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2001 AES REPORT

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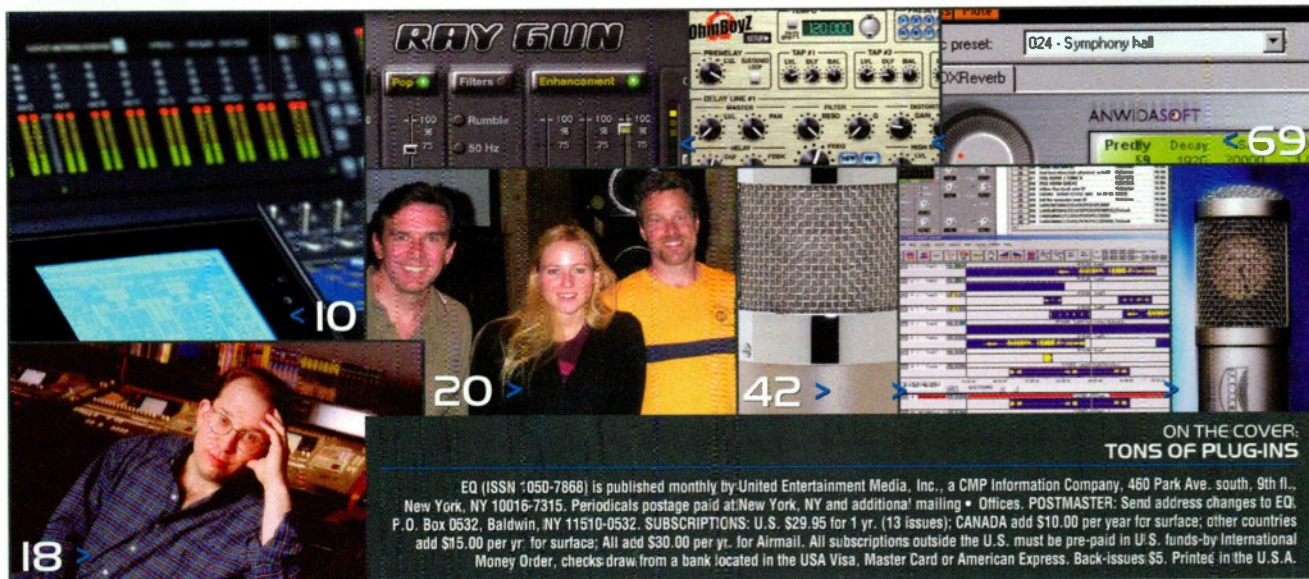
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Against All Odds

As I'm writing this, it's a short time after the rescheduled 111th AES tradeshow, which took place here in New York City from November 30 to December 3. There was quite a lot of trepidation for all of us heading into the show; rumors were rampant, major exhibitors had dropped out, and no one knew if attendees would show up.

I'm extremely pleased — and more than a little proud — to report that the show went off as planned, and was, in fact, successful beyond expectations. Hundreds of manufacturers arrived and manned their booths, paper presentations, panels, and conferences proceeded according to schedule, and thousands of attendees walked the floor in search of new products and networking opportunities. In addition, a boatload of new products were ogled and fondled by the masses. Check it out for yourself; initially we had slated our AES report in this issue for four pages of coverage, but, after returning from the show and wading through all the new product literature and the notes we'd taken, it became obvious that so many products had been displayed that more room was required.

I believe that this AES show will be remembered in the years to come as evidence of our industry's strength and spirit. This was a show where people took the time to talk to one another; where the mood was positive and supportive, and where both attendees and manufacturers enjoyed themselves — and got a lot of business done.

A week later, on the opposite end of the country, the third annual Surround Conference took place in Beverly Hills, CA. This conference and tradeshow, co-sponsored by *EQ* along with our sister publications *Pro Sound News* and *Surround Professional* magazines, brought together manufacturers and audio engineers to discuss and learn about the burgeoning field of surround sound production — as well as to check out the latest and greatest in technology. As with the AES show, attendance was excellent, and the mood and spirit were high.

I'm proud that our industry was able to come together at these shows and display our support and solidarity. And I'm pleased that we were able to close out what has undoubtedly been one of the roughest years in recent memory with two positive events.

I believe the enthusiasm shown can only mean that the coming year will be a good one. Onward and upward!

—Mitch Gallagher
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SMOOTHING OUT CYMBALS ON DIGITAL RECORDINGS

Is it just me, or is anyone else driven crazy by cymbals when recording digitally? Being an old analog-head who just loves the silky sound of cymbals on 15 ips tape, I find that sound nearly impossible to achieve on anything digital. In particular, the bell of the ride cymbal and the top end of the hi-hats can take your head off — even with rolling some of the top off with a good EQ.

I would be more than happy to blame myself, my comparative lack of experience with digital recording, my cheap microphones, etc. However, when I listen to most of today's major label releases, I hear the same thing. A lot of people probably wouldn't notice it, but I do because it just isn't the sound I'm looking for.

So far, the only way I've come up with to smooth things over is to actually run the tracks out to a piece of analog tape and back again (I have an Ampex 1/4-inch two-track from 1965 that's great for this purpose). Does this drive anybody else nuts besides me, and, if so, what do you do about it?

—Lee

I'm with you every single step of the way. I don't know if it has something to do with the converters I have, or what it is! But I hear it, too, and I can't remove it. It's on guitar, vocals; it's all over the place. I have no solution other than tracking through analog preamps/EQs/compressors. —Axis

Next time, try recording drum overheads with ribbon mics, such as Royer R-121's and Beyer 160's, which give a non-hyped top that seems to

bide with digital a lot better. I find condensers sometimes can be too brittle, especially on drummers favoring their right hand (cymbal smashers).

—Jay

These days, every time I run into something that sounds too harsh and "digital," I listen to it through a [Empirical Labs] Fatso to see if a dynamic high-frequency clamp will ameliorate the problem. About half the time, I stay with the Fatso. For the other instances, I use a good EQ to look for sharp dips that might take some of the hideousness out.

—George Massenburg

DO I NEED ONE?

Here's an email that I recently received from "DJ" in Los Angeles: "I just read your article, 'Is It Time' (EQ, August '01) regarding having a dedicated digital clock in your studio.

"I've got two PC's in my room. One running Cakewalk Pro Audio 9.x with a MOTU 2408 and a second running Gigastudio with an Aardvark Ark 24. The only 'link' between these two machines is a MIDI cable.

"If I read the article correctly, you are suggesting that I can get my 2408 to actually sound better by purchasing an external digital clock and attaching it to the word clock input. Does the same apply to the Ark 24?"

"I'm on a waiting list for the new TASCAM DM24 digital mixer. Does it figure into this concept in any way?"

—David Frangioni

I'd say that unless you're never digitally transferring Gigastudio tracks into Cakewalk, you're going to want them both clocked together. What are you doing now — outputting analog audio



Have a question you'd like answered? Visit Roger Nichols, George Massenburg, and David Frangioni online at www.eqrng.com

from both into an analog mixer?

The traditional advice is that once you've gone beyond two or three digitally interconnected devices, a master word clock is a very good idea.

I have not tried the new TASCAM yet, but it looks like a powerhouse, especially at that price. I have no idea from your post what your actual mixing needs are: Do you have outboard gear? Lots of hardware MIDI instruments, or mostly "soft synths"? If hardware, do they have digital outs? What type of music? Lots of simultaneous live mics to be recorded?

But for me, going to a digital hardware mixer has been a great experience — especially if you get one with MIDI continuous controller capabilities — with a desk like that, you can use the hardware faders to control the onscreen controls/faders in Cakewalk.

If you do get the TASCAM, I'd definitely recommend adding a master word clock and hook up everything you can to it — Aardvark, MOTU, and TASCAM. Several devices are out on the market — Aardvark Aardsync seems to be the current "standard," while many people seem happy and report significant audible improvements with their Lucid GENx6 and Rosendhal Nanosync units.

—Phil

CORRECTIONS

The proper credits for the December issue's Roy Thomas Baker cover should have read:

Photo: Edward Colver; Cover Concept & Design: T.S. Baker for Imagemaker USA; Clothing: Traffic and Politics; Make-Up: Maria Hero.

Also, in the Product View on the new Yamaha digital console, the model number was listed incorrectly. The correct model number is the DM2000, and you can find out more by reading this issue's First Look on page 10.

ROGER NICHOLS
DIGITAL RECORDING FORUM

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TASCAM DM-24: The Affordable Luxury Console Is Here



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

The DM-24's features are usually reserved for super high-end mixers. With 24-bit/up to 96kHz digital audio, the DM-24 blows away the standards in sonic quality for affordable consoles. With its internal automation, you'll get more power at your fingertips than you would from those huge consoles in commercial facilities. With some of the finest spatial and modeling processing from TC Works™ and Antares™, you can create fully polished productions without ever going to the rack. With incredibly flexible routing, fully parametric EQ, machine control capabilities, touch-sensitive motorized faders, and lots of audio interfaces, you can integrate the DM-24 into any studio environment.

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



Two DM-24s can link together with optional Cascade modules to create a seamlessly integrated 64-channel super console. For larger studios operating on a budget, it's a no-compromise affordable solution for high-end digital mixing.



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By Steve La Cerra

Yamaha DM2000

Digital Production Console

Yamaha has announced the introduction of their new flagship Digital Production Console, the DM2000. Intended for use in audio production, postproduction, and surround sound mixing applications, the DM2000 features extensive audio routing and is designed to process 96 audio channels at 24-bit/96 kHz resolution. The DM2000 can also process 44.1, 48, or 88.2 kHz sampling rates with 16- or 24-bit resolution. Onboard A/D and D/A are performed with 24-bit/96 kHz resolution, while internal processing (including effects) is at 32-bit resolution.

Inside the DM2000 is a huge amount of horsepower based on large-scale integrated circuits developed specifically by Yamaha for use in the new console. A total of 14 Yamaha DSP7 LSI's are employed for processing in the mixer section, while an additional eight DSP6 LSI's are dedicated to effects processing. By comparison, Yamaha's 02R uses six DSP3's in its mixer section. One DSP7 has more than four times the processing power of a DSP3. This tremendous potential for digital audio crunching means that the DM2000 isn't reduced to a smaller number of channels when working at 24-bit/96 kHz resolution.

The DM2000 controls

96 channels in four "layers" of 24 channels. Each layer of input channels has a dedicated button on the front panel, allowing instant access to channels sets 1–24, 25–48, 49–72, or 73–96. Out of the box, the DM2000's input section contains 24 channels of balanced XLR mic/TRS line level input, each featuring a newly designed, high-quality mic pre with individual phantom power, input trim control, pad, and insert point. Unlike most mixing consoles (analog or digital) the DM2000's insert sends and returns are on separate, balanced TRS jacks, maintaining a balanced analog audio path throughout the signal chain. Each channel has On/Off, Sel, and Auto (automation on/off) buttons. Pressing a channel's Sel button calls direct control over that channel to the DM2000's Selected Channel Section, where dedicated EQ, pan, aux send, and routing encoders can be used to adjust parameters without the need to scroll through menus. Individual numeric indicators for each of the four parametric EQ bands show frequency and dB values directly below the encoders so you don't have to look at the LCD to ascertain EQ settings. Each channel may be named with four characters visible at all times, and a long name (up to 16 characters) displayed when the Sel button is pushed down and held. A set of Fader Mode keys allows the DM2000's channel faders to be switched between fader, aux send, or matrix level control, while Encoder Mode keys set the rotary encoders to pan, send level, and other assignable functions.

An optional meter bridge for the DM2000 features 48 twelve-segment LED meters that

YAMAHA DM2000

WHAT IS IT? A 96-channel digital production console with 24-bit/96 kHz audio and complete DAW control.

WHO NEEDS IT? Steve La Cerra...and quick! Audio and postproduction studios as well as surround mixing suites.

WHY IS IT A BIG DEAL? The DM2000 features Yamaha's proprietary DSP7 and DSP6 large-scale ICs, allowing it to retain the ability to run 96 channels at any resolution, including 24-bit/96 kHz.

SHIPPING: Second quarter 2002

PRICE: Under \$20,000 (DM2000, meter-bridge, and wood side panels)

CONTACT: For more information, contact Yamaha Corporation of America at 714-522-9000 or visit www.yamaha.com/proaudio.

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can be used individually or in pairs to display pre-EQ, pre-fader, or post-fader input channel signal levels, or level for the eight busses, 12 aux sends, and four stereo matrix busses. A separate 32-segment LED meter indicates L/R master bus level. A series of Display Access keys determine the information shown on the DM2000's LCD panel, including channel settings, digital I/O, routing, or utilities.

Signal routing in the DM2000 is extremely sophisticated. Digital cross-patching gives the DM2000 the ability to route any input, insert, effect, or output bus to any channel. A direct out function is available for routing any channel to any analog or digital output. Input channels as well as effects may be assigned to the eight record busses. Eight effect processors can be fed from any of the DM2000's 12 aux sends, or may be patched insert-style on any channel. A 22x8 (four stereo) matrix is

external computer.

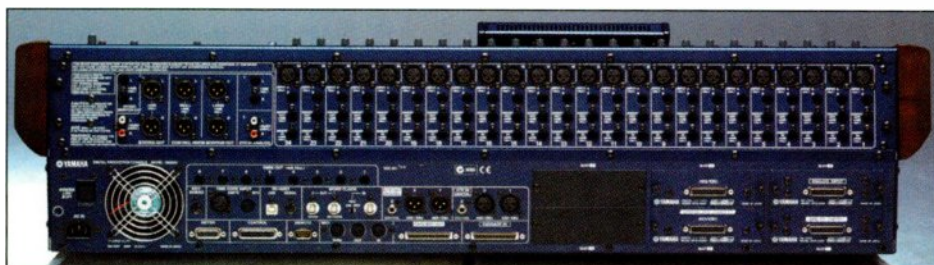
An onboard effects library includes algorithms for hall, room, stage, gate, and plate reverbs; delay, flange, filter, mod filter, amplifier simulation, pitch, rotary, chorus, and phaser, as well as a series of effects written specifically for surround sound mixing applications. Each of the eight effect processors has a dedicated access key that instantly brings up the parameters to the LCD screen for easy editing. In addition to independent compression and gating on each channel, six "patchable" 31-band graphic EQs are available.

Additional inputs may be added to the DM2000 via six mini-YGDAI card slots on the DM2000's rear panel. Complementing those cards already available, a new series of mini-YGDAI expansion cards from Yamaha has been developed for the DM2000, including the 24-bit/96 kHz MY8-AD96 (eight-channel analog input), and MY8-DA96

The DM2000 features two types of onboard automation. Up to 99 scene snapshots may be stored and recalled using increment/decrement controls (or the data wheel) for total reset of the desk, including routing configurations. Specific scene numbers may be assigned to any of the 16 user-definable soft keys for instant access to frequently used scenes. Dynamic automation is included in the form of Yamaha's Automix, which locks to external MTC or SMPTE timecode with 1/4-frame accuracy. Along with real-time fader and mute changes, Automix provides dynamic EQ adjustment, aux send level control, and effect parameter changes, plus the ability to "sequence" a series of scene snapshots for recall over the course of a song. Although not required for use of scene memory and Automix functions, Yamaha's Studio Manager software (available for Mac or PC) is available to complement the DM2000 by placing control of every parameter on the desk into a personal computer with a color, graphic user interface. Changes may be made in real-time or edited offline. Studio Manager includes a graphic EQ editor and a patch library for dynamics, EQ, and effects.

Yamaha has designed the DM2000 to function as a full-featured master controller for any DAW or for external machines such as multitrack recorders. Sony nine-pin and MMC protocols are supported, with dedicated transport controls and arm buttons for 24 tracks. The data entry wheel doubles as a jog/shuttle wheel for scrubbing audio. A specially designed "Pro Tools Remote Layer" assigns all 16 soft keys to specific Pro Tools functions, facilitating mixing, processing, and access to editing screens. Steinberg Nuendo control is under development, and Yamaha stresses the fact that any DAW can be accommodated through appropriate assignment of MIDI control messages.

Other features of the DM2000 include a dedicated timecode display, talkback and slate functions, 100 millimeter, touch-sensitive motorized faders, and a cascade port for linking two DM2000's together. A Smart Media Card slot allows the contents of the DM2000's memory to be backed up or off-loaded for use in another DM2000. ■



provided for zone mixing, cue mixes, or "downmixing" purposes. Patch routing graphics may be displayed on the LCD panel for an instant visual indication of routing.

Rear-panel jacks include balanced analog outputs for the master L/R mix; studio, control room, and alternate monitors; eight "Omni" outputs, and two analog two-track returns (one balanced, one unbalanced). The Omni outputs are "floating" and may be assigned to output whatever a user requires, such as aux sends 1 through 8. Digital I/O is provided via S/PDIF and AES/EBU jacks. Onboard sample-rate conversion allows the digital output of a CD player to be monitored or routed to any channel without the need for the CD player to sync to a master clock. Jacks are also provided for word clock in and out, SMPTE and MTC timecode input, MIDI in/out/thru, and serial and USB "to host" jacks for connection to an

(eight-channel analog output). Cards are also available to accommodate TDIF, ADAT, and AES/EBU digital I/O. The DM2000 also accepts third-party cards such as Apogee's AP8-AD (eight-channel analog input) and AP8-DA (eight-channel analog output), or the Waves Y56K effects processor card.

For ease of use in multichannel mixing situations, the DM2000 features bass management and facilities for speaker alignment, 5.1 monitoring level control, a joystick with 128-x128-step resolution for surround panning, and the ability to mute, attenuate, or even delay individual speakers for time-alignment purposes. A "downmatrix" can deliver 3-1 (LCRS) and stereo mixes from a 5.1 mix. The 3-1 output may be fed to a two-track recorder via Dolby Surround encoder, and then back to the console via Dolby Surround decoder for instantaneous comparison between pre-encode and post-decode signals.

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CIRCLE 71 ON INFO CARD

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(L-R) Producer Dann Huff, Jewel, and engineer Jeff Balding

By Lisa Roy

Jewel Acoustic Guitar

For engineer Jeff Balding, it's a string thing

"Since Dann and I have been working together, acoustic guitar is an instrument that I get to record a lot (being in a town that has great guitarists with great sounding instruments is a pleasure)," boasts Jeff Balding. "In the past few years I've recorded acoustic guitar on virtually every record I've done. (Yes, even Megadeth!) It goes without saying that I've had plenty of opportunities to experiment with different techniques. In fact, when I did the *Breaking Silence* album with Janis Ian, we spent a lot of time experimenting with different techniques and ideas on acoustic guitar. One thing we stumbled upon was placing several acoustic guitars on stands around the player to increase the sympathetic tones.

"Jewel is into a lot of the technical aspects of recording, which made communication real easy between us. John Willis got the call to add his flavor to the acoustic guitar part. Between Jewel, a guitar player herself, and Dann's talents as a guitarist, this really put the pressure on me and John to hit the mark. When we started the

record, we talked about what directions would be great. Jewel was really a big fan of analog and wanted to have a mix of rawness as well. With this in mind we put the game plan into action. With [Digidesign] Pro Tools being such an indispensable tool in recording today, I made the usual reassurances that I could make this record feel analog, even though we were recording digital. In regard to that, I spoke to my good friend Keith Thomas last week, and he was sure I had cut this record on analog."

SIGNAL PATH

"Before I even start with the signal path, I want to let you in on the secret of a great acoustic guitar sound...a great sounding acoustic guitar," confides Balding. "The room is the next obstacle. You need a room that doesn't close the sound down or muffle the resonance of the guitar; size is not necessarily an issue. On 'Standing Still,' John weeded through his massive collection of acoustic guitars and chose a Gibson J200 (with new strings...which John will tell you is very important).

"Since we were looking for something that was raw and earthy, yet sonically satisfying, I immediately went to a combination of an Audio-Technica AT4051 and an old condenser mic that I found at a garage

DATE: 5/19/2001

STUDIO: Sound Kitchen, Big Boy Room

LOCATION: Franklin, TN

ARTIST: Jewel

PROJECT: *This Way*

TRACK: John Willis playing acoustic guitar on "Standing Still"

PRODUCER: Dann Huff

ENGINEER: Jeff Balding

ASSISTANT ENGINEER: Jedd Hackett



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CIRCLE 198 ON INFO CARD
World Radio History

Additional Tracks Tracks on Reel Date: 5-17-02 of Studio A		Title Standing Still Artist Jedd Client Atlantic Records Producer Dann Mann Engineers Jeff Balding		4874 30 min Start Time 2:00 End Time 2:15 Tempo 120 BPM Level 2.0 @ 0dB Sample Rate 44.1K Reel 1 Cut 1 Key D VSO Speed			
1	2	3	4	5	6	7	8
- Kick -	- Snare -	Hat	Tom	Tom	Tom		
9	10	11	12	13	14	15	16
- OH -	- H -	- R -	- R -	- R -	- R -	- R -	- R -
17	18	19	20	21	22	23	24
Take 1	Jerris	Snare	Snare	Snare	Snare	Snare	Snare
25	26	27	28	29	30	31	32
Take 1	Kick	Analog	Take 1	Take 1	Take 1	Take 1	Take 1
33	34	35	36	37	38	39	40
Crashed	Crashed	Crashed	Crashed	Crashed	Crashed	Crashed	Crashed
41	42	43	44	45	46	47	48
Cells	Cells	Cells	Cells	Cells	Cells	Cells	Cells

sale. The only thing written on this mic is the letters R-SP. I have no idea what brand it is. In fact, I figured the 'R' stands for Radio Shack, and the 'SP' stands for stereo pattern. For the preamp, I chose a Neve 1081. For this song I also decided to add a compressor that could bring the sound forward, but not destroy it; an API 2500 did a great job. (This gave me the option of squashing the hell out of it later if I wanted.)"

MIC POSITION

"There are a lot of different ways to mic an acoustic guitar," states Balding. "Sometimes it just depends on what mood you're in (that's the creative side of me speaking). For 'Standing Still,' I placed the two mics side by side somewhere between the hole and where the neck ends on the body of the guitar, then about 10 inches back away from the guitar. Distance may vary depending on whether the guitar is boomy or bright, or what type of sound you're looking for."

PROCESSING

"With a great sounding guitar and unbelievable mic placement, there's not much else for you to do, but, alas, you have to look like you're doing something to deserve engineering credit," explains Balding. "I didn't do much EQ, because not much was needed. I used the compressor to bump the hard slams a little with a low ratio and 1 or 2 dB of compression. The API 2500 is very versatile and has an extremely musical quality."

TRACK NOTES

Balding concludes, "When we tracked this record, we cut one song

a day. Most of the time was spent on pounding out the arrangement. At the end of the day, we had the song pretty much finished and ready to mix. Dann likes to keep several good takes along with the master take, and then pull the great licks or fills from those other takes into the master. This really allows more freedom for the musicians and takes some of the pressure off if everyone doesn't have that great take at the same time. This also preserves several vocal performances for Dann, so you don't lose the great vocal pass if the band didn't have their great take. That's where Pro Tools really shines. Having that flexibility to go between takes with ease and really getting the ultimate single performance. I think Pro Tools allows you to make better records (not cheaper records), because, ultimately, we are in the business of trying to always put out a quality product!

"Something I would like to do, that isn't done often enough, is say thanks to some of the support team that makes recording an album very smooth: Jedd Hackett, Mike Griffith, the staffs at Emerald Studio, Sound Kitchen Studio, Oceanway Studio, Audio One, and Underground Sound Rentals. Making a record would not be nearly as enjoyable without the right people involved."

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Yamaha is a registered trademark of Yamaha Corporation. All rights reserved. *Estimated street price **Dual stereo returns feature EQ but no dynamics

CIRCLE 33 ON INFO CARD

World Radio History



By Steve La Cerra

Michael Whalen

Toys in the Attic

STUDIO NAME: The Attic Studios/Michael Whalen Music, Ltd.

LOCATION: Boston, MA

KEY CREW: Michael Whalen

CONSOLES: Yamaha 02R [3], Digidesign Pro Control

RECORDERS: TASCAM DA-88 [2], DA-45HR DAT [2]; Yamaha CD-R

MONITORS: Genelec 1031A [2], 1030A [5]; Event 20/20, Auratone Cubes

EFFECTS: Lexicon 960, JamMan; "Zillions of plug-ins for Pro Tools," MoogerFooger stomp boxes, Electro Harmonix Memory Man

OUTBOARD: Avalon AD2022 mic preamp, Amek/Neve 9098 dual mic preamp

MICROPHONES: Neumann M 149 [2], TLM 103 [2]; Shure SM-57

VIDEO: Sony A-500 Digi Beta, UVW-1600 Beta SP, UVW-1800 Beta SP, SVO-5800 S-VHS

KEYBOARDS/SAMPLERS/MIDI:

Synclavier 9600 (96-voice) with 756 MB RAM; Akai S6000 [3], NemeSys GigaSampler Studios [2], Roland VP-9000, JV-2080 [3], JD-990 [2], XV-5080, JP-8080; Kurzweil K2500R, K250RMX [2]; Yamaha EX-5R, Motif-7, DX-1, S-80, WX-11 MIDI Wind Controller; Korg Triton, Electribe ES-1; Studio Electronics Omega-8, Big Briar Minimoog Voyager

DAW EQUIPMENT: Digidesign Mix 24 [2], 888 [4]; MOTU 2408

COMPUTERS: Apple G4 [5], IBM Intellistation (600 MHz)

SOFTWARE: Synclavier 5.1, Coda Finale 2001, Digidesign Pro Tools 5.1, TASCAM GigaStudio 160, Sonic Foundry Acid, Apple Final Cut Pro, MOTU Performer

STUDIO NOTES: Michael Whalen says his studio was "built for speed. I went through a period of having gear as eye candy, but now it's about having less gear with the same capabilities. I did the wiring design and layout, with much of the equipment hardwired to the Yamaha 02R's for quick access without patching. In the past 18 months, I've done 40 projects (including three major films), so there's a need to work quickly. Because so much of my composing and recording is done to picture, having clear sight lines to video is extremely important. I have a main video monitor, a Sony Pro color-corrected monitor, and a Sony projection unit against the far wall. Wherever I turn, I have the ability to see picture to make sure that it's married to the audio. Some composers write away from the picture for too long a period, but I don't find that effective."

EQUIPMENT NOTES: "I have been using the Synclavier for 13 years, and I rely upon it heavily. I've owned or listened to every sampler and nothing is in the same realm — plus I have amassed quite a col-

► continued on page 112



Visit the Michael Whalen Web site at
www.michaelwhalen.com

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CIRCLE 80 ON INFO CARD



PHOTOS BY WES BENDER.

By Britt Strickland

Willie's Place

Sound designer/
musician/
composer
Willie Wilcox's
new solution
for an old
problem

MIXING CONSOLE: Digidesign ProControl (at the USA/Sci-Fi Channel Studio), Control 24 (Willie's Place)

MONITORING: Tannoy 800A XL Active [2 pr.], Sennheiser HD 250 Linear MK 2 headphones [4]

MICROPHONES: AKG C414b-TL2, C4000b

OUTBOARD: Line 6 Pod Pro, Bass Pod, Echo Pro; Midiman Super DAC 2496

SYNTHS/SAMPLERS/MIDI: Korg Triton (76 key), Midiman Midi Sport 8x8 [2], Delta 1010; Clavia Nord Rack 3, Ddrum 4 pads/brain, Emu XL-7 Command Station

COMPUTERS: Apple G4 733 with SuperDrive and 80-GB IDE internal drive, Dr. Bott DVlator [2], Apple Studio 17-inch displays [2], Soundchaser PC, Apple G3

DAW EQUIPMENT: Digidesign Pro Tools Mix³, 888 24 I/O, 1622 I/O [2]; Club Mac 80-GB FireWire hard drives [2]

SOFTWARE: Digidesign Pro Tools 5.1, Reverb One; Waves Gold Bundle, Renaissance Collection 2, Restoration; Line 6 Amp Farm, Echo Farm; Gallery Alkali, Mtools, Virtual VTR; Wave Mechanics Ultra Tools, Wave Mechanics Speed, Sound Blender, Pitch Blender; Access Virus, TASCAM GigaStudio, Sonic Foundry Acid, Propellerheads Reason

SYNCHRONIZATION: Aardvark Aardsync 2

ERGOTRON MIX COMPOSE WORKSTATION 76

WORK SURFACES: 48 x 30 inches for each

workstation

OVERALL HEIGHT: 54 inches

RACK SPACES: 48

COMPONENTS: LAN3000 modular workstation, Desk Clamp 300 series flat-panel monitor arms with extension speaker arms and tilt platform, cable management system

CONTACT: Ergotron, www.ergotron.com

PRICE: Not available at press time

The urge to settle into one professional discipline is strong, and the path of least resistance certainly does have its charms. But for composer/producer/musician/inventor Willie Wilcox, the status quo isn't quite seductive enough, and he continues to display a persistent drive for technical as well as creative progression in audio recording, musical composition, and yes, even studio furniture design.

