

# Project **Post Production** Special

# E

PROFESSIONAL  
PROJECT  
RECORDING  
& SOUND

APRIL • 1999

## REVIEWS:

**Empirical Labs  
Distressor**

**Audix CX-111 Mic**

**Yamaha DSP Factory**

**TASCAM DA-45  
24-Bit DAT Recorder**

**Quested F11  
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**Next! VOX-II  
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# EQ

PROJECT RECORDING  
& SOUND TECHNIQUES  
VOLUME 10, ISSUE 4  
APRIL 1999



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*Thee Joker performs on stage. Photo by Markus Schulze.*

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# Spin It Again Spam...

## Or What the Heck is a Performing Engineer?

If you hate this issue of *EQ*, blame it on Craig Anderton. If you think it's right on the money, give him all the credit. No doubt, it's going to be one of the more controversial issues in many moons. But then again, as you probably know, *EQ* is always full of surprises.

Anderton, our resident technology editor, has been touring the globe of late, spending a considerable amount of time in Europe where the dance scene is dominating the entire music business. And it was there, during a recent concert tour, that he first recognized that those guys up on stage, spinning records and driving the groove, were actually "playing" the kind of gear that you'd ordinarily see patched together in a recording studio. Recording technology, with all its mixers, tape and MIDI machines, sequencers and PCs, has finally broken lose from the dark confines of the studio for the spotlight of center stage. And the guy who's performing the stuff — someone most commonly referred to as a DJ — is actually a recording engineer who's (somehow, some way) found his way up on stage.

Don't misunderstand. We're not talking about recording dance music or even remixing. We're not talking about DJs like Junior Vasquez who have made the transition from the clubs to the recording studio (though these are the type of cutting-edge trends that have been impacting the studio business and the recording process for years). What we're talking about are guys like you (and me) somehow breaking all preconceptions about what a recording engineer does for a living by utilizing their recording tools as performance instruments. These guys are really much more than DJs. They don't play weddings and bar mitzvahs, or spin discs at their neighborhood Holiday Inn on Saturday nights. They're performing engineers who may augment their recording prowess with a heavy dose of musicianship. They may have a turntable or two up there, but you can also expect to see drum machines with trigger pads, sample-based keyboards, and maybe even an analog tape machine for creating strange effects. They're serious groovemasters with absolute control over the latest studio technologies.

The readers of *EQ* have shown that the project studio is a dynamic trend, much more than a place to make recordings. It's a state of mind, a business, a profession, and an art. It's a way of grabbing hold of affordable recording and sound technologies and making them do things their inventors never thought possible. Ever thought of using a Mackie as a performance instrument? These performing engineers are now doing it. How about using a sampling keyboard to spontaneously jam or groove over a bass and drum loop? These are some of the ways in which *EQ*'s readers are stretching the boundaries of what technology can offer. Several years ago, they emerged from their basements and bedrooms to turn the entire recording scene on its head by taking control of the recording process. Now they're bringing their craft out onto stage with a similar intent for live shows. Music recording and stage performances will never be the same.

The creative technologist has grabbed the power and, in the hands of an innovator who dares someone to say *no*, realized that this is a wild and weird weapon. The performance scene is the next stage (sic) for the project studio revolution. And project studios in concert are finally giving engineers the kind of attention that they have craved for so long — to emerge from behind the console, out onto centerstage, where they can drive crowds crazy with their mix mastery and engineering prowess. Who's that guy in the spotlight? Not the lead guitarist. Not the drummer or rhythm guitar. It's the performing engineer.

Now if we can only convince Bruce Swedien to squeeze into a pair of spandex tights, smash his vintage Neumann collection to smithereens and set his project entire studio on fire. That's entertainment!

— Martin Porter, Executive Editor



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CIRCLE 29 ON FREE INFO CARD



## COST-EFFECTIVE RESTORATION

As a novice/amateur audiophile, not in the biz, I have found your magazine to be a great insight into the professional world of recording. In your February article on Seth Winner ("Reclaiming the Halls of History"), I was astounded to find that so much could go into audio restoration. For those on a "shoe-string" budget, like me, I thought I'd share my tools.

I am on a PC with 16 GB of storage and a SoundBlaster AWE64-Gold sound card. But the software I have learned on is Syntrillium's Cool Edit Pro ([www.syntrillium.com](http://www.syntrillium.com)). This package can be found on the open market for under \$300. With a decent phono cartridge and preamp stage, or tape unit, getting the analog recording into digital is the easy part. But Cool Edit has an array of built-in and customizable filters to sample and remove noise (even the original console). It allows for custom EQ, and hiss and crackle removal. There's a compander filter, too. It also has a 64-track function I've yet to fully utilize.

The bottom line is that it is possible to reclaim that old analog source for a fraction of Seth's \$150K system. It may not be as good as what he is putting out, but much better than when you started. Still, I have to confess that I was drooling over his setup in the article! Truly a niche business.

James Lloyd  
via Internet

## WHO ARE THE REAL PIRATES?

I think that you've missed a big point on the pirating issue [Editorial, *EQ*, February '99]. A lot of these "poor little software companies" need to get real about the prices they charge for software. Software should not cost as much as a damn computer — simple as that.

Also, some of the software in the marketplace is so lame that I wouldn't use it if someone *did* give it to me for free. Do people deserve to get rich just because they come up with some lousy DX plug-in package that sounds "virtually" ridiculous? Don't get me wrong, I do buy software and support companies that seem to be in it for more than just the money — companies that have artistic vision. I have no sympathy for the companies that rip off the general public with exorbitant pricing. I think we all know how much it

costs to reproduce CDs. I know that money is being spent on research for such products, but it only costs a few cents to reproduce the "product." One hand will wash the other...

Jack Odom  
via Internet

## REAL TROUPER

I enjoyed reading Mike Sokol's article on the performance by our dance troupe as part of the Mountain Green Cultural Arts Association concert series [*EQ*, February '99].

Mike gave us one of the best live mixes and recordings we've ever experienced. Mike's skill and expertise made for a very smooth and comfortable presentation, and is much appreciated by all of us involved in the production. We'll be carrying a copy of his article with us wherever we go. It's a first class primer on how to meet the audio needs for our program.

Our musicians and performers talk about our appearance at the Kepler Theater as one of the best ever — a tribute to Mike, Joe Marshner, David Fitzwater, and all the kind folks in Hagerstown, Maryland.

Gary A. Marco  
Program Administrator,  
The Dance Troupe of Cambodian  
American Heritage

## CRITICAL READING

I am writing to give you some feedback on an article from the February '99 issue of *EQ*, entitled "Guide to Critical Listening" by Chris Pelonis.

I found this article to be extremely intuitive on the tech side of things when it comes to monitoring or mix-down. To the best of my knowledge, after five years in music retail with Guitar Center, the article gave accurate facts and related the technical side of monitors to listening and monitoring your mixdowns. It helped me to understand phase and other monitor qualities and how they relate to acoustics and listening in general. On the down side, I would have expected a little more in-



REAL TROUPER: Members of The Dance Troupe of Cambodian American Heritage.

depth focus on the monitoring process. All of the facts stated in the article were in-depth and applicable. However, listener's fatigue and other important points were not mentioned, such as monitoring on different speakers or systems to get a wider range of reference for your mix and the ever-so-minor but always overlooked *take breaks*. I suppose, in general, the article did not approach the subject of listening fatigue. This plays the most important part in listening in general.

In closing, I enjoyed the article and have enjoyed reading *EQ* since I've been producing music.

Stephen J. Malone  
"iNK" Records, CA

[Editor's Note: In fairness to Chris, it is impossible to cover all topics in a single article. Perhaps he will tackle listening fatigue in a future article for us.]

## CLARIFICATION

In promotion of a sponsored lecture tour on digital mixing, *EQ* ran a full-page ad that, unfortunately, didn't use the words promotion, sponsor, educational, lecture tour, or advertisement. No specific endorsement of the Panasonic DA7 by either *EQ* or Craig Anderton was intended, and none should be construed. We apologize for any confusion that may have resulted.



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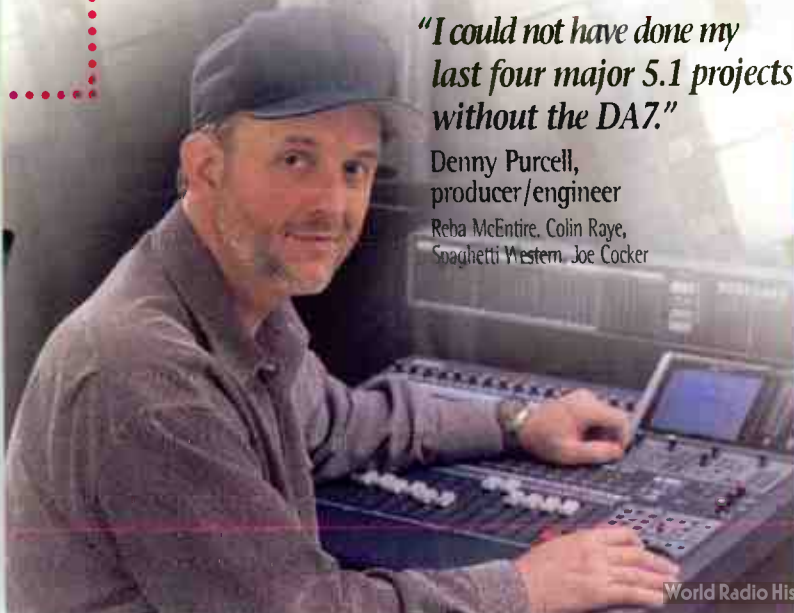
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## LIVE RECORDING

**Q** I am mixing a live concert in an auditorium and I plan to do a live recording at the same time. My problem is this: if I use only one mixer board, the recorded sound wouldn't sound good because of the FOH mixing. Also, if I plan to use two separate boards, is there any way to split the signals into two from the stage? Lastly, can I use the inserts on every individual channel to split the signal from the stage — that is, the signal comes in from the stage and goes into the FOH mixer. From the FOH mixer's individual channel inserts, I tap a line out and go into the recording mixer.

Joseph Chin  
via Internet

**A** Since you have identified the main challenges of live recording, here's a few things you can do to get the best results. Let's say, for instance, you want to record direct to 2-track DAT with a single console. If you set up the board traditionally and do a recording of the L/R outputs, you will get a recording mix that's missing any loud instruments on stage. That's because they didn't get turned up in the FOH mix, and will never make it to the tape deck. But if you use a postfader aux channel to drive the FOH instead (let's use aux 1 as an example), and reserve the L/R outputs for the tape deck, you can get two different mixes going at the same time that suit each situation. Consider a loud guitar on stage coming into channel 11. On the fader for that channel, you turn up the gain until the guitar is at the proper level in the L/R outputs going to the tape deck, which you can monitor directly with headphones. Now, since you don't need the guitar in the FOH mix, you turn down the aux 1 send from channel 11 until the guitar is at the proper level in the house speakers.

For your second situation, you can get a snake with a monitor feed and use it for the recording board instead. Such a snake might have a 100-foot run to go to the FOH console with 16 to 48 XLR outputs and a matching 20-foot run with the same type of outputs then goes to monitor world. If, though, you're doing monitors from prefader aux sends on the main console, then that monitor snake could go to the recording console instead. You can also get snakes that

have three sets of outputs: one for FOH; one for monitor world; and one for recording. Separate splitters are also available that do the same thing, but in a box with lots of XLR outputs. Check out companies such as Whirlwind for a catalog of snake types.

Many boards will have a direct-out on each channel that can feed a separate recording console or tape track. Usually, on small format boards, this is the 1/4-inch TRS insert jack on the channel strip. If you push in a 1/4-inch mono plug one "click," it will tap the output of the channel without interrupting the feed back into the mixing bus. I've done it lots of times, and all you need is a bunch of 1/4-inch to 1/4-inch cables to link the direct out of the first console to the line-in of the second console. But to do that you usually have to give up the insert jack and can't insert a compressor or outboard EQ on a channel strip, which may or may not be a problem for you.

Some mid-format consoles have dedicated recording outputs from each channel strip (good examples are the Allen & Heath consoles) that can be selected prefader (so the level stays the same even though you work the channel faders) or postfader (so the mix going to the recorder follows your fader moves). Anything, however, that uses channel output recording will need a separate recording track for each channel strip. So you might need a few ADAT or DA-88 decks to record 16 or 24 tracks. Believe it or not, it's a lot easier to record on lots of channels (16 or 24) rather than mixing live to a 2-track DAT. That's because with lots of tracks you only need to assure that everything gets on a separate channel and stays out of the red. On the other hand, a mix to DAT requires you to make critical mixing decisions while under fire.

Mike Sokol  
Contributing Editor  
EQ magazine

## SHOP AROUND

**Q** I have been working on a Fostex X-55, but am not really pleased with the flexibility of it. I have been checking out multitrack prices, and this is what I need to know:

1. Why are manufacturers such as Fostex making uncompressed instead of compressed digital multitrackers?

2. Why do uncompressed systems cost so much less than compressed?

3. The price is steadily dropping on all digital merchandise. For example, in just a four-month period, Roland dropped the price of one of their units \$600 dollars. At what price do you think the Fostex FD-4 will bottom out?

The battle (for me) is to find the most inexpensive way to make the best recordings possible with as little sound degradation as possible.

Andrew  
via Internet

**A** Almost all machines have data compression options. Most people in our biz shy away from it, but it does make the ability to record more tracks at once (or have more recording time) less media dependent. Data compression is reflected in the price of the recording media. Normally, a 44.1 kHz recording takes up 5 MB per mono minute; 100 MB holds 20 mono minutes, 10 stereo minutes, five 4-track minutes, etc.

Competition is the answer as to why manufacturers have reduced their prices. When Roland introduced their product line, there was less competition. The more competition there is within a product line, the more likely the reduction in price points for that line. The sound-recording field operates by the same principles of supply and demand as other businesses.

Your desire for "the most inexpensive way to make the best recordings possible with as little sound degradation as possible" is mighty lofty. Nonetheless, I think even the FD-4 (or the FD-8, which runs about \$899 retail), with a street price of \$499, is better sounding than a \$1500 cassette-based unit. What more could you want? (More tracks of course!)

Whatever your choice, data compression sounds better than analog cassette — especially after a few overdubs and track bounces. The FD-4 has two virtual tracks and there is no problem bouncing adjacent tracks. You just can't do that on an analog 4-track-open-reel or cassette. Good luck.

Eddie Ciletti  
Manhattan Sound Technicians  
NYC, NY

## GETTING BURNED

**Q** I have been following Mike Sokol's article on baking a CD-AC3 ("Burning for Surround," February 1999) and I have a small problem. I do not understand





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*what he means in Step 6. I have toasted three CDs, and no audio yet. I plan on using these in a test for DVD players.*

*After three tries and three wasted CDs, I was able to make a version that works. I am still not sure what I did to make it work, but now that I am able to make one work, I will work on repeating the process.*

*Do you have any ideas on why I have experienced some random stuttering in the Sony DVD player when playing back the test clip?*

*My next goal is build a test CD with test tones for each channel. If you had not written that article, I would not have been able to do this. (We are developing a PC sound card that sends S/PDIF audio out to an external decoder, so being able to make test clips is of the utmost importance.)*

Michael Miller  
Gallant Computer, Inc.

**A** I'm glad you've had success. I wrote the recipe out step-by-step from the computer screen, so if you follow it exactly, it should work. Ref the stuttering: try a different brand of CD-R or go to a CD-RW disc if your writer will support it. Also, some decoders put out a little white-noise burst when the disc is first accessed, but this occurs even with a standard DTS disc going into my Lexicon DC-1 decoder (a decoder that's about as good as they get).

I'm investigating if there's a different method of burning the WAV file to a Red-Book CD-R that will make it completely universal. I'll keep you posted.

Mike Sokol  
Contributing Editor  
EQ magazine

## DRUM MIKING

**Q** *I have a Peavey 24-channel board with an on-board, 4-band EQ section with sweepable high mid. How should I be setting each of the four bands when mixing a kick drum? I get a hundred different answers from each band I work with. I realize listening critically has a lot to do with it, but some advice from a pro would help.*

John Johnson  
via Internet

**A** There are too many variables to give a single answer, of course. The first step is to use a microphone that

captures the basic desired flavor of the drum [and music]. There are many good mics to use, but I typically use either an Electro-Voice RE-20 or a Sennheiser Evolution E602. (Also, a Sennheiser 421 will work for me in a pinch.) The RE-20 delivers a nice big bottom, but can be too woofy on a lot of large systems. The E602 is a favorite with some Reggae bands I've worked with. Ask the band if they have a favorite kick mic and you'll get an idea what they're looking for. Also, how your FOH speaker system sounds is a big factor, because you can't provide a decent kick sound if it's under-amplified or can't move enough air.

Another thing is to try changing your absolute polarity on the kick channel. If you have a phase-reverse switch, give it a try in soundcheck. The idea is you want all the woofers to move out on the impulse of the kick, rather than moving in. Not all microphones (and, surprisingly, not all XLR cables) are wired with correct polarity. Sometimes it can make a huge difference.

Finally, all music styles need a different sound from the kick. For example, Country typically has more skin tone and less bottom, while Metal/Rock requires a big bottom around 30-40 Hz. Your board EQ may be a bit limited, so I suggest you get a basic parametric equalizer and insert it on the kick channel. That way you can sweep the fundamental tone of the kick around until it sounds right. Many touring rigs typically use both a gate and a compressor on the bass drum channel, which you might consider. If you're doing sound for a bunch of different bands, as you appear to be, then whatever they like is "right." It is all about using your ears — and the gray matter in between them.

Mike Sokol  
Contributing Editor  
EQ magazine

## ASK US

Send your questions to:  
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# EQ

## PRODUCT VIEWS

### LONGER IS BETTER

In response to a growing demand, HHB has launched a new 60-minute ADAT tape, the HHB ADAT60L. In addition to increased recording time, the new tape is supplied in a professional library case. The ADAT60L shares the same specification as HHB's existing ADAT tape. Features include an ultra-fine, high-output ferric oxide recording surface, a special binder formulation to minimize oxide shedding, and a precision-molded cassette to ensure accurate tape handling and reduced snapping. For more information, call HHB Communications at 310-319-1111 or fax them at 310-319-1311. Circle EQ free lit. #101.



### GET DUPED

Discmatic has introduced two new multidrive CD duplicators, one that can produce up to 21 full CDs per hour and another up to nine per hour. The MDX7000 and MDX3000 tower CD duplicators combine Discmatic's user-friendly EZ-ONE controller engine with seven and three CD-R drives, respectively. A newly designed SCSI bus allows a faster data transfer rate and permits copying of up to seven discs simultaneously. With a 4 GB internal hard drive, the MDX7000 and MDX3000 can store a large volume of data, while Discmatic's Multiple CD Image Management system makes it easy to manage the data. For large duplicator jobs, Discmatic will soon offer the option of connecting up to eight MDX7000 and MDX3000 duplicators via a SCSI channel to build a networked duplication system capable of producing 56 discs at once. List prices for the MDX3000 start at \$3035. List prices for the MDX7000 start at \$4835. For more information, call Discmatic at 800-422-6707, fax them at 516-864-9700, or visit [www.discmatic.com](http://www.discmatic.com). Circle EQ free lit. #102.

### MAKING THE MOST OF MINI

TASCAM introduces the MD-801RmkII MiniDisc recorder/player designed for the broadcaster, sound contractor, DJ, or anyone in need of a system that takes full advantage of MiniDisc's capabilities. Unique to the MD-801RmkII is a new, rapid-access drive, 20-bit A-D/D-A converters, separate Monitor/Online outputs, an input sample-rate converter, Sound Sync recording, and an Incremental Play function. A Relative Time display enables the operator to set a "zero" counter position at any desired point — independent of the unit's ABS (Absolute) time. With the Title Copy function, both program material and subcode data are copied when making duplicates between two MD-801RmkII's. The suggested retail price is \$2699. For more information, call TASCAM at 323-726-0303, fax them at 323-727-7635, or go to [www.tascam.com](http://www.tascam.com). Circle EQ free lit. #103.







## MEGA KEYBOARD

**G**eneralmusic's WK8 Megastation is the latest addition to the company's GEM World Keyboard Series. In addition to the immense sample-based sound libraries of its predecessors, the 61-key WK8

offers eight additional megabytes of new waveforms, expanding the database to more than 1000 ROM presets. The new Drawbar Performances provide organ sounds of the past that are controlled using eight panel sliders. The new Real Audio Synchro Style (RASS) feature integrates sample grooves into the styles of the WK8. With RASS, it's also possible to add guitar phrases, vocal backgrounds, and "tuned samples" that will follow the chord changes at any desired speed. The keyboard comes equipped with a 1.4 GB hard disk containing over 1100 songs with text, over 190 new styles, and 60 MB of new samples. Other features include 32 tracks, a capacity of 250,000 events/16 songs, a resolution of 1/192 ppg, microscope editing, groove quantize, and background loading. For more information, call Generalmusic Corp. at 630-766-8230 or fax them at 630-766-8281. Circle EQ free lit. #104.

## MM GOOD

**M**illennia Media introduces the MM-990 high-performance audio amplifier module. Offering 100-percent compatibility with Jensen/Hardy 990, API 2520, and others, the MM-990 is a pure Class-A, all-discrete J-FET amplifier. It will produce a maximum output level of

25.5 dBu into a 600-ohm load (1% THD+N). Frequency response is stated as 0.3 Hz to 355 kHz (-1 dB). The MM-990 is now shipping for \$75. For more information, call Millennia Media at 530-647-0750, fax them at 530-647-9921, or visit [www.mil-media.com](http://www.mil-media.com). Circle EQ free lit. #105.

## PUSH THE ENVELOPE

**I**ndependent Audio is shipping the Mutronics Mutator in the United States. The Mutator is a stereo analog filter and envelope follower with full control facilities, containing two independent voltage-controlled filters — similar to those found in analog synthesizers — that can be used to treat any external sound source. Each filter can be controlled from its own associated low-frequency oscillator and/or its own envelope follower section, which extracts the envelope contour of an input signal and applies it to control the cut-off frequency of the filter. Each envelope follower can be switched to track either the envelope of the sound that is being treated by the filter, or that of any independent external control signal. This external control signal can be any audio source, e.g., a drum sound, guitar, synth, sampler output, or even a mic. The price of the Mutator with MIDI capability is \$1125. For more information, call Independent Audio at 207-773-2424 or fax them at 207-773-2422. Circle EQ free lit. #106.



# WHY DOES THE RESPONSE OF BECAUSE IT'S



## WHERE'S THE EXTRA SUBWOOFER?

Greg Mackie and his team were recently invited to present the Digital 8•Bus to Britain's top engineers and producers in the "A" rooms at two of the world's most famous recording studios. Of course we

used HR824 active monitors.

When the presentations were over, many of the veteran engineers were astonished to learn that they had been listening to 8-inch monitors instead of the studio's Big Speakers. Some even so far as to touch the house monitors' 12 and 15-inch cones while the HR824s were playing. They just couldn't believe the bass output from such a compact box.

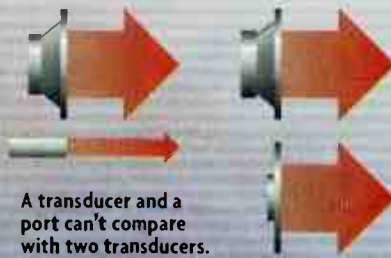
## TIGHT, RESPONSIVE BASS FLAT DOWN TO 39HZ.

Reviewers and owner's warranty card responses are unanimous: The HR824 has the most accurate bass they've ever heard from an 8-inch monitor.

And the quality is as astonishing as the quantity. Fast low frequency transients like kick drum slaps and electric bass notes have a crisp articulation that makes other monitors sound like mush.

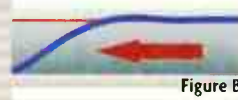
## ANOTHER TRANSDUCER INSTEAD OF A PORT.

The more LF transducer cone area a speaker has, the more bass it can produce. But a huge low frequency transducer isn't an option on a compact near field monitor. To augment primary bass output, other monitors resort to using ducted ports that can convert cone movement into extra low frequency air movement. But for optimal output, a ducted port needs to have the same area as the low frequency transducer. In other words, an 8-inch near



field monitor would need an 8-inch vent. Needless to say, you haven't seen any vents this big on our competitors' near field monitors. When vent size is reduced to maintain compact enclosure size, bass output is compromised. And, forcing a lot of energy out of a couple of small ports can create audible wheezing and whooshing.

Instead, the HR824 adds a large passive transducer with the cone area of another 8-inch woofer. Occupying the entire rear panel of the monitor (see photo below), this ultra-rigid honeycomb laminate piston tightly couples with the 824's active bass transducer. With a combined cone area greater than a single 12-inch woofer, you get exceptionally extended bass without port noise complaint.



Pushing out the curve: redistributing LF energy with synthesized mass.

## SYNTHESIZED MASS AND

**OTHER STORIES.** The cool thing about an active speaker system is that you can basically rewrite laws of physics that otherwise limit passive speaker designers.

A low frequency transducer's free air response graph looks like a bell curve—it's most efficient in the mid band (Fig. A above). To flatten the curve (and extend low bass), you have to proportionally reduce higher frequency output. Acoustic designers use all sorts of tricks to do this—and usually end up with response something like Fig. B.

The most effective way to "shape" an LF transducer's output would be to increase its mass (cone weight). But for designers of traditional passive speakers, adding mass hasn't been a practical option since it would dramatically slow down the woofer's transient response.



Rear view: The HR824's electronics conceal an ultra-rigid, honeycomb composite passive transducer.



Last fall we won the pro audio industry's coveted TEC Award for best near field monitor. Modesty prevents us from listing the impressive field of competitors but you'll probably encounter their ads in this magazine.

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# HR824 HAVE THE MOST ACCURATE BASS ANY 8-INCH ACTIVE STUDIO MONITOR? REALLY A 12-INCH MONITOR IN DISGUISE.

Because the HR824 is internally powered (active), we could precisely control parameters that normally occur outside of the loudspeaker. Greg and the engineering team were able to create an electronic "symbiotic relationship" between the low frequency transducer's voice coil and its FR Series amplifier voltage output. At mid-band frequencies, the woofer "sees" extra synthetic "electronic mass." This effectively pushes out its lower bass response without compromising its lightning-fast transient response (Fig. C).

## MASSIVE POWER THAT WOULD PROBABLY POP A PASSIVE MONITOR.

Punching out crisp bass requires a lotta watts. The FR Series' high-current bass amplifier module inside the HR824 delivers a solid 150 watts of power with peak output in excess of 250 watts (plus another 100 watts for mid and treble). That's significantly more than any other 8-inch active monitor. Moreover, the HR824's servo coupling and ultra-short signal path put that power to work far more effectively than a passive monitor and a 250-watt stereo amp could.

**PART OF A TIGHTLY-INTEGRATED SYSTEM.** Our servo bass system is only one contributing factor to the HR824's amazing accuracy.

Internal power amplifiers are "fed" by phase-accurate, low distortion electronic circuitry instead of a crude coil-and-capacitor passive crossover. The HR824's proprietary logarithmic wave guide not only widens treble dispersion but



also smooths the midrange transition between high and low-frequency transducers. At the critical 3500Hz crossover point, the alloy HF transducer's output is acoustically the same diameter as the LF transducer's output, thanks to the wave guide's flaring design (refer to the actual HR824 photo on the other page, not our ad folks' fanciful rendering at left).

Indirectly, the HR824's LF transducer even contributes to high midrange accuracy. In many monitors, woofer cone harmonic vibrations bounce around inside the enclosure and then exit through the thin woofer cone. The result: smeared imaging and muddled details. Instead of a chintzy chunk of fluff, the HR824's enclosure is utterly packed with high-density absorbent foam. Cone vibrations go in, but they don't come back out.

**DON'T SKIMP.** It's amazing how many studio owners will mortgage the farm for money-is-no-object, esoteric microphones... and then monitor on cheap, passive loudspeakers. If you aren't using ACTIVE near field monitors, you're seriously compromising your creative product.

We urge you to visit your nearest Mackie Designs Dealer and seriously audition **all** of their active monitors with some demanding, bass-rich program material. Judge our claims (and those of our competitors) for yourself. We think you'll agree that the HR824 is truly the best of the best.



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# EQ PRODUCT VIEWS

## TAKE A SOLO

The Solo Digital Audio Recording System from SeaSound is a hard-disk recorder interface, mic preamp, headphone amp, MIDI interface, and mixer — all in one. The Solo features a pair of high-quality, dual-impedance universal preamplifiers with 65 dB of gain control. The low-level inputs include insert I/O jacks following the preamplifiers for insertion of processing units such as compressors or parametric equalizers, prior to mixing and digital recording. Four inputs are mixed into two channels using individual level and pan controls. The built-in mixer permits recording of live instruments or vocals, while monitoring MIDI drums or keyboards. The Solo enables interactive monitoring of the record and playback signals with separate level controls. The unit operates with all sample rates from 8 kHz to 96 kHz with 24-bit resolution in both record and playback modes. The router/mixer on the Solo controller card allows it to perform digital audio format translation tasks, such as analog to S/PDIF, S/PDIF to analog, record to DAT, and sync to S/PDIF. For more information, call SeaSound at 415-331-4978 or visit [www.seasound.com](http://www.seasound.com). Circle EQ free lit. #111.



## SEER IS BELIEVING

Seer Systems introduces the SurReal software for Pentium PCs. SurReal brings the five major types of musical synthesis — sampling, FM, physical modeling, analog, and modal — to desktop and laptop computers. The front panel allows 16 channels of sound to be set up, adjusting for volume, left/right balance, reverb, and chorus. Each channel also has Solo and Mute functions and a new “Vari” feature. Vari is an edit feature for each voice, controlling preset parameters to vary the sound’s textures and tonality. The new Sequence Playback feature loads and plays standard MIDI file sequences. With just two mouse clicks, General MIDI files can be translated into SeerMusic files for real-time playback on the Internet. SurReal’s built-in effects give two channels of reverb and delay effects. The suggested retail price is \$129. Download the SurReal demo at [www.seersystems.com/surreal](http://www.seersystems.com/surreal). For more information, call Seer Systems at 650-947-1915 or fax them at 650-947-1925. Circle EQ free lit. #112.

## THIS SYNTH IS A CINCH

Korg’s next-generation, half-rack multimedia sound module, the NX5R, incorporates Korg’s AI<sup>2</sup> Synthesis System with 12 MB PCM wave memory and an XG tone generator board. The NX5R features 96 voices, 48-channel multi-timbrality, 2365 sounds, and 52 different drum kits. In addition, it fully supports XG and GM and provides sound maps for GS and the Korg Super-series (X5 tone generator map). The NX5R also has a built-in computer interface that allows connection to a Macintosh or PC-compatible computer. With its expanded polyphony, multi-timbrality, and compatibility with most formats, the NX5R is ideal for music recording, multimedia, and desktop music production. Other features include a high-capacity PCM ROM, two independent stereo multi-effects units, a highly visible graphic display interface, and line-in/out jacks that eliminate the need for an external mixer. The NX5R is available for \$725. For more details, call Korg at 516-333-9100 or fax them at 516-333-9108. Circle EQ free lit. #113.





## LOW END DRIVER

**R**adian Audio Engineering has introduced the model 2216, a 15-Inch low-frequency component that features a die-cast aluminum frame, Kevlar-impregnated cone material, and an edgewood 4-inch voice coil. Power handling is rated at 1200 watts continuous program (600 watts RMS) with a sensitivity of 96 dB (1 watt, 1 meter). The maximum SPL is 131 dB. The 2216 is recommended for low-frequency applications requiring very tight bass response and high power handling capacity. For more information, call Radian at 714-288-8900, fax them at 714-288-1133, or go to [www.radianaudio.com](http://www.radianaudio.com). Circle EQ free lit. #114.



## PACKAGE DEAL

**M**icroboards Technology has announced 8X CD-R drive enhancements for Cedar Technologies' Desktop CD-R Publisher. The package includes two 8X recorders, a Fargo Signature CD Color Printer, the Cedar Autoloader, Cedar CD Face label editing software, premastering and robotics software for Win-

dows 95, dedicated duplication software, printer alignment posters, power cable, printer control cable, and a user's guide. Signature prints full-color, high-resolution text, graphics, logos, and photographs directly onto printable-surface 8X CD-R media. The MSRP is \$7995. For more information, call Microboards Technology at 612-470-1848, fax them at 612-470-1805, or visit [www.microboards.com](http://www.microboards.com). Circle EQ free lit. #115.

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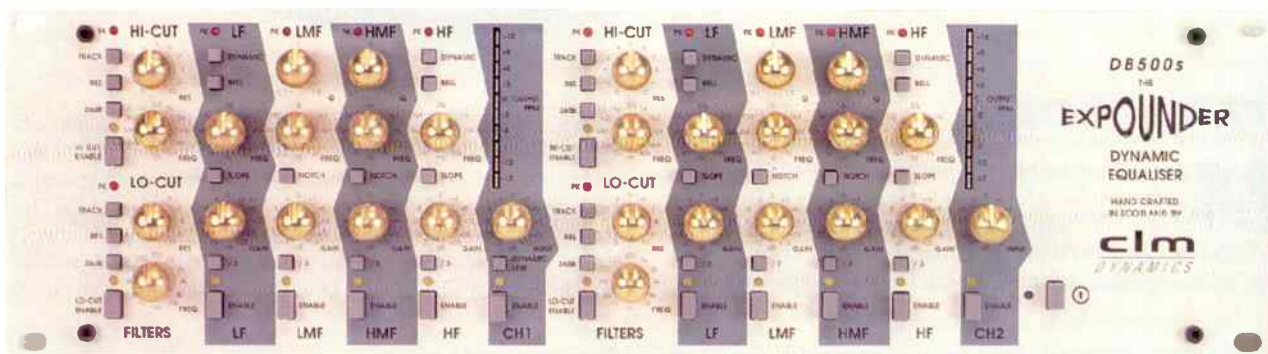


CIRCLE 29 ON FREE INFO CARD

# EQ PRODUCT VIEWS

## TOOLING AROUND

**T**C WORKS introduces TC Tools 3.0 for Pro Tools, featuring a new set of enhancements and features for the popular DAW. TC Tools 3.0 is a high-end reverb, EQ, and chorus TDM plug-in bundle for Pro Tools. One improvement is the new Mega Reverb Hi-End Reverb Plug-In, replacing the original TC Reverb. Also, the user interface of TC EQSat and TC Chorus/Delay was updated to the same look as MasterX and MegaReverb. TC Tools 3.0 is now compatible with Pro Tools PCI, 24, and 24 Mix, and MegaReverb allows up to two instances per DSP on Pro Tools|24 Mix. The plug-in bundle requires a PCI Mac equipped with Pro Tools PCI, 24, or 24 Mix. It has a suggested retail price of \$999. Registered owners of Version 2.0 can upgrade for free and Version 1.0 owners can upgrade via mail for \$199 with the original master disk and proof of purchase. For more details, call TC Electronic at 805-378-1828, fax them at 805-379-2648, or check out [www.tcelectronic.com](http://www.tcelectronic.com). Circle EQ free lit. #116.



