kind of opened my eyes. to the fact that you can record anywhere you just need to bring your environment."

The living room in one of the two apartments serves as central station, with audio tielines to the other rooms in the apartment as well as to the ajoining one. It houses two Panasonic DA7 digital mixers (about to be supplemented by a Sony DMX-R100), eight Alesis M20s, a maxed-out Prc Tools system, and an extensive set of mic preamps and outboard processors (see sidebar); monitoring is through Westlake Audio BBSMs and Yamaha NS-10Ms. Master clock is provided by an AardSync, and the Tidal Wave microphone cabinet includes models from AKG, Audio-Technica, GT, Soundelux, and Earthworks. "I learned how to listen to a mix in the studio [sitting] in the middle," Ladanyi notes, "and that's where you had to sit to understand everything that was going on. But here I often find myself in the kitchen or the dining area, listening to music the way everybody else out there listens to music. That's because the ASC treatments allow the sound to travel around the room, so that if I go over to the kitchen area it's not going to be so different from in the sweet spot, except, obviously, in the sweet spot I can hear the stereo detail impeccably. But over there I can hear all of the instruments too, because the room is more real in that

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(and just for the record, we think the Redwood trees in the picture are the perfect metaphor for Ashly...)



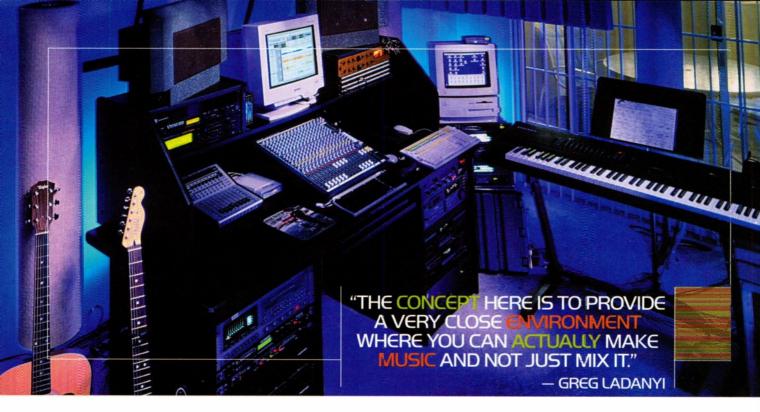
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sense. And that's really made me pay a different kind of attention to the detail of why I can't quite hear the acoustic guitar or the bass; if it's not right over there, I'll come back to the sweet spot and mess with the EQ. Best of all, when I go to my car or somebody else's house, the mixes sound great."

The aforementioned Studio Traps --- rotatable tubes on stands that provide a "dead" surface on one side and a reflective surface on the other — are used liberally throughout the recording areas to create different acoustic spaces for the musicians, but Ladanyi occasionally brings them into the control room as well. "Sometimes I'll get into a certain kind of mix and I'll surround myself with the Studio Traps as well, putting the dead side on the inside, so the sound just goes into it and doesn't travel any further." More often, they're used to create instant vocal booths ("they allow me to put the vocalists anywhere I want them," Ladanyi points out) or as acoustical gobos.

"When we did the string trio [violin, viola, cello] with David Campbell on a recent Jo Davidson record, we positioned Studio Traps around the players — one in the center and one on either side, so they were all looking at each other, with the baffles in-between them and around them. I wanted to get an isolated sound from each instrument, but I still had a [Neumann1 U 47 to pick up the sound of the room. It sounded incredible; we did it four or five times and it sounded like we had a whole string section." Noxon expands on the notion of using Studio Traps as gobos: "Because there are always gaps in these setups, one advantage is that you can look between the Traps, allowing the musicians to maintain visual contact and keep in time with one another. You can also adjust the reflectors: because each

is half reflective and half absorptive in the treble, and the whole thing is absorptive in the bass, you can use this as an acoustic valve to adjust which way the high frequencies are scattered and how much leakage there is between spaces. Everything that goes between those cracks goes through a slot, and once it gets through to the other side, it becomes a line source. So, it's just like a long, thin PA system that spreads horizontally and beams very quickly. So whatever gets through, it's like an exponential horn, and, wham!, the sound immediately diffuses."

The vocal room, which is the "bedroom" of the apartment, is essentially an oversized vocal booth, set up for lead vocals and acoustic guitar. In addition, a Yamaha upright piano is positioned in one corner. "I like to put the mics behind the piano, about four feet off the floor. Depending on how far back I pull the microphones, that gives me control over the apparent size of the piano, but I needed to do something with this corner area, because acoustically it was a mess." The solution was to install a bass trap on the ceiling and place a series of ASC scatter sound planks on the wall, effectively creating small reflective strips in-between each plank. "The sound comes off the wall strips and it spreads horizontally," Noxon observes, "so he's dumping sound out over the top and down toward the floor, plus it's playing back off the side of the planks, which are very irregular."

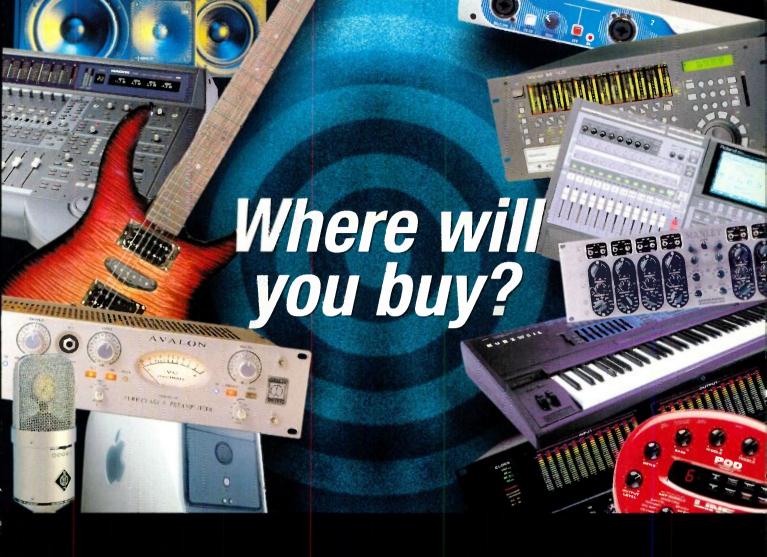
Next door, the second apartment's living room area is a dedicated drum room, with an Alesis DM Pro kit set up and ready to go. Adjacent to that is a "loud" room, with custom cabinets designed to house various guitar amplifiers cranked to the max. So what do the neighbors think of all this? "Actually, the

neighbor factor isn't a problem because I've kind of surrounded myself with myself — I live above the two apartments! If I wasn't there, it would be a little difficult," Ladanyi admits.

He continues: "Another thing I was interested in was, how far could I take this before I actually had to go in and put sound absorption inside the walls and ceiling? Obviously, the ceiling aspect here is not ideal and [neither is] the wall aspect, though the outside walls are no problem. But all I would do is pack it with fiberglass; I wouldn't necessarily start going in and recreate a wall with special wood and things like that, because the Studio Traps and reflector panels take care of that, and they're also very designable; they give a room a look."

Currently Tidal Wave is available by invitation only: recent projects include Jo Davidson; a tribute to The Crickets, featuring Eric Clapton, Jackson Browne, Graham Nash, Rodney Crowell, and Vince Neil; and overdubbing and mix sessions for The Tubes' new live album and a Spanish band named Araque. But Ladanyi's ultimate plans are even more adventurous: "We'd like to have eight of these rooms surrounding one very large, beautiful recording facility. All of the rooms would be interchangable, so if you needed three rooms, you'd have it. Eventually, I hope to have one [of these facilities] in L.A., another in New York, and a third in London and tie them all together, so you could really have a broad scope of recording going on and contact with different kinds of music.

"You know, this was an experiment in the beginning," Ladanyi concludes, "and now it's impossible for me to leave this place, because it's so much fun here!" At the end of the day, that's as glowing a testimonial as you can get.



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STEVE FONTANO ON RECORDING CARLOS SANTANA

You might say that Steve Fontano knows a little bit about recording the electric guitar. In addition to his work as engineer or producer with artists such as David Bowie, INXS, Sly Stone, Tower Of Power, Jason Becker, The Dells, and Gregg Bissonette, he's also recorded with shredders such as Greg Howe, Marty Friedman, Allan Holdsworth, Richie Kotzen, Jeff Watson, Rick Derringer, and Pat Travers. Over the past several years, Fontano has become a mainstay engineer for Carlos Santana. In addition to working on Santana's hugely successful *Supernatural*, Fontano has also been recording the guitarist for guest appearances on new material. Steve recently shared some of his guitar recording techniques with *EQ*.

EQ: You've been working with Carlos Santana since Supernatural. How does your approach to recording Carlos differ from recording other guitarists?

Steve Fontano: Because he performs live so often, Carlos prefers more of a room sound than a direct sound. I think he's used to his sound sort of bouncing around in large halls. Typically when recording a guitarist you put a microphone close-up on the cone of the speaker, or just off of it. Carlos hates that dry, direct sound. He usually plays in the control room. He'll ask you to open the door and listen to his amp — so you're hearing it from the other room with the door open. That's the sound he likes to hear. To capture that you back the mic up — as far away as six feet from the amp. I might start three feet away and then move the mic around depending on how loud he's playing and what kind of part he's playing. The mic is usually off-axis, sometimes as much as 45 degrees off-axis. Also Carlos is not big on effects processing or chorusing. He wants a very natural guitar sound.

Is Carlos' chain from the guitar straight into the amplifier?

No. He has a pedalboard, which controls his amplifiers. He plays a Marshall, his Boogie, maybe a Fender Twin or a couple of exotic amps. He'll use combinations of them all, or sometimes one or two combined. A lot of his sound on *Supernatural* is the Boogie and the Marshall blended together.

Are those amps active in the studio at the same time?

Yes. There might be four or five cabinets out in the studio with a mic on each cabinet. While we're listening to each amp individually, I'm also listening for the combinations. I might tuck a Boogie into the Marshall sound or vice-versa. For a couple of songs on *Supernatural* we used only one amp. "Maria Maria" was just a Fender Twin, as was the track with Eric Clapton ["The Calling"]. I think that "Love Of My Life" with Dave Matthews was also just a Twin. Outside of those three songs everything else was a blend of Marshall, Boogie, and Fender.

How do you maintain isolation between the mics?

Good question. I baffle between the amps, create a "wall" between them. Each amp is inside the "walls" or baffles. It's not total isolation but it certainly helps. The gobo's were about five feet tall so they rose above the cabinets a bit. I didn't do the house [build an enclosure of gobo's around each guitar amp]. Had I tracked Carlos in a situation where his amp was inside the live room with the band that would have been the thing to do. But Carlos likes to focus on playing the guitar so when he tracks with the band, he often re-records his guitar. When playing with the band he's thinking about the big picture — the feel, the song. For example with "Smooth" we tracked him live with the band and his amps were in a separate room. But later we set his rig up in the main room and re-cut the guitar tracks. It's usually a compromising situation with



GUITAR MASTERY

his guitar setup. Carlos has to turn the amps down because it'll bleed into everything, yada, yada, yada....

Another thing I found is that because he likes the sound of the guitar in the room more than he likes the sound of the guitar coming straight out of the cabinet, the microphones are placed very low to the ground. I used a [Sennheiser] 421 on the Boogie and the Marshall. The Boogie microphone might have been no more than a foot off the ground. And like I said off-axis by about 45 degrees.

In addition to the 421's for the Marshall and the Boogie, were there other mics in use as well?

Yes, there's a Neumann SM269, which captured the Fender Twin. I also used that microphone as the main mic for his acoustic guitars on *Supernatural*. Carlos loves that microphone.

How do you maintain the definition of a guitar tone when you're not miking close?

Carlos plays loud enough where — even if a microphone is three feet away from the cabinet — you're still getting definition. He doesn't play very fast. He uses a lot of vibrato, lots of sustain, long notes. Therefore you can put a microphone three or four feet away from his amp, off-axis, and it'll produce this nice round sound. We're not talking about someone like an Yngwie [Malmsteen], where you need the articulation because of the fast scales and arpeggios. Then you would need to move the mic closer. Distant miking works for Carlos' style of playing.

Part of his sound is also a delay feeding a reverb. Not to get an echo-y sound, but to add sustain and give his notes a bit of a trail. As soon as I get a blend from the various cabinets I'll setup a delay of maybe an eighthnote and send that delay into some reverb. I was basically using [Lexicon] PCM42's for the delays. At Fantasy [Studios, where Fontano has been recording much of Carlos Santana's recent work] we have EMT plates so I was using those as much as possible. The return of the

delay came into a channel on the board. I would then send that channel to reverb. Let's say aux send one is my reverb plate. I would patch the delay to a channel, and then feed that to send one. In effect you're getting delayed reverb.

And you're also getting that delay on a channel so you have control over the delay level?

Yes but I would never use only the delay — always the delay fed to reverb. Also I would put a touch of reverb on his guitar channel. So the guitar channel in the board would get "regular" reverb, Then it would send to delay, which is then going to the reverb as well. Generally, there was also a Pultec EQ in the chain with an LA2A [compressor].

How were those patched?

Because I was often using multiple mics on multiple cabinets, individual channels would be bussed together to either one or sometimes two tracks. The patch was generally from the bus to the compressor, out of the compressor into the EQ, out of the EQ to tape. If I was using two busses to feed two tracks, then both busses would feed an LA2A and a Pultec.

So the tendency was not to record each cabinet to an individual track and do a blend later on...

It varied due to track availability, but there were situations where the amps were recorded on individual tracks. Here's the Marshall track, there's the Boogie track, etc.

What were you doing with the Pultec?

A lot of the time it was +4 at 100 Hz, bandwidth at about ten o'clock; +5 or +6 at 8 kHz depending on the song and the part he was playing. Those were pretty consistent settings.

Did you have a preference for the type of Pultec?

The EQP was pretty much the one. I think it was a 1A3. When you move the mics off-axis you may need to add a bit of EQ to fatten the lower mids. Sometimes I used the input channels of the board. Most of the time I was on a Neve



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board, and of course the EQ's are nice. I'd add a little in the area of 100 Hz to 300 Hz.

How do you keep that frequency range of the guitar from taking up too much room in the track?

That issue actually came up when we were doing "Smooth." I picked and placed the mic for Dave Thorner, hooked up the Pultec, and sort of got the settings. (Dave Thorner truly was the engineer on that date, but he also respected the fact that since I had been recording Car-

los' guitar for the record 1 was very familiar with his sound.) Anyway there was a lot of that +4, +5 at 100 Hz on the Pultec, and some more of 200 to 300 Hz at the console. As Carlos played into the track, there was too much of that low end, sort of "tpumtp, tpumpt" - the picking and all that. A lot of Carlos' guitar sound is in the higher register, which can sound thin. Therefore you add a lot of low end to make that high register warmer and as fat as possible. In the track itself it did create a problem so there had to be a bit of give and take.

What's your feeling on putting the compressor or the EQ at the front of the chain?

It depends on what I'm doing and the circumstances. Looking at Carlos' sound as an example, I find that the compression helps but also darkens the sound a hair. So I'd add a bit of 8 kHz after the compressor. I like to EQ my compressed sound as opposed to compressing my EQ'd sound, but that could change depending on what we're talking about. In this situation I was EQ'ing my compressed sound be-

cause the compression would fatten things up and color it. Carlos doesn't like a lot of compression and his ear is very educated. You know, he's been doing this for a couple of days! [Laughs.] He knows what he wants to hear.

Was there any direct sound?

Never.

Did you have concerns about whether there might be differences in arrival times between each mic/cabinet combination?

There's definitely phasing problems. The way I dealt with that is that it's the blend of the mics. If on a given song he wants to hear more of the Boogie, you bring that microphone up. If you wanted to bring a little bit of the Marshall into his sound then it's question of how much you're using, which will

alter the phase of that sound. That was definitely an issue.

Did you find the volume level he played at challenging?

Challenging when you're out there trying to move the mic—ouch! [Laughs.] Not really; the biggest challenge was coming into the control room, listening to a mic, and "Oh it sounds like sh*t." So you go out there to move the mic, and you can't really move it around unless he's playing—so he's playing—loud! In that aspect it was difficult.

When something like that happens at a session,

does it affect your sonic perspective when you return to the control room?

A little bit because you're out in the room, typically a big room. The amps are loud and it's a wall of sound. Back in the control room it's a microphone coming through this thin wire, coming out of the control room speakers — which sounds nothing like this huge room which is being engulfed with his sound. Therein lies the challenge: How do you get this microphone to sound like his amp sounds in the room? Which is, of course, what any quitar player wants. That's where the delayed reverb comes into play, moving the mic way off the cabinet. Turning the mic so that it's capturing more of the room than just the cabinet.

Were there any strange sonic adventures?

Lauren Hill brought two songs in, but only one ended up on the record. For the other song, we were working on the guitar sound and Carlos said that when he worked with [engineer Eddie] Kramer, they had this Hendrix tape-slap going. He wanted to know if we could do that. I ran his guitar through a 15 IPS tape slap and patched the tape slap through an autopan to move it around. It was this really cool, delayed, kick-ass psychedelic guitar sound. You needed two tracks each pass to do it in stereo. We did five or six takes...used up about ten

tracks. I think I was sending the mics via a bus to the tape slap, tape slap coming back to the console, sending that to an autopan, autopan back to the console, bussing those with the mics to two tape tracks. Because I wasn't going to mix it, Lauren's engineer [Commissioner Gordon] said he'd rather have it printed on tape so that he wouldn't have to recreate it. Had I known I'd be mixing I would have done it on the monitor side for the control factor.

In practical terms, did you have someone watching the two-track machine so that you wouldn't run out of tape?

Yeah, me! [Laughs.] Every time we started a pass I'd make sure that there was more than half a reel of tape on ► continued on page I50

"THEY JAMMED TO THIS LOOP AND **WROTE WHAT IS** NOW KNOWN AS 'THE CALLING.' AND I RECORDED THEM **LIKE THAT! THEY** CAME IN TO USTEN AND I SAID, 'PLEASE TELL ME WE'RE **GOING TO RECORD** THIS FOR REAL I HAVE TO SET UP THE ROOM DIFFER-**ENTLY....' THEY'RE** LIKE, 'NO THAT'S IT. IT'S GREAT! CARLOS WAS SO INTO IT WITH ERIC. AND I'M THINKING, 'OH MAN...'"





DRE-S777 HANDS ON WITH FILIPETTI

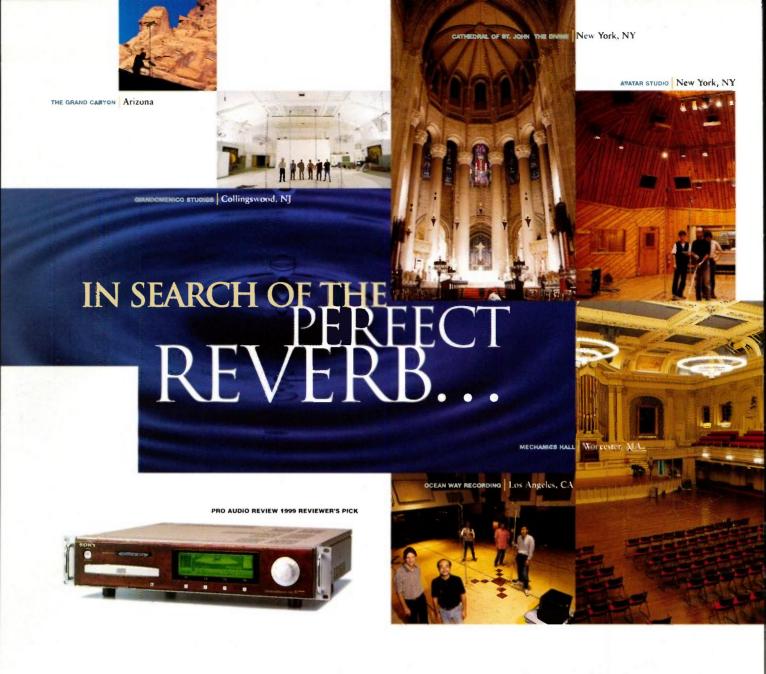
XM Radio Goes With Oxford DMX-R100 at SPARS NY

DMX-R100 Scores

Bruce Botnick and Other Industry Leaders Speak Out on the Sony Console

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XM Radio Picks Oxford For Digital Studio

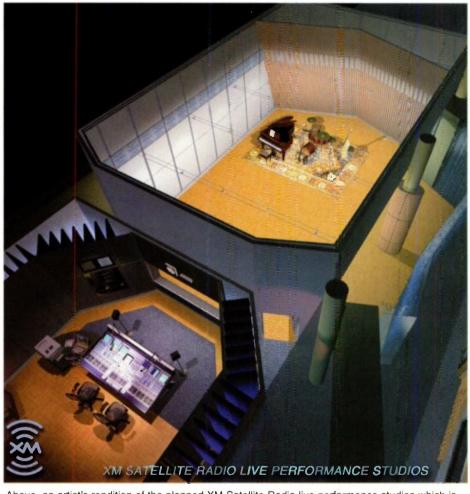
XM Satellite Radio is installing a Sony OXF-R3 Oxford console in the 2,300 square-foot Performance Studio of its new state-of-the-art 150,000-sq. ft. digital broadcast center. According to XM, the Washington, D.C.-based complex is the largest digital broadcast facility of its kind in the United States. It is fully equipped with 82-interconnected studios and a digital library containing more than 2.5 million titles. During its open house celebration last September, XM demonstrated its first prototype satellite radio for the U.S. market.

XM has stated that it hopes to change the way Americans listen to radio by creating and packaging up to 100 national channels of digital-quality sound. It also stated that it plans to provide seamless coast-to-coast coverage of music, news, sports, talk, comedy and children's programming. Harnessing the power of today's advanced technology, XM Radio will transmit its radio broadcasts from its all-digital studios

using some of the most powerful commercial satellites ever built, enabling direct satellite-to-radio transmissions with coast-to-coast coverage. For a per-month fee, sub-

scribers will receive the XM signal in their cars and homes using small car phone-sized antennas and XM-capable radios. These radios will be manufactured by the leading names in consumer electronics and available at retail stores nationwide or as an option with the purchase of a new car. According to XM, the commer-

XM vice president of operations, Tony Masiello.



Above, an artist's rendition of the planned XM Satellite Radio live performance studios which is scheduled to include the Sony Oxford console as part of its operations.

cial launch of this service is scheduled to begin broadcasting coast-to-coast this summer.

According to XM vice president of operations Tony Masiello, the Oxford console will be used to produce and mix live concerts and studio recording sessions: "XM plans to use the console for all types of music including classical, big band, rock & roll, folk and opera. We needed a console that offers excellent sonic quality, a clean signal path and extensive automation. The Oxford really delivers. The board is easy-to-use, and has excellent equalization, flexible configurations and good ergonomics."