Starting his career as a drummer with Hall and Oates and later doing sessions with Mick Jagger and Transvision Vamp, Wilcox went on to become a member of the band Utopia, working with Todd Rundgren and the other members of the group and recording, producing, writing, drumming, and singing on more than fifteen albums. Five major publishing deals as a writer/producer led to successful work with the likes of Pointer Sisters, Luther Vandross, Natalie Cole, Stacey Q (#1 dance record), and Meatloaf. Currently, as the senior sound designer and music composer at the Sci-Fi Channel and

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CIRCLE 45 ON INFO CARD
World Radio History





USA Cable, Wilcox's restless talents have found a home that affords him a fitting range of new and interesting challenges. Any day could find him writing and producing an orchestral score for one of the channel's *Exposure* short films, or utilizing a variety of musical genres and audio technology to sound design the latest "I am Sci-Fi" celebrity trailers.

"You have to wear a lot of different hats," says Wilcox. "Sometimes I am doing drum 'n' bass stuff, and sometimes it's techno stuff. Sometimes it's heavy guitar-oriented tracks." Always a proponent of the organic "artistic flow" of live performance, Wilcox often adds live drum parts via his Ddrum 4 set to the compositions he creates on his Korg Triton keyboard. "There are a lot of different things that you are called upon to do, so I have to use different tools to facilitate those styles." Finding the right tools to do what he does has led Wilcox to use a variety of DAW setups and configurations. Currently he has two nearly identical DAW workstations. One is at the USA

Sci-Fi studios in Jersey City, NJ, and the other is at Willie's home studio in Lebanon Township, NJ, better known as Willie's Place. For video and audio file exchanges between these two locations and the USA studios in Los Angeles, Wilcox uses Sci-Fi's and his own FTP site.

Managing these various DAWs and multimedia formats has led to a true appreciation of proper syncing. "When you have jitter-free clocking of an entire system, like the Aardsync 2," stresses Wilcox, "it really tightens up the entire imaging." But there was one remaining obstacle that he wanted to overcome.

FENG SHEI FOR THE AUDIO-INCLINED

"There are a lot of guys that are composing music and are audio engineers," Wilcox explains, "and they are doing it simultaneously. I think, obviously, the advent of the computer has spawned this new individual. Based on that, there has to be a lot of people exactly like myself that have encountered the same kinds of problems."

One of these problems is the challenge of ergonomic gear placement, and the accessibility of all aspects of an engineer's workstation.

"Technology has made a lot of us loners. You end up doing all this stuff by yourself and you need to be able to have your hands on everything. Prior to now, it seemed impossible for me to be able to get to everything." One solution that Wilcox envisioned was a complete re-take on how the actual skeleton of the workspace was constructed — a literal redesign of the furniture that holds the recording equipment was required. The result is the Mix Compose Workstation 76.

For Wilcox, the first stop was Ergotron, a company known for developing computer-related furniture and ergonomic solutions for business and healthcare environments. "With my



For more on Ergotron furniture go to www.ergotron.com; for more information on Willie Wilcox visit www.williewilcox.com.

audio experience and Ergotron's product solutions, there was a perfect pairing." As the pro audio design consultant on the project, Wilcox worked with the Ergotron team on every aspect of the workstation, trying to make key components flexible and accessible to the DAW user.

"Whether you're sitting at the composing station or mixing station, you just grab the two flat-screen monitors that originate in the corner of the workstation unit, which are attached to two articulating arms, and swing them to either station location. No more looking up or straining to view your software. The user puts the monitors where he or she wants them. The same monitors service each station!"

Writing, performing, and producing music to accompany on-screen images often forced Wilcox to compromise ideal stereo positioning with his monitors. This, too, was something he addressed. "Each stereo pair of speakers is suspended from the workstation frame and can be moved into the ideal position for the user. The user is no longer restricted to fixed height and width for playback monitoring. Even the worksurfaces are adjustable. It is a completely modular system."

The Mix Compose Workstation is slated to be available in the first quarter of 2002. In the meantime, Willie is also involved in an artist development project with Click Model Management, as well as a unique band project in collaboration with a graphic artist and a producer. "I'm constantly in the process of re-inventing myself, otherwise I am incredibly bored," says Wilcox. Not surprisingly, the urge to "settle" is nowhere to be found. ■



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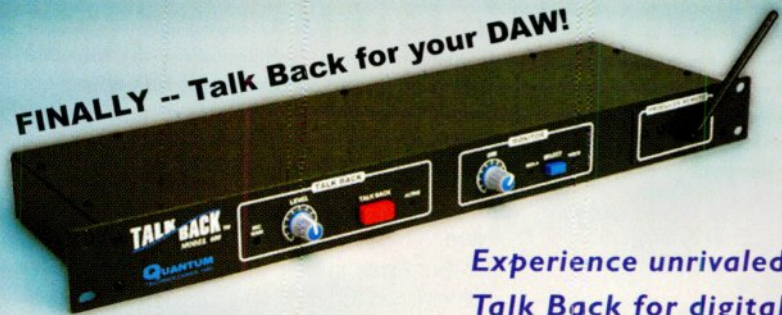
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CIRCLE 25 ON INFO CARD

Leonard Cohen, Laurie Anderson,
and more

Leanne Ungar



MR. BONZAI

SUSPECT:	Leanne Ungar
ANCESTRY:	Father: Hungarian-speaking Jew from a Transylvanian village. Mother: Cleveland.
OCCUPATION:	Producer/engineer
BIRTHPLACE:	Worcester, MA
RESIDENCE:	Sherman Oaks, CA
VEHICLE:	Used
DIET:	"Amazingly, no caffeine."
PET PEEVE:	Gas-guzzling, view-blocking SUVs.
NOTES:	Ungar began her career at Sound Ideas in New York. After a stint at Montreal's Le Studio, she returned to New York and joined the staff at A&R Recording. Her independent recording career began with a series of film and album projects produced by John Lissauer. Ungar has worked with Cat Stevens, Loudon Wainwright II, Janis Ian, Leonard Cohen, Laurie Anderson, The Temptations, Fishbone, Holly Cole, Joe Henderson, Adam Cohen, Guster, Joy Askew, Carlene Carter, Willie Nelson, Big Mountain, Luther Vandross, Natalie Cole, Vonda Shepard, Tom Jones, The Paul Winter Consort, and many others. Film scores include <i>Matewan</i> , <i>Passion Fish</i> , <i>Pump Up the Volume</i> , <i>Kafka</i> , <i>The Underneath</i> , and <i>The Limey</i> , among others.
CURRENT CREDITS:	Leonard Cohen's live album, <i>Field Commander Cohen</i> , was produced by Ungar. She also recorded Cohen's new studio album: <i>Ten New Songs</i> .
SUSPECT CONTACT:	studioexpresso.com

BONZAI: How and why did you become a recording engineer?

UNGAR: I studied the flute and ballet as a child. I never once considered how sound got onto — at that time — vinyl. I had dropped out of college and moved to New York to pursue a career in dance. It took me about three months to find I disliked the ratio of low dollars to high pain.

But I was in love with New York and was determined to find a way to stay. I had musician friends, and the first time I walked into a studio for their demo session I fell head over heels for the whole scene. This was Richard Factor's Eventide Studio, 1972. There was a small recording studio at the publishing house where I had a temporary job. My friends and I started going in at night and making tapes. Eventually, the publisher hired and trained me, and I took the IAR course, which at that time was only 10 weeks. What I really wanted was a job in a big — at that time — 16-track studio. I took my resume to Sound Ideas, and about a month later they called. Ironically, the dollar-to-pain ratio of the assistant engineer is about the same as a dancer's.

Can you describe the mood in this workshop when Mr. Cohen steps up to your microphone?

Leonard is searching for a character who embodies the story of the song. I am waiting to meet that character, to believe him. Sometimes it happens right away, sometimes after much searching. In the past, working in various studios, there was a healthy dose of approach/avoidance in the process. On *Ten New Songs*, a certain level of intimacy and comfort was achieved due to his being able to work at home.

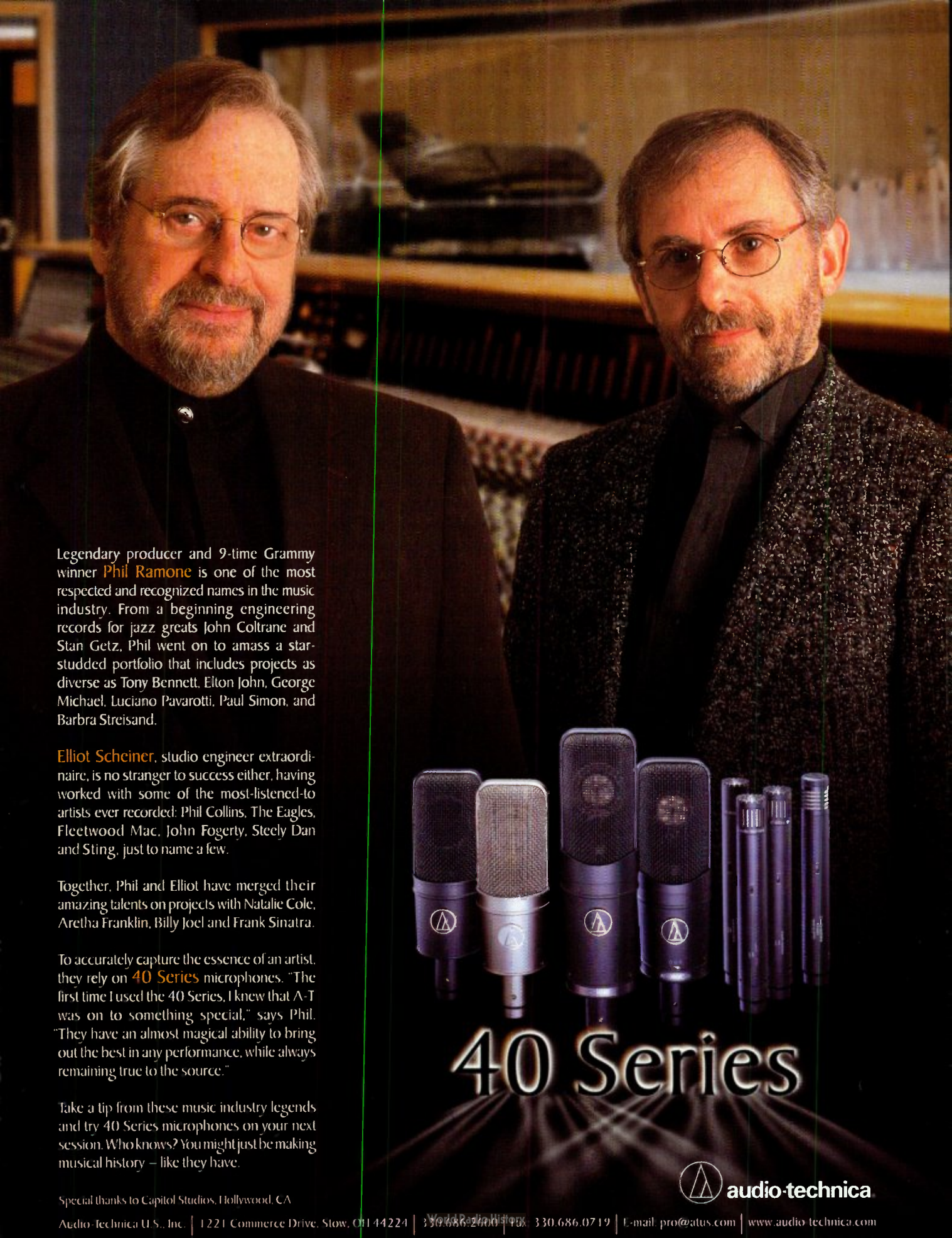
Sharon Robinson, who produced the record, and I would set up a rough mix and vocal sound he was comfortable with, and then we would leave. He was able to record whenever the mood struck, most often at 3:00 AM, his normal rising time. He would put down track after track on a [TASCAM] 24-bit DA78, whispering into the mic alone in the quiet of night. This also worked well for me, as the studio wasn't really soundproof, and it cut down on the amount of dog barks and helicopter passbys I had to edit out. We would come back much later and the three of us would sift through, find the performance, and transfer it into [Digidesign] Pro Tools.

Sharon collaborated with Leonard on the writing of all ten songs. He wrote the lyrics and she wrote the music. She has a Pro Tools setup at her place, too. The hard drive would go back and forth for many revisions as the arrangements grew. Most of the sounds are samples that she played. When you listen to the backing tracks, you can hear that she created incredibly dense and complex rhythms that still are able to hang back and allow the lyric and voice to be the focus.

What are your preferred recording tools?



Leanne Ungar and Leonard Cohen



Legendary producer and 9-time Grammy winner **Phil Ramone** is one of the most respected and recognized names in the music industry. From a beginning engineering records for jazz greats John Coltrane and Stan Getz, Phil went on to amass a star-studded portfolio that includes projects as diverse as Tony Bennett, Elton John, George Michael, Luciano Pavarotti, Paul Simon, and Barbra Streisand.

Elliot Scheiner, studio engineer extraordinaire, is no stranger to success either, having worked with some of the most-listened-to artists ever recorded: Phil Collins, The Eagles, Fleetwood Mac, John Fogerty, Steely Dan and Sting, just to name a few.

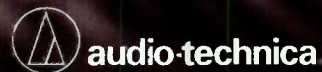
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I have always been a vintage Neve, tube-mic-type person, but the focus of recording has to be the song, the mood, and the performance. So I've always made it a point to keep the recording methods from intruding. Analog and digital are just storage mediums. They both have sound problems that need to be worked around, and I can go either way. With digital, I'm usually looking for warmth and depth, while, with analog, I'm chasing after high end and avoiding noise.

What gear do you carry with you to sessions?

I have a Neumann tube 47 that I sometimes use on vocalists or solo instruments.

It always sounds big, and can take a tremendous amount of level without the capsule sounding collapsed. I also have a pair of AKG 451's that I use in stereo and are very versatile on percussion and acoustic instruments. I don't own lots of gear. I like to play with other people's toys.

As producer of *Field Commander Cohen*, what was required?

The *Field Commander Cohen* tapes were beautiful recordings done by Henry Lewy in England in 1979. There were four concerts on two-inch tape, still in very good shape. We listened to rough mixes made the night of the concerts, comparing the various versions of each

song. Some songs had one standout magical performance that was apparent on first listen. "The Smokey Life" was one of those. Other songs were good on every night, and it took repeated listenings to discern the favorite performance. [Our pick for] "The Stranger Song" had a huge mood-spoiling thud about halfway through the song, so I looked for a place where I could edit in that line from another version.

When I had a list of all the possible songs we might use, I transferred them onto a hard drive and brought them into Pro Tools. Once I had access to each individual track, I was able to clean up lots



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of extraneous noise, feedback, even some musical indiscretions. Some songs improve more than others when you finally get inside the tracks — and sometimes bigger problems are revealed. The thud on “Stranger Song” disappeared, so I never had to edit it. There were a few things I did edit, however, to bring all the best bits together. Having assembled all the magical moments, I tried to remedy anything that distracted from the magic. Then the tracks went to Bill Schnee for the final mixing and fairy dusting. Being able to work with another mixer, especially one of his caliber, was extremely rewarding for me.

What is Laurie Anderson’s modus operandi in the studio?

Laurie is one of the most energetic, driven people I’ve ever worked with. Often, I would leave her studio after midnight, exhausted, having worked 12 to 14 hours. She would be pulling out a new project as I left, a tray of slides, or writing, or — most amazing of all to me — getting the vacuum to do a bit of housecleaning!

She is using DAWs now, but, at the time (the early '80s), we used all kinds of methods to capture and manipulate loops. Tape loops forward and backward, the Synclavier, the first sampling keyboard. The famous “Superman” vocal sample was captured in a [Eventide] 910 Harmonizer. Every time she would perform the song, she would trap a new “ha” in the delay.

We had one song where the loop was a grouping of 17 piano notes, counted over a bar of 11 beats. This was the rhythm track, and my job was to punch in as we recorded other instruments. We ended up giving each note a letter, A through Q, and we would sing the alphabet over and over as we worked. “Okay, punch in at M” — it couldn’t be counted numerically. When the song was finished, it was mixed without the loop, and no one ever heard it but us. I still sing it when I hear the song, “Langue D’Amour.”

Who were your recording heroes when you were getting started?

From the point of view of achievement, the women artists of the time: Joni Mitchell, Laura Nyro, and Bonnie Raitt. From an engineering perspective, I was inspired by the way Alembic was hand-making electronics gear for the Grateful Dead and knocked out by the Todd Rundgren records that he recorded by himself. That’s when I really started thinking of the artistry present in the craft of recording.

I loved the British records — the Beatles and Glyn Johns’s recordings. I thought Roy Thomas Baker made amazing sounding records. But I really loved the trashy sounding records too — the Kinks, “The Bird Is the Word” by the Trashmen, the Phil Spector records from my childhood.

Who do you respect and admire?

I’ve always admired the work of Bob Clearmountain. I think Chuck Ainlay makes beautiful, warm records.

► continued on page 112

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Using delay to create those in-between notes

Delay Subdivisions

by Jon Chappell

Most people regard their trusty delay unit as an echo or ambient processor, but it can act as musical tool, too: a cascader, arpeggiator, and tremolo picker. The key is to think of your delay as a digital recorder, and the tempo in terms of delay times. Once you know how to convert tempo (beats per minute, or BPM, and rhythmic subdivisions) to milliseconds (delay time), you can create some really cool effects.

CLONING NOTES WITHOUT CONTROVERSY

Most delay tricks require that you set the feedback control, or the number of repeats, to one. That means you will hear only one discrete repeat of your sound. The other fixed setting is the delay level. Set the level of the effect so that it's the same volume as the original note. In other words, an exact clone.

TIME PASSAGES

Now you're set to start fiddling with the time. First, consider the tempo of the song. You have to sync yourself to a steady tempo, or you won't be able to set the delay time accurately. Let's take the tempo of $q=120$. That means that there are 120 quarter-notes in a minute's time. Since a minute is 60 seconds, you divide 60 by the tempo to get the rate of a single beat (in this case, a quarter-note) in seconds.

Using our example, divide 60 by 120 to get 0.5 seconds. At this tempo, a quarter-note occurs every 0.5 seconds. You've just converted tempo to seconds. However, for delay times, we need milliseconds, so multiply the time in seconds by 1,000. At a tempo of 120, quarter-notes occur every 500 milliseconds.

Expert tip: If you want to do the conversion in one step, divide 60,000 by the tempo.

ENOUGH MATH, WHERE'S THE MUSIC?

If you set your metronome at 120, your delay time at 500 ms, and begin playing quarter-notes, you'd be playing along in rhythmic unison with yourself. Not very exciting. But if you change the delay time to 250 ms, then the delay would spit back an eighth-note repeat of your quarter-note. To the listener, it would sound like you were double-striking eighth-notes. Imagine being able to play a boogie-woogie bass line in that double-strike fashion, but having only to play in quarter-notes. I actually had to do

tremolo picking, like on a mandolin.

CASCADE: A DISHWASHING SOAP AND A DELAY EFFECT

One of the most famous uses of delay for subdivision work is the "cascade effect" made famous by guitarists Eddie Van Halen on "Cathedral" and Albert Lee on "Luxury Liner." It's a popular guitar stunt, but you can do it with any instrument. The trick is using the correct subdivision and the proper musical line. The subdivision is a dotted eighth-note delay, and the line is played in eighth-notes. That causes the

TABLE 1

BPM	TEMPO IN MS	DIVIDE BY...	TO GET...	WHICH FALL ON...
120	500	1	Quarter-notes	0 ms, 500 ms
120	500	1.33	Dotted eighth-notes	0, 375
120	500	2	Eighth-notes	0, 250
120	500	3	Triplet eighth-notes	0, 166, 333
120	500	4	Sixteenth-notes	0, 125, 250, 375
120	500	6	Triplet sixteenth-notes	0, 83, 166, 250, 333, 416

this on a gig once. The tempo was so fast and the segment so long (there was an extended vamp as the singer worked the crowd) that I quickly fatigued. A delay was the perfect solution. The trick was getting the drummer to count off consistently.

It gets better. What if our boogie pattern wasn't in straight eighths, but in *swing* eighths (also known as jazz eighths or shuffle)? Simple. You just change the delay time setting to 333 ms. Now when you play quarter-notes, your repeated note will be spit back as the third note in an eighth-note triplet group — the definition of swing eighths. To derive any subdivision of the beat, take your quarter-note and divide it by the number of times the subdivision occurs in the beat. Table 1 uses our example of 120 BPM.

To get more than one repeat out of your delay, set the feedback to produce the desired number of repetitions. For example, five repeats (or using a five-tap delay) at sixteenth-note triplets is a great way to emulate

delay to spit back the repeat on the in-between sixteenth-notes. Try this example: Set your drum machine or metronome to 120. Set your delay time to 375 ms. This produces a dotted-eighth-note delay. Then play an eighth-note line. If you've got the parameters set correctly, you'll hear the cascade effect: a sixteenth-note melodic sequence spilling out of your monitors while you're just playing eighth-notes.

You can hear delay used as a tempo-specific note-repeater in many pop songs, played by a variety of instruments. Phil Collins used it on his voice in "Follow Me," and U2's The Edge is the delay-subdivision master. Try experimenting with your own eighth-note lines on the cascade effect, or make up new subdivision solutions for the options listed above.

Jon Chappell's has such poor short-term memory that he keeps his DDL on 500 ms just so he can remember what he played a half-second ago.

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The Job Jacket

By Jim Bordner

As my business grew, it got to a point where just keeping up with the phone, the filing, and the FedEx was a part-time job, and was seriously cutting into my productivity. My wife Lisa joined This Thing of Ours as my assistant and project manager.

Now, Lisa is a very analytical and task-oriented person, and when she saw how I was keeping track of project information (that is, carrying it around in my head), she had the project manager's version of a coronary. Not to mention that most of her job depended on getting information from me. I was spending almost as much time communicating to her what needed to be done as I used to spend simply doing it myself. Clearly, something needed to be done.

No point in reinventing the wheel, we figured. I used to work for ad agencies, and every one of them used the same system to keep track of all vital job information: a traveling pouch called a "job jacket." (Or job pouch or job ticket, depending on where you work.) Even if you work alone, a job jacket makes so many daily tasks easier, it makes sense to set one up that's tailored for your operation. Here's what a job jacket is and how to use it.

Physically, the jacket is just an envelope with an information form on the outside. Most agencies I worked for went to the trouble of designing a custom envelope and having them printed in massive quantities, but we just bought a box of heavy-duty manila envelopes and designed an 8.5x11-inch sheet we tape on the outside.

On the outside: Your form should include spaces for all the at-a-glance information you may need. Depending on your operation, that

may include:

- A job name and number (which will become your invoice number when the job is closed).
- Client contact info (names, titles, addresses, phone, email).
- Deadlines or session dates.
- Billing information: supplies, outside talent used, studio time, creative time, whatever you may create, pro-

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TASKS EASIER, IT
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vide, or resell.

On the inside go your notes from meetings (live or phone), printouts of emails, invoices pertaining specifically to the job, time sheets, track sheets, licensing agreements...well, no point in making a list. You just put everything pertaining to the job in the jacket.

There. Now you have a central place for project information. So what's the big deal? How does this

improve productivity and profit?

In daily practice, the job jacket eliminates a phalanx of profit-robbing biz problems. For example, let's say your voiceover guy is billing through you because you quoted one price for the whole project. You kill and bill the spot, but the VO guy was a little slow in sending his invoice, and when you get it, you realize you forgot to include his charge in your invoice. With a job jacket, you would have written him down on the outside, and when you billed, you would have scanned the jacket and said, "Hmmm...I wonder why Dave hasn't billed me?"

Or imagine that you're out of town when a client calls with a problem on a nearly completed job. Your assistant takes the call, and, unless you've had a specific conversation about this project, all he or she will be able to say is, "Well, he's out of town." With a job jacket handy, he or she can pull the file and confidently say, "Well, according to Jim's notes...."

It helps you control costs. It lets you see if a job is staying profitable *while the job is in progress* (a real help when you get into one that drags on and on). It gives you a central reference point when working with clients, and it makes invoicing a snap.

We've even designed our outside jacket form so it can be used as an estimating tool. The estimates live in Lisa's in-box until we get the okay, and then she just gives it a job number and slaps the ticket on a new jacket.

It may be hard to see the advantages from my description, but when you put the tool to work, the advantages will become immediately obvious. Give it a try, and let me know what ideas you came up with while designing your own job jackets. ■

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MORE POWER to You

by David Frangioni

During the 15 years I lived in Boston, the worst power problems I encountered were a couple of blackouts and a few brownouts. Then I bought a house in South Florida, where the electrical problems are both numerous and intense. I was in a technologically advanced part of the United States with third-world power — not the best combination when you have hundreds of clients, and everything that you service and install uses electricity. But even one power problem can cause irreparable damage, so no matter where you live, here are some tips on coping with power problems.

PRACTICING SAFE POWER

Prior to even specifying a recording studio or home theater setup, I analyze the power needs and first work on lightning (i.e., high voltage surge) protection. Spikes and lightning aren't easy to suppress in "the lightning capital of the world," so where do you start?

First, calculate approximate amperage usage. Are you trying to protect a 15-amp load or 100 amps? Either way, one of the best and most reliable solutions is the SurgeX line of products [www.surgex.com]. They make standalone products such as the SX15-iR2, which can handle 15 amps without having to install anything new at the electrical service panel. For larger installations, they make panels such as the SX20-NE. This installs in the electrical room and is able to stop multiple surges of up to 6,000 volts (and unlimited surge current) without producing ground contamination. Lightning ceases to be a problem, as these units will go before anything (or anyone!) does.

Even more common, and universal throughout the world, are the daily dips and peaks your gear must withstand. On any given day, your studio's voltage may go from 105 to 130 volts, so always use dedicated circuits for your electronics.

This means that your studio, home theater, computers, and so on should get their power from outlets that go directly to a circuit that is not shared by any other equipment. In a perfect world, there would be sub-panels with all circuits in that panel feeding only electronics. In many installations, the sub-panel ranges in capacity from 60 amps to 200 amps. Typically, there are 20-amp circuits that fill the panel, with each one distributed to

“ON ANY GIVEN DAY,
YOUR STUDIO'S
VOLTAGE MAY GO
FROM 105 TO 130
VOLTS, SO ALWAYS
USE DEDICATED
CIRCUITS FOR YOUR
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certain outlets throughout the installation.

Once your equipment is isolated, protect it. Line noise, voltage drops, and extreme spikes are usually by-products of the local power company; while you can't prevent these from happening, you can install equipment that protects equipment from being adversely affected by power anomalies.

Recently, I have been using two wonderful Monster Cable products [www.monstercable.com]. While marketed for home theaters, they work great in any application involving electronic gear.

The Monster HTS5100 is primarily for line filtering and isolation. This unit has

five pairs of outlets, each with a unique filter. The filters are:

- High current audio
- Video
- Analog Audio
- Digital filter 1
- Digital filter 2

Each filter is optimized to reduce noise generated by the specific type of equipment. This unit is especially useful when conditions make it impossible to use dedicated circuits (i.e., when renting warehouse space or working in an apartment).

Monster's AVS2000 effortlessly regulates the AC voltage, up to 15 amps. If the voltage falls below 86 volts or rises above 134 volts, the unit will shut down so that your gear never sees the abnormal voltage. All other voltages are regulated, and output at a pure 120 volts. I use three of them in my studio and home theater, and at least one in all my recent installations; they are awesome. A handy front-panel readout displays power consumption and voltage regulation.