## THE UNIVERSE IS EXPANDING

**C**LM Dynamics introduces the DB500 Expounder, a high-end EQ with dynamic and resonant filters. The hi- and low-cut filters offer a new level of control for tracking, mixing, mastering, or archiving. Using frequency selection, the dynamic filters set the level to where the Expounder analyzes the sound, determining what it will or won't let through. Additionally, the dynamic section can add or subtract frequencies by comparing the overall output. In doing so, it rides the fader of the frequency, keeping it in proportion with the mix. The DB500 Expounder is available for \$3299.99. For further information, call CLM Dynamics' distributor, PMI Audio Group, at 877-563-6335 or visit [www.pmiaudio.com](http://www.pmiaudio.com). Circle EQ free lit. #117.

## MAKE THE CONNECTION

**N**eutrik has introduced the 2-Pole Speakon NL2FC and NL2MP connectors. This connection system offers a reduced number of pins from the well-established 4-Pole version, while maintaining compatibility between the NL2FC female connector and the NL4MP male plug by picking up pins 1+ and 1-. The housing of the 2-Pole cable version is a two-piece configuration with insert, chuck, and locking sleeve attached in one housing and cable boot as the other.

The new chuck design accepts a wide range of cable diameters. The 2-Pole series maintains compliance with European safety regulations requiring connectors to be electrically touch-proof. As a result, the 2-Pole carries the UL recognized and CSA symbol. For more information, call Neutrik at 732-901-9488, fax them at 732-901-9608, or visit [www.neutrikusa.com](http://www.neutrikusa.com). Circle EQ free lit. #118.





## MULTICHANNEL EFFECTS

**E**ventide's Orville is the latest in their line of Harmonizer-brand effects processors. Orville provides true multichannel operation, supporting up to four analog and four digital inputs and outputs simultaneously. The unit's architecture is an A/B configuration with two DSP processors, allowing the user to process two completely independent multichannel

effects simultaneously. Orville provides 96 kHz sampling at 24 bits. The unit comes standard with a built-in sampler, allowing recording up to 174 seconds. It allows real-time pitch change and time change on playback. Orville's collection of on-board software programs includes Eventide's pitch shifters, reverbs, and effects. New programs can be created on a PC, using Eventide's effects module building-block approach. For more information, call Eventide, Inc. at 201-641-1200 or visit [www.eventide.com](http://www.eventide.com). Circle EQ free lit. #119.

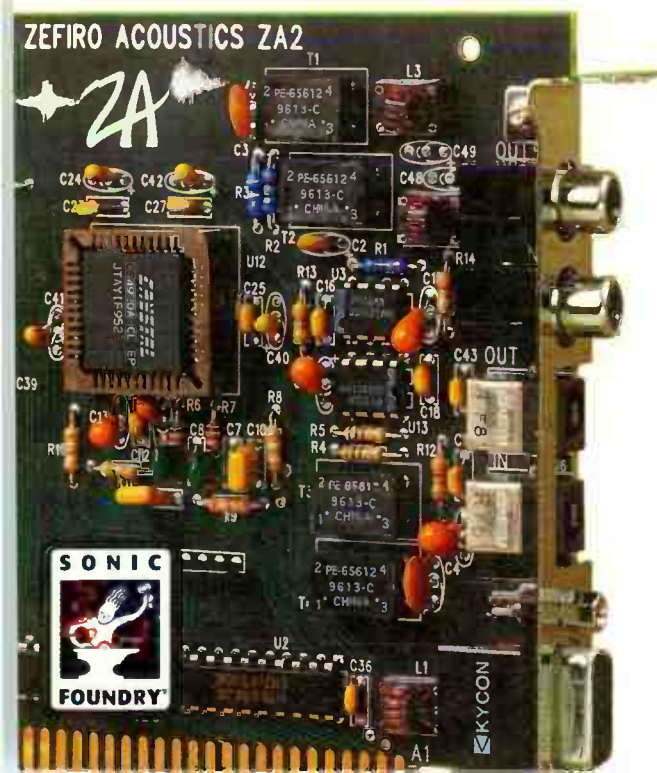


## AN ACTIVE ANSWER

**G**enelec's 1034B active monitoring system is a three-way system designed for large control rooms in the studio, postproduction, broadcast, and CD mastering markets. The 1034B was designed to be used either free-standing or flush mounted in the control room wall. Featuring two 12-inch low-frequency drivers, a 5-inch mid, and a 1-inch high-frequency tweeter assembly in a vented configuration, the system can produce peak sound pressure levels in excess of 125 dB with sonic accuracy. The system is completely self-powered; the bass, midrange, and treble amps produce 2 x 400 W, 350 W, and 120 W, respectively. The 1034B features bass, midrange, and treble controls. For more information, call Genelec, Inc. at 508-652-0900, fax them at 508-652-0909, or visit [www.genelec.com](http://www.genelec.com). Circle EQ free lit. #120.

# No Other Card Can Touch It.

With built-in Sample Rate Conversion and Multi-I/O the **Zefiro Acoustics ZA2** is the Master of CD Mastering.



**T**he ZA2 includes the professional features the other cards leave out. Its powerful 24-bit DSP sample rate converter lets you take inputs directly from a 48kHz pro DAT or a 32kHz LP DAT, and converts them on the fly to perfect 44.1kHz for CD mastering. Its Multi-I/O configuration gives you AES/EBU on real XLR cables and S/PDIF (both optical and coax) inputs and outputs, plus analog outputs for monitoring. You can use all the inputs and outputs simultaneously to do sample rate or format conversion (for example, S/PDIF in and AES/EBU out) or tricks like managing SCMS, or manipulating DAT start ID's or CD PQ codes — and you can switch back and forth between inputs with just a few mouse clicks.

The ZA2 delivers up to 24-bit recording — beyond the range of any commercially available A/D converters. It also works as a Windows sound card, converting all wave audio data (even mono, 8-bit, or 11kHz) to 16-bit stereo. You get drivers for Win95 and NT, plus Sound Forge XP 4.0 editing software and a promotional offer for upgrading to CD Architect.

Basically, the ZA2 packs in more features than we can cover in an ad. Check it out at <http://www.zefiro.com> or call 949.551.5833 and find out how affordable the right card can be.



Our new InBox has an outstanding mic-pre & built-in 20-bit A/D converter for just \$295!

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# Altec 201B

Do you remember  
this AKG disguised  
as an Altec?

**MICROPHONE NAME:** Altec 201B

**FROM THE COLLECTION OF:** Jim Morley, ZTX  
Event Productions

**PRICE WHEN NEW:** Estimated at around  
\$500

**YEAR OF MANUFACTURE:** ca. 1978

**TYPE OF MIC:** FET-based condenser

**POLAR PATTERN:** Omnidirectional

**FREQUENCY RANGE:** 20 Hz to 20,000 Hz

**POWER REQUIREMENTS:** 9 to 52 volts DC phan-  
tom power


**RATED SOURCE IMPEDANCE:** 180 ohms at 1 kHz,  
±10%

**CURRENT DRAW:** Less than 5 milliamps

**OPERATING TEMPERATURE:** -20 to +55 degrees  
Celsius

**DIMENSIONS:** 6.6 inches (length) x 0.97  
inches (diameter)

**MIC NOTES:** If this Altec microphone looks suspiciously familiar, there's a good reason — during the 1970s, AKG OEM'd this mic for Altec. Based upon the (AKG) C451 and its companion CK capsules, the primary difference in the Altec 201B was that its electronics were slightly modified to include a four-step sensitivity switch with settings for 0, -10, -20, and -30 dB. None of these settings employed a bass rolloff. This particular 201B is fitted with Altec's C71 omnidirectional capsule, which was interchangeable with their C70 cardioid capsule. Sonically, these capsules were similar to AKG's CK2 and CK1 capsules, respectively. The diameter of the 201B was 19.5 millimeters, while the diameter of the C451 was 18.5 mm, so CK capsules will not fit onto the Altec preamp (the threading is also different). However, it is possible for the condenser element of an AKG CK capsule to be inserted into an Altec capsule housing.

**USER TIPS:** Jim Morley uses his Altec 201B "as an overhead microphone from drum kits primarily, though the omni pattern gives me a bit of a problem on some gigs. It has a very bright sound — clean and crisp with a good ear to upper details. Other instruments that I have tried this mic on include a harp and a flute." 

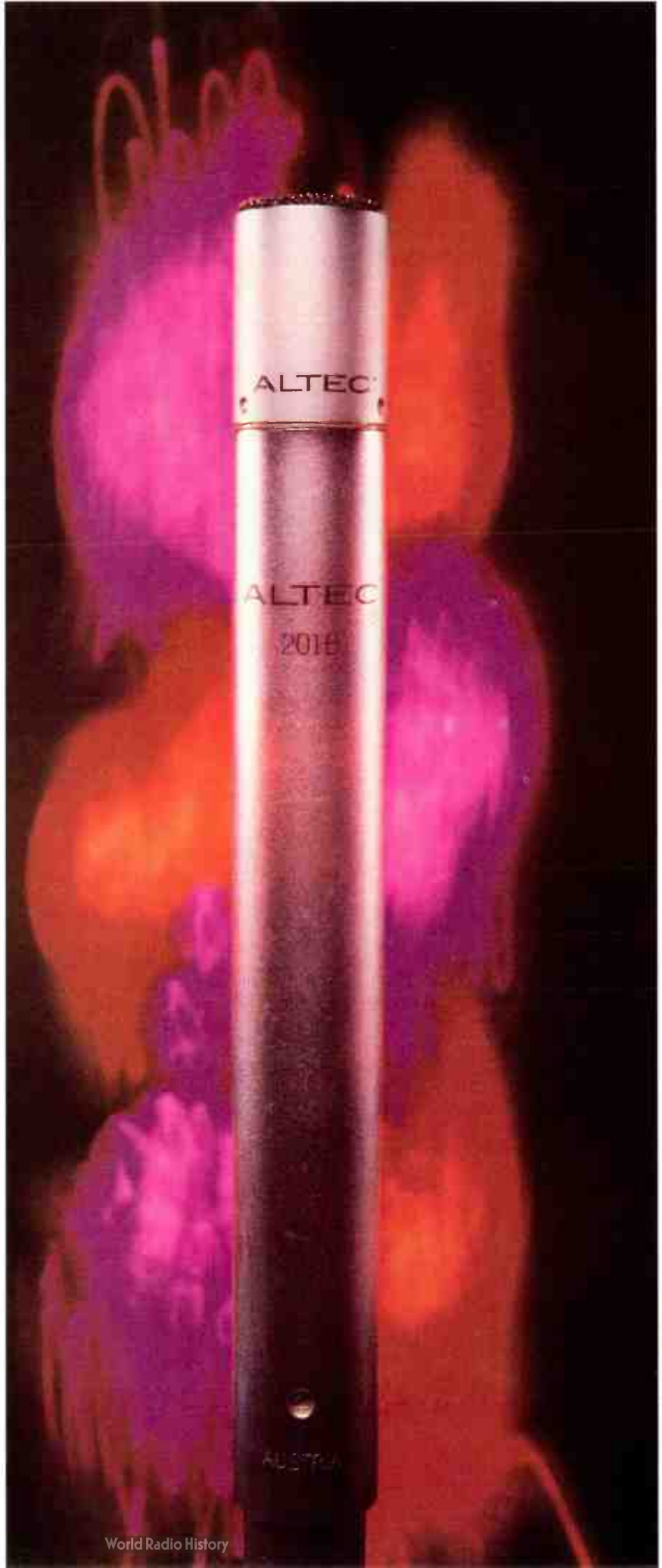


PHOTO BY EDWARD COLVER



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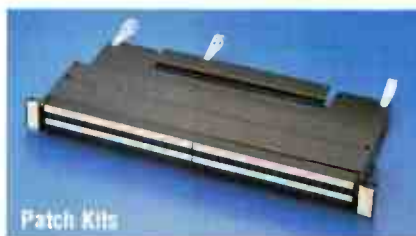
**TTP96 Series**

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- Extra wide labeling strips
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# The Beat Goes On

Ricky Lawson  
uses his well-equipped  
project studio  
to march to the beat  
of his own drum

**STUDIO NAME:** Ahhsum Lawson Studios

**LOCATION:** Walnut, CA

**KEY CREW:** Ricky "Ahhsum" Lawson, drummer, Grammy Award-winning composer, and *Modern Drummer* Reader's Poll "Best R&B Drummer 1999"; Ian Kenne, chief engineer

**CREDITS:** Musical director on Michael Jackson's *Dangerous Tour*; co-authored and co-produced the Pointer Sisters "Uh-Uh" on the *Serious Slamin'* album and the Fatburger hit "Good News"; other credits to Ricky's writing and producing catalog include TriStar Pictures' *Only You* featuring Marisa Tomei and Robert Downey, Jr., "I Love You Song" in the summer hit *Barney's Great Adventure*, Paramount Pictures' *Star Trek V: The Journey Home*, Kirk Whatum's "Fall in Love Again," Howard Hewitt's "Just to Keep You Satisfied," Perri Sisters' "No Place to Go," Helen Baylor's "There's No Greater Love," and Fourplay's "Dream Come True" from the *ELIXER* album. He has also performed on the soundtrack for *EdTV*.

**CONSOLES:** Yamaha 02R [2]

**MONITORS:** KRK V8 powered monitors in 5.1  
**RECORDERS:** TASCAM DA-98 w/sync card and DA-38 [3]; Akai DR16 hard-disk recorder; Akai GX912 cassette [2]; Panasonic SV-3700 DAT machine

**OUTBOARD GEAR:** Martech mic preamp [2]; Jensen mic preamp; Summit DCL200 dual compressor; Focusrite RED 2 dual EQ; Neve 9098 EQ [2]; dbx 160 XT [2]; Lexicon PCM70; Yamaha REV 5 and SPX 90 II [2]; Ensoniq DP/4; Alesis Wedges [2]

**MICROPHONES:** Shure KSM32 [2], Beta 52 [2], Beta 57 [2], SM81 [3], SM57 [6], SM91 [2], and SM98 [6]; Neumann U87 [2]; AKG C414 [2]; Sennheiser MD421 [2]

**HEADPHONES:** Sony PRO [6]; AKG 240M [2]

**STUDIO WIRING:** All by Klotz Cable, Germany

**MIDI EQUIPMENT:** Akai Custom Black MPC3000 w/Zip drive, S3000, CD3000, and S6000; EMU Planet Phatt; Roland D500, JV2080 w/five

cards, JV1080 w/four cards, JD990 w/two cards, JV880 w/one card, P330, and MKS50; Korg MIR EX and WaveStation SR; Studio Electronic SE-1; Ensoniq ESQ-M; Yamaha TX 81Z, MV802 mixer, and Rack 816; MIDI Time Piece [2]

**MIDI KEYBOARDS:** Akai MX1000 Master Keyboard; Korg Trinity Plus, 01W PRO, and M1; Roland D50 and JD800; Ensoniq TS10 and MR Rack 61

**MIDI DRUMS:** Akai MPC 3000 Drum Machine; Roland V Drums and R8M; EMU PRO/CUS- SION, WORLD, and KAT Trigger Pad

**COMPUTER:** Apple Macintosh 540C

**DI UNIT:** BBE DI 100 [6] and DI 10 [4]; Ebtech Line Level Shifter for all MIDI gear [13]

**RACKS:** Argosy racks and console housing  
**STUDIO NOTES:** Nigel Martinez, builder of Ricky Lawson's studio, states: Initially, the room was a rectangle with a small window-





mounted air conditioning unit and a patio door overlooking a large swimming pool and a sizzling barbecue pit. My main concern was to keep it aesthetically open and airy with lots of daylight. To accomplish this, I installed four large-block glass windows that would give us the daylight while minimizing outside noise pollution. Next, I partitioned the room off to accommodate a recording area sufficient enough to house two extensive drum kits. Two sets of dual-paned doors were used to further the open, airy aesthetic. The floor in both rooms are floating hardwood floors.

Now, with the floors, glass, doors, and

Ricky's abundance of rack equipment, I was faced with a lot of reflective surfaces. So it was necessary to treat all existing walls with absorption to counter balance the reflections. Once the 02R consoles and the rest of the equipment were moved in, additional absorptive panels were mounted to further soak up unwanted reflections. These treatments were also applied to the drum/vocal booth, along with bass traps to flatten out any unwanted lows. Because this is a project studio, I used light, cool greens with warm woods that fit in with the rest of the house's interior.

**EQUIPMENT NOTES:** Owner Ricky Lawson com-

ments: This studio has all the gear. Like the old studios back in the Motown days, the guys can just show up and play. I've got all the amps and stacks and two drum kits set up, so all they have to do is just show up. As far as equipment goes, my KRK V8 studio monitors are taking everything up to the next level. I'm hearing stuff now that I couldn't hear before — stuff that I need to possibly remix. Those speakers are killer. My Martech mic preamps are also among my favorite pieces of gear. It gives musicians a chance to hear what their instruments really, truly sound like. They help bring the whole situation up to the next level.

**EQ**



# MTX Audio PM210H Monitor Speaker

Do two 10's  
really beat a 15?

BY ROGER MAYCOCK

For live performance, few items are as critical as your stage monitors. Inaccurate sound reproduction here is likely to cost you out front where the audience hears what's really going on. With the introduction of their new PM210H monitor speaker, MTX Audio believes they have addressed the age-old "bigger is better" mentality by incorporating two 10-inch woofers and a high-frequency driver to deliver more accurate sound reproduction than that of the conventional single 15-inch woofer.

The PM210H is one of two stage monitor offerings in the MTX Power Loudspeaker lineup. The monitor speaker houses two 10-inch woofers used in conjunction with a high-frequency compression horn and a crossover network to deliver the most accurate reproduction of your performance possible. Concerned that you might not get the output level you need from that combination? Fear not. MTX reports that the PM210H offers output levels comparable to a single 15-inch cabinet — ultimately yielding the level you need with more accurate sound reproduction.

Suffice it to say that the Targeted Dispersion Pattern is created by a unique speaker configuration offering several design benefits over the conventional single woofer and a horn stage monitor. This unique configuration consists of two low/mid drivers mounted horizontally with a high-frequency driver centered on the horizontal plane. The benefit of such a configuration results in a reduction of the amount of off-axis output, which typically bleeds into the microphones on stage, causing feedback in the process. The

Targeted Dispersion Pattern speaker configuration enables you to better hear the monitors without the headaches and aggravation of feedback problems. Additionally, since this configuration is perfectly symmetrical, the speaker's output is equal regardless of whether you are standing center, left, or right of the monitor.

## I WANT MY VCC!

MTX has included a Vocal Contour Control on the PM210H. This specially designed equalization circuit enables you to contour the "voice" of the monitor within the vocal range to your specific preference. The Vocal Contour Control is conveniently located on the front of the monitor — providing easy access for adjustment during your performance. Being the control freaks that we are, it's surprising that this feature isn't more common — especially when you consider that rarely does a live performer have personal control over the sound on stage. The Vocal Contour Control has a frequency range from 300 Hz to 5 kHz, matching that of the typical human voice.

## A FUNCTIONAL ENCLOSURE

The new PM210H monitor enclosure is made from High Density Polyethylene. The first time you lift the cabinet, you'll appreciate its design, as it is considerably lighter than cabinets made from wood.

This material

and scrapes that invariably find a home on your equipment. Combined with a small footprint, the PM210H travels easily and retains its appearance longer.

Wouldn't it be great if every place you played had a stage area that gave the entire band a reasonable amount of room? Dream on! For this very reason, MTX recognized that some nights you'll need a short-throw monitor and other nights you'll need a long-throw. Hence, the PM210H offers a dual-angle design to help you meet those needs. The enclosure also has a low-profile stance so that it doesn't interfere with the audience's line of sight.

## WHAT'S YOUR NUMBER?

For those of you who must have some specs, take note. The PM210H has a frequency range of 48 Hz-20 kHz. With a standard 8-ohm load, power handling (in watts) is 200 RMS or 800 total. The maximum peak sound pressure level is 124 dB. Dimensions are 12 1/16" x 34 3/4" x 17 3/16" (H-W-D). The cabinet weighs 37 lbs.

With their new PM210H monitor speaker, MTX has come up with an attractive solution to the problem of being able to adequately hear oneself on stage.

MSRP: \$449.95. For more information, contact MTX Audio at Tel: 602-438-4545; Fax: 602-438-8692. Web: [www.mtxaudio.com](http://www.mtxaudio.com). Circle EQ free lit. #121.



typically wears better than wood as well — being less susceptible to all the scratches





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World Radio History

# Peavey and Cakewalk StudioMix

Two well-respected  
companies join  
together to  
create a software/  
hardware hybrid

BY ROGER MAYCOCK

Of the many new product offerings at this January's NAMM show, perhaps one of the most talked about products in pro audio circles was the introduction of StudioMix — an integrated multitrack recording software package and dedicated hardware mixing console. StudioMix is a combined effort of Peavey and Cakewalk, and combines the flexibility of computer-based multitrack recording with a professional-quality, fully customizable mixer — enabling the recording engineer to gain a tactile control interface over an otherwise software-based recording system.

## FIRST THE HARDWARE

For anyone who has experienced a multitrack recording setup based around a personal computer, the power and flexibility of the environment often becomes quite addicting. Unfortunately, this positive side has all too often been compromised by a less than stellar interface that is better left to word processors and Web browsers

— the mouse. Adjusting pan pots, EQ settings, and fader positions with a mouse is...well, let's just say less than inspiring.

The Peavey StudioMix control surface features nine motorized faders, 14 momentary switches, 18 rotary encoders, a transport area, a "Panic" button (which can be re-assigned), and a jog/shuttle wheel. The system also includes an audio mixer section with all the necessary cables to connect to and from the computer's sound card, plus a stereo record/playback source.

During recording, the motorized faders update automatically in response to the software parameter values. As one would expect from a professional-quality digital recording system, the momentary switches and rotary encoders are fully assignable, enabling the recording environment to be customized to your preferences.

The control surface provides eight customizable mixer modules for control of volume, pan, aux send and return levels, track arm, mute, and solo, plus chorus and reverb settings. The transport controller looks like a standard tape recorder's, and, best of all, the unit provides analog control over input levels for both a mono balanced microphone and

unbalanced stereo line input. This capability facilitates easy connections for your source signals — which has traditionally been one of the biggest challenges of getting audio into the computer in the first place.

## NOW THE SOFTWARE

The StudioMix software provides simultaneous record and playback capability of eight tracks of CD-quality audio in synchronization with as many as 248 MIDI tracks for a combined total of 256 tracks. For comping vocals, solos, or just plain old experimentation, StudioMix also facilitates 256 virtual digital audio tracks — providing ample opportunity to assemble that "best of" composite performance you've always wanted to engineer. StudioMix supports a variety of sampling frequencies up to 48 kHz.

For editing your audio, StudioMix provides standard cut, copy, and paste operations, plus incorporates facilities for normalize, fade/envelope control, cross-fade, and reverse audio. Edits can be performed with sample-rate accuracy. MIDI data can be edited in multiple views — including graphical Piano/Controller, standard event list, synchronized lyrics, system





exclusive, and real-time notation display and edit. The program provides unlimited "undo" capability, so you can always return to the original take.

StudioMix provides powerful audio effects optimized for 32-bit floating point processing. These include Parametric EQ, Reverb, Delay, Echo, Flange, Chorus, and Pitch Shift. The program also supports Direct X plug-ins so that additional effects can be incorporated as needed. Optional plug-ins like Cakewalk Audio FX 1, 2, and 3, plus QSound's QTools/AX, can all be added. StudioMix enables you to apply up to eight simultaneous effects in real-time.

For the composer in you, StudioMix's music notation capability supports up to 24 staves per page with sizable fonts. The program includes provisions for guitar chord grids, percussion notation, lyrics, title, composer name, expression text, hairpins, pedal markings, and enharmonic spellings.

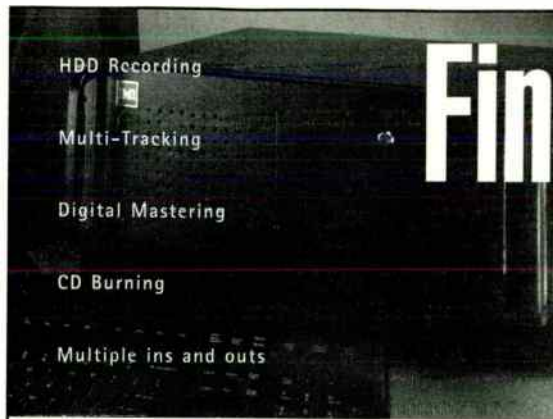
StudioMix is ready to grow as your needs require. The system can interface with and automate other popular studio equipment. The software includes ready-to-use virtual control panels for many of the popular MIDI-compatible devices on the market. The program also supports the Cakewalk Application Language (CAL) to expedite common tasks and create custom editing commands such as quantization routines, chord builders, data thinners, and drum maps. Additionally, custom macros can be created by recording keystroke and mouse movements, after which five of these macros can be assigned to the five macro buttons on the StudioMix hardware console.

#### AS AN INTEGRATED SYSTEM

The unified system provides a wealth of flexibility. Loop recording with a multi-take option is supported, as is sound-on-sound recording. You can, of course, step enter MIDI data and punch in and out on the fly. There are provisions for creating stereo submixes, re-routing audio I/O, defining aux busses, and automating volume and pan levels. StudioMix supports markers for identifying specific points within your project — all of which can be named and identified as text cues.

When it comes to multimedia applications, StudioMix lets you open AVI, MPEG, and QuickTime video files and then sync up to eight audio and 256 MIDI tracks with frame-accuracy. Upon completion, files can be exported to AVI

*continued on page 140*



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# SONY

# NHTPro A-20 Monitor System

The well-respected home manufacturer enters the pro studio market

BY ROGER MAYCOCK

Founded in 1986, NHT has become quite well known for hi-fi and home theater loudspeaker systems. But while this segment of their business has been very rewarding, many within the company had their sights set on creating professional audio products, as this is where their roots were. Hence, NHTPro was born in early 1998.

NHTPro recently introduced the A-20 studio reference monitor system, which is targeted for sound designers, mastering suites, and project, commercial, and postproduction studios. The system employs modular design, incorporating a pair of 2-way, acoustic suspension monitors along with a system-specific control amplifier.

The A-20 driver complement consists of a 6.5-inch treated paper, long-throw woofer in a sturdy cast frame along with a 1-inch liquid-cooled, aluminum dome tweeter. Both drivers are magnetically shielded. The 1-inch aluminum dome avoids the typical "ringing" problem characteristic of many metal dome tweeter designs by utilizing a micro-fabric surround at the edge termination along with ferro-fluid in the voice-coil gap for proper damping. The company claims the tweeter's "under-hung" motor design eliminates voice-coil mass for linear, high-frequency response and low distortion at even the highest power levels.

Additionally, the woofer incorporates a mitered, outer cone to help minimize cone-related standing waves for delivering uncolored sound reproduction. The vibration-damping properties of its butyl-rubber surround reduce standing waves in the cone body, which, in turn, reduce undesirable mid- and high-frequency cone resonance.

The angled cabinets of the A-20 are manufactured using "medium density fiberboard and high-pressure laminates both internally and externally." This construction method provides an acoustically neutral, structurally sound enclosure.

NHTPro elected to take a modular approach to the issue of supplying power as opposed to building a "powered monitor." Hence, the A-20 comes with a 2U, rack-mountable power amplifier specifically tailored to the system. The company feels this approach offers improved headroom and better heat dissipation while eliminating the potential for vibration-induced amp failure. The A-20 control amplifier features dual-mono construction and discrete output devices delivering 250 W RMS per channel (400 W peak). The A-20 features a system status display that enables the operator to monitor AC line voltage, heat sink temperature, and sound pressure level.

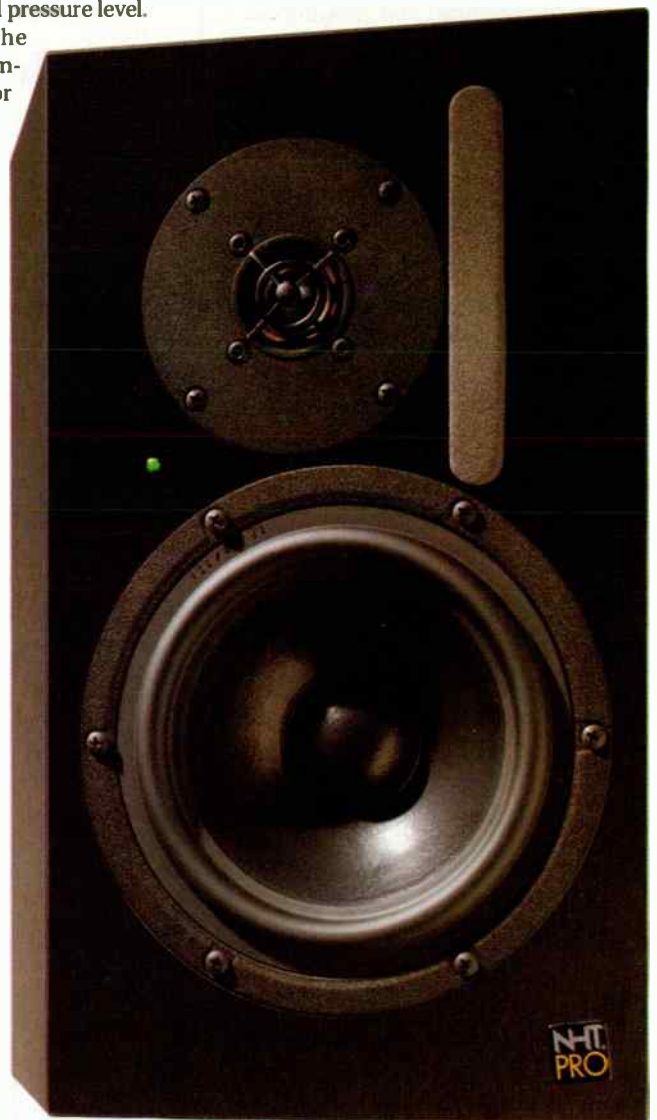
Located on the front of the power amplifier are controls for Boundary Proximity, Distance Proximity, and Switchable Input Sensitivity. The A-20's boundary control is a five-position, low-frequency compensation circuit for adjusting the system's bass response when the speakers are placed in a corner or in the middle of the room.

The Distance Proximity control is intended to accommodate subtle high-frequency adjustments when moving from the nearfield to the midfield to the farfield. This parameter compensates for the higher ratio of reflected sound to direct sound as the listening position changes from nearfield to farfield and in between — enabling the same high-frequency response at all listening positions.

The A-20's Switchable Input Sensitivity control provides a five-position input sensitivity switch with settings for +11 dB, +4 dB, -3 dB, -10 dB, and mute.

The A-20 monitor connects to its companion power amplifier via XLR connectors with the supplied matched-impedance cables. The A-20 system is capable of 117 dB short term SPL while maintaining a THD specification of less than 0.4 percent (90 dB, 100 Hz-10 kHz @ 1M).

For more information, contact NHTPro, Tel: 707-751-0270; Fax: 707-751-0271. Web: [www.nhtpro.com](http://www.nhtpro.com). Circle EQ free lit. #134.





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# Opcode Studio Vision

Do these frequently asked questions match your own queries about Opcode products?

BY ANGELA HILL,  
OPCODE TECHNICAL SUPPORT  
REPRESENTATIVE

In Opcode Tech Support, we find that there are some questions we're asked at least once every day. Here are answers to a couple of them — one we've been asked for years and one that's specific to Vision DSP and Studio Vision 4.2.

**Q. I striped one track of my ADAT tape with SMPTE and then recorded the tape's audio into SVP while locked to the SMPTE. Now, when I switch back to SVP's internal clock, the audio drifts behind the MIDI. What happened?**

**A.** Although this seems a bit like "voodoo" at first, it makes a lot of sense. There are a few things to remember: [1] every timecode source is a little bit different, [2] audio in Acadia mode always plays at the same speed, regardless of the timecode source (if there's no word clock or superclock involved), and [3] MIDI timing freely adjusts to timecode changes.

First, SVP is slaved to SMPTE, and you hear the perfect sync while the audio tracks are recorded into the sequence. But here's the trick: the MIDI in the sequence is "flexing" to match the rate of the SMPTE timecode; for this example, let's say that the SMPTE is a little slower than the computer's internal clock. You don't hear the difference in the MIDI because there's no change in pitch and the tempo change is negligible.

When you're ready to start mixing in SVP, switch back to internal sync and hit Play. Little by little, it seems that the audio tracks are falling behind the MIDI.

Actually, and this is key, the MIDI is drifting ahead of the audio. Audio always plays back at the same speed, but MIDI timing is variable. The MIDI is referencing its new (internal) clock source, so it plays a little faster and the audio seems to fall behind.

How can this be avoided? There are a few options. Make a word clock or superclock connection. Either of these will create sample-accurate sync by constantly adjusting the audio's playback speed so you can use any sync source. Or use the same sync source for the entire session. You don't need hardware that accepts word clock or superclock, but now you have to deal with lock-up time every time you press Play.