"We are delighted that XM Satellite Radio has chosen the Sony Oxford for such an innovative application," said Courtney Spencer, vice president of professional audio products at Sony Electronics' Broadcast and Professional Company. "It exemplifies the diverse capabilities of the console."





All Star Guitar Night To Heat Up Winter NAMM



Muriel Anderson's next All Star Guitar Night will be held at the Winter National Association of Music Merchants (NAMM) convention in Anaheim, California on Saturday, January 20th, 2001 at 8:00 p.m. Sony Professional Audio is once again a co-sponsor of the event. The All Star Guitar Night will benefit the "Music for Life Alliance," an organization founded by Anderson to help coordinate and bring funds to charities devoted to providing musical instruments to children.

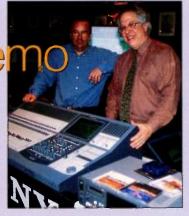
"We are always happy to co-sponsor this event," said Paul Foschino, marketing manager for professional audio products at Sony Electronics' Broadcast and Professional Company. "Not only does it bring together many of the best guitarists in the world for a fun night of music, the proceeds from the event always support a worthy cause."

The international lineup for the event is scheduled to include Muriel Anderson (pictured left), Julian Lage, Memrox, Jacques Stotzem, Franco Morone, Danny and Beth Gottleib, Paulo Giordano, Stanley Jordan, and Pierre Bensusan.

Tickets for NAMM participants will be available at All Star Guitar Night sponsors' booths. For more information on the event, please visit www.all-starguitarnight.com.

SPARS NY Hostse Sony DIX-R100 De

Sony Professional Audio Group product manager Karl Kussmaul (left) and regional audio manager, Northern Region Andy Munitz presented a demo of the DMX-R100 digital console at the recent SPARS regional meeting at Gallagher's Restaurant in New York City. The SPARS event drew a number of leading studio owners, managers and engineers. Munitz and Kussmaul also demonstrated the Sony DRE-S777 Digital Sampling Reverb and discussed two recently released sampling discs – "American Acoustic Spaces," and "Japanese Acoustic Spaces" as well as the just-released "Sample Your Own Spaces" software now available on CD-ROM.



Sony PCM-3348 Digital Recorder Installed at Southern Tracks Recording

Southern Tracks Recording recently installed a Sony PCM 3348 digital recorder in its George Augspurger-designed studio. Host to many of today's most celebrated producers, engineers and artists, Southern Tracks has already used the new unit on projects for The Offspring, Our Lady Peace, hip-hop artists Outkast and alternative rockers Train.

"Several of our clients had used Sony's PCM 3348 during mix sessions at other studios, and they like working with it. That's a main reason behind our decision to purchase the recorder," said Southern Tracks owner Mike Clark. "Clients

like to track with analog and then dump the analog tracks into the 3348. Sonically, it is a great machine. Plus, the sampling function is outstanding."

"The PCM is also good for archiving," continued Clark. "Record companies still require something on tape that they can archive, and while some labels are beginning to accept Pro Tools files, how easily will they be able to retrieve the material 10 years from now? Computer-related software seems to change every couple of weeks. This digital recorder offers a reliable, long-term solution."



Grammy award-winning engineer/mixer/producer Frank Filipetti is a busy man. With credits like Barbra Streisand, Elton John, James Taylor, Natalie Cole and Mariah Carey on your discography you're certain to be short on spare time. Recently catching up with him, SoundByte was able to ask him a few questions about using one of his favorite new studio toys - the Sony DRE-S777 Digital Sampling Reverb.

What acoustic samples on the \$777 do you like the best so far?

My favorite sounds so far are on the European Halls and Churches disc.

I especially like the Concertgebow Orchestra Hall, but there are several other terrific halls and churches on the disc as well. I haven't heard the new American Sounds disc, but I've been told it's amazing.

What projects have you used the \$777 on recently?

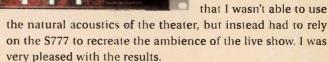
I used the Concertgebow algorithm on two Billy Joel 5.1 surround sound albums I just completed, 'The Stranger' and '52nd Street.' I especially love the ability to select actual mic placements in the hall. For surround sound material it's incredible. I've also used it on the most recent Pavarotti and Friends CD and video. It was my main

orchestral and band ambience, which was also the case on the 'Aida' cast recording.

Can you describe a specific way that you used the \$777?

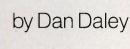
For most of my work. I don't use the \$777 to solve problems as much as to add a sense of depth and realism to the space I'm working in. But on the recent Liza CD, 'Minnelli on Minnelli,' I had a real problem to solve, and the S777 really

> came through. recorded Liza live on stage at the Palace Theater. Her vocal level in the hall was so loud that I wasn't able to use



What are your overall impressions of the \$777?

The sound of the unit is superb. You totally forget that you're using a digital unit. The clarity, smoothness, depth and detail are simply amazing. And the positional cues are dead-on accurate. It is the first stereo in - stereo out unit I've used that honestly correlates the pan of the field of the source as opposed to changing a few early reflections. I can't wait until I can sample my two favorite EMT plates at Right Track and be able to carry them around with me."



The R100 Console Offers Users of Every Type Plenty of Features, and as a Result They Have Plenty to Say

Since it first became widely available just a few short months ago, Sony's DMX-R100 digital console has proven itself to be a giant step forward in virtually every audio application and with every type of user. Whether it's been used for music recording, 5.1 surround mixing, or broadcast commercial work, whether it's been implemented in large, multi-studio complexes or in personal production facilities, the Sony DMX-R100 has gained a fast-growing group of adherents who have found it to be not only a great-sounding, intuitive-to-run digital audio tool, but also a true solution as the audio industry itself undergoes evolutionary and revolutionary changes. And talking to R100 users from a range of applications dramatically underscores how well this new console serves so many roles and serves them all so well.

Michael Wagener has become renowned as an engineer, producer and mixer for such leading hard rock, metal and pop artists as Metallica, Ozzy Osborne, Queen, Skid Row and Janet Jackson. Last year, at his four-year-old WireWorld Studio in a suburb of Nashville, Wagener installed a Sony DMX-R100 console after spotting it online. "Just what I read about the console told me: that's what I need," says Wagener. "I've always been a fan of digital audio, and I was ready to upgrade my own studio from 16 to 24 bits and to 96 kHz. I was in the market for a new console for the Millennium and this had all the features I was looking for at a price that works for a personal studio."

Actually, Wagener liked the R100 so much, he bought two, ganging them together via the R100's flexible combination of analog and digital I/Os and giving him 112 inputs at up to 48 kHz and 56 inputs at 96 kHz. "And I use every single one of those inputs, too," he adds. He also works at various sampling rates, something the R100 easily accommodates.

One thing that's striking about Wagener's observations about the R100 is that, for such an avid aficionado of digital audio who has spent a career collecting high-end A-D converters, he now finds that he uses the R100's onboard converters most of the time. "I think that surprised even me, at first," he says. "But the R100's converters are smooth and transparent. That's one of the hardest things to get right on a digital console, and Sony got it right for the R100." Wagener is equally effusive about the sound and the operation of the R1100's other onboard signal processing and dynamics.

"Actually, they got a lot of things right on this console, and that's the point," he observes, preparing for WireWorld's first all-R100 production of Florida band Olive Carpet. "The whole experience of using the console is transparent. You don't think about moving between digital and analog domains. You're not thinking about the interface between the console and a lot of outboard gear. You're just thinking about music. It makes the process very transparent and moves the sessions along."

Sony's DMX-R100 Digital Console:

Let's Give Them Something to Talk About!



Legendary producer Bruce Botnick with the Sony DMX-R100 at his home studio.

Let's Give Them Something to Talk About!

In a very different part of the business spectrum is Soundtrack, the multi-room commercial, music and multimedia facility in Boston, sister facility to another complex of studios in Manhattan. When Soundtrack Boston installed its first Sony DMX-R100 in its Studio E last September, the studio's chief engineer Allen Smith was looking for a solution to a number of technical and business issues. "In Boston, we have seven studios, and we were looking to begin an upgrade process throughout the facility in 1999," he explains. "Not only did we want more and more sophisticated digital audio capability, but we also started seeing clients express interest in 5.1 surround mixing. And we knew we wanted 24-bit and 96-kHz capability. The studios vary in size, so our [digital] console choices had to have certain size parameters, as well, in some cases. Finally, any decision for a complex facility such as this has to be cost-effective."

Smith says he found the solution, to every one of those considerations in the DMX-R100. Not only did Soundtrack's first R100 replace a much more complex and more expensive older digital audio workstation platform, but did so at a very attractive price point, says Smith. "There's a big gap out there between the R100 and everything else out there with regard to digital audio mixers," Smith says. In addition, Soundtrack's engineering staff - which has used the R100 on radio productions, audio post for PBS broadcast programming, and sound design projects - was extremely positive about the new board's sound and functionality. According to Smith, these factors have already led to a decision by Soundtrack Boston to purchase two more R100s, each of which will also replace larger, more expensive digital audio platforms, giving the facility an enhanced scheduling flexibility by providing a consistent platform in multiple studios. It's also been installed in a studio which already has multichannel monitoring and mixing capability. "We can get the studio itself running in surround mode within a day or two, as soon as our clients start requesting it," says Smith. "But we know the R100 is ready to do surround the moment we turn it on."

New formats offer audio professionals new opportunities, and the Sony DMX-R100 is proving to be the perfect tool to leverage those

possibilities. At Mi Casa Multimedia, a private Los Angeles facility (located in the restored hacienda-style home of classic horror-film actor Bela Lugosi), owners Robert Margouleff and Brant Biles have created, they say, the first facility dedicated to remastering theatrical film releases specifically for the DVD home theater market. And the centerpiece of Mi Casa's main studio is a newly delivered R100 console, which Margouleff says will be its main engine for 5.1 surround sound restorations for films.

"The R100 is perfect for this use because it packs a lot of power into a little box — it's a small-format board with a grown-up attitude," Margouleff states. "We're getting ready to do a lot of big films in the coming months, and the R100 figures largely in those plans."

Margouleff and Biles first worked with the Sony DMX-R100 console when they used it during a live audio streaming demonstration during the AES Convention in Los Angeles last year, doing a real-time, 24-bit/96-kHz 5.1 mix at USC's Norris Hall venue of a live performance of a 16-piece band playing nearly 3,000 miles away at McGill University in Toronto. "That was a stunning experience," Margouleff recalls, adding that the R100's performance for that event clinched his and Biles' decision to get one for Mi Casa. "The 24/96 EQing was phenomenal," Biles observed, focusing on the R100's exceptional tonal capabilities. "It was great to boost things up in the 30 kHz area and be able to give extra life to incoming signals."

The ease with which users can access the DMX-R100's numerous features is highlighted by producer/engineer Bruce Botnick, who chose the R100 as the first console for his personal studio in Southern California. And fittingly, Botnick, whose long list of career credits includes recording The Doors' classic albums, applied the R100 to a remix of a Doors concert – in Detroit from May 8, 1970. "That record is in stereo, but future ones will be in surround, and the R100 is going to make that process much easier and more creative," Botnick predicts. "The console's dynamic automation allows me to be more creative and reduce the thinking portion of the process of mixing. You know what continued on page 94

Sony Dealers Say the R-100 Has Put the Excitement Back in the Business

While users of the Sony DMX-R100 have been effusive about how good they've found the digital console to be, pro audio dealers of the DMX-R100 have been equally enthusiastic. But they're also noticing something that goes well beyond the exceptional technical capabilities and features of this remarkable console.

"From my perspective as a dealer what I've noticed most is that the R100 has put some buzz back in the business," observes Mike Poston, president and owner of Equipment Pool, Inc., a Nashville-based pro audio dealership, which has sold nine DMX-R100 units since it began shipping to dealers last September. "Users have commented to me on any number of technical aspects of the console. But what I really notice is that it has brought an emotional component with it — it's one of those rare products in the history of the pro audio industry, like the Alesis Adat, that truly excites people's imagination and sparks their sense of creativity and passion. That's what the R100 really brings to the game."

Dealers have also found that the DMX-R100's feature set and inherent audio quality have been making users into fervent converts. "In terms of features, the R100 offers lots of bells and whistles. But the comments that keep coming back to me are how impressed people are with the way it sounds," remarks John Conard, Sales Manager for pro audio products at Westlake Audio, in Los Angeles. "In terms of sonic quality, this board very much speaks for itself."

Both dealers agree that the DMX-R100 has revolutionized the mid-market console sector. Comments Poston, "Where the R100 fits in the market is where much of the industry is moving: it's perfect for mid-level music and post facilities, artists' and producers' personal studios, as a console for B rooms at higher-profile facilities, and as a powerful tool for recording artists and composers."

Adds Conard, "It's raised the bar for that market, in terms of quality and capability, like nothing else has. It's a new kind of tool that serious professionals take very seriously."

Sony demos a full array of versatile new products on the show floor in Anaheim. Winter NAMM 2001



Sony Unveils CD Recorder Offerings For the Pro Audio Market

At Winter NAMM 2001, Sony Electronics is demonstrating its first two CD recorders for pro audio applications. The CDR-W66 is designed for mid- to high-end recording studios and broadcast production; the CDR-W33 targets more cost-conscious users, but offers most of the capabilities of its higher-priced sibling.

"Both units incorporate several unique features," said Courtney Spencer, vice president, Professional Audio Group, Broadcast and Professional Company, Sony Electronics Inc. "These include selectable DSP functions like Parametric EQ, Limiter & SBM (Super Bit Mapping®), and high-quality, 24-bit AD/DA conversion."

Physically similar, and sharing many of the same features, the innovative CDR-W66 and CDR-W33 offer CD-TEXT™ support, which allows disc/track names to be displayed and entered from the front panel AMS controller, the supplied remote control, or an optional PC keyboard. Remote transport control can also be accessed via Control-S or a PC-compatible keyboard. In addition, the CD recorders include a wireless/wired remote unit.

CDR-W33 Additional Features

- 32 kHz 48 kHz built-in sampling rate converter
- Recordable and re-recordable recording media support
- FL display
- I/Os equipped with Coaxial Digital, Optical Digital, Analog Unbalanced phone jack
- 2U rack-mountable size in EIA.

In addition to functions found on the CDR-W33, the CDR-W66 offers such key features as:

- · Word Clock interface
- 32 kHz 96 kHz sample rate converter range
- Selectable SCMS modes
- AES EBU digital I/O, balanced XLR analog I/O
- RS-232C and parallel (GPI) control ports
- •2X speed duplication link for dubbing audio titles (using two
- DSP functions available on digital inputs as well as analog

New Wireless Components

Building on the success of the 800 Series UHF Wireless Microphone System, Sony Electronics is showing the latest additions to the wireless microphone family: the newly developed WRT-847B UHF Synthesized transmitter unit, its interchangeable microphone

heads, and the WRR-862B UHF synthesized Dual Diversity Tuner.

Five types of microphone heads are available for use with the WRT-847B. The CU-F780, CU-G780, and CU-E700 optional microphone capsules are designed for vocal applications such as broadcasting and live con-

certs. The CU-E672 and CU-F117 microphone capsules are intended for interviews in news gathering and field productions.

The WRT-847B transmitter unit offers several important key features, including: selectable RF output level (10 mW for multichannel operation and 50 mW for long working distance); audio gain and attenuation setting from +9 dB to -12 dB in 3 dB steps; and an easy-to-read LCD that indicates extensive information on operating conditions such as channel number,



wireless channel frequency in MHz, audio input level, compander time constant, battery status, and accumulated operating time.

The compact new WRR-862B unit also operates over a 24 MHz frequency band and it has two built-in tuner modules to meet the demand for two-channel reception in ENG and EFP applications. Designed so that it can be easily mounted on Sony cameras, the tuner's magnesium diecast body is extremely lightweight and rugged. The WRR-862B can simultaneously receive two independent signals on two separate channels. The space diversity system is employed to eliminate signal dropout and provide stable reception. Two SMC9-4S (Sony 4pin) audio output connectors are provided on the top panel.

Pro MiniDisc Recorders

Sony Electronics is also displaying two 1U-high rack-mountable MiniDisc recorders. The MDS-E10 and the MDS-E12 incorporate the latest ATRAC type "R" algorithm for superior sound and provide a host of new options. The new units replace the earlier 2U-high MDS-E58 and the MDS-E11.

Sharing many of the same characteristics, the MDS-E10 and MDS-E12 feature: 10 "Instant Start" memories that allow immediate playback of any 10 tracks; SPDIF coaxial and optical digital I/O, as well as analog RCA I/O; Long REC/PLAY (Max. 320 min.) using ATRAC3 REC mode; and versatile menu control of various functions including: HOT START, AUTO CUE, AUTO PAUSE, SOUND START PAUSE, VARISPEED, NEXT TR RESERVE, LONG REC MODE (320 min), AC TIMER REC, and DIGITAL REC LEVEL ADJUST.

"The MDS-E10 is ideal for radio broadcast and DJ applications," states Paul Foschino, marketing, Professional Audio Group, Broadcast and Professional Company, Sony Electronics Inc. "The 'Instant Start' option stores the very beginning of the audio in RAM on up to 10 tracks which is great for triggering samples. Both models have pitch control as well. The MDS-E12 incorporates several additional options such as analog XLR I/O which makes it a higher-end recorder for broadcast pros, system contractors, and studio users."

DMX-R100 Sales Representatives

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For more information on the Sony DMX-R100 recording console, please visit: www.sony.com/proaudio

Something to Talk About!

continued from page 92

they say: 'Don't think — it's dangerous!' Well, the R100's operation lets me get right down to reacting to the material. I don't have to think about the mechanics of running the console."

The second project the R100 was used on in the two months since Botnick installed the console was mixing of the 5.1 and stereo versions of the soundtrack album for the forthcoming major motion picture from Paramount Pictures "Along Came a Spider," the score for which was composed by the legendary Jerry Goldsmith.

"The sound and the features of the R100 put it into a class of equipment you wouldn't have expected to find in a personal studio even a few years ago," Botnick says. "5.1 music mixes, film scores – I can do them all in high resolution 96/24 on this console."

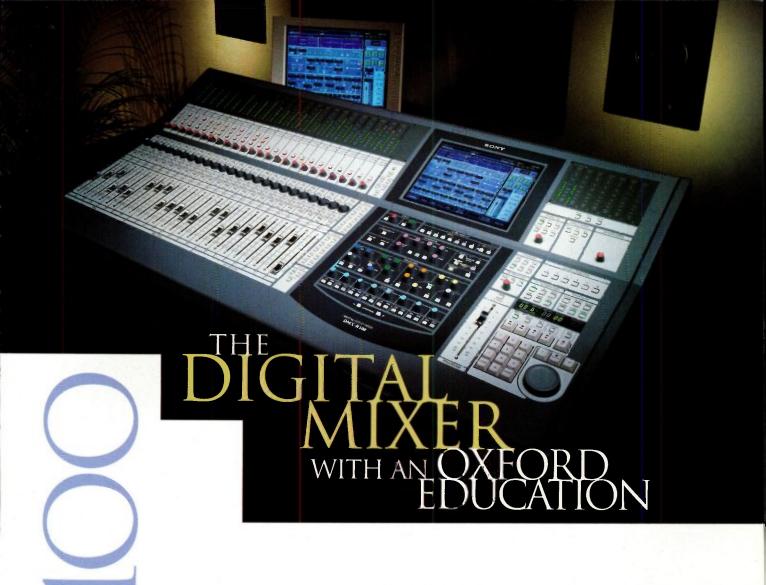
The R100's high-resolution capability is illustrated at Classic Sound, in Manhattan, where owner and engineer Tom Lazarus recently edited and mixed three 24/96 projects that he had recorded on remote: Ravi Shankar's Carnegie Hall performance, guitar virtuoso Steve Mackey's new concerto "Tuck and Roll," and pianist Andre Previn's "Live at the Jazz Standard," all intended for DVD-Audio and CD release. Installed in Classic Sound's surround mixing suite, the R100 gave a technical performance as flawless as the artists' own.

"Besides sounding as good as it does, the R100 also helps position us for these new high-resolution audio formats," explains Lazarus. Classic Sound's mastering veteran Scott Hull, who also worked on the Ravi Shankar and Andre Previn projects adds, "Now we can record, edit, mix and master in high-resolution for both stereo and surround. Projects like these had been waiting over a year for the arrival of a console like this."

The Sony DMX-R100 has managed a rare feat in a highly technical industry: it serves many applications for a variety of users, and serves each one adroitly. That's because, as Bob Margouleff puts it so succinctly, "It's the best small-format console we have ever worked on. It really gives an outstanding performance."

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The CDR-W66 (not shown) adds balanced XLR analog and AES/EBU digital I/O plus 2X speed duplication with a second CDR-W66.

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World Radio Histor

TYPES OF REVERBS

Although *EQ* magazine has never taken a formal survey, we'd venture a good guess that reverberation is the most widely used effect of those available in the contemporary control room. These days you'll likely find an assortment of digital hardware and software plug-in reverbs peacefully coexisting with traditional "mechanical" reverbs in the same studio. Each has their advantages and disadvantages, as well as a distinct personality. Here's a look at some of the options:

■ LIVE CHAMBER — This is reverb au natural, generated by using a real live room. A speaker is set at one end of the room, and a microphone is positioned at the other end of the room. Signals are sent to the speaker via an aux send from the console, and the microphone picks up this sound (two mics may be used for stereo pickup). The mics are returned to the console and mixed in with the original source. A quiet room that can be dedicated to the purpose is required, and changing the sound of the reverb requires physically changing the room in some manner, or moving the mics to a different position. Commercial facilities sometimes

use a stairwell or vacant area of the basement as a live chamber. At last you'll be able to get some use out of the racquetball court you had built into the barn!

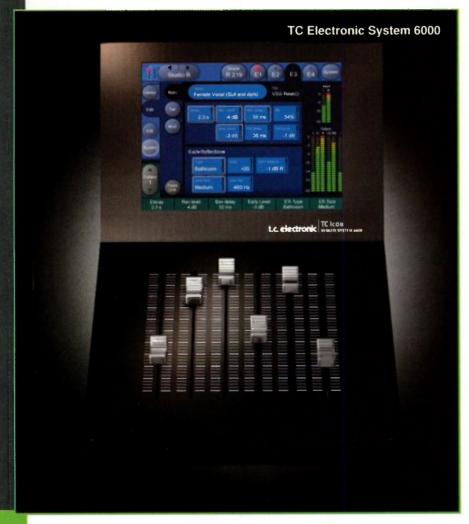
■ PLATE REVERB — A plate reverb is a large, rectangular, metal plate suspended within a sealed enclosure. Small drivers mounted on the plate cause it to vibrate in response to audio signals. Also attached to the plate are contact pickups that receive the sound vibrations after they have been transmitted along the plate. Maximum reverb time for a plate is a function of its size, though it may be dampened to reduce reverb time. Plates tend to be large — sometimes as large as 4 x 8 feet — and should be set up in a quiet, vibration-free room.