Recently, Julio Iglesias needed to relocate his studio in the Dominican Republic, which has very iffy power — but the HTS5100 and AVS2000 solved every problem we encountered. The only other device we needed was an uninterruptible power supply (UPS) for the computer to cover possible blackouts.

THE NEVER-ENDING STORY

Power is one aspect of the studio installation environment that always presents new challenges. Be aware of what is necessary before plugging in your equipment to avoid harming your investment and your music — lost ideas are priceless.

Until next time, visit the EQMag.com Studio Tech Web forum to discuss all technological matters.

David Frangioni, studio tech to the stars, has recently finished studios for Mike Shipley, Journey, Aerosmith, and NBC.

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How to create a mini remote mixer/fader
for your studio for \$25

The Mixball

by Jeff Boller

Mixing on a digital audio workstation with a mouse doesn't even come close to moving hardware faders on a real mixing board. Hardware manufacturers have rushed to fill this void with "human interface" remote controllers, but they tend to be pricey.

The Mixball, an alternate interface that delivers that "fader feeling," will set you back only a few bucks and a little do-it-yourself time. It doesn't replace a full-blown remote interface, but you may be surprised at just how effective it is, and how much it can improve your studio's ergonomics. I created the Mixball for use with Cubase Windows, but it works on any program whose automation/mixing moves require that you press the left mouse button and move the mouse vertically at the same time.

WHAT YOU'LL NEED

The Mixball is a modified trackball. The best PC trackball I've found for this project is the \$20 CompUSA Crystal Trackball (SKU #173445; see www.compusa.com/products/product_info.asp?prodzip=&product_code=173445). This trackball glows green when no buttons are pressed, and turns red when a button is held down. Using a trackball that

provides visual feedback is an essential feature, as we'll see later.

Before modifying the trackball, verify that your computer allows simultaneous mouse and trackball operation. I've connected a mouse to the PS/2 port, and a trackball to the serial port. There are other ways to connect a mouse and trackball simultaneously (such as a USB hub); the specifics depend on your computer platform and hardware.

The CompUSA trackball has a "hold" switch for the left trackball button, but it feels flimsy, so you'll need a push on/push off button, too. I suggest using Radio Shack part #275-1565B. You'll also need a drill, soldering iron, solder, and two 5-inch wires.

CREATING THE MIXBALL

One problem when mixing with a mouse is that if you inadvertently move to the left or right before clicking on a fader, you may click on the wrong fader — or nothing at all. Therefore, our first step is to eliminate the trackball's ability to move horizontally.

When you open up the trackball, you'll see three rollers that touch the ball. We're interested in modifying the vertical roller, because it tracks horizontal movement. The wheel on the vertical roller is near an optical reader (a component that sends trackball movement to the computer). To eliminate all horizontal movement, remove

the vertical roller and put it back into place so that the wheel is on the opposite side from the optical reader (fig. 1).

Next, install the push on/push off button. Drill a hole for the button in the top trackball panel's upper left corner; find a spot where there's sufficient depth to accommodate the button.

The push on/push off button has to simulate a left mouse click, so solder two wires from the button to the left mouse switch solder points (fig. 2) on the circuit board.

THE MIXBALL IN ACTION

Here's how to automate a fader:

1. Use the mouse to place the pointer over the appropriate fader.
2. Press the computer keyboard's play button.
3. Press the Mixball's push on/push off button to engage the fader.
4. Move the ball up and down as needed, and "punch out" by pressing the push on/push off button again.

The best part is a built-in feature of the CompUSA trackball: when a fader is engaged, the ball glows red; otherwise, the ball is green. That way, you can always tell whether the Mixball is currently writing a fader move or not. What's more, the Mixball looks downright groovy in a darkened studio, so dim the lights and start mixing!

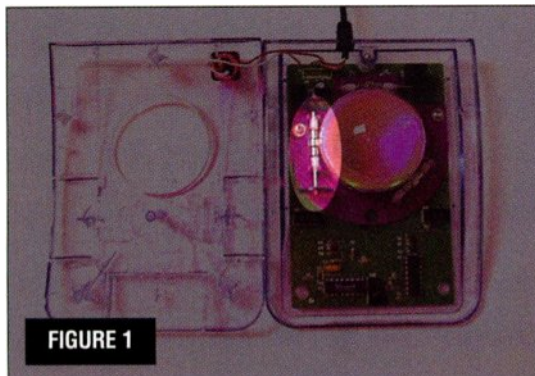


FIGURE 1

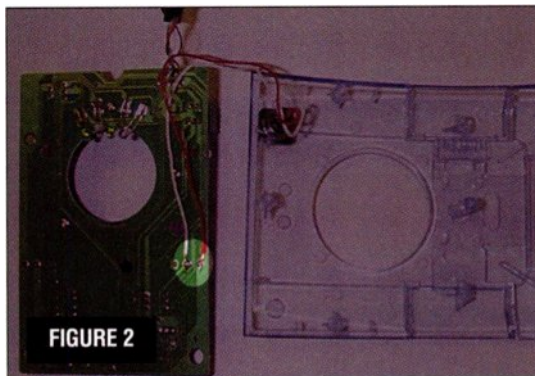


FIGURE 2

Jeff Boller is a multi-instrumentalist, songwriter, home studio warrior, and creator of the children's 3-D video game, *Waterslide Island* (www.waterslideisland.com).

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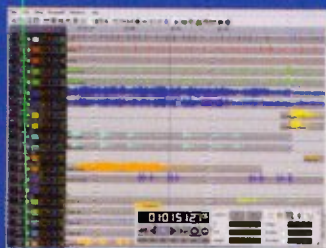
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Other reasons to get an MX-2424 for your Pro Tools rig? Since the MX-2424 records to SCSI drives, you can hot-swap them between systems without powering down your computer and recorder. You can record remote performances conveniently, leaving your computer in the studio. You can enjoy a familiar interface with the classic feel of a tape recorder. And perhaps most important, you can bet that the MX-2424 will satisfy your highest expectations in audio quality. If your editing/mixing system is based around Pro Tools or any other DAW, check out the ultimate companion piece – the MX-2424 – at your TASCAM dealer today.



If you don't have a DAW system, TASCAM's MX-View waveform editing software runs in native Mac and Windows versions and connects via a fast 100Mb Ethernet interface. With MX-View, you get sophisticated, sample-level waveform editing, drag-and-drop editing on the fly, click and pop repair with the pencil tool, onscreen metering for up to six MX-2424s, editing across multiple machines, easy management of virtual tracks and much more.

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Internet Audio is Dead, Long Live Internet Audio!

by Jon Luini and Allen Whitman

The frenzy over multi-million dollar Internet-related IPOs is a faded memory, and these days people are more concerned with covering their DSL bill. It's time to take a realistic look at the true value the Internet offers us audio geeks.

Why should songwriters and musicians give a damn about Internet audio?

Internet audio, though far from pristine, isn't going to go away. More and more people use the Internet as part of daily life and, as we all know, music is a big part of life. Just as radio became a staple for getting music into people's lives, so (to some degree) has the Internet. But if you aren't where the people are, you won't be able to affect them with it. So whether your music drives people to laugh hysterically, ponder deeply, or bawl like a baby, the Internet is one of the most efficient means to reach people ever created — but you've got to *use* it. In this way, Internet audio is really about promotion. A musical simulacrum of itself, the Internet is still only for the "representation" of audio, not the audio itself. The CD remains *the* format for delivering high-fidelity sound, and (for the time being) there's no need for the Internet to take that role. The semi-mythical "near-CD" audio quality is suitable for now (and will only continue to improve). Just as important, the Internet is still an excellent way for the motivated musician (with a manageable following) to actively stay in touch with fans, include them in the musician's life, and maybe even engage in a more intimate form of patronage. And email is far cheaper than traditional postal mail.

Why should recording engineers, sound designers, postproduction

technicians, and audio geeks give a damn about Internet audio?

Traditional wisdom says the recording process tends to happen in one room, the studio, and there doesn't seem to be (outside of high-profile "Duet" recording events) a compelling urgency to connect these

“THE INTERNET, COMBINED WITH CONTINUING DEVELOPMENT OF AFFORDABLE HOME RECORDING STUDIO SOLUTIONS, HAS ALSO MADE MOVING THE RECORDING PROCESS FROM STUDIO TO STUDIO MORE EFFICIENT.”

rooms together. But your FezGuys see new musical communities emerging from the use of new technologies. And we see the continuing expansion of electronic music as a recognized genre and that amazingly vibrant community has spawned uncounted online musical families that use these technologies to collaborate in real-time from all around the Earth. Physical barriers are

removed and the infusion of unique musical traditions from different cultures continues to wash away corporate "genre" definitions. A new breed of electronic musician/producer is born — people with equal parts technological expertise and musical passion. The Internet, combined with continuing development of affordable home recording studio solutions, has also made moving the recording process from studio to studio more efficient. It may take a long time, but it's possible to take a Pro Tools session and use the Internet to transfer the entire session to a producer far away. The simple act of publishing near-CD-quality rough mixes online, affordably, to a wide audience is a value within itself.

Nonetheless, your FezGuys remember that over the past five years we've seen a lot of raw enthusiasm and potential turned into corporate buyout. To a faceless corporation, the Internet is just another barbed-wire trench in a front of Web-based marketing defenses, designed not to engage and inform, but to keep people at arm's length (with a flashy Java intro), burying them in useless information and impenetrable design while emptying their wallet by any means necessary.

So what's a global network of computers good for? Certainly data storage; it does that great. Backup systems can reside anywhere and be accessible from anywhere. How about gross processing power? Using a wide interconnected network of computers to figure a large mathematical problem makes perfect sense. That's good if you're

► continued on page 115

► **weblink**

Visit the FezGuys online: www.fezguys.com



Kill Your Mouse

No, no, no... we're not advocating violence against defenseless little animals (if they were rats, maybe...). But we are suggesting that if you're making music with computers, you need to jump on the EZbus—and make the process way more simple, and way more fun.

Take mixing, for example. Without an EZbus, you adjust each of your magnificently crafted tracks one at a time with a mouse. With an EZbus, you reach for an honest-to-goodness hardware mixer, and move eight faders at a time. (Now *that's* mixing!)

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And then, when you're all done recording, disconnect the EZbus from your computer, throw it in a gig bag, and make it the heart of your live mixing setup. Because this mouse-killer is also a full-blown **digital mixer**, with all the features, sonic performance, and rugged dependability you'd expect from a piece of gear with the Event name on it.

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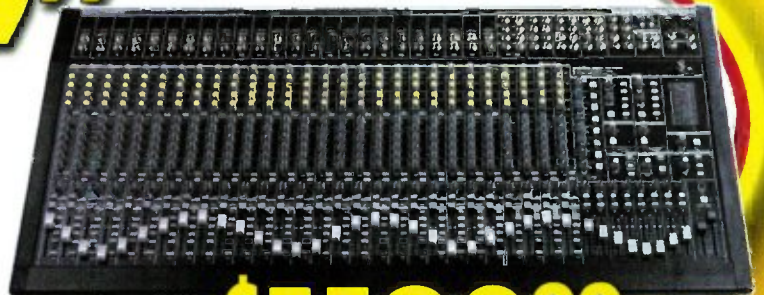
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SOUND AND SAMPLE LIBRARIES

Sound Ideas, having inked a distribution deal with **Sononic** (the mammoth online library of professional samples and sound effects), also showed a number of new sound effect libraries. These include **Thunder**, a collection of thunder and rain effects combined with storm ambiances, **Powersurge 2** (high voltage effects), **Crash and Burn** (earthquakes, explosions, and other sound effects), **Mix VIII** (a collection of sound effects and visual elements), and **Mix IX** (a collection of varied rhythm racks for various applications).

Sonic Sense's Blow Tools 12-CD sound effects library has over 700 minutes of wind and air effects, including the sound of air locks, ducts, and objects falling or moving through air.

The **Serafine Collection** offered **Sci-Fi: The Library**, five CDs of effects created by sound designer Frank Serafine. Several of these were used in the *Star Trek* movies, as well as other movie productions.

Wave Distribution's collection of performance-oriented drum loops, **Reel Drums**, includes over 25 sessions of 24-bit, multitracked drum tracks performed by studio heavy Joe Franco. They include a variety of genres such as ballads, pop, alternative, and deep groove.

The **Groove-Doctors Professional Music Production Set** is a five-disc music library utilizing Sony's Super Bit Mapping Process. Arranged as a "construction set" of one-bar grooves and variations played by live musicians, there are pre-mixed drum patterns/fills, guitar and bass parts, and audio CDs for auditioning. Users can mix and match the various elements to create complete arrangements.

SOFTWARE AND PLUG-INS

Arboretum Systems previewed their **Montage** software, a product allowing users to freely layout various forms of media (audio, video, MIDI, text) and process, edit, mix, etc. the material in the same project window, allowing new

freedom in processing components regardless of whether they are part of the same media family. Process parameter changes can also be controlled via MIDI, and the automation is recorded and can be further edited later.

Sony and **TC Works** have announced a **plug-in collaboration for the TC PowerCore DSP-card** based on the processing algorithms developed for Sony's digital mixing consoles.

SOUND REINFORCEMENT

Allen and Heath's ML3000 15-bus live sound console, available in 24-, 32-, or 40-channel versions, can serve as a monitor or front-of-house desk. Also from Allen and Heath comes the **Xone:02**, a two-channel DJ mixer accommodating four stereo and two mono sources.

Audio-Technica displayed a new range of accessories for their UHF wireless products including the **ATW-DA600** and **ATW-DA700** UHF antenna distribution systems and the **ATW-A62P** and **ATW-72P** UHF powered dipole antenna.

Bag End is adding a little extra thump to studios with the **Infrasub-12**. It's a self-powered subwoofer system with a direct radiating 12-inch cone loudspeaker in a sealed enclosure, along with built-in ELF dual integrator.

Community showed off their **WET** Series of weather-resistant loudspeakers with fiberglass enclosures and stainless steel hardware. The **WET218** employs one eight-inch, carbon fiber woofer and a one-inch



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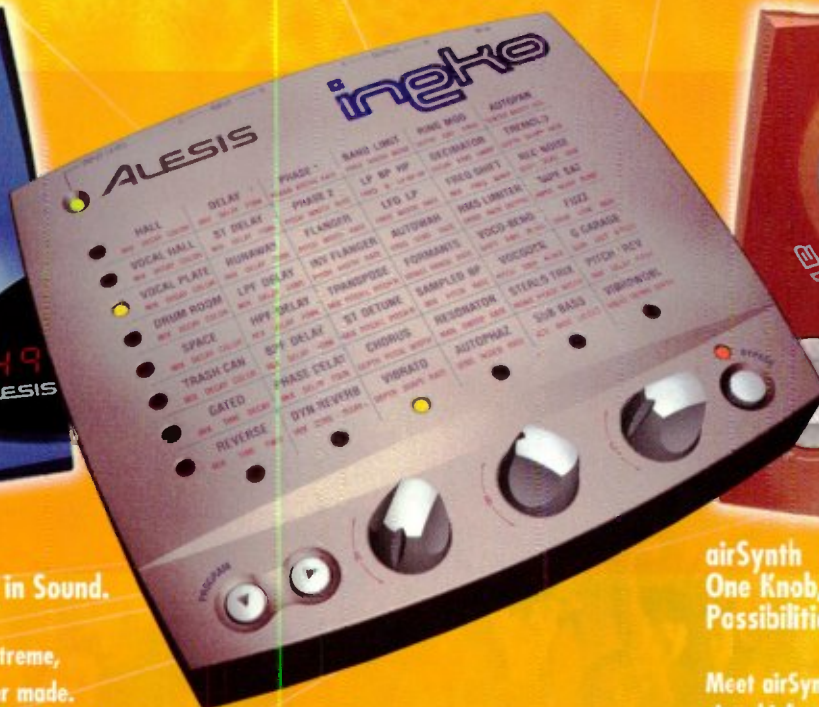
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compression driver, while the **WET228L** houses two 8-inch woofers and a coaxially mounted HF driver.

Joining **Crest's** XR Series of mixers is the **XR-M** rackmount monitor console. Housed in a 10-space chassis, the XR-M generates up to 12 mono or six stereo mixes (for in-ear applications).

Crown unveiled the XLS Series power amps. Capable of driving 200, 400, or 600 watts per channel into four ohms, respectively, the **XLS 202**, **402**, and **602** each have a three-position high-pass filter, front-panel level controls, and clip LEDs.

dbx introduced the **1074** Quad Noise Gate, a tunable noise gate with an assignable input filter developed specifically for live sound percussion.

For remote operation of their Dx38 digital controller, **Electro-Voice** has developed **RACE 2.00** software, which runs on any PC. Up to 31 Dx38's can be controlled via RS-485 interface at a distance exceeding a half mile.



Electro-Voice rolled out a ton (literally) of new loudspeakers, starting with their **Fri+122** (12-inch/two-way) and **Fri+152** (15-inch/two-way) cabinets, the **QRx 212/75** (full-range/two-way), and the **QRx 218S** and **QRx 218SF** (dual 18-inch subwoofers). The **QRx 218SF** comes with L-track rigging for flying. Electro-Voice also showed off their **SxA180** powered subwoofer and **EVID** (Electro-Voice Innovative Design) **3.2 SOS Hot Spot Monitor** with dual three-inch LF drivers and a 3/4-inch direct radiator.

Gold Line's **EQ2** is a two-channel, 24-bit digital EQ that provides 10 parametric filters per channel, high- and low-pass shelving, and two discrete delay lines.

From **Mach** comes the **M125iW** (12-inch/three-way) speaker for horizontal or vertical flying, and the **M151iW** single 15-inch subwoofer in a polyurethane-coated cabinet with recessed Speakon input.

Manufactured by Audio Engineering (London), **Micron** added several models to its 700 wireless series, including the **TX700** belt pack transmitter, **TX703** hand-held transmitter, **SDR770** small diversity receiver, **MR700** monitoring receiver, and the **MDR762** twin diversity receiver.

Midas made a huge splash by lending their golden touch to the **Legend 3000**, a semi-modular production console for mixing front-of-house, monitors, or both simultaneously. Legend circuitry

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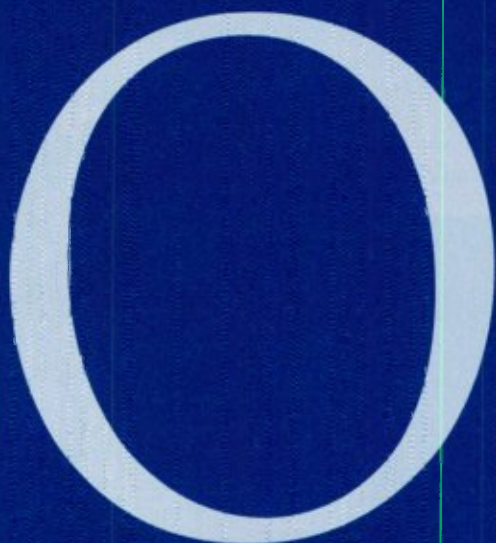
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DREAM Satellite

DREAM Satellite is Fairlight's new digital audio workstation, engineered to streamline and simplify the processes of audio acquisition, editing and track laying to a degree previously unobtainable. Expanding on the intuitive operation and ease of use of Fairlight's MFX generation, DREAM Satellite offers up to 48 tracks of pristine 24-bit, 96kHz digital audio quality. Designed for use with a studio's existing analog or digital mixer, DREAM Satellite is available in 16, 32 and 48 track configurations with a choice of analog and/or digital inputs and outputs.

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DREAM Station is a comprehensive digital audio recording, editing and mixing environment, capable of delivering final mixes in any format up to 7.1 surround. Station incorporates all the functionality of a 48-track Satellite integrated into a full specification, fully automated 56/16 mixing system. With third-party plug-ins rounding out the effects processing capability, and all the bussing, sub-bussing and monitoring facilities required for a vast array of post-production tasks, DREAM Station is all a studio needs for full production and mixing of the majority of short form, commercials and radio projects. Station may be further expanded with optional Sidecar bays in blocks of 8 faders and external metering options are available to enhance the high-precision on-screen meters.

DREAM Console

Representing the peak of performance for full-scale recording, editing, production and mixing of the most complex multi-format audio projects, DREAM Console is not simply a powerful mixing system but a complete recording and editing environment equipped with the degree of functionality and processing found only in dedicated large-format digital consoles. A fully configured DREAM Console offers 48 tracks of Binnacle™ editing seamlessly integrated with 192 channels returned to 48 mix busses, with 6-band EQ and filtering and two stage dynamics processing on 96 of these inputs, plus 48 returns with 2-band EQ, and 48 short fader paths that can share EQ and Dynamics with their associated full channels. The bus structure of the DREAM Console has been expressly designed for multi-format projects for the simultaneous generation of multiple, multi-channel formats up to 7.1 with individual level trims for each independent mix. The extensive automation system encompasses every parameter of every onboard function, including processing, routing and third-party plug-ins. With the same recording, editing and mixing capabilities as DREAM Station, but on a much larger scale, the DREAM Console delivers resources which have been hitherto unavailable on any system, at any price, and puts them within reach of any facility aiming at serious production and mixing work.

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PRIOR ASSIGNMENTS: Alice Cooper, Motorhead, Slaughter, Anthrax; Showco monitor systems engineer

TRANSPORT: RCA 20 Glass by MT Case Company, Chicago, IL (20-space wood construction, fiberglass coated, foam shock-mounted)

HARDWARE: Middle Atlantic D2 rack drawers [2], FK-2 (UCP) Universal Connector Panel fitted with Whirlwind W2 61-pin, female panel mount connectors [2], UCPB1 blank panel, UNIV4 fitted with four male XLR connectors, UNIV2 fitted with two Neutrik PowerCon AC connectors; ETA PD11LVP power conditioner (set to 110v), Behringer T1952 Tube Composer Pro, MDX2200 Composer Pro, MDX1400 Autocom Pro [2], XR4400 Multigate Pro [2], DSP8024 Ultra-Curve Pro, DSP1000P Virtualizer Pro [2]; Shure DFR-11 equalizer [2], U4D Wireless with Beta 58 microphones and UA830 active antennas

CABLING: Whirlwind 25-foot 20PR24 FLEX cable with W2 male x W2 female connectors [2], 5-foot 20PR24 FLEX cable with W2 male x 20 1/4-inch TRS breakouts [2]; 5-foot Canare L-4E5AT with Whirlwind W2 female panel mount x 10 XLR female and 10 XLR male [2] (these are mounted on the FK-2 modular panel system mentioned earlier). All 1/4-inch and XLR connectors are Neutrik

COMMENTS: Kevin says he carries this gear to "give the stage a more consistent sound and to help eliminate soundchecks. Being a metal monitor mixer as of late, just getting it loud enough is only half the battle. Cues-a-plenty these days, and bands half on wedges, half on in-ears. You have to set yourself up for two different kinds of mixing.

"I patch coming out of my rack from the two W2 panel mounts on the FK-2 to my two 25-foot W2 inline male x W2 inline female. From there, I add on my W2-to-1/4-inch TRS breakouts so I can get into the channel inserts of the console. For effects, I have 1/4-inch TRS females x XLR males and females. The UNIV4 has four XLR males, of which I only use two for the outputs of the Shure U4D wireless. I like to have everything on the front of the rack because it's easier to see, and since space is often tight, the rack will have to go right up against a wall — plugs on the back of a rack can get broken off, tripped over, and stepped on. Last on the patchbay is the UNIV2, which has two Neutrik PowerCon connectors for AC. One is the power input and the other is a power rack jumper.

"I would say my main piece of gear is the Behringer Tube Composer. It works equally well, and is unnoticeable on a soft vocal like Alice's (where I use it to help get gain) as on Ripper [Owens, Judas Priest's lead vocalist]. The Behringer gear works very well, and, when you turn a knob, the units react. I use the Virtualizers for drum reverbs and reverb/chorus on acoustic guitars. With the quality of wedges and consoles these days, I use very little outboard EQ. I use the Shure DFR's for parametric EQ, usually on the lead vocal mixes and the sidefills. When working with new wedges, I set the Ultra-Curve to Feedback Destroyer mode, stick a microphone out there, and run the fader up. It tells me the hot spots, I set a parametric to match the curve, and then turn off and erase the Feedback Destroyer mode.

"Priest is a very loud band — in the 120's on stage — so I like using microphones that can handle that kind of level. We use lots of [Shure] SM-57's, 81's, Beta 58's and 98's, and KSM32's for overheads and guitars." ■



Kevin McCarthy may be reached via email at tateraudio@aol.com.

IT'S JUST A PHASE I'M GOING THROUGH

How to time align your backline

While there a lot of things you can't control at a live gig, you can help avoid phase problems between a PA system and the backline by time-aligning the two. It's an interesting and simple concept that avoids a multitude of sonic problems, and works equally well in clubs or larger venues.

Almost every venue has a PA that sits forward of the stage — in other words, the “frontline” band members are located behind the house speakers. If this isn't the case, you need to either move the band back or move the PA forward — otherwise you're inviting feedback between the house PA and the vocal mics. As a result of the band's location, there are two distinct “sources”

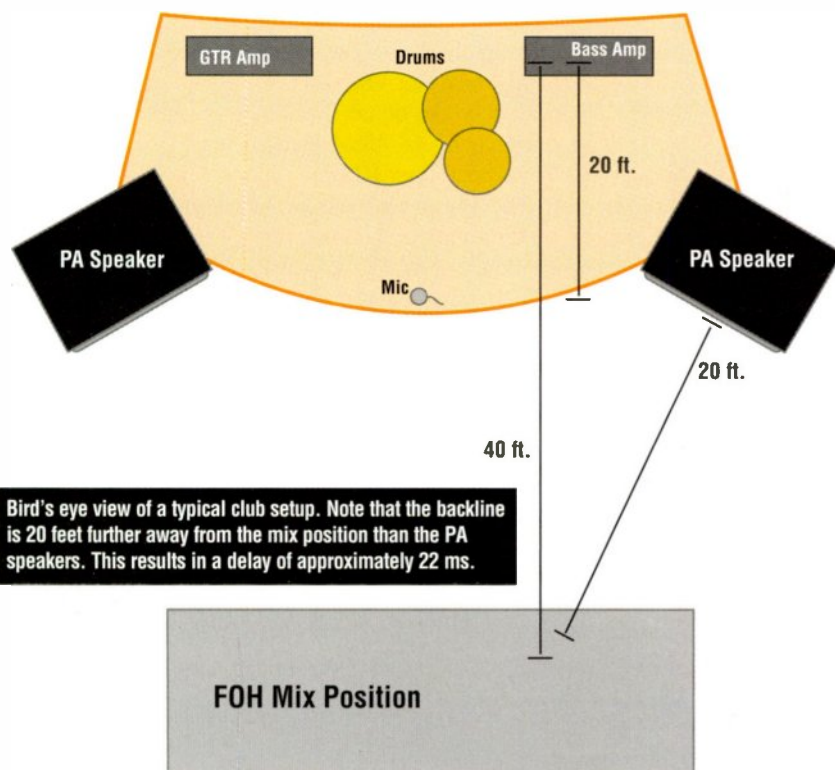
from which sound emanates. The first is the band's backline: amps, drums, etc. The second source is the house PA (there are stage monitors as well, but I'm hoping that you don't hear them from the FOH mix position).

By nature, the backline and the house PA speaker stacks aren't phase coherent due to the physical difference in their positions; this phase difference is determined by the distance between the backline and the house stacks. In small rooms, this may be as little as eight feet; in larger clubs, the PA stacks might be 25 feet in front of the backline.

If you dust off your knowledge of acoustics, you might recall that sound travels at approximately 1,100 feet per second in ambient temperatures near 70 degrees Fahrenheit. Do some quick math, and you'll discover that when the PA is sitting 20 feet in front of the backline, sound comes off the backline roughly 22 milliseconds later than it comes out of the house PA. Can you say “phase shift”? If you don't think a 22-millisecond delay is significant, put that amount of delay on a bass and listen. The distance between the backline and the PA stacks is messing with the phase of your audio, particularly in the low end.