The third option is the one I like to work with. Opcode's Studio 64XTC has an ADAT sync out port; connect your ADAT directly to the XTC, and you'll never have to stripe an ADAT track with SMPTE again. The 64XTC acts as the timecode master for your studio — it drives both the ADAT and

SVP, with complete control of the ADAT via MMC and MTC. Once your audio is in SVP, take the ADAT offline with a button in OMS. Keep the same timecode source (the XTC), so you don't hear any drift, but lock-up time is now less than a second. The 64XTC also generates word clock and superclock, and (of course) syncs to incoming SMPTE/MTC, so options for the future are flexible.

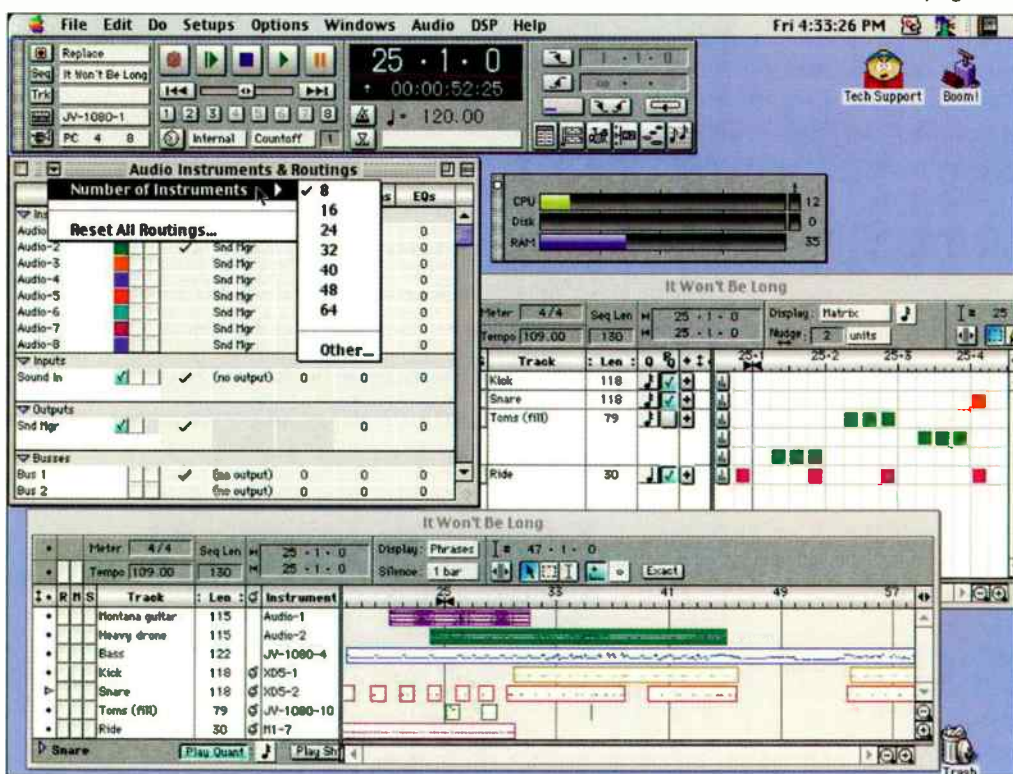
**Q. The Performance window keeps interrupting playback when I'm in Acadia mode. How can I optimize my system for use with Acadia?**

**A.** There are several things that determine performance in Acadia.

1. CPU. Apple G3's are great — in general, the higher speed and performance CPU your computer has, the more tracks and plug-ins you'll get. Opcode recommends a 604e or better processor.

2. Hard drive for digital audio. It's important to store your digital audio on a fast drive that does *not* contain your System Folder or the Vision DSP application. Ultrawide SCSI drives are best. Minimum

*continued on page 140*





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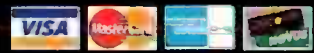
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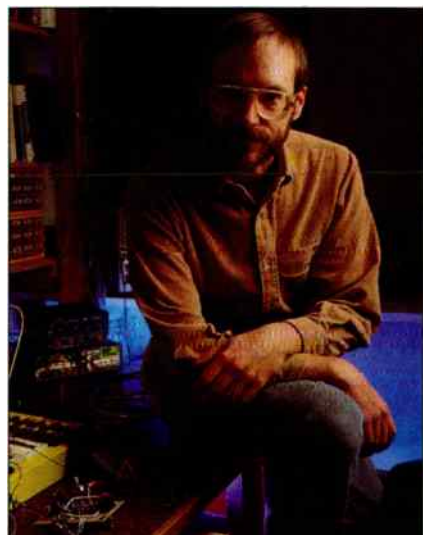
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# Lessons In Production

Tips on capturing a great performance in the studio



BY CRAIG ANDERTON

Recently, I produced a CD that was pretty unusual for me: no MIDI, synths, electric guitars, or vocals. In the process, I learned a lot, and thought that you might glean some tips from my experience, too.

The project involved harpsichord player Michael Kac and classical guitarist Linda Cohen (I had produced Linda's three previous albums back in the '70s; her most recent, *Angel Alley*, was re-released on CD by Tomato Records in the mid-'90s). We were to record in Minneapolis, where

Michael lives, to avoid having to ship the harpsichord.

## LESSON 1: SIMPLER IS BETTER (AND CHEAPER)

My studio is great for editing, but not for recording acoustic instruments. So the plan was to record basic tracks in a commercial studio and edit/mix in my project room. For recording acoustic instruments, I usually go direct to tape through a mic preamp. So all I really needed was good mics and preamps, a decent room sound, good monitors, and an ADAT (for compatibility with my studio). Why spend the money on something like an automated SSL board if you're just tracking a duet?

## LESSON 2: PEOPLE CAN MATTER MORE THAN GEAR

Because none of us knew the local studio scene, I spent hours on the phone interviewing studios listed in a local arts and entertainment paper. Several studios had the gear we needed, but the engineer at a studio called Bryte Spot, Rob Hilstrom, became intrigued with the musical concept, and made it clear he wanted to participate. His motivation served us well when we needed to book some extra time or run over on a session — he was more interested in the project than punching the clock.

## LESSON 3: IF IT AIN'T BROKE, DON'T FIX IT

Neither of us had miked a harpsichord before, so we allotted an hour to work on mic placement. We had Michael play while we poked our ears around the instrument searching for sweet spots. Then set up a Neumann KM 100 (supercardioid, small diaphragm condenser) and a larger diaphragm, MicroTech Gefell UM 70 [evolved into the current model UMT 70S] as a basic stereo A-B setup, but pointed outward a bit. Both fed an Aphex 107 mic preamp.

When we walked between the control room and the main room, the harpsichord sound was identical. We liked it, and Michael liked it, so we just went with the initial setup. Total time: less than five minutes. I must admit, if I'd been the only engineer, I would have tried out other placements, and probably have just wasted the time since the initial placement worked just fine. But having another set of ears confirmed that we nailed the sound.

We did end up removing the harpsichord cover. Normally this reflects sound out into the audience, but all it did was create standing waves.

Incidentally, for the classical guitar, a Groove Tubes 1A + DP-1 preamp did the trick, pointing toward (and about 18 inches away from) the 12th

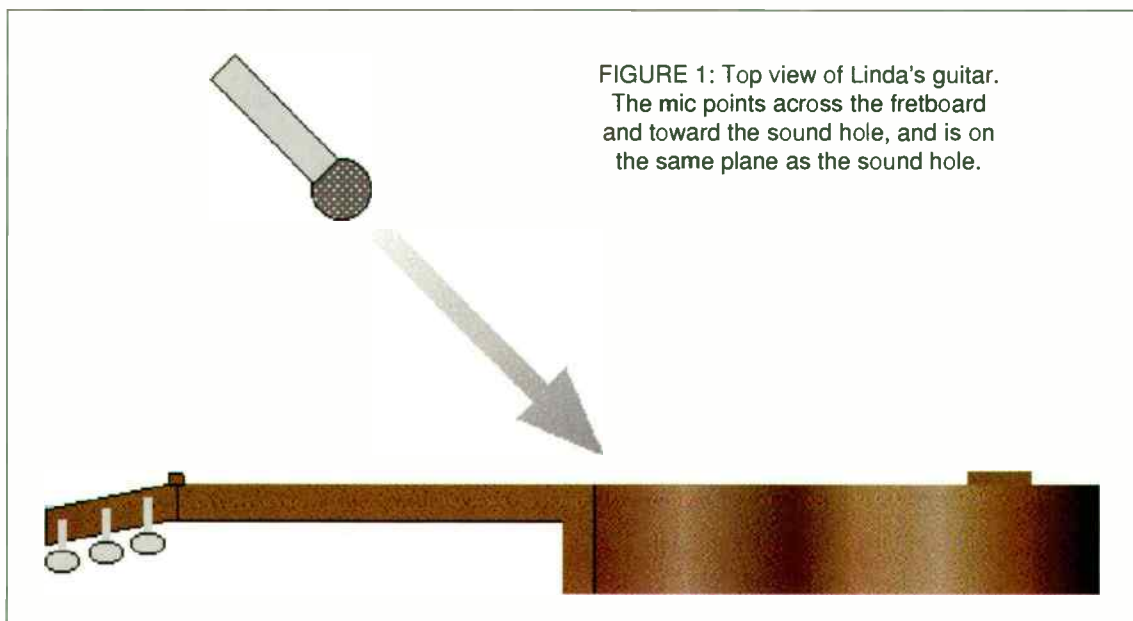


FIGURE 1: Top view of Linda's guitar. The mic points across the fretboard and toward the sound hole, and is on the same plane as the sound hole.



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fret, at about a 45 degree angle (see fig. 1). We used the Neumann on steel string, with the same basic placement. I know it's normal to record guitars in stereo, but I usually record Linda in mono to avoid phase problems, and spread it in stereo (with digital EQ) during the mix, as described previously in this column. Also, in this case we expected to pan the harpsichord left and right, leaving a hole in the middle for guitar. Had we miked it in stereo, the two channels would have ended up pretty much centered anyway.

#### LESSON 4: DRUMS BEAT CLICKS

Two of the more difficult tunes needed to be recorded in sections, and since these were also pieces with remix possibilities, they needed to be cut to a click.

Both Michael and Linda, who are not used to working with a click, hated it. When Michael suggested it would be easier to have the click on 1 and 3 than on quarter notes, I realized that maybe a drum part would be better. Rob had a two-measure loop sitting in his Korg M1, so we put it in the 'phones and, as if by magic, Michael and Linda had no problem following it. In fact, they liked playing with the "drums" so much that they did better performances, even compared to using no click at all.

#### LESSON 5: A GOOD PERFORMANCE BEATS LEAKAGE (AND ERRORS)

Michael and Linda needed to be able to see each other to interact, which precluded overdubs. I was concerned about leakage, particularly if any hard-disk editing was required. We baffled the best we could, but I hoped that we could

record a guide track, then do overdubs so there would be isolated tracks. That idea went out the window about 20 seconds into their first tune: with all the rickards and tempo changes (with the two exceptions noted above) it would be impossible to play along with a click, much less do perfect overdubs.

As it turned out, being able to interact led to far fewer errors than trying to do overdubs. Paradoxically, the mechanism designed to compensate for errors — overdubbing — set up a situation where errors were bound to occur. Going for real-time recording of two musicians, theoretically the option where errors would be most problematic, caused the most error-free performances.

#### LESSON 6: NEVER TUNE ACOUSTIC INSTRUMENTS TO EACH OTHER

Harpichords are a bear to tune and need constant touching up. Furthermore, sometimes the harpsichord would drift sharp or flat, but you didn't notice because only a few strings would drift significantly sharper or flatter than the others — so it was easy to assume that just those strings were out, and fix them. If you came back the next day to do an overdub, you now had to tune to an out-of-tune instrument, which is always harder than tuning to standard pitch. Whenever

tuning is required, tune to a stable reference.

#### LESSON 7: LEAD IN AND OUT OF SECTIONS

Instruments like harpsichord and guitar have a certain natural resonance. In fact, a harpsichord sounds like it has reverb built-in due to the resonance of the strings, even if you cut off a chord abruptly.

When recording a song in sections, it's important to play for 15 seconds or so before the punch point. Otherwise, when you punch, it will cut off the residual string decay and sound clipped. You can cover this a bit with reverb, but that's a band-aid, not a solution.

#### LESSON 8: LEAVE SOME NOISE AT THE BEGINNING

The tracks were recorded into ADAT and bounced over to the Ensoniq PARIS hard-disk system for editing and cleanup. When cleaning, it's tempting to silence everything before the first note comes in so you don't have to do it in the mix, but that can cause problems. Using computer-based noise-reduction algorithms to get rid of mixer or preamp noise, even if it's way down (-85 dB or more), can make a difference in the transparency of the mix. However, these need a brief "noise print" sample in order to "learn" the noise characteristics, which it can then remove from the signal. If you plan to remove noise from the signal, do it before trimming the beginning and end.

#### LESSON 9: DON'T THINK AND PLAY AT THE SAME TIME

Oddly, it often seemed that the takes I thought were best were not initially the ones the artists liked the most, and the ones they thought were best turned out not to be. Fortunately, when they came in to the control room to listen, they'd end up agreeing with my assessment. My theory on why this is so: if the artist is spending any brain power on evaluating their take, they're not performing at the optimum level. If they just perform without judging themselves, the take is more "from the heart." When producing, encourage the musicians not to judge their playing, but just to play. Tell them the time to decide whether a take is good or not is after it's complete, not during the process of playing.

If readers would like to hear some clips from the final CD (titled *Naked Under the Moon*), surf to [www.kac-cohen.com](http://www.kac-cohen.com).

*Craig Anderton just got back from gigging in Germany, and is continuing to work on a series of books about recording with guitarist/producer/songwriter Jay Graydon. For a listing of Craig's books, go to amazon.com and do a search on Anderton.*

*When recording a song in sections, it's important to play for 15 seconds or so before the punch point. Otherwise, when you punch, it will cut off the residual string decay and sound clipped.*



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# Track Sheets



PHOTO BY JONATHAN POSTAL

More good habits  
than a nun's closet

BY AL KOOPER

The track sheet, the map to your multitrack tape, should provide as much info as possible, be neatly arranged, and have a permanent place to live in your studio. I have discussed the horrors of somebody else trying to decipher your unkempt track sheets in an earlier issue, so I'll just remind you of the golden rule: Y'all reap just whatcha sow. If you don't erase from your track sheet and MTT (multitrack tape, henceforth in here) what you are not using, somebody else (or even *you*) will not know better and use it.

Let's start with basic tracks — write in what's on what track, the date of recording in the upper left corner, what microphone was used (or synth as the case may be), and EQ settings if necessary.

Now, as you overdub, you may put a guitar part on and become unsure about it. If you have 16 or 24 tracks, you may want to mute it and redo the guitar part on another day. So you play them back and you love the old guitar part on the verses, but the new part is killin' on the choruses. So you punch the choruses onto the original guitar track and *voilà* — the best of

both worlds, and the newest guitar part. *Please* go back and erase the flotsam and jetsam that are left over — in this case, the original of guitar part B. It gives you a clean open track, and it ends confusion a week later when you get unsure about which part is which. Obviously, this work ethic extends to all sound sources.

Now, when I record vocals on my 24-track setup, I always record four different takes on tracks 17–20 and combine these vocals to track 16. On my home tapes, my lead vocal is *always* on track 16. After listening for a few days, when I'm sure it's the final vocal, I erase tracks 17–20 whether I need the open tracks or not. This is a habit left over from when I worked as a producer for various record companies. This way, they can't use the wrong vocal when *they* invariably remix it behind my back. It does the artist *and* myself a service. I learned this the hard way.

I once produced BB King and I cut the basic tracks myself, while BB was on the road. I hired a session singer to sing the song, and I played lead guitar in the places I was suggesting to BB to play. I mixed it down and sent it to BB so he could rehearse to the track before we got together to actually record. I sent him a mix with the session singer and my guitar leads, and then just a mix of the track. After he had come in and put his vocal and guitar on, I did not erase the guitar track I had done. MCA (BB's label) came in after I had mixed it and decided to remix it. So imagine my surprise and horror when the record came out and my demo guitar leads were occasionally in the master mix. I called BB terrified, but because he had heard it at the same time I had, he already knew

about it, and because he is conceivably the nicest guy on the planet, he told me to relax because he knew it was not my fault. I am still horrified to this day, and damn lucky that it was BB I was working with. Any other artist would have bad-mouthed me all over the industry for something that was not my fault. If I had just erased that track, it would have *never* happened. Learn from my mistakes.

Clean your MTTs *and* your track sheets.

Now what would any of this good work do if you lost the track sheet? In the old days, they fit magnificently into the box for a 2-inch, 24-track tape. Everyone just bunged the track sheets into the box, and that's where anyone could find them. Today's tape formats are much smaller, and a master can be spread over three different reels. A filing system is necessary to keep up with the track sheets.

On Hi-8 format, I recently finished a reel (three 8-track reels actually) with over 20 songs on it. Thassa lotta paperwork, dude. So I clearly marked the three tapes as 1998–99 Reels A, B, and C.

And I also had a log sheet that told me what titles were on the tape and what the starting and ending times were on each song. I filed the log sheet and the track sheets in my filing cabinet under "98–99 Track Sheets," and when I needed to work on an old song, I made a copy of the track sheet and

put the original back in the file. The problem is, I'm 55 years old. I don't work on this stuff as much as you 20-somethings do. So start filing and following these tips, and by the time you're my age, you'll have everything you ever worked on and know exactly where it is. Nuff said. **EQ**

*The track sheet,  
the map to your  
multitrack tape,  
should provide  
as much info  
as possible, be  
neatly arranged,  
and have a  
permanent place  
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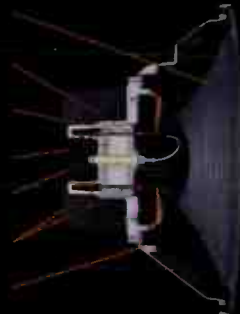
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# John X



PHOTO BY ED FREEMAN

Talking with the outspoken and versatile producer/mixer/engineer

**BY MR. BONZAI**

**Bonzai:** What are your main recording tools here in your product studio?  
**X:** The Pro Tools rig is definitely crucial. Let's see: the old Akai 612 sampler, the newer S2800 sampler, Oberheim Matrix 6, Kawai K-1, Korg DVP-1. My new Roland 8080 is probably my favorite instrument, and the TC Fireworks is definitely my favorite new toy. Other faves: the DigiTech Vocalist, DigiTech Talker, and Sony DPS-M7. I've always kept my rig pretty small.  
**Which commercial studios do you haunt?**  
 Lately, I've been at NRG a lot, Westlake, Record Plant, and Sonora Recorders in Los Feliz.



**What consoles do you prefer?**

I do like those [SSL] 9000's and the classic Neves. But I've worked at so many studios — whatever you stick in front of me, I'm gonna make it work.

**Microphones?**

Can't beat those old Telefunken and ELAM 251's. But I also love the Shure SM7.

**Analog or digital?**

**How is the debate raging in your head?**

There are good sides to both. Again, whatever medium you're using, you gotta make it work. There's a lot of things I like about digital, but it still seems nonsensical to be slicing up sound, which is a continuous event. Anyway, by the time it hits the CD, it doesn't matter what you were using.

**What's your latest recording gadget?**

My friend, Digital D, just brought me this lovely Casio CTK-501, which does bass and accompaniment at the same time. I could just toss all the sequencing gear and use this. It knows the chords — it even tells me what chords I'm playing. Listen to this!

**Beautiful. You could get a gig at any Holiday Inn.**

I have to prepare, you know, because there is no retirement plan in this business.

**What is your recording secret weapon?**



Danny Saber and I were looking for a way to bring in album budgets a little lower. Why do the projects take so long? Why are we spending so much time on vocals? It

didn't hit me until I was watching the Olympics swimming competition. The swimmers keep themselves hairless to cut wind and water resistance, so we started waxing the singers. Then we oil them down a little before doing vocals — it's unbelievable how fast it goes now. Sounds like it might put the artist in a new "head space," too?

Oh, yeah — they feel pampered. And let's face it: singers love to be pampered.

**What would you like Santa to bring you this year?**

Diplomatic immunity.

**Did you ever lose anything?**

Well, I haven't lost my virginity, but, being an engineer, that probably comes as no surprise.

**But what about this rumor that you and Mick had a little fling?**

There was nothing little about it!

**If you were a musical instrument, which would you be?**

There's a Bulgarian bagpipe made from a sheep, called a Gida. It makes one of the most horrible sounds I've ever heard —

**Suspect:** John X Volaitis

**Ancestry:** Greek with a trace of Transylvanian Dutch

**Occupation:** Producer, mixer, engineer, writer, musician, programmer, fashion model

**Birthplace:** Back seat of a squad car near Flushing, Queens, NY

**Residence:** Cahuenga and Melrose, near a tar pit

**Vehicle:** Shopping cart

**Last Seen:** In a karaoke bar.

**Identifying Marks:** Bootprints and lipstick smudges on buttocks

**Credits:** Suspect has recorded and mixed Ice Cube, Videodrone, Black Grape, Rolling Stones, Garbage, David Bowie, Barry White, The Dickies, X, Love-Hate, Marilyn Manson, Jesus Lizard, Michael Hutchence, Korn, U2, Black Sabbath, John Lydon, The Jackal, Doppelganger, and The Dead Girls Corp, amongst many others.

**Notes:** Likes to "dress up."



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me, I had always thought of myself — so did most managers — as unmanageable. She, being the Unmitigated Queen of Misfit Island, knew that I really just wanted to be a dentist, so she hooked me up with every abominable snowman that would have me.

**When did you start engineering?**

In 1979, I started as an assistant engineer while I was in college. Before that, I worked at Eventide Clockworks when I was still in high school — building 949's, which may explain why some of them are

a little quirky. I asked the owner, "What am I making?" He took me into the studio and showed me how it worked. I loved it. The rest is history.

**Who were your heroes when you were a little snotnose?**

My formative inspirations were Todd Rundgren and Brian Eno. And I'm still a little snotnose.

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

Barbra Streisand. I have never hit on any artist that I've worked with, but if I was

working with her, I'd have to say: "Barb, not only are we doing the album, but we're gettin' married as soon as I'm done mix-in', babe."

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

Of all the unbelievably talented people who have just knocked me out, the most awesome sight was seeing Tom Jones walk into the studio to sing Prince's "Kiss" for the Art of Noise. He had laryngitis — no voice, could barely speak, but he went out there and belted it out in one take. That's the vocal that's on the record. It took me longer to set up the microphone than the actual entire session did.

**What makes a great producer?**

Fashion, multiple phone lines, and a lot of patience.

**What is the biggest mistake of your life?**

[Laughs.] Besides this interview? There have been a million mistakes, but nothing that I regret.

**Any advice for getting a good start as an engineer?**

Try it out and don't do it unless you really love it. It's a pretty grueling lifestyle, especially in the first 15 to 20 years. I can't believe how long I've been on this freelance roller coaster.

**How are the "kids" doing today?**

They got it hard. There's a lot more information flying around than when I was a Boy Scout. A kid today turns 11 and he wants a car and a credit card.

**Have you ever really pissed anyone off?**

Who me? [Laughs.] You're talkin' to the king of pissing people off. I guess I can get a little pushy and, well, sometimes people blow up.

**What will you be doing in ten years?**

Probably waiting for a check. **EQ**

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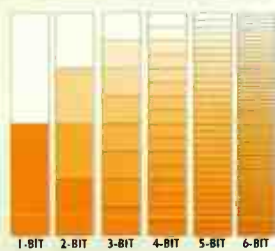
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World Radio History

**ALESIS**  
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# Getting (and Staying) in Sync

How to record your sequencer's multiple MIDI tracks into Pro Tools in perfect sync

BY DARRYL S. DUNCAN

I realize that, over the last two years, there has been a huge explosion of audio and MIDI software products developed for the Windows platform. But I have always been and will always be a "MACaholic," so I hope I am not too presumptuous by assuming that most audio work is *still* being done on a Macintosh. With that in mind, I'd like to outline the

recording process I use from MIDI composition to final audio mix when using separate MIDI and hard-disk recording software on the Macintosh platform.

The specific software I use is Opcode's Studio Vision and Digidesign's Pro Tools124 digital audio workstation, but it is important to remember that the following method will work with just about any of the popular Macintosh MIDI or digital audio applications that support OMS (Opcode MIDI System), which most do, including Cubase and Logic Audio. Even though Mark of the Unicorn's Performer does not use the OMS standard (yeah, I know), Performer can emulate the way OMS works, even though their system is called "FreeMIDI."

## VARIOUS METHODS

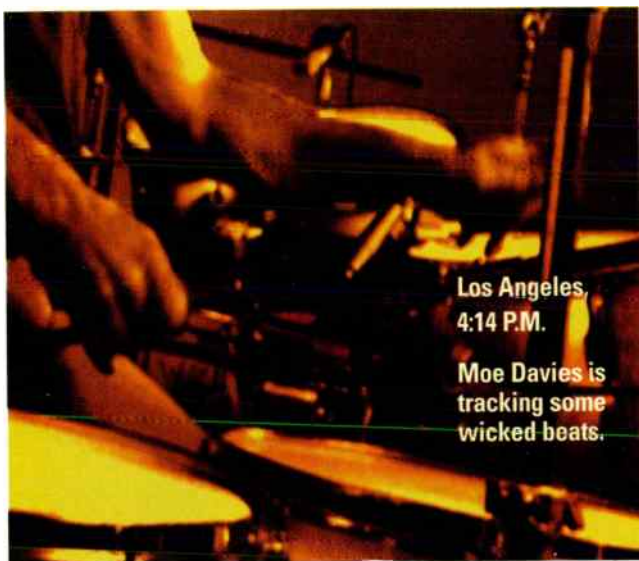
I know that many of you are already thinking that Opcode and Performer al-

ready have the ability to record audio direct to disk, so why sync to or even use Pro Tools. Well, because I find the Pro Tools environment a lot more straightforward, flexible, powerful, and user-friendly than the audio portion of Vision or Performer (IMHO). Don't get me wrong, I swear by Vision, but only as my MIDI sequencer. (I used Vision when it was called Sequencer 2.5 in the mid-'80s.) I also use Performer from time to time. Even though Pro Tools has some "basic" MIDI features, it is by no means a MIDI sequencer. Besides, once you've used the power of true DSP card-powered system, you won't really want to hear anything about "CPU-dependent based effects." I look at it like this: Vision is my main MIDI sequencer and Pro Tools is my hard-disk recorder, and to be able to seamlessly integrate the use of both systems is



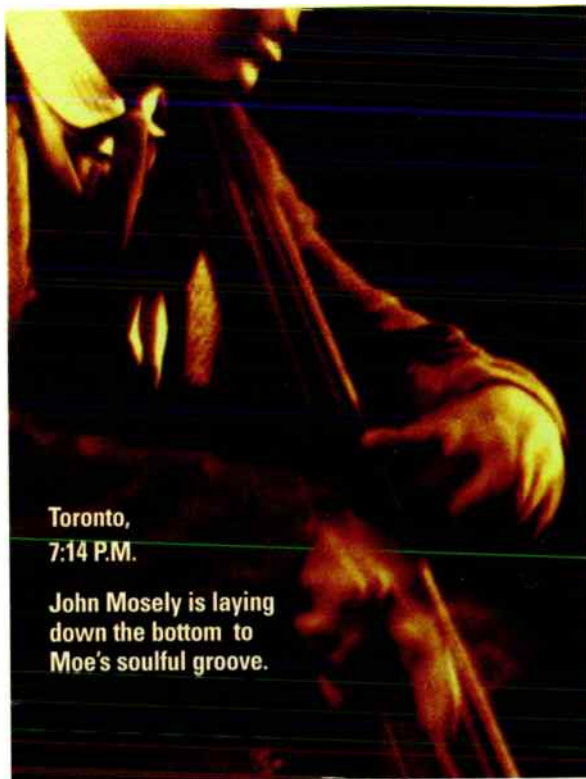
HE GOT GAMES: Darryl Duncan heads up GameBeat, which specializes in audio for multimedia, video games, and advertising — all of which require precise sync'ing. Here Darryl tells us how he does it.





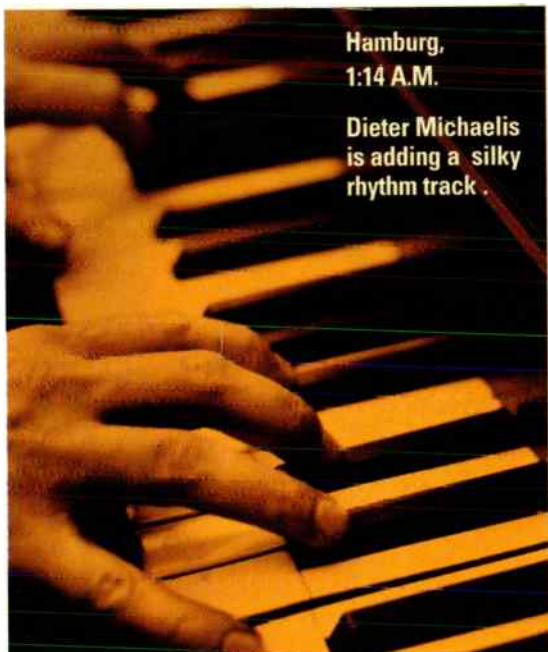
Los Angeles,  
4:14 P.M.

Moe Davies is  
tracking some  
wicked beats.



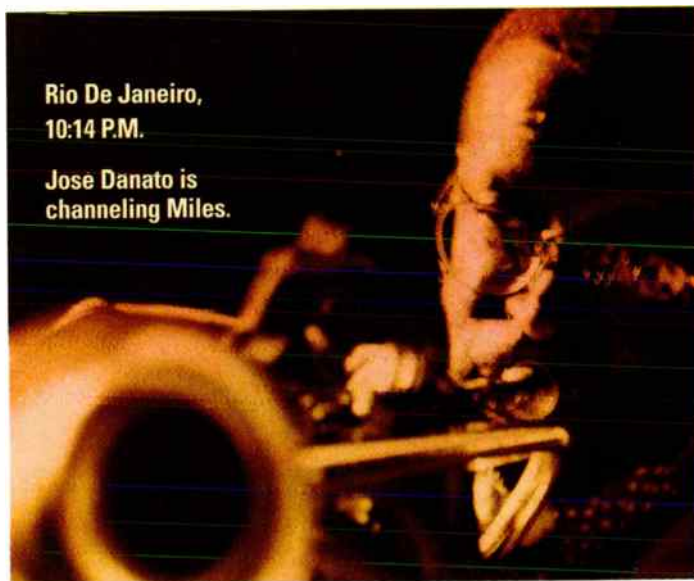
Toronto,  
7:14 P.M.

John Mosely is laying  
down the bottom to  
Moe's soulful groove.



Hamburg,  
1:14 A.M.

Dieter Michaelis  
is adding a silky  
rhythm track.



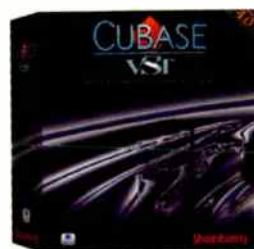
Rio De Janeiro,  
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Jose Danato is  
channeling Miles.

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what this article is all about. The magical tool (or OMS extension) that makes this all possible is called IAC, which stands for "Inter-Application Communication," but more about that in a minute.

Some like to leave synths on and run their sequencer live with recorded audio of vocals, etc., so that the synths can play live with the music as you go to mix. This works for many, however, I prefer not to do it this way mainly because this means that each time you

play your track you need to have your synths on to hear them playback, and this generates unnecessary heat in my "not so huge" facility. This increases the chances of things going wrong and problems arising. My motto is get it all committed to tape (or hard disk) as soon as possible and not fear some type of catastrophe with all the synths playing live. Call me paranoid, but I think we've all experienced what can happen when your entire session is "hot" and something wacky happens, like your 3-

year-old coming in and deciding to push some buttons.

#### THE PROCESS

I start out by sequencing my music as usual, using Vision and my arsenal of samplers and sound modules. When my sequencing is complete and I have the basic structure and length of my song sequenced, that's when Pro Tools and IAC come in. It is important to understand that it is not crucial that you "finalize" all your sequenced parts, because, with this method, you can always go back to your sequence and add, remove, or rearrange any part and still be able to fly in into Pro Tools at any time in perfect sync, even after all of your tracks have been recorded into Pro Tools.

Now, let's say you have completed the main drum and rhythm sequencing (or all of the parts you wish to sequence), and it's time to record your work into Pro Tools. First of all, you must make sure that you have OMS installed on your system (if you are using Vision, it is) and that the IAC Drive is also installed. It is possible to install OMS without IAC, so make sure you have installed both. If it is not installed, you can also install it from your OMS installer. It also comes with Pro Tools. It will be placed into your System folder/OMS Folder/OMS IAC Driver.

Open up your OMS studio set-up document and make sure that the IAC Driver shows up in your studio set-up document. In the OMS SetUp window, double click on the IAC Driver icon and type "IACBus" into the first field (or something that will be descriptive for you). In the Edit menu,

*My guess is that Pro Tools will soon integrate a killer sequencer. Wouldn't it be nice if they teamed up with one of the top sequencer companies?*



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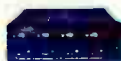
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choose OMS MIDI SetUp and make sure the "Run MIDI in Background" is checked. Now the OMS document is ready.

**THE SEQUENCER SETUP**

In your MIDI Sequencer, be sure to allow for external synchronization and set it up to receive MIDI timecode. In Vision, you will need to set the receive sync device to "IACBuss" (or whatever you named this above). The exact command may differ slightly depending on what sequencer you are using. In Vision (and other sequencers), your final song ends up being a particular sequence letter (or number), let's say it's the letter Z for this tutorial. You need to set that sequence's SMPTE start time to a certain SMPTE start number. You cannot have your sequence offset start at zero because you want a second or two to allow the internal synchronization to take place, so anything over 3 seconds should be safe. I usually use a start time of 5 seconds. This start time is when your MIDI sequence will start *after* the Pro Tools counter reaches 5 seconds.