SPRING REVERB — Spring reverb employs a small electro-mechanical transducer to excite a coil spring (or series of springs) suspended in a metal "tank." Sound vibrations are transmitted across the length of the spring, and another transducer picks them up, producing the effect. Spring reverbs have traditionally been standard equipment in guitar amplifiers due to their small size (they can fit easily in the rear of an open-back guitar amp) and low cost. Reverb time is dependent on the physical properties of the spring and

is generally not adjustable, though there are exceptions.

DIGITAL REVERBS -- Probably the most familiar type to modern engineers and musicians, a digital reverb takes an audio input, converts it into digital information, and processes the signal via DSP (digital signal processing) chips to simulate an acoustic space. Most digital reverbs are capable of producing a variety of reverb types such as live rooms, halls, chambers, plates, and springs, as well as "early reflection" programs, which simulate small acoustic spaces such as tiled bathrooms. and sounds that would be impossible in nature, such as "backward" reverbs.

verb plug-ins use the processing power of your computer or a proprietary DSP card to simulate an acoustic space, allowing you to generate reverb within an audio workstation environment. Plug-in reverbs have several big advantages over hardware units. When running within a digital recording program, plug-in reverbs reduce the number of A/D and D/A conversions, helping maintain accuracy of the original



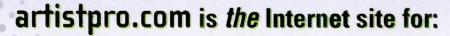
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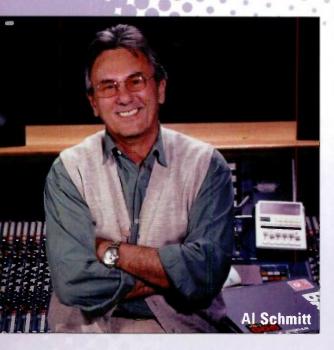
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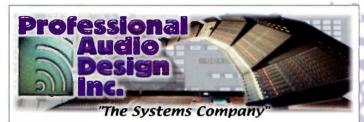
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signal. They can easily be automated, and — depending on the amount of muscle in your CPU — may support multiple "instances." This means that a single plug-in can be used to simultaneously create several reverb "machines" with varied algorithms for different sounds — one for drums, another for vocals, etc.

STATE OF THE ART: SAMPLING REVERBS

BY RICH TOZZOU

With the advent of powerful DSP technology, a whole new generation of reverbs has begun to appear on the production horizon. These sampling reverberators, both in hardware and plug-in form, offer something that no "conventional" reverb can offer: Actual "acoustic fingerprints" of real spaces. What does this really mean? Well, if you'd like to hear your guitar played in New York's St. John the Divine church, or even in your favorite high-school gymnasium, you can.

Three new reverbs offer this technology: Sony's DRE-S777, Yamaha's SREV1, and Audio Ease's Altiverb (plug-in). Using what's called "convolution processing," these processors take impulse response samples of actual spaces, and turn them into useable reverb presets. These samples can be created by sweeping a sine wave in an acoustic space (Note: you could fire a starter pistol, but the signalto-noise ratio won't be as good), and recording the results into each unit with up to four microphones. The units then turn the captured sound into a digital audio file; by extracting the dry source from that file, the reverb tail is isolated, and an "acoustic fingerprint" is achieved. This sample will have the exact acoustic characteristics of the space you actually captured.

Realizing this process is easier said then done, all three units have presets, or previously "captured" acoustic spaces, for you to instantly call up. The S-777 and SREV1 are hardware-based, and sounds are easily loaded in via a CD-ROM library. Both have a variety of analog and/or digital I/O options. Just introduced at Winter NAMM, the Altiverb plugin uses the power of the Altivec Velocity Engine processor in Apple's Mac G4 computers to crunch numbers. As a bonus, the plug-in can store acoustic samples along with JPEGs of the captured space, allowing you to "see" the space you're using to process your tracks.

Each unit has incredible multi-channel potential — ideal for simulating acoustic spaces in surround mixes. I've personally used the Sony '777 on almost a dozen 5.1 mixes, and many other audio professionals are integrating these processors into their reverb arsenals. Altiverb, currently slated for Digital Performer and MAS use, will be released later this year.

One can only imagine where this technology will lead. You may start "listening" to your apartment stairwell or local racquetball court in a whole new way. "That would sound great on my mix" will have a new meaning, as users begin to collect vast libraries of "real" acoustic spaces. The future is here, go forth and sample!

REVERB GLOSSARY

BY STEVE LA CERRA

ALGORITHM: A set of instructions run by a DSP to simulate an acoustic space. Most digital reverbs use different algorithms to create rooms, halls, early reflections, plates and springs.

DECAY TIME (also known as RT60): The amount of time it takes for the reverberation to decay by 60 dB below the sound level of the original source. Let's say your hand clap is at 95 dB. Five seconds later, the sound level in the room is at 35 dB. Reverb time for the room is five seconds.

DIFFUSION (or density): This refers to how "thick" the reverb sounds. Higher diffusion increases the reflections resulting in a heavier sound. Decreasing diffusion thins out the reflections, making the sound lighter and more ethereal.

EARLY REFLECTIONS: Reverb is actually a series of echoes bouncing around a room, but the echoes are so close or dense that we can't hear them separately. Early reflections are the first of these echoes bouncing off the boundaries nearest to the source. They are generally short, tight delays which imply a small acoustic space (such as a bathroom).

GATE TIME: The amount of time you are allowed to hear a reverb that is being run through a noise gate. This is independent of decay time. You could have a decay time of five seconds with a gate time of 0.5 seconds. For the 0.5 seconds that the gate is open you'll hear a reverb simulating a very large room. When the gate closes, the reverb abruptly shuts off.

PREDELAY: The amount of time between the source sound and the onset of reverb.

REVERBERATION: The sound left over in a room after the source stops. Imagine yourself in a large empty church. You clap your hands once. The sound remaining after you clap your hands is reverb. This is different from an echo, which is a distinct repeat of a sound.

WET/DRY MIX (also known as blend): Sets the mix between the reverberated and straight signals.

LEARNING TO HEAR REVERB

BY RICH TOZZOLI

I think of reverbs in a recording in the same way I think of paint colors in a painting. Each adds character and dimension as needed, yet something wonderful can still be created using one color, or one reverb. It's a reflection of the skill of the engineer to add just the right touch at the perfect spot in the song.

In my experience mixing, I've found many of the artists I work with have a definitive idea of the overall sound they're going for, and that applies to the specific use of reverbs. Al Di Meola has taught me a lot about reverb and the placement of it in a mix; he prefers a classic plate sound from his old Lexicon 200, with a short pre-delay and longer decay. It just seems to work perfectly on his guitars with his style. I've tried other, newer processors that just don't have the same feel.

Guitarist Ricky Byrd, on the other hand, loves his vocals and guitar very dry, and I've found the Avatar sample on the Sony '777 gives him exactly what he needs, enhancing the feel of the song without the listener actually "hearing" much reverb. Like music in general, reverb use on a song boils down to personal taste, and more often it is easier to hear what *doesn't* work than what does.

In learning to choose the right reverb for a track or song, it's important to spend time listening to different reverbs. When I'm trying a new unit for the first time, I run a short sample — say, a snare drum — through many of the presets. This will quickly give you a good idea of what that particular model does well, and also of what it doesn't do quite as well - or at least of what its presets are set up to do well and not so well. Doing this will also give you a decent introduction to the different types of reverbs in use - listen close, and make sure you understand the sonic differences between a plate, a hall, a chamber, a spring, and so on. Experiment with turning up the early reflection levels. increase the pre-delay time, shorten the reverb decay time, play with the various sound-shaping filters and other parameters the unit provides. The idea is to familiarize yourself with what the reverb can do, and with what its different programs and algorithms sound like.

Next sit down with some of your favorite recordings — hopefully you'll include some from the past as well as the present — and listen carefully to how reverb is used on the various vocal and instrumental tracks. Is the engineer/producer trying to simulate a room? Is reverb used to blend things together? To add spaciousness? Is it employed to fatten or "wash out" particular sounds? Maybe as a special effect? Attempt to identify what type of reverb your hearing; is it a hall?



A plate? The spring reverb in a guitar amp?

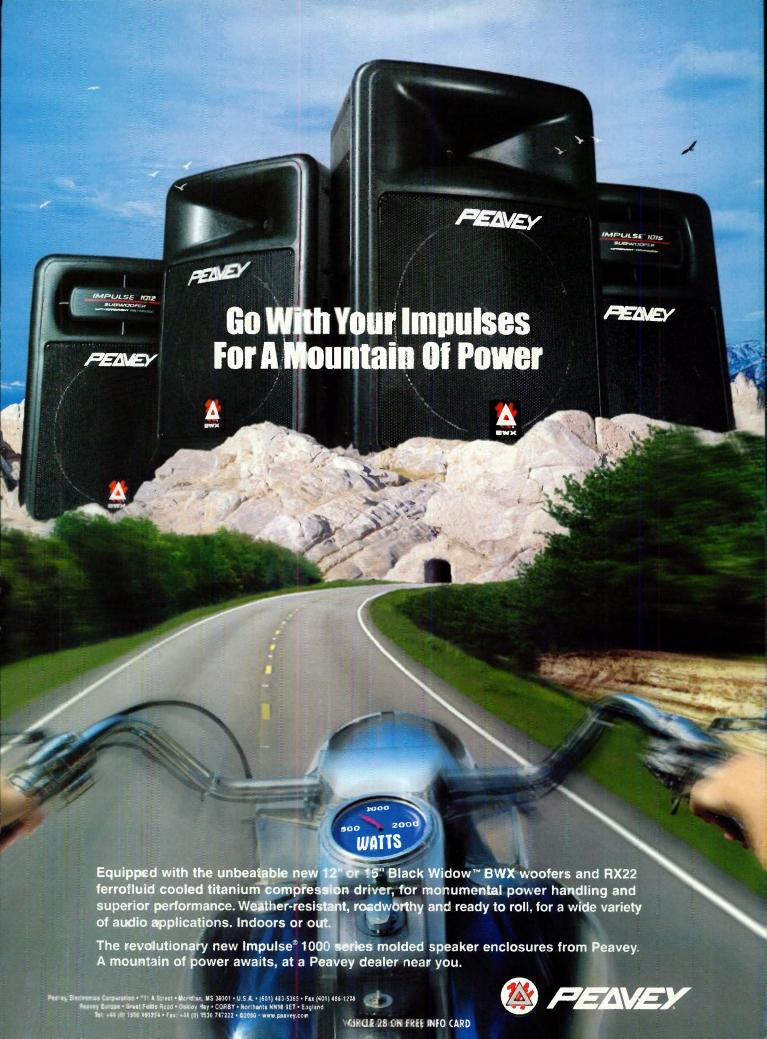
As your listening, also pay attention to how reverbs are used in recordings of different vintages. When were gated reverbs on snares popular? Huge halls on snares and toms? Who used electric guitar panned to one side, its reverb panned to the other?

Think how different the reverbs are behind voices such as Sade, Robert Plant, Aretha Franklin, and Peter Gabriel. The smooth halls used on Sade are quite different than the springs or plates used on Aretha Franklin, but they both sound amazing. Think how dry AC/DC mixes are, or how wet Madonna mixes are. It depends on the needs of the song and the artist, and on the instrumentation involved. I learn a great deal by putting on the headphones and hearing what Daniel Lanois, George Martin, Eddie Kramer, and others have done with reverb. Take a recording you love, put on the cans, and focus in on just the reverb for every song, every instrument. Listen to a whole mix, focus just on the snare drum, and so on. As you get more experienced, you begin to recognize the sounds of certain reverbs, even on compressed radio mixes. Learn from the great ones, then go out and apply the sounds and techniques to your own projects.

IO TIPS FOR BETTER REVERB SOUNDS

BY STEVELA CERRA AND MITCH GALLAGHER

- **1.** Roll off the top end. Most real rooms don't produce reverb with a frequency response extending from 20 to 20,000 Hz. Rolling off the top end at around 5 kHz can result in a more natural sound.
- 2. An easy way to modify the apparent size of any reverb is to insert a delay between the console send and the reverb input. This "pre-delay" makes the space seem larger.
- **3.** Put that old two-track to work! Use any three-head analog deck to create a warm pre-delay for a digital 'verb. Put the deck into record and monitor off the playback head to create the delay. Vary the



pre-delay time by changing the tape speed. You can even use a three-head cassette deck for this purpose, though delay time will be short.

- **4.** Keep it short. Long reverb times can make a mix muddy. Use small rooms or early reflections to put a sound in a space without making it wishy-washy.
- **5.** Solo the 'verb. Solo your reverb return just like you'd solo a tape track for critical evaluation. You'd be amazed at what you'll hear. Use EQ to smooth out fluttery decays, or try a bit of compression to lengthen the apparent decay time.
- **6.** Experiment with EQing signals both before they enter the reverb, and after they've been processed cutting the low end on a dry signal before it enters a reverb is entirely different than cutting the low end on the processed sound.
- **7.** Go for the real thing! Playing back the sounds you want to add reverb to in a nice (or not so nice) acoustic space. Throw up a mic or two, and record the results back to tracks. Mix with the dry signal just as you would when working with an artificial reverb.

- **8.** If you're having trouble with vocal intelligibility, clarity on instrumental passages, or muddiness, lengthen the reverb pre-delay time. A longer pre-delay can help move the reverb out of the way of the dry signal.
- **9.** If your reverb offers separate control over low- and high-frequency decay, set the low-frequency decay longer for increased fatness, the low-frequency decay shorter for a less-muddy, lighter reverb.
- **10.** To create a decent surround reverb when you don't have an actual "surround"-capable processor at hand, use two stereo units (preferably of the same model). Set them up for an identical reverb program, feed the same signal to both, and route one to the front left/right monitors, the other to the rear left/right monitors. Now subtly change a few parameters on the processor routed to the rear speakers try lengthening the pre-delay just a bit, making the reverb decay slightly longer, and reducing the level of early reflections. Making the reverb programs very slightly different "decorrelates" the ambiences they produce, while still giving the impression that you're in one sonic space.

The following chart lists many of the reverb processors available on the market today. It's by no means comprehensive, but it should get you started in your search for ambience Nirvana! Even though many multi-effects processors can also do reverb, we've focussed the listings on processors that have reverb as their primary purpose in life.

MANUFACTURER		URL		CHANNELS	
Alesis	NanoVerb	www.alesis.com	hardware	2	\$249
		www.alesis.com			
		www.artroch.com			
		www.audioease.com			
Cakewalk	AFX3 SoundStage	www.cakewalk.com	plug-in	2	\$249
		www.demeteramps.com			
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		www.kindofloud.com			
		www.lexicon.com			
		www.lexicon.com			
Lexicon	PCM91	www.lexicon.com	hardware	2	\$2,995
Lexicon	300	www.lexicon.com	hardware	2	\$4,995
		www.lexicon.com			
Lexicon	960	www.lexicon.com	hardware	multi	\$15,000
Quantec	2402 Yardstick	www.quantec.com	hardware	2	\$2,999
		www.rolandus.com			
Roland	SRV330	www.rolandus.com	hardware	2	\$995
Sonic Foundry	Acoustic Mirror	www.sonicfoundry.com	plug-in	2	\$59.95
Sony	DRE-S777	www.sonyproaudio.com	hardware	multi	\$12,600
TC Electronic	M•One	www.tcelectronic.com	hardware	2	\$699
		www.tcelectronic.com			
TC Electronic	M5000	www.tcelectronic.com	hardware	2	\$4,103
TC Electronic	System 6000	www.tcelectronic.com	hardware	multi	\$9,395
		www.tcworks.de			
Waves	Renaissance Reverb	www.waves.com	plug-in	2	\$300-\$600
		www.waves.com			
		www.yamaha.com			
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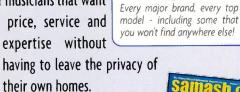
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Propellerheads Reason

Propellerheads take the integrated software studio concept to the next level Reason vaporizes any possible remaining doubts about the viability of software synthesis. This grand, sweeping program packs an entire virtual studio — sound generators, sample players, interfacing, MIDI, and sequencing — into a compactly coded (and efficient) package for Mac OS or Windows.

A downloadable demo version (about 12 MB) is available from the Propellerhead website; the demo can't export/save, and quits after 20 minutes, but it's good enough to explore the program. (The PDF documentation is also downloadable so you don't have to "fly blind" with the demo.) Therefore, rather than list every little bell and whistle, which would take up the next 40 pages anyway, this review will concentrate on

an overview of the software modules, the applications for which Reason is most suited, and provide some context as to what this program means to computer-based studios.



The Reason package consists of two CDs, one containing the program (Mac and Windows versions), the other with about a half-gigabyte of sounds and samples. Copy protection is via serial number authorization. A 91-page printed manual gets you started; a PDF file handles the fine points. Reason offers several modules:

- "Rack" foundation with I/O (MIDI, audio, and ReWire)
 - 14x2 mixer
- Seven effects: Reverb, delay, envelope follower, twoband parametric EQ, distortion, chorus/flanger, phaser, compressor
- NN19 sample playback synth
- Subtractor polyphonic "analog" synth
 - ReDrum drum machine
 - Dr. Rex (REX file player)
 - Matrix-style sequencer
- Standard multitrack sequencer
- ReWire 2 capabilities
 But that's a bit misleading,



World Radio History

because these are just building blocks from which you can create vastly larger systems. For example, for a live performance setup I created a Reason rack with 16 sample playback units, two mixers, and a bunch of effects. Each NN19 was loaded with a loop, and a Peavey PC-1600 MIDI fader box controlled the level of each synth. Within minutes, I was doing live remixing of 16 different loops. Amazingly, despite all this activity, the CPU meter didn't even come close to maxing out on a PowerBook G3.

You can also treat Reason as a live performance setup comprising multiple instruments — the virtual equivalent of Korg's Electribes, where several boxes that fulfill different functions coalesce to form a system. Or in the studio, treat the modules as software synths you play from a MIDI controller or sequencer. The studio is also where ReWire comes into play (see sidebar).

I think it's also safe to say that there are probably cool Reason applications that will surface only after the program has been out there for a while. For example, I can see it providing sounds for museum installations — load it into a laptop, develop some sensors or controls that output MIDI to allow for interaction, and go. Despite the seeming dance-music orientation of the instrumentation, Reason goes way beyond that. For instance, there's no reason you can't load orchestral samples into the NN19s and tympani into ReDrum, or do strange, avantgarde experimental work.

Reason will work with relatively modest computer systems, but more CPU power and more RAM translates into more modules for your rack. Using ReWire also ups the power ante, because even though ReWire is pretty much just a passive conduit, running multiple programs by definition requires a more powerful computer.

About The Modules

Let's look at the modules in a bit more detail. Note that with large rack setups, you could go nuts just scrolling from one end to the other. Thankfully, each module can be "minimized."



► PROPELLERHEADS REASON

MANUFACTURER: Propellerheads Software. Web: www.propellerheads.se

SUMMARY Reason is a breathtaking program, especially (but by no means exclusively) for those into dance/techno/rap-type musical genres.

STREMETHS: Useable with fairly modest computers. Outstanding MIDI control options. Low latency with ASIO drivers. Excel ent complement of modules. Includes around 500 MB of free sounds and samples. ReWire-compatible. Absurdly cost-effective. Versatile. Intuitive interface. Comprehensive documentation. Stop me before I list every feature in the program.

WEAKNESSES: With live use, requires workarounds to transition smoothly between different songs. Program hiccups when loading new files into modules. No DirectConnect for TDM systems

PRICE: \$399

EO FREE LIT. 1: 114

The Rack

The rack comes "hard-wired" with MIDI and audio interfacing sections; this is where you route signals to and from computer interfaces. The sequencer is also permanently installed. Anything else is up to you; go to Create Device, make your choice, and another module pops into the rack.

Reason connects up each new device in a normalized, logical way. You can name devices and move them around. But the big surptise happens when you hit the Tab key and — hey, you're looking at the back of the rack, where all the patch points are available for patching. The various devices have modulation inputs and outputs, allowing control of, say, a Subtractor filter input from an NN19 audio output. You can go really crazy here. And of course, unlike the modular behemoths of old, patches get saved with the song.

Mixen

The mixer is straightforward and features four aux sends, four returns, panning, mute, solo, and high/low shelving EQ. If you run out of inputs, create more mixers.

Subtractor

This is your basic modeled analog, dual oscillator per voice polyphonic synth (99 voices max). If offers 32 waveforms, FM/ring/phase modulation (the latter can

do hard sync-type sounds), the five resonant filter options (lowpass 12 dB/octave, lowpass 24 dB/octave, highpass, bandpass, and notch), a second lowpass filter with resonance, dual LFOs, three envelope generators, white noise generator, and portamento.

Sequencers

There are three sequencers in Reason. The drum machine has its own pattern-based sequencer, but there's also a 32-step, "analog"-type mono matrix sequencer for quick programming of bass lines and such. It has adjustable resolution and time signature, and borrows features from ReBirth, such as sequence randomization, position shifting, and ties. It can also create complex sequences of "control voltages" to vary instrument or processor inputs.

A more complete sequencer includes various views, controller editors, automation, snap, quantize, grooves, import/export MIDI files, drum machine-style editor page, etc. - all the standard accoutrements, although there's no notation. One unexpected feature is due to integration within Reason: you can record changes in processor knobs, synth controls, etc. But even better, it's easy to override the automation — great for live use, because you can fall back on the automation, or take off in a different direction if required. And yes, tempo changes are possible, although NN19 samples will not time-stretch or compress à la Acid.

Dr. Rex

This is dedicated to playing REX files (see sidebar). The sequencer has a dedicated REX file editor so you can easily shift the segments around by moving notes within the editor, but the player is also filled with audio-bending options: change the level,

SYSTEM REQUIREMENTS

MAC: 604/166 MHz or better, 64 MB RAM, Mac OS 8.6 or later, OMS 2.2 or later (AltiVec-compatible for G4).
WINDOWS: PII/233 MHz or better, 64 MB RAM, Windows 98/NT 4.0/2000.

TEST CONDITIONS: Version 1.0 tested on a 400 MHz Apple G3 Power-Book with 192 MB of RAM.

WHAT IS REX?