The trick is to delay the PA stacks just enough to acoustically align them with the backline. When you get to a gig, measure the distance between the backline and the acoustic center of the PA speakers. Be aware that some PA cabinets are very deep — so the rear of the cabinet may be a foot or more behind the acoustic center of the driver. I

► continued on page 115



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TECHNOLOGY ON TOUR

BY STEVE LA CERRA

JANET JACKSON PUTS TECHNOLOGY TO WORK RE-CREATING THE SOUND OF HER RECORDS

Janet Jackson is an artist whose live show is as much an event as it is a concert. With high expectations from her audience for “sounding like the record,” Jackson and her musical directors went back to the source tapes to extract sonic elements for use in her current tour in support of the CD *All For You* (Virgin).

Paul Mirkovich, music director/live music producer, served as the programmer and engineer in charge of sourcing the tapes used on the tour with Jackson’s live band. (He also programmed synth sounds for the tour.) “They wanted the show to sound great,” Paul begins, “and my goal was to help the band give a completely accurate representation of the records. I have a real reverence for Janet’s music, and wanted to analyze it to the point where — if we were making any changes — they would be made by choice, not by matter of ignorance.”

Paul contacted Jackson’s record labels to locate the master tapes. “Much of it was 24-track analog,” he continues. “Even though the masters had been carefully looked after, some were in bad shape because of tape deterioration and had to be baked before transfer. It was fortunate that this came to the attention of the labels because in another two or three years the damage would have been beyond repair. I brought a Studer two-inch machine into

my studio and had Ralph Cook come in with some MOTU 1296’s. We transferred some of the songs using Digital Performer through the 1296’s, and for other songs we used Panasonic/Ramsa WZ-AD96 converters (eight-channel 24-bit/96 kHz A/D) through my Panasonic DA7, and then to [Steinberg] Cubase. A lot of material from the last two or three records was archived at Flyte Tyme (Jimmy Jam’s production studio), so they transferred those tapes directly to Sound Designer files on CD at 44.1.”

Paul compiled tracks from approximately 35 songs spanning Janet’s career and stored the files in three different places for safety. Then he began the task of re-creating sounds from the records: “Unlike what you hear on Janet’s finished records, the information I received was raw — non-EQ’d, non-compressed. I had to re-engineer and remix her entire career for this tour. I did a lot of the arranging in Cubase (because I’m extremely familiar with it) and then used a function in [Steinberg] Nuendo called ‘Import Cubase Song’ — so the work I had done in Cubase could directly transfer to Nuendo. All of the mixdowns, effects, and EQ came out of Nuendo in a bunch of different ways. I cut up drum sounds used on the records in Nuendo, bounced those little pieces of audio as separate

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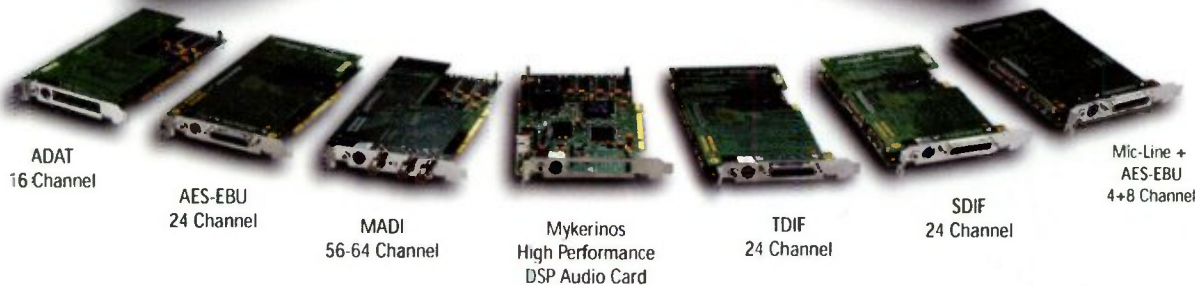
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World Radio History

TECHNOLOGY ON TOUR

files, and then dragged and dropped the whole set into Native Instruments' Battery. I could truncate or adjust gain of the sounds in Battery and quickly hear the results. Then I made AIF's of the sounds and brought them into BIAS Peak because Peak can export to the Akai sampler format. Those samples were used by [drummer] Brian Fraser Moore for triggering from his live drums using an Akai sampler.

"Some of the percussion EQ on *Rhythm Nation* and *Control* was drastic

— real in-your-face. To re-create that in Nuendo took some time, but the result was pretty phenomenal. I found the stock EQs very effective, plus I used EQ plugins from TLA and TC Electronic, as well as Spektral Delay from Native Instruments. Nuendo has offline processing where you can process a piece of audio again and again, but then undo sequentially. Let's say you used EQ, then delay, then compression, and liked everything except for the second effect. You can peel that second layer off but leave

the others. This gave me the chance to go back and make changes after hearing the sound in the context of the song."

During rehearsals, Paul and Janet's band determined which parts would be played live (and by whom) and which prerecorded parts would be used for the show. Paul approached it "almost like subtractive synthesis. I started with everything in 'the box' (an Apple Dual G4/500 MHz with 1 GB RAM). Any part that could be played was taken out of 'the box.' I like musicians to feel that they're as busy as they possibly can be. The keyboard players performed as much as they could — all the piano parts, the two-handed string parts, and anything that

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was fun. The mechanical parts remained in the box. Ethan Farmer [bass] also played synth bass on many tunes. In songs that had both, he played electric and the synth bass came from the box. Brian played all the drums, but not the loops. On every single song he triggered real kick and snare sounds from the records, plus any signature percussion sounds from the record — like the toms from 'Love Will Never Do (Without You).' Most of the guitar parts were eliminated from the box because Dave Barry [Jackson's guitar player/musical director] played on all of the records.

"Once we figured out which parts from the box could be muted, the remaining parts — 30 to 40 tracks — were mixed down in Nuendo to 16 tracks [maximum] so that they'd be manageable at front of house. In the case of 'If,' there're five different drum loops playing simultaneously, which had to be mixed with the same compression and EQ as the record. There were instrument groups for every song: percussion,

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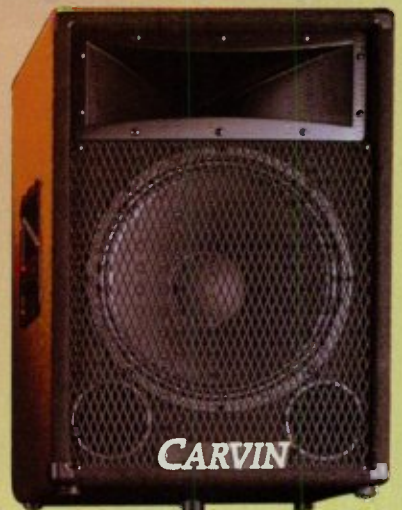
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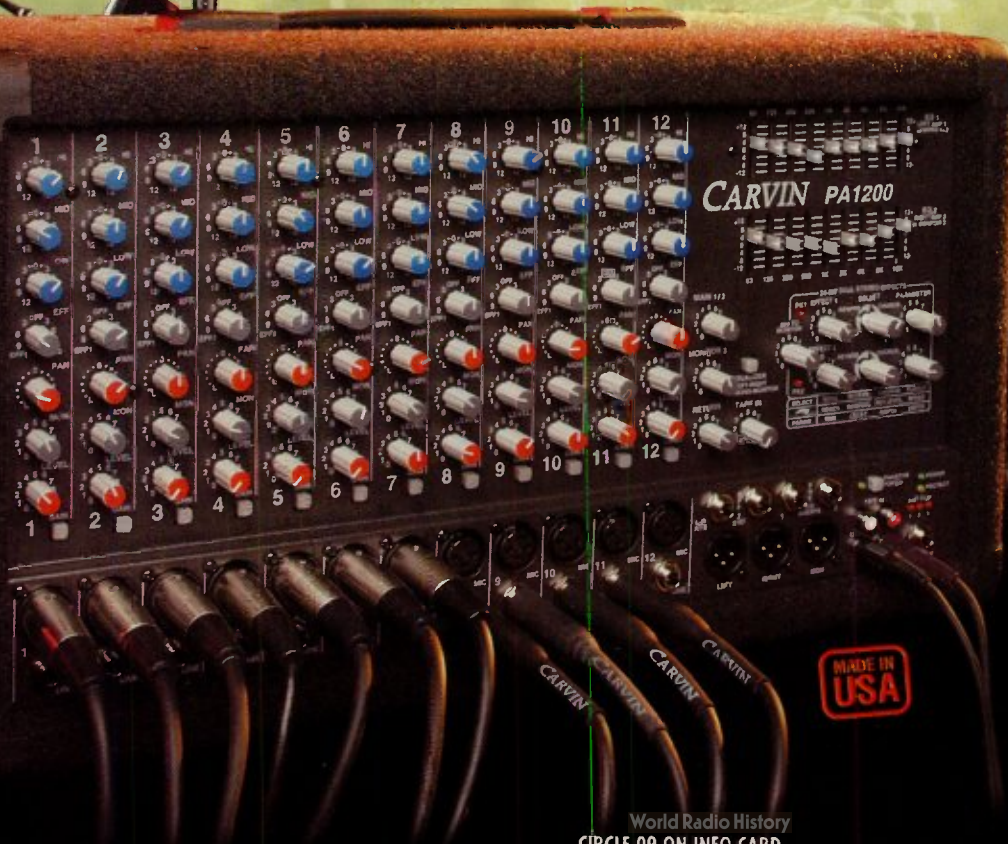


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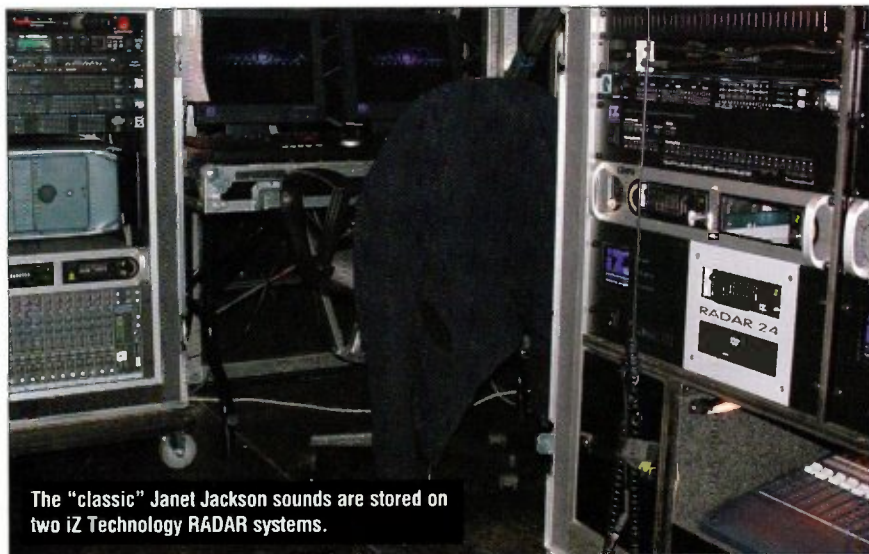
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TECHNOLOGY ON TOUR



The "classic" Janet Jackson sounds are stored on two iZ Technology RADAR systems.

drums, extra keyboards, guitar, synth bass, and some background vocals supplementing the people onstage."

LET'S GET THIS SHOW ON THE ROAD

Three days before the tour started, Paul and Michael Bernard — who would be

responsible for running 'the box' — digitally dumped the tracks from Nuendo to two iZ Technology RADAR systems via Mirkovich's Panasonic DA7. Onstage, the analog audio outputs from each RADAR are patched to a custom-built A/B box via DB25 connectors. "The output of the A/B box is connected to a

splitter, which feeds the monitor and FOH desks," reveals Michael. "A single, relay-controlled switch instantly swaps the machine appearing on the output of the A/B box. If there is a power failure, the relays remain in position and leave one machine connected."

Bernard listens to his own mix from a Panasonic DA7 located near him underneath an elevated section of the stage. This position provides him with "clear visual lines to Janet and to the band, so I can start the RADAR machines when they are ready. Sometimes I get a visual cue, but I also have an intercom system so Dave can cue me. He has a separate talk mic that goes directly to me with an infrared switch. When Dave moves to the talkback mic, the switch automatically opens, and I can hear his cue [this mic is in addition to Dave's vocal mic]."

And when that cue finally comes, how does Michael roll the two RADAR systems in sync? The old-fashioned way: by hand! "I did the same thing for
▶ continued on page 125

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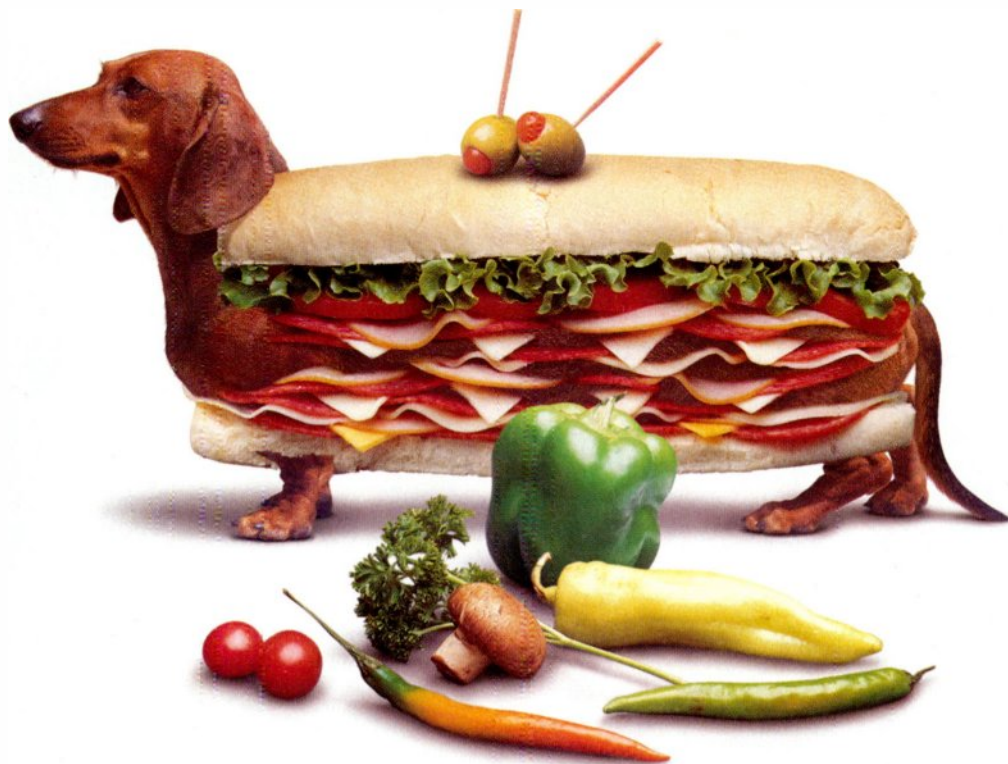
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is sure to be welcome in your workspace.

We could (and should) go on about the other extra's in our new gourmet offering, but the proof of the pudding is in the eating, and the PS350B is most definitely-Hmmm...Yum.



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THE WIDE WIDE WORLD OF

PLUG-INS

Twenty years ago, hardware engineers would string together resistors, capacitors, and op amps to form new processors. Now, in labs that range from industrial parks to basement apartments, inspired engineers/musicians are stringing together lines of code to create *plug-ins* — unquestionably the signal processing star of the 21st century. From emulations of vintage gear to flights of imagination that produce entirely new sounds, from low end to high end, plug-ins are re-shaping the world of recording by adding new capabilities to familiar host programs.

And it truly is a wide world of plug-ins: the following reviews have representatives from Russia, France, Germany, Poland, Norway, the Netherlands, England, Czechoslovakia, Israel, the United States, and Italy. Use these plugs, and there's a vibe that comes with them — from the clean, efficient Scandinavian Ultrafunk bundle, to the dark-as-a-Dostoevsky-novel Delay Dots front panels, to the latest from Israel's Waves (whose motto should be, "If we can make the desert bloom, then, dammit, we can make digital audio sound good!").

Plug-ins are an international phenomenon that spread at the speed of the 'net, which, for some companies, is their primary mode of distribution. And why not? For a few bucks, you can spend a little download time and be processing a few minutes later...no patch cords to set up, no AC power or batteries, and no sweat about whether the I/O is balanced or unbalanced. Furthermore, the march of progress is relentless: the latest plug-ins may have automatable parameters, MIDI control, and even different "skins" (appearances) to match your mood — whether you're a straight-arrow engineer working on a platinum release, or someone with more body piercings than a pincushion.

We've scoured the globe for the most interesting, most useful, most outrageous, most cost-effective, and most fun plug-ins we could find. They'll change your music, they'll change your attitude, and they'll make sounds you've never heard before...as well as familiar sounds you have heard before, but couldn't obtain through any other means.

Welcome to the 21st century, and an exciting new way to warp your sounds. One final thought: don't use illegal copies. Demos are available if you want to evaluate plug-ins; and if you use the full versions, make sure you compensate the people who make it all possible. (For a full listing of the plug-ins in this section and what pages they appear on, see the Table of Contents on page 4.)

— CRAIG ANDERTON

PLUG-INS

AUDIO EASE ALTIVERB

By John Krogh

CONCEPT: Creates its ambiances using samples taken of actual spaces instead of synthesizing room characteristics



such as number of reflections, high-/low-frequency damping, and so on. It requires an Altivec-equipped (G4) Mac.

FORMAT: MAS (Mac VST, RTAS, and HTDM are in the works)

WHAT'S HOT: Incredibly realistic-sounding reverbs that can make even the most bone-dry drum kit, direct-recorded guitar, or whatever, sound like it was recorded in a real space.

Included presets are useful for music and sound design applications. Hall presets were recorded with omni and cardioid mics set up in the front and rear of the rooms. Clever, informative, and intuitive user interface. Supports stereo and surround reverbs. You can sample your favorite hardware reverb units (no, it's not illegal) or real rooms!

WHAT'S NOT: Processor intensive, especially in No Latency mode.

COPY PROTECTION: Serial number with challenge/response authorization.

BEST USE: Does a remarkable job of placing disparate tracks in the same "space." Great for enhancing the realism of MIDI orchestral mockups. Equally useful as a postproduction tool for placing sound effects and dialog in specific types of rooms.

OVERALL: Hands down the most natural-sounding reverb plug-in around.

PRICE: \$495

CONTACT: www.audioease.com

EQ FREE LIT. #: 102

VIRSONIX BBE SONIC MAXIMIZER

By Emile Menasché

CONCEPT: A software version of the BBE Sonic Maximizer designed to restore punch and sizzle to tracks and mixes. You get four controls: Lo Contour (brings out the bass), Process

(adds presence and sizzle to upper mids and highs), Volume, and Bypass.

FORMAT: Mac VST, PC DirectX

WHAT'S HOT: Realistic re-creation of the BBE Sonic Maximizer. Simple user interface. Enhances the clarity of vocals,

percussion, guitar, and bass. Relatively modest system requirements, yet supports 16-, 24-, and 32-bit floating-point processing

and sample rates up to 96k.

WHAT'S NOT: Over-processing may make your mix sound hyped — and can skew your hearing so that unprocessed mixes sound as though the midrange has collapsed. Can't tweak individual channels in a stereo pair.

COPY PROTECTION: Serial number.

BEST USE: For quick and effective audio enhancement, the BBE is hard to



beat. It can bring out frequencies that excite the ear without detracting from the overall harmonic balance of the material. It's especially effective on mixes and subgroups, and can add an almost magical punch to bass tracks.

OVERALL: A useful tool to have in your arsenal at a good price. Just watch that continued use doesn't dull your perception of unprocessed mixes.

PRICE: \$129

CONTACT: www.virsonix.com, www.cakewalk.com (PC version)

EQ FREE LIT. #: 103

IZOTOPE OZONE

By Craig Anderton

CONCEPT: Mastering suite with multiple modules (parabolic EQ, mastering reverb, loudness maximizer, multiband harmonic exciter, multiband dynamics, multiband stereo imaging, phase meter).

FORMAT: DirectX

WHAT'S HOT: This extremely cost-effective package hits a high standard of graphic beauty, sound quality (thanks to



64-bit processing), and flexibility.

Multiband dynamics (particularly cool, with limiting, compression, and expansion in one module), exciter, and stereo imaging controls are more versatile than single-band units, while a spectrum analyzer that helpfully superimposes the real-time or average spectrum on the module displays provides visual feedback. Module order is switchable, the modules work together smoothly, and the interface is a joy to behold.

WHAT'S NOT: Because it has multiple modules, if you activate them all, the processor bite is pretty substantial.

COPY PROTECTION: Authorization code.

BEST USE: Ozone is wonderful with narration as well as program material. It also works well on single tracks, but, given the processor power needed to work at full throttle, you won't be adding it to many tracks simultaneously.

OVERALL: Judging from the price, you might expect Ozone to be "training wheels" for mastering, but it far exceeds expectations. The sound quality compares with much higher-priced plug-ins, the functionality is great, and, overall, it's definitely a best buy.

PRICE: \$199

CONTACT: www.izotope.com

EQ FREE LIT. #: 104

METRIC HALO CHANNELSTRIP

By Mikail Graham

CONCEPT: An "all-in-one" plug-in with single-band compressor, gate/expander (including a two-band filtered sidechain), six-band parametric EQ, channel delay, gain compensation, phase inversion, and comprehensive metering.

FORMAT: Mac TDM, RTAS, AS, MAS

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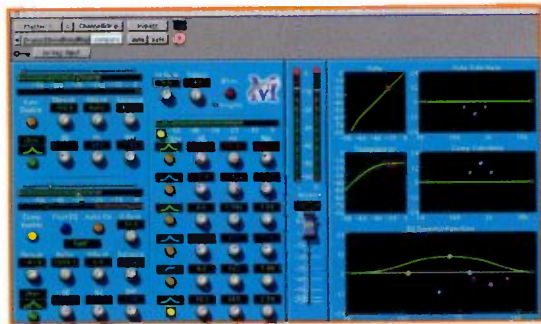
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WHAT'S HOT: Extremely low latency of 40 samples with TDM, and only 16 samples with MAS. This plug-in sounds great and really delivers the goods, providing a near-perfect solution for almost any EQ and dynamics needs. Includes 127 clearly organized presets to get you started.

WHAT'S NOT: TDM version runs on MIX systems only. No VST version.

COPY PROTECTION: Serial number with challenge/response.

BEST USE: Extremely effective plug-in tool for drums, bass, guitars, and vocals. The low latency and minimal DSP usage make it ideal for use across a group of tracks. I can't say it's the overall best sounding EQ and dynamics plug-in, but it's certainly among the most useful all-in-one tools currently available.

OVERALL: An easy-to-use, near-perfect solution for individual or group tracking. The full version isn't cheap, but certainly worth the price of admission.

PRICE: ChannelStrip TDM/RTAS/AS, \$699; ChannelStripISP (scaled down version) TDM/RTAS/AS, \$349; ChannelStrip MAS or RTAS/AS, \$345; ChannelStripISP* MAS or RTAS/AS, \$175

CONTACT: www.mhllabs.com
EQ FREE LIT. #: 105

OHM FORCE PREDATOHM

By Craig Anderton

CONCEPT: Multi-band distortion/signal warper.

FORMAT: Pro version — PC/Mac/BeOS VST and DirectX. Expert — VST or DirectX. (Pro and Expert offer up to 32-bit resolution with MIDI I/O.)

Standard — VST or DirectX (16-bit, no MIDI, no commercial use license).

WHAT'S HOT: For distorted, sick, brilliant, industrial sounds, look no further — what this does to drums is probably illegal in most countries. The four bands have independent controls for level, dynamics

(compress/expand), dynamics intensity, and distortion amount and type. Post-distortion controls affect tone (frequency and shape) and feedback to the input (frequency and amount). Presets are cross-platform and MIDI-savvy. VST2 hosts let you tweak the controls via MIDI faders (trust me, you want to). Mild CPU loading.

WHAT'S NOT: Mono output only, except when the phase-based stereo simulator is active (careful of canceling if the mix plays in mono). The feedback control can be very touchy.

COPY PROTECTION: Registration code.

BEST USE: Dance, hardcore, industrial, rap, soundtracks, and sci-fi sounds are obvious. When set for maximum filth, it's excellent for driving out unwanted houseguests.

OVERALL: I love this processor, it's



absolutely fabulous — you can get totally out of control.

PRICE: Pro, \$149 (CD); Expert, \$59; Standard, \$9.95 (latter two are download only).

CONTACT: www.ohmforce.com
EQ FREE LIT. #: 106

DELAYDOTS SOUND DESIGNERS BUNDLE

By Craig Anderton

FORMAT: PC VST, DirectX

PLUG-IN DESCRIPTIONS

DaBomb: Distort me, baby, with either a clip/saturation mode or two flavors of Tube Screamer emulation. This makes no pretense of subtlety; I found the saturator mode most useful, but the Tube Screamer mode can turn even the most polite loops into turbulent filth monsters.

Phat: This generates a subharmonic



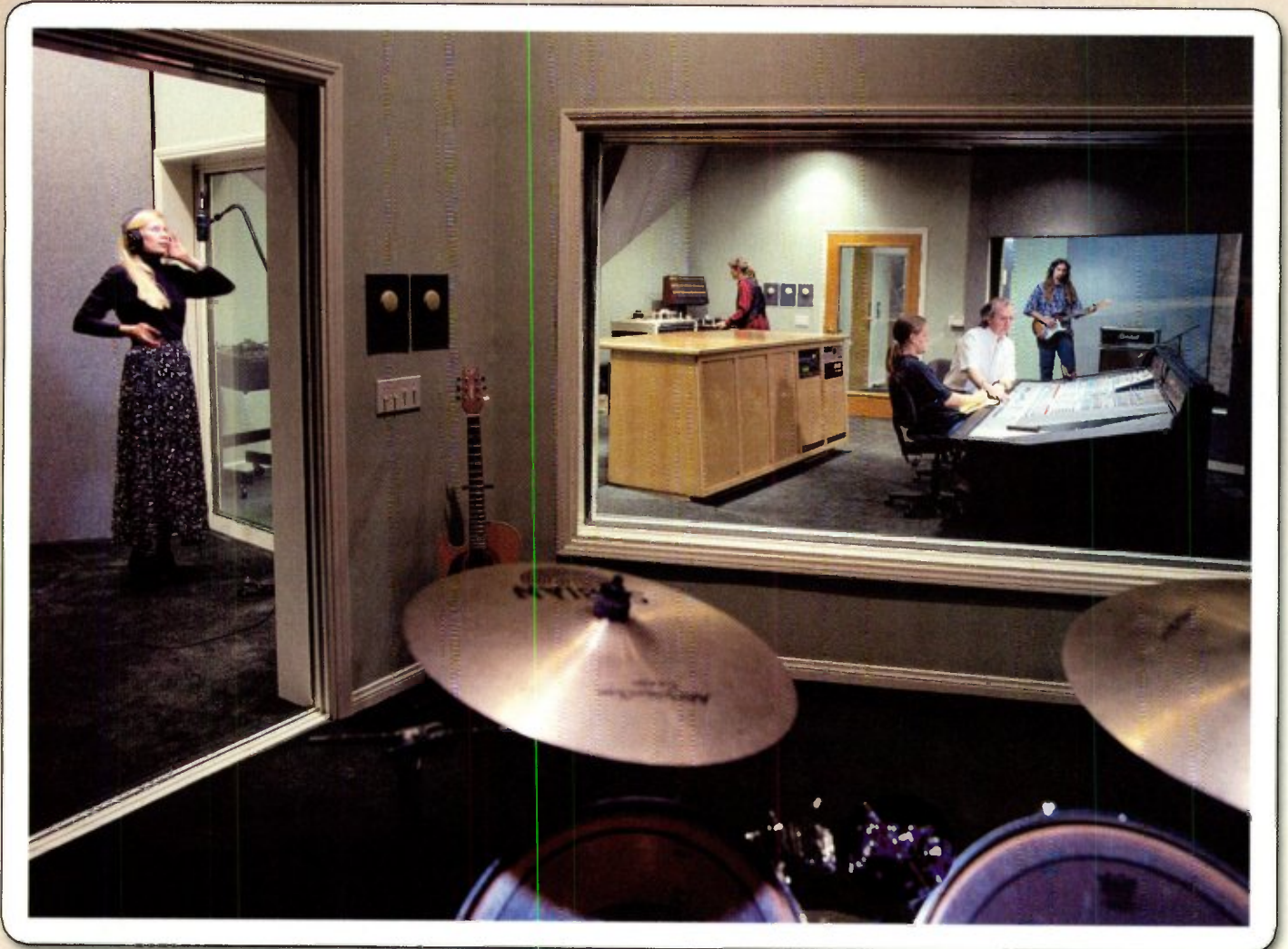
signal, then follows it with a low pass filter and compressor. One control changes the compressor threshold to bring the subharmonic signal up, while a tone slider tunes the filter from 20 to 420 Hz. Need your kick drum to hit you in the stomach and your bass to rattle the walls? Use Phat.