You can use any start time, but keep in mind that if you start Pro Tools in Record from the beginning, the amount of time until the sequence starts is recorded silence on your hard drives. So you will want to keep this start time relatively low, I'd say under 10 seconds. No matter what, though, once you set the sequence or song's SMPTE start number in your sequencer and record your first track, this number should *never* change or your subsequent record passes will be out of sync. Be sure that your sequencer is set to EXTERNAL sync and is set to receive SMPTE timecode as a synchronization master internally via the IAC driver. You might want to double check your particular sequencers manually, as it may be done slightly differently than in Vision. Also, be sure to set your sequencer to allow for remote starting. If you do not have this feature, simply pushing the Play button should ready your sequencer to receive its external sync. Now the sequencer is ready.

**THE PRO TOOLS SET-UP:**

Now open Pro Tools along with your OMS sequencer. Of course, they both will have to be running, so you'll need to have enough memory installed in your Mac to have both of these applications comfortably running together. You can close the OMS application itself, as it works invisibly in the background.

In case I didn't mention it, Pro Tools will act as the Master Sync, "internally" generating SMPTE timecode via IAC to your sequencer. In Pro Tools there is a couple of things you will need to do to prepare it to record your sequenced tracks. Open the "Session Set-Up Window." The only things you will need to do in this window is check the box called "MTC to Port" (MTC stands for MIDI timecode) and directly below is a pop up window where you will need to select "IACBuss," as you named it earlier. You can now close this window also, and everything should be ready. I suggest you also open up the Big Counter window in Pro Tools so that you can clearly see where your counter is based when your sequencer starts.

**THE NITTY-GRITTY**

Here's the fun part: You will *only* be recording the tracks *one* at a time. This may seem tedious at first, but it does give you a sense of doing it slow and right. Depending on the number of busses your mixer has or how many sound modules you are recording from, you could possibly record more tracks with each pass. Even though I have the ability to do eight tracks at a time, I like to record one track/instrument at a time so that I can concentrate on its input levels, etc.

So, for example, with a five-minute song it will take you less than an hour to record 10 instrument tracks from your sequencer. If you are doing this with just one sound module, you can mute various MIDI channels or instruments from within your sound module/sampler. So go to your sequencer and enable, say, just the kick drum

track. Now, as your entire song plays through, you will only hear the kick drum. In Pro Tools, create a pile of new tracks and record enable track 1.

You can go ahead and name all of your Pro Tools tracks if you know how you plan to lay them out. With the kick drum track record enabled in Pro Tools, push Play in Pro Tools (not record yet, because you are only testing levels). When the start time you set in your sequence is reached in the Pro Tools counter, the sequencer starts and you should hear the kick drum. Set its levels — no need to let the entire song play through — after you are satisfied with the levels you can hit return to 0 and go into Record. The kick drum track is then recorded into Pro Tools.

When the entire song is over and you have recorded your kick drum, you'll want to stop Pro Tools immediately so you won't be wasting hard drive space by recording silence. Now repeat this process for every instrument in your sequencer. In summary: solo the instrument you want to record, record enable the desired track in Pro Tools, let a few measures play to test levels, go into Record, and do another pass! Remember, as long as you *never* change the SMPTE start time of the sequence in your sequencer, every pass you make will be in perfect sync.

*It is not crucial that you "finalize" all your sequenced parts, because, with this method, you can always go back to your sequence and add, remove, or rearrange any part and still be able to fly in into Pro Tools at any time in perfect sync.*

**ADVANTAGES, SUGGESTIONS & CLOSING:**

There are several clear advantages to this process. First of all, there is no need for expensive external hardware sync devices. You end up with all of your synth tracks captured to hard disk permanently. The best part of all is the fact that, at a later date or even in the middle of your tracking session, you can open your sequencer (save and close your Pro Tools session if



desired), re-record any part you want, or add some other parts into your sequencer and then simply set up the same sync parameters and the "exact same" sequencer start time and dump the new parts into Pro Tools — all in perfect sync!

As Pro Tools users know, each session is kept neatly in one folder. I also save my master MIDI sequence file in the same folder right next to the session file, so everything gets kept together. It's also a good idea to

document your sequence SMPTE start time in a separate "read me" text file or, if your sequencer supports embedded text notes, you can document your set-up notes there.

There are a couple of things to remember with this process. First, you must have sufficient memory in your computer to run multiple applications, and, second, you must have the proper software extensions correctly loaded, namely OMS and IAC. My guess is that Pro

Tools will soon integrate a killer sequencer. Wouldn't it be nice if they actually teamed up with one of the top sequencer companies? Vision or Performer as a component or plug-in to Vision? It's possible, many thought the DSP plug-in market would not open up to various software packages as it did, but until that happens, this method really works for me and I never have any problems using this process. Good luck and have fun! **EO**

## ABOUT THE AUTHOR

GameBeat was formed in April 1998 by Darryl S. Duncan. Darryl, a 17-year veteran of the music industry, has several industry credits to his name. As a former staff writer for Warner Brothers, he has written for and/or produced top recording artists, including Michael Jackson, Jeffrey Osborne, Chaka Khan, R. Kelly, Earth, Wind & Fire, and countless others — including his own 1987 solo album on Motown. His music has also been featured in several major motion picture soundtracks, including *Police Academy 4* and *Revenge of The Nerds*.

Darryl's most recent credits, however, are in the video game industry. After working for over two years for Electronic Arts Florida, Darryl stepped out on his own and formed Game-

Beat. GameBeat specializes in "custom" audio content for the video game, multimedia, and advertising industries. Darryl did the music and sound effects for some of Electronic Arts most successful video game titles, including, *Madden Football 98*, *Madden Football 99*, *Madden N64*, *NCAA Football 98*, *NCAA Football 99*, and *Nuclear Strike PC*. He has been contracted to work on *Madden 2000* (on all platforms).

GameBeat's new production facilities have a 32 track digital recording setup with dozens of musical instruments, as well as a massive sound effects library at their disposal. To learn more about GameBeat and their services, visit their Web site at <http://members.aol.com/GameBeat>.

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# Sennheiser MD-409 Restoration

How to fix this classic gold and black beauty

BY EDDIE CILETTI

I first discovered the Sennheiser MD 409 microphone back in the '70s. After a long, hard tour it had become "roadie bootie" — finding its way into a club band's otherwise battered assortment of sound gathering devices. Perhaps you've seen pictures of Pink Floyd or The Doobie Brothers singing into this gold and black beauty. Both physically and functionally, the MD-409 is the sexy "Virginia Slims" version of an AKG D-12.

Sennheiser recently reissued this dynamic classic as the e409. Its distinctive, rectangular profile and light weight make it perfect for hanging (from its ca-

ble) in front of a guitar amp — sans stand. Its shallow profile is also squeezable between a rack tom and low-flying cymbal. I like it on snare.

It is described as a "Pressure Gradient Receiver," generating a figure-of-eight pattern at low frequencies. The tuned baffle on the rear side of the capsule filters out upper-mid to high frequencies, giving it a more-or-less cardioid characteristic. The large diaphragm gives a thunderous, low-frequency boost at close proximity.

A particularly ancient version of MD-409 is shown in photo 1. You can buy lots of things on the Web, but don't pay too much for this muffler. One overly eager audio enthusiast paid \$200. Don't go nuts, OK? (It's only that cool if Daisy Duke kept it packed with her frilly underthings for safe keeping next to her Bellamy Brothers 8-track tapes. Otherwise, it's not worth more than \$100 unless it comes with a guarantee.)

This venerable 409 has every conceivable oddity, including the 3-pin DIN

connector, on-off switch, and a tapped pivot that can directly screw on to a Euro-style mic stand. See the Echolette graphic stylishly captured in photo 4? Though Sennheiser was the Original Equipment Manufacturer (OEM), this version was obviously made for another company.

The exterior condition was quite good, but just a little shake revealed the lack of internal shock mounting; it had all dried up. The rear exposure in photo 3 shows the capsule just lying inside (all the crusty stuff having already been removed).

Another unusual feature is the lack of internal transformer. This yields a more direct signal, but makes the voice coil a bit more vulnerable to accidental DC overdose. Phantom power shouldn't harm any dynamic mic, but this one left my shop functional only to return as toast. (Got any jelly?) Someone thought applying phantom power would make it louder, but I suspect a miswired cable was the cause. (Cue the





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PHOTO 3



PHOTO 4

Homer Simpson sound effect.)

The nice folks at Sennheiser provided a new capsule (and DIN connector) for under \$100. It came with a cozy internal shock mounting kit, making all snug-as-a-bug in photo 4.

For more information, contact Sennheiser Electronic Corporation, 860-434-9190; Web: [www.sennheiser.com](http://www.sennheiser.com). For more links to other microphone manufacturers, visit Eddie's Web site at [www.tangible-technology.com](http://www.tangible-technology.com)





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# Check Your Heads

## Using Metric Halo's SpectraFoo for alignment of analog tape machines

BY STEVE LA CERRA

One of the less obvious — but quite useful — applications for Metric Halo's SpectraFoo is head alignment for analog reel-to-reel tape machines [Metric Halo Laboratories, 914-462-1230; Web: [www.mhllabs.com](http://www.mhllabs.com)]. Traditionally, head alignment on analog machines has been most accurately performed using a dual-trace oscilloscope. An alignment reference tape (such as those available from Magnetic Reference Laboratories) is played on the machine in question and two tape track outputs are routed into the two traces of the oscilloscope. By observing Lissajous patterns displayed on the 'scope, head azimuth may be optimized. Now, it's no secret that a dual-trace oscilloscope is a serious investment, so audio techs have figured out ways of performing tape head alignment without a 'scope.

One method involves routing two tracks from the tape machine into a console, summing them to mono, and adjusting head azimuth for a peak reading on the console's VU meter. Although this method can be used in a pinch, the result is, shall we say, less than scientifically accurate.

### LISSAJOUS PHASE SCOPE

SpectraFoo in-

cludes two tools that simplify azimuth adjustment for open-reel or cassette tape machines. SpectraFoo's Lissajous Phase Scope performs the same function as a dual-trace, 20 kHz-bandwidth 'scope. To perform a head alignment using SpectraFoo, connect a cable to each of two outputs from the tape machine — preferably the two edge tracks. For example, use tracks 1 and 4 on a 4-track tape machine, tracks 1 and 8 on an 8-track, 1 and 16 on a 16-track, etc. If you are aligning a stereo cassette machine, you have no choice but to use the left and right output. Azimuth errors are most obviously revealed when the edge tracks are compared for phase; that's why it makes sense to use the first and last tracks. Many engineers will "confirm their suspicions" by checking the second-to-edge tracks (2 and 15 on a 16-track) and even the third-to-edge-tracks (3 and 14 on a 16-track machine).

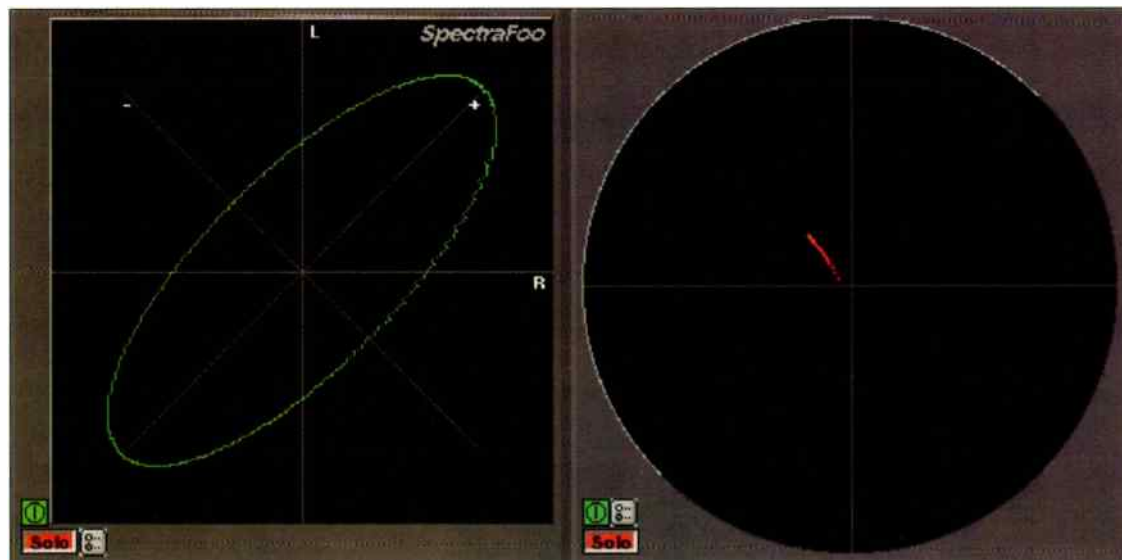
Regardless of which tracks you decide to use, patch the outputs of these tracks to the audio inputs of the computer that is running SpectraFoo. Audio input to SpectraFoo can be on a Mac A/V's built-in line inputs, or you can use any other Mac-compatible interface such as a Digidesign Audio Media III card. In any case, one track goes to the left input and the other track to

the right input of SpectraFoo. Connect the audio output of the computer to two channels of your console so that you can monitor the audio, but keep the volume level down because calibration tapes contain very annoying (and potentially speaker-damaging) sounds.

*Note: Before placing a calibration tape on the machine, we strongly suggest cleaning and demagnetizing the heads and tape path.*

When doing a head alignment, the playback or reproduce head is aligned first, using the calibration tape. Then the record head can be aligned to the playback head. On a three-head multitrack machine, set the monitor select to "repro." If you are aligning a three-head cassette deck, set it to monitor tape playback. Next, the calibration tape is played.

Typically, two tones for azimuth adjust are furnished on a calibration tape: a lower-frequency tone (usually 8 kHz) for coarse alignment and a higher-frequency tone (usually 16 kHz) for fine azimuth adjustment. While the first tone is being played into SpectraFoo, observe the Lissajous Phase Scope. If the head is out, you'll see an oval or a circle on the Scope. Adjust the head's azimuth screw until the Phase Scope shows a straight line at a 45-degree angle to the X-axis. This tells you that the



SEEING IS BELIEVING: In SpectraFoo, an oval shows that the heads are not aligned.



heads are in phase at the first frequency. Then do the same thing for the higher frequency. If the Phase Scope shows you a line or oval at  $-45$  degrees, then the heads are 180 degrees out of phase (just for kicks, try recording cymbals on those two tracks. You'll get a very cool flanger!).

As you adjust the azimuth screw and bring the tracks into alignment, the circle or oval will flatten out until it becomes (optimally) a straight line. On machines where head azimuth is not rock solid, you may not be able to get a straight line — only a squashed oval, which is OK. Do not try and save time by going straight for the fine azimuth adjust without doing the coarse (8 kHz) adjustment first. It is possible for any 'scope to show the  $+45$  degree line at 16 kHz when tracks are 360 degrees out of phase.

#### PHASE TORCH METER

Using an "ordinary" oscilloscope can be frustrating at times because it's possible for azimuth to be incorrect even though the 'scope shows the  $+45$ -degree line. (In other words, it's possible for the heads to be so "out" that a 'scope thinks they're "in"). That's where the Phase Torch Meter comes in.

You can use the Phase Torch to perform or check very coarse alignment. Play the reference tape starting from the lowest tone, which is usually 100 Hz. As the frequencies on the tape change, watch the Phase Torch. When azimuth is correct at a particular frequency, the Phase Torch will show a narrow stem in the color that represents the frequency. For example, if you run a 100-Hz tone into SpectraFoo, when the two tracks are aligned, the red part of the Phase Torch will become very narrow. This technique is most effective when you suspect that the heads are *way* out of whack and you want to use the 100 Hz tone for a very

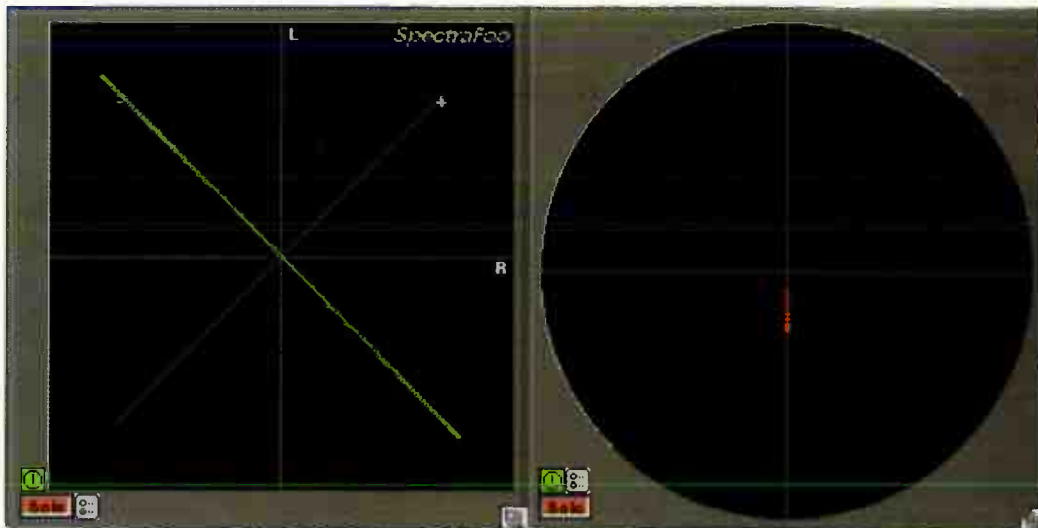
coarse adjustment. As the tones get up past about 1 kHz, noise generated by the tape machine may "cloud SpectraFoo's judgment."

#### WORN HEADS

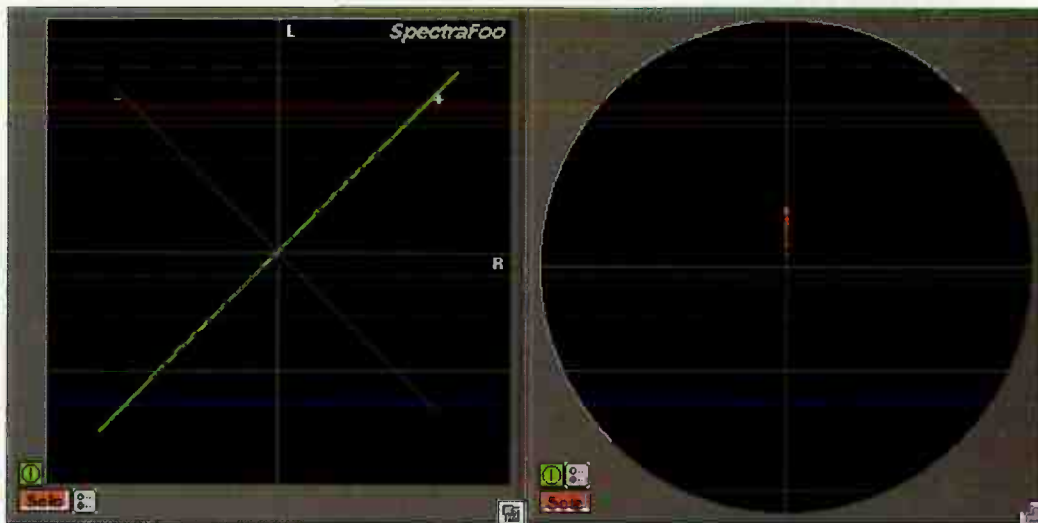
One last note: If you have trouble doing the adjustment due to inconsistent level of the tones, the heads may be worn — and this usually is most evident on the edge tracks. You can verify this by using SpectraFoo's Single Trace 'Scopes. If they are not already patched in, patch the edge tracks into SpectraFoo. Play three different tones — 100 Hz, 1 kHz, and 10 kHz — from the tape and observe the 'Scopes. If you see the amplitude of the waveform in the 'Scopes bouncing up and down, that's an indication of headwear (if the tape machine has VU meters, their levels will bounce around as well). The amount of headwear can roughly be shown by which tone bounces: new heads will

show little or no bounce at all three frequencies. Slightly worn heads will show a bit of bounce on the 10-kHz tone, but not the others. As headwear becomes more severe, the 1-kHz tone will bounce, and if the 100-Hz tone is varying, your heads probably need to be re-lapped.

*In addition to being the senior editor of EQ magazine, Steve La Cerra engineers live sound for Blue Öyster Cult and works as an independent producer and engineer in the New York Area. When not on tour, he may be found teaching audio at Kingsborough Community College, or screaming loudly from the top of a snow-capped mountain as he contemplates his descent. He can be reached online at: WoodmanEQ@aol.com*



ALMOST THERE: Sure, the line is straight, but the  $-45$ -degree angle means that the heads are 180 degrees out of phase.



NOW YOU'VE GOT IT: The way properly aligned heads should look.

# Adding to the Mix

Songwriter/producer  
Kike Santander adds  
a mix room to  
his project studio's  
list of capabilities

BY DAVID FRANGIONI

As a studio installer working with a lot of different artists and producers, I find there is a constant demand and challenge to create a one-room-does-it-all environment for their studio. As many of you are aware, the most challenging element of any project studio is that of its mix capabilities. Of course, the demands of a mix room vary as much as the people demanding it, however, one thing is for sure, and that is that *one can never have enough outboard gear!*

Recently, Kike Santander, an internationally known songwriter/producer, decided to push the envelope and create a room that provided virtually all of the solutions for writing, tracking, overdubbing, and mixing an entire record. Kike had been successfully writing and tracking at his project studio for years. He penned hits for many Latin superstars, including Gloria Estefan and Thalía. His method of working consisted of sequencing all of his MIDI tracks into [Emagic's] Logic and then tracking live instruments into Pro Tools. He would slave the Logic sequence from Pro Tools (via a USD) and complete the vast

majority of tracking at his studio, leaving only the mixing and mastering to be done at an outside facility. He had been happily using a TASCAM 3500 console for several years. Some guys would be satisfied with being able to complete that much of the recording process in a project studio — but not Kike. Fortunately for Kike, the timing of his vision was great, as a major breakthrough in technology had just occurred.

Kike first called my office requesting price and availability on a Digidesign Mix-Farm card (this new DSP card offers more than three times the power of the original DSP Farm). It seems that he wanted to upgrade his current Pro Tools|24 system to the newer and more powerful Mix system. He and I spoke to co-ordinate the details

of delivering and installing the new card.

I was blown away by the sheer amount of MIDI gear in his studio. He had virtually one of every synth and an awesome Pro Tools system consisting of an expanded PT|24 and a Mac PPC9600/300. Kike began to talk about his studio and his future projects. He mentioned that he wanted to upgrade his current studio, but was frustrated that he would still have to mix at an outside facility. I told him that there was a movement beginning to happen whereby engineers and producers were mixing entire records with Pro Tools. I had already recently installed two studios (one for Desmond Child and one for Charles Dye) that were being used for mixing entirely in Pro Tools. Kike was intrigued.



PHOTOS BY WES BENDER

MIX IT UP: Kike Santander wanted to do it all in his project studio — including mixing.





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LET IT SLIDE: Kike's Mackie D8B console slides off to the side to reveal the Digidesign Pro Control system.

We spoke for nearly six hours and exhausted dozens of ideas to fulfill his vision. A new meeting was scheduled with his engineer (Marcelo Anez), MIDI programmer (Daniel Betancourt), and the two of us. Again, the four of us were moving a mile a minute. We discussed the need for lots of inputs for use during MIDI tracking and writing. There would have to be a seamless integration of a mixing environment without disturbing the MIDI world of mondo inputs.

After much discussion, the Mackie Digital 8•Bus was chosen. It offered just enough analog and digital inputs, along with very cool routing and automation, to suit Kike's needs. Kike also wanted to add a few more synths to expand the available palette of sounds. The Yamaha EX5R, EMU Proteus 2000, Roland D-550, Yamaha TX816, Novation SuperNova, and an Akai S6000 were some of the modules added to the arsenal. We sent Kike's [Kurzweil] K2000RS to Bruce Hendrix at Sweetwater Sound for upgrades and modifications. It arrived back chock full of killer new sounds, ready to roar. The MIDI rig was coming together.

The final element of the MIDI rig consisted of the integration of the various SCSI devices along with the samplers. There was an Akai S6000, EMU E64, and Kurzweil K2000RS, along with a 2 GB Jaz, 32X CD-ROM, and internal drives in each of the samplers. Each of these samplers needed to access either of the two external drives, as well as the Mac computer. However, the Mac computer needed to access not only any of these samplers, but also a CD-RW and DDS3 drive (for backup). I designed a cross-switch system that would accomplish the feat. The Mac (narrow) SCSI Bus would connect to the CD-RW and DDS3 drive, then go into "A" of an AaBb switcher. The switcher would have a terminator on the "a" of its output. The samplers would connect to a Glyph 3-1 SCSI switcher (internally terminated on all inputs not currently selected). The common output of the Glyph switcher would connect to the CD-ROM, Jaz, and, finally, the AaBb switcher. This system has worked flawlessly, and all devices can talk to each other (as well as their drives) with no problems.

The turning point for accomplishing the most important part of the studio was that of installing the Digidesign Pro Control with the new Mix Plus system. Kike upgraded his Pro Tools system with a 13-slot Magma expansion chassis, six Mix Farm cards, two vintage DSP Farms, a new G3/300 (replacing the 9600), and a 16-channel Pro Control. Of course, the system is only as strong as the plug-ins that you have, so an army of plug-ins was added, including the Waves Gold Bundle, Arboretum Hyperprism TDM, TC MasterX, TC Tools, Antares Auto Tune, Lexicon's Lexiverb, and more. He now had the DSP firepower to actually *mix* in his room.

We were close. The only limitation encountered at this point was that of space. Now that his studio had grown by about three (or more) times, the walls were starting to close in. Kike's first reaction was to buy another house — the only problem was that there was not enough time. Kike called in a local studio designer, Danny Diaz. Danny had worked on the room when it was first built and knew the construction inside and out. Danny called me early into modifying the construction of the room (space had to be made for the Mackie D8B *and* Pro Control). He asked what I thought of a possible "swinging arm" concept where the Mackie would rotate back and forth — allowing it to move in and out of Kike's way (similar to that of a computer monitor). The only problem was that the Mackie weighed about 75 pounds! Good idea, though.

Danny kept thinking about it, and came up with a solution. What about the Pro Control living under the Mackie until it is time to mix? Then the Mackie can slide to the left, exposing the Pro Control, and either mixing console can be dead center with full access to its controls. Brilliant. Will it work? Well, it worked great (as you can see from the pictures), and both environments were implemented without sacrifice. Kike now had achieved the best of both worlds.

The success of Kike's studio will only be determined by the musical results achieved in it. As of this article, Kike has written, recorded, and overdubbed an entire album there. Javier Garza is mixing the new Christian Castro record there, and things are going well.

*David Frangioni is an accomplished studio designer and installer who has built rooms for Aerosmith, Desmond Child, Mark Hudson, and many more. He can be reached at [www.audio-one.com](http://www.audio-one.com).*





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# Mastering Demystified

Roger Lian of Masterdisk reveals what really happens when your project is mastered

BY STEVE LA CERRA

*It seems mastering is like the Holy Grail of audio. It's a crucial part of CD production, yet often looks like a combination of technology, art, and a good dose of smoke and mirrors. In any case, it certainly can make or break the sound of a project destined for release on CD. Since there are so many variables in the mastering process, EQ had a sit-down with Roger Lian, mastering engineer at Masterdisk in New York (Masterdisk owner and president Doug Levine estimates that over 26,000 records have been mastered there since 1973). Roger has been at each end of the spectrum, mastering artists from Slayer to Mariah Carey, with hundreds in between. He's also been witness to the brilliant and the spastic in the wide world of mixing and attempted mixing. Roger had a lot of interesting tips for keeping your project at the highest level of quality at the mixing and mastering levels.*

**EQ:** If a studio plans on mixing to DAT, does it make sense for them to bust the bank on an expensive DAT recorder? **Roger Lian:** I think most new DAT machines made today will sound good, and the cost is relative to the grade of its A/D and D/A

tape path hardware, and the amount of features/functions it offers. You can find a reasonable-sounding DAT for reasonable dollars, but make sure it's a machine that's been manufactured within the past few years.

**What about external converters? Is it a good idea for a project studio to invest in a set of external converters?**

If you have the money, why not? External converters vary in price and sound, but also give your music a little more sonic zing than if you had used the internal converters of the deck. You can spend thousands of dollars on these boxes, so if you have a project studio with minimal funds, get a Panasonic '3800 and save the money for something else. For those with a little more money, just buy an external A/D converter so you get the benefit while recording the mix to DAT, and then monitor from the machine's internal D/A.

**When a studio has the option of mixing to either DAT or to a workstation card in a computer, which do you think is the way to go?**

I haven't heard everything, but Sonic So-

lutions or Pro Tools24 would be ideal for good-sounding recordings. If you have both a DAT machine and a workstation, try recording the same piece of music to both formats and compare the playback to hear which has more impact. If you already know that your workstation's A/D converter doesn't sound as good as the DAT machine, try recording through the DAT's analog inputs and feed the digital out of the DAT to the digital input of the workstation — thus letting your DAT's better-sounding converters do the job. MiniDisc, with its data compression, and the older Pro Tools 16-bit version should be avoided. In my opinion, DATs will always sound better than those devices.

**Does the type of cable and its quality make a difference?**

Big time! Cheap cables should not be used — especially in the main runs between the output of the mixing console and the input to the master recorder. For both analog and digital paths, cheap,



SECRETS OF MASTERING REVEALED: Roger Lian (inset) tells what happens inside one of Masterdisk's mastering rooms.

LIAN PHOTO BY YUKIO GIOM



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frayed, kinked, or cables with black electrical tape in numerous spots are often the source pops, clicks, glitches, and poor sound quality. Also, keep the length of cable runs as short as possible.

If a project is headed for a mastering studio like Masterdisk, should audio files be normalized, either in the computer or via external device?

Many times an engineer will call me as he's about to start mixing a project and ask if I want DAT, CD-R, or whatever to master the final mixes. Usually, the first device that

you've recorded to is the source I would use for mastering. I never advise under normal circumstances to normalize, compress, EQ, limit, or use that BBE box — at all. Leave that for the mastering. Do whatever you want to get your sound for individual channels, but leave the 2-channel, stereo mix alone. By making things louder or more pleasing in your listening environment, you're limiting what I can do with my EQs and compressors when you get here. This is a common scenario for achieving "badness." You've just mixed multiple takes of

your project to a DAT, which is now your mix master tape. You think, "Let me load it into my hard disk, put the tracks in sequence, edit heads and tails, and then run it through some plug-in to make it louder with compression, maybe a little EQ to sizzle the top end, and then spit out a new DAT master." You proudly send me the new DAT master, thinking you produced the best-prepared tape and I'll have a easy time mastering, so I'll charge you less! Not so fast. I *always* ask for first-generation source. Even if you just go DAT-to-DAT to eliminate the unwanted takes, keep the safety and send me the master. I think it'll always sound better in the end.

**Can a DAT be sent to the manufacturing plant for CD production?**

"It's all digital so what's the difference?" you say. To keep the opportunity of a problem from developing (a sonic change or a moved start ID), limit the plant's involvement with the data. A DAT must be transferred to a hard disk, then to a CD-R, and then to a glass master. A lot can happen during this process (which you're not present for) — so ask what format will generate the least amount of involvement from the plant.

**How about transferring the DAT to a CD-R and sending the CD-R to the manufacturer?**

You can do that, or a PMCD, Exabyte tape, or PCM 1630 U-Matic tape would be fine, but each manufacturer has its own set up. You have to be very careful about sending a CD-R. There are sonic differences in CD burners. Some can flatten that three-dimensional quality a stereo mix is supposed to have, and overall they can f\*\*k up the sound. My experience has been that when you make the glass master from either the 1630 or a PMCD, it'll sound better than making it from a DAT or a CD-R made from a consumer CD recorder.

**How do you make sure that the glass master is being made directly from the PMCD or 1630?**

You have to take the manufacturer's word that the plant is cutting the glass master from the PMCD or 1630, but you don't really know. If they don't have 1630 equipment, they might send it to another studio for transfer to a CD ref. Then the ref comes back to the plant where they make the glass master at 4X speed. Unless you're sitting there watching, you're taking their word for it.

**What exactly do you do with projects that come in for mastering?**

Just about every project that comes in here — regardless of what format it comes in on — I convert to analog. Equalization, com-

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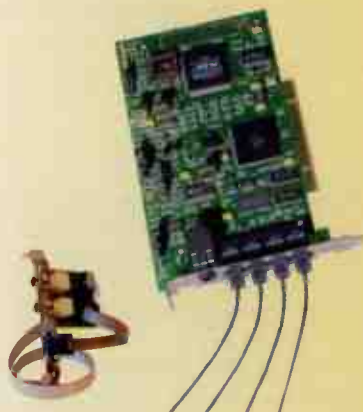
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pression, and level manipulation are done. Then the audio is sent to a DCS 24-bit A/D converter and recorded into 24-bit Sonic Solutions, where I do the editing. Some mastering engineers will stay in the digital domain, but I feel I can reverse some of the digital harshness that's common in ADAT-to-DAT projects with my vintage analog gear like my Sontec 430 EQ or Neumann EQs. On the other hand, great digital recordings sound incredible with my set up as well. Throwing a little dirt on a shiny digital recording hasn't failed me yet. [Laughs.]

While I'm mastering, I monitor through two different encoders that are simultaneously fed from my hard disk: the dB Technologies d3000 and the Apogee UV22, which both truncate the 24-bit signal down to 16-bit. Each has a different element that it adds to a specific type of music, and I make the decision on which to use while I'm working. I seldom monitor through 24-bit converters because the CD is going to be 16-bit. I want to know that what's coming through the speakers is the same 16-bit end product that you'll hear on a CD. It's like when some people mix to analog tape — they'll monitor the 2-track return during mixing to hear how the mixdown deck contributes to the sound of the mix. They hear the output of the tape machine as opposed to the input to the tape machine.

Let's say a studio receives a project on a bunch of ADATs that have been formatted at 48 kHz and the studio has a Yamaha 02R console. Because this project has started at 48 kHz, it basically has to stay there...