The REX file format was developed by Propellerheads in their ReCycle program. This was the forerunner of Sonic Foundry's Acid, in that it allows speeding up or slowing down loops without changing timbre. It does this by slicing a loop up into segments that can be triggered by MIDI note commands. If these triggers occur closer together, the loop speeds up. If further apart, the loop slows down (an ingenious method of synthesizing a decay fills in any gaps when slowing down).

Reason does not include ReCycle, so if you want to develop compatible loops, you need the program (available for Mac or Windows). Unfortunately, ReCycle currently works only with mono files. A stereo version is expected to be announced at Winter NAMM later this month.

pitch, pan, or decay for each slice, apply any of five resonant filter options, modulate with dual envelopes, apply a multi-waveform LFO, and the like. Although you can't generate REX files in Reason (only play them back), there are 400 sample files included with the program.

ReDrum

ReDrum accepts WAV or AIFF samples in its 10 channels of drums, and has the same Roland-style programming interface as ReBirth. It's easy to audition drum sounds, or arrange them in an order and scan through them. You're not limited to using particular samples, nor the onboard pattern sequencer; you can drive it from MIDI, the main sequencer, or from a different sequencer running on the same machine. Each drum sound channel is relatively complex; in addition to solo and mute, there are dual effects sends (you can also "insert" effects on individual sounds), pan, level, decay time (gated or smooth fade), and pitch controls. Some channels handle velocity differently than others. For example, three of them route velocity data to filter cutoff, five allow using velocity to change the sample start point, and two route velocity to pitch.

Patterns can be up to 64 steps long (four measures of sixteenth notes), but more importantly, patterns can run at multiples or submultiples of the master tempo (while remaining synced). For example, quadrupling the speed can yield sixty-fourth note patterns. Flam and different dynamics levels are also available.

NNI9 Sampler

This sample playback device (it doesn't sample) accepts WAV or AIFF files, mono or stereo. It does the usual keymapping/transposition tricks for stretching a limited number of samples across a keyboard, and in addition to one-shot triggering, handles forward or forward/backward looping. However, looping is primitive, as you can't set loop points (other than loop start, so the loop can jump back somewhere other than the beginning), nor is there crossfade looping. Like

Dr. Rex, the NN19 expects you to import files rather than create them. There is one very nifty exception, though; you can always create cool loops in the program, then "render" them as audio files. Import these into the NN19 as source material for further tweaking.

Speaking of which, editing options include tuning and pitch for the various samples, as well as dual envelopes, multi-waveform LFO, and the familiar five resonant filter modes. Interestingly, it can provide good mono mode effects — you can retrigger or use legato

the world. I wouldn't be surprised to see someone come up with a dedicated hardware controller, although the Peavey PC-1600 and Panasonic DA7 mixer's MIDI layer are fine for now.

Even The File Handling Is Innovative... Okay, Reason saves. And can save everything in a song as a self-contained package, including samples. And it can render a finished composition as a WAV or AIFF file. But an additional "publish" mode saves songs in a playback-only mode that doesn't allow any changes, including extracting elements from it (so people can't rip off your original samples or modify the tune). This is in essence another method of digital music distribution, and it will be interesting to see where this goes.

Is there anything not to like? Well... hmm...okay, if you want to use it live for a continuous mix set, it's hard to transition smoothly between multiple songs. You can have more than one song open at once, but if the songs use a significantly different repertoire of instruments and samples, you're going to run out of RAM or CPU power long before dawn comes up and the party ends. In a perfect world, Reason would have an "ondeck" song that would be loaded and ready

WHAT IS REWIRE?

ReWire 2 (the latest version of ReWire) is a protocol, developed by Propellerheads and licensed free of charge, which provides a software connection for up to 256 channels of audio between ReWire 2-enabled programs (the original ReWire provided 64 channels). This is different from VST plug-in technology, which allows devices to work within a single host program. For example, with ReWire 2, you can run Reason and have its outputs show up in Cubase as audio channels. From there, apply plug-ins, mix, and so on using the Cubase mixer. All audio transfer is sample-accurate (no word clock issues), and furthermore, all start/stop activity is synced — if you hit Cubase's start button, the Reason sequencers and drum machine march right along. An even bigger change in ReWire 2 is that MIDI communication is now supported, with up to 4080 MIDI channels and 255 16-channel MIDI busses.

In addition to Cubase, the original ReWire spec is supported in Emagic Logic, Mark of the Unicorn Digital Performer, Opcode Vision DSP, Bitheadz Retro AS-1 and Unity DS-1, and Koblo synths that use their "Tokyo" engine. Hopefully many of these companies will upgrade their software to support ReWire 2.

mode, with or without portamento. Polyphony is selectable from one to 99 notes.

Total Control

Something as cool as this demands real-time control, and Reason doesn't disappoint. In MIDI control mode, little arrows point to each parameter that can be MIDI-controlled. Choose one, click on Learn, wiggle your controller, choose another, then repeat the process until all the parameters you want are under MIDI control. With the ability to respond to 64 MIDI channels (four ports), you can rule

to go. As soon as you pressed "Stop" on the transport, the next song would move to the front and start to play. And of course, I'd want to be able to load the next song while the current song is playing.

Overall, Reason is a technological, and artistic, triumph. It's even extremely well behaved, especially for being version 1.0. If you make the kind of music for which Reason is optimized, you will be absolutely blown away...and your hardware rack might all of a sudden start to look so 20th century.

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Medéa AudioRaid disk array for digital audio workstations

The ultimate digital audio storage solution?

If you're one of the growing number of digital audio workstation (DAW) users, then you're probably all too aware that the fate of your audio hangs by a tenuous thread. Putting your trust in a thin magnetizeable disk whirling at speeds up to 10,000 RPM borders on the ludicrous, if you think about it. (I, for one, try not to.) While hard drives have become inexpensive and reliable in the past few years, the demands audio production puts on a disk remain significant. Not only must the drive have large capacity and be able to spit out large amounts of data on a continuous basis, but random access editing means that the drive must be able to access many chunks of data (which may be spread across the disk) nearly simultaneously. Current drives are fast enough to handle this load, although the strain the drive is under doesn't inspire much confidence. One solution to the problem is to spread the audio file load across multiple drives, which also increases the available storage space. But this approach can be a pain when it comes to file organization and backing up.

Medéa offers another solution with their Audio-Raids, which combine multiple hard disks into a single enclosure and use proprietary "striping" software to spread data across the drives. This reduces the load on any single drive, and increases access

speed and data transfer rates. The beauty of the





►MEDÉA AUDIORAID

MANUFACTURER: Medéa Corporation, 5701 Lindero Canyon Road, Building 3-100, Westlake Village, CA 91362. Tel: 818-597-7645. Web: www.

medeacorp.com.

SUMMARY: High-performance storage solution for hard disk-based studios.

STRENGTHS: Fast disk performance. Support for playback of up to 64 tracks of 24-bit/96 kHz audio.

WEAKNESSES: Pricey

PRICE: 80-GB, \$1,649; 120-GB, \$1,999

EO FREE LIT. #: 117

AudioRaid is that it appears as one huge drive to the user and his software and computer. Two AudioRaid models are available, the 4/80, which uses four 20 GB drives for an 80 GB total capacity, and the 4/120, which uses four 30 GB drives for a 120 GB total capacity. For this review, Medéa provided me with a 4/120.

No special drivers or software are required; simply plug a 68-pin SCSI cable from your computer to the AudioRaid, follow the simple step-by-step directions for setting the drive up with your particular OS, and you're happening — this took me all of 30 seconds to accomplish. The AudioRaid looks cool, finished in stealth-black, with muted blue lights indicating when each drive is accessing data. It's reasonably quiet, although it's too loud to have near open mics during tracking.

In use, the AudioRaid handles the necessary file tasks in the background, writing each individual data file across the four drives in sections. Playback for a single file starts momentarily on the bottom drive, then shifts briefly to the top drive, to the second drive, the third drive, then back to the bottom drive where the cycle starts over again. This spreads the data reading/writing requirements across the four drives, reducing the load any single drive must bear.

Putting It To The Test

I ran the AudioRaid as my primary audio drive for work in Pro Tools, Digital Performer, and Logic Audio with nary a glitch or problem, even when



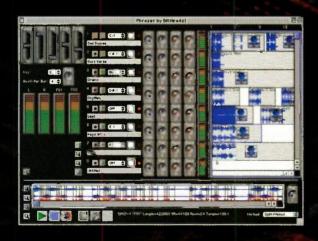


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SYSTEM REQUIREMENTS

Ultra Wide or Ultra2 SCSI host adapter; Windows 95B/98/NT/2000, Mac OS 8.1 or higher, IRIX, Linux

TEST CONDITIONS: 400 MHz blue and white G3 Mac with Newer Technology 400 MHz G4 upgrade card, 512 MB RAM, Mac OS 9.04, Adaptec PowerDomain 2940U2W SCSI host adapter card, SBS Technologies PCI expansion chassis, Digidesign Pro Tools Mix Plus 5.01, MOTU Digital Performer 2.7.1

playing digital video along with large surround multitrack audio sessions. The drive "feels" solid, responds quickly, and at 120 GB, is gloriously spacious. I felt confident having my data residing on it — but not to the point where I didn't back up!

But how does one go about testing the limits of the performance of such a hard disk system? You could do low-level data transfer testing, measure seek times, and so on. That works for a lab, but it's just not very meaningful in the real world. Instead, I came up with four tests for the Audio-Raid using scenarios (albeit somewhat extreme) that might have some relevance in day-to-day studio work. For the sake of comparison, I ran the exact same tests.

using the exact same files, on my trusty 7,200 RPM Ultra2-Wide SCSI 9-gig hard drive. (See "System Requirements" sidebar for complete test conditions.) Both the 9-gig and the AudioRaid were freshly formatted/initialized before I started testing. Keep in mind that the AudioRaid results are very conservative since due to my system's limitations, I was unable to test with high sample rate audio. Pro Tools is limited to 64 tracks of 24-bit playback, Digital Performer tops out at 96 tracks of 24-bit playback on my computer.

Test #1

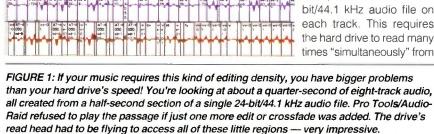
Number of tracks of simultaneous continuous playback with a unique 24-bit/44.1 kHz

audio file on each track. In the case of the 9-gig, it (obviously) read all the audio files from one disk; the AudioRaid divided the files across its four disks.

Pro Tools: 9-gig - 64, AudioRaid -- 64 Digital Performer: 9-gig — 71, AudioRaid — 96

Test #2

Number of tracks of simultaneous continuous playback, with the same 24bit/44.1 kHz audio file on each track. This requires the hard drive to read many times "simultaneously" from



This was also the maximum track length that would play; if I made the section/track any longer, I got errors. Since the passage took a few seconds to begin playing, I assume that the AudioRaid was buffering the audio data. When it attempted to read any more data "on the fly" during playback, it wasn't fast enough to do so. Keep in mind that for this example, all of the data was coming off of just one of the AudioRaid's four drives; much higher edit/crossfade densities (if you need them!) can be achieved with multiple source files or files/regions that span multiple drives.

the same point in the file, and also limits the AudioRaid to playing off of one disk at a time, as opposed to splitting file access across its four disks.

Pro Tools: 9-gig — 60, AudioRaid — 64

Test #3

Number of tracks of simultaneous continuous playback; as with Test #2, the same 24-bit/44.1 kHz audio file is loaded into all tracks. But this time, the track entrances were staggered 100 msec apart, thus requiring the hard drive to read "simultaneously" from a different point in the file for each track.

Pro Tools: 9-gig -- 64, AudioRaid -- 64

Test #4

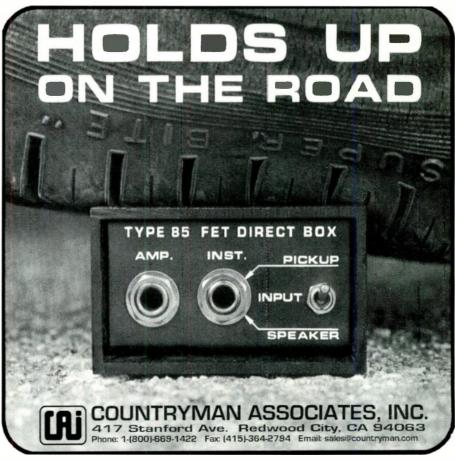
Playback of one 1/2-second 24-bit/44.1 kHz audio file, cut into many tiny regions (the largest was 10 msec long). Those regions were then randomly assembled across eight tracks to the point where the disk was too slow to accommodate playback. At this point, crossfades were added until playback was impossible. (See Figure 1)

As with Test #2, the AudioRaid is forced to play audio solely from one disk. When the AudioRaid is allowed to spread file access across multiple disk, the edit/crossfade density can be much higher. On the 9-gig, I was able to add four more regions, and six more crossfades before it was too much for the drive to handle.

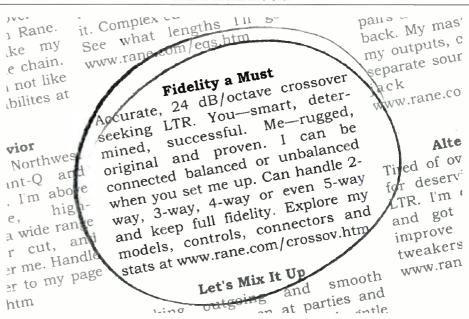
As mentioned above, these tests (except for Test #4,which is a worst-case scenario) provide conservative results. In general, the computer/audio software topped out long before the AudioRaid was even breathing hard. With the 9-gig drive, the computer/software response became more and more labored as heavier loads were piled on. The AudioRaid response remained snappy regardless of the load put on it.

Conclusions

If you're looking for the pinnacle of digital audio workstation storage solutions, the Medéa AudioRaid is among the best I've seen. Throughout my time with it, it performed flawlessly; only through extreme measures was I able to push it to the point where it was unable to deliver. It's expensive — you could buy equivalent hard drive storage capacity for significantly less than the AudioRaid's sticker — but for serious applications, the convenience and bulletproof operation the AudioRaid provides are worth the investment.



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TASCAM DA-98HR high-resolution eight-track recorder

TASCAM's
latest digital
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features high
sample rates
and new
capabilities.

Although tape-based systems may not be the sexiest gear these days, the TASCAM DA-88 family of DTRS recorders remain a standard workhorse in wide number of areas in the audio business, especially in DVD content delivery and post-production. The latest entry into this family, the DA-98HR, typifies this family's growth and change by taking it to the next step both functionally and sonically. Not only are its many existing features more refined than its predecessors, but TASCAM has included some new, much requested capabilities as well.

The Next Level

The DA-98HR is basically a descendent from the now familiar DA-88, but it's evolved beyond that venerable machine in many ways. Although 24-bit capable like its DA-78HR cousin, the 98HR is capable of operating at high resolution sample rates of 88.2-, 96-, 176.4-, and 192 kHz. With these 88.2/96k sample rates you get four-track capability, and at 176.4/192 k, you can record/play two tracks. Finally we have a tape machine capable of the sonic benefits of both high bit resolution and sample rates without resorting to expensive outboard bit splitters. And, different sampling rates can even be recorded simultaneously on different tracks on the same tape.

Another much requested and useful feature is a Confidence Mode, which provides off-tape monitoring while recording is in progress. This is something that I've found personally helpful since we frequently convert long-form program such as movies to 5.1, using DA-88's as the delivery medium. On an older model machine we'd have to literally listen to a playback of the entire program (as much as two hours



NANUFACTURER: TASCAM, 7733 Telegraph Road, Montebello, CA 90640, Tel: 323-726-0303. Web:

www.tascam.com.

SUMMARY: The DA-98HR is an eight-track DTRS recorder that has the ability to operate at high sample rates and to synchronize to other devices.

STRENGTHS: The most professional MDM ever built. Operates at 96 kHz sample rates with 24-bit resolution. Built-in synchronizer, digital mixer, and on-board routing.

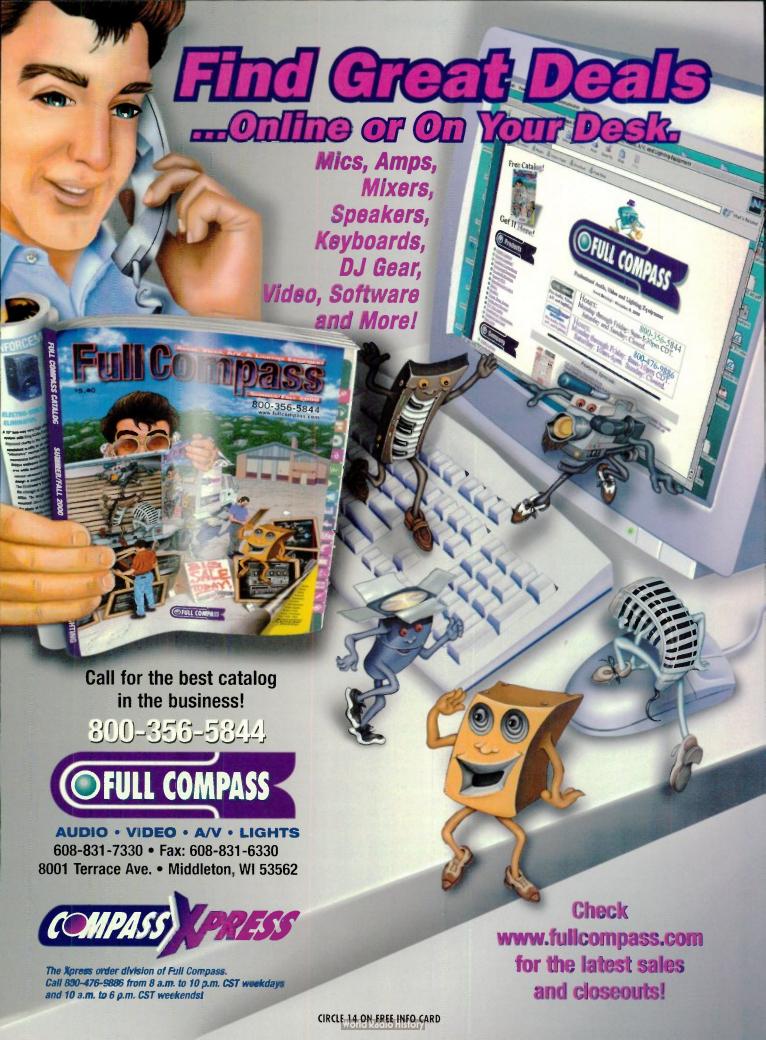
WEAKNESSES: Expensive

PRICE: \$6,999; IF-AN96HR analog I/O option, \$799

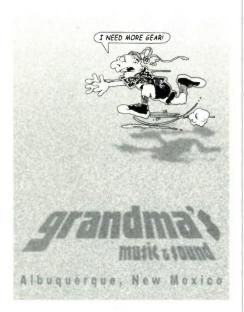
worth) to check for any problems. With the Confidence Mode engaged we can make the check while recording and eliminate the extra (and time-consuming) playback check pass.

But we're not finished here. There's also full builtin SMPTE timecode synchronization and an onboard timecode generator, a digital sine wave oscillator with settings at 440 Hz for tuning and 1 kHz for line-up, digital input and output patchbays for onboard routing,

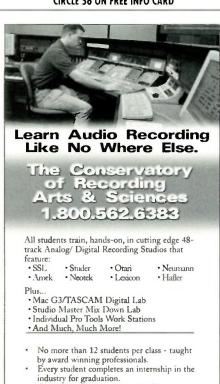




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track slipping from ~200 to +7200 samples, and an internal digital mixer. The last feature allows you to perform the neat trick of being able to mix down eight recorded tracks to stereo on the same machine. Doesn't that require 10 tracks, you ask? Since DTRS recorders read the old digital data before writing new data, it literally lets you mix eight tracks down to two on the same machine. This is a destructive operation and will replace your previously recorded tracks with the new stereo mix, but if you're sure of the mix it's a lot better than not being able to do

The 98HR takes up the same 4U footprint as its predecessors, weighing 24 lbs., and although it has the same basic look as earlier DTRS-family models, it is at the same time both sleeker and more industrial looking. Sleeker in the clean front-panel graphics, highquality hardware, and engraved buttons; industrial in that the unit exudes a workmanlike robustness. The front panel is more or less similar to previous incarnations of the deck except for the inclusion of a LCD display and an extra row of monitor switches below the record arming buttons (under the meters). The unit also has more accurate metering, offering 15segment peak meters with user-selectable ballistics and variable hold time including a continuous peak hold feature. The meters are much improved over the original DA-88's and the peak hold feature is a blessing if the machine is not in a place where you can watch the meters continuously.

The rear panel contains both TDIF and AES I/O, which reside on what is becoming the standard connector, the DB-25. There are also connectors for sync in and out, word clock in, out, and thru, video sync in and out, and MIDI in, out, and thru. A small but nice addition is the inclusion of rear-panel XLR connections for SMPTE in and out (they were RCA connectors on other DA-family models). Two expansion slots for accessory boards such as the optional IF-AN98HR balanced analog input and output card (again on DB-25 connectors) are also provided.

Several things become apparent to DA-88 veterans while using this machine. First of all, setup is easier once you get the hang of how the display works and you figure your way through the operational possibilities (more on this later). Second, the transport is really fast with fast forward and rewind seemingly happening in a flash. Third, these machines sync up in no time, with lock taking place in just a second or so in most cases.

This is a great machine that, once it's set up, not only works flawlessly but sounds great as well. I found the optional analog converters

to be much better sounding than any other DTRS machine that I've used, with not only better detail, but a bit more bottom end. Although I didn't use the machine at 192 kHz since I didn't have the requisite converters (the 98HR converters don't record beyond 96k yet), the machine at 96k worked about the same as the lower resolutions. This is quite a feat in itself, since in my experience many other devices that provide the 96k feature seem to perform rather unevenly at that speed.

I FOUND THE ANALOG CONVERTERS TO BE BETTER SOUNDING THAN ANY OTHER DTRS MACHINE THAT I'VE USED, WITH BETTER DETAIL, AND A BIT MORE BOTTOM END.

The 98HR is designed to be used for just about any audio task and therefore has a multitude of setup possibilities. Unfortunately that means that you will most certainly have to refer to the manual at some point in order to integrate it into a particular situation. That being said, the front panel 20 character by four line LCD display is very helpful, particularly after you get the hang of how it works. Plus, the ten most commonly used functions can be assigned to front panel soft keys for easy recall.

Conclusions

The DA-98HR is a huge step ahead in terms of the evolution of the TASCAM DTRS family. This is truly a professional machine that literally can fit into any audio situation. Some of its features may be a bit overkill for the typical project studio, but if you require a multitrack tape machine with 96/24 resolution or that can lock to picture, there's no better choice available.