PitchShift Multiband: This two-band, formant-based pitch shifter preserves duration while adding totally weird pitch changes. On voice, you can generate almost all of the alien voice effects ever used in any sci-fi flick, and one setting made acoustic drum loops sound like a TR-808. While I

have no idea how the FFT size control works, trying different values adds all kind of interesting effects. This plug-in is a definite winner for fresh, novel, extragalactic sounds.

LoopsFix (DirectX-only): This utility lets you specify a number of samples to fade in and fade out a looped sound, saving a lot of time compared to magnifying, selecting, and fading at the beginning and end to eliminate clicks. It works on complete loops, or for extracting

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loops from a longer file. The bad news: mono only.

PhatPro (DirectX only): This has the same goal as Phat — create sonic corpulence — but has an additional sub-harmonic synthesis algorithm, a more sophisticated compressor, and a somewhat smoother overall sound.

THE VIBE: These are not your father's plug-ins. They're creative and, for lo-fi freaks, this package is a dream come true — you can turn any sound into something that's at least bizarre and, at most, extremely anti-social (as the copy for Phat says, "Ideal for creating booms, guns, explosions"). I expect to hear this on a bunch of hardcore techno and rap tracks in the months ahead. If electro-punk ever becomes a musical genre, these plugs will be in the vanguard.

WHAT'S HOT: Under VST, they respond to automation as well as MIDI controllers. They also look cool. When you buy the bundle, you get PhatPro (DirectX only) along with the regular Phat. And because they're not me-too effects, you can make sounds that will have people wondering how you got them.

WHAT'S NOT: No presets included with the package; cryptic documentation. DaBomb could use a nice parametric EQ. Phat and PitchShift need at least a 500 MHz processor for real-time processing.

COPY PROTECTION: Authorization code.

OVERALL: You can't beat the price — even if you use only a few of these plug-ins on a few sounds, they're worth it. PitchShift is the star here, but PhatPro can bottomize your sounds in a way that EQ never could. Delaydots gets high marks for creativity, originality, and cost-effectiveness.

PRICE: \$55 (DaBomb, Phat, and PitchShift Multiband available individually for \$19.99; PhatPro DX for \$24.99)

CONTACT: www.delaydots.com

EQ FREE LIT. #: 107

WAVES RENAISSANCE COLLECTION 2

By John Krogh

FORMAT: Mac/PC VST, MAS, RTAS, AudioSuite, DirectX

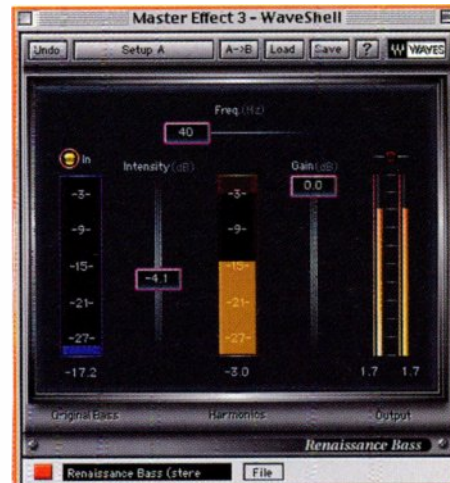
PLUG-IN DESCRIPTIONS:

Bass: Anyone who's familiar with Waves MaxxBass will immediately grok Renaissance Bass. This plug-in synthesizes overtones (or low-frequency harmonics), which allows tiny speakers to seemingly reproduce low-frequency information that they otherwise couldn't produce. It's a psychoacoustic trick on the ears and mind; the main concept behind Bass is that the ear hears a bass tone's harmonics and fills in the missing fundamental. Multimedia production is the obvious application for Bass, but, because you can also significantly increase fundamental low tones without clipping, sound designers and musicians in search of "deep bass" will find it with this plug-in.

Vox: As implied by its name, Vox is perfectly suited for pumping up vocal tracks, but it works equally well for solo instruments, bass, electric and acoustic guitars, and even sub-mixed drums. You only get three parameters to adjust (gate, compression, and gain), making it dead simple to dial in the right amount of compression. After all, who wants to get tied up with a bunch of controls? This baby is way smooth and makes it easy to get a great sound happening fast. Drag the Attenuation control down to increase the amount of compression. The Gate control is used for downward expansion — dragging the fader up will clamp down on the signal more, resulting in less noise.

DeEsser: The difference between Waves' original DeEsser and the Renaissance version is more than subtle. For starters, Renaissance DeEsser is smoother and more transparent. Highs are preserved, yet sibilance is tamed without sounding "digital" or harsh. Nearly the same controls are used for both plug-ins; a Range control has been added, though, which essentially controls how much gain reduction will occur when frequencies in the sidechain cross the threshold.

THE VIBE: Essential, but not terribly inspiring, tools that are tremendously



useful for their respective applications, and also offer friendly user interfaces and pristine audio performance to boot. No doubt, there's an improvement over the older de-esser plug-in from Waves. If you're looking for flash, look elsewhere. But if you need to get the job done quickly and correctly, these plug-ins will get you to the finish line on time and sounding great.

WHAT'S HOT: Ridiculously simple to use — the Renaissance Collection 2 plug-ins put the emphasis back on using your ears rather than your eyes to dial in the best sounds. Vox is smooth and

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transparent; hard to beat when it comes to getting great vocal sounds with minimum fuss.

WHAT'S NOT: There's not a huge difference (sonically) between Renaissance Bass and the original MaxxBass.

COPY PROTECTION:

Challenge/response authorization.

OVERALL: In a word, the Renaissance Collection 2 effects are utilitarian. No fancy sweetening effects here — just effective, easy-to-use tools for dealing with common mix issues: bringing solo instrument/vocal tracks up front, getting bass guitar and other low-frequency sounds to translate to small speakers with little bass response, and taming sibilant vocals. If you already have MaxxBass and the original DeEsser, you probably won't find a lot of value in this bundle. However, of the three plug-ins, Vox is the superstar, and worth the price of admission by itself.

PRICE: \$200 (VST, RTAS, MAS, AudioSuite, DirectX); \$400 (TDM)

CONTACT: www.waves.com

EQ FREE LIT. #: 108

MCDSP ANALOG CHANNEL

By Mikail Graham

CONCEPT: Emulation of classic analog tape machines. A combination of two plug-ins: AC1 and AC2. The first works as a digital preamp for adding tons of gain without digital distortion. The latter works like a virtual tape machine with control over bias, playback speed and head configurations, selectable IEC EQ, and tape type.

FORMAT: Mac TDM, RTAS, AS

WHAT'S HOT: If you need to make your mix as hot as can be, jack up the bass, or splatter that guitar sound, this is the plug-in for you. Beyond just making tracks loud, it can also help a mix breathe by adding an analog-like character that is missing in all-digital mixes. It's quiet (-138 dB noise floor) and DSP efficient. It has 24 mono (16 stereo) AC1 or eight mono (four stereo) AC2 on a single MIX chip. Also supports older Nubus and PCI systems.



WHAT'S NOT: Only available for Pro Tools systems. Can easily add distortion if not set up correctly.

COPY PROTECTION: Key Disk, iLok dongle.

BEST USE: Great tools for adding analog life to any track. Can work on an entire mix, but is best suited for individual tracks such as drums, bass, or guitar.

OVERALL: More than just making things louder, this plug-in makes any audio track sound fatter and warmer.

PRICE: \$495

CONTACT: www.mcdsp.com

EQ FREE LIT. #: 109

ANWIDA SOFT DX REVERB 32-BIT

By Craig Anderton

CONCEPT: Dedicated reverb plug-in.

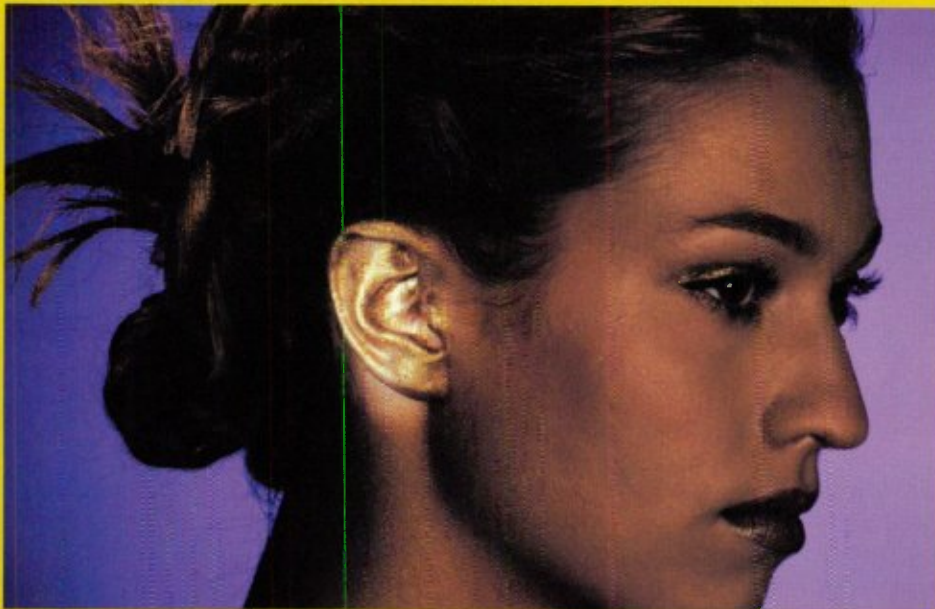
FORMAT: DirectX

WHAT'S HOT: 11 algorithms (two small rooms, two medium rooms, two large rooms/halls, two plates, two gate reverbs, and one inverse reverb) feature true stereo operation and 64-bit internal resolution. They have six to eight parameters each, so you can do a fair amount of tweaking, and there's support for both 16- and 24-bit files. Accepts mono signals, and generates a stereo field.

WHAT'S NOT: Accessing parameters uses the old-school VST plug-in concept, where you scroll through settings and adjust each value as you go. It's intuitive, but tedious.

COPY PROTECTION: Registration code.

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PLUG-INS



BEST USE: I particularly like the plates — they're nice and silky with voice, and aggressive with snares — but the halls are equally satisfying. The small and medium rooms are a bit metallic, with a sense of detachment instead of warm envelopment; they work well for modern, in-your-face drum sounds. I'd use most of the algorithms on individual tracks or in an aux bus, but the halls do the job for program material.

OVERALL: This fine-sounding reverb is versatile enough that you're bound to find something that works for you. If not, a little tweaking will get you there.

PRICE: \$149

CONTACT: www.anwida.com

EQ FREE LIT. #: 110

OHM FORCE OHMBOYZ

By Craig Anderton

CONCEPT: Multi-tap delay designed by alien life forms.

FORMAT: Pro version — PC/Mac/BeOS VST and DirectX. Expert — VST or DirectX. (Pro and Expert offer up to 32-bit resolution with MIDI I/O.) Standard — VST or DirectX (16-bit, no MIDI, no commercial use license).

WHAT'S HOT: This over-the-top plug-in has two main delays, each with multi-mode filter, distortion, pan, high shelf EQ, standard feedback, and cross-feedback (one delay's output feeds the other



input). These are fed by a four-tap delay, each tap with level, delay, and pan.

Nineteen of the 24 available parameters can be modulated by a 10-waveform LFO, LFO and delay times can display in musical units based on tempo, presets morph over a variable amount of time, and the controls respond to MIDI.

WHAT'S NOT: No way to feed the input directly to the output. To hear a straight signal, dial up a pre-delay stage with no delay.

COPY PROTECTION: Registration code.

BEST USE: Aside from rhythmic delay processing, the filtering, distortion, and extensive LFO modulation possibilities help OhmBoyz cross over into signal generation territory — you can literally make input signals unrecognizable.

OVERALL: Another plug for the dance crowd, but definitely not just another plug. You won't find this combination of delay and filtering anywhere else.

PRICE: Pro, \$199 (CD); Expert, \$79; Standard, \$9.95 (latter two are download only).

CONTACT: www.ohmforce.com

EQ FREE LIT. #: 111

WAVES L2 ULTRAMAXIMIZER

By Mitch Gallagher

CONCEPT: True "brick-wall" limiter that allows gain to be pushed to the max without fear of digital overs or distortion.

FORMAT: TDM

WHAT'S HOT: Super easy to use: just set the output "ceiling" level and pull down the Threshold control to boost your tracks. L2's clean sound improves over the company's older L1 plug-in. IDR noiseshaping provides for dithering signals to lower resolutions. ARC (Auto Release Control) makes set up a breeze. Fairly DSP-efficient (three instances per chip). In addition to maximizing levels, adds a subtle fatness to tracks.

WHAT'S NOT: Requires Pro Tools Mix TDM system. Stereo only — no mono

version. Pricy, although it comes in at 1/3 the price of the hardware version.

COPY PROTECTION: Challenge/response.

BEST USE: L2 is really designed for one thing: to help you make your tracks as loud as possible without risking digital overs or distortion. But even if you're not pushing the volume to obscene levels, L2 is useful for dithering files using IDR. With its clean sound, L2 is especially useful for limiting delicate acoustic



tracks that fall apart when processed with other limiters.

OVERALL: If you're looking for a software plug-in that will allow you to push your mixes to the absolute edge level-wise, look no further.

PRICE: \$800

CONTACT: www.waves.com

EQ FREE LIT. #: 112

PSP VINTAGE WARMER

By Craig Anderton

CONCEPT: Combines "vintage sound" single-/multiband compressor, high- and low-pass shelving, and overdrive to beef up tracks or mixes.

FORMAT: Mac/PC VST, DirectX, MAS

WHAT'S HOT: Really can perk up levels and punch; when driven into distortion, the results are warm rather than spiky. The EQ doesn't replace a parametric, but adds useful high- and low-end lifts/dips. Includes well-programmed presets, but if you want to tweak, the interface is inviting. Meter response is either VU or PPM, along with overload indicators.

WHAT'S NOT: Requires fast CPU (400 MHz PII/350 MHz G3) due to intensive graphics and metering. You can't type in numeric values, and there's no peak hold for the meters.

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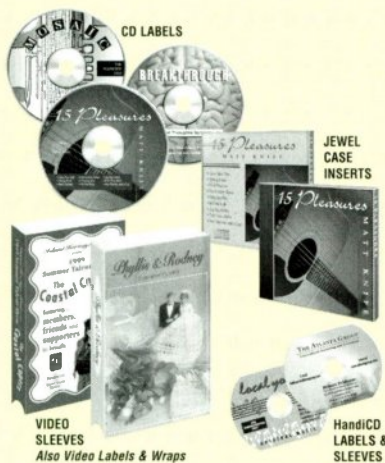
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COPY PROTECTION: Authorization code.

BEST USE: Extremely effective on drums and guitars to give them more power. Adds crunch to bass, but pull back the highs to avoid sounding tinny. As a mastering tool, use it to add forcefulness to a track — it's not a transparent volume booster, it has attitude.

OVERALL: A fine-sounding tool for aggressive mastering and tracking. Not necessarily cheap, but, considering what you get and how it sounds, the price is fair. I reach for it a lot these days when I need to give a track some extra "wow" factor.

PRICE: \$149

CONTACT: www.pspaudioware.com

EQ FREE LIT. #: 113

FXPANSION SERIES ONE BUNDLE

By Craig Anderton

FORMAT: Mac/PC VST, DirectX (allows MIDI parameter control via MIDI Yoke or Hubi's Loopback Device), Pulsar/SCOPE.

PLUG-IN DESCRIPTIONS:

Autopole: Dual stereo, multimode filters (24 dB/octave) are controlled by stereo envelope followers with adjustable attack/decay and a single, four-waveform LFO (which, in suitable VST 2.0 hosts, can retrigger based on tempo). Routing is cool: go through both filters in series or parallel, or dedicate one filter to the left and one to the right channel. Control signals can be inverted for the two channels for some wonderful stereo effects.

MTap: These four delay lines can lock timing to VST 2.0 host tempo and follow tempo changes, or sync to fixed BPM. They also include useful high- and low-frequency damping controls and panning for both the main delayed outs and feedback. But the extra goodie here is a flexible input bus and feedback scheme, where you can cross-couple the delay lines to feed back into each other. This can create some really bitchin' polyrhythmic delay effects.

Phat.Sync: This consists of a resonant filter and pattern generator; it must receive MIDI tempo

info (MIDI loopback for DirectX, or VST 2.0 host) in order to work. There are 16 sliders for filter cutoff and 16 more for resonance, all of which you can tweak in real time. The base resonance, base cutoff, mix, glide, and mode mix controls allow further tweaking. You can also store four patterns in memory and use Matrix mode to assign these to any of four single-measure slots. If you like synchro-sonic filter effects, this is great.

MidiComb: Running under VST 2.0, this shows up as a MIDI output because, although it processes digital audio, MIDI notes trigger the frequency of a comb filter, which is adjustable for high degrees of resonance. Like Phat.Sync, it's great for synchro-sonic effects, but very hard to describe because there's nothing quite like it. The



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PLUG-INS

three main parameters are feedback, low-pass filter cutoff, and high-pass filter cutoff, but additional sliders determine how note velocity affects these as well as the overall level. Furthermore, there's a dry/wet mix control.

Ring Modulator: Like other ring modulators, this requires a signal (carrier) input and modulator input. The modulator waveform can be square, sine, triangle, or sawtooth, with four different ranges. Its frequency can be envelope-controlled or LFO-controlled (with four LFO waveforms), and the envelope can affect LFO frequency as well. My favorite feature: Stereo invert, which inverts the LFO phase for the left and right channel oscillators. You can also lock the two envelope generators together.

RobotiK Vocoder: With DirectX, this requires a left input for the carrier and right input for the modulator, so I usually insert it in a bus and pan the digital audio tracks, feeding it left and right. The VST version allows using the

vocoder as an insert on the carrier track, then opening up a second plug-in, ExtModulator, as an insert on the modulator track — definitely more flexible. Additional controls set how rapidly the 24 bands of filters respond to changes in the modulator, filter resonance, and resonance for low frequencies (lowering resonance reduces boominess). An unpitched noise generator (with variable tone and level) kicks in when the vocoder perceives reduced tonal content in the signal.

THE VIBE: These plug-ins were clearly designed by someone who got beyond the preset level in synthesis, and probably knows how to plug patch cords in a modular system. They seem focused on creative, synth-type processing as opposed to being modules you'd find in a typical studio's outboard rack. Back in the '70s, people used to assemble these kinds of things with soldering irons.

WHAT'S HOT: The various functions are perhaps esoteric from a mainstream

perspective, but hark back to the days when synthesizers were more adventurous. The DirectX automation is cool, as are the hooks into VST 2.0 programs that allow for timing and reset options, and VST automation (within the limits of the host program). These plug-ins just beg to be used for dance music and hip-hop, especially because of all the available rhythmic tie-ins.

WHAT'S NOT: If you don't have MIDI Loopback installed, the DirectX Comb Filter and Phat Sync can't be used, nor can you take advantage of automation under DirectX.

COPY PROTECTION: Authorization code.

OVERALL: These are flat-out fun, especially if you want to add an edge to dance music productions. They're well crafted, the price is right, and they give you tools that can really help your music stretch out.

PRICE: \$100 Mac/PC

CONTACT: www.fxexpansion.com

EQ FREE LIT. #: 114

True blue.



S-com plus Stereo Compressor/Limiter

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DSOUND SIMPLE AUDIO PLUG-IN PACK I

By Craig Anderton

FORMAT: DirectX

PLUG-IN DESCRIPTIONS:

Parametric EQ: This seven-stage parametric (with six response choices per stage) offers pleasing sound quality and more functionality than usual. Its frequency response graph is helpful, as you can tweak curves directly on it, as well as move sliders or type in values. For just a little boosting or cutting, this is probably overkill, but, as you can set different values for the left and right channels, this plug really shines for problem files, as well as for those that need very specific equalization (e.g., multiple notch filters).

BPM Double Delay: This serves up two independent delay lines. With 4/4 time, you can select the rhythmic offset between the delay lines in eight steps, from whole note to sixteenth-note triplet. Choices are similar in 3/4. A "3-D Echogram" shows the relationship among channels, echoes, rhythm, and

levels. Unfortunately, the plug-in won't track tempo; also, you can't use odd time signatures such as 5/4 or 7/4, nor is there any way to reduce highs with successive echoes to prevent echoes from "stepping on" the dry signal.

Modulation FX: This includes four parallel delay modules, each with delay (0–45 ms), depth, regeneration, pan for the left and right wet signals, LFO speed, and LFO waveform (eight choices with invert). Each stereo channel is independently adjustable, but you can also link a given parameter for all modules — changing one shifts them all equally to preserve any offsets. For thick, clean modulation effects, this is great — even though you can't sync LFO to MIDI clock.

THE VIBE: These are relatively conservative, well-engineered plug-ins that



sound very good and provide solid, predictable operation. They are capable of subtle, detailed sound, but the Modulation FX plug-in can go way over the top if you want to stretch.

WHAT'S HOT: Operation is true stereo — you can process each channel independently — and the interface adjusts automatically for mono or stereo signals. The manual and online help are useful, and scrolling mice are supported for precise parameter adjustment.

Different shades of blue.



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PLUG-INS

Useful copy functions and preset management make it easier to create your own patches; the parametric can process with surgical precision.

WHAT'S NOT: No sync functions or external MIDI control, which would have raised the modulation and delay plugs to a whole other level. There's no metering, and the price — though reasonable — is relatively high compared to, for example, the Ultrafunk bundle.

COPY PROTECTION: Authorization code and occasional CD insertion.

OVERALL: These plug-ins are clean, effective, and will solve problems for you without getting in the way — they're even easy on the CPU.

PRICE: \$199

CONTACT: www.dsound1.com

EQ FREE LIT. #: 115

ULTRAFUNK SONITUS BUNDLE

By Craig Anderton

FORMAT: PC VST, DirectX

PLUG-IN DESCRIPTIONS:

fx:compressor: The usual threshold, ratio, attack, release, gain controls, and input/output metering, but also a variable knee control (from hard to very subtle), look-ahead limiter (on or off), and "vintage" option that reduces compression on the loudest peaks. A Transient Controlled Release function changes the release value in real time to reduce breathing. A useful graph shows the dynamics curve, based on the parameter values. It's single-band only, but has a smooth sound.

fx:equalizer: Six-band parametric; each band has selectable high-/low-/band-pass and high/low shelf responses. Frequency is variable from 10 Hz to 22 kHz, Q from 0.1 to 100, and gain is ± 18 dB. Additional features include a button to flatten the curve, separately enabled stages to save processor power, and a spiffy frequency response graph (with four selectable ranges, from ± 5 to ± 40 dB). Enter parameter values or drag points along the graph to create a curve.

fx:modulator: Provides flanging with one delay line per channel, ensemble with three delay lines, and a "string phaser" effect (like the Mutron Bi-Phase). In addition to the usual types of

controls, you can add low- or high-cut EQ, choose among six different LFO waveforms, invert the feedback and/or wet signal, alter the phase relationship between the LFOs used for each channel in the flanger or string phaser mode, and do through-zero flanging.

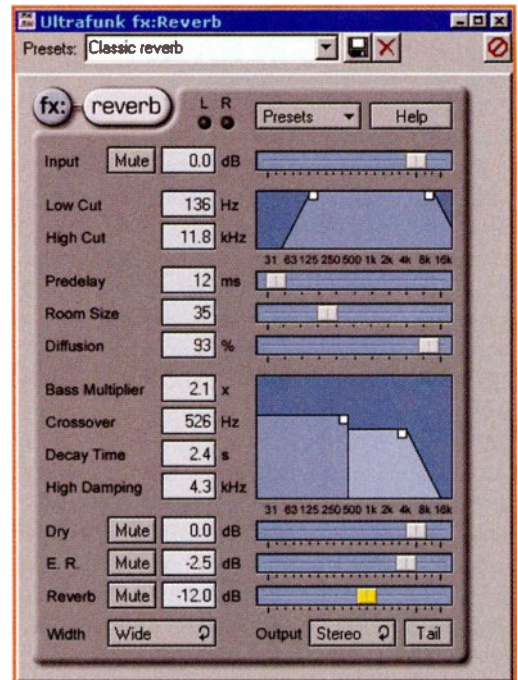
fx:phase: LR phase mode alters the phase relationship of two channels and works for widening (with small changes) to vocal elimination. MS Phase changes the phase difference between the centered, mono signal and stereo difference side signals; CS Encode places center channel info in the left channel and surround information in the right; SC encode places center channel info in the right channel and surround info in the left. This may be a killer module for surround enthusiasts, but is limited if you just want to process tracks or mixes.

fx:reverb: This single-algorithm reverb has flexible enough controls (high-/low-cut input filters, predelay to 250 ms, room size, diffusion, decay time, high-frequency damp, separate mix sliders for early reflections/reverb tail/dry signal, separate low-end decay time, input mute, and five width options to provide a variety of reverb effects. Two options are DirectX only: stereo/mono output and a "tail" option that extends a short sample if needed to accommodate the added delay time.

fx:surround: This 5.1 panner offers Doppler shift, attenuation and the ability to draw panning "curves" and automate them over time. Even if you're doing stereo instead of 5.1, this plug can make all kinds of goofy stereo and panning effects.

fx:wahwah: Manual, periodic (LFO), or triggered (envelope) control, with separate high/low limits and Q. It's limited to band-pass response and lacks a dry/wet balance control, but does the job.

THE VIBE: These have a professional feel, despite being done by a small, download-only company. But whoever programmed them also seems to have



a good set of ears; the sound quality treads that fine line between dull and hyped, staying mostly in the natural/accurate zone. These aren't anti-social plug-ins — they're polite, efficient, and get the job done with a minimum of fuss.

WHAT'S HOT: Although they don't respond to MIDI controllers, parameters are automatable under a VST host. The sound is clean, the online help is indeed helpful, and all plugs are compatible with scrolling mice for precise parameter adjustment. There's also outstanding preset management. And while the look is plain, the end result is functional.

WHAT'S NOT: No sync functions or external MIDI control; also, no undo or compare function. The reverb presets are nowhere near as good as the reverb itself.

COPY PROTECTION: Serial number.

OVERALL: These plugs are all cost-effective, but unless you want them all, you may save by ordering only the plugs you need. The reverb is definitely an overachiever, the compression has a natural sound, the EQ is functional and sounds neutral, while the wah-wah and modulator are useful if you need effects. Perhaps it's not a spectacular set, but you'll find yourself plugging them in when you need to get a job done quickly and have it sound right.

PRICE: \$200 (also available individually: fx:compressor, \$50; fx:equalizer, \$50; fx:modulator, \$30; fx:phase, \$30; fx:reverb, \$50; fx:surround, \$50; fx:wah-wah, \$30)

CONTACT: www.ultrafunk.com
EQ FREE LIT. #: 116

WAVE ARTS MASTERVERB DX

By Craig Anderton

CONCEPT: Dedicated reverb plug-in.

FORMAT: DirectX

WHAT'S HOT: Extremely efficient operation. It's easy to tweak; a reverb control window adjusts room size and decay simultaneously (green cross-hatching indicates settings for the most natural sound), and there's a cool 3-D graph for visual feedback. Individual early and late damping controls compensate for a lack of control over early reflections and diffusion, and a low-frequency scale parameter sets a separate low-frequency decay time. There's support for 16-/24-bit files, 96 kHz sample rates, and true stereo (also generates stereo from mono).

WHAT'S NOT: No diffusion control. On some signal sources, early reflections



sound "fluttery" with minimum damping.

COPY PROTECTION: Registration code.

BEST USE: This reverb offers a lush, enveloping sound — perfect for adding reverb to program material or individual tracks. Unlike some reverbs, it seems particularly well suited to delicate instruments such as acoustic guitar because of the sweet decay

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and warm (not muffled — warm!) sound quality.