It should. Sample-rate conversion kills music.

Let's say the project goes through the overdub and mixdown stage and stays digital at 48. This means the mixdown DAT is sampled at 48 kHz. What kind of a problem does that present to you?

For me, personally, it's actually better because I do my mastering analog. So the 48 kHz rate gives us higher resolution. I prefer it that way.

What about mastering engineers who want to stay in the digital domain?

Every mastering engineer has their own approach. In places like Masterdisk, there are choices in the approach, but in smaller mastering houses or where the engineer wants to stay strictly digital, your choices are limited. Staying at 48 kHz is a serious disadvantage. At some point, if you stay digital, you'll have to do a sample-rate conversion. I haven't heard one that sounded good yet, and I don't expect to anytime soon.

Taking that a step further, what happens

to a project that's mixed to DAT at 48 kHz and then goes off to the pressing plant? They'll probably take the analog outs of the DAT machine and play it into their computer at 44.1. Then they'll spit out a CD at 44.1 kHz and make the glass master from the CD.

So, in your opinion, it's better to go through an extra set of analog/digital conversions than to do a sample-rate conversion?

Absolutely.

What does it mean when you see an ad in the back of *EQ* magazine for CD production and it says "mastering included"?

If the manufacturer offers mastering in the "package price," you may be getting an engineer who's actually putting in some hard work and cares that he's made the most of your music. It's also very possible they set up for a DAT-to-hard-disk transfer and do nothing else. They get one setting for the entire record and let 'er rip. The package price usually means you can't attend the session, so pay for a reference CD. Don't commit to 1000 CDs that you'll be embarrassed to play, let alone sell.

Most of the cheaper package deals don't allow the artist and engineer to be present at the mastering session. They charge you just like we do here — it's cheaper if you don't show up, because we can do it at our convenience. But if you show up, then you have a say about what happens at the session. If you don't show up, you're either stuck with what they give you, or you have to pay extra for revisions.

Do you still get projects on analog tape?

Most professionals won't do it any other way, simply because it sounds so much better than DAT or any 24-bit medium. Period. Artists with a budget are still mixing that way because they can afford it. Those are all cartons filled with 1/2-inch tape for an album, hundreds of dollars in analog tape (Roger points to a five-foot stack of boxes outside his studio) — as opposed to a DAT for \$6, which fits 20 mixes on it. To me, the best mixdown format is analog 2-track, 1/2-inch at 30 ips, no noise reduction. It costs a lot, but it sounds great!

*In addition to the credits previously mentioned, Roger Lian has recently mastered records for Heather Nova, Archers Of Loaf, Stuck Mojo, Stained, Pist.On, and Overkill. Roger has worked with producer/engineers Steve Albini, Nile Rogers, Rick Rubin, Terry Date, Andy Wallace, and Mike Barile.*



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## The New Wave of Live Performance

### The Emergence Of The Performing Engineers

BY CRAIG ANDERTON

There's something going on in the world of live performance. Underground currents are rising to the mainstream, minimal setups are making maximum sounds, and musicians are forming alliances with DJs — and vice-versa.

Maybe this hasn't hit your hometown yet, but it will. What started in the U.S. and migrated to Europe is coming back to us, mutated and amplified, creating a hybrid of Hip-Hop, Rock, Rap, electronics, vinyl, and samples that spans the electronic lexicon from vintage analog gear to state-of-the-art, digital wonder boxes.

In this special section, *EQ* puts a magnifying glass on the underground. The genesis for many of these articles came from the artists who performed at the 1998 Battery Park electronic music festival in Cologne, Germany. The festival brought together musicians and DJs from the U.S., Spain, the U.K., Russia, Germany, France, Austria, and many other countries (see the related article on "The Desktop Concert" in the December 1998 *EQ*).

Curious about the tools that (em)power these new musicians? Check out the stories by Frank Heiss, Fred Giannelli, and Irwin Leschet, detailing three different — but very effective — stage setups. Still don't think DJs are worthy of respect? Read Thee Joker's article, which explains basic DJ techniques for the uninitiated. Wondering what DJs are doing to stretch the art form? New Yorker Sheldon Drake explains his techniques for pushing the envelope.

And since you're reading *EQ* magazine, you probably want to record some

of this stuff, too. Reinhard Schmitz describes how the rules of recording change when the musicians run the mixer, acts are setting up and tearing down at the same time, and the working environment approximates that of a rain forest.

These are exciting times — DJs are getting more musical, and musicians are applying DJ concepts to live performance. Even more telling, more and more bands now include "turntablists,"

and DJs are discovering the joys of adding live musicians to their act. Music stores report that the items really flying off the shelves this year are DJ gear, which are particularly favored by a new generation of performers who, 30 years ago, would have been buying Hagstrom guitars. This is something that's only going to get bigger. Now as to where all this hybridization will lead...well, *EQ* is the magazine that will keep you posted. **EQ**



PHOTO BY MARKUS SCHULZE



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## The Art of **the Studio on Stage**

If You Think All  
We Do Is Spin  
Records, You Are  
Sorely Mistaken

**BY THEE JOKER**

If I had a nickel for every time someone said to me, “Oh, you have the perfect voice for that!” when I mention I’m a DJ, I would have a ton of nickels. Even my family had to see a performance before they could understand what I do...and they still don’t, not really.

Over the past decade, DJ’ing has turned into more and more of an art form — DJs have progressed from just “spinning records” to playing turntables and mixers like an instrument. They’re even adding CDs, samplers, synthesizers, other instruments, and “traditional” musicians to the mix, as well as developing techniques unique to DJ setups that have no parallel in standard audio.

### **IN THE BEGINNING...**

For most people, Hip-Hop conjures up a very specific mental image. Now, throw that out so we can start with a clean slate. If it wasn’t for Hip-Hop or “Breakbeat,” the current standard of hooking up a mixer between two turntables may not have evolved as quickly as it has.

Hip-Hop and Rap music developed in the mid-’70s in the Bronx borough of New York City. As remote sound systems became common, a DJ named Kool Herc started using two turntables with a mixer to “loop” instrumental breaks on R&B records, thus extending the song into a longer, more danceable format. Thus the term “Breakbeat” was coined to describe what would become Hip-Hop rhythms.

Herc’s original technique has

evolved to where today’s club DJs not only extend the breaks, but also blend multiple records together into seamless soundscapes where you can’t really tell when one record starts or another one ends. Creating a truly smooth transition requires that a DJ learn to “beat match” records of different tempos, but how do you take a record with a tempo of 120

beats per minute (BPM) and mix it with a record running at 130 BPM?

### **THE BEAT (MATCHING) GENERATION**

The “industry-standard” DJ turntable is the Technics SL-1200, which incorporates some very DJ-friendly features. The 1200 is a direct drive turntable, meaning that the motor that turns the



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**THEE JOKER’S WILD:** Thee Joker explains what a performing engineer does.





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# performing engineers

platter connects directly to the spindle. This allows a start time of about 0.7 seconds; from a dead stop, the record will reach full speed in less than 1/4 of a rotation, which helps in correctly matching the beats of different records. In addition, there's a continuously variable sliding pitch control with a maximum

variation of  $\pm 8$  percent.

Hooking up a line mixer between two turntables allows users to smoothly blend the sound of one record into another, without any gaps or silences. A DJ mixer may also provide limited EQ adjustments (typically highs, mids, and lows), which are suitable for effects or

to compensate for room acoustics or discrepancies in the DJ's sound system. (There is also something to be said for playing on a huge system and cranking up the bass just to give people's bodies an "audio massage.") However, the mixer serves an even more important function as a monitor for the DJ.

As one record plays over the speakers, the DJ can listen through headphones to the record that will be played next. The object is to adjust the new record's tempo to match that of the one that is currently playing, using one or more of the following methods:

- Moving the pitch control
- Pushing the record forward manually
- Slowing the record down by dragging your hand on the side of the platter

Incidentally, the 1200 ships with a thick rubber mat on which the record sits when played. Most DJs remove this and replace it with a felt "slipmat." This lets you hold a record still with your hand while the platter continues to spin underneath, then release the record in time with the one currently playing. This allows the beat-matched record to lock in time with the other when released.

Once the record tempos are matched and locked, some DJs prefer to fade one record into another by moving one fader up slowly then moving the other down; some prefer using a single "crossfader" control, and some use a combination of both techniques. While slowly crossfading between turntables can produce a smooth blend, there are other crossfader techniques that let you get really creative.

"Switching" quickly with the crossfader between two time-locked records can create completely new songs or sounds. Imagine being able to play two bars of one record, then two bars of another, back and forth without a break or the tempo changing. With vocal songs, the possibilities range from simply starting a new vocal as the old one ends to something comical, like having ABBA sing during the chorus of a James Brown song. If you have two copies of the same record, you can loop bars back and forth to extend vocal or instrumental sequences. With instru-



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mentals and electronic music, you can cut back and forth to make new sequences, or even let both records play simultaneously to fashion completely new sounds.

### APPLIED SCRATCHOLOGY

Like some DJs, I'm not content simply to blend records together, and want to add my own sounds while playing live. One of the most common, and most fun, options is doing rhythmic scratching. Scratching a record on purpose?! Yes! What this entails is moving a record back and forth manually, while manipulating the fader rhythmically to create entirely new sounds.

What to scratch, where to scratch, and how to scratch is something I can't explain...it's something you feel. Sometimes it's like taking a solo, although scratching can also serve a structural purpose by providing transitions or building a climax even further than what can be achieved by playing records alone. Some DJs don't ever do it, or couldn't imagine grinding a record backward against the needle, but for

*continued on page 140*

## DJ/STUDIO SIMILARITIES

By Craig Anderton

Recording studio pros will recognize many of the concepts presented here — mixing and crossfading, for starters. DJs also rely on synchronization, although it tends to be manual, free-running sync as opposed to sync'ing to an external reference. Layering records on top of each other is not all that different, at least conceptually, from doing overdubs or layering synth sounds. And scratching is what happens when you want to wail — something I'm sure any jazz saxophonist or lead guitarist can understand.

A DJ's vinyl collection is like a keyboard player's sound library (one of the hardest parts of being a DJ is carrying a ton of records to a gig — those suckers weigh a lot). The crucial element that raises a DJ from a "player of records" to a bona fide musician is that all this is done in real time in front of demanding audiences that don't expect the music to stop — and who

are not real happy to have their rhythmic mood broken by sloppy transitions. This takes skill, musical knowledge, a good sense of timing, and experience.

In addition to a high level of technique, it is also the DJ's responsibility to be an "arranger" — in both the usual sense (having the records work in context), but also to "arrange" the mood of the crowd. Timing is everything; you have to know when to stick with a groove, when to change it, when to break things up completely, and when to chill out a bit (see the related piece by Sheldon Drake in this issue). A DJ is constantly treading a fine line between groove, which, if it overstays its welcome becomes monotony, and variety, which, if it changes too fast, runs the risk of destroying the groove. It's a balancing act that may look simple on the surface, but is extremely difficult to pull off.

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## User Options & the Desktop Concert

These Are A Few Of My Favorite Things — For Making Unique Sounds

BY FRANK HEISS

Performing live with electronic music devices has influenced my choice of machines, how they're used, and how I compose music. It's easy to forget about improvisation when using music machines, because some composers working in the studio fall in love with the chance for perfection. However, many studio options aren't available when you play live; one possibility is to play back a DAT prepared in the studio, but it's not really fun to work solely with a prerecorded mix of tracks — the point of playing live is to work within the magic of that moment.

The decision to play live begins a mental battle between order and chaos that poses several questions: How can I do something "live" the way I do at home, without taking my entire studio? What about maintaining the option to change a track's mix and form at a live gig? Is it possible to fit my gear on a desktop, keep the setup portable, and still make the sounds I want to make? And, most importantly, how can I have the maximum amount of fun?

If an absolute answer existed to these questions, I would be bored. The process of finding the answer is what's interesting, but the main idea is to make it simple. There is a difference between keep it simple — the passive act of simply not using certain tools — and make it simple, which involves making conscious, and sometimes difficult, decisions about what gear will give the most user options in return for the least amount of complexity.

With that in mind, here are the machines I'm currently using in my desktop concert setup (fig. 1), and why I chose them.

- **Akai S20 Multi Sampling/Multi-Timbral/Real Time Performance System (Phrase Sampler):** I use this to hand-trigger 16 loops, each of which contains a large portion of any given mix. The S20 features an internal sequencer that holds one sequence, but it doesn't quantize. Therefore, the sounds in the S20 should first be sequenced with an external sequencer; record its output into the S20 for playback.

I sample most of the mix in multi-bar phrases, minus improvisation, by setting up the mix on my studio gear at home with EQ, effects, etc. One particularly cool S20 feature is that you can reverse the loop or pitch it up or down

(with the display updating the BPM as the pitch changes), all in real time. A useful trick to add variety is to have a 16-bar piece of audio, but with the "loop start" at bar 9. This way you hear the first eight bars only when you first trigger the loop, thus providing more options over the track's form.

Setting the loop length in the S20 is a little tricky. I make the loops on an Akai MPC3000 sequencer/sampler, then sample them into the S20. Because I already know the BPM, I can use the formula "60/BPM" to derive the number of seconds in a single beat. Multiply the number of seconds in a single beat by the number of beats in the phrase, and then multiply the number of seconds in the entire phrase by the sample rate (32, 16, or 8 kHz). The final number is the loop length.



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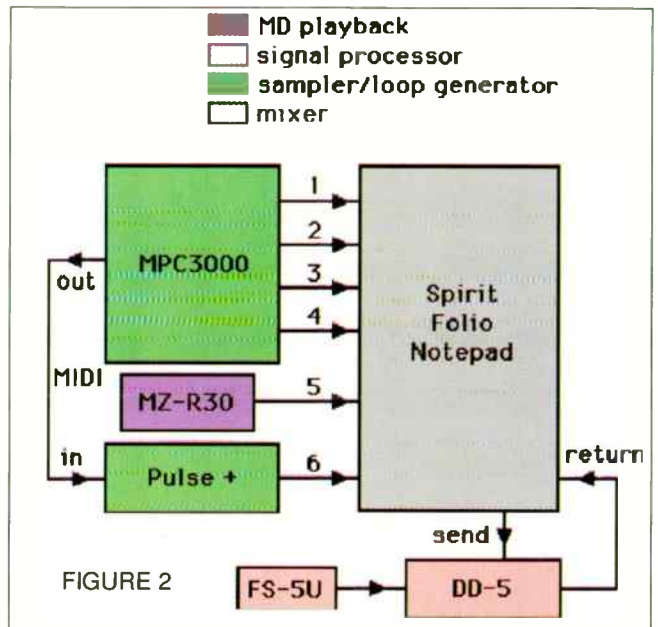
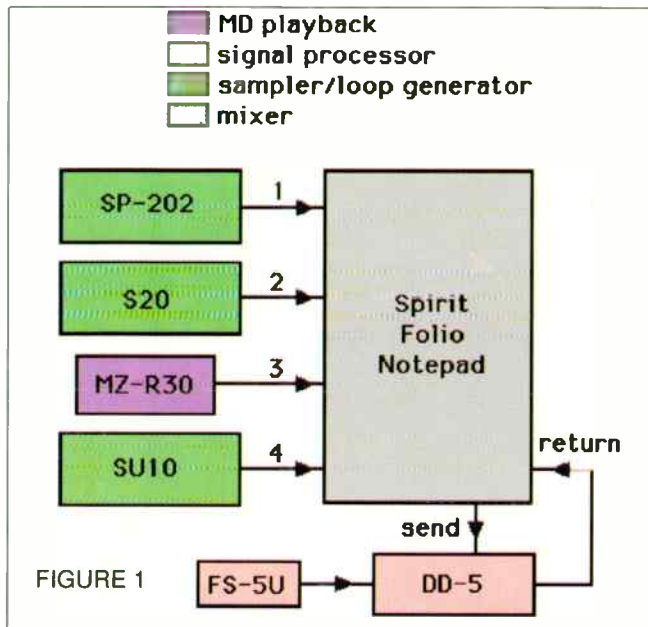
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You can use as little as one pad for the rhythm section or as many as 16 pads. It depends on how soon you want to reload samples into the S20's memory, although you can always use two S20's and reload samples into one while the other plays.

- **Boss SP-202 "Dr. Sample":** This is the only sampler I know where you can change a sample's start and end point while it is looping and adjust the pitch and/or a ring modulator. You can also change the direction of the sample playback anytime, unless the ring modulator is active. This machine is absolutely amazing for spoken samples.

My favorite feature is that it has a built-in microphone (and can run on

batteries), so you can sample your friends saying things before the party or concert, then manipulate their speech later during your live set while they listen — mad fun! This machine is for the virtuoso sampler fan; I like it because, by studio standards, the sound is so lo-fi that the only way to make it "speak" is to mentally abuse it in real time.

- **Yamaha SU-10 Sampling Unit (Phrase Sampler):** This box is great because it is as small as a videocassette, runs on batteries, and, best of all, you can assign a sample to be pitched on different pads with a range of 12 half-steps. The sound quality is so bad, and the pitch range so limited, that this machine is the world's gift to playing

bass samples live. I remove the high frequencies (unless I want white noise to be a part of the sound), then play bass samples on the 12 pads with my fingers. If you limit yourself to just a couple of notes, it is easy to make a great bass pattern in real time without a sequencer.

- **Boss DD-5 Digital Delay Pedal:** This machine is small, inexpensive, and you can tap in the tempo (with a Boss FS-5U Trigger Pedal), as well as adjust the rhythmic value of the delay taps — which are in stereo, so the delay pans from side to side. Thanks to the small size and flexibility, this machine is a must-have for the live electronic junkie.

- **Spirit by Soundcraft Folio Notepad Mixer:** I use this only because it is so small, yet offers 4 mono in, 2 stereo in, 1 aux send, and a stereo return. There is not much headroom and the EQ options are minimal; however, I work around these limitations by sampling my S20 loops with EQ and effects already optimized for the mix. The only real reason I need the mixer is to use the one FX send for any effect that's not already embedded in the sample; I adjust most volumes on the machines themselves, not at the mixer.

- **Headphones/microphone:** It's no big secret that if you plug your headphones into a mixer input and crank up

*continued on page 140*

## THE "TUBE" SETUP

I use a different setup, called TUBE (my alter ego), mostly for breakbeat music (jungle, drum and bass, etc.). With faster music where there are more notes to play, it helps (but is not always necessary) to have a sequencer. Referring to fig. 2, I'm using an Akai MPC3000, with four of its outputs feeding the Folio Notepad mixer. Also, it's a nice change of attitude to incorporate a synthesizer (in this case, a Waldorf Pulse +), as this allows altering melodic components of the music with var-

ious modulation sources.

The TUBE setup is also good when performing with other people because the MPC3000 generates and reads MIDI clock. However, the TUBE setup is much more bulky, not so easy to transport, and costs a good bit more money.

Really, there is no special reason to use one or the other of these setups other than the type of music I'll be playing, and what kind of mood I'm in!

—Frank Heiss



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# performing engineers

front panel for LFO shapes (normally, switching from square to sine requires opening it up). It's not just a fun noise-maker, but a sort of homage to Tod Dockstader.

- **Boss RPS-10 DDL:** Half-rack space DDL with knobs, used only for the Doepfer MS-404 and panned hard left and hard right.

- **Boss SE-50 Digital FX:** This half-rack space, all-purpose FX box provides reverb in my live set. It's an excellent value on the second-hand market.

- **Electro-Harmonix Micro Synth:** I've heard on various Internet lists that this is being produced again in limited quantities. Grab 'em while you can.

- **Korg KMS-30 Sync Box:** This takes MIDI in, and sends Roland 24-pulse sync out to the Roland TB-303. The Roland TR-909 provides the master clock. Along with a Mackie CR-1604, the promoter provides a TR-909 as part of my rider. I'd like to replace it with a Jomox Xbase 09 someday; then I'll be able to ditch the KMS-30, since the Xbase 09 has a Roland 24-pulse sync output.

- **Lexicon JamMan DDL:** A straightforward long delay for live use.

- **Super Tone Control:** This is Project #17 from Craig Anderton's book, *Electronic Projects for Musicians*, and is the ultimate low-budget tone tweaking device. I've built three for myself and several for other musicians and DJs. Other projects I use from this book include the Dual Frequency Filter (Project #10), which is optimized for adding boominess to thin digital kick drums, and the Ring Modulator (Project #9). It's a bit like the one in the EMS Synthi; I wish I had the Synthi, but this is close enough, and it's small. Finally, I use the Phase Shifter with Envelope Follower (Project #21), which sounds a lot like the old Univibe phaser.

- **Roland R-70 Drum Machine:** A digital drum machine with assignable outputs! Why don't more new drum boxes do this? The sounds are boring, but that's why I run them through the homemade filter boxes. Hard left output is straight percussion; hard right output is more percussion run through Super Tone Control for tweaking. R-70 output 1 is the bass sound (kind of weak, but sounds better after going through the

Super Tone Control), and then gets beefed up with the EH Micro Synth. R-70 output 2 runs through the Dual Frequency Filter box to add boom and overdrive to kick drums (I've used this box to make a TR-707 and Casio RZ-1 kick have enough punch and bottom to actually carry a track).

- **Roland TB-303:** The "reference standard" Acid House machine, which I use sparingly because it's kind of out of fashion. However, running it through a ring modulator and DOD FX25 envelope filter adds a new, noisy twist.

- **Waldorf Pulse +:** Along with the Doepfer MS-404, this is a great synth bargain. I run the output through a Super Tone Control, usually in Hi-Pass mode, to add a little edge to an excellent synth.

- **Yamaha EMP-100:** This cheap, second-hand digital effects box mostly serves as a resonating flanger for special effects.

- **Zoom 234 Drum Machine:** Great, though flawed, inexpensive drum box with bass sounds. Runs through another Super Tone Control. I use the Zoom 234 in the "groove play" mode, where each pad triggers a complete pattern. All drum machines should do this! There are only three obvious flaws: no MIDI out for sysex data dumps, no assignable individual outputs, and no panning control. However, the sounds are great, "groove play" mode helps us live acts compete with DJs by adding in cross rhythms on the fly, and, most important for the traveling live act, it's extremely lightweight.

*The Kooky Scientist, a.k.a. Fred Giannelli, is a producer/remixer/performer who recorded and toured with Psychic TV in the late-'80s and currently runs Telepathic Recordings. His extensive discography includes co-producing "My Life with the Thrill Kill Kult," producing Spawn's "Tension," contributing the "Mindblower" track on the Wax Trax Black Box set, and remixing Chris & Cosey's "Twist." His latest recording, Unpopular Science, is a quirky yet catchy collection of electronic pop music on Plus 8 Records.*



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## Beyond Solo Performance

When Performing Engineers Interact On Stage, Interesting Things Can Happen

BY IRWIN LESCHET

Interacting with machines can be great fun, but interacting with other people and machines can make for a more varied sound and a more satisfying musical experience. For a recent performance at the Battery Park Electronic Music Festival, our "group" consisted of myself on electronics, Dirk Krause on guitar (processed through a Korg D5 multieffects), and Yusef Ham-moudah on Arabian tabla, miked via a Shure SM58 (fig. 1).

My setup consists of the Akai MPC2000, Nord Modular synth and rack, a Behringer 2802 mixer, and a DigiTech Studio Quad for processing — a compact, but quite powerful, collection. All the electronic drum sounds come from the MPC; about half of the pads contain loops, while the other half contain single drum sounds that are assigned to mono outputs (kicks, snares, hihats) so they can be mixed and processed independently.

Formerly, I had a bigger live setup, but that changed when I saw an amazing live act, Atomheart, at the Liquid Sky club in Cologne [a haven for experimental and electronic music —Craig Anderton]. He used only an MPC3000, which was plugged from the headphone out to the DJ mixer. I instantly realized that you didn't need super high-end quality and tons of equipment to make really cool sounds and move people emotionally. So now, I usually play with just the MPC2000 and Nord Modular, a fairly recent acquisition that allows adding more improvised textures to what's being generated by the MPC.

Yousef is a great percussionist — he

told me that he's slept with his tabla for three years now (I don't know if I can really take that too seriously, though...). The acoustic percussion sound gives an "organic" feel that augments the electronics, and is especially good for loud, foggy, strobed technoparties. But it works in smaller club settings as well.

Dirk is a "real" musician who has played guitar for over 20 years; he thinks in song structures, like "intro, part 1, bridge," etc. — the opposite of many other electronically oriented musicians and me. Maybe that's why we complement each other well in the studio; his discipline

*continued on page 143*

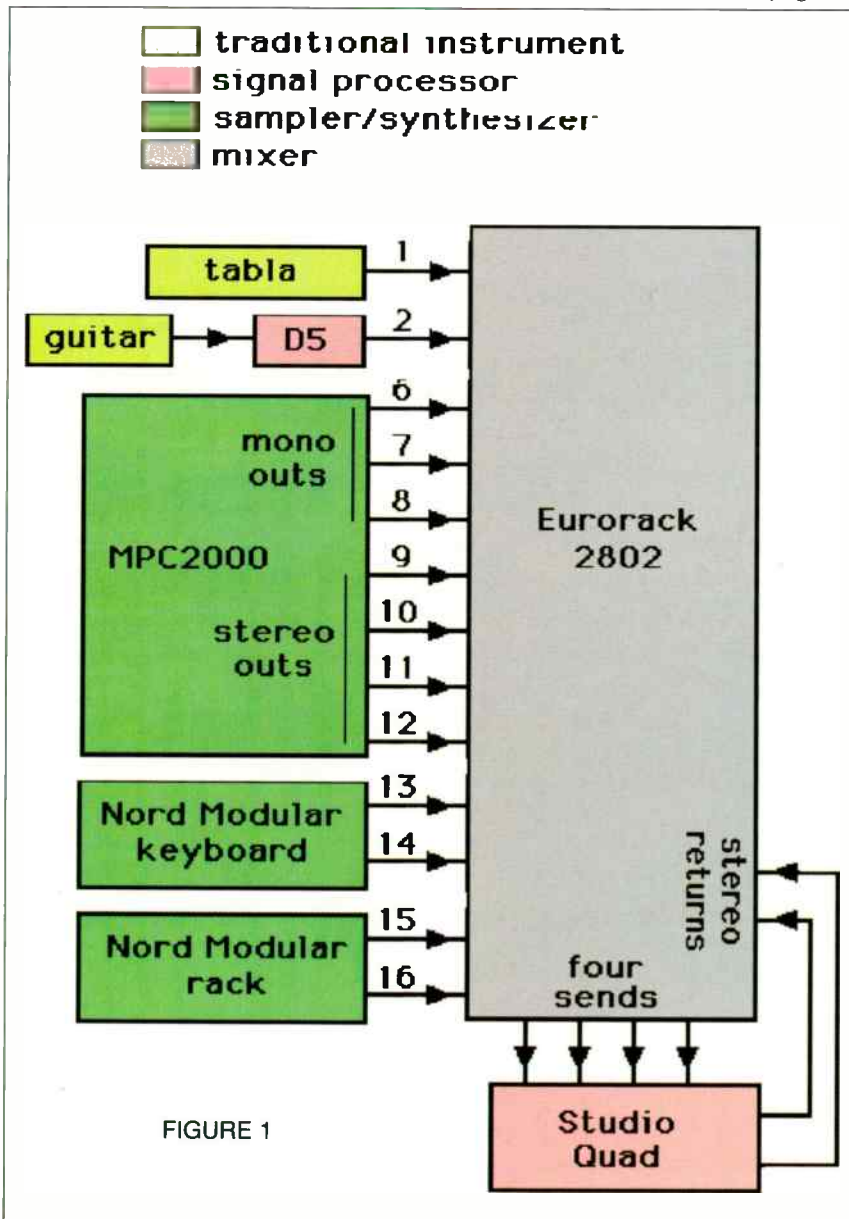


FIGURE 1



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## A Different Kind of Engineer

Creating A Mix That Inspires Some Weird Feelings And Disorientation

BY SHELDON DRAKE

There's more than one style of DJing, and what I do is a little different compared to most other DJs. Their primary focus is working a dance floor, while I usually play for more of a chilled-out room. Their goal is a seamless mix with slow builds and powerful, even peaks, while I'm after weirdness and disorientation. I am always looking for a new way to turn the experience on its ear and reveal something unexpected. One example is playing a nice recording of swamp noises, which is initially very sweet and pastoral, but I very slowly turn it up to full volume — at which point you just want to die. I also like to mix in hard experimental ambient glazes over beat records; I think it's a bit of a no-brainer as it's an easy way to make a good record twice as dark, but hardly anyone else seems to do it much.

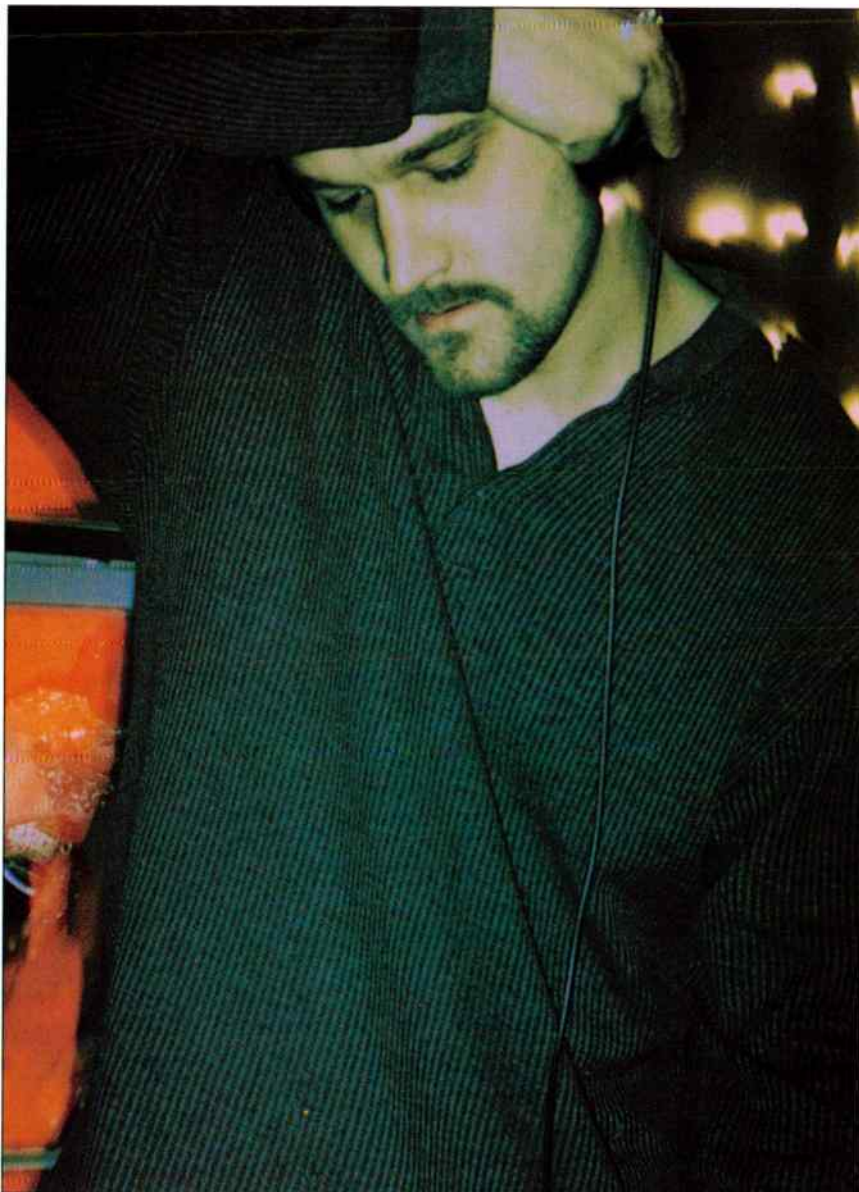
Lots of dance DJs have their whole set pretty well worked out, but I select my records on the way out the door, and couldn't tell you much about most of them. For me, it's all about the combinations, and just listening hard for that remote possibility of joining disparate elements and forcing them to work. If I'm flipping through my bag and I feel a record say, "No way, this would be a really bad idea," then that's often the one I go with.

My model is the daydream, half-in/half-out reverie. I always think back to something like taking a nap while someone was mowing a lawn nearby, and the sound of a passing plane modulates in and out, where you just float, dumbfounded by the sound. It sounds a bit corny, but I think provoking reveries

in others is a bit of a political act; the only right nature grants us anywhere is the right to our own illusions, but so few ever explore this.

When possible, I get really lost in the sound myself — sometimes, when you've got the right combination going, you can

just feel it sweep the room like a chill. It's a strange goal, as your ego desperately craves knowing that it can create access to the place where the ego is obliterated; even when it's completely dumb luck creating the current rush, you get a neat little boost.



BEYOND DANCE: Sheldon Drake tells how performing engineers can create a different kind of mood.



With luck, soon I'll be doing my own material, and I'm currently investigating software synthesizers. Spinning is fun, but I have such an urge to constantly mess with sound that I'm gonna need to go live before too much longer.

**TECHNIQUES**

With a DJ mixer, you basically tend to mess with anything that's available...flicking the Line/Phono input switch lets you cut the signal in and out, flashing the faders up and down can give a nice tremolo, and the more EQ, the better. In rare instances, you get an effects send, which is a riot.

Though playing on only two turntables is common, it's also a bit challenging. I much prefer to have three sources (or more, three decks and two CDs is perfect), so I can have two elements playing together while I work on the third. CDs are fine for lots of things, but the bottom line is that they're nowhere near as sexy as vinyl. For me, it's not so much about craft and technique (though I'm certainly floored by it in others; no disrespect), as about quick and bizarre

creativity, and, especially, serendipity, very much the main tool in my box. Needless to say, my sets often have rough edges showing here and there, but that's the price of spontaneity.