Bobby Owsinski is a surround mixer and DVD producer, and the author of *The Mixing Engineer's Handbook* and *The Mastering Engineer's Handbook*.

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Soundfield MKV Microphone and Model 45I 5.I Decoder

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In the last couple of years, I've tried a number of surround microphones. From prototypes to jury-rigged home designs to well thought-out and precisely engineered models, I've tried them all and had reasonable results with most. But, the one microphone I've never used has not only been around the longest, but is probably the most highly developed as well—the Soundfield microphone. While this mic has been around since the '70s in a stereo version, the latest version of Soundfield, the MKV, has truly become a surround microphone with the recent addition of the model 451 surround processor.

Eager to see and hear what the unit was all about, I tried it on a variety of acoustic instruments during 96 kHz tracking for the new L.A.

Jones DVD-A release.

The Specs

The Soundfield microphone employs a fourelement array in a tetrahedral pattern that can be electronically controlled from the

supplied preamp/controller. A 55-foot multi-core cable is used to connect the mic to the controller. The mic itself is rather small and unobtrusive, considering the number of capsules employed, and can easily be placed in most miking situations, even when using the supplied shock mount.

The accompanying Soundfield controller is a multi-function processor that combines a microphone preamp, which provides a line-level output and the requisite electronics needed to control the various parameters of the MKV. The front panel has an input section that consists of a Master Gain control that provides up to 30 dB of gain in 10 dB steps, and a Fine Gain control, which is detented at 0. The input section also has solo switches for the individual capsules as well as switches that compensate for microphone orientation if the mic is used in either an inverted or an end-fire position.

The controller includes a stereo output section that consists of a pattern control, which is variable from omni to figure-eight, an angle control, which electronically points the capsules either in the same direction (0°) or 180° opposing, and a headphone jack with gain control. There are also switches for a 40 Hz high-pass filter and for M/S decoding, as well as a set of four LED bar graphs that can be switched to display either the B Format output (more on this later) or the stereo output levels.

The heart of the processor lies within the Sound-



► SOUNDFIELD MKV MICROPHONE

MANUFACTURER: Soundfield, dist. in the U.S. by Transamerica Audio Group, Inc., 4760 West Dewey Drive, Suite #133, Las Vegas. NV 89113. Tel: 702-365-5155. Web: www.transaudiogroup.com.

SUMMARY: The Soundfield MKV is a non-traditional mic that provides depth, width, and height information, and can be configured for anything from stereo to 5.1 output.

STRENGTHS: Realistic reproduction in either stereo or surround. Able to change the pickup characteristics during playback.

WEAKNESSES: Expensive. Documentation could be improved.

PRICE: MKV. \$9,150; 451 surroumd processor, \$4,100. EO FREE LIT. 1: 115

field controls, which offer some unfamiliar parameters not usually associated with a microphone. For instance, Azimuth provides for complete electronic rotation of the microphone, Elevation allows for ±45° of continuous variation of the vertical alignment, while Dominance, is a form of "zoom" control that gives the effect of the mic either moving closer or farther away from the sound source. There's also an In/Out control for the Soundfield controls as well as a B Format input switch for using the controller with pre-recorded B Format material.

The rear panel consists of a multi-pin microphone input for the MKV, four XLR's for B Format out (labeled W, X, Y, and Z), four XLR's for B Format in, and XLR's for stereo output. There's also the standard IEC detachable AC power cable input as well as a power on/off switch.

R Format

While stereo defines the world of sound in just two dimensions, B Format defines it in three. The MKV B Format outputs contain information that defines front to back (one dimension), left to right (two dimensions), and up and down (three dimensions). Essentially B Format is a sphere with four elements: an "X" plane (front to back), a "Y" plane (left to right), and a "Z" plane (up and down), all with a central reference called "W."

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SoundField uses B Format as its core technology for documenting and translating the four elements of the MKV so they can be recorded on a four-channel audio recorder and manipulated later, by playing them back through the controller.

Decoding 5.1

True optional SoundField 451 Surround Decoder enables the MKV to become a true 5.1 microphone. The processor takes either the B Format outputs from the MKV processor or B Format tracks that have been previously recorded and delivers full 5.1 surround output via rear panel balanced XLR connections. The 451 features a Master Gain control and individual channel gain controls with meters and center detents. At the heart of the unit are the Spatial Imaging controls, which take the place of the Soundfield controls on the Stereo Processor. These controls include Front Width, Rear Width, and Rear Focus. There's also three switches labeled Aux, Mode 1, and Mode 2 that allow for different control cards, which electronically set the 5.1 pickup pattern of the MKV

I'd classify the manual for the MKV (the 451 didn't have one) as only adequate in that it certainly covers the basics (theory of operation, specifications, application suggestions, alignment, and cable and connector details) but doesn't really go into any great depth considering the many possibilities of the microphone. Plus many of the processor controls referred to in the manual didn't actually exist on the unit — a fact that caused some initial head scratching. It seems that some of the manual referred to an earlier model instead of the new MKV; considering the amount of money the unit costs, one would expect the manual to be up to date.

In Hise

I used the MKV/451 system on a number of different instruments with spectacular results. On drums I used it as an overhead in the middle of the kit, placed about two feet higher than the cymbals. The coverage was so good that it was the only mic

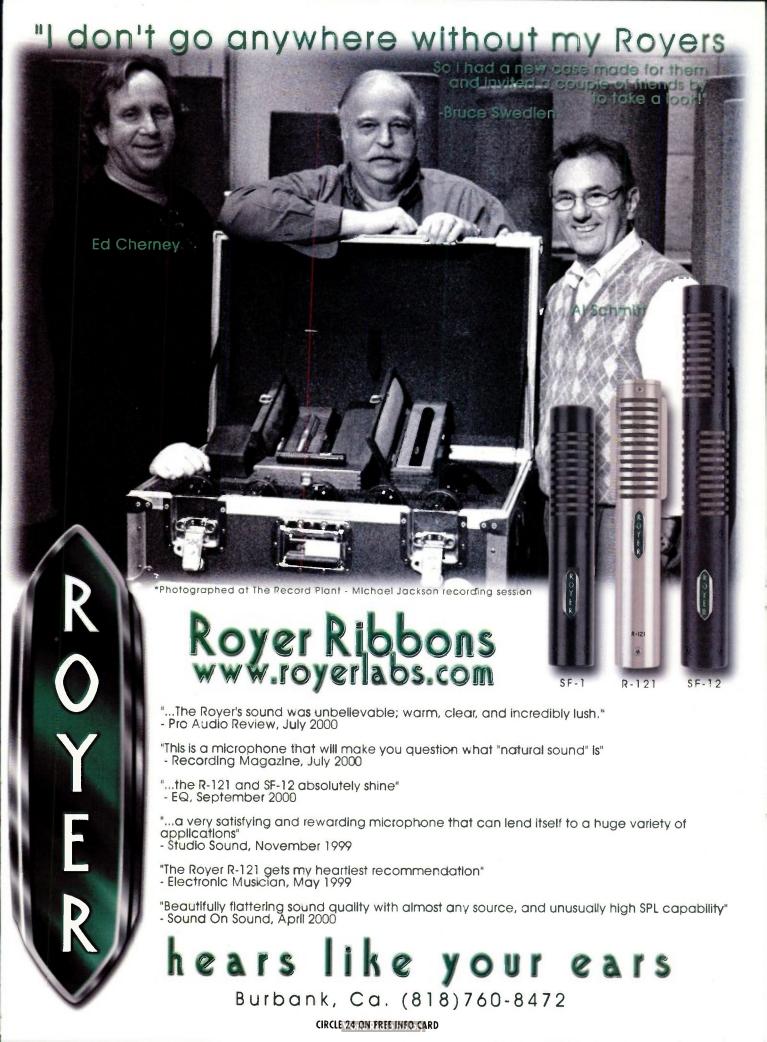
required except for a separate kick drum mic. (Later in the session, I also used a separate mic to bring the toms out a bit for a particular track.) The beginning of the first playback told the tale: There was one of those "Is it live or is it Memorex?" moments. The spatial imaging of the drummer's count-off was so realistic that the assistant and I kind of looked at one another and said, "Did you hear that?"

The Spatial Imaging controls of the 451 work really well in surround, especially the Rear Width and Focus controls. These allow for a great deal of image variation without making anything sound artificial, hyped, or overblown. For example, in using the Soundfield as the main drum mic, it was possible to spread the hi-hat out wide on the left surround, while keeping the kit sounding natural. On acoustic guitar, the sound was huge, but was easily controlled by simply adjusting the Spatial Imaging. The key here was that the MKV actually made a rather mediocre instrument sound outstanding.

All the other instruments that I tried the system on, from percussion (different shakers and tambourines) to grand piano had the same results. There's a sense of openness and realism with this system that was pretty amazing. Even in stereo, with the MKV up against a really good stereo mic, the Soundfield won hands down as far as natural sound quality and realism. However, I'm forever spoiled in that I now want to record everything on six channels with the MKV (and I'm going to be doomed to 200-channel mixes as a result).

Conclusions

The Soundfield MKV and controller is far from inexpensive at \$9,150 retail (the 451 surround processor is another \$4,100), but at that price you're getting much more than just another microphone. You're getting a full microphone processing system capable of a tremendous sonic quality and an amazing amount of imaging variation, both during recording and after. In my opinion, money well spent indeed.



IN REVIEWS



By Mitch Gallagher

Early last year Alesis released the MasterLink ML-9600 High-Resolution Master Disk Recorder, which combines a stereo hard disk recorder with a powerful DSP-based processing/editing engine and an integrated CD burner. In addition to this, MasterLink can operate at resolutions up to 24-bit/96 kHz, and supports burning high-resolution audio files to CD in a special computer-compatible CD24 format; the unit can even play high-rez files from CD24 in real time. Since its release, the MasterLink operating system ("MLOS") has had a couple of minor updates. Now Alesis has released MLOS Version 2.0, which comprises more than 20 new features.

Since I gave MasterLink a complete review in the April '00 issue, I'll refer you to that article (available at EQmag.com) for a basic overview. This review will focus on what's new in Version 2.0.

Installation: First off, to determine which MLOS version is currently in your MasterLink, press the Utility button repeatedly until the display reads, "Util x: Sys Info, Software: x.xx." For version 1.xx machines, this information will be under "Util 4"; for version 2.0x, "Util 9." MLOS updates are installed into a MasterLink off of a special CD-ROM using the machine's built-in CD-R drive. There are four ways you can obtain MLOS Version 2.0 update disc: 1) Call 1-800-525-3747 to have a CD-ROM sent to you. 2) Contact your nearest Alesis dealer. 3) If you have a PC or Mac and CD-R burner, download the MLOS CD-ROM image from www.alesis.com/products/ml9600/index.html and burn your own CD-ROM. A PDF version of the Version 2.0 Manual Addendum can also be downloaded. 4) Order the CD-ROM from the above URL.

Regardless of which method you choose, the update is free, and installation is as easy as popping the CD-ROM into your

MasterLink and pressing the "Yes" key a few times. Note that installing a new MLOS version may erase all the data (meaning your precious audio) on the unit's internal hard drive (depending on the version you're updating from). Backup to CD-R first!

What's New: Among the powerful features in the new version are seamless adjacent track transitions — consecutive tracks can now play back with no audible gap between them. This is useful in variety of situations, but is especially nice given the new "Track Split" command, which breaks a single track/audio file into two tracks/audio files. Naturally you have to be a bit careful of wildly mismatched levels at the transition, but I found this feature to work quite well.

By combining Track Split with seamless transitions, you can insert track ID markers into long files, break a long recording into discrete songs, re-sequence or "comp" parts of songs, or isolate parts of a song for DSP processing. Conversely, you can also join two tracks/audio files into one track/audio file. Other new track features include the ability to copy the DSP settings from one track onto another, and to copy an audio file before performing destructive editing (such as when using the new "render DSP" command, which permanently applies DSP processing to an audio file).

You can also perform a number of "real time" tasks while audio is playing, such as setting Track Split points and capturing track start and end pointers. While recording, you can press the New Track button, which essentially performs a Track Split on the fly. This is useful for live recording situations, or when transferring material from DAT, since MasterLink doesn't recognize DAT Start IDs.

A number of new "utility" features have been added in Version 2.0. You can offset Red Book CD start and end times anywhere from 0 to 30 CD frames. There's a command to reset all the DSP for a given track to the default state. Two other handy things: There's a new safeguard feature that tells you if (and where) a given playlist exceeds audio CD or CD24 disc capacity. And the new version allows you to manually override Audio File Delete, allowing you to delete a file even if it's used by more than one playlist

Version 2.0 allows you to loop playback of tracks, playlists, or CDs, and supports transfer of an entire audio CD to the internal hard drive (earlier versions only supported transfer of one audio

WEBLINK

 \mathcal{EQ} 's review of Alesis MasterLink vI.O ran in the April 2000 issue. The article is also available in the \mathcal{EQ} archives online at www.eqmaq.com.

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World Radio History

IN REVIEW

CD track at a time). Each CD track shows up as a separate audio file and playlist track. A new playlist backup command writes raw AIFF files to a CD24 disc, and writes a small file containing any playlist/DSP parameters. This lets you restore a backed-up playlist to its original form; previously CD24 discs contained rendered audio files without playlist information. This is nice if you're transferring raw AIFF files into a computer for editing/processing, but still might want the ability to get back to the MasterLink playlist you previously were using. Speaking of file transfers to computer, the new version has improved Mac AIFF compatibility (v2 adds File Type, File Creator, and Finder Flag info to the CD24).

Conclusions: All in all. Version 2.0 contains a number of desirable new features. It doesn't address any of the weaknesses I mentioned in my original review, but those were mostly hardware-based — besides, the new stuff is all quite useful. However, based on some transfers I've done in the past few days, I now really wish the unit could detect DAT Start IDs, something I missed in my first review — yes, you can split tracks on the fly, but that's not quite the same. Maybe in MLOS Version 3....

Lended my review of MasterLink in the April '00 issue by saying, "Keep those older stereo recorders around for playing archive tapes, for everything else, MasterLink." MLOS version 2.0 further cements that verdict.

ALESIS MASTERLINK VZ.O

PRICE: MasterLink, \$1,699; Version 2.0 update, free. CONTACT: Alesis, 1633 26th St., Santa Monica, CA 90404. Tel: 800-525-3747. Web: www.alesis.com. EQ free lit. #119.

AKG D440 MICROPHONE

AKG'S NEW CLIP-ON MIC WORKS PARTICULARLY WELL FOR DRUMMERS

Bu Steve La Cerra

AKG's D440 is a cardioid dynamic microphone intended for instrument miking. Included with the D440 is AKG's H440 mounting bracket which - when attached to the mic's swivel mount - allows it to be clipped onto the rim of a drum. An internal shock absorber protects the D440's capsule from impact damage. The external grill, plus a layer of fabric underneath the grill, provide wind noise filtering. I tested the D440 in a number of circumstances, the first of which was miking a 2x12 guitar amplifier. Since I was mounting the D440 to a microphone stand, I didn't attach the H440. I also removed the threaded brass insert that mates the D440's swivel mount with the thumbscrew from the H440. (If you intend to use the mic without the H440, a bit of care should be exercised to ensure you don't strip the plastic

amp with AKG's C2000B condenser microphone (see review in the September 2000 issue of EQ); switching to the D440 yielded a rounder tone with comparatively less emphasis in the upper mids and more "chunk" in the lower register. This quality helped the D440 ▶ continued on page ISO

AKG D440 MICROPHONE

threads inside the swivel mount.)

I had been miking this particular

PRICE: \$198

CONTACT: AKG Acoustics, 1449 Donelson Pike, Nashville, TN 37217, Tel: 615-360-0499. Web: www.akgonline.com. EQ free lit. #120.

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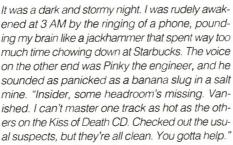
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	131	Lynx Studio Technology, Inc.	15	949-515-8265	13	Yamaha Corp. of America	38	714-522-9000

The Case of the Missing Headroom



Like a Palm Pilot at a trade show, my brain went into overdrive. Pinky knew his stuff...how to gain-stage, when not to compress, how to master. If headroom was stolen right out from under his nose, it had to be someone stealthy. Someone you didn't notice unless you had your waveform Y-axis magnification up. Someone like...DC Offset.

Okay, so DC offset isn't a particularly sexy topic. But think of this month's column as an "eat your vegetables" type article, as DC offset can be the culprit behind such problems as lowered headroom, mastering oddities, pops and clicks, effects that don't process properly, and other gremlins.

DC Offset In The Analog Era

We'll jump into the DC offset story during the '70s, when op amps became popular. These analog integrated circuits pack a tremendous amount of gain in a small, inexpensive package with (typically) two inputs and one output. Theoretically, in its quiescent state (no input signal), the ins and out are at exactly 0.00000 volts. But alas, due to imperfections within the op amp itself, sometimes there can be several millivolts of DC present at one of the inputs.

Normally this wouldn't matter, but if the op amp is providing a gain of 1,000 (60 dB), a typical 5-mV input offset signal would get amplified up to 5,000 mV (5 volts). If the offset appeared at the inverting (out of phase) input, then the output would have a DC offset of –5.0 volts. A 5-mV offset at the non-inverting input would cause a +5.0 DC offset.

There are two main reasons why this is a problem.

• Reduced dynamic range and headroom. An op amp's power supply is *bipolar* (*i.e.*, there are positive and negative supply voltages with respect to ground). Suppose the op amp's maximum undistorted voltage swing is ±15 volts. If the output is already sitting at, say, +5 volts, the maximum voltage swing is now +10/–20 volts.

However, as most audio signals are symmetrical around ground and you don't want either side to clip, the maximum voltage swing is really down to ± 10 volts, a 33% loss of available headroom.

• In a DC-coupled circuit (sometimes preferred by audiophiles due to superior low-frequency response), any DC gets passed along to the next stage. Suppose the op amp with a +5 volt output offset now feeds a DC-coupled circuit with a gain

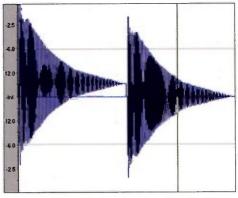


FIGURE 1: Two identical drum hits. The first one has a significant amount of DC offset. The second has been corrected to get rid of DC offset, and can now be normalized for more level if desired.

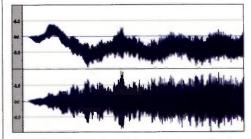


FIGURE 2: The top signal is the original normalized version, while the lower one has been processed by a steep low-cut filter at 20 Hz, then re-normalized. Note how the level for the lower waveform is much "hotter."

of five. That +5 volt offset becomes a +25 volt offset — definitely *not* acceptable!

Analog Solutions

With capacitively coupled analog circuits, any DC offset supposedly won't pass from one stage to the next because the capacitor that couples the two stages together can pass AC but not DC (of course, the DC offset still limits dynamic range in the stage in which it occurs). However, if the coupling capacitor is leaky or otherwise defective, some DC may make it through anyway.





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There are traditionally two ways to deal with op amp offsets.

- Use premium op amps that have been laser-trimmed to provide minimum offset.
- Include a trim pot that injects a voltage equal and opposite to the inherent input offset. In other words, with no signal present, you measure the op amp output voltage while adjusting the trim pot until the voltage is exactly zero. Some op amps even provide pins for offset control so you don't have to hook directly into one of the inputs. Note: As trim pot settings can drift over time, if you have analog gear with op amps, sometimes it's worth checking for offsets and re-adjusting the trim pot setting if needed.

Digital DC Offset

In digital-land, there are two main ways DC offset can get into a signal.

- Recording an analog signal with a DC offset into a DC-coupled system
- More commonly, inaccuracies in the A/D converter or conversion subsystem that produce a slight output offset voltage. As with analog circuits, a processor that provides lots of gain (such as a distortion plugin) can turn a small amount of offset into something major.

In either case, offset appears as a signal baseline that doesn't match up with the "true" 0-volt baseline (Fig. 1).

Digital technology has also brought about a new type of offset issue that's technically more of a subsonic problem than "genuine" DC offset, but nonetheless causes some of the same negative effects. One example: Once I transposed a sliding oscillator tone so far down that it added what looked like a slowly varying DC offset to the signal, which drastically limited the headroom (Fig. 2).

In addition to reduced headroom, there are two other major problems associated with DC offset in digitally based systems.

- When transitioning between two pieces of digital audio, one with an offset and one without (or with a different amount of offset), there will be a pop or click at the transition point.
- Effects or processes requiring a signal that's symmetrical about ground will not work as effectively. For example, a distortion plugin that clips positive and negative peaks will clip them unevenly if there's a DC offset.

More seriously, a noise gate or "strip silence" function will need a higher threshold than normal in order to be higher than not just the noise, but the noise plus the offset value.

Digital Solutions

There are three main ways to solve DC offset problems with software-based digital audio editing programs.

- Most pro-level editing software includes a DC offset correction function, generally found under a "processing" menu containing other functions such as change gain, reverse, flip phase, etc. This function analyzes the signal, and adds or subtracts the required amount of correction to make sure that 0 really is 0.
- Apply a steep high-pass filter that cuts off everything below 20 Hz or so. (Even with a comparatively gentle 12-dB/octave filter, a signal at 0.5 Hz will still be down more than 60 dB). In practice, it's not a bad idea anyway to nuke the subsonic part of the spectrum, as some processing can interact with a signal to produce modulation in the below-20 Hz zone. Your speakers can't reproduce signals this low and they just use up bandwidth, so nuke' em.
- Select a 2-10 millisecond or so region at the beginning and end of the file or segment with the offset, and apply a fade in or fadeout. This will create an envelope that either starts or ends at 0, respectively. It won't get rid of the DC offset component within the cut (so you still have the restricted headroom problem), but at least you won't hear a pop at transitions. The optimum fade time depends on the amount of offset; larger offsets require longer fade times.

There, Now Don't You Feel Better? Granted, DC offset usually isn't a killer problem, like a hard disk crash. In fact, usually there's not enough to worry about. But every now and then, DC offset will rear its ugly head in a way that you do notice. And now, hopefully you know what to do about it!

Craig Anderton, Creative Director for MusicPlayer.com, has given seminars on technology and the arts in 37 states and IO countries. He has also played on, produced, or mixed I8 major label releases, and is the author of the classic books Home Recording for Musicians and Multieffects for Musicians (AMSCO, available from Amazon.com).