OVERALL: Despite being a single-algorithm reverb, it's flexible enough to provide a variety of useful effects. The sound is natural and sweet, and the interface makes it painless to adjust parameters. The fact that it requires very little CPU power is icing on the cake.

PRICE: \$149

CONTACT: www.wavearts.com

EQ FREE LIT. #: 117

ARBORETUM SYSTEMS RAY GUN 2.0

By Craig Anderton

CONCEPT: Reduce noise, pops, hum, and rumble with vinyl, tape, narration, etc.

FORMAT: DirectX, Mac RTAS (Mac Ray Gun 1.2, which doesn't have the enhancement or filter section, is available for Mac VST, AudioSuite, and Premiere.)

WHAT'S HOT: If Arboretum's



Ionizer is overkill for your needs, the Ray Gun program is not only cheaper and incredibly easy to use, but almost magical in its ability to clean up recordings. The stereo enhancement retains full mono compatibility, and the bass/treble boosters can be very helpful. With Windows, it also works as a stand-alone application.

WHAT'S NOT: No VST version yet of

the 2.0 revision. Stereo enhancement works only with stereo signals and can't "stereoize" mono.

COPY PROTECTION:

Authorization code.

BEST USE: Remastering hissy tapes, cleaning up signal processor or mixer noise, notching hum, and, for DJs, taking out vinyl scratches and pops. However, even with clean signals, the enhancement section

can be very useful, particularly to improve stereo imaging.

OVERALL: This plug-in totally rocks when you need to do spring cleaning on your audio. It's way effective, reasonably priced, and you can just about work it in your sleep. Two (very quiet) thumbs up.

PRICE: \$119

CONTACT: www.arboretum.com

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PSP MIXPACK I.5

By Craig Anderton

FORMAT: PC/Mac VST, includes mono and stereo versions

PLUG-IN DESCRIPTIONS:

MixBass: Designed to enhance low frequencies, MixBass has a low-end harmonics generator, "downward" compressor (compresses levels *below* the threshold), and soft clipper (to allow more level before the onset of digital distortion). Controls include tune (crossover to separate the lows for processing), compressor threshold, harmonics "color," bass level, overall gain, and bass section mix with the straight signal. It works like a champ — if you like reggae-style low end and throbbing bass, this plug delivers.

MixTreble: This treble processor has four sub-sections: hiss remover (quite

there somewhere.

MixSaturator: This is a tube/tape saturation device; think of it as an expanded version of the saturation options found in the other plug-ins, with separate processing for the bass and treble regions. In addition to a drive control that sets the overall distortion, there are seven different algorithms — two tape, two tube, one digital. The meters are multi-function types, like those in the MixPressor. A little goes a long way for mastering, but some individual tracks seem to like major crunching.

THE VIBE: These are a nice mix of pro quality and mad scientist functions. It's clear that when the designer was faced with a decision of whether to include a parameter or not, it always made it in — these are surprisingly complex, given their intended application.

WHAT'S HOT: All the processors come with useful presets to get you started, which range from the subtle to the extreme. The documentation is also comprehensive, and helpful in figuring out some of the fine points of these deceptively sophisticated processors. What's more, you can't beat the price.

WHAT'S NOT: About the only downside is these aren't idiot-proof. You really need to read the documentation to fully understand how to use them.

COPY PROTECTION: Authorization code.

OVERALL: This is a convincing, highly cost-effective group of plug-ins. They work best when used to give that extra 10% to a sound, whether you're talking high end, low end, distortion, or dynamics.

PRICE: \$100

CONTACT: www.pspaudioware.com
EQ FREE LIT. #: 119

ANTARES AUTOTUNE 3

By Mitch Gallagher

CONCEPT: Designed to automatically pitch-correct out-of-tune tracks based on user-selected scales and tunings/temperings or using a graphical mode.

FORMAT: Mac VST, Direct X, MAS, Mac TDM, Mac RTAS

WHAT'S HOT: Version 3 features a cool, easy-to-understand user interface. Easy to use. Source specific algorithms



effective), transient restoration, stereo enhancement, and harmonics generation. Each is useful, but it's easy to overdo things — the reason for the four modules isn't to use all of them at once, but to choose a discreet combination. The transients expander is particularly effective, but they are all useful. As many of the controls interact, you need to spend some time learning this processor.

MixPressor: If you need a good mastering/track look-ahead compressor, this plug-in is versatile and offers an impressive set of controls. In addition to standard compressor features, there's a limiter and multi-purpose meters that indicate peak and VU levels before and after compression, along with amount of gain reduction. Note that this is not a loudness maximizer-type processor, but more like the classic, relatively gentle compressors of yesteryear (and the Saturation function brings back memories of tape crunch). Like the other MixPack modules, it takes a while to figure out how to best use all the controls, but the setting you want is in

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PLUG-INS

Recherches Musicales de l'Institut National de l'Audiovisuel (Ina-GRM), the plug-ins in this bundle have a polished feel and a great sound. At first glance, they may seem complicated, but thanks to a great user interface, you'll find yourself creating totally radical effects in no time, and with a minimum of effort.

WHAT'S HOT: Most of the plug-ins in this bundle (with the exception of Comb Filters and the TDM-only Equalizer) feature a very hip two-dimensional potentiometer that allows multiple parameters to be controlled (and/or automated) simultaneously by dragging a handle across a screen area. Every plug-in also contains 16 presets, and you can easily morph between any two, or, using a "Super Slider," interpolate between any user-defined set of presets; this is also a handy way to create new presets. All parameters (including two-dimensional pot and morphing and morph time moves) are automatable.

WHAT'S NOT: Lots of DSP power required. No sync functions or external MIDI control. Some differences between the TDM and other versions: for example, only the TDM version allows direct entry of numeric values, and only the RTAS and VST versions contain a Wet/Dry mix control.

COPY PROTECTION: Challenge/response.

OVERALL: Most of these plug-ins are

totally unlike anything else out there, so if you're in the market for basic reverbs, dynamics processing, and the like, look elsewhere. But if you want to create truly unusual effects — and especially if you do sound design for a living — GRM Tools is a must-have.

PRICE: \$349 (RTAS), \$459 (TDM), \$199 (Steinberg-distributed VST bundles of four plug-ins each)

CONTACT: www.grmtools.org
EQ FREE LIT. #: 122

LINE 6 ECHO FARM

By Mikail Graham

CONCEPT: Vintage echo- and delay-based effects, featuring emulations of 12 classic tape echo and analog effect boxes.

FORMAT: Mac TDM

WHAT'S HOT: Spot-on emulations of the Maestro EP-1 Tube Echoplex, EP-3 solid-state Echoplex, Roland RE-101 Space Echo, Boss DM-2 analog delay, Electro-Harmonix Deluxe Memoryman, and a cool Dynamic Delay that's very similar to the TC Electronic 2290. Currently there's simply nothing better when it comes to an all-around echo/delay plug-in.

WHAT'S NOT: Each instance uses up one entire DSP chip. Only runs on Pro Tools|24 and Mix systems. Deluxe Memoryman emulation doesn't include the original vibrato mode, only chorus.

No MIDI beat clock sync.

COPY PROTECTION: Key disk.

BEST USE: Perfect for adding just a touch of analog color to any track. The reverse tape and filter sweep delays are great for creating unique signature guitar solos. The Auto Volume algorithm makes it easy to create ambient swells out of any audio input. Also includes BPM/note value display or tap tempo for setting delay time, and full automation of all parameters.

OVERALL: Just about every classic echo effect you could want with a great stomp box-like GUI, super easy to use, and oh, so analog sounding!

PRICE: \$495

CONTACT: www.digidesign.com
EQ FREE LIT. #: 123

WAVES RESTORATION BUNDLE

By Mikail Graham

FORMAT: Mac/PC AudioSuite, MAS, Mac/PC RTAS, Mac/PC VST, DirectX
PLUG-IN DESCRIPTIONS:

X-Noise: A single-ended noise reduction plug-in. Like similar processors, you tell it what you find offensive by selecting a section of noise in the audio to create a noise profile. Broadband noise reduction is then applied to eliminate background noise from the source. The control set is quite simple, yet still provides a lot of useful options including a very effective visual analyzer. The Difference option allows for quick auditioning of how effective the controls are set by monitoring only the noise being removed; if any audio is still present, simply adjust the settings until you only hear noise. Noise profiles can be saved and loaded if desired. Best of all, this plug-in works and sounds very good, rarely adding the usual array of quirky underwater artifacts.

X-Click: Best for removing DC-offset noise and clicks from vinyl records and vintage 78's. Again, the control set is quite easy to use. Click removal can be done automatically, or, if you want to take the time, you can do this manually by recording the actual clicks onto a separate track using the Difference option and remove only those you don't want. X-Click works quite effectively without leaving noticeable artifacts,



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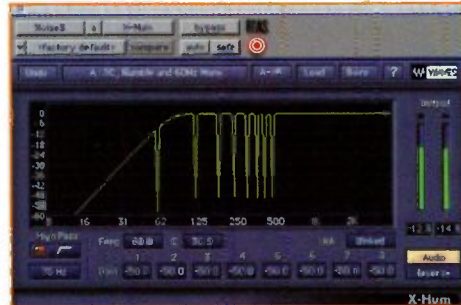
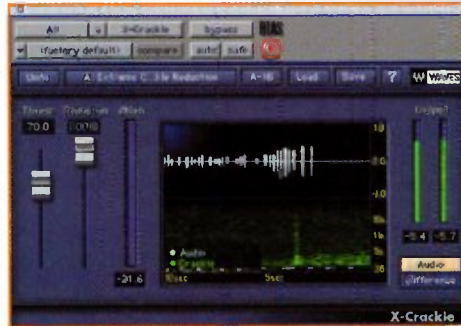
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linked notch filters. It can reduce ground loop hum up to -60 dB and has several useful modes: linking all or choosing an odd/even pattern of filters, plus there's a free mode where each of the eight filters can be adjusted independently. The Inverse option keeps the same frequency position, but applies a relevant boost instead of cutting the gain reduction, which is a useful feature for finding troublesome audio. Overall, it is an effective tool for removing steady hum and rumble noise.

THE VIBE: This entire plug-in suite is based on the audio restoration technology that Waves recently licensed from Algorithmix GmbH, Germany. They all have a great look and feel and are the best restorative software solution I've come across yet, as compared to hardware-based tools costing four times the price.

WHAT'S HOT: These four plug-ins pretty much cover the gamut for any restoration needs. The X-Noise plug-in, in particular, is exceptional, and can rid most any audio input of noise and buzz without adding undesirable digital artifacts.

WHAT'S NOT: No TDM version. Price isn't cheap for the casual user. Latency is quite high, making it near impossible to use for monitoring live input. The click, crackle, and hum algorithms could be better.

COPY PROTECTION: Challenge/response.

OVERALL: An effective set of noise and hum reducing tools for native host applications. The price is a bit high when compared to

though in my tests it left some clicks no matter what settings I used.

X-Crackle: This plug-in seems to work best in combination with X-Click as a second-stage process for eliminating crackles and surface noise. It appears to be intended more for the very low-level clicks and pops that X-Click might miss. Certainly a good tool to have, but much more limited in its overall usefulness.

X-Hum: Hum, rumble, and DC-offset removal using a combination of high-pass filtering and eight harmonically

some of the similar PC-based tools available, but, for the Mac platform, this is about as good as it currently gets.

The manual reads well, but a good tutorial would go a long way toward making this a stronger set of tools for the novice. From my tests, X-Noise will most likely be the main tool of choice, nonetheless, it's great to have all of these plug-ins available in one easy-to-use package.

PRICE: \$1,200

CONTACT: www.waves.com

EQ FREE LIT. #: 124

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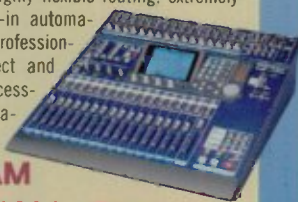
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TASCAM

Korg D1600

The Korg D1600 is a 16-track digital recorder that packs recording, mixing, and final CD mastering into a professional quality all-in-one unit.



KORG

Alesis Hard Disk Recorder

The HD24 from Alesis delivers 24 tracks of Hard Disk recording at an unbelievable price, and offering incredible performance and stability, thanks to Alesis' unique method of writing to the hard drive designed and built exclusively for recording music.



ALESIS

Millennia Media STT-1 Origin

Millennia's new STT-1 Origin is like having a large rack of vintage and modern outboard recording equipment with over 130 product combinations!



T.C. Electronics Voice Prism

VoicePrism is an entire vocal channel under preset control.



t.c. electronic

Mackie MDR24/96 Digital Multi Track

Mackie's new MDR24/96 is the perfect price-busting commitment to non-linear hard disk recording for the first time recordist or those replacing aging gear!



MACKIE

Avalon VT-747SP

AVALON DESIGN

The Avalon VT-747SP combines a creative STEREO tube-discrete Class A spectral-opto-compressor with a musical six band program equalizer, L-R output level and gain reduction metering and internal regulated power supplies in a 2U space.



Focusrite ISA-430

Focusrite

The ISA 430 is truly a "Producer's Pack", which combines the best of analogue and digital technologies, the first Focusrite product to include a range of different classic Focusrite modules in a single unit!

PreSonus



PreSonus Digimax 8Channel Microphone Preamp

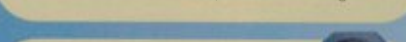
The Digimax combines 8 channels of pristine mic pre-amplification with 24 simultaneous digital and analog outputs.

Mark of the Unicorn, Inc



Mark of the Unicorn 2408MKII

If you've been wishing for hard disk recording, the 2408mkII can now make your dream a reality at an affordable price. The 2408mkII gives you 24 simultaneous inputs/outputs for under a grand!



Tannoy System 800A

180 watts with 8" bass transducer.

TANNOY



Event PS8

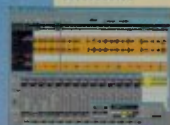
The PS8 by Event features an 8" Magnetically shielded low frequency driver.

EVENT ELECTRONICS

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MENTION CODE ME01

PLUG-INS

KIND OF LOUD SMART CODE PRO

By Mitch Gallagher

CONCEPT: Creates 5.1 surround encoded files that can then be burned to CD or DVD. Three versions are available: Smart Code Pro DTS-DVD, Smart Code Pro DTS-CD, and Smart Code Pro Dolby.

FORMAT: Mac AudioSuite

WHAT'S HOT: Very easy to use.

Support for 16- and 24-bit encoded files. Data rates can be optimized for various delivery mediums. Flexible channel/track assignment. The Dolby version provides many parameters and requires correspondingly more knowledge if you really want to get into it; the DTS version is extremely straightforward. Useful presets are provided that makes operation of either version a snap.

WHAT'S NOT: Offline file-based processing can take some time on slow computers. Manuals could be better.

COPY PROTECTION:

Challenge/response.

BEST USE: Excellent for creating discs for reference listening on home surround setups and in other studios. Also good for those who want to burn their own short-run CDs and DVDs with surround-encoded material.

OVERALL: One-button encoding! If you're doing surround work in Pro Tools, you'll see the value in this plug-in right away. There's not an easier way to create encoded reference discs and masters than this!

PRICE: Smart Code Pro DTS-DVD (CD and DVD), \$1,495; Smart Code Pro DTS-CD, \$495; Smart Code Pro



Dolby (DVD), \$795.

CONTACT: www.kindofloud.com

EQ FREE LIT. #: 125

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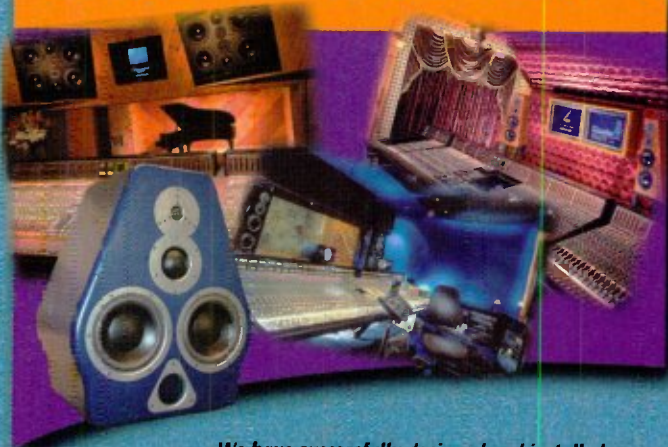
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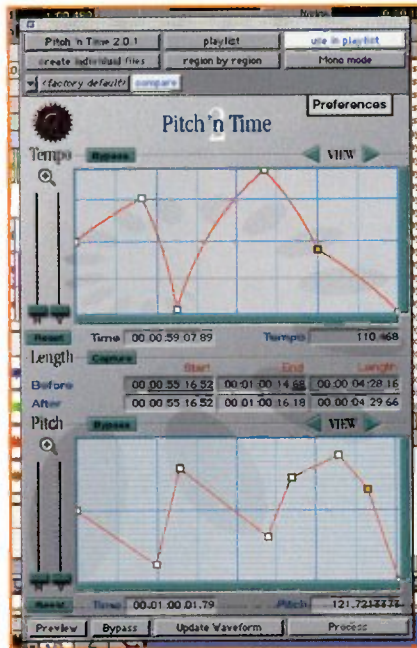
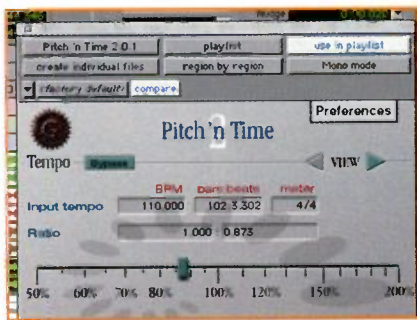
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CIRCLE 91 ON INFO CARD

PLUG-INS



SERATO PITCH 'N TIME 2

By Mitch Gallagher

CONCEPT: Time-compression/-expansion and pitch-shifting combined in one easy-to-use plug-in. Multiple working modes are provided, including fixed, morphing (works on just part of a file), variable (graphic), and vari-speed modes.

FORMAT: Mac/PC AudioSuite

WHAT'S HOT: Good sound quality within reasonable compression/expansion/pitch-shift limits. Preview mode is almost as good as real-time processing capability. Graphic editing modes let you go way beyond simply changing the tempo of a file — you can literally create pitch-shift and time-stretch “maps” for processing audio, or use the Morphing mode to compress/expand/shift as little as one note within a phrase. Nondestructive operation. Think

stereo time-compression/-expansion and pitch-shifting is cool? Pitch 'n Time 2 is phase-coherent for processing up to 48 tracks at once!

WHAT'S NOT: No formant compensation for pitch-shifting vocals.

COPY PROTECTION:

Challenge/response or iLok.

BEST USE: On the surface, the applications for Pitch 'N Time are obvious: slow down and speed up tracks without changing their pitch, and change pitch without changing track tempo or file length. Because of its high sound quality, this makes it great for tempo- and pitch-matching loops, among other audio tasks. However, this tool can go far beyond those basics, offering re-pitching, harmonizing, re-phrasing, and the ability to create wild pitch/tempo effects.

OVERALL: An exceedingly powerful processor for pitch-shifting and time-stretching/-compressing audio.

PRICE: \$799

CONTACT: www.serato.com

EQ FREE LIT. #: 126

PROSONIQ ORANGE VOCODER

By Mitch Gallagher

CONCEPT: Designed to simulate the effects generated by an analog vocoder. Also includes an eight-voice synthesizer, graphic EQ with up to 12 bands, filter with distortion, ring modulation, and reverb (although it's more synth release than “reverb”).

FORMAT:

Mac/PC VST, Mac RTAS

WHAT'S HOT:

Can create a variety of very good vocoder effects. Easy to use. Presets make good starting points. Powerful built-in synth. Can take carrier signal from a track or the built-in synth, and use any track as the modulator

signal. Input Channel Flip allows you to swap the carrier signal for the modulator signal, without “re-wiring” all your routings. EQ is useful for tone shaping and improving intelligibility.

WHAT'S NOT: No MIDI control over synthesizer under RTAS severely limits the usefulness of this plug-in for Pro Tools users. (Will be addressed in the next version. The VST version does allow playback of the synth via MIDI.)

COPY PROTECTION: Key disk (RTAS), serial number (VST).

BEST USE: The obvious application is vocoding, but this plug-in is capable of creating all sorts of new sounds and textures.

OVERALL: A powerful processing tool capable of generating a variety of lovely (and not so lovely — in a good way) timbres. However, lack of MIDI control limits this plug-in for RTAS/Pro Tools users.

PRICE: \$245

CONTACT: www.prosoniq.com

EQ FREE LIT. #: 127

SONY OXFORD EQ

By Mitch Gallagher

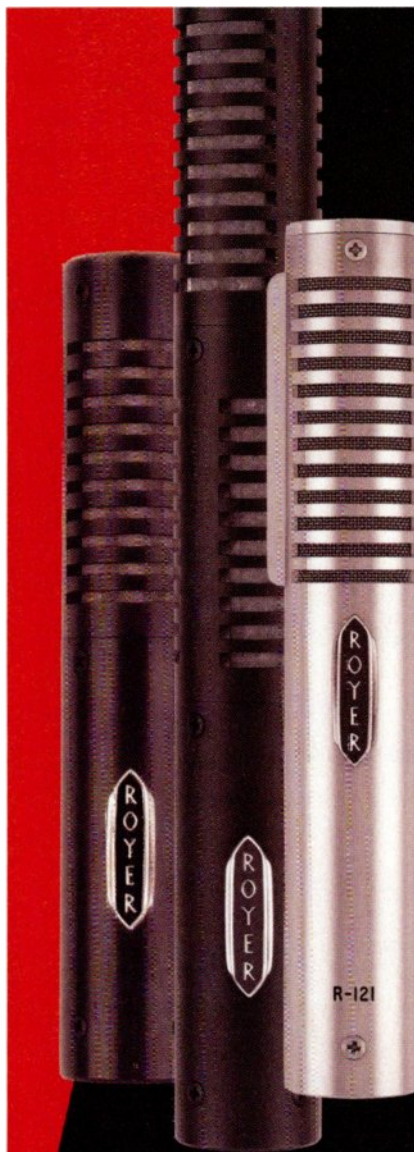
CONCEPT: High-end equalization plug-in based on the EQ section found in the stratospherically priced Sony OXF-R3 digital mixing console. Comprises five fully parametric EQ bands with separate variable-slope low- and high-pass filters. Includes four selectable EQ response types; there's also an optional GML 8200 type.



ADINDEX

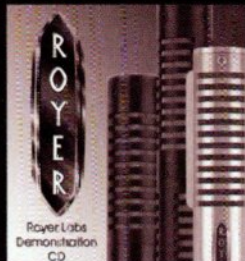
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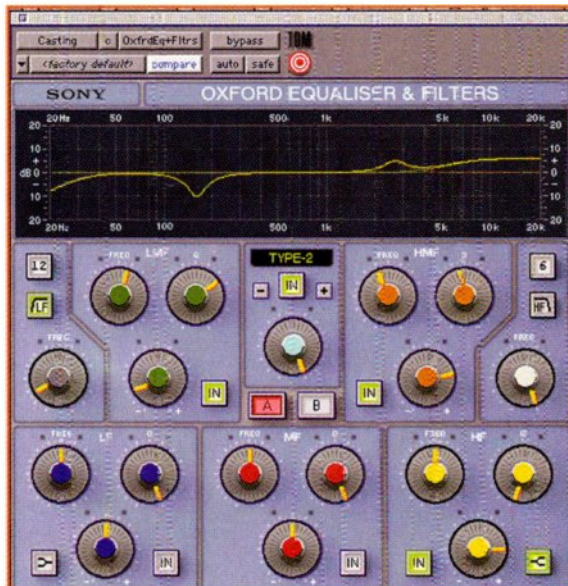
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THE WIDE WIDE WORLD OF

PLUG-INS



FORMAT: Mac TDM, TC Works PowerCore version coming soon.

WHAT'S HOT: Outstanding sound quality. Two complete EQ settings can exist simultaneously; A/B buttons allow toggling between them. GML 8200 option adds yet another highly desirable EQ flavor. Three plug-in versions are included — five-band EQ, five-band EQ+filters, and filters — allowing you to maximize DSP usage. Did I mention outstanding sound quality?

WHAT'S NOT: Expensive. Only available as a download from www.sonyoxford.co.uk.

COPY PROTECTION:

Challenge/response.

BEST USE: Excellent all-around EQ for use on mono or stereo tracks, or for complete mixdowns. Whatever your EQing chores might be, the Sony Oxford EQ delivers excellent results.

OVERALL: The only way most of us will ever be able to afford to own the sonic capabilities of a Sony Oxford console! This is a truly high-end professional EQ for Pro Tools. The GML 8200 option is icing on the cake. If you can't get it sounding right using this one....

PRICE: £550 (about \$800 at press time); GML 8200 option, £220 (about \$320 at press time)

CONTACT: www.sonyplugins.com
EQ FREE LIT. #: 128

TC WORKS POWERCORE 1.5

By Emile Menasche

FORMAT: Hardware DSP-based plug-ins running on a proprietary PCI card. Supported plug-in formats include Mac/PC VST and MAS. Version 1.5 also adds support for VST instruments. Up to four cards can run simultaneously.

PLUG-IN DESCRIPTIONS:

As of version 1.5, the PowerCore is bundled with a fairly complete roster of effects:

Megareverb, TC Chorus Delay, TC EQsat, TC Voicestrip, TC Vintage CL (Compressor/Limiter), and TC Master X3 mastering plug-in (the latter is included as part of the bundle through March 2002). A copy of Spark Le audio editing software is also included, and, by the time you read this, registered users will be able to download the TC PowerCore 01 Monosynth. TC also offers a number of optional PowerCore plug-ins, and is working to increase third-party support.

Megareverb: This reverb offers plenty of dimension and a *spectacular* tail. You can set reverb time for different frequency bands, adjust room factors such as shape, size, and diffusion, and exert precise control over predelay and frequency response. When I replaced a Waves Renaissance Reverb in a mix with the Megareverb, my G4's processor load dropped by 30%. If you're a reverb junkie, this alone may be worth the price of admission — up to eight Megareverbs can run on a PowerCore card at once.

TC Chorus Delay: Lush shimmer defines this algorithm, which is borrowed from the TC Electronic 1210 Spatial Expander. You can go from subtle dimension to out-and-out sonic mangling. The delay also sounds good, but is limited to a max of 500 ms. On the plus side, the delay can be used at the same time as the chorus.

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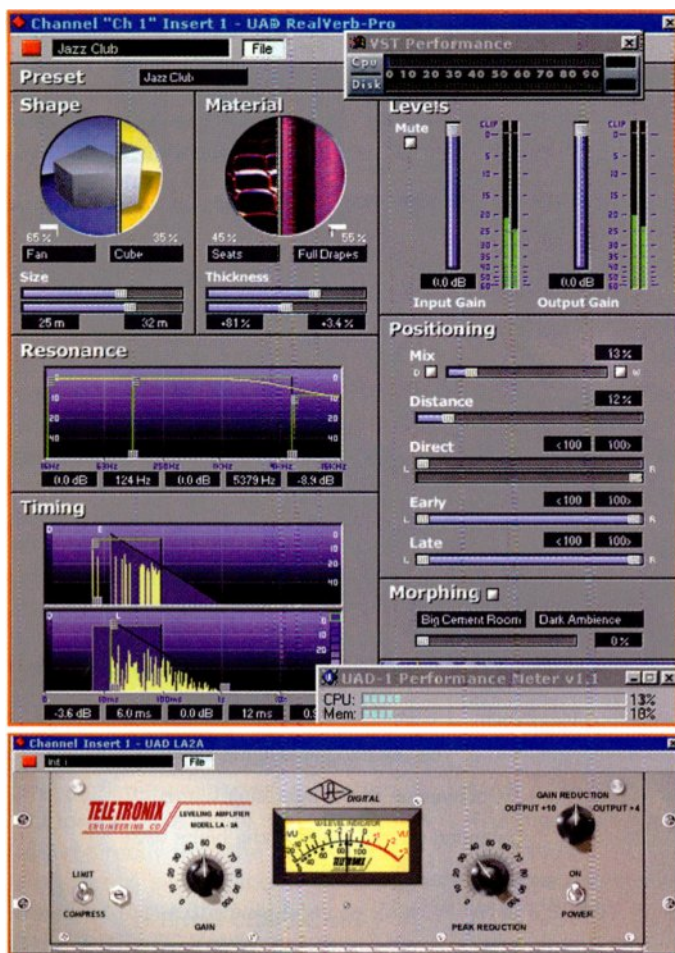
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For more about Zoom, click to www.samsontech.com or email info@samsontech.com ©2001 Samson

CIRCLE 84 ON INFO CARD

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World Radio History

PLUG-INS



UNIVERSAL AUDIO POWERED PLUG-INS

By Craig Anderton

FORMAT: DSP-based PC VST plug-ins that run on a proprietary PCI card. Compatible with Cubase VST, Nuendo, and Logic Audio. Compatible with Wavelab under Windows 2000, soon for Win98. Compatible with Wavelab, Sound Forge, and SONAR as DirectX effects in conjunction with FXpansion's VST-DX wrapper. Mac VST and MAS support are on the way.