One basic thing I do, for anybody who wants to learn (and I was 35 when I started, so find a better excuse!), is move my hand in the direction of the record and grab it at the beat, at the end of the hand motion; that way you're in good position to pull it back, and the release position will be at the forward end of your stroke. If you grab it at the beat, then screw with it, and release it at that position on the beat, you're good to go. There are so many things to do — I'll thump the label for a deep kick or for a shaky modulation, flutter my hand against the vinyl to warble the pitch, drag the needle across the record, push it, pull it; generally just violate whatever expectations I can. If you want to hear a real virtuoso, check out DJ Olive (of WE, on Asphodel, buy it); he plays vinyl like a damn violin.

My main trick is to buy only what I think are really great records; that way, even if my mixing is off, I'll still only fall

so far. If I can't listen to it before I buy it, it stays in the store.

**DON'T QUIT YOUR DAY JOB...**

As far as the economics of DJing goes, I can't stomach hustling, though I do try to send cassettes to anybody I dare, and always try to have a few extra in my pocket to give to friends and acquaintances. I really love mix tapes; for a buck and some change you can make a copy that gives someone hours of weird dreams. I don't support myself DJing; I have a regular job for that (video graphics). Most people really don't want to be challenged by sounds at all, so I'm a bit of a niche specialist, even here in NYC. I'd generally, however, rather be playing than not, so if somebody offers me beer, I'll bring the vinyl.

*Sheldon Drake does video graphics by day and spins at night. Check out his Web site at [www.bway.net/~schnoidl](http://www.bway.net/~schnoidl), which displays several of his oil paintings and also contains links to RealAudio files of some of his sets.*

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CIRCLE 84 ON FREE INFO CARD

## Live Recording & the Desktop Concert

Capturing An Electronic Show On Tape, Disc, Or Whatever

BY REINHARD SCHMITZ

Recording a "desktop concert" requires different thinking than traditional live recording, starting with the fact that the musicians themselves — not an engineer dedicated specifically to mixing — are the ones controlling the mixer.

We had a chance to successfully test a somewhat different recording approach during the final event of the Battery Park Electronic Music festival (Cologne, Germany), which featured a concert with Air Liquide and Coldcut, two prominent electronic music bands. (You can hear Coldcut on the Absolut Web site, [www.absolutvodka.com](http://www.absolutvodka.com); also check out their label, Ninja Tune. Air Liquide has released several CDs on the Harvest and Rising High label.)

We had originally planned to record with ADATs, but came to the realization that, given the context, this wouldn't be optimum. Tape changing was one issue; although the ADAT provides a mode that can extend recording beyond the usual one-hour limit, that requires more ADATs, and more "babysitting" of the machines.

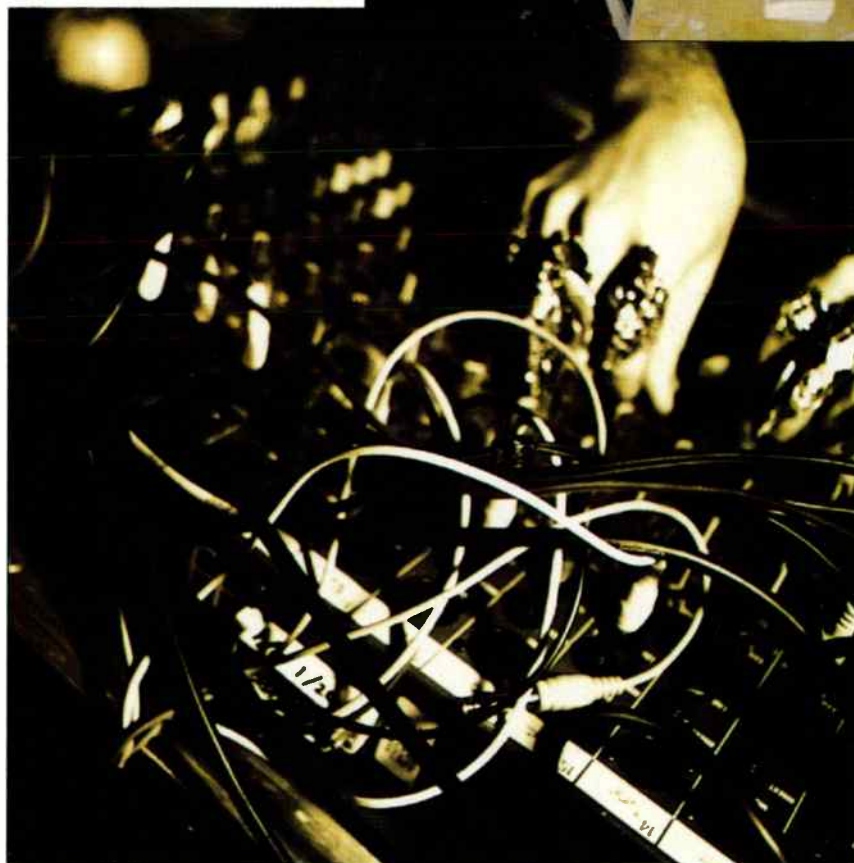
Another issue was the way Air Liquide (and most electronic acts I know) do FOH mixing. Basically, there is no FOH mixing in the classical sense, as the mixer sits onstage, and the musicians themselves do the mix. Also, there is no special monitor signal, as the monitor mix is the same as the mix for the audience. That way the musicians know exactly what the audience is hearing at any given moment.

Furthermore, the input levels of professional-level

recording machines (like the ADAT, DA-88, or multichannel analog tape decks) can't be controlled directly at the machine; you have to do all level adjustments at the mixer. Normally this is no problem, but if — as in our case — the mixer is already being used pretty much as a musical instrument by four musicians, the recording engineer, as the fifth person, doesn't only *have* a problem, but *is* a problem.

For example, Air Liquide's favorite mixer for live performances is a Crest Century 24-4-2, which has four subgroups. For the concert, two subgroups were used as stereo master volume for Coldcut, the other two as stereo master volume for Air Liquide, and all four

subgroups were routed to the main stereo outs that controlled the overall mixer volume. With a configuration like this, the subgroups can't feed a recording device that doesn't allow input level control: the levels of the subgroups may change during the performance (and they do change



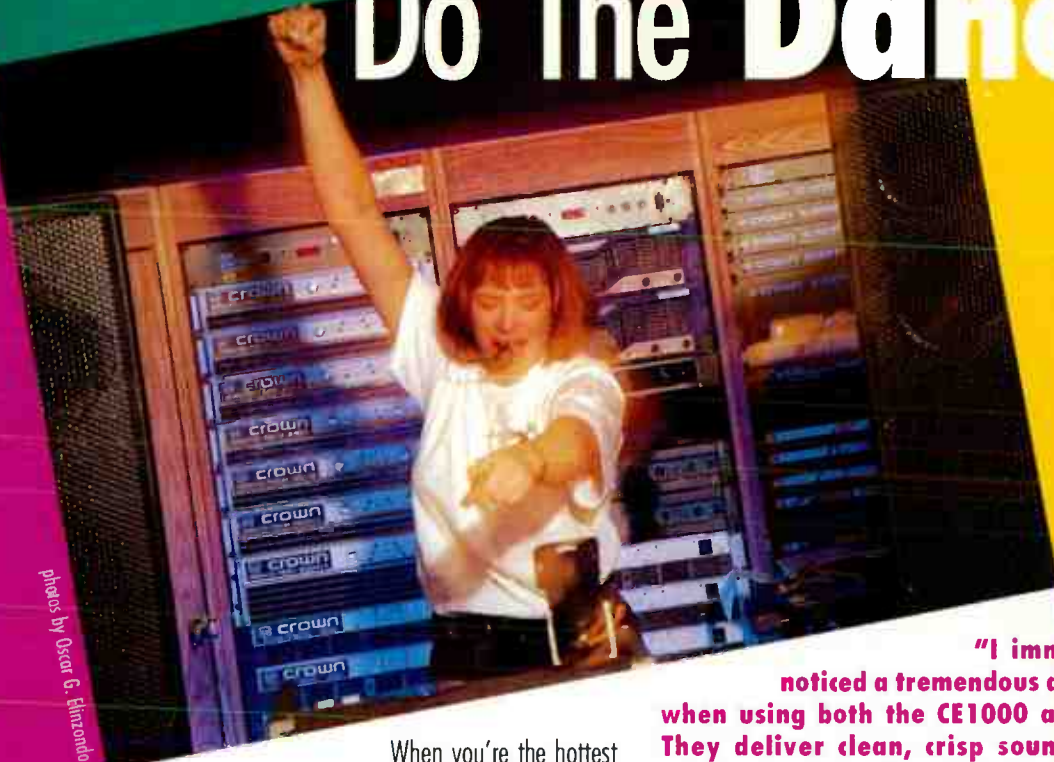
GEAR FACTOR: The gear behind Air Liquide's performance.

PHOTO BY MARKUS SCHULZE



# Can your audio gear Do The Dance?

photos by Oscar G. Elizondo



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Zenon Schoape, EQ Magazine August 1998



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## AIR LIQUIDE'S GEARBOX

Air Liquide used an eclectic collection of gear for their concert, including:

- Akai MPC3000 x2 (samples, loops, effects)
- TSR Virus synthesizer (sequence playback)
- Atari Stacy laptop computer with old version of Cubase (four control of the Virus sequences)
- Jomox XBase 09 (programmed in step-mode, real time)
- E-mu SP1200 drum machine
- Clavia Nord modular (four synth effects, pads, solo sounds)
- Yamaha QY20 (bass lines and additional lo-fi drums)
- Yamaha CS30L (weird noises)
- Lexicon JamMan (samples the hand-played synths — Nord modular, CS30, and SH-3A — in real time)
- Roland SH-3A keyboard synthesizer (more weird noises)
- Roland VS-880 hard-disk recorder (used as a submixer and effects processor for the lo-fi trash delay effects)
- The E-mu SP1200 provided the master MIDI clock to which the other instruments synchronized; all outputs fed into the Crest mixer.

— they're constantly getting louder).

In addition, Dr. Walker (one-half of Air Liquide, along with partner Jammin' Unit) is constantly playing the mixer's EQs in real time; he also works the faders to control the dynamics of the instruments, rather than simply set levels. As a result, it would have been necessary to have a second mixer (dedicated to feeding the recorder) patched between the main mixer and the recording device, and this seemed too complicated.

Finally, we needed to record not only the mixer outs (Coldcut stereo, Air Liquide stereo), but also the room ambience, using two microphones. How can you feed these signals into an FOH mixer and get them out into a recording device, especially if all mixer channels are already occupied by the instruments?

We decided that the easiest solution would be to record into the Roland VS-1680 portable hard-disk recording studio, as it could "grab" the appropriate busses as



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needed and offer level control and other essential features normally found in an out-board mixer. Another advantage was that Jammin' Unit has a VS-880 (which is compatible with VS-1680 files). Dr. Walker has been working with the VS-1680 since it first came out, and, besides, Matt and Jon from Coldcut didn't care which recording format we used — so everybody was satisfied with the decision to go with the VS-1680.

The rest was easy: we connected the mics to the 1680's mic inputs, Coldcut stereo got two channels, Air Liquide stereo got two channels, and that was it. If the volume of one act increased during the performance, it was easy to correct the input level with the 1680's faders.

But what counts at the end is the result, and result in the case of music means sound quality. Even though we used the MTP (light data compression) mode to extend the hard disk capacity, the sound was excellent. Roland's data compression algorithm has little in common with the kind used for products such as the MiniDisc; although it doesn't save quite as much memory as other data compression techniques, the sound coloration is minimal. In fact, some people actually prefer the sound of the Roland VS-880 and -1680 using the data reduction mode.

It's also worth noting that the 1680 worked perfectly, despite recording for over two hours on an extremely hot stage, while enduring humidity comparable to that of a Brazilian jungle and earthquake-like bass frequencies vibrating the hell out of everything. There were no dropouts, hard drive crashes, glitches, or any other problems, even though we didn't use an uninterruptible power supply.

All this may sound very simple — perhaps too simple. But believe me: especially in the field of electronic music, which often seems so complicated, the simple things are very often the best.

*Reinhard Schmitz is the former editor of the German magazine Keyboards and is currently doing press relations for CreamWare. He and Cologne musician Dr. Walker have just co-founded Syncom Productionz, a label dedicated to electronic music. Reinhard's drum loops have also shown up on various sample CDs.*

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CIRCLE 66 ON FREE INFO CARD

World Radio History

## Next! VOX-II Vocoder

### The Return Of The Hardware Vocoder

BY CRAIG ANDERTON

Once, the Roland SVC-350 vocoder ruled its product category: plug in your guitar or keyboard, plug in a mic, and you were ready to make those "talking instrument" sounds that used to be so trendy (see the sidebar for info on vocoder basics). But, like many great vocoders (Sennheiser,

ternal input (see later); a power jack accepts the wall-wart 12V AC adapter.

#### IN OPERATION

The manual is cryptic and poorly organized, which is unfortunate because the VOX-II offers several possibilities beyond traditional vocoders (Tracoman recognizes the problem, and says that a new manual is pending). However, spin a few knobs, and it eventually becomes clear anyway. Some high points:

- The VCO is very cool if you play with the front-panel frequency control while speaking into a mic. For robot voice effects, the VCO eliminates the need for an external audio source.
- Having individual, adjustable levels for

monitors the switching action, which simplifies the adjustment process.

#### VOICE OF THE PEOPLE

Frankly, the talking instrument thing gets old after a while, but that's precisely the strength of the VOX-II. That is, it's flexible enough so that it works well with instruments (I dedicate two mixer aux busses to vocoder — one for the modulation input and one for the carrier—so that any signal can modulate any other signal). And, unlike the vocoders of old, the VOX-II is a trim, single-rack-space device that weighs less than 3 lbs. If you've been looking for a hardware vocoder, they're back — and this is a particularly good implementation. **EQ**



Synton, Bode, Electro-Harmonix), the SVC-350 hasn't been made in years.

Fortunately, the vocoder is having a renaissance, and Next!'s VOX-II is the latest entry. A totally hardware unit, the VOX-II's core is a filter bank, each with an individual front-panel level control. Frequency bands are 100, 225, 330, 470, 700, 1030, 1500, 2280, 3300, 4700, and 9000 Hz, making this an 11-band vocoder.

Other front-panel controls include input levels (with accompanying overload LEDs) for the modulation and carrier signals, and a VCO control that sets an internal sawtooth oscillator's pitch (this comes into play if there's no external input). The output section has four mix controls: original carrier and modulator signals, filter bank output (adjustable independently of the vocoded effect), and overall vocoded level.

Rear-panel I/Os consist of a mono, 1/4-inch line input and XLR mic input for the modulation input, along with 1/4-inch mono phone jacks for the carrier input and overall output. Another 1/4-inch jack handles the unvoiced sounds ex-

ternal input (see later); a power jack accepts the wall-wart 12V AC adapter. The filter bank is great, as you can "weight" the vocoded sound toward a particular part of the spectrum. While useful with voice, this is essential with "cross-synthesis" applications where you use something like drums to modulate guitar or synth. Want the kick to provide more "kick"? Simply turn up the associated filter bank knob. For more "definition," increase the upper midrange.

- The filter bank option (i.e., no modulation) provides a tone control that's different from the norm — like a graphic EQ, but with more resonance and articulation.
- For greater intelligibility with voice, the voiced/unvoiced detector detects unpitched sounds ("s," "f," "sch," etc.). When these sounds occur, the detector switches over to either an internal noise generator or an external input plugged into a dedicated jack. The noise generator mimics the unpitched sounds, giving a more realistic effect for voice. Two rear-panel trimpots set the switching action threshold; if set overly low, the noise will appear too often, but, if set too high, the effect gets lost. An LED

**MANUFACTURER:** Tracoman, 2821 Evans St., Hollywood, FL 33020. Tel: 954-929-8999. Web: [www.tracoman.com](http://www.tracoman.com).

**APPLICATION:** Provides "talking instrument" and "cross-modulation" effects.

**SUMMARY:** In a vocoder world dominated by limited digital emulations, it's nice to get your hands on the real thing, with real controls.

**STRENGTHS:** One function, one knob; filter bank usable separately; good output mixing capabilities; on-board compressor for modulation input makes it harder to distort than older vocoders; quite intelligible with voice; on-board noise gate reduces noise.

**WEAKNESSES:** Sketchy manual; panel markings are very difficult to read under low ambient light conditions.

**PRICE:** \$689

**EQ FREE LIT. #:** 140



## VOCODER BASICS

A vocoder includes two inputs, one output, and two filter banks. The analysis or modulation input (typically a mic) passes through one filter bank. This derives control signals proportional to the amount of energy at each filter's output; these signals then control the levels of the filters in a second bank, through which the other input (carrier or synthesis input) passes. So, if you say an "a" sound, that opens up the filters on the carrier bank that mirror the "a" sound. The intelligibility de-

pends on the number of filters; eight are considered the minimum necessary for a convincing "vocal" effect.

Drums are also popular modulators: the kick drum opens up the lower filters in the carrier filter bank, toms emphasize midrange sounds, and cymbals "open up" the high frequencies. When applied to something like power chords, the result is a highly rhythmic guitar sound that "morphs" with the sonic characteristics of the drums.

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### GET THE LED OUT

Gemini Sound Products has launched the BPM-500 stereo preamp mixer with LED beat monitors. Digital beats per minute (BPM) displays and beat offset indicators enable users to see clearly when two tracks are in sync. The BPM-500 is a 19-inch, 4-channel stereo rack-mount mixer with three phono, eight line, and three mic inputs. For more information, call Gemini Sound Products Corp. at 800-476-8633, fax them at 732-969-9090, or visit [www.geminidj.com](http://www.geminidj.com). Circle EQ free lit. #142.

### MIXING WITH PEAVEY

Peavey has announced the release of the 3D Mix Pro mixer. Featuring a new graphic look, the latest in SRS technology, and a dedicated Collapse button, the 3D Mix Pro has several new features. Among these are SRS stereo image enhancement for expanding the music's space, two stereo channels, each with phono/CD and line inputs, and three-band equalization with 22 dB of cut on each channel. For more information, contact Peavey Electronics Corp. at 601-483-5365. Circle EQ free lit. #143.

### SWIVEL STYLE

Sony's MDR-V700DJ and MDR-V500DJ headphones come in silver and black, respectively, and feature a "swivel" earcup for greater flexibility and mobility. Both headphones will be available in June for a manufacturer's suggested retail price of \$149.99 (MDR-V700DJ) and \$79.99 (MDR-V500DJ). Contact Sony at 201-358-4201. Circle EQ free lit. #144.



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# project post

Techniques from the pros on how to work with composers and how to use your project studio to perform audio-for-video work successfully

BY  
ALAN  
DI PERNA

# The Composer Connection

Tradition meets the future at the  
composer-oriented Music Forever

**A**nthony Marinelli's Music Forever project studio has been designed around the composer's own approach to creating music for films and television.

"I do whatever fits the scene," says Marinelli. "If it needs to be sequenced, I'll do it that way. But I'm comfortable writing notes on paper, too. Or sometimes I'll bring some musicians in and just improvise. Some of my best themes have developed that way. Within one score, I might use three or four different methods."

Marinelli and his longtime engineer, Mark E. Curry, bring an element of pop music production to their film scores and TV ads. Over the past two decades, their open-ended, eclectic approach has served them well on film projects that include *Leaving Las Vegas*, *Two Days in the Valley*, *Young Guns*, *Internal Affairs*, and the new Julia Sweeney film, *God Said Ha!* They've just finished work on *The Runner*, starring Courtney Cox and John Goodman.

"The standard film procedure is that you go in and cut everything at the same time on a sound stage," says Marinelli. "I like doing that, but a lot of things need more attention to detail — rhythm sections among other things. So it's nice to have a studio where you can approach a score like a record and layer things and evolve the whole project."

"We do a lot of different styles of music," adds Curry. "But the common denominator is that we tend to do it like a record. Because that's the world we both come from."

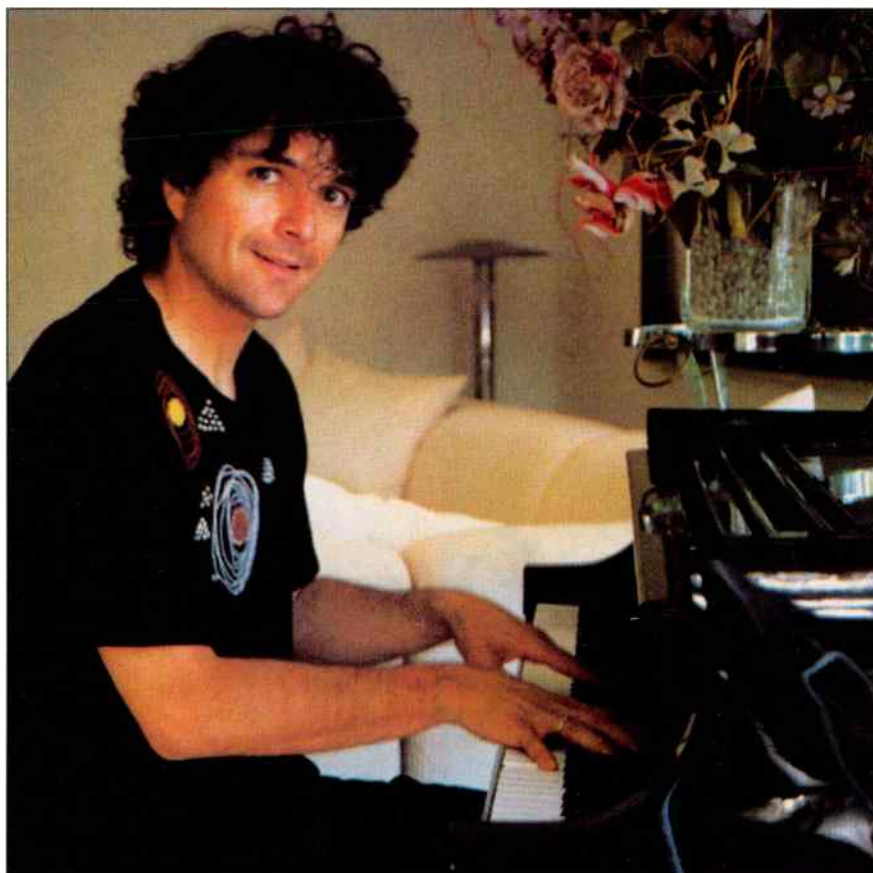
Marinelli started out as a synthesist and songwriter. By the early '80s, he'd built a home studio based around a 3M M79 24-track machine in a small build-

ing in the back yard of his parent's house in the Los Angeles area. He made the transition to film work by doing arrangements for other composers. Before long, he was taking on his own film projects.

"The first time I did a movie, *Blue Thunder*, I thought that frame clicks were fractions of a second," Marinelli

laughs. "I worked for a month that way. Luckily I had four or five months on the movie to figure out the mistake I'd made. That was a good way to learn."

Curry, who'd been working at Larrabee, one of L.A.'s top record studios, had been friends with Marinelli since the late '70s. He began to collaborate with his old school pal, bringing his technical expertise to the partnership. By 1986, their business had outgrown mom and dad's backyard, and they set up shop at the current Music Forever headquarters on Highland Av-



PIANO MAN: Composer Anthony Marinelli approaches scoring as he would a record, and uses his studio to concentrate heavily on things like the rhythm section.



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venue between Sunset and Hollywood Boulevards, right across from Hollywood High School —

a prime Filmland site. At first, Marinelli leased 1700 square feet on the first floor at 1606 N. Highland. But he has gradually expanded and recently purchased the entire building. An upgrade is near completion that will make Music Forever a three-story, 3800 sq. ft. complex with multiple studios, composer rooms, offices, and lounge space. But, as always, the heart of the facility is the first floor studio where Marinelli works. The studio was designed by Brett Thoeney of BoTo Design and constructed by Mark Curry himself. The main recording space is roughly 45 by 20 ft., with 16 ft. ceilings. "We can get

about 12 string players in there," says Marinelli. "Plus there's a second room that can fit three to five musicians."

The control room houses a Sony 3324 digital 24-track recorder, a 24-(stereo) channel Euphonix CS200/CS11 console with total recall and Marinelli's MIDI sequencer setup. The latter is based around Logic software running on a Mac that's locked to 3/4-inch video worktapes via a TimeLine Lynx. The sequencer commands an array of tone modules that includes a Synclavier II, Korg M1R, Yamaha DX7 and YC30, a Roland MKS-20, two Roland 1080's, and 15 Roland 760 samplers.

"The samplers are loaded with orchestral sounds 90 percent of the time," says Marinelli. "I use one 760 per instrument in the orchestra — like 760 Number One is violin, 760 Number Two

is viola, and so on, all the way down through the woodwinds and English horn. I'm pretty well set up with music printing, so once the score is completed, we can go to the scoring stage and replace all that stuff with a real orchestra. But the samplers are good to have as a mock-up so the director can hear the music, and so that we don't have to get slowed down on the scoring stage because the musicians don't know what it's supposed to sound like."

The control room is designed so that composition, recording, and mixing are all part of one integral process. "I'll stop in the middle of composing something and we'll do some recording," says Marinelli. "Or I'll walk away for a while and let Mark mix the cue, saying 'I don't know what else this needs. Mix it.' And his mix will help me



KEEPING IN CONTROL: Engineer Mark Curry helped construct the control room, which is designed to handle composition, recording, and mixing.



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Play to Out Point  
Loop  
Jump to Splice Point  
Jump to In Point  
Jump to Out Point  
Jump to Marker  
Zoom In by 2  
Zoom Out by 2  
Zoom to Sample Level  
Zoom to Full Recording  
Rescale waveform  
Scale in Real Time  
Scale in Beats per Minute  
Scrub Automation  
Autorewind on Stop

realize what else needs to be added."

The Euphonix console design, which offers six inputs per channel, greatly assists the process, according to Marinelli: "You need a lot of inputs to work this way. It's not uncommon for us to fill up 24 tape tracks and have a lot of MIDI stuff running live, although a lot of that often gets eliminated in the final mix."

Curry adds that the Euphonix total-recall automation system helps keep the creative process fluid: "Each cue can grow with the film. You don't have to finish a cue, put it away, and then go on to the next one. Often, when you do that, you get to the end of the film and go back to that first cue you did and discover, 'Gee, the reverbs are a lot longer than what we're using now. I wish we had done it differently.' With the Euphonix, you can call the cue up and change whatever you want. It's very easy to switch between cues. So the whole process becomes more progressive. Doing a film is a journey. I don't know exactly how I want it to sound when I'm starting off with a film.

It kind of takes you along with it."

Music editor Terry Wilson works closely with Marinelli and Curry when they're doing a score. An upstairs multipurpose room is equipped with a Digidesign Pro Tools system that Wilson uses. Digital editing becomes especially intensive and crucial when Marinelli does more free-form, improvisational cues with live musicians.

"If the music is supposed to be fluid, sometimes it sounds terrible if you use a click track," says Curry. "We try and give the musicians the freedom to play and not be so constrained by tempo. Afterwards, we may have to fix a few things with digital editing. Like maybe the guitarist played a great lick, but it's two frames late. I'd much rather go in there digitally and move that great performance than say, 'Okay, let's punch in again, 'cause you were late.' So we're trying to use the technology we have in the most creative way possible."

The next logical step, Curry feels, will be a move to a hard-disk recording system, which would eliminate the need to transfer back and forth between the 3324

and Pro Tools: "When you work on films, you want to have a thematic, cohesive thread to the music," says Curry. "You may have a theme that you want to repeat in several different scenes — almost the same music, but with a different arrangement. It would be great to have all the music on hard disk, because you could take just the rhythm track and bass from your theme, for example, slip it to another scene, look at it against the picture, and see what else is needed. This way, the music has a thematic thread. You're almost using some of the same performances, but you're varying them. A hard-disk recorder is great for that. So we're very strongly considering going that way."

"I started out working with a lot of different composers," says Marinelli, "and I learned a lot of different ways of working. They all yield different results, and I feel comfortable going from one to another. When you're doing hours of music, it can be a task not to repeat yourself. So it helps to change your method. Each different approach will lead you in a different direction, bringing up new choices, new colors." **EQ**

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# Doing a Digital Juggling Act

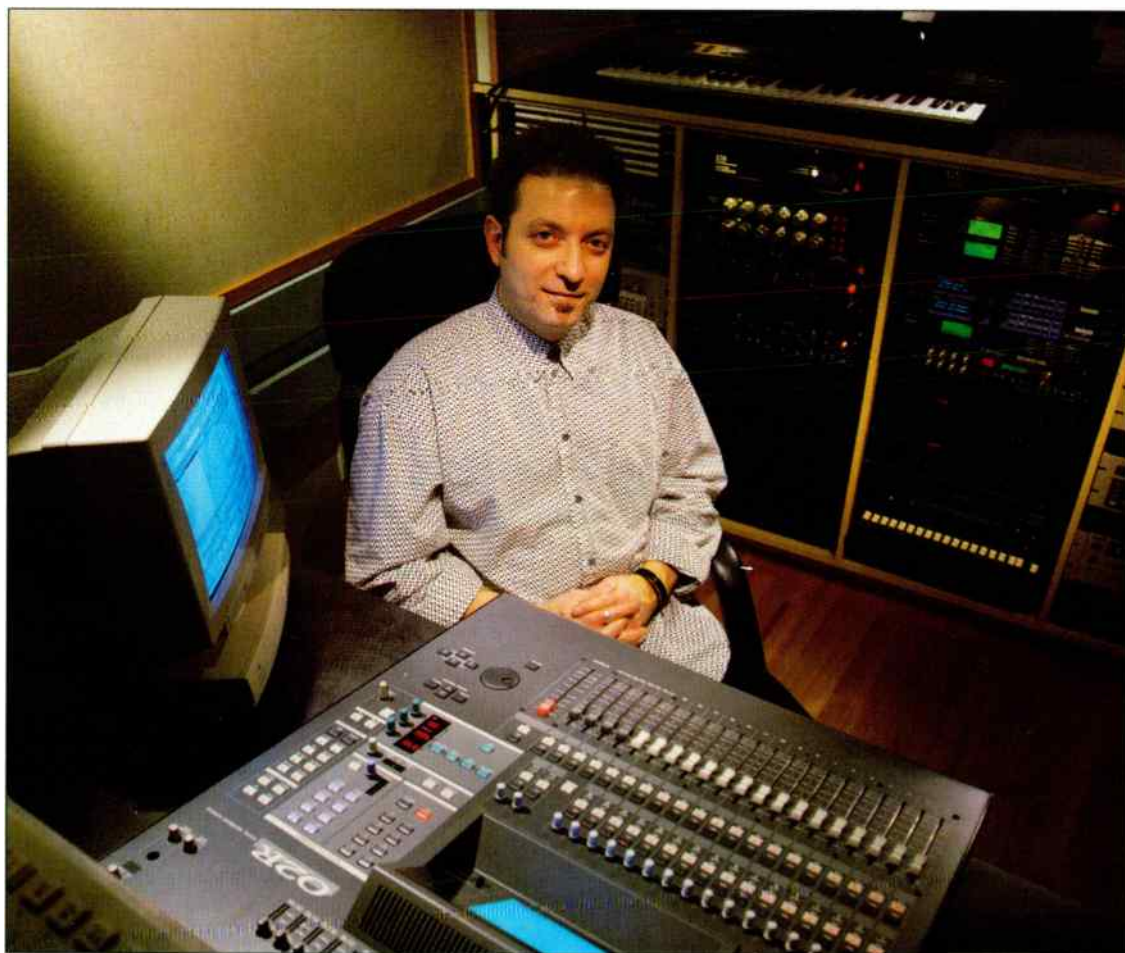
Writer/producer/performer Tom Goia  
praises console automation for letting  
him juggle his many post and music jobs

In the late 1990s, the main problem in most mid- and small-sized production studios is not a lack of clients or effort, but time. Writer, producer, and performer Tom Goia somehow manages to juggle and excel at a collection of tasks and projects that would trouble even the most organized studio operators. In an average month, Goia writes and records eight finished songs for various television daytime dramas, engineers and produces various album releases, designs and builds a studio or two, and somehow finds time to work on his own material.

Goia's studio is based around a Yamaha 02R digital recording console, which acts

as the main point of entrance for all audio tracks going to and from his three TASCAM DA-88 multitrack recorders

and racks of outboard gear. "I'll work on my television stuff in the morning, I might do some tracking in the afternoon, and then I'll mix or track some guitars at night," says Goia. "I could never do this with an analog board. The 02R's automation lets me keep multiple mixes in memory that I can recall with the push of a button. If I sold all of my equipment, I might be able to buy one



MEGA MULTI-TRACKING: The automation feature of his Yamaha 02R helps Tom Goia keep track of his various projects — from postproduction to recording guitars.



of the large-format digital boards, but then I wouldn't have funds for any out-board gear."

In addition to Goia's traditional productions, he also offers a unique service to guitarists looking to capture the best sound possible for their tracks. His studio contains a custom-made rack-mount unit for the re-amping of guitar tracks. When a guitarist records his instrument in Goia's studio, in addition to the signal sent to the amp, a direct signal with no processing is sent to a track on one of the studio's TASCAM DA-88's. When this track is played back, the re-amping box takes the +4 dB audio signal coming from the tape machine and changes its impedance back to that of an instrument-level signal. The track can now be sent to any of the vintage guitar amps in the studio for recording just as if it was being played live, with no coloration of the signal.

"Guitarists send me tapes from all over the country," notes Goia. "The multitrack layout I normally receive is a single clean guitar track, another track containing a processed version of the guitar track, and a stereo mix of the total song so that I can make my work fit in tonally. For the ultimate in guitar recording, we'll put a single guitar track through three different amps to take advantage of their respective tonal qualities. Some amps are great for high frequencies, some have a good mid-range, and so on. The sound that results from mixing all these different amps is just incredibly rich."

To record the amps, Goia runs signals straight from one of his analog microphone preamps into a line-level input on the 02R. "I've tried every possible routing configuration for recording, and it just sounds best to go straight into the 02R," recounts Goia. "While I love the TASCAM DA-88's for the reliability of their transports and their rock-solid sync, the 02R's converters provide greater clarity and warmth, without sounding harsh and digital."

To expand the capabilities of his studio even further, Goia will soon be adding a second 02R and a Digidesign Pro Tools/24 hard-disk recording system.