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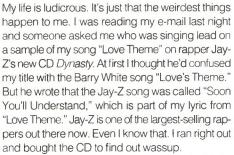
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DISC RECORDER



Dr. Al hits number one on the charts — sort of

Jay-Z and Al-C



This is a song I wrote in 1969 for the Hal Ashby film *The Landlord*. It's the last song you'd think a rapper would sample 'cause it's painfully white and it's a ballad. This apparently didn't deter Jay-Z. He sped the track up until it was at a tempo over which he could overdub hip-hop drums and bass. As readers of this magazine know, technology is widely available that allows one to speed things up and slow them down without disturbing the pitch—practically every computer sequencer has had this as a feature for years now. But Jay-Z saw fit not to use this technology, and so on his CD I sound like a duck singing my little four-bar sample over and over again *ad nauseum*. Thanks, Jay.

A Brief Flashback...

Now going back a few years ago in this ludicrous tale, The Beastie Boys sampled my Blues Project composition "Flute Thing" for their song "Flute Loop." They proposed a deal that wasn't particularly generous, but we knew it would be a large-selling disc so we grudgingly agreed. If they'd only sold a million units, it would have been a lousy deal, but they sold five million units and it was a nice taste for a song that seemed to have run its course. (In Nashville this is known as "Mailbox Money.") I was paid as the sole writer and as one-fifth of The Blues Project for the performance of the sample.

Right around that time, a writer from Hip-Hop magazine called for an interview. I told him I was happy to oblige, but that I knew comparatively little about hip-hop as a musical genre. He said that wasn't important. The reason he wanted the interview was because his magazine had just taken a poll of the top ten sampling DJs and I was the only artist included on all ten DJ's lists. I thought this was particularly ludicrous, but I was flattered. This was at a time when rap acts were beginning to sample and they weren't automatically paying the creators of the samples. Kinda like Napster right now. So at that time, God knows how many records were released with samples of my stuff. I certainly wasn't paying attention. But the Beasties helped to right that wrong in their own way.

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Have a question or comment for Al Kooper? Visit him online at the EQ Boards, www.somag.com.

..And We're Back

Returning to the present, I e-mailed the guy back and told him that it was indeed me singing lead on that song "Love Theme" (I don't know of any covers) but that I hadn't heard Jay-Z's record. I'm sitting in Boston supervising the moving of my mother into a nursing home, I have a song on the number one album in America, and no one bothers to tell me! What a wonderful world the music biz encompasses. I could have really used the moral support provided by knowing that information, too — those of you who've had to put your parents into nursing homes know of what I speak!

On top of all this, I had no idea what kinda deal the publisher had made with Jay-Z's people for the use of my song and my recording. Of course, they spelled my name wrong twice in the credits — but I'm used to that by now.

So the album has been out for two months and sold in excess of two million copies. But I have no idea whether I'll make money on it or whether the publisher had sold me out for a flat fee. All I know is, if that guy hadn't e-mailed me, I wouldn't have known about the situation at all. I call my lawyer at home at 7:30 AM the next morning, 'cause I'm genuinely excited. He has a new baby and I know he'll be awake. But he cools my jets pretty quickly with all the possible legal ramifications I could be facing in the wonderful music biz. Don't get me wrong. At age 57, with many of my income sources depleted, I'm thrilled to be included on any #1 CD — even if I do sound like a duck and am called "Al Cooper" on it.

So it's Friday night now and I guess I won't know until probably Wednesday whether to cancel the order for the Rolex or not.

Not really — I'm not the kinda guy that would wear a Rolex, even if I could afford one. I've been wearing the same watch for over ten years now, and it don't look like the times they are a-changin'.

P.S.

It's Wednesday now. The publisher did the right thing, Jay-Z did the right thing, and everything's fine except that I could easily not have known about this at all. The publisher had no current contact numbers for me and the money would have been put in escrow until the day I discovered the situation, if I ever did. Once again, the creator gets left out of the equation. As I just said, I don't see this changing anytime real soon.



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From the Publisher of EQ

For years EQ magazine has featured the dynamic world of remix art and science within its pages. And in 2001 it's breaking out from the traditional publishing mold by launching a multimedia campaign that will provide a platform for manufacturers to reach and influence the most creative and technical buyers of DJ hardware and software with the following program:

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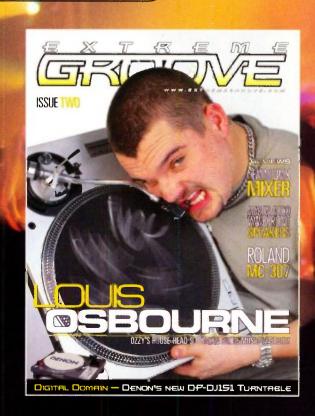
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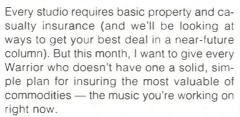
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Another Three-Step Program



For example: If your Digital Remarginalizer (the key to your killer mastered sound) makes a small popping noise and coughs up a coil of purple smoke, sure, it's a big-time hassle. But there are lots of Digital Remarginalizers exactly like that one in the world. You can get another one.

Now, compare that possibility with the following: it's 7 PM, and you're putting the finishing touches on the final five minutes of a score for a 60-minute documentary. The deadline is very tight, so you've been working 16-hour days, and maybe you're not saving your work as often as you usually do. But you're feeling good — just another hour or so of tweaking and it will be Miller time. That's when your friendly neighborhood power company pops the grid for a 1/2-second just long enough to shut your computer down in the middle of a disk write. Your last four hours of work are gone, off to Tumbolia. And when you reboot, the file won't open. The whole show, 42 minutes of music synced to video, has locked away inside a corrupted file. The producer is expecting you to show up with the finished score at 10 AM tomorrow. and you've got nada. You can't call up your favorite dealer and ask him to FedEx you another five working days.

If you're thinking this scenario is just a little too detailed to be fiction, you're right. That's how I learned the hard way about guarding my work in progress. When this happened to me, I got lucky. We figured out how to crack the file and fix the problems, so we made our deadline in a quick walk. But it could have been the disaster to end them all, and days later I still couldn't shake the feeling that went with it. Vowing never to feel that way again, we started taking steps to make our DAW as bulletproof as possible. Three steps, to be precise.

Step One: Steady power. If your computer and drives (or any digital recording device) aren't plugged into an uninterruptible power supply (UPS), then make one your next gear purchase. If you're recording on a computer, plan on plugging in the CPU,

the monitor, and any essential peripherals. Make sure you get one that's beefy enough to do the job. Check the manuals for your stuff and add up the power requirements, then choose a unit that will provide more power than they need for at least 15 minutes. The first unit I bought was underpowered, because I wasn't aware that the hot-rodded PowerMac 7100 I used in those days was a notorious kilowatt hog — the first time the power went out, the Mac did, too.

There's also a nice bonus that comes with using a UPS. An ordinary surge suppressor will perform perfectly well if Mondo Amalgamated Light and Power sends a nasty

THERE SHOULD ALWAYS BE MORE THAN ONE COPY OF A WORK IN PROGRESS. IT DOESN'T HAVE TO BE STORED IN A BANK VAULT. YOU JUST WANT A COPY OF THE FILE THAT ISN'T BEING READ AND WRITTEN TO CONSTANTLY.

spike down the line. But it probably won't stand up to the awesome, unbridled hilarity of a lightning strike, which consists of something like six million volts at an amperage you can't even get your head around. Confronted with that kind of juice, your surge suppressor will decide to change careers and become an arc lamp. But, a good UPS can actually save your gear from a lightning strike. (It'll be the last thing it ever does, but that's what makes a hero.) In fact, most makers of UPS's will replace any connected gear (up to \$25,000) that is destroyed by lightning. Pretty cheap insurance, and it may reduce your P&C premium.

Step Two: Multiple copies. There should always be more than one copy of a

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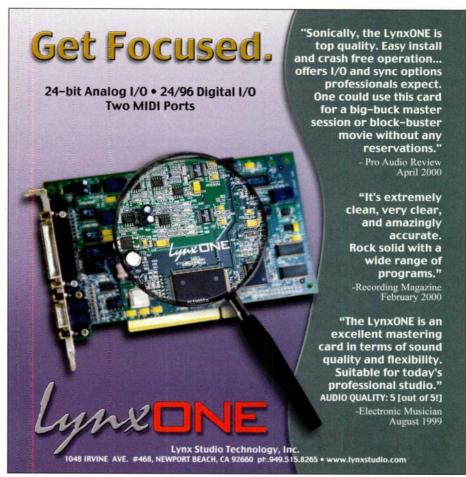
work in progress. It doesn't have to be on removable media and stored off site in a bank vault. You just want a copy of the file that isn't being read and written to constantly. In addition to the main work drives, I run an external "archive" drive, and anytime I stop and save the file I'm working on, I just drag a copy of it to the second drive. Now, if something stupid happens during a disk write, I have my last save in a non-corrupted form.

Step Three: Archives. When the project is finished, I burn the files from the external drive to CD-R, verify the CD files, and then clean the files off the hard drive. Every few months or so I burn duplicate CDs, which are stored in another building (so I won't lose years of work to a fire or flood).

The CD archives are always a great way to recall old projects when a past client calls and says, "You remember that jingle we did about five years ago? Well, we lost our masters, and...." Pretty handy, at least until we ended up with a couple hundred hand-labeled CDs. I finally found a very cheap and very cool solution for keeping track of archives on a Macintosh. Disk Recall automatically creates a searchable database of removable media — open the program, pop the disk in the drive, and everything on the disk is added to the list, including the disk's name and directory structure. If you give the disks numbers instead of names, and write that number on the disk itself, they're easy to find and never get into the wrong jewel case. To find an old project, just open Disk Recall, type in the project name, and see instantly that the multitrack files are on Disk 33 and the mix package is on Disk 34.

The authors of Disk Recall say it catalogs disks ten times faster than other programs, and I believe it. The speed is terrific, but best of all, the price is only \$20. There are free programs as well, but none I've found have the speed and elegance of Disk Recall. (Check the Web Link for freeware for PC users, too, but I can't vouch for them — try them out and let me know how they work.)

That's how we do it. Maybe your system is different but just as effective. But, if you don't have a system in place, take mine. Please.



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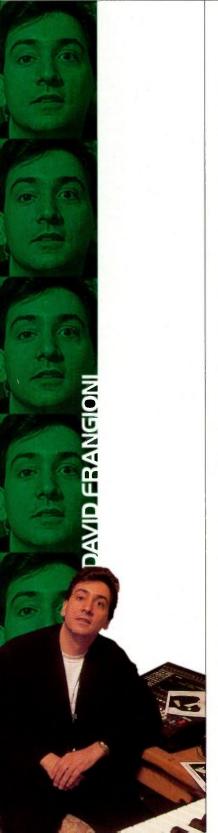


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Mac versus PC — and the winner is — you!

Platform Wars



Recently, I received an email from Ken P. in Cincinnati, Ohio. Ken writes, "I was wondering if anyone could give me some insight on the Mac versus PC war when it comes to audio production. I have a home studio that was primarily based on hardware multitrack recording and MIDI implementation for electronic-based music. Now that I've gotten over my fear of crashing computer-based systems, I'm upgrading to a digital hard disk recording system. My automatic first instinct was to go with a Mac. I plan to go with the MOTU 2408 Mk II system with Digital Performer. Everyone I mention this to has a different opinion on whether I should go with a Mac or a PC. The computer tech at work told me that Pro Tools, which I plan to expand into in the very near future, will only be made for PCs. How true this is? As of now I don't know, but this is also coming from a die-hard PC tech. A Mac, being the computer I was been born into, was my primary choice, and the price to me was worth the extra investment for smoother operations and for solid MIDI timing. But now, it seems PCs have come a long way when it comes to audio, and, being told I could get a PC with three times the power of a Mac for a third of the price, I am thinking twice. Is there such a thing as an unbiased opinion on this subject? Before I make this huge investment and get stuck with either a dying Mac or a crashingall-the-time PC, I'd like to know all the pros and cons of both machines."

Take heart, Ken! Those questions sum up the dilemma facing most of the people out there planning to purchase their first computer-based DAW. If you already own a computer, the hard part is over; then it's just a matter of choosing a software/hardware package that fits your needs and budget. Visit my forum on EQMag.com and you'll find plenty of opinions on which way to go. For those of you who haven't yet chosen a computer platform (or are thinking about switching), you're in the same boat as Ken. Let's begin by looking at the overall pros and cons of each platform.

Obligatory disclaimer: I am well aware of the "religious" opinions that many people have when it comes to their computer platform of choice. This topical discussion is not intended to sway you (you've already made your choice!).

Macintosh

Pros

- Easy to set up and use "out of the box"
- Fairly simple to troubleshoot if something goes wrong
- A virtual "standard" in the professional studio community
- Pro Tools software/hardware very well developed and established

Cons

- Limited amount of overall available software (music and other)
- Expensive, especially considering price versus performance ratio
- · Very limited hardware upgrade paths

Windows PC

Pros

- · Lots of software available
- Easily and readily upgradeable to newer and faster models
- Inexpensive to buy and able to be hand-built or customized by the user with off-the-shelf parts
- Windows 98 and above offers a very Mac-like graphic user interface, giving users the most friendly PC interface to date

Cons

- Difficult to troubleshoot for the ordinary computer user if something goes wrong
- Pro Tools software/hardware not very well established yet
- Installation of software/hardware can be difficult

As we can see from our list above, the Mac tends to be more user-friendly but the PC is more flexible in its offerings. Personally, I use both platforms in my studio. On the PC, I run Sonic Foundry's Acid software for looping. I also run Internet, AOL, and business applications from the PC. It works great and it frees up my Mac for primarily running Digidesign's Pro Tools. This helps with the stability of what is essentially the foundation of my studio (a Mac). I have learned the hard way that stability is *critical* when all of your projects rely on a computer program.

The key to making a decision on a computer platform is weighing your options and evaluating your priorities. If you need a flexible platform on which to do *everything* from music to the business of music, then a PC might be the

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Want to talk about computers and studio technology? Participate in David Frangioni's Studio Tech forum at www.musicplauer.com. One thing is for sure, there's always something new to discuss!

way to go. Also, there are so many great programs available for the PC, music and otherwise, that it may offer all that you need with the added bonus of being quite cost-effective. I know a lot of people who have purchased a PC solely for running Acid. Period. They couldn't be happier.

The same process should be employed when considering a Mac, in the sense that you need to choose your preferred software application first. You have to meet your needs. For a lot of my clients, Pro Tools or Digital Performer fit the bill as the foundation of their studio. Therefore, the Mac is the only way for them to go. Their needs dictated their decision. The argument that Mac computers will not be around much longer should not be a factor. In a worst case scenario with Apple ceasing to produce computers tomorrow (unlikely); the software and hardware available today

would still get you through another few years of serious music making. More than enough to justify the power of its solution. Your decision should be based mainly on "today" with a cautious eye toward tomorrow.

Choose Or Lose

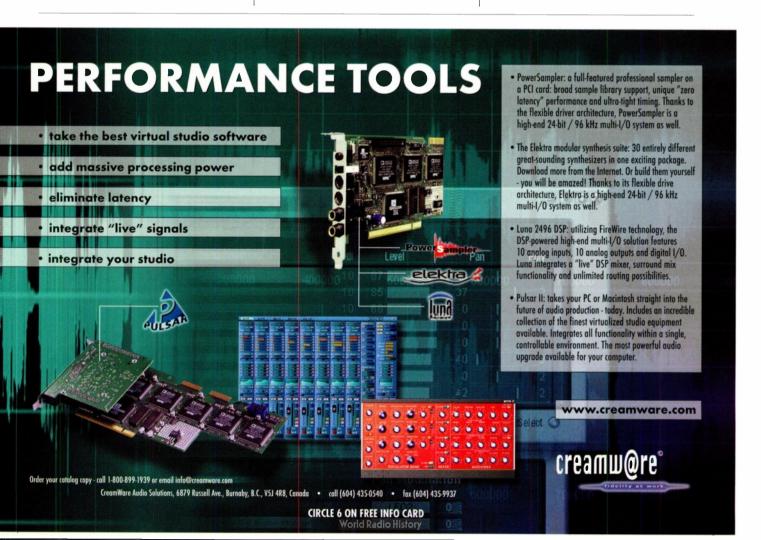
Computer technology changes so rapidly that you will drive yourself crazy trying to stay on top of the latest and greatest trends. I have a friend who always waited for the fastest computer to become available. The only problem was that he never stopped waiting. Finally, I said to him "Do you realize how much time and money you've lost by not buying a faster computer than the one that you use?" He went for the fastest CPU available at the time and almost immediately paid for it twice over in time saved. Within the first month (he was doing CPU-based video editing) it was already total justified as an investment for his business. The bottom line is, that at some point, actually using the computer needs to surpass the technological status of the CPU.

Which computer, then, should Ken

buy? Given that he's interested in MOTU products with the possibility of upgrading to Pro Tools. I'd recommend that he go with a Mac. It fits his requirements for today and tomorrow. I don't feel that there's any need for Ken to be wary of buying an Apple computer. The new G4's are about to get a speed increase (to be announced at MacWorld in January 2001). This will drop the price of dualprocessor G4/450's and 500's as well as the price of single processor G4's. Any of the current G4's are fast enough to do serious work without problem. On the PC front, as of this writing. Dell just released THX-approved computers running at up to 1.5 aiaaHertz!

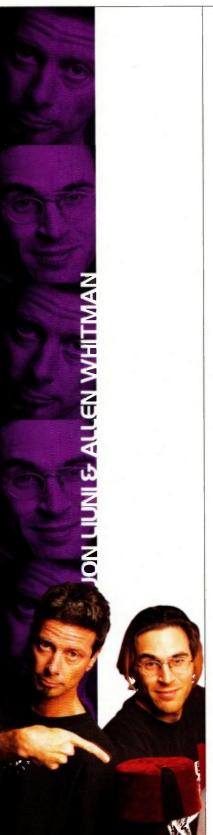
Every year, I find myself thinking the same thing about the "current" state of computers: What a wonderful time to be alive and well in the world of technology! Keep those great ideas and letters coming!

David Frangioni is pleased to announce that, due to popular demand, Studio Tech will now be a monthly column. Look for him every month in these pages!



The brave new world of online music distribution rights, part I

Hello Songwriters, Are You Listening?



Think of the current state of music publishing as an enormous and gaudy cruise ship. The captain and chief officers represent the collection societies (ASCAP, BMI, etc.). How they got their positions of power is unclear, but they've managed to give the impression of smooth sailing while actually being drunk with complacency and passed out in their cabins. The crew is their lawyers, and they're all grabbing at the wheel, claiming to be in command. How they treat the passengers (the songwriters) depends. 90% of the passengers wait in the dark and airless decks below, in steerage, for the crew to toss them crusts of bread. The crew does this when it suits them, or when forced by an outside influence (a pirate ship shows up and the captain trots out passengers in a show of solidarity and defense). The other 10% are treated like gods. What makes them deserving is a combination of timing, aggression, sheer chance, and simple beauty (and occasionally a good song). The lucky 10% are rewarded with roomy cabins and prompt and attentive service.

But, the crew has become panicked, knowing the passengers (even some of the well-treated ones) could become a rowdy mob at any moment and throw them overboard in favor of a new system for the service and distribution of bread. And, as the ship nears the New World, the sea is thickening with privateers. These notorious swashbucklers include John Castle (Cantametrix), Francois Xavier Nuttal (Audiosoft), John Simson (RIAA's SoundExchange), and Ron Gertz (MusicReports.com). Any of these could bring a previously unseen efficiency to the tracking of online music royalty payments, making the traditional collection societies unnecessary in the online world.

So the love boat of online publishing careens its ignorantly inertial way through uncharted shoals. The steerage passengers, successfully conned by adverts promising a lovely sea cruise, accept that life is hard and, as emotional necessity, even derive some small sense of moral superiority from it. Poor fools.

With that analogy taking on water faster than tech stock portfolio devaluation, we figure it's time to revisit the storm-tossed foredeck of online music rights. As we quickly find out, every answer raises new questions. Collection societies have rigged themselves into a system that's basically incomprehensible to anyone without a law degree and countless hours available to wade through massive amounts of paperwork. Most of that paperwork appears to merely guarantee the societies the legal right to do what they do in the

way that best serves their own interests.

From a historical perspective, it's useful to remember these societies came into being when sheet music was the only way to be paid for a popular song. The societies helped songwriters by busting people who printed thousands of copies of a song and sold those copies out of the trunk of their Model T, pocketing all the proceeds and furthering the downward spiral of many musicians into alcoholic insanity.

Each new distribution technology found the collection societies right there, wrapping up their piece of the pie and touting how they always operate in the songwriter's best interests, for at least 50% of the take. Nowadays these bloated bureaucracies are desperately trying to control the online music realm. They have financial muscle, industry connections, and an eager lobbying faction in Washington, D.C. (a city described by our FezFathers as: "forty square miles surrounded by reality").

ASCAP

We'll start with the biggest of the "big three." Digging around on ASCAP's (The American Society of Composers, Authors and Publishers, www. ascap.com) Web site we find "ASCAP Licensing" and from there the "Internet License Agreement." Downloading a PDF file finds us with a dense document written in legalese with the word "Experimental" prominently displayed in the title. Cool. ASCAP is tossing out an online licensing payment scheme to see if anyone will take it seriously. Online music licensing is a convoluted and complicated issue to be sure, but it's somehow reassuring to realize collection societies are only fishing, like the rest of us, to see how much they can get away with. We wish they had thought to open up a forum where their customers (the musicians) and experts who understand the technology could contribute toward deciding what was fair. There's no info in the document about how, exactly, monies will be distributed in the online realm and a site search under "Royalty Information" yields no results.

The site offers a readable overview column on how the whole system operates, "Music and Money." The authors, Todd and Jeff Brabec, offer this caveat: "Ranges of fees, as well as comments, vary based upon individual negotiations and situations." Noted. The article goes on: "...each source of income (CD or cassette sales, radio or TV play, live performance, broadcast outside the U.S., sheet music sales, or use in a commercial or movie) has its own distinct payment structure and figuring out exactly how a songwriter, artist,

WEBLINK

<u>www.music-law.com</u> — a very practical Q&A series.

www.lcweb.loc.gov/copuright — allthings-government related to the subject.

or music publisher makes money and where that money comes from can be a major challenge." That's putting it lightly. But, the authors remind us, "a fortune can be made from a single composition." So Puff Daddy's mansion wasn't a gift from Rudolph Giuliani for his good work with teens at risk? Over three billion dollars are collected worldwide each year, we learn. Dammit, we want our piece!

The authors pause for a moment of realism amidst the happy hype: "Although most writers never achieve this level of success, it's helpful to know what's possible at the top end." Very helpful. Taken as a group, musicians revere that top-end possibility as the Holy Grail of musical fulfillment. Right this second your frolicking FezGuys are dreaming of living large. Ah yes. What classic pop track can we destroy for the sake of a dancing teen's career?