PLUG-IN DESCRIPTIONS:

RealVerb Pro: This is where having dedicated hardware DSP makes a huge difference. The reverb is beautiful, flexible, and clean — and when you hit Stop during playback, the tail keeps going. There's excellent control over early reflections, choice of shapes, and room materials, and separate panning for direct sound, early reflections, and late

reflections.

RS-1 Reflection Engine: A CPU-light relative of RealVerb Pro, this has delay, size, recirculation, damping, wet/dry mix, and shape controls, so you can still go pretty far. It's an ideal track reverb when you need multiple instances.

LA-2A Leveling Amp: This digital emulation of the Teletronix classic offers a Limit/Compress switch (changes compression ratio) and controls for Gain and Peak Reduction

(threshold). It's simple, effective, and spends very little CPU power.

1176LN Limiting Amp: As it models a solid-state device, you'd expect a brasher sound than the LA-2A... and it delivers. Operation is simple: choose from 4, 8, 12, or 20:1 compression ratios, set the desired amount of compression with the Input control, make up for gain lost with the Output, and set the Attack (20-800 μ s) and Decay (50-1,100 ms) for the desired dynamic characteristics.

EX-1 Equalizer/Compressor: This five-stage parametric EQ/compressor has a few surprises. The lower two bands' bandwidth control sets bandwidth, but, when fully counter-clockwise, changes the response to low shelf and, when fully clockwise, sets a high-pass response. The upper two bands work similarly, but with high shelf and low-pass responses selected, respectively. Each band can be bypassed individually, and the

boost/cut range is ± 18 dB. The compressor section is for those who want more flexibility than the LA-2A and 1176LN emulations, with continuously variable compression ratio and wider-range attack and decay controls.

DM-1 Delay Modulator: This provides chorusing, flanging, slapback, and related effects, but won't go beyond 300 ms and won't lock the LFO to tempo. The coolest effect here is QuadChorus, where the LFOs for the two stereo delays are 90° out of phase — it's righteous on guitar. In addition to the usual delay/rate/depth controls, the recirculation control allows positive and negative feedback, while a damping control can limit high-frequency response.

CS-1 Channel Strip: This combines the EX-1, DM-1, and RS-1. **THE VIBE:** UAD has produced a nice mix of the past and future. The vintage compressor emulations bring back the '50s, yet the reverb is thoroughly modern, and the rest fall somewhere in between. They have a nice look, too (although they take up a lot of screen real estate). Overall, these are plug-ins that you'd likely use every day — an important consideration when deciding whether to spend the extra bucks for a DSP card.

WHAT'S HOT: Reduces CPU load dramatically while delivering great sound. 24/96 compatible. Automatable parameters, and the reverb not only sounds wonderful, but can morph between settings. **WHAT'S NOT:** Multicard operation yet not supported. No third-party plug-in support. No sync-to-tempo option for the delay LFOs.

SYSTEM PERFORMANCE: It was indeed fun to keep piling on the plugs without having the VST performance meter flip out: after adding two channel strips, two reverbs, DM-1, RS-1, LA2A, and 1176, the board's performance meter (not Cubase's VST meter, which stayed under 10%) showed about 60% CPU load, and 50% memory. However, after that point, crackling and audio weirdness

started to appear. RealVerb is the biggest power-sucker (three channel strips use less DSP power than one reverb), but given that it's more likely to appear as a single aux bus effect than multiple times in different tracks, that's not a real issue.

In general, the few problems I experienced seemed to accumulate over time: if you loop multiple tracks, then add plug-ins, then edit them, then add more plugs, then remove some plugs and add different ones, at some point the system will complain. I found that stopping and starting the transport usually set things right; if not, turning off the plugs, then turning them back on again "reset" the system. Basically, the issue appears to be host system integration rather than the plugs themselves. This is the type of thing that tends to sort itself out over future software revs.

COPY PROTECTION: Plug-ins that work only with a specific PCI board is pretty much the ultimate form of copy protection.

OVERALL: Yes, DSP does make a difference. This isn't a knock on native plug-ins, which have reached a level consistent with decent outboard gear. But these plugs take aim at high-level outboard gear; the reverb tails are smoother, the early reflections more complex, and the compression models more sophisticated.

I was initially disappointed not to find some more esoteric functions, but then I realized that devoting DSP to "bread-and-butter" plug-ins is the best way to go — spend the dedicated DSP for the plugs you use all the time, and reserve your CPU's power for the native plugs that give that extra cool or weird effect. Besides, what's more important than sweet-sounding compression, EQ, and reverb? Those tend to be what's most lacking with budget setups — and UAD's Powered Plug-Ins decisively upgrade those crucial functions.

PRICE: \$995

CONTACT: www.uaudio.com

EQ FREE LIT. #: 130

resulted in wide exposure and industry opportunities for Oasis clients. When we send out the Sampler that includes your song, we'll also provide you with a mailing list of recipients so you can be in touch with the DJs to promote your music directly.

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AES REPORT

► continued from page 52

3.1 update for DP3 (Digital Performer 3), which now features unlimited multiple undo (which shows up as thousands of actions in the refer-

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CIRCLE 72 ON INFO CARD

ROGER NICHOLS

► continued from page 130

Pro Tools, Sony DMX-R100, Emagic Logic Audio, Sony Oxford, Neve Capricorn, and analog Neve and SSL consoles.

There are some consoles that I like better than others, and there are some DAWs and converters that are better than others. Sometimes it's easier to record on better equipment or the latest hard disk recorder, and sometimes one microphone or one converter improves the sound of your work, but if you have a tool to do your job and you know how to use it, it does not have to be the best, shiniest tool, it just has to be a tool that works.

STORAGE, STORAGE, STORAGE

Let's talk about hard disk storage for a minute. For digital audio recording, there's no such thing as "too much storage." The parameters that have meaning to us digital audio guys are capacity, average seek time, RPM, transfer speed, and interface type.

Capacity of hard drives has reached 180 GB at a price of about \$2 per gig for EIDE drives and \$7 per gig for the SCSI version of the same drive. Sixty GB drives can be found for about \$120. There's no reason not to have plenty of storage.

Average seek time is the time it takes the read/write head to get from one piece of data to another piece of data. This could be the most important specification for digital audio recording. By the mere nature of editing digital audio non-destructively, the data becomes fragmented on the hard disk and the heads must search across the entire disc for the audio to be played back. A more meaningful spec would be average latency. This would take into consideration the speed of the rotating platter carrying the data. Even if the head moves fast from one place to the next, it must then wait for the chunk of data to come around the platter. If the head gets there just after the data goes by, it must wait one revolution for the data to get back to the head. Here is where RPMs comes in. If the disk is rotating at 5,400 RPM, it takes about twice as long for the data to get back to the head as it would in a 10,000-RPM drive, or three times as long as a 15,000-RPM drive.

Transfer speed is the result of two factors. The first factor is the interface used to connect the drive to the computer. The fastest interfaces today are UDMA 133 at 133 MB/second and Ultra 160 and Ultra 320 SCSI at 160 and 320 MB/second, respectively. Even though FireWire is the current buzzword, the transfer rate is only 400 megabits per second. Notice I said megaBITS — 400 megabits is only 50 megabytes per second, or about 1/3 the speed of UDMA and SCSI.

It must be noted that there's no such thing as a true FireWire-interfaced hard disk. The drives are usually EIDE and are connected to a converter that translates the data stream to IEEE1394 format. Because the 1394 transfer rate is slower than EIDE, there's no speed penalty for the conversion, and 400 megabit rates can be easily achieved.

It should also be noted that these interfaces are backward-compatible with earlier, slower versions of hard drive interfaces. This means that a computer with an older, slower disk controller can still access data on the new drive, but at the slower transfer rate. In order to transfer data at the highest speed, you must have a matching hard drive controller in your computer.

HARD DISK TRICKS

There are a couple of ways to cheat when it comes to hard disk storage. First, if you don't have a 15,000-RPM drive and want to improve the multitrack reliability of your DAW, try partitioning your drive into smaller logical drives. Nine-GB partitions work well. If you have a 36-GB drive, then you would end up with four 9 GB logical drives. The advantage is that the heads only have to move 1/4 the distance from one chunk of data to another, lowering the average seek time. This won't work if you record 24 tracks on one logical drive and another 24 tracks on another logical drive. If you are going to split tracks, they must be split across two physical drives.

Another trick is a hard disk system from Medea. They use EIDE drives in an enclosure that's connected to the computer by a SCSI interface. The drives are configured in a RAID configuration that makes your computer think that you have a 10,000 RPM, 160 GB SCSI drive instead of two 80 GB, 5,400 RPM EIDE drives. Cool, huh? ■



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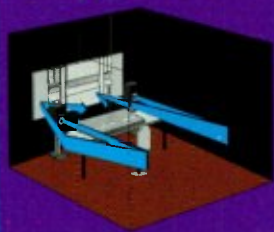
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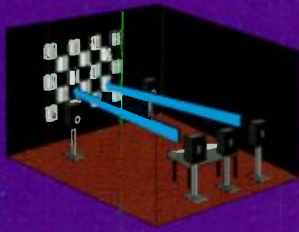
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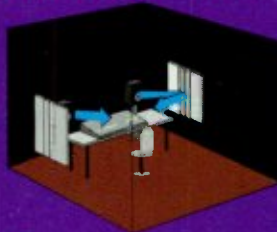
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- 4 **Australis Bass Trap**
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*Suggested US retail price.

ROOM WITH A VU

► continued from page 18

lection of sounds and sequences. Although the company was out of business for a while, they came back around four years ago, and since then they have written several software revisions per year. All of the processing is done in one of the G4's; the Synclavier just does voice processing. Originally I had a filing cabinet full of five-inch floppies, then I went to a WORM drive, then magneto optical, and now I have 80 GB FireWire drives containing my entire library — 300,000 to 400,000 sounds. With 756 MB RAM, I'm not afraid to load a big, scary sound into the Synclavier. The bulk of what I do is orchestral, and the quality of the Synclavier strings is very rich, deep, and detailed (the sampling was done at 50 kHz). I'll combine the Synclavier strings with a synth as 'glue' to get a sense of many people playing. In an orchestra, each musician plays with a slightly different tuning, and I can accomplish that

aspect more with a synth sound than sampler."

PRODUCTION NOTES: One of the projects that Michael recently completed was his new solo CD *Mysterious Ways* (available from Koch Records). "We recorded the CD directly into Pro Tools with myself, Danny Gottlieb, Chuck Loeb, and Bashiri Johnson playing live. Chris Botti couldn't be there with us during tracking, so I sent him the Pro Tools session on CD-R with charts. He recorded four or five parts, FedEx'd the session back to me, and I comped the parts. Jon Durant also recorded this way at his home studio and sent back zillions of tracks to me. It's amazing how seamless the process was — even with David Torn, who recorded his parts into Logic Audio. After we finished recording, I simply sent the session to Roger [Nichols], who mixed and mastered the project at his studio in Florida. It's the first project I have ever done this way, and it's amazing. Now I can't imagine doing it any other way." ■

LEANNE UNGAR

► continued from page 28

What is the biggest mistake of your life?

Being out of town the day James Taylor left a phone message saying he wanted to record.

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

Make sure it's really your passion, because the competition will be fierce and you'll have to work insane hours with little immediate reward. Then get a job at the best studio you possibly can, because the people you meet, even in a gofer capacity, will be the ones who are your clients 10 years later. Finally, do not let anyone discourage you from your goal. Just before I was hired by A&R Recording in 1976, I remember going to one of the biggest studios in New York, looking for work. I played my tape for the chief engineer, who shall remain nameless, and he loved it. Then he told me he didn't believe in female engineers. I said, "How can you not believe, I'm right here. You like my tape." I wonder if he believes yet. ■

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CIRCLE 40 ON INFO CARD

FEZGUYS

► continued from page 38

looking for anomalies within large data sets from earthbound radio telescopes leased by SETI. But all that computing power is pretty useless if you're trying to come up with a tight *Gaida* sound that fits perfectly in a mix.

So, what's the point? If there's value in something, the creative mind will find a way to use it. Find the reasons that resonate for *you*, and then take action with the same passion and enthusiasm you put into your music. Understanding the value of the Internet is just as important to the modern musical mind as knowing which contract to sign and which to trash.

PARTING REMINDERS

Upload sites are still useful. They won't cure the common cold, but you never know what might happen when you put yourself forward. It's still a good idea to get that music out of your head. The recording studio is one step in that chain. Hopefully, for you, the Internet is another. ■

JUST A PHASE

► continued from page 60


usually measure to the throat of a horn or the voice coil of the woofer. If you're not good at math, use the number of feet as the number of milliseconds by which to delay the PA, and throw in an extra millisecond for good measure. (Note: the horns and low-frequency drivers may be in separate enclosures. If the installer of the system hasn't aligned these drivers, the system has inherent phase problems that may be difficult to cure).

Once you have that number, you'll have a couple of options for correcting the problem. Hopefully the PA has a drive processor on the L/R master output such as an Ashley Protéa or a BSS Omnidrive. These devices include a delay function, and can display delay time in feet so that you don't have to calculate. Simply set the delay to the number of feet (or milliseconds) between the PA and backline. This delays the L/R mix enough to put the PA in phase with


the backline. You can fine tune or test the accuracy of the delay by asking the bass player to turn on his stage amp, and play a low "E" note. As the note rings, bring the faders up for the bass signal and change the delay time while listening to the quality of the bass. When you hit the correct delay time, you'll hear the bottom end become reinforced — letting you know that the PA and the backline are in-phase. If the PA system doesn't have a drive processor, or the processor is locked, you can use any effect unit capable of performing delay — but if you use this approach, be sure that there is no "dry" signal (or feedback) mixed into the output of the effect device.

In some situations, the difference will be subtle — especially in rooms that have modal problems. However, in other situations, the improvement will be dramatic.

Steve La Cerra is on tour grasping for every dB he can possibly wring out of PA systems.



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COMPUTER-BASED AUDIO

MOTU 828 Firewire Audio Interface

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

MOTU Digital Performer 3 Digital Audio - MIDI Sequencer For Mac

- Complete virtual recording studio with fully automatable mixing, effects and EQ • Unlimited audio tracks • Sample-accurate waveform editing
- 32-bit real-time effects • 64-bit MultiWorks Limiter and Multiband Compressor • POLAR window - Interactive audio loop recording
- New in DP 3 -
- Redesigned user interface based on Apple's OS X
- Apple G4 Multi-processor support • Pro Tools Import/Export via DigitalTranslator and OMF with all tracks, regions, crossfades, and time-stamps in tact • Open architecture surround compatibility with support for mono, stereo, quad, LCRS, 5.1, 6.1, 7.1 and 10.2 surround formats
- Vocalign ADR (Automatic Dialog Replacement) support

emagic Logic Audio Platinum Music Production Software For Mac & PC

- Unlimited MIDI tracks • Up to 64 audio tracks (128 with multiple hardware) • Supports 24-bit/96kHz audio resolution • Support for up to 24 audio instruments • Includes 40 native effect algorithms • 32 effect buses • Up to 8 effects inserts per track or bus • Plug-in support for VST2.0 and DirectX (Win and ReWire)
- Arrange and edit MIDI and audio tracks with a comprehensive set of tools • Draw controller data directly into the arrangement with HyperDraw
- Instantly switch between 90 Screensets containing customized window configurations • Built-in Stereo Sample editor • Supports all currently available Surround formats • Hardware support for ASIO, (3) AudioI/Os, ProTools TDM (Mac), DIGIC01, Yamaha DSP Factory and more

RealVerb Reverb Plug-In For TDM & MAS

- Uses complex spatial and spectral reverberation technology to accurately model an acoustic space
- Choose from a graphic menu of Room Shapes and Sizes (from 0.5 meters to 99 meters) as well as Materials with adjustable thickness
- Two different rooms shapes/sizes & materials can be blended and even morphed in real-time
- Control intensity and timing of early reflections and late-field reverberation
- Intuitive graphic control over Resonance (EQ), limiting and diffusion patterns
- Stereo Soundfield Panning uses psychoacoustic principals to allow spread and control of the signal between stereo speakers creating an impression of center and width.

M-AUDIO USB Audiosport Quattro 4-in/4-out Audio Interface w/ USB and MIDI

- 24-bit/96kHz compatible • Multitrack recording and mixing without PCI card installation • Zero-latency direct monitoring
- Balanced 1/4" TRS connectors
- Selectable input and output levels provide compatibility with both pro and consumer equipment • 1x1 USB MIDI interface
- Ships with ASIO drivers for Mac & PC - more drivers are on the way
- Add even more professional connectivity with the optional Omni I/O which provides 2 mic preamps with phantom power and independent gain and pad, 8 additional inputs, 2 headphones sends, an FX send and return, dedicated monitor and record outputs, and more.

Steinberg Cubase VST 5.0 Complete Pro Music Recording System

- Combines high resolution MIDI recording with audio recording in either 16 or 24 bit formats
- Up to 72 audio tracks • Includes lots of VST Plug-Ins • Access the world's largest range of add-on real-time audio effects and sample accurate synth plug-ins • True Tapo analog sound recording built in • Supports ASIO audio cards - accessing the latest low latency audio cards • Includes the Universal Sound Module VST instrument with over 70 MB of sound data
- Also Available: **Cubase VST 32 5.0**
- Up to 128 Channels of Audio • 32-24-20- and 16-bit recording
- Up to 96kHz • Apogee UV-22 dithering included

cakewalk Sonar Digital Multitrack Recording System

- Unlimited digital audio and MIDI tracks
- 24-bit/96 KHz audio • 32-bit, real-time effects
- Multi-processor and dual monitor support
- Audio loop construction and editing tools with automatic beat matching and full support for importing ACID loops • DXi (DirectX Instruments) software synthesizer plug-ins
- Fully-automatable DirectX 6 audio effects Plug-Ins from Power Technology • Includes DXi-compatible soft synths from Roland, Applied Acoustic Systems, Live Update, and Audin S-mulation • Optimized for Windows 2000/ME/98 SE systems
- Compatible with Microsoft's WDM low latency audio driver technology

Cam Labs MotorMix Desktop Motorized Fader Worksurface

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

TC | WORKS PowerCore The DSP-Turbo For Your Native Audio Workstation

- Crossplatform PCI card with 5 hi-end DSPs (2800 MHz WORTH OF DSP POWER)
- World class Reverb, Modulation FX and EQ right out of the box
- 24/96 compatible • Works with any VST/MAS-compatible application
- Works with all sound cards supported by the host software • Includes TC TOOLS/96 PLUG-INS - TC MegaReverb, TC Chorus/Delay, TC EQ SAT
- Also includes SPARK LE Mastering Software • One complete set of TC TOOLS Plug-Ins (MegaReverb, Chorus/Delay and EQ) only requires one DSP to run • Optional TC MASTER X 3x5 multiband mastering processor
- Open processing platform allows future Plug-In compatibility by 3rd party developers

serato Pitch 'n Time 2 Time-stretcher & Pitch-Shifter (AudioSuite)

- ProTools compatible Time Stretching, Pitch shifting AudioSuite plug-in for Mac and PC
- Performs a sophisticated auditory scene analysis based on the human auditory system and uses a patented mathematical algorithm to speed up or slow down music without artifacts - works on solo instruments, voice and complete mixes
- Preserves sample accurate timing
- Works with all bit depths, and sample rates
- Multi-channel phase accurate processing works with 5.1 and 7.1 surround stems without loss to the surround image.

digidesign DIGI001 Digital Audio Workstation For Mac & PC

- Completely integrated digital recording, MIDI sequencing, mixing and editing environment for the Mac OS and Windows
- Sample-accurate simultaneous editing of audio & MIDI
- 18 simultaneous, 24-bit ins and outs with support for 44.1 and 48 kHz sample rates
- 2 XLR mic/1/4" line inputs with 26 dB pad, 48v phantom power, gain knob, and HP Filter at 60Hz
- 6 1/4" TRS balanced/unbalanced line ins w/ software controlled gain
- 4x8 balanced 1/4-inch Main outputs and balanced 1/4" monitor outs with front panel gain knob
- 1/4-inch unbalanced line outputs channels 3-8
- Headphone output with independent gain control knob
- 2 channel S/PDIF coaxial digital I/O and 8 channel ADAT optical I/O (switchable to 2 channel S/PDIF)
- Includes Pro Tools LE software, based on Digidesign's world renowned ProTools software, supports 24 tracks of 16 or 24-bit audio and 128 MIDI tracks
- Supports both RealTime AudioSuite (RTAS) and AudioSuite effects Plug-Ins - Buried RTAS plug-ins include: 1 and 4-band EQ, Dynamics II-compressor, limiter, gate and expander/gate, Auto Delay - short, stop, medium, and long delays with modulation capabilities for chorus or flange effects and other AudioSuite plug-ins include: Time Compression/Expansion, Pitch Shift, Normalize, Reverse.
- All mixing parameters including effect processing can be fully automated.

GLYPH X-Project Firewire 30GB Firewire Hard Drive

- 7,200 rpm 30GB drive optimized for digital AV
- EEK 1594 (FireWire) Interface - drive automatically mounts drives on your desktop
- Record, mix & edit 144 minutes w/ 24 track audio at 24 bit, 48kHz
- Tablet or rack-mountable configuration
- Hot-pluggable dynamic reconfiguration allows re-cabling peripheral devices without re-booting
- Includes Rack ears, feet, firewire cable, power cord

WAVES Version 3.0 Native & TDM Plug-In Bundles

- Waves Bundles feature some of the hottest software processing plugins for tracking, mixing, remixing, mastering and sound design. Choose from the precision dynamics and spatial processing capabilities of the Native Power Pack (TDM Bundle for ProTools), the vintage processing characteristics of the Renaissance Collection and the extreme sound shaping capabilities of the Pro-FX Plus Bundle. Also available is the G4 Multiband Parametric Processor which provides 4 discrete bands of dynamics and EQ. The Waves Gold Bundle features all of Waves processors in one affordable package.

ANTARES Auto-Tune 3 Pitch Correction Plug-In

- Real-time pitch correction without distortion or artifacts • Preserves all of the expressive nuance of the original performance.
- New features in Auto-Tune 3
- "Source Specific" pitch detection and correction algorithms including Soprano Voice, Instrument, Bass Instrument, and more
- Phase-coherent pitch correction of stereo tracks • Bass Mode lowers the lowest detectable frequency to 25Hz • Set target pitch in real-time via MIDI from a keyboard or sequencer track • Make Scale From MIDI function allows you construct a custom scale from a MIDI keyboard or sequencer
- Sample rates of 88.2kHz and 96kHz are now supported • Available for TDM, RTAS, MAS, VST and Direct compatible digital audio applications.

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RECORDERS, GROOVE SEQUENCERS & DIGITAL MIXERS

TASCAM 788 8-Track Hard Disk Recording System

- 8-track simultaneous record • 250 virtual tracks • 24-bit A/D converters
- 14-channel mixer • 3-band EQ
- Dual effects processor • 10 scene memories per song • S/PDIF digital out • (4) 1/4" TRS mic/line ins • RCA main and monitor outs
- (2) 1/4" aux sends and returns
- 1/4" headphone output • MIDI in/out • Optional CD burning kit
- Non-destructive editing with 999 levels of undo
- Jog scrubbing and Shuttle with real sound • Dedicated locate and editing buttons • Wave form display • Title edit functions
- 46% pitch control • Built-in metronome



KORG D-12 12-Track Hard Disk Recording System

- 12 tracks of uncompressed 15-bit playback or 6-tracks at 24-bit • 16 track mixer with 3-bands of EQ per channel
- Comprehensive editing and DSP functions with 98 levels of undo • 20-bit A/D converters • 4 analog inputs including a dedicated guitar input • 24-bit optical S/PDIF I/O • 106 REMS effects types
- 11 simultaneous realtime effects — 8 insert, 2 master and 1 master bus effects • Powerful scene memory and realtime automation capabilities
- Internal 6GB hard drive allows up to 16.8 hours of 16 bit recording
- Optional internal CD-RW drive • 50-pin SCSI-2 connector
- Built-in auto-chromatic tuner and metronome



KORG D-1600 16-Track Hard Disk Recording System

- Korg's top-of-the-line full integrated hard disk recording system
- 16 tracks of 16-bit or eight tracks of better than CD quality 24-bit recording
- 24x8 mixer • 3 bands EQ with a sweepable mid per channel
- 24-bit A/D converters • 8 analog inputs including a dedicated guitar input
- 24-bit optical S/PDIF I/O
- 106 REMS effects • 11 simultaneous realtime effects — 8 insert, 2 master and 1 master bus effects • Massive 26GB internal hard drive provides 31 hours of 24 bit/44.1 kHz
- Optional internal CD-RW drive
- 50-pin SCSI-2 connector • Editing functions are controllable using the 240 x 84 pixel TouchView waveform display.



AKAI DPS-16 16-Track Hard Disk Music Production System

- True 24-bit/96kHz recording capabilities provides up to 144db dynamic range
- Record up to 10 tracks simultaneously
- Coaxial S/PDIF Digital I/O
- 56-bit internal processing
- 6 analog inputs including 2 XLR mic inputs with phantom power • 10GB IDE internal hard drive • 16 track faders with pan, 3-band EQ, 4 aux sends and mute per channel • Optional EB4M 4 bus EFX card can be assigned to any of the 4 aux sends or inserted on any channel
- Large flip-up graphic display and user-friendly interface makes editing and navigation a breeze • Built-in scene memory as well as dynamic automation capabilities via MIDI



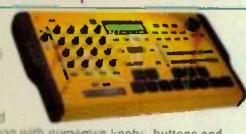
YAMAHA AW4416HDCD 16-Track Digital Audio Workstation

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



E-MU XL7 Command Station Tabletop Groove Station

- Combines the synth engine of E-MU's Proteus 2000 and XL-1 sound modules with a new multi track sequencer • Designed for Electronic-High Energy Dance styles • Equipped with a one octave, velocity sensitive key pad with aftertouch, a touch strip along with numerous knobs, buttons and switches
- Easily expandable with 3 additional ROM slots • Easily rack mounted into a 6-space rack • 512 presets, 128 voices and 128 Factory Sequences with hundreds of user locations • Dual effects processor
- Compatible with external MIDI devices via its Sequencer, Arpeggiators, Controller Knobs, Trigger Button Section and Key Pad.



SONY CD-RW66 Standalone CD Recorder

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



marantz CDR-500 Standalone CD Recorder / Duplicator

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



MICROBOARDS DSR-1600 Series CD Duplicators

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



Panasonic

WR-DA7 MKII

24-Bit Digital Mixer

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

FEATURES-

- 32 fully featured inputs and 6 auxiliary send/returns
- 8 buses (sub-groups) can be digitally routed using a built-in patchbay for a total of 24 digital and analog I/O's
- 32-bit internal processing and 24 bit A/D/A converters yield a dynamic range 115 db
- 21-100mm Motorized Faders, Jog-Dial, Cursor keys and 10 key Keypad
- Moving fader dynamic and scene automation with instantaneous recall
- Multi-layer fader layout for controlling legat channels, Aux sends and returns and buses as well as a fourth layer that adds user-assignable MIDI faders
- Built-in 16-bit dithering to 23 outputs.