"The main reason for going with a tapeless system is to free myself from fast forward and rewind times," says Goia. "And because the 02R has such extensive onboard dynamics and effects processing, the DSP power of my Pro Tools system will be available for more esoteric applications, such as pitch correction or harmony generation." **EQ**

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BY  
JOHN  
TOWNLEY

# Lords of the Soundtrack

Pop veteran Phil Collins, composer Mark Mancina, and engineer Steve Kempster score big with Disney's *Tarzan*

Four years in the making, Disney's new animated feature *Tarzan* will explode onto the screen June 18th with a soundtrack that features five new songs by pop veteran Phil Collins and a soundtrack composed by double Grammy-winner Mark Mancina, renowned for innovative scoring on the likes of *Speed*, *Speed 2*, *Twister*, *Moll Flanders*, *Return To Paradise*, *ConAir*, and *The Lion King*.

Far from the grand orchestral oceans that engulf films scored by the likes of John Williams, Mancina and scoring engineer Steven Kempster's [*Armageddon*, *Jack Frost*, as well as the above tracks with Mancina] soundtrack is a haunting mixture of themes and textures closely linked with the individual characters in the film that propels Collins's songs into the heart of the jungle like an indigenous species. To achieve this, the team used a new approach to composition that is uniquely enabled by today's state-of-the-art digital recording tools.

How did they go about reworking the traditional methods of scoring into an in-your-face sound that pulls you into the echoing ambience of the rain forest? We spoke to both composer and engineer to get a soup-to-nuts recipe from tools and technique to creative method and manipulation. First, the tools and technique, from engineer Steven Kempster:

"I recorded and mixed the orchestra with some of Phil's drumming overdubs, and I set up Mark

ahead of time because Mark played most of the percussion on it. He brought a bunch of African hand instruments, and, instead of using samples, played everything. He played a lot of guitar — he's really crafting things down — and it's very exciting. Working on this film 15 months, he recorded most of the ethnic woodwinds and the percussion in his own studio. I set him up with a Brauner VM-1 through a Focusrite 215, the old Blue series, and a Manley variable MU compressor. He was working on

Cubase and had the Sonorus 16-bit digital system to record into. That's how he did his prerecords, and mocked up the rest of the orchestra with samples for the most part, which all got replaced with the real orchestra when I got into the game. We had an orchestrator by the name of Dave Metzger who did a really nice job. The orchestrator takes down notes, makes changes, and then dump the samples. That hasn't always been the case, but it's how we're trying to do things now as much as possible."

Sounds tricky, starting with essentially project-studio recordings. Were there some ticklish moments integrating an intimate, project sound with a full orchestra?

"Not at all," explains Kempster. "Mark built on a 48-track with his assistant Chris Ward, who does an amazing job,



HIM TARZAN: The creators of the audio for Disney's *Tarzan* wanted the score and the soundtrack to have a cohesive sound, so composer Mark Mancina worked with songwriter Phil Collins.

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with stereo stripes of their samples — strings, brass, and all the things we would replace with real orchestra — and left the percussion and ethnic woodwinds on individual tracks so that we could treat them and blend them in with the orchestra so they seemed to belong in the same place. Then we'd record orchestra to 48 tracks on a new machine, so we were using 96. We would give percussion and some of the ethnic woodwinds to the orchestra along with click, and it pretty much went without a hitch."

Does it always go so easy? "No, this can be difficult," continues Kempster, "especially when composers write with samples, sometimes they have a tendency to try to get the orchestra to do things it wouldn't naturally do, and that gets to be a real struggle. Once a composer gets his act together and has an orchestrator who understands, a lot of that problem can be avoided. I have to

we used Sennheiser condensers on woodwinds, along with mostly Avalon mic pres, Focusrites, and Millennias."

How long does it take to finalize this kind of effort? "On animated films, it's spread out," says Kempster. "We did the first orchestra sessions in November, another batch in January, and another batch in March. We could be done — although we still have a fix day, one day of orchestra, and two days of mixing we're holding on to in April, in case we need to come back because the release date's in June. We do two or three days of orchestra and then do a day and a half to two days of mixing for every day of orchestra prerecords. It has to seem as if they all played at the same time."

Once recorded and premixed, the final steps are getting it matched to the visuals and then mixed for theater play — in a variety of different formats: "In the theater, it will come out in all kinds of formats — it will be THX, Dolby stereo, even SDDS, because it's got to play in every theater. The way we

struments. That goes to the dub stage as 16 or more channels (on some, up to 21 discrete channels).

"That will all go to the dub stage, so if, for instance, the brass is a little too enthusiastic on a line of dialog or something gets moved against the music, they can access it and pull it down or push it up. Generally, what they do is try to maintain the mix on the stage and ride the mix if it's appropriate. But, having said that, we work to dialog and we try to mix it as closely as we can to what we hoped the finished product would be. The fellow who is doing the final dub is a very talented guy, and he'll have the access to do what he needs to do, but we try to make it as easy on him as we can. Everybody benefits from that, because the composer's vision is well-represented on the stage."

The composer's vision, intimately linked with the new technology, is at the heart of the production. For Mark Mancina, who already has two Grammys for his innovative approaches, it was time for yet another way to make the musical rhythm fit the visual rhyme:

"We've done a lot of things on this score that, from a musician's standpoint, are really interesting," enthuses Mancina. "Ever since digital audio has become a reality, it's easier to write movie music, but record acoustic instruments as you're working. It used to be you'd sit at a piano and play the themes and show the ideas that way. Then you had sequencers and you'd use MIDI to show what the score is going to be. But when digital audio started happening, for me, it was kind of like going back to the '70s and being able to record ideas for your score and show the ideas not only already recorded, but actually played. Now MIDI is in some respects old news.

"When I started on this score, the very first thing I did was start working on the songs with Phil [Collins]. Steve Kempster set me up with one of Dirk Brauner's mics and a Focusrite and a Manley compressor. That was the chain, and I wanted that to go directly onto the hard disk — straight in — just like that, so what I was recording was as natural and unaffected as I could possibly get it.

"I felt like what I wanted to do was to hear something different. I keep hearing the same samples and the same sounds on so many scores, and I don't like them. I wasn't really concerned on this movie about African instruments or anything like that. I was more concerned that it sound non-derivative, and the only way I could really do that was for me myself to play a lot of the instruments because I felt like I wanted to put my own seal, flavor, and spin into the score.



PHOTOS BY KELVIN JONES

TARZAN, UNPLUGGED: Mark Mancina's love of acoustic instruments can be heard in *Tarzan's* score.

say, *Tarzan* was a piece of cake in that regard — I think the orchestra really enjoyed playing on this one.

"As far as recording the orchestra, I used the Brauner VM-1's for the tree, Manley Gold Reference for wide left and right, C12's and C12 VR's on strings, U 67's on basses, and M 149's on French horns and trumpet. And we tried some great new ribbon mics made by Wes Dooley, basically a remake of the RCA 44's. I just ordered three, and they are remarkable sounding. Finally,

deliver it, when we go in to mix, is we monitor in what is basically a 5.1 system. It's LCR with sub, but the sub is the low end of the LCR combined — that's the way I like to do it — and then with discrete surrounds. I use Genelec 1031A's with a Genelec subwoofer. We mix to 16 tracks of Pro Tools, 24-bit, through Apogee 8000 converters, and we end up with an LCR of orchestra, an LCR of percussion, an LCR of ethnic woodwinds, and, in this case, a stereo pair of vocals, a stereo pair of guitars, and miscellaneous in-





**GROUP EFFORT:** The soundtrack was completed through cooperation between many people, including composers, songwriters, and engineers.

"This is a little bit different than what I normally do. I've done some acoustic guitar work on some live scores, as well as some vocal stuff, but I did a lot of it on this score. I did layers of percussion. Obviously, Phil, being a drummer, came in and played drums and Louis Conti played percussion on the songs along with what I had already prerecorded myself. On the track, I had a friend of mine, Lou Molino, who's a really good drummer, come in and we did some hand parts together, but, for the most part, it was me experimenting — trying to come up with some form of bed that wasn't just orchestra.

"Then I recorded all of the acoustic instruments here at my studio before I recorded any of the orchestra stuff. This was a little bit of an odd way to do it because I was playing to piano maps or samples where I knew where it was going to go, but not where it was right then, so it was layered that way. We ended up doing all of the woodwinds with a guy named Fred Seldon, who came in and we went through a hundred different woodwind instruments to try to find the right voice for each of those sections and prerecorded all of that stuff. The orchestra was the last thing we did, besides the children's choir. I felt the combination of a children's choir with a bunch of different and interesting sounding instruments and then an orchestra was a nice combination."

In the end, the track had to evoke a jungle, and that took a variety of approaches and home-brewed textures: "The first thing I did was work on the songs. There's an opening song called 'Two Worlds' — Phil had done a version of it that was really cool, but I felt like taking it to another place, so I started by layering percussion instruments and laid down percussion beds against his vocal. Then I

went into the studio with Lou Molino and had him play some drums, just to get a flavor going. I'm a real Beatles fan, and I have a '65 Hofner bass that I laid down and then put these little acoustic guitars strumming against it, before figuring out how the orchestra was going to sit in it. Then I did layers and layers of background vocals, anything from breaths to big, chugging sounds, pitching my voice in different ways, doing it on snare hits and tom hits, to try and create a really jungly kind of an atmosphere. Not necessarily an Africa kind of jungly, just kind of a fantasy world jungle, because that's what the movie is. It's about a texture of the whole score being a spirit from this story. I used an Australian bullroarer, the thing you swing around your head — and almost clobbered three people doing it — and I used sticks against rim and plastic, all to associate with the leopard. I also used a hammered dulcimer for melodies instead of piano."

Along with such textural leitmotifs, Mancina's grand scheme was to integrate the songs with the track in a particularly upfront fashion: "The first time Phil and I sat down together, we felt like we wanted the songs and the score to sound like it was a complete thought. We didn't want it to feel like the songs had been written and recorded in England and then sent over and dropped into the movie. We really wanted it to feel like they were seamless, and the only way to do that was for me to become involved in the songs and for Phil to become involved in playing drums on some of the score, because his drums and his drumming add a definite color and dimension."

The net result is a team effort of singer/songwriter, composer, engineer, and technology that will likely help propel another Disney feature to the top. **EQ**

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BY  
RICH  
TOZZOLI

# Speaking the Same Language

Gizmo Productions spotlights a  
real-world application of OMFI  
during the production of shows for VH-1

In a perfect world, we would all make lots of money and all of our file formats would be compatible. We would seamlessly fly sessions around from room to room, facility to facility, not caring if it were audio, video, or graphics.

As reality has it, it doesn't always work out that way, but at Gizmo Productions in New York City, their daily use of OMFI (Open Media Framework Interchange) certainly makes file transfers and editing sessions run smoother. Cutting audio and video for such shows as VH-1's *Behind the Music*, *Legends*, and *Before They Were Rock Stars*, Gizmo engineers find OMFI to be an invaluable tool. The facility, which has four Pro Tools systems and three Avid suites, also uses OMFI to cut films such as *Chasing Amy* and documentaries for Discovery Channel and Disney.

Working on a U2 *Legends* show recently, Pro Tools engineer David Glaser went to the VH-1 offices and took the files directly out of their Avid System. "I opened up the project in Media Composer, found the finished sequence, duplicated it, and took the video tracks off. Taking only the audio files, I consolidated it to a Jaz cartridge, and, using OMFI, created a new document," he states. "Back at Gizmo, I then transferred the information from the Jaz cartridge to our Seagate drives for editing. Using the OMF tool, I opened the document, and it created a Pro Tools session of the U2 show. OMF

takes the AIFF Avid resources and imports them as Sound Designer II files."

The file now opens up in Pro Tools exactly as it was laid back to the Avid, with all the audio information — fades and cuts intact. "Now I can take advantage of the capabilities of Pro Tools, cleaning up the sound bites with EQ, maximizing levels, and making the music edits tight," continues Glaser. "Since we mixed to picture, we had the VH-1 video editor make a D-2 of the final cuts, and that is what our finished Pro Tools output was mixed back to."

Glaser also comments that he always makes a copy of the Avid project folder, just in case it may be needed to remanipulate the file data if there were errors during the OMFI export.

Gizmo, which is owned by Gary Moscato and Brian Mackewich, was designed from the ground up to use

*continued on page 141*



POST PRODUCERS: Gizmo Productions staff from left to right: Brian Mackewich, mixer/editor/owner; David Glaser, sound design, and Sean McAuliffe, sound design.  
Inset: Paul DiNatale sits in Avid Room #3.



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# PHISH story

PHISH PHOTOS BY JEFF KRAVITZ © 1998 PHISH



NEW GEAR PG 124

# THE MAN BEHIND THE GROOVE

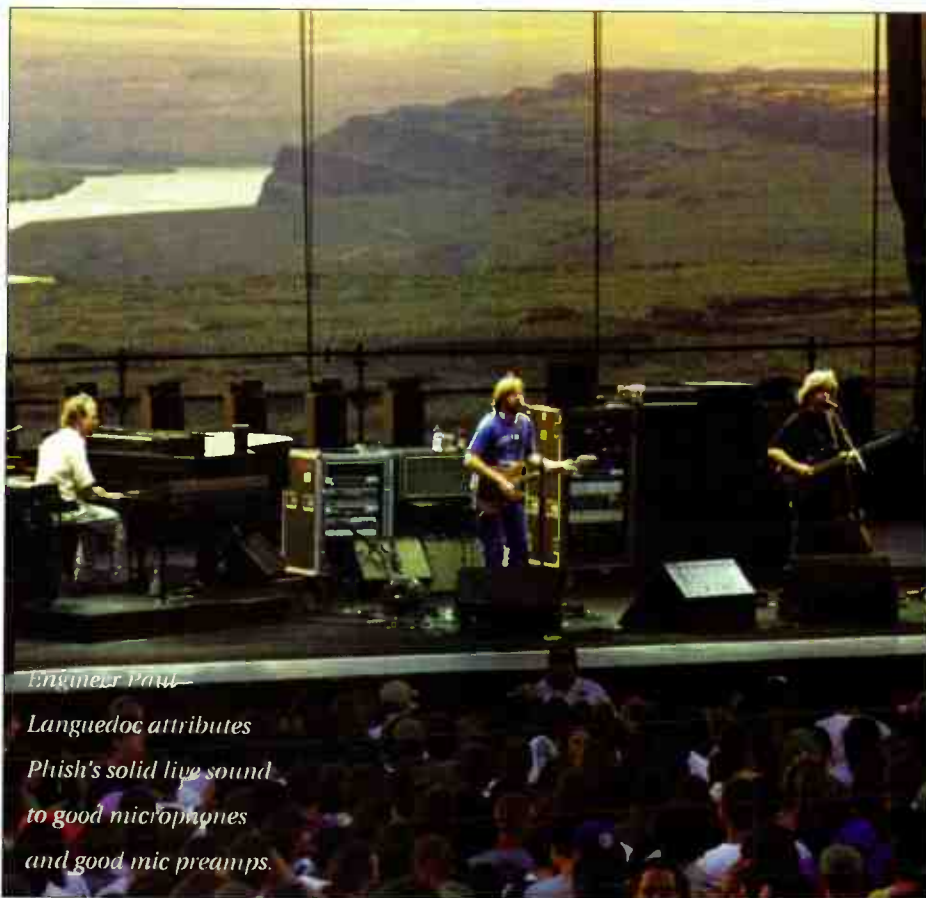
PHISH IS ONE OF THE WORLD'S BUSIEST TOURING BANDS. HERE'S HOW THEIR SOUND ENGINEER GETS THINGS DONE.

By Michael Sanchez

The improvisational rock group Phish has slowly and steadily emerged, after a decade and a half of relentless touring, as the live band in popular music today. With 70–90 of gigs a year and an ultra-devoted fan base that follows the band from venue to venue, Phish's live sound has to be tight, to say the least. Live sound engineer Paul Langedoc has helped the four-man ensemble please their zealous fans since the mid-1980s.

## BACKGROUND

"After college, I moved to Burlington, Vermont and I was working in a small guitar shop building instruments and doing repair work," recalls Langedoc. "[Guitarist/vocalist] Trey (Anastasio) came in regularly, and we got to be friends. At one point, I was staying at Trey's house and I walked in on the band rehearsing. They were in the midst of a discussion about wanting their own soundman. I just kind of walked into the middle of it, and Trey said, 'How about Paul?' It was kind of like that 'Let's get Mikey, he'll do anything' commercial."



Engineer Paul Langedoc attributes Phish's solid live sound to good microphones and good mic preamps.

Having no prior experience in the sound business, Langedoc had to learn the basics. He began observing and assisting the soundman at one of the bigger Burlington nightclubs, and thus received an intensive, informal education. What he didn't pick up during this basic training, he would soon learn through research and experience.

He and the band hit the local club scene with their very own PA system — an old Peavey rig left over from bassist/vocalist Mike Gordon's high school band. Langedoc remembers: "It was a little mixing console with 12 in and it had everything built in, like a spring reverb and amplifiers and everything — all in one console. It had 8-channel graphic EQs."

Langedoc's education in live sound engineering continued on the road by "making a lot of mistakes and figuring out why things were always breaking." As the

band continued to grow and gigs began popping up throughout the Northeast region, it was time for a new PA system. Langedoc and company brought in a couple of EAW FR-350's and a RAMSA 8118 18-channel board. After a lot of fine tuning and the acquisition of some higher-quality outboard gear — subwoofers, amplifiers, monitors, etc. — Phish had a sound system that would help them spread their groove throughout the country.

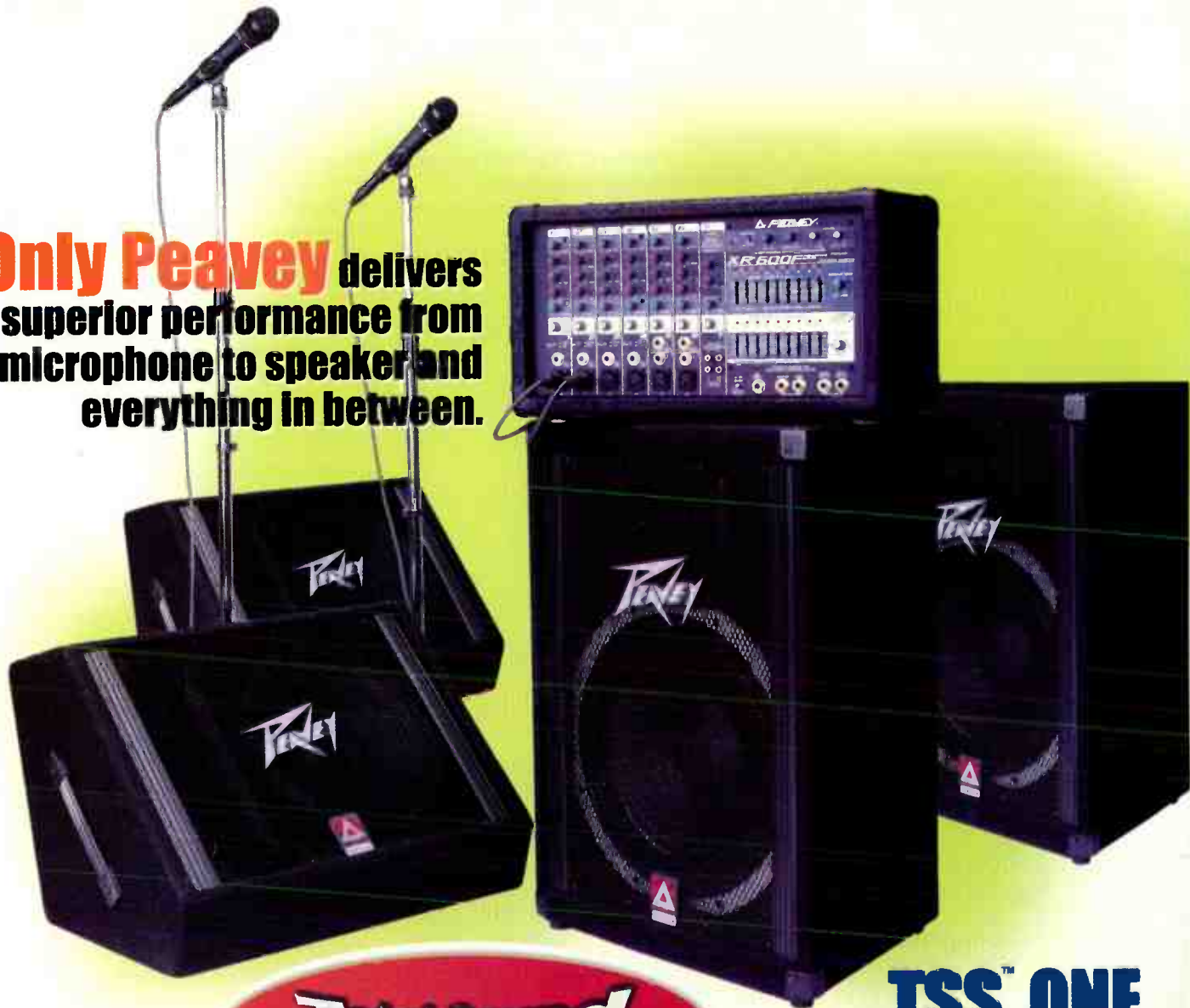
## MICS, MICS, MICS

Today, with the band doing Spring, Summer, and Fall tours throughout the United States and Europe, Langedoc and Phish's sound company, Snow Sound, are providing that groove to more people than they ever imagined. Good microphones and mic preamps are key ingredients to their success.

"The band owns all their own micro-



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phones, and I'm really into good microphones, good sources, and good preamps," says Languedoc. "We've been using some high-quality mic preamps on stage. We've got 48 channels of Grace Design 801 preamps. And we have a really good microphone package. For vocals, we're using Neumann KMS 150's. Also, we have lots of Sennheiser 409's, which they don't make anymore. By a lucky coincidence, we happened to buy a lot of them just before they stopped making them. I've gotten to the point where I wouldn't want to live without any of these things."

To mic Anastasio's guitar rig, a cus-

tom Paul Languedoc hollow body played through a single Fender '65 Deluxe Reverb amp, Languedoc uses a pair of AKG

414's. One of the 414's is set about six inches from the amp, while the other is set about 12 inches from the amp. They are panned hard right and left. "This makes the guitar sound really wide," he says.

One of the main miking challenges Languedoc has to face on a daily basis is how to get the best sound from the soft and eclectic drumming of John Fishman. He comments, "I'm used to Fishman being a light, jazz-type player, but one thing he does that is a bit of a problem is he

keeps his cymbals very low, so they're really right on top of the toms and everything else. It's a bit of a challenge. One thing that's helped a lot is using different kinds of stereo delays to offset the time from the tom mics to the overheads. There's five toms organized into two sub groups. Those go through a stereo delay of about 40 inches, which is the distance to the overhead mics. That has helped clean up the cymbal sound quite a bit.

"Most of the drum mics are Sennheiser 409's," he continues. "They are great for close miking and they handle a pretty high SPL. The kick drum mic is an Electro-Voice RE27, which is a neodymium version of an RE20. And the snare mic has ended up being a pair of Shure Beta 57A's."

Since the drums are located right next to the bass rig, Languedoc has resorted to gating the bottom snare mic to avoid the unwanted sound of the snare rattling from a bass note.

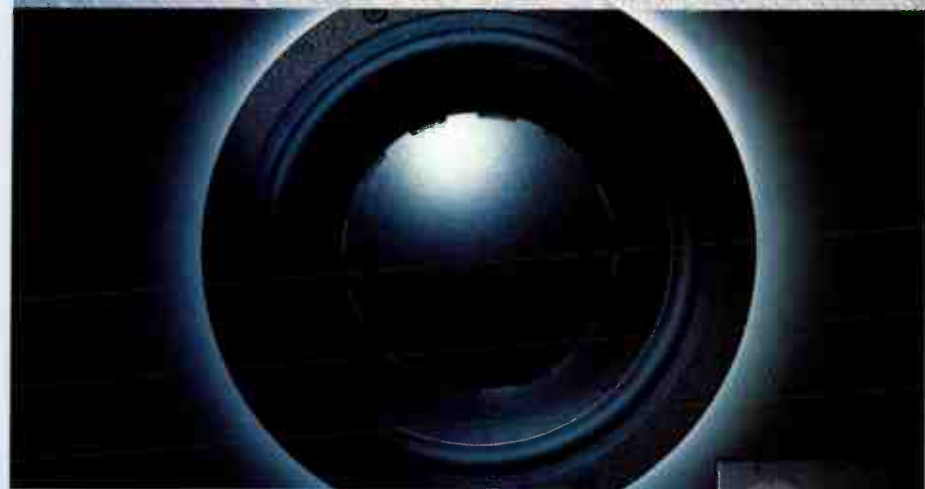
Another challenge that Fishman often presents Languedoc with involves a vacuum cleaner and some very inspired noise. During Phish's shows, Fishman will often perform a vacuum cleaner solo, in which he sucks air and sounds out of his mouth in time with the music. Languedoc explains how he captures this unusual phenomenon: "Fishman uses one of the vocal mics. I just crank up the compressor. What he's doing is producing a harsh square wave. I just compress it to soften it up." Languedoc also uses a pair of Neumann U 87's on a stereo bar to reproduce the sound of the band's *acappella* numbers.

In the way off effects, Languedoc believes that less is more. He explains, "There's a certain amount of stereo reverb on the vocals. I pretty much always have an Eventide Harmonizer on the vocals to fatten them up a little bit and a couple of programs that I might change depending on the song, but really nothing flashy. I also use some nice Summit DCL200 compressors. I feel that if you can hear an effect, then it's too much. Effects, to me, are simply to make it sound more natural."

#### DYNAMICS

Although Phish's music has always run the gamut of dynamic range, it was not until recently that Languedoc began taking an active role sweetening up the quiet and loud sections. "I pretty much have let them go as far as dynamics go," he explains. "My philosophy was always to give every instrument its own space in the mix and just make sure you can hear everything. Lately, though, a lot of the new quieter songs and acoustic numbers

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require more dynamic mixing. During the recording of the last album [*The Story of the Ghost*], Trey liked the sound of his voice kind of quiet and compressed. He's trying to do that on stage, too. So that is a little challenging. When they're singing very quietly for effect, you have to mix everything around the vocal a little more."

#### VARIOUS VENUE SIZES

Over the past several years, Phish has played venues of all shapes and sizes — from 2000-seat European auditoriums to 20,000-capacity American stadiums; from surprise gigs in tiny bars with 600 happy fans in attendance to annual, outdoor, weekend-long summer festivals accommodating up to 70,000 "Phish Heads." Does this "venue hopping" present Languedoc with a challenge?

"It's fun for me," he says. "We did a lot of club work for years. I'm pretty familiar with smaller venues, so it's like a trip down memory lane. It's not a problem. As far as huge outdoor shows go, you have to make sure the PA is adequate. When we've done those bigger shows, we've brought in delay systems and stuff to make it as even as possible. Mixing outside is generally pretty easy compared to doing an arena because you don't have all the reflective stuff going on. It's a lot of fun to do a big outdoor show. It's all in the preparation. We have a good sound team."

When preparing for an indoor show, the first thing Languedoc does is determine how long the reverb time is. He achieves this by taking a microphone, tapping it with his hand, and counting the amount of seconds it takes to echo. "At that point, I know if I'm go-

ing to have an easy night or not," he says. "If the amount of reverb time is under two seconds, that's pretty good. If

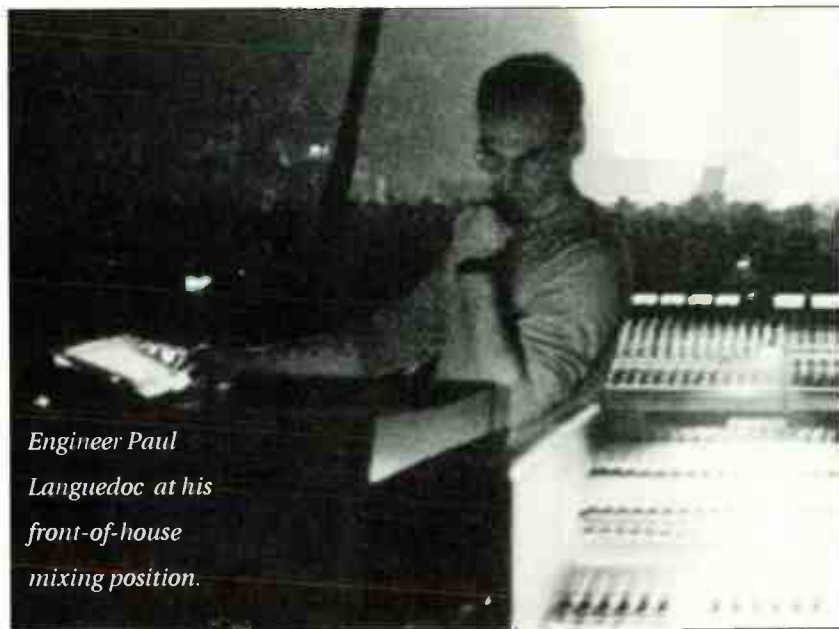
it's more than two seconds, that can be a problem."

#### TAPING

One major factor that has contributed to Phish's success over the years is the spread of live "bootleg" tapes throughout America's college campuses and Internet chat rooms. In fact, Languedoc and the band designate a section of each venue for fans with "tapers" tickets, who set up elaborate recording gear — including DAT machines and expensive microphones — and tape show after show. However, these "tapers" aren't the only ones recording Phish shows. Languedoc tapes every show on 40 channels of multitrack, a DAT machine, and a simple cassette recorder.

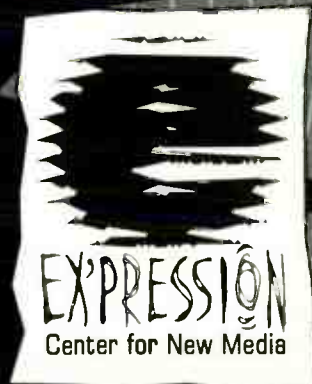
"At any given show, we've got five TASCAM DA-88's and one DAT machine. Plus, we have one cassette recorder attached to a stereo mic, which is very similar to what the 'tapers' are getting. So, yeah, we make a lot of tapes. I'll listen to bits and pieces of them almost every day. On tour, they turn into a really good reference tool for me because I can go back and listen to any specific track. We tape every show because you never know what's gonna happen — maybe a great show. Taping and storing these shows is a very small investment."

When asked if he felt the pressure of being the live sound man for such a prolific touring band, Languedoc replied, "I don't think so. It's been a very gradual, natural progression from one thing to the next — very organic. I don't know how it happened." **EQ**



Engineer Paul Languedoc at his front-of-house mixing position.

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# GROUP THERAPY

HERE'S A  
CREATIVE SOLUTION  
FOR THE PROBLEM  
OF NOT HAVING  
ENOUGH SUBGROUPS

By Steve  
La Cerra

If there's one thing that just about any engineer can always use, it's more inputs. The flip side is that having a lot of inputs makes *managing* them during a live show more difficult, so many engineers rely upon audio subgrouping to facilitate mixing. Given the typical 8-group console, subs can get eaten up pretty quickly, particularly with a large input list. The good news is that there're a few tricks for actually getting more audio subs without selling off your console. Before we figure out how to do that, let's take a look at an input list for a band with drums, guitars, vocals, bass, and keys where "eight ain't enough." Note that this is not an imaginary situation — I just mixed 17 shows in 20 days with this input list and some of the mixing desks provided were, shall we say, unqualified for the task.

The sidebar shows the 30 channel assignments. To make matters a bit more complicated, let's add in a bunch of extras such as a CD player, three or four stereo effects, and maybe a cassette deck. Right now it doesn't matter if these extra inputs are connected to channels or to effect returns, but if they are connected to the returns, it's imperative that the returns can be assigned to any of the groups (not every console allows that).

For a quick refresher, let's take a look at the bus assignment section of an input

channel (fig. 1). As shown, many sound reinforcement consoles provide assignment to eight audio subs plus the L/R mix bus (at the moment, we're not concerned with VCA groups). Many engineers take advantage of subgrouping to control the level of many inputs with only one or two sub faders.

For example — assuming a stereo PA system — it would be easier to assign all of the drum channels to a pair of subs, and use the two sub faders to control the drums (rather than messing with 13 separate faders to make the drums louder or lower). One sub is routed to the left mix bus, and the other to the right mix bus. Now the entire drum kit is on a pair of stereo faders which can easily be moved while maintaining the balance between the original 13 drum channels.

For best results during mixing, it's a good idea to also assign the drum reverb to these same groups so that when you raise and lower the level of the sub faders, the 'verb on the drums stays in proportion. If you assign the 'verb directly to the L/R mix, then you can actually pull the sub faders down to kill the dry drums, but you'll still hear the 'verb (which could be a cool effect).