But we digress. We finally get to parse some real world dollars and cents in the "tutorial." This is where it gets interesting. Let's look at mechanical royalty info first. Here's how record companies really excel at cheating the songwriter.

"Under the U.S. mechanical rate of 7.55 cents per song for the years 2000 and 2001 (this will go up to 8.0 cents in 2002-2003), a million-selling single would be worth about \$75,500 in combined royalties to the publisher and writer. (For) album sales, the above royalties would be multiplied by the number of songs on the album (to a maximum of 10). (Thus) if 10 songs were included on a CD and each received a 7.55-cent royalty, a total of 75.5 cents in mechanical royalties would be generated from the sale of each album. If the album sells between one-million and ten-million copies, the (total) writer and publisher royalties for the album would range from \$755,000 to \$7,550,000." So far, so good. But wait! The authors go on to mention that: "the per-song mechanical royalty can be reduced under certain circumstances (for example: if the writer is the recording artist)." These reductions are, apparently, "voluntary and occur only if the publisher agrees or if the songwriter is a recording artist and has to accept lower royalties in the record company contract." That's great. If you write and record the song you'll be penalized. How in the hell did that happen? To take it one step further, it appears that if a songwriter has anything to do with the actual recording of the song on an album the mechanical rate to the writer and publisher is

reduced for that album and a cap is placed on royalties. God knows what strange standard of business practice this grew out of.

But back to ASCAP's brave new online world and performance royalties. The document talks about the "many new words and concepts that creators and publishers must learn," such as "service provider, search engine, broadband, encryption, and compression." The authors acknowledge that "many of the established concepts of royalties and copyright also apply to this (online) area." Tellingly, Messrs. Brabec and ASCAP

clarify the current state of online music publishing by highlighting its unknowns. "Copyright law, statutory licenses, compulsory arbitration, voluntary negotiations, etc. between parties continue to be in effect for the determination of what type of license is needed as well as how much that license will be." Well put. Translation: "We don't know what we're doing with regard to the Internet but we're working really hard at it." This includes figuring out who will own the Web site content and the domain name and some

▶ continued on page I37



March

distribution: Frankfurt Musik Messe; report: Winter NAMM 2001, Macworld 2001; special: Synchronizers — time code and word clock explained, studio sync issues, buyer's guide; supplement: Extreme Groove \$3

April

distribution: NAB; report: Frankfurt Musik Messe 2001; special: Careers in audio — schools and internships, alternate careers, making money with your studio, recording schools buyer's guide; supplement: Audio for Video

May

distribution: AES Europe 2001; report: NAB 2001, special: Control surfaces — advantages and how to buy, using a digital mixer as a control surface, buyer's guide; supplement: Extreme Groove \$4

June

report: AES Europe 2001; **special:** Software synths and samplers — the state of software synths and samplers, tips and tricks, buyer's guide; **supplement:** EQ Live

July

distribution: Summer NAMM 2001; special:
Guitar recording tools — speaker and amp emulators/
simulators, direct boxes, splitters, tips and tricks, buyer's
guide; supplement: Extreme Groove #5

August

special: Converters — how to choose, resolution issues, dithering, new technologies, buyer's guide; **supplement:** *EQ Live*

September

report: Summer NAMM 2001, Macworld 2001; special:
Acoustics — basics of studio control room acoustics, buyer's guide; supplement: Extreme Groove #6

October

distribution: Fall AES 2001; **preview:** Fall AES 2001; special: Software plug-in dynamics processors — compressors, limiters, gates, unique applications, tips and tricks, buyer's guide; **supplement:** EQ Live

November

report: Fall AES 2001/Blue Ribbon Awards; special: Digital Mixers — getting the most from digital mixers, interconnect/sync issues, buyer's guide; supplement: Extreme Groove #7

December

distribution: Surround 2002; special: DAWs — the state of computer production tools, choosing the right one, computer issues, buyer's guide; supplement: Music Technology Buyer's Guide 2002



For more information about The New EQ, please

Editorial

Mitch Gallagher Email: mgallagher@uemedia.com

Sales

Michael Mathieson, East Coast Tel: 631-493-9470 Fax: 631-462-9650 Email: mmathieson@uemedia.com

New EQ, Steven Daszykowski, Midwest Tel: 212-378-0493 Fax: 212-378-2158

contact: Email: sdaszykowski@uemedia.com

Holly O'Hair, West Coast Tel: 909-693-9598 Fax: 909-693-9598 Email: hohair@uemedia.com

Len Keeler, West Coast Tel: 909-672-8059 Fax: 909-672-8058 Email: Ikeeler@uemedia.com



MATT SERLETIC

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say that, in actuality there's probably more background vocals on a lot of the records that you may be thinking of than are actually brought to your attention.

Having said that, I do believe in keeping some sense of honesty about the performance in that you still have one single point to identify, and that's the lead vocal. That person is singing to you, and it's not my job to get in the way of that with 15,000 backing parts and 27,000 guitar parts. To me, a record should be a constant dialogue between a vocal and something else. It might be that right here the bass comes up or in another spot the toms drive up and then all of a sudden there's a glorious organ in the chorus, but it's always about having a dialog.

A good record should be like you're pulling a string toward you constantly, and you never let up. There's a constant tension that maintains your interest. That can be the vocal dipping into the way a guitar line leads into the pre-chorus; there's always this constantly connected thread. Especially when I'm doing a final mix, I'm always looking for that point where the string breaks. Then I say, "Okay, we've got to fix that." If I'm not believing it past this point, I've lost it, it's not right.

"Bed Of Lies," which you cowrote with Rob, is a standout production on *Mad Season*. How did that track come together?

The song is really about the desperation of a failing relationship, and the haunting "I could have done this better" feeling that one might have. Rob and I were both newlyweds at that point, and it started as a discussion about how to do marriage right and what happens when it isn't right; that horrible feeling when the relationship breaks down, as they always do, and you have to fix it. So that song started as a sonic landscape of haunting surrealism. like a Peter Gabriel record. It was always about painting this bleak, austere, yet emotionally turbulent landscape - rolling low cellos and all that urgency yet veiled serenity: "Everything's okay, everything's okay." The keyboard pads help create that lushness that is countered by urgent cellos and Kyle's quitars.

There's a low drum at the end that's almost like a harbinger of doom, like you'd hear at a funeral march.

Exactly. It's all about painting a haunting picture, and that world came upon me sitting there working on that song. It's an extension of the very intent of the song, and I think the better records are that. If the intent

is to write a great party song, then the track better be partying!

It's amazing that the two of you could have come up with those lyrics despite the fact that neither of you had experienced it.

But I think, as a songwriter, you take the little incidences of your existence and your remembered experience and blow them out, blow them up, make them grander than they are, smaller than they are. All of us have experienced pain and loss in a relationship in some way, even if it's your dog dying when you were a kid or something. So it might not be that specific instance, yet you still felt that really heart-wrenching feeling, and that's what's so great; music is the language of emotion. It's the only thing that clearly paints a picture of sadness turning to joy turning to hope turning to despair. It's so much more eloquent than trying to write though history's full of amazing writers that have done it successfully — but you can do in two or three minutes in a song what might take several chapters to get across in a book.

Another standout track on that album is "You Won't Be Mine."

That came from reacting to occurrence. Rob was writing some songs in New York - he was living in Soho at the time - and he played me this song over the phone. He had this little fake piano and he started playing the song; it wasn't finished yet, but he propped the phone on a table and started singing it. At the same time, I was hearing all this traffic noise from noisy Manhattan. To me, the song became quintessentially the loneliness of New York; of being in a place of packed-in people and yet being so individually alone. Again, that sense of longing, the need to be connected and yet never really connecting. That's how that track came about: I literally used traffic samples.

It's like a tone poem.

Yes, exactly. That's what it evolved into. It was really an outgrowth of that initial experience of hearing Rob play me that song over the phone and knowing the environment that he was in.

You know, the great thing about making records is also the saddest thing: when you perform, you're immediately getting a reaction from the audience. When you make a record, it just goes out there, and you never really get that visceral, immediate reaction. But it also lasts for so long; it's a document for all time, and, to me, that's ultimately a better statement.

Howard Massey's latest book, *Behind The Glass*, is a collection of interviews with record producers, now available from Miller-Freeman Books.

ROGER NICHOLS

▶ continued from page IS4

surround mixes on a Neve 8078 (like we did for Steely Dan) or you're trying to do surround mixes in your project studio, then you are up the creek without a paddle.

There are a lot of small consoles that let you mix surround. Some of them require that you use some of the aux outputs to feed the additional monitors. This works in a pinch, but how do you listen back to the mix you just printed? What if you need to listen to the stereo CD to make sure you are in the same ballpark as the original mix? How do you calibrate all of the speaker levels? What if you have full-range speakers but no subwoofer? What if you have a subwoofer but your main speakers don't reproduce enough lows?

I found the box to solve all of my monitoring problems. The Martinsound Multi-Max EX is a monitor control box. You can select from multiple surround sources and multiple stereo sources. You can even set the system up for 7.1 monitoring if you are so inclined. The system has built-in pink noise generation to help set up speaker levels. After calibration, an easy twist of the volume pot displays the sound level in dB. A built-in bass management system compensates for speaker low-end deficiencies and automatically switches on the correct speakers for the source being monitored.

To me good speakers make the difference in a final mix. Good monitoring control makes just as much of an impact on your workflow and the quality of your final product.

Driveway.com

Have you ever tried to e-mail a file larger than five megabytes? Maybe when trying to send an audio track to a friend at full bandwidth? None of the e-mail servers will accept it. I found a new way! A Web site called driveway.com will give you 25 MB of FTP storage for free. You can purchase up to 525 megs of space for really big files. You upload your files to your account at driveway.com and enter a password for download authorization. You then e-mail the location and password to the recipient. He then goes to the FTP site, enters the password, and downloads the file. Perfect.

Also I got an e-mail that Rocket Network is upgrading their site to make it easier to use for those of you sharing files between distant computers. Rocket Network allows more than one person to work on the same audio files by storing them on a Web site.

Guitar players in L.A., keyboards in London, didgeridoos in Sidney...the world is getting smaller. Does that mean I will have less room to store all of my cool stuff?

FEZGUYS

▶ continued from page I35

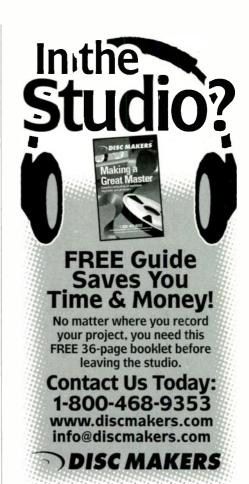
"new-technology rate reductions." Can't wait. Always looking for another excuse to shrink the cut. To drive the point home: "...the increasing utilization of online distribution is creating new types of business models and considerations which are changing the way artists and record companies negotiate their deals." Will it be an equitable change?

Music publishing is defined as: "one of the centerpieces of entertainment programming." Are you, hopeful musician, looking forward to taking your place in the brave new world of online entertainment programming? Are you eager to join an organization that pays all members on a standard defined: "monies collected goes into a 'general' licensing fund that is paid out to members on the basis of feature performances on radio and all surveyed performances on television." Because everybody is on TV and radio somewhere? On what planet is that equitable? Oh, right! The same planet where payments are received nine to 10 months after a transaction has taken place and the societies have had plenty of time to invest your money and fluff their nest without sharing any of the interest with you. Your FezGuys don't think our landlord would go for that kind of financial dawdling.

The article, brimming with lots of helpful information about how this odd music use fee collection system works (or doesn't, depending on how you read it), justifies its placement on the ASCAP Web site. "ASCAP collects and distributes more money in performance royalty income than any other organization and our payment system is by far the fairest and most objective in the U.S." If that's fair and objective it's hard to imagine how they define "usurious" and also makes us wonder why the government is currently dissecting and comparing both ASCAP's and BMI's services.

Online distribution presents an intensely diverse array of possible methodologies. Everyone involved is making it up as they go along. In a perfect world the final results will accurately reflect the efficiencies that new technologies bring, such as trading in fuzzy royalty payments made from big radio station "estimates" for accurate per-song tracking. The FezGuys, prodigal as we may be, don't have all the answers, or even some of them. Well, maybe a couple, which we'll get into next month as we continue our uncompromising observations of the current state of online music distribution rights. We'll look at BMI, SESAC, RIAA, DMCA, NMPA, HFA, and all the big acronyms as well as deconstruct SoundExchange, the next generation of online music policing (if the RIAA gets their way).

Special Thanks to Bill Colitre for his valuable assistance in assembling this column.



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Pro Tools LE

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MID1 Functions

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 AudioDesk Audio Workstation Software for Mac 05 eatures 24-bit recording, multi-channel waveform editing, automated virtual mixing, graphic editing of ramp automation, real-time effects plug-ins with 32-bit fleating point processing, crossfudes, support for third-party ludio plug-ins (in the MOTU Andia System and Adobe Premiers formats), background processing of file-based operations, sample-accurate editing and placement of audio, and more



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- . Transport controls with jog/shuttle wheel for controlling

- · 8 primary audio channels from any analog or digital input
- · Mute and Solo on each primary audio charmel
- · 4-band EQ (sweepable high and low shirlving plus two fully parametric bands) and Programmable dynamics (compressor/expander/gate) on each primary audio

- · One stereo and two mono Returns
- 4 Sends per channel, assignable pre- or post-lader · 4 virtual audio channels (EZbus Returns)
- · 4 multi-input analisg charmels; accept up to three indenendent source signals per channel.
- EZnus Audio Routing Matrix provides easy to use. flexible input/output routing capabilities · Save and recall 32 internal inapshets of all mix and
- system parameters · AudioAlert function notifies user of errors, such as overloading an analog input digital dropouts, or clipping
- due to excessive FO. ADAT Lightpipe provides 8 direct outputs for primary mixer channels-ideal for use as a front end for an
- ADAT or Lightpipe-equipped audio card Asynchronous sample-rate support out S/PDIF with high quality sample-rate conversion.



US-428 USB Digital Audio Workstation/ Controller

The US-428 is a 24-bit USB-based audio controller co-designed by TASEAM and Frontier Design Group. The control surface includes plenty of faders, teansports and other dedicated controls compatible with the most-used functions in today's DAW applications. The US-428 supports a total of four channels of audio in and two outs simultaneously. The interface plugs right into a USB equipped PC or Mac computer— no opening your computer and no sound card to install. Musicians taking the leap from Portastudios to computer-based DAW programs will feel right at home with the tactile control surface.

FEATURES-

- · PC and Mai: compatible
- · Works with most major DAW programs
- 24 bit D/A and A/D converters
- · Bunkled with Steinberg's Cubasis VST sequencing software for Windows (MacOS version shipping soon)
- · Total of four channels of audio in (analog or S/PDIF) and two out simultaneously via USB

 • Two XLR mi: inputs, two balanced 1/4 TRS inputs, two unbalanced 1/4" inputs (switchable to Hi-Z)
- S/PD/F digital I/O
- . Two independent MIDI I/G (32 channels)



- Unlimited banks of eight faders
 Transport, mute/solo and locate keys.
- An EQ module supports coutrol of up to four bands of fully parametric EQ
- · Four aux sends and a panpot
- · Can be customized to control everything from virtual synths to MIDI righting panels



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CDR-1000 Standalone CD Recorder

The Yamaha CDR1000 is a fully professional standalone CD recorder that's fully compatible with CD-R and CD-RW discs. Features like audio delay (buffering), track numbering and indexing as well as the



systems and ensures the CDR-1000's place in commercial facilities and project studios.

FFATURES-

- Compatible with CD-R, CD-RW (Audio and Data discs)
 Frequency Response 20 Hz 20kHz
- · Built-in sample rate converter automatically converts 30-50 kHz audio to 44.1kHz
- S/N 97 dB typical (analog recording and playback)
- · 97dB dynamic range
- · An ideal CD playback deck with the ability to configure a fully digital system without having to change the master/slave clock settings.
- XLR-balanced analog inputs (selectable +4dB/-10dBV)
- as well as +4dB balanced XLR analog outputs

 XLR-balanced AES/EBU digital input and output as well as coaxial S/PDIF digital input and output
- Stereo headphone output with level control
 Word clock input (BNC) for AES/EBU pass-through
- Incorporates Apogee UV22 Super CD Encoding that permits high-quality 16-bit encoding of sources originally recorded at higher bit resolutions
- High-precision recording start feature ensures professional takes without missing a beat
- Audio delay jets you buffering the input up to 5 sec s

- · Manual and automatic track number increment functions. The threshold level for auto track increment can be set to -96 or to any value between -70 and 30dB, when the icput signal gives below the threshold for more than three seconds
- · An index recording function let: you place multiple IDs within a single truck Fade In/Fade Out
- · Easy to read 16-segment level meters with peak hold function
- · Quad-speed finalize capability
- Selectable copy protect functions including Permit (unlimited copy). Once (SCMS compatible) and Protect
- · A digital cascade output function with multiple machine synchronization capability allows easy duplication
- Includes full-function wireless remote controller that provides access to all main operating features
- · A parallel I/O port allows for external control by input and output pulse.
- · A foot switch connector is all c providers for recording start and stop control using an optional foot switch

DIGITAL MULTI-TRACK RECORDERS

2424 is an affordable 24-bit, 24-track hard disk recorder that also has the editing power of a digital audio workstation. A 9GB internal hard drive comes standard as well as a SCSI Wide port that supports external LVD (Low Yoltage Drives) hard drives from up to 40 feet away. An off onal analog and several digital I/O cards are available so the MX-2424 can be configured to suit your work environment. SMPTE synchronization. Word Clack, MIDI Time Code and

FEATURES-

- · Records 24 tracks of 54-bit audio at 44.1 or 48 kHz ur 12 tracks at 38.2 or 96 kHz. Up to 24 tracks can be recorded simultaneously using any combination of
- digital and analog I/O.

 Supplied 9GE internal drive allows 45 minutes of audio across all 24 tracks
- Wide SCSI port on the back panel allows you to add multiple drives. A front 5-1/2' bay available for installing. an additional drive, or an approved DVD-RAM drive to
- ViewKet MX: a daya-trased software suite for Mac and PC offers DAW style *diting of audio regions, dedicated system set-up icreeps that make set-up quicker and easier and track load screens that make virtual track management a snap. Connects to a computer via a stangard Ethernet line
- . Can record to Mac (SDH) or PC (.WAV) formatted drives. The Ocen TL format allows compatible software to recognize vertual tracks without have to load reposition and trim each digital file

Transport Controls-

- · MIDT in, Oat, and Thru for MMC & MTC

MX-2424 24-Bit 24-Track Hard Disk Recorder

MID! Machine Control are all built in for seamless integration into any studio

Editina-

- . Built-in editing capabilities include cut, copy, past : split and ripple or overwrite
 - 100 levels of undo.
- · Supports destructive loop recording and non-destructive loop recording which continuously records new takes without erasing the previous version

Build-In Synchronization-

- TBUS protocol can sample accurately lock up to 32 machines together.

 Can generate or chase SMPTE time; ode pr MTC.
- · Word Clock In, Out, and Thru ports

10 Options-

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

Software Updates -

System updates are made available through a front panel Smart Card slot or via computer directly from the ITASCAM web site

Masterlink ML-9600 High-Resolution Master Disk Recorder

The MasterLink ML-9600 combines stereo hard disk recording CD burning, DSP and mastering functions to deliver compact discs in the standard "Red Book" 13-bit/44 1kHz format, or high resolution 24 hit/96kHz CDs that utilize Alesis'



revolutionary CD24 technology. The ML-9600's amazing sonic quality and powerful built-in tools offers a uniquely versatile and affordable solution for everyone from large commercial facilities to project studios and recording musicians • 1/4" headphone out w/ level control

FEATURES-

- Reads/writes 16-bit 44 1kHz Red Book Audio CDs as well as files in Alesis' CD24 24-bit/96kHz highresolution mastering- an AIFF compatible file format that can be read by MacOS. Windows and Urux computer platforms.
- 24-bit 128x oversampling A/D/A
- · Built-in 3.2GB IDE hard drive
- 4x CD burning using standard CD-Rs · Up to 20-40k Hz frequency response
- · 113dB S N ratio (A-weighted)
- Supports 16- 20- and 24-hit wordlengths and 44.1, 48, 88.2, 96 kHz sample rates
- Built-in sample rate conversion & noise shaping
- · Create and store up to 16 playlists containing as many as 99 tracks
- Inputs and Outputs Analog- XLR-balanced and unbalanced RCA connectors
- . Digital- AES/EBU (XLR) and coaxial S/PDIF (RCA) I/O
- Editing Gain control
- · Cropping allows adjusting start and end points. · Join and Split for combining and
- separating song sections. **DSP Finishing Tuols**

Equatication, Compression

- Normalizing and Peak Limiting
 - Infra red remote control and rackmount brackets

FFECTS PROC

MPX-500 24-Bit Dual Channel Effects Processor



The MPX 500 is a true stereo 24-bit dual-channel processor and like the MPX100 is powered by Lexicon's proprietary Lexichip and offers dual-channel processing. However, the MPX 500 offers even greater control over effect parameters, has digital inputs and outputs as well as a large graphics display.

- · 240 presets with classic, true stereo reverb programs as well as Tremolo, Rotary, Chorus, Flange, Pitch,
- Detune, 5.5 second Delay and Echo

 Balanced analog and S/PDIF digital I/O
- 4 dedicated front panel knows allow adjustment of effect parameters. Easy Learn mode allows MIDI patching of front panel controls.
- Tempo-controlled delays look to Tap or MID! clock

t.c. electronic

M-One Dual Effects Processor



The M-One allows two reverbs or other effects to be run simultaneously, without

compromising second quality. The intuitive yet sophisticated interface gives you instant control of all viral parameters and allows you to create awesome effects programs quickly and easily.

- · 20 incredible TC effects including, Reverb, Chorus Tremolo, Pitch, Delay and Dynamics
- · Arralog-style user interface • 10D Factory/100 User presets
- Bual-Engine design • 24 bit A/D-D/A converters
 - S/PDIF aigital 1/9 44 1-48kHz · Balanceri 1/4 Jacks - Dual I/O
 - · 24 bit internal processing



The Microboards StartREC is the first digital audio editing system combined with a multidrive CD recordable duplication system for professionals. Audio is recorded to the internal 6.2 GB IDE hard drive using analog or digital inputs. Sample rate conversion is automatic. Tracks can be edited and sequenced using the StartRECs user friendly interface and up to 4 CDs can be recorded simultaneously. StartREC is the ideal solution for studio recording, mastering, post production or any pro audio environment requiring digital audio editing and short run CD-R duplication.