Connectivity

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

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



OPTIONS-

- WR-ADAT 8-channel ADAT digital I/O card
- WR-TDIF 8-channel TDIF digital I/O card
- WR-AESS 8-channel AES/EBU and S/PDIF digital I/O card
- WR-ADDA 8-channel A-to-D, D-to-A card
- WR-TNDM Tandem (dual-console) option/carc
- WR-SMPT SMPTE and V-sync card
- WR-MTBR Meter bridge (Included)
- WR-WRRC Remote control software

TASCAM MX-2424 24-Track Hard Disk Recorder



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

I/O Options-

- IF-TD24- TDIF module
- IF-AD24- ADAT Lightpipe module
- IF-AE24- AES/EBU module
- IF-AN24- A-D, D-A I/O module with DB-25 connectors



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PROCESSORS, MICS & MONITORS

PreSonus DIGIMAX

8-Channel Mic Preamp With Digital Outs



- 8 Dual Servo Mic Preamps with Ultra-Wide dynamic range and very low noise operating levels
- Dual Domain limiter on every channel
- EQ enhance, Pad and Phantom Power on every channel
- Instr. inputs on channels 1 & 2
- Phase reverse on channels 1 & 2
- Eight 24 bit ADC converters
- 24-bit Light Pipe and S/PDIF digital outputs
- AES/EBU digital outputs are available as an option
- External clock sync input and Master clock output
- 1/4" thick, milled aluminum panel with blue anodized knobs

AVALON DESIGN AD2022

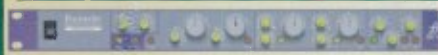
Dual Mono Pure Class A Preamplifier



- 4th generation fully discrete, symmetrical Pure Class A mic preamp
- Mic and hi-Z instrument inputs
- Selectable mic source loading for optimized cable/mic matching
- Gain switched in 4dB steps with a 3dB fine output trim
- Regulated +48v phantom power supply
- Phase reverse
- Variable-passive HPF
- 20dB pad
- Large illuminated analog VU meters and twin peak LEDs
- High headroom +36dB input before overload
- Fully discrete Class A regulated audio power supplies
- Teflon/silver wiring and doubled plated circuit boards for superior low level signal transfer

Focusrite ISA 110

Channel Strip



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

Lexicon MPX-200

24-Bit True Stereo Dual Effects Processor



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

ANTARES ATR-1a

Auto-Tune Intonation Processor



- Automatically corrects pitch in realtime while preserving the integrity of the original performance
- Includes factory programmed chromatic and standard diatonic scales and has the ability to create custom scales
- Bass Mode detects pitch down to 25%±
- Make Scale From MIDI function allows you to construct a custom scale using a MIDI keyboard or sequencer
- 29-bit data path, 56-bit internal processing and balanced I/O

TC-HELICON Voice Prism

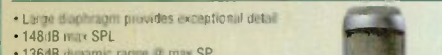
Vocal Formant Pitch Processor



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

audio-technica AT3035

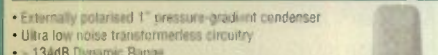
Cardioid Condenser Microphone



- Large diaphragm provides exceptional detail
- 148dB max SPL
- 136dB dynamic range @ max SPL
- 12 dB/octave bass roll-off @ 60Hz
- 10 dB pad
- Requires 11 - 52v phantom power
- Custom shock mount provides superior iso at cn
- 20Hz - 20kHz frequency response
- Includes shockmount and protective pouch

RØDE NT1000

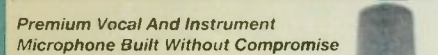
Cardioid Condenser Microphone



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

SHURE KSM-44SL

Multi-Pattern Condenser Mic



- Premium Vocal And Instrument Microphone Built Without Compromise
- Dual 1-inch, 90°-layered, Mylar diaphragms
- Class A, discrete, transformerless preamplifier
- Cardioid, omni and bidirectional polar patterns
- Includes ShureLock elastic-suspension shock mount and swivel mount, protective pouch and locking aluminum carrying case
- 20 Hz - 20 kHz frequency response

Hafler TRM-6 & TRM-10

Complete 5.1 Surround Monitoring Solution

TRM-6 Bi-Amplified Studio Monitors

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

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

TRM-10s Active Subwoofer

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

- 10-inch cellulose fibre cone down firing woofer
- 200 watt low frequency amplifier
- 30Hz to 110Hz frequency response ±2dB
- 24dB/octave Linkwitz-Riley crossover variable (40Hz to 110Hz)

JBL LSR Series

Linear Spatial Reference Monitors

Ideal For Surround Sound Applications

- LSR28P Near-Field Monitors
- Bi-amplified design— 250 watts for the low frequency and 120 watts for high frequency
- 8" woofer and 1" tweeter
- XLR 1/4" combo input connectors can accommodate balanced and unbalanced signals
- 50 Hz - 20 kHz frequency response

- LSR25P Near-Field Monitors
- Bi-amplified design— 100 watts for the low frequency and 50 watts for high frequency
- 5.25" woofer and 1" tweeter
- Shielded
- XLR balanced and RCA unbalanced inputs
- Front Panel Volume and Power Controls
- Built in 80 Hz HPF for use with optional subwoofer
- 70 Hz - 20 kHz frequency response

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

YAMAHA MSP-10

Bi-Amplified Monitor Speakers

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

Mackie HR-824

Bi-Amplified Studio Monitors

- 150W LF amp, 100W HF amp
- 8.75" mineral-filled polypropylene cone woofer
- 1" aluminum dome tweeter with ferrofluid-cooled voice coil
- Every set is a "true" matched-pair with a signed certificate from Mackie designs to prove it.
- Full space, half space and quarter space placement compensation
- 39Hz to 22kHz frequency response ±1.5dB
- Broad "sweet spot"
- 1/4" and balanced XLR inputs

ACOUSTICAL PRODUCTS

BIG STUDIO SOUND: \$299*



With the new Roominators™ Alpha1™ Acoustical Control Kit, it's easy to make your place sound great!

Big-name artists, networks, motion picture companies & studios know it: good gear in a bad room sounds no better than bad gear, so they tame their acoustics with goodies from Auralex. Now we've shrunk that big-studio sound down into the handy "take home" sized Alpha1!



It's never been this **easy & affordable** to make your room sound better!

• In this one kit you get **everything you need** to improve the sound of your small studio, iso booth or control room: bass traps, absorbers... even adhesive & installation tips! If your needs dictate, simply add more Alpha1 kits.

• You'll **immediately** notice improved imaging, tighter bass & less "room" sound.
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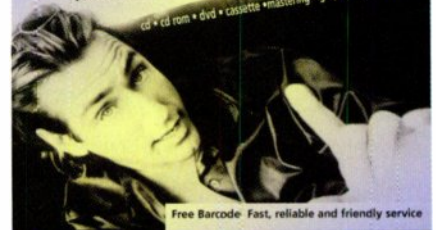
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JANET JACKSON

► continued from page 66

Christina Aguilera and Cher, and it served me well," he explains. "We did find out that the RADAR's 1/4-inch footswitch jack engages play slightly faster than the controller button, so iZ built 'play' switches that plug into the rear panel with 1/4-inch connectors. I could have used multiple Macs with a timecode reader for sync, but we felt more comfortable with a dedicated hard disk recorder. Computers tend to crash more. I cannot have a machine hold up the show. The two RADARs are *not* locked together, and there is no timecode between them. This allows independent starting and stopping of the machines without worry that any synchronization information from one machine will affect the other."

Michael monitors both RADARs through a Panasonic DA7, which also serves as a clock master. The RADAR TDIF outs feed an iZ UFC-24 Universal Format Converter, which then sends three optical outputs to the DA7: tracks 1 through 8, and 9 through 16 from

RADAR A; plus tracks 1 through 8 from RADAR B. [Optical lines are used because they carry a one-way signal, as opposed to TDIF, which carries in and out on a single cable.] The remaining eight tracks from RADAR B are connected to a MOTU 2408 via optical cable. The MOTU converts the signal to analog, and then the analog outs of the 2408 are connected to analog inputs of the DA7, utilizing all 32 inputs of the of the DA7. This is done so that the RADAR's analog outputs are going directly to the FOH and monitor consoles without any further processing or conversion.

Listening to both RADAR machines simultaneously allows Michael to hear how accurately they are synched. "If the B machine is slightly ahead, I can quickly press 'stop' and 'play' to re-align them. Or — since I have markers for every section of a song — I can advance the B machine to a marker and manually start play from the marker point when the band reaches that section. I'm on the money about 95% of the time, but for that other 5% I make an adjustment."

Running the show in this manner gives Bernard a tremendous amount of versatility. "There's a spot in the show where the band stops and Janet holds a note. I cue up the next marker, and when she is ready to bring the band back in, the keyboard player plays a pickup. After the pickup, the band comes back in and I start RADAR with them. At the beginning of one song, Janet and the dancers are on a lift. On one occasion the lift got stuck, so I stopped machine B and rolled it back to the start of the introduction. I used the intercom to tell the band that we were going to repeat the intro. At the end of the first time through the intro I rolled machine B, essentially starting the song again. While the intro re-played, I cued machine A to the verse, and when the verse hit, I started machine A manually. Both machines were back in sync, we extended the intro section, and didn't lose a beat."

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plug-ins appear in Digital Performer's mixing board, just like regular native plug-ins, but they run on four powerful 56K DSP chips on the TC•PowerCore PCI card. It's like adding four G4 processors (equal to 2.8 gigahertz of extra processing power!) to your computer. Run 12 studio-quality TC plug-ins with no hit on your CPU power, and run other native plug-ins at the same time! And coming soon from 3rd party developers: Waldorf Vocoder, Antares AutoTune, TC Helicon Voicecraft and others.

TC | WORKS

Aardvark Aard Sync II™

Ultra-low jitter master clock for your MOTU studio

The problem? Multiple word clock devices that you need to sync perfectly with your MOTU system. The Solution? The AardSync II Master Clock from Aardvark. The Aard Sync II will make everything in your studio slave together smoothly. With four industry standard word clock outputs and ultra low-jitter performance, you can set the Aard Sync II to generate any digital audio sample rate desired—not only 44.1 and 48 kHz, but also the pull-up and

pull-down rates required for film and video applications. The AES/EBU outputs are low-jitter approved and make any converter sound more accurate. No clicks, no pops, no falling out of sync! Slaves to video blackburst in both NTSC and PAL/SECAM format. If you've got multiple digital audio devices in your MOTU studio that need to stay in sync, Aard Sync II is the wonder box you've been looking for. Call Sweetwater today to find out more.



Peak™ 3.0

Advanced waveform editing and mastering

BIAS Peak 3.0 for Mac OS 9 and X, is the ultimate editing, processing, and mastering companion for Digital Performer! Peak gives you lightning fast, nondestructive waveform editing with support for audio files up to 32 bits and 10 MHz, including 24-bit/96kHz files. Unlimited Undo/Redo gives you the freedom to work creatively. Select an audio region in DP, choose the "Use External Waveform Editor" command, and instantly switch into Peak! Peak's sophisticated options for on-the-fly marker, region and loop creation are simply unparalleled. Advanced DSP and looping tools include Convolv, Repair clicks, Loop Tuner™, Loop Surfer™, Loop It™ and Guess Tempo™ and more.

Process thousands of files, or just a few, using Peak's batch processor. Peak directly supports all MOTU audio interfaces and includes Roxio Toast™ Lite CD for burning your own redbook audio CDs directly from Peak's powerful playlists. Create web or multimedia content for export with multiple file formats, including Apple's QuickTime.

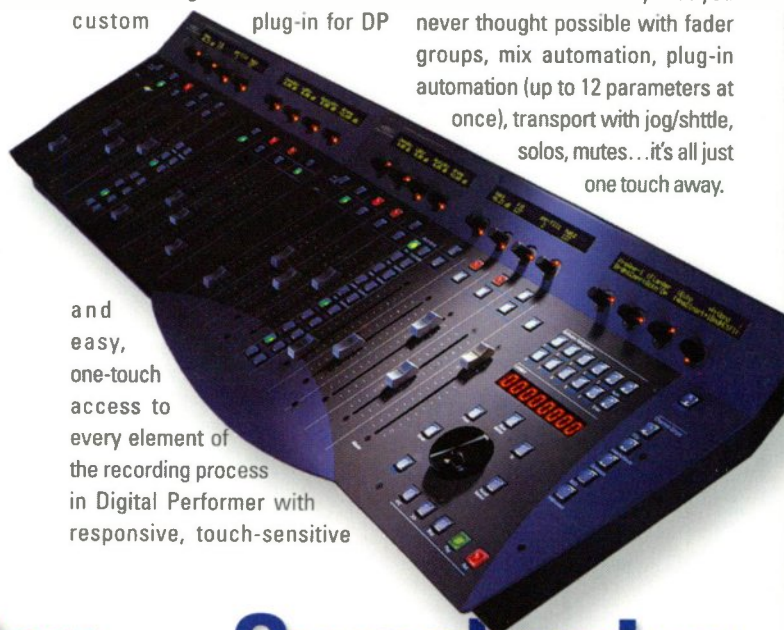


SAC-2K™ controller

Precision touch-sensitive automated worksurface

The Radikal Technologies SAC-2K sets a new standard for hands-on control of Digital Performer with a custom plug-in for DP

automated controls. Within minutes, you'll achieve a whole new level of interaction and creativity that you never thought possible with fader groups, mix automation, plug-in automation (up to 12 parameters at once), transport with jog/shuttle, solos, mutes... it's all just one touch away.



and easy, one-touch access to every element of the recording process in Digital Performer with responsive, touch-sensitive

order yours today

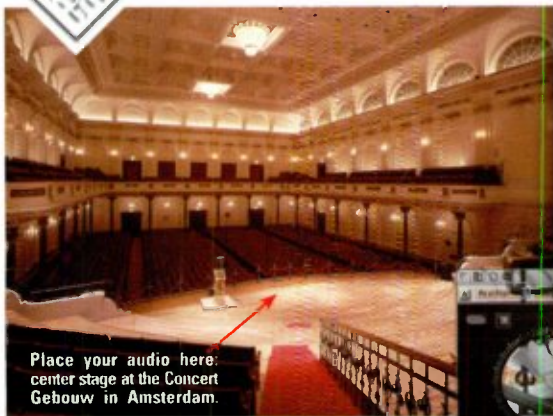
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- MOTU DP3 audio workstation software**
Now with full surround production up to 10.2
- MOTU 828 FireWire audio interface**
Or a MOTU PCI interface like the 2408mkII or 1296



Altiverb™ Add real acoustic spaces to your mix with the first and only sampled reverb plug-in



Place your audio here: center stage at the Concertgebouw in Amsterdam.

Pictured here is the Concertgebouw, a world-famous concert hall in Amsterdam with superb acoustics. Altiverb, the first (and only) real-time sampled acoustics plug-in, delivers the sound of this hall to your Digital Performer virtual studio — along with dozens of other sampled acoustic spaces. Altiverb is an astonishing breakthrough in reverb technology

because it fully reproduces the acoustic qualities of real spaces, rather than synthesizing an approximation with artificial algorithms. Only a few very expensive (\$10K+) hardware processors offer sampled acoustics processing, but Altiverb gives you this unsurpassed level of realism for less than \$500, thanks to the amazing "Velocity Engine" Altivec processor in all G4 Power Macs. Provides dozens of real spaces, from concert halls to closets, or sample your own! Now shipping exclusively for Digital Performer. VST version coming soon.

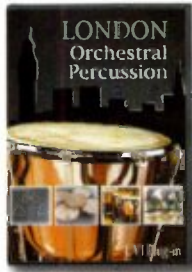


bigfish audio™ UVI Plug-ins™ Universal Virtual Instrument plug-ins for Digital Performer and MAS

The UVI Plug-in will revolutionize your Digital Performer system. It's a playback sampler that opens as a plug-in right inside your Digital Performer project. With nine brand new titles to

choose from, you can have a different sound library with hundreds of samples at your fingertips. What makes this plug-in so unique? Instead of trying to cram an entire sound collection into a ridiculously small amount of RAM, these libraries serve as a

virtual sound module right inside DP. No more wasted time loading CD-ROMs, waiting, listening, loading again, waiting some more... With UVI plug-ins, the patches are loaded in seconds and are available directly inside Digital Performer. There's nothing quite like this! London Orchestral Percussion, Prosonus Orchestral Collection, Prosonus Grand Piano, Six PlugSound Volumes: 1-Keyboards, 2-Frets, 3-Drums, 4-Hip Hop Toolkit, 5-Synth Collection, 6-Global and more titles on the way.



Cool Breeze Systems Cool School Interactus™ SweetCare™ 24-hour support from the MOTU system specialists!

Vol. 6 — Interactive Training for Digital Performer 3



From the newbie to the guru, there's no better way to get more out of Digital Performer than CSI-Volume 6. It's like having a DP product specialist looking over your shoulder, with click-for-click tutorials, a massive glossary of DAW-related terms and over 40 movie tutorials. Includes our new "AutoPlayer" mode: just sit back and soak up the info!

Nobody knows MOTU-based systems better than Sweetwater. So we've developed SweetCare, one of the most comprehensive approaches to technical support in the music industry. On the web or in person, our commitment to helping our customers is our passion. Our 23 years of experience with advanced music technology products from companies like MOTU is at your disposal 24/7 via our online 24-Hour SweetCare Support Center or in person six days a week with new extended hours on Saturdays. SweetCare includes on-line services beyond just Q&A, such as in-depth articles, live media, online forums, and the most complete knowledge base of musical and technical information available anywhere. Visit www.sweetwater.com/support for complete details.



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The VT-737SP brings that magic Avalon sound to your MOTU workstation. Run your dullest, most sterile mic through the VT-737 SP and you'll be amazed at how warm and sweet it sounds. This 2U space combo brings a new standard to high-end audio, taking your sound to places you never thought possible and giving you precise creative control. With vacuum tube and discrete design, the VT-737SP provides a wide range of tube tone and control: Avalon sound with maximum flexibility.



AVALON  DESIGN

PURE CLASS A MUSIC RECORDING SYSTEMS



DigiMax™

Pristine 8-channel mic pre-amplification for the MOTU 2408 audio interface

Why is the PreSonus DigiMax perfect for your MOTU rig? Because it's the purest path to digital. DigiMax combines 8 channels of award winning 24-bit mic pre-amplification with our unique simultaneous

RMS/peak detection limiting and EQ enhancement, giving you maximum gain before clipping while maintaining the musical transparency of a compressor. The result? Fast, natural and versatile

limiting on every channel. And DigiMax connects all 8 channels via ADAT optical to your MOTU 2408 system in pristine, 24-bit digital glory. And you can expand: add up to 3 DigiMax's to your 2408.



MotorMix™

Hands-on automated mixing for Digital Performer



Dashboard™

Editing worksurface for Digital Performer

With its new, custom software written specially for Digital Performer, MotorMix becomes a seamless, tactile extension of your MOTU software recording environment. Put your hands on eight 100mm motorized faders and rotary encoders to tweak your mixes in record time. Gain instant easy access to all MIDI and audio tracks with control banks. You'll never even think about mixing with a mouse again. Imagine having tactile control over most of Digital Performer's features with MotorMix's



intuitive layout and easy operation. MotorMix gives you all the advantages of a professional mixing board, at an incredibly affordable price. Bring motorized mixing to your MOTU desktop today. For more info, visit cmlabs.net or contact your Sweetwater sales engineer today to enter the future of mixing.



In the beginning, there was only magnetic tape and razor blades, but editors could still make over 200 edits per hour! Dashboard restores speed and finesse to editing with DP3 and eliminates fatigue caused by point-and-click editing. Dashboard will bring you the same level of control to Digital Performer as the very

popular Motor Mix. Dashboard can operate as a stand-alone worksurface, or it can be fitted to one or more Motor Mixes. Dashboard's Locator, Navigator and Zoom control sections get you quickly to where you want to edit, and the Clipboard section makes your actual edits. You can arm and record tracks remotely with Dashboard just like machine control. The mixer section provides access to Digital Performer's mixer and plug-ins.

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MOTU 1296 12-channel 96kHz audio interface

Or any MOTU PCI interface like the 2408mkII or 1224



Gold Native™ Version 3.2

Optimized performance and complete automation

Check out the new Restoration Bundle — download the demo at www.waves.com



Waves Native Gold gives you the complete line of legendary "must-have" Waves processing, including C4 MultiBand and Renaissance Reverb. Version 3.2 introduces cutting edge performance optimizations and complete MAS automation. What does this mean for you? Apply more Waves processing to your mixes than

ever before possible. Automate your Waves plug-ins with pristine, sample-accurate precision and 32-bit floating point processing. You get everything you need to track, sweeten, sound design and master. Get Native Gold now and join the top industry pros who rely on Waves to make their mixes Gold everyday.



M Project™

High-performance FireWire hard drive storage

M Project is the new FireWire hard drive for your MOTU hard disk recording system from Glyph Technologies. M Project adds up to 75 GB of audio storage to your MOTU rig in seconds, backed by Glyph's legendary service and support. M Project is the only MOTU-approved FireWire drive for the 828 and all MOTU PCI-324-based

systems, including the 2408mkII, 1296, 1224 or 24i. M Project easily shares the FireWire bus with the 828, and even allows you to connect multiple 828s to your computer. And M Project is the ideal alternative to SCSI drives because it frees up a PCI slot. So call Sweetwater today and ask about M Project, the ultimate storage solution for MOTU hard disk recording.



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Smart Code Pro™

Surround Encoder Plug-ins For DP3

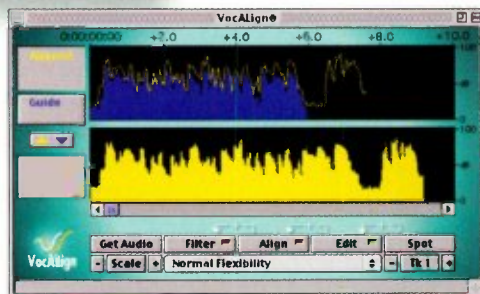
SmartCode Pro is the first and only surround encoder plug-in for Digital Performer. It allows you to deliver fully encoded surround mixes to your clients. Burn CDs or DVDs that you can preview using any consumer DVD player that supports Dolby Digital™ or DTS™ — a crucial final step in producing professional quality surround mixes. By encoding with Smart Code Pro directly within DP3, you avoid having to invest in expensive dedicated hardware encoders (that cost thousands), which saves you both time and money.

SmartCode Pro is available in two versions to accommodate the two most widely used surround formats: Dolby Digital and DTS. Both versions allow you to preview your 5.1 surround mixes in real time 5.1, then encode and decode the mix to create a 6-channel surround master. Smart Code Pro is a must-have for serious surround production with DP3.



VocAlign™ Project

Unique automated audio alignment software



Still spending hours re-recording dialog or vocals? There is another way! Because of its unique ability to align two signals, VocAlign can be used creatively to take guide or even live tracks and create performances with perfectly aligned overdubs. VocAlign also gives the producer the ability to choose the rhythm and pace for a specific vocal, or even lay down the required tempo pattern for the artist. VocAlign gives you

perfectly aligned double-tracked vocals, tight backing vocals, easy re-grooving of recorded vocals for remixing and shorter overdub sessions. For post-production, VocAlign is designed to take a line of replacement dialog and precisely align it with the dialog recorded with picture. And VocAlign Project™ integrates seamlessly with Digital Performer 3. At only \$299 list, can you afford to be without it?

800-222-4700

Resolve This!



ROGER NICHOLS

There's still much confusion about the benefits, if any, of the 96 kHz sample rate and 24-bit resolution. My first impression is that 24-bit is always better, but 96 kHz is sometimes, maybe better, I think.

Besides any improvement in the quality there may be with 24/96 recording, you must contemplate the additional burdens that have to be overcome. Twenty-four-bit requires 50% more storage as well as 50% higher bandwidth in data transfers. If you could just barely playback 24 tracks at once when you were recording at 16 bits, then you will only be able to playback 16 tracks at once at 24 bits. If your 16-bit song consumed 2 GB of storage on your hard disk, then the same song at 24 bits will require 3 GB. If you also decide to record at the 96 kHz sample rate, the requirements for this one song becomes 6 GB, and you would only be able to playback eight tracks at a time with the same hardware.

As with any endeavor, there are trade-offs. Is the higher resolution worth the reduction in the number of tracks? If I need the same number of tracks, is it worth the expense of bigger, faster hard drives, the upgrade to 96k-capable recording devices, and the purchase of higher resolution converters? It's a tough call.

DOES HIGHER RESOLUTION MATTER?

Last month, I sat down with a few other engineers and producers to listen to all of the CDs submitted to NARAS for consideration in the "Best Engineered Non-Classical" Grammy category. There were 267 albums submitted. We listened to every single one of them. Each album couldn't be listened to all the way through, but we listened to about 1/4 of three or four cuts on each CD. The goal was to make sure that every entry, even if it only sold one copy, had an equal shot at being included in the chance for a "Best Engineered" Grammy.

Why did I bring this up? Well, because every single CD was squashed to death, had no dynamic range, and sounded like crap. Instead of listening to find the best of the CDs

entered, we had to change the criteria and listen for the least offensive entries. On some of them you could tell that the recording was well done, but in the mixing or mastering the finalizers and plug-ins were cranked up to "eleven" so that their CD would be the loudest when played on the radio or boom box in a trunk-rattling Toyota. Not one of the 267 entries attempted to take advantage of the dynamic range or cleanliness of digital recording.

When each song started playing, the meters on the console jumped up to zero and never dropped below -18 dB until the fade. With this much processing, no wonder the kids can't tell the difference between a CD and an MP3 copy of the same song. No wonder after they download the MP3 they don't have the desire to go buy the CD.

I see questions on my EQmag.com forum like, "I'm compressing everything to make it very loud, but at what stage should I dither from 24-bit to 16-bit, and which dithering method is the best?" My answer is that it doesn't matter. You can't polish a turd.

WHAT SYSTEM SHOULD I RECORD ON?

There are about 3,146,237 different DAW and hard disk recording systems to choose from today. The lowest common denominator is that they will all record 16-bit/44.1 kHz or better. Remember that CDs are 16-bit/44.1 kHz. Even the smallest, cheapest digital portable studio will record at "CD-quality."

Some of the best-sounding records I've recorded were done on black-face 16-bit ADATs with more than 10,000 hours on the heads. If you listen to what you're recording and make it sound the way you want, then it doesn't matter whether you record 48-bit/96 kHz on next year's top-of-the-line system, or 16-bit/48 kHz on 10-year-old ADATs. Every one of the hard disk recording systems available today has the potential of recording next year's "Best Engineered" Grammy.

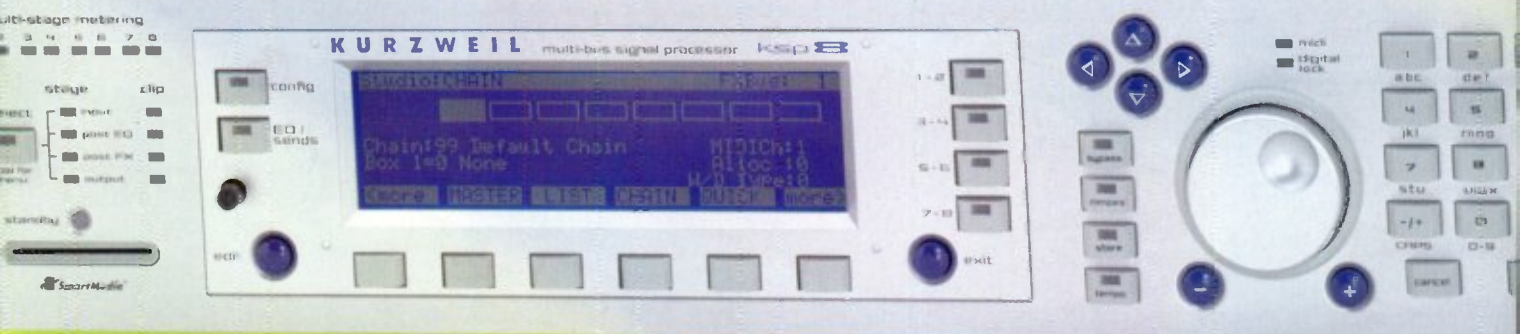
I've made good-sounding records mixing on Yamaha 02R, Mackie d8b, MOTU Digital

► continued on page 110

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- 8 XLR analog outputs switchable between +4dB and -10dB.
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- Connect up to four 896s (72 channels at 48kHz) with no FireWire hub required. Add more units via 3rd-party FireWire bus expansion.
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