FEATURES-

- 2X, 4X, or 8X recording speeds
- 6 2GB IDE hard drive
- · Editing functions include move, divide, combine or delete audio tracks, add or drop any index or sub index. and create track fade in or fade out
- Coaxial S PDIF and AES/EBU digital input plus optical

StartREC Models Include: ST2000- w/ (2) 8x writers

StartREC Digital Audio Editing/CD Duplication System



- XLR balanced and RCA unbalanced inputs and outputs
- Automatic sample rate conversion from 32 and 48kHz · Automatic CD formal detection feature and user friendly
- interface previde one fouch button operation Front panel trim pot and LCD display provide accurate
- input signal and time labse metering SCMS (Serial Cupy Management System) is supported regardless of the source elsc copy protection status



Based on the same technology as the Antares Mic Modeler plug-ins for Mac and PC, the Track space AMM-1 transforms the sound of any reasonable quality microphone into any of avareity of high-eric mics. Simply select the kind of micropure using and then select the micropure using and then select the micropure using and then select the micropure using the select to move. Even the filter settings, holar pattern and proximity can be selected for the source and micropure using the select the micropure using the select to micropure using the select to micropure using the select the select the select the micropure using the select the sel



- Reproduces all of the subtle characteristics of your favorite microphone victuding filter settings, polar pattern, proximity as well as wirdscreen on/off Variable tube suturation control
- Over 100 mic models built-in
- as well as AES/FBU digital LO Full MIDI control (In and Out)
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· XLR-balanced and 1/4 unbalanced analog inputs and outputs

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MICROPHONES



C2000B **Condenser Mic**



The C 2000 B is an all-purpose cardioid condenser microphoni perfectly suited for both recording and live sound situations. The newly developed small-diaphragm transducer capsule is made using a unique manufacturing process that ensures high sensitivity, lowself no se, and excellent bass response

· Cardioid, omni- and bi- directional polar

· Subsonic filter eliminates rumble from

Integrated 3-stage pop grille and shock

mechanical vibration below 17 Hz.

FEATURES

- Cardioid polar pattern
- Switchable bass rolloff filter (6 dB/octave @ 500 Hz) and -10dB pad
- · Built-in pop screen reduces sinwanted noise
- · Rugged construction, elegantly styled diecast metal housing, and silver-gray finish
- 30 Hz to 20 kHz frequency response

KSM44/SL **Multipattern Condenser Mic**



- frequency filter virtually eliminates unwanted background noise and controls proximity effect
- · Includes ShureLock elastic-suspension shock mount and swivel mount, protective pouch and locking aluminum carrying case
- 20 Hz 20 kHz frequency response



patterns

Radius 40 **Tube Voice Processor**

The Radius 40 is a self-contained tube processor designed for direct to tape recording in project and professional studio environments. By combining a mic pre amp and line input with a compressor, expander / gate and an equalizer the Radius 40 will also enhance the sound of any source from vocals to bass guitar and keyboards.



FEATURES-

- · Four stage tube voice processor with a pre amp compressor, expander and equalizer

 Balanced XLR mic/ 1/4 line inputs and both XLR and
- unbalanced jack line outguts
- · Input and output gain control
- Bypassable compressor, featuring variable threshold, ratio, gain, attack and release times
- · A four band bypassable equalizer section with 12dB boost and cut per band
- Low Freg band 60Hz. 120Hz. 250Hz or 500Hz. La Mid band - 250Hz, 500Hz, 1kHz or 2.2kHz, High Mid band - 1.5kHz, 2.2kHz, 3.6kHz or 5kHz, High Freq band - 2.2kHz, 5kHz, 8kHz or 12kHz · EQ may be switched before or after the compress:
- · Backlit VU meter displays input, output or gain reduction signals
 Stereo link for connecting two Radius 40s
- . Stabilized 15CV DC power supply

L2 ULTRAMAXIMIZER **Brick Wall Peak Limiter**



The L2 is a proprietary brick wall look-ahead peak limiter with IDR (Increased Digital Resolution) dithering technology based on the award-winning L1 software. Featuring 48-bit internal processing and support for 96kHz sampling rates as well as digital and agains FO with 24-bit A/D and D/A converters means the L2 is ideal for the maximum number of audio applications, from mixing to mastering to concert sound. The L2 Ultramaximizer performs high quality re-quantization to 24, 22, 23, 18, and 16-bits, plus the Waves ARC (Auto Release Control) technology continuously

- audio signals without introducing audible side effects
- 44 1 48 kHz, and x2 88 2 and 96 kHz sample rates.
- · Linked stereo and dual mono operation
- Look ahead technology anticipates peaks before they happen, thereby minimizing the possibility of artifacts.
- · ARC (Auto Release Control) dynamically controls release time allowing a greater amount of limiting and level maximizing without artifacts.
- proprietary wordler gih-reduction (quantization), uither and noise shaping technology which preserves and even increases the resolution of digital signals
- · Ded cated bargraph meters for input, output and
- . AES/EBU (XLR) and S/PDIF (coaxial) digital I/O

TUDIO MONITORS

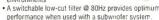
MSP10 **Biamped 2-way Powered Speaker**

The Yamaha MSP-10s are biamplified 2-way studio monitors totalling 180 watts per speaker. The separate amplifier for the 8" low-mid-frequency driver and the 1 tweeter allows the crossover to handle line-level signals, resulting in exceptionally smooth, natural response over the prossover range with an absolute minimum of distortion at all frequencies. The master volume control low and high EQ and low-cut filter allow you to tailor the speakers to any production environment.

FEATURES-

- 40 Hz 40kHz frequency response (-10dB)
 120-watt power amplifier for the low/mid driver and a
- 60-watt power amplifier for the tweeter
- 8" (20-cm) woofer
- 1" (2.5cm) titanium-dome tweeter utilizes a waveguide horn that achieves broad, uniform high-frequency dispersion regardless of listening position
- Balanced XLR inputs for direct compatibility with
- professional equipment

 Magnetically-shielded enclosures
- . Green power on and red clipping #EDs
- · Master volume control for each speaker
- · 3-position low and high trim switches (0dB, 1.5 dB. -3.0dB @ 50Hz & + 1.5dB, 0dB, -1.5dB, @ 10kHz respectively) optimize system response for a wide range of acoustic
- environments



- Available in Black (MSP10) and Maple-Sunburst
- (MSP10M) . SW10 powered sub-woofer also available

Hafler



The Hafler M5s are lightweight, portable studio monitors with all the qualities of the TRM6 in a more compact, non-amplified package. They are an ideal monitoring solution for broadcast and project studio environments.

FEATURES-

- 70 21k Hz frequency response ±3dB 20 200 watts power handling
- 5.25" polypropylene/rolled nitrile rubber surround 1" silk dome/waveguide tweeter
- 5-way gold plated binding post inputs
- · Shielded woofer magnet
- User selectable front panel 3dB tweeter level control · 4th order Linkwitz-Riley crossover at
- 3.2kHz, Zobels, tweeter overload protection.

 Dimensions 12.25"H x 6.75"W x 7 D
- · Weight 12 lbs. net

VERGENCE M-00 Powered Mini Monitor System

The M-00s are an integrated, self-powered, 2-way acoustic suspension mini monitoring system designed for near/mid-field monitoring. They're portable enough to take anywhere, have balanced and unbalanced inputs with lots of output power (75 watts/ch) and a tough cast metal enclosure.

FEATURES-

- · 4.5" treated paper woofer, 1" soft fabric
- dome tweeter with full magnetic shielding) · Built-in 75 Watt per channel (continuous) amplification
- 20k Hz frequency response ±2dB @
- . XLR, TRS & RCA input connectors
- · Cast aluminum/zinc alloy body & Glassfilled ABS baffle.
- · -10 +4dB input sensitivity & near/midfield proximity switching · Power On, Auto-On, Off
- · Sensitivity, Power & Standby Display
- Anti-clip circuitry
 9 h x 5.7 w x 7.3 d / 14 lbs





D-45 & D-75A POWER AMPS



The D-45 and D-75A are ideal power amplifiers for moderate power applications such as recording or broadcast studio near-field monitoring, video suite audio monitoring, a recording/broadcast headphone amp or a small paging system. Crown's AB+B circuitry ensures efficient use of output transistors while incorporating protection against shorted, open, mismatched or low-impedance loads

FEATURES-

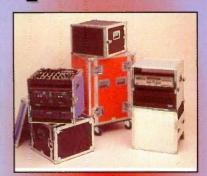
- Standard 1 RU 19" rack mount design
- Load Impedance rated for 4 to 16 ohms in Stereo and 8 to 16 ohms in Bridge-Mono.
- Signal-to-Noise: (Unweighted) 106 dB below full rated power from 20 Hz to 20 kHz.
- · Power, channel 1 and 2 controls, dual/mono jumper
- . Combination XLR and 1/4" Neutrik inputs per channel · Four-terminal barrier block outputs (two per channel) and stereo headphone jack
- Less than 0.001% Total Harmonic Distortion (THD) from 20 Hz to 400 Hz and increasing linearly to 0.05% at 20 kHz delivering rated power into 8 ohms/channel.
- Standard three-wire grounded AC Line connector
 THREE YEAR NO FAULT WARRANTY
- Max. Average Power at 1kHz with 0.1% THD or less D-45: 20 watts into 16 ohms, 25 watts into 8 ohms, 35
- watts into 4 ohms and 70 watts into 8 ohms bridged D-75A: 25 watts into 16 ohms, 40 watts into 8 o ins. 55
- watts into 4 ohms and 110 watts into 8 ohms brimged

controls the optimal release time for maximizing levels and minimizing audible distortions

FEATURES-

- · 2U rackmount limiter with 48-bit processing • IDR (Increased Digital Resolution) is Waves' significantly increases the average signal level of typical
 - Quantization- The wondlength of digital signals can be quantized and output to 24, 22, 20, 18 or 16 bit resolution
 - attenuation with infinite peak hold and peak meter reset 24-bit Balanced XLR and unbalanced RCA analog /O

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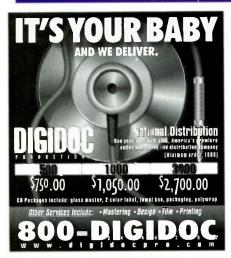
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STEVE FONTANA

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the two-track. So I'd have to rewind the slap after a take. That's something Carlos would put up with because he liked the sound. That was the first time I had put a tape slap on a guitar, but if the circumstances come up again, I want to experiment with that. It was some cool sh*t!

How did you record Carlos' acoustic quitar?

It was the Neumann M269. Like "Put Your Light's On," that's the '269, and so is "Maria Maria." The mic was about three feet away, aimed sort of at the hole, just off-axis of the hole.

Far enough away from the guitar that miking for the hole doesn't get muddy.

Exactly. It was the '269, Pultec, and an LA2A for 3 or 4 dB of compression. Not too much.

Tell me about the session you did with Carlos and Eric Clapton.

The thing that cracks me up, and stands out for the whole record is the Clapton track and how it was done. To see it win a Grammy was mind-boggling to me.

We knew Clapton was coming in and that it'd be just Eric, Carlos, and CT [Chester Thompson], Carlos' keyboard player. No drummer, no bass player. I'm thinking, "This is going to be amazing...." Carlos told me they were just going to hang out and play and maybe write a little. So I set up two Fender Twins and two Strats — two pristine 1954 Strats brought in from a collector. Amazing quitars. CT had his B3 and a couple of synths. Eric came in and they were trading ideas and tapes. Carlos told me he had a CD with a drum loop, and asked me to loop it for five or ten minutes. It was a four-bar groove. But first I asked Carlos if we were going to record. And it was like, "No, no, we're only writing, and we don't even have anything written. We are not recording." No drums, no bass, so I'm thinking "Okay they're not going to record."

I aimed Eric's Twin at Carlos, about twelve feet away. Carlos' amp was aimed at Eric so they could hear each other. So now they're sitting directly across from each other, amps facing each other, really loud. The Leslie for the B3 is right there in the room so they can hear it. CT is playing some synths, which are going through two more Fender Twins. Set up rehearsal style, but I had microphones out. All of a sudden Carlos asks me to play the drum loop over the studio loudspeakers so that they can hear a beat. "Turn it up louder, louder...." (because their amps are so loud). Now you have this drum loop bleeding into the mics, yada, yada. To make a long story short, they jammed to this loop and wrote what is now known as "The Calling." And I recorded them like that! They came in to listen and I said, "Please tell me we're going to record this for real. I have to set up the room differently, blah, blah, blah...." They're like, "No that's it. It's great." Carlos was so into it with Eric. And I'm thinking. "Oh man...."

And the drums looped through the studio speakers...

...Is the sound you hear on the record! An engineer's nightmare! And it's *Eric Clapton* and *Carlos Santana*. Recorded that way, and it wins a Grammy! You can be under the most pristine conditions with everything baffled and isolated yada, yada, yada, direct to tape this, and audiophile quality that. Perfect record. Then you set up like this and win a Grammy. Go figure! That was interesting situation.

Plenty of bleed I imagine...

Oh yeah. Chester was playing bass with the pedals of the B3 through a Fender Twin loud enough for Carlos and Eric to hear. It was breaking up the Fender and it's on tape with that distortion because the Fender is totally overloaded. They were strictly jamming. I happened to be in "record" and that's the take. A perfect case of, "Always push that red button." It was an amazing session, but an engineering nightmare! One of those sessions where I walked out and thought, "They're going to pay me, too?"

NAMM FIRST LOOK

▶ continued from page 24

analog mixer — the **MRS1-30.** Designed primarily for live use, the board features three-knob surround sound panning and true surround monitoring, with LFE sends for each channel and instant stereo downmixing.

On the software front, Mark Of The Unicom announced Digital Performer 3. a powerhouse upgrade that includes surround support (from LCRS all the way up to 10.2, with USB joystick panning, surround delays, bass management, and speaker calibration tools), an integrated MIDI and audio sequence editor, and 15 new plug-ins. And the hot new plug-in for Digital Performer and MAS environments was unquestionably Audio Ease Altiverb, which utilizes the power of the Mac's G4 processor to not only create multichannel reverbs, but actually allows you to sample your own environments and apply those acoustic spaces to your tracks and mixes.

That's it for this month, tune in next issue for EQ's completely over-the-top coverage of all that was new and cool at Winter NAMM 2001!

REVIEW SHORTS

▶ continued from page 122

complement the typical harshness of many PA systems, but sounded a bit dark under studio conditions.

I next attached the H440 and used the microphone just about everywhere on a drum kit. The H440 clips onto the rims of most drums; beware of rims that don't have a flanged edge, as the flange helps secure the clip to the rim. Rack toms were wonderful with the D440: round, fat, and meaty in the bottom end, with plenty of "doooooooom" on the decay. Ditto for floor toms, though I wrestled with the H440 in trying to achieve optimum position for the mic (of course, "optimum" position is a subjective call). Both rack and floor toms benefited from a touch of EQ in the high end, just to open up the "air" around the toms.

Compared with both a Shure SM57 and Beyerdynamic M420 on snare drum, the D440 sounded less extended in the high frequencies, but produced less midrange "clang" as well. The result was a lot more "whump" in the area around 200 Hz than I'm accustomed to hearing from this particular snare drum (a Noble and Cooley Alloy Classic) - making the snare sound more powerful through the D440. When the drummer switched to playing sidestick, the D440 clearly produced the definition of the stick's attack against the rim while avoiding a thin sound. But keeping the mic out of the player's way was tough using the H440; it's probably best to use a stand for a snare drum situation.

Although there's no mention of kick drum in the informative manual furnished with the D440, I achieved surprisingly good results using it on a kick. While it doesn't reproduce enough bottom end to make your pants leg flap, D440 does produces a tight, lean kick sound good for situations where you want the kick to pop through the mix without stepping all over a bass guitar.

In spite of the fact that the D440 is lightweight, it appears to be ruggedly built. The review unit took a four-foot drop onto a hardwood floor without sustaining so much as a cosmetic blemish. Since the mic is likely to find its way onto a variety of stage situations, this is an important strength.

Conclusions:

Drummers, in particular, should check out the D440 for its great tone on rack and floor toms. No doubt the AKG D440 will find favor with gigging musicians and live sound engineers who need the convenience of a clip-on mic with the wide frequency response of a full-size capsule.

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Nautilus is the latest ground-breaking audic effects processing technology from Netherlands-based Audio Ease, the leader in plug-ins designed

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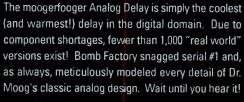
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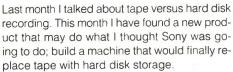
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World Radio History

The Diskovery Channels



Alesis has announced a new 24-track hard disk recorder. It is two rack units high, has ADAT optical in and out, analog 24-bit in and out, ADAT sync connections, and two drive bays in the front for removable drives. The box is 96 kHz-capable with external converters (feeding the ADAT optical inputs) and can perform edits without a video screen or external computer. There is also an Ethernet port for transferring files directly to your DAW. When connected to a BRC, it shows up as three ADATs.

What makes this unit so different from all of the others? The way the data is stored on hard disk. All other hard disk recording systems use a random access file system to store the audio. Each piece of audio has a name that makes it unique so that the software program knows where to place the audio file in the song. To go one step further, the software program can denote regions of the audio file and place them anywhere it wants. These regions are basically aliases of portions of the same audio file.

In the computer program, which is the only place you have access to the audio, you can arrange the regions wherever you want. There can be software errors that place these regions wherever the computer wants. If this happens, the exact timing relationship between tracks is corrupt.

On high budget projects such as Steely Dan, we use the Sony 3348 48-track digital tape machine as the master. The tracks are recorded on tape so that they can't move. We bounce things over to Pro Tools to work on them, but we move everything back to tape as the master. On lower budget projects I make backups to ADAT for timing reference. I can always dump the tape back into Pro Tools to make sure everything is still lined up. This is much more time-consuming, but it works.

In the new Alesis 24-track machine the hard disk is formatted with a proprietary system that makes it work just like tape. All of the space on the hard disk is allotted to audio ahead of time. If you have inserted a 90-minute disk, it will record 90 minutes of audio on 24 tracks, but it also will only record 90 minutes of audio if you're only using two tracks — just like a piece of tape. If you make an edit to the song, it works just like

cutting the tape with a razor blade; that segment is skipped over during playback.

The tracks can't slip in time like they can with a normal hard disk recording system. For me, this is the first step in actually replacing tape with hard disk or optical disc storage. It's about time!

New Apples

Apple has announced its annual crop of new Macs. The lineup includes a single processor G4 at 733 MHz, gigabit Ethernet, five PCI slots, faster AGP video acceleration, and a DVD-R recorder. Eat my socks! You can get optional software to author DVD videos that include AC-3 encoding. The DVD will play back your movie with Dolby Digital surround on your DVD player.

On top of that, Apple announced a new 500 MHz G4 laptop made out of titanium that's only one inch thick. The screen measures 15.2 inches diagonally, but only as high as the 14.1-inch screen. With a resolution of 1152 by 768 this works as a widescreen display for playback of DVD movies, and room for more Pro Tools waveforms.

Notice that the new G4 has five slots instead of four. This means that you can host an expanded Pro Tools system without adding an expansion chassis. Three slots for Pro Tools cards, one slot for a SCSI card, and one slot for the AGP video board.

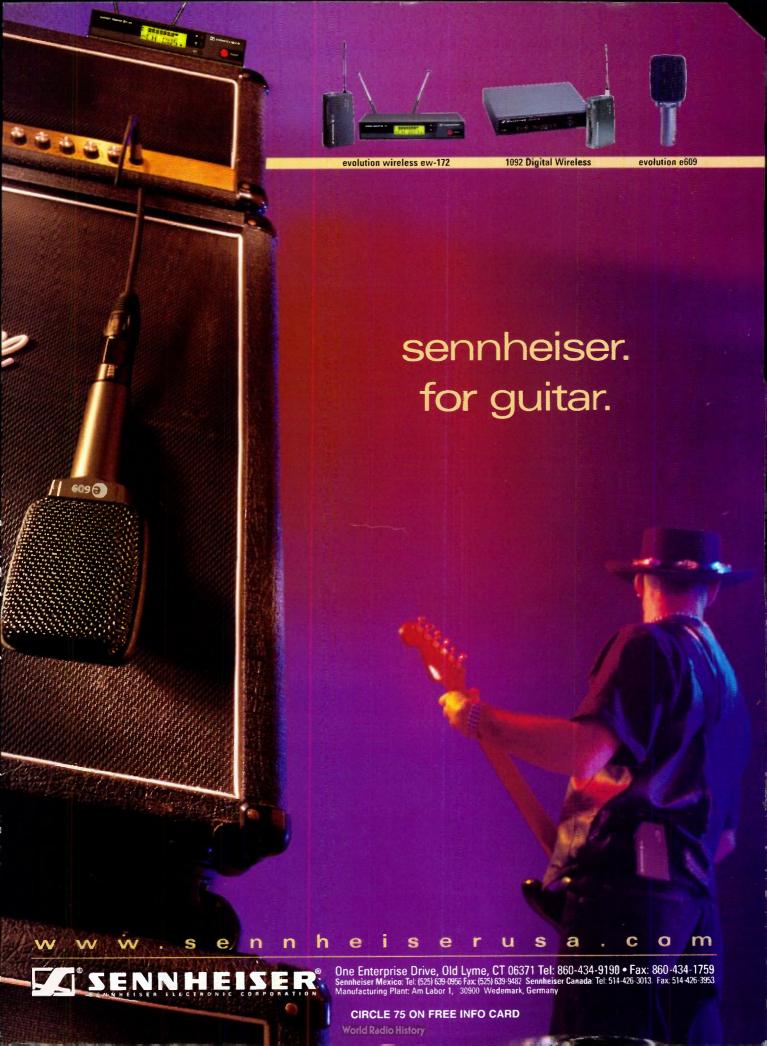
Gigabit Ethernet marks the start of project studio networking that is affordable. I was able to record 48 tracks of audio in Pro Tools to the server hard disk mounted on my desktop. This means that you can share hard disks among multiple computers. I use one computer to edit and master stereo and surround audio. Another computer is used for all of the multitrack Pro Tools 24lMix Plus AV stuff. I mount the disk of the mastering computer on the desktop of the 24lMix Plus computer. When I bounce to disk, I bounce to the mastering disk. Ethernet takes care of the transfer without interfering with the work at hand. The mastering computer can be burning CD-Rs at the same time without a hiccup. Things are starting to get good.

Surround This

The most difficult part of surround mixing is the monitoring. If you're using a professional studio with a million-dollar console setup for surround, then you are lucky. If you're trying to do

| Continued on page 137





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