We

could proceed with our submixing assignment, grouping instruments into stereo pairs: keys in stereo on subs 3 and 4, vocals on subs 5 and 6, effects on subs 7 and 8, and maybe the guitars on....uh-oh, we ran out of subgroups and we haven't even taken care of the bass player yet. Fortunately,

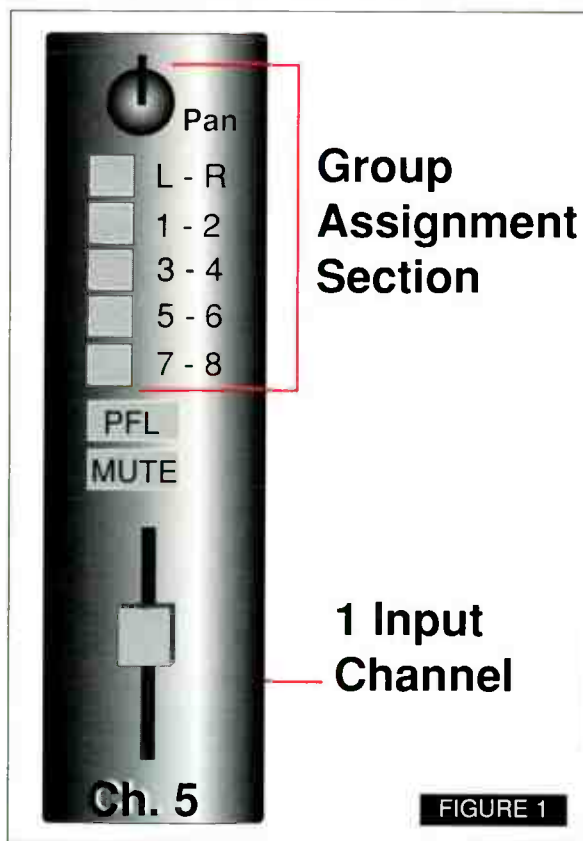


FIGURE 1

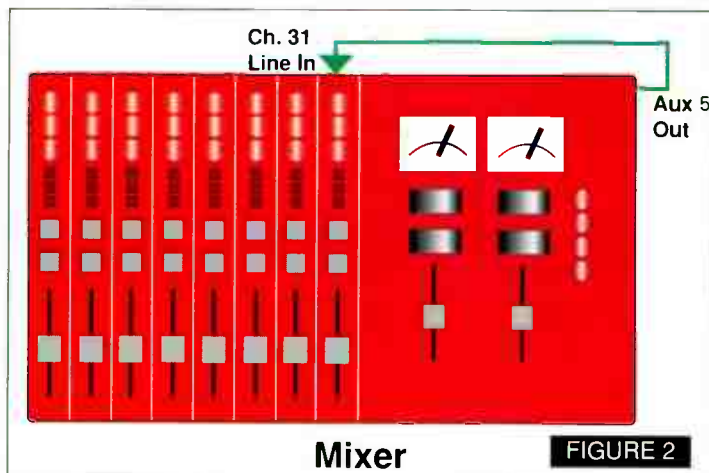
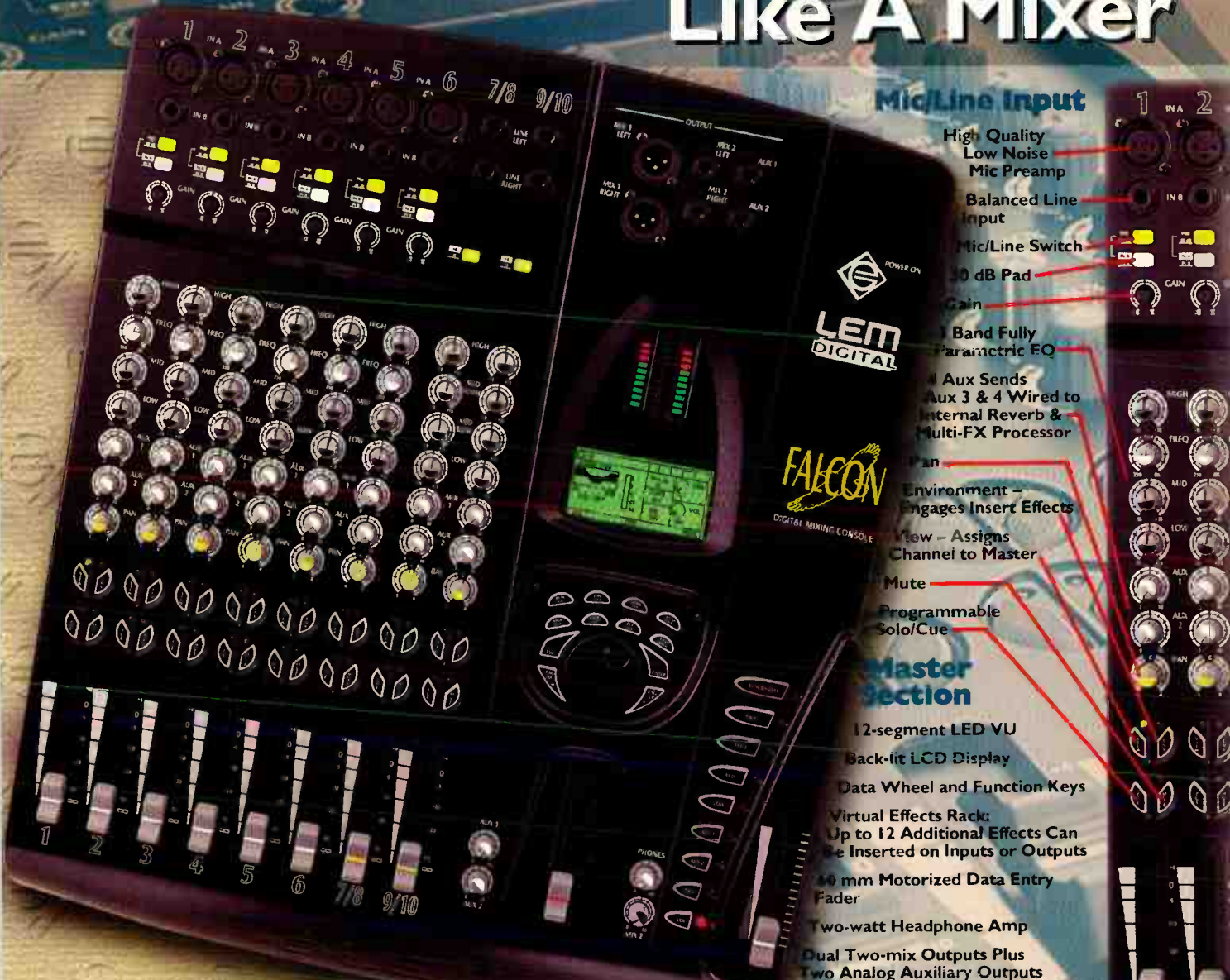


FIGURE 2



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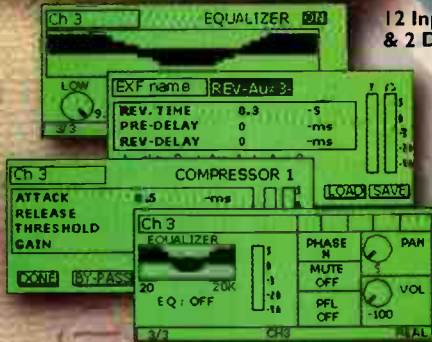
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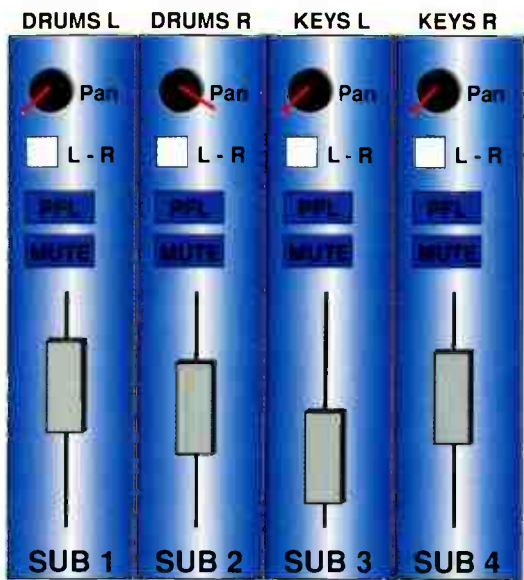
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4 Group Channels **FIGURE 3**

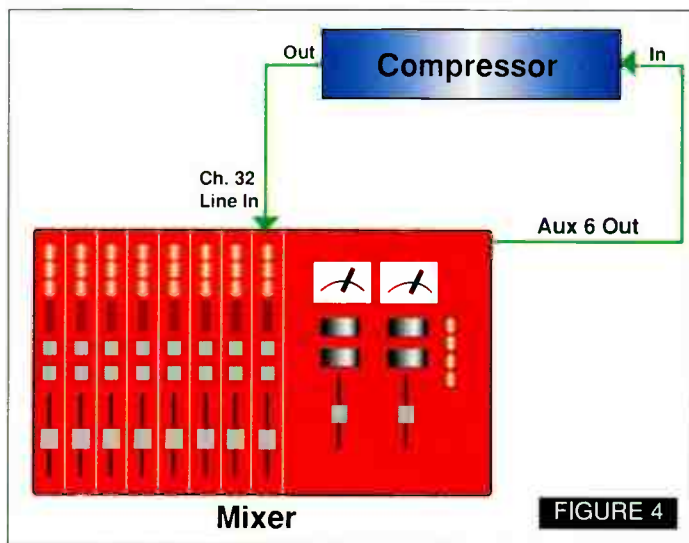
or to the bass tone (some engineers use a mic on the bass amp as the second channel). Together, they make up the overall bass sound. Once the two signals are balanced, it'd be nice to be able to make the overall bass sound louder or lower without destroying the balance between the two different signals.

Start by assigning the bass channels directly to the L/R mix. Listen to the different sounds while balancing and EQ'ing the channels. Then remove both channels from L/R assign-

ment. Pick an available aux send; let's say it's aux 5 in this case. On both channels, turn up aux send 5 to the same setting (three o'clock, for example). Make sure the aux 5 master is turned up. On the rear panel of the console, patch the

snare. Bringing this signal into the mix along with the "normal" drums adds some slam to the sound of the mix. Since kick and snare are normally panned to the center of the mix, only one sub is needed for the compressed sound. To create this sub, patch a cable from aux 6 out on the rear of the console into the compressor. Patch the compressor output into an open channel — #32 for example. Make sure that the master for aux 6 is turned up. To get the kick and snare into our newly created group, turn up aux 6 on the kick and snare channels, which will send the kick and snare mics to the compressor (see fig. 4). Set the comp to do whatever you want. Then bring up channel 32 to introduce the compressed kick/snare sound into your mix. You've now turned aux send 6 into an audio subgroup. There's one thing to watch out for: be absolutely certain that the aux 6 send knob on channel 32 is all the way down. Otherwise you'll create a feedback loop by sending channel 32 to the compressor and bringing the

*continued on page 143*



**FIGURE 4**

most bassists play in mono, requiring only one sub as opposed to a stereo pair. Now you have to start thinking about prioritizing which inputs get sub'd. You might think, "Do I really need to waste two groups on those effect returns?" That depends upon your mixing style and how important it might be to easily kill all of the vocal effects between songs when the band talks to the crowd (personally I've always found it silly when a lead singer addresses the crowd with reverb and a 300 millisecond delay on his voice). Regardless of how you look at it, we've run out of subgroups; this can happen as easily on a \$2000 console as it can on a \$20,000 console.

You can create extra subgroups on your existing console, providing that you have an open channel or two and an open aux send or two. As an example, take a look at the bass channels on our input list. Channel 14 is a straight DI directly off the instrument. Channel 15 comes from a SansAmp Bass DI used to add col-

output of aux send 5 to the line input of an available channel (e.g., channel 31). Assign 31 to the L/R mix, set the input trim, and bring up the fader. You'll hear the combination of the bass sounds on channel 31. During the show, when you need to make the bass louder or lower, you do it at channel 31 with your new subgroup. The balance between the different bass signals will stay the same. As a bonus, if you want to put an effect on the bass, you can use a send on channel 31 so that you don't have to worry about which bass channel has more juice in the effect send. (See fig. 2.)

Here's another example, which is one of my favorites. I like to have several different kick and snare sounds happening in the mix at the same time. Typically, I'll assign the drum channels to groups 1 and 2 as my "main" drum subs; in a stereo mix, sub 1 is panned left and sub 2 is panned right (see fig. 3). But I also like to run just the kick and snare mics to a third sub, insert a compressor on this group, and compress the crap out of the kick and

## CHANNEL ASSIGNMENTS

Channel:	Instrument:
1	Kick drum
2	Snare drum top
3	Snare drum bottom
4	Main hihat
5	Remote hihat
6	Rack tom 1
7	Rack tom 2
8	Rack tom 3
9	Floor tom 1
10	Floor tom 2
11	Floor tom 3
12	Drum overhead left
13	Drum overhead right
14	Bass DI
15	Bass SansAmp
16	Alesis piano module left
17	Alesis piano module right
18	Yamaha DX7II
19	Korg M1
20	Guitar 1 (amp)
21	Guitar 2 (amp)
22	Guitar 3 amp left
23	Guitar 3 amp right
24	Guitar 3 DI from preamp
25	Vocal 1
26	Vocal 2
27	Vocal 3
28	Vocal 4
29	Vocal 5
30	Acoustic guitar DI



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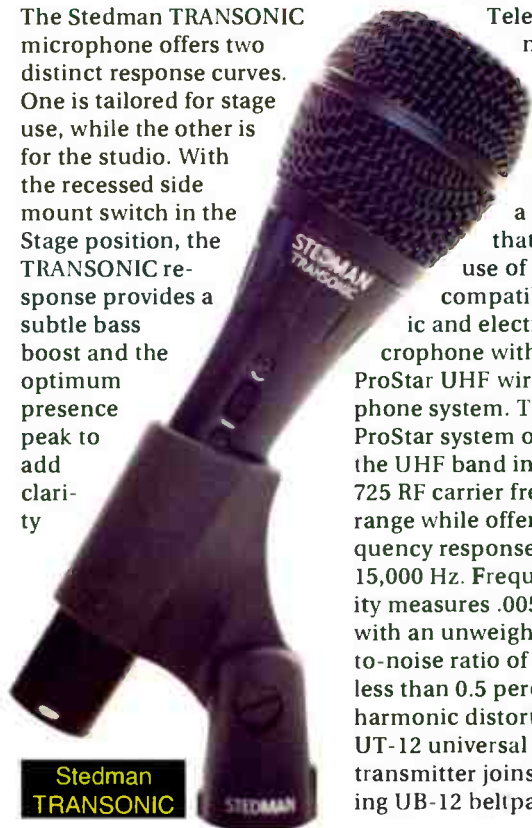
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call Stedman at 616-629-5930, fax them at 616-629-4149, or visit [www.stedman-corp.com](http://www.stedman-corp.com). Circle EQ free lit. #123.

## PROSTAR OF THE SHOW

Telex Communications' ProStar UHF UT-12 universal plug-on transmitter, a transmitter that allows the use of any XLR-compatible dynamic and electret-type microphone with Telex's ProStar UHF wireless microphone system. The Telex ProStar system operates in the UHF band in the 690 to 725 RF carrier frequency range while offering a frequency response of 50 to 15,000 Hz. Frequency stability measures .005 percent with an unweighted signal-to-noise ratio of 91 dB with less than 0.5 percent total harmonic distortion. The UT-12 universal plug-on transmitter joins the existing UB-12 belt-pack, UH-12

fixed handheld, and UG-12 guitar transmitters, offering a choice of up to eight factory preset, crystal-controlled frequencies. RF power output is rated at 10 to 15 Mw as typical and provides up to eight to ten hours of performance using alkaline batteries. A standard three-pin XLR-type female connector allows for connection to the UT-12, making the transmitter compatible with virtually all dynamic and electret-type microphones. The unit features an audio mute switch, power switch, battery status LED indicator, and screw-type gain adjustment. For more information, contact Telex at 612-884-4051. Circle EQ free lit. #124.

## TICKLE ROLAND'S LATEST IVORIES

Roland Corporation, pioneers of the digital piano, has introduced the RD-100 digital stage piano. A velocity-sensitive 88-note keyboard, full 64-voice polyphony, instrument sounds, and seven types of chorus and seven distinct reverb effects are among RD-100's features. The Tone Select buttons located on bright LEDs make for simple operation and practice features include an onboard metronome and dual headphone jacks. The 2-track sequencer facilitates single-hand practice with accompaniment and allows performances to be recorded. The RD-100 Digital Stage Piano is lightweight and easy to transport. For more information, contact Roland at 323 685-5141 and visit their Web sites at [www.rolandus.com](http://www.rolandus.com) and [www.rolandgroove.com](http://www.rolandgroove.com). Circle EQ free lit. #125.



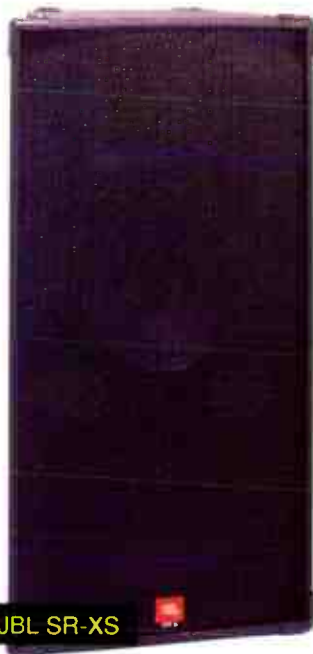
**Azden 411DRH & 311DRH**



### WIDE RECEIVER

Azden Corporation has announced two new wireless receivers designed specifically for rack installations. Both the 411DRH UHF receiver and the 311DRH VHF receiver are manufactured in metal half-rack cases and are designed to either stand alone or, with optional rack adapters, mount in a standard rack. The true diversity 411DRH features an on/off switch, a volume adjust, and an RF and audio level display — all on the front panel. Additionally,

the front panel houses group and channel adjustment switches for choosing one of the 63 user-selectable UHF channels. The rear panel features twin removable antennas, both a balanced XLR and unbalanced 1/4-inch



output connector, the 12-volt DC power connector, and a squelch adjuster. The true diversity 311DRH VHF receiver has the same front- and rear-panel features as the 411DRH, but operates in the VHF domain. The 411DRH retails for under \$500, while the 311DRH retails for \$300. For more information, call Azden Corporation at 516-328-7500, fax them at 516-328-7506, or check out [www.azdencorp.com](http://www.azdencorp.com). Circle EQ free lit. #126.

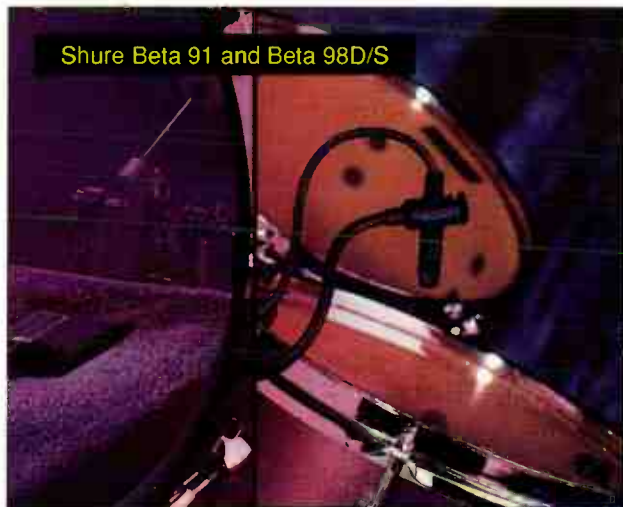
### PORTABLE VERSATILITY

JBL Professional has introduced the high-performance JBL SR-X Series portable live sound reinforcement loudspeakers. The SR-X Series is available in 11 configurations and comes in an affordable and portable package. Features include VGC (Vented Gap Cooling) low-frequency transducers to control heat build-up, pure

titanium diaphragm compression drivers mounted to Optimized Aperture horns, nonresistant metal grilles, 13-ply Russian birch enclosures finished in DuraFlex, and a newly designed crossover network. For applications requiring flying or suspension of the speaker system, all SR-X models (except subwoofer and stage monitor models) will

applications, the new low-profile Beta 91 and the miniature Beta 98D/S represent the latest additions to Shure's Beta family of professional sound reinforcement microphones. The Beta 98D/S is a miniature condenser unit designed expressly for toms, featuring a maximum SPL rating of 160 dB and a frequency response tailored for this application. Each Beta 98D/S comes with Shure's new A98D drum mount, which is equipped with a flexible gooseneck for either horizontal or vertical applications. The Beta 91 is Shure's successor to the SM91, the mic that

**Shure Beta 91 and Beta 98D/S**



be offered as SR-X/F versions. SR-X/F will include four "L-track" flying points, which will accommodate "fly clip" fittings for portable use, as well as 10 mm eyebolts for fixed installations. For more information, call JBL Professional at 818-894-8850, fax them at 818-830-7802, or visit [www.jblpro.com](http://www.jblpro.com). Circle EQ free lit. #127.

### CAN'T FIND A BETA MIC

Ideally suited for live performance or recording ap-

popularized the use of condenser boundary microphones in kick drums. Outfitted with a cardioid capsule, the Beta 91 provides solid gain before feedback and rejection of unwanted noise. It's best used without hardware, simply resting on a pillow or blanket within the kick drum. The Beta 98D/S retails for \$395.95 and the Beta 91 retails for \$341. For more information, call Shure Brothers at 800-25-SHURE or visit [www.shure.com](http://www.shure.com). Circle EQ free lit. #128.

# Audix CX-111 Microphone

Audix's high-quality, reasonably priced condenser mic is put to the test

BY MIKE SOKOL

Some might say I like mics too much, or that my middle name should be Mike (which, in fact, it is). I guess it's because I learned my engineering chops in the '70s when great microphones were only affordable by the top studios. Now, though, no one can use the excuse of not being able to afford a great transducer. Excellent, affordable mics are out there. Check out, for example, the latest mics from Audix, which offer a superb balance of performance, sound quality, and cost effectiveness.

The first time I used Audix mics was at a live show last year featuring Hot Tuna. The group had me substitute a pair of Audix OM5 dynamic mics for the Shure Beta 58's already in place. The OM5's seemed to need a little less EQ than the Shure mics, and once the monitor engineer got the feedback sorted out, the sound was great. I was mixing FOH, and was quite pleased with the results. Consequently, I was more than a little interested when a box with the Audix name arrived at my studio. Audix was nice enough to send two CX-111's for auditioning (it's a stereo thing, don't ya know...). The CX-111, and its brother, the CX-101, are both side-entrance, large-diaphragm, condenser mics requiring 48-volt phantom power. The CX-101 is rated for SPLs up to 135 decibels, while the CX-111 is rated up to 145 decibels with the 10-dB pad. They came ruggedly packaged in a road-worthy, foam-lined, hard case, which also included a shock mount.

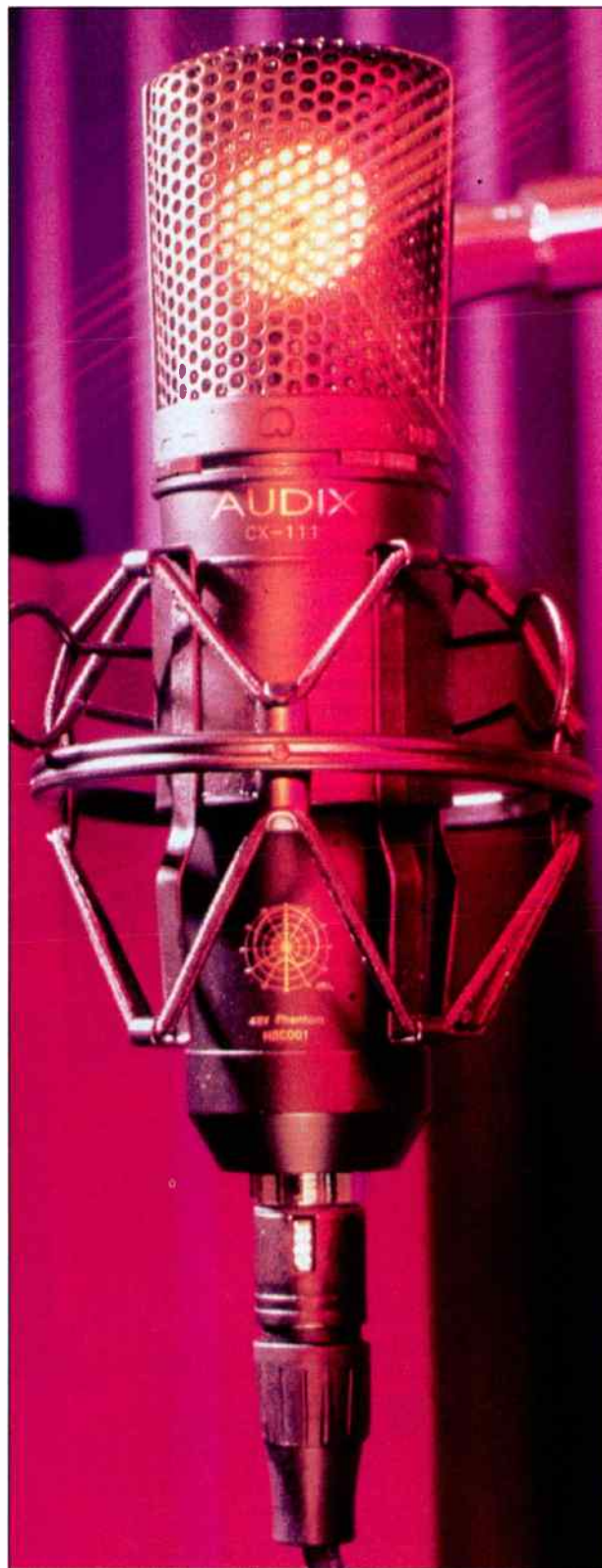
## LOX AND VODKA ANYONE?

My first informal testing was to fire one up in my control room and listen to myself do a DJ voice-over. On my own voice, the sound was very warm and large, but with a nice top end. Since they looked pretty sturdy, I decided to take the mics on a live gig the next day for a real baptism by fire. I was doing both FOH and monitor sound

for a Klezmer act called Lox and Vodka. (Klezmer music uses a mixture of accordion, clarinet, double bass, and percussion with vocals on top.) And this act was really hot, with lots of dynamics. I put the CX-111 up over a traditional drum set as overheads, and was very pleased with the extra "lift" they captured from the chime trees and cymbals. From the mics' frequency-response chart, I can see a few dB rise in the 12–15 kHz region, and this seems to be the ideal range to add some "air" to the mix, and is what I consider to be largely the "sound" of a good condenser mic.

A few days later, I had several tracking sessions in the studio with both female and male vocalists, so I put the pair of CX-111's up for a try. The first singer had an opera background, and was possibly one of the loudest female singers I've tracked in a while. She had a great vocal quality that I didn't want to lose with a dynamic mic. The 10-dB pad came in handy, and quickly tamed the levels to a manageable point — while still giving me a very flattering condenser sound.

Next, I tracked male lead and backup vocals for a country act where the lead singer was dead center on the first mic and the two backing singers were off-axis on the second





mic. On the male vocals I captured a nice, warm bottom with lots of testosterone and just enough "zip" on the top end that I didn't feel the need to touch the equalization. For a cardioid pattern mic, the CX-111 had very even off-axis response, so I didn't miss not having an omni pattern for backup singers (my usual mode of operation). Surprisingly, even without a pop filter, the vocalists were able to get within a few inches of the mics and not get any 'plosive pops. So, even though the grille looks and sounds very transparent, it did an excellent job of pop rejection.

The CX-111 also includes a bass roll-off switch, which did help the low-frequency build-up you always get on close-miked vocals with any cardioid pattern mic. The switch, though, wasn't really steep enough to keep floor rumble out of the mic without affecting the timbre of the sound. I, therefore, would engage it for a close-miked situation to keep the bass under control, but defeat it and use a low-cut filter on the channel strip if I needed to get rid of stage thumps and other infrasonic noise.

The shock mount included with the mic is nicely made, but I think its performance could be improved a bit by using a softer elastic band. According to Audix, the elastic will loosen up with age and give better isolation, so the design is probably correct, but using the 80-Hz cut on the channel strip is all that's needed to remedy the situation while the elastic's still tight. Maybe it's the JBL subwoofer sitting under my console, but I'm getting really picky about keeping the infrasonic garbage out of my mixes (especially those destined for a 5.1 mixdown).

In all, this new Audix CX-111 mic is a very handsomely made microphone that offers performance that exceeds that of units costing twice as much. It really shines on studio vocals, but is not afraid to hit the road. Plus, you can afford to get two with shock mounts (remember, it's a stereo thing...) for what you might expect to pay for one high-quality mic. Or use the money you save to treat yourself to a nice mic preamp.

For more information, contact Audix Corp., 9400 S.W. Barber Street, Wilsonville, OR 97070. Tel: 503-682-6933. E-mail: [Info@audixusa.com](mailto:Info@audixusa.com). Web: [www.audixusa.com](http://www.audixusa.com).

Price: CX-111, \$599, w/shock mount and case; CX-101, \$499 w/shock mount and case; optional windscreens, \$30. Circle EQ free lit. #129.

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# Yamaha DSP Factory

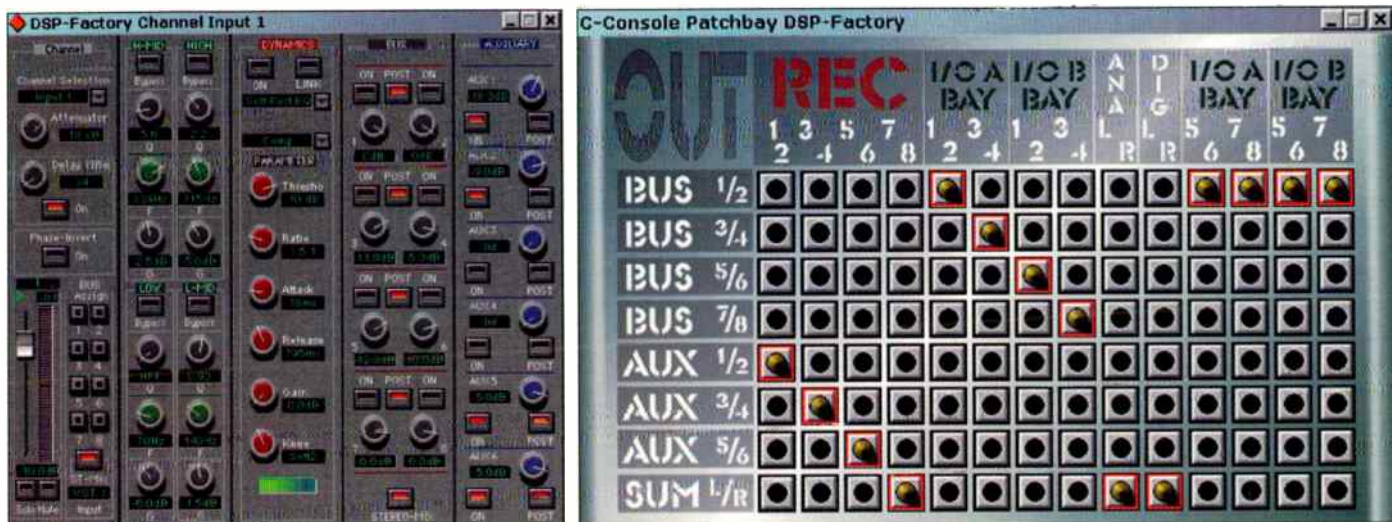


FIGURE 1 (TOP LEFT): The DSP Factory inputs have the comprehensive control of a digital mixing console. Shown here is the Input Window from Steinberg's Cubase VST controlling a DSP Factory input channel.

FIGURE 2 (TOP RIGHT): The DSP Factory includes access to both input and output patching. Shown here is the Output Patchbay from C-Mexx's C-Console for DSP Factory with plugs indicating the current patch configuration.

Get 02R 32-bit  
mixing on your  
personal computer

BY WADE MCGREGOR

I have held heavy-duty DSP cards in my hand (while wearing an ESD wristband!) that may have had more processing power than the five dedicated audio DSP chips on the new Yamaha DS2416, but they cost over 10 times more and required proprietary software. The incredible power of the Yamaha DSP Factory is not only affordable, it is supported by most of the major PC multichannel hard-disk recording packages (see sidebar). There are also very cool 3rd-party software applications (see sidebar) dedicated to controlling this DSP's mixing and processing functions. The hardware is built for incremental expansion and, yet, even the base unit provides surprising mixing, recording, and signal processing power.

The DSP Factory is a system of interconnecting components. The primary component is the DS2416, which

offers two channels of 20-bit I/O (on four RCA-type connectors) and S/PDIF digital I/O (also RCA-type connectors and switchable to 24-bit) on a half-length card that drops into the PCI bus of a PC or Mac. Five of the latest generation of Yamaha's dedicated audio DSP chips (as used in the 02R, 03D, and 01v digital mixers) are mounted on the card, with functions assigned for the most efficient processing. The card requires only modest system resources, while it is

capable of expanding with one or two AX44 units and a second DS2416 (and two more AX44's) connected over a dedicated digital bus for up to 48 channels of mixing. In early spring of '99, Yamaha will be releasing the AX16-AT 24-bit optical DI/O (\$299) and AX88 8-channel 24-bit rack-mount analog interface (\$750). Windows drivers supporting the ASIO standard and the NT operating system will also be released in the spring. An ASIO-compliant Macin-

## EQ LAB REPORT

**MANUFACTURER:** Yamaha Corporation of America, 6600 Orangethorpe Avenue, Buena Park, CA 90620. Tel: 714 522-9011. Web: [www.yamaha.com](http://www.yamaha.com).

**APPLICATIONS:** A combination of 02R 32-bit mixing and effects and a 16-track hard-disk recorder residing inside a PC.

**SUMMARY:** Multichannel PCI-bus interface for the PC with a host of well-integrated DSP functions and broad 3rd-party software support.

**STRENGTHS:** Optional I/O in convenient 5.25-inch bay format; low-CPU use even with reverb or pitch-shift effects; high-quality audio path (even while inside a PC); lots of choices for user interface.

**WEAKNESSES:** Quality of user interface is dependent on 3rd-party applications; access to features also depends on 3rd-party applications; Windows driver could offer more direct control of patching functions.

**PRICE:** \$999, DS2416 PCI-bus interface card; \$299, AX44 optional 4-channel I/O.

**EQ FREE LIT. #:** 130



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				25	Zefira Acoustic	72	714-551-5833



**FIGURE 3:** The audio mixer view from Emagic's Logic Audio with equalization, compression, and effects inserted into specific input and output channels.

tosch driver is available for the unit on the Yamaha Web site, and works with Opcode's Studio Vision and will be supported by Emagic's Logic Audio and Steinberg's Cubase.

The DS2416 is easy to install in the

## MANUFACTURER SPECIFICATIONS

**Sampling Frequency:** Internal: 44.1 kHz and 48 kHz; externally variable between 30.08 kHz and 50.88 kHz; internal vari-pitch 41.45 to 50.88 kHz.

**Signal Latency (fs = 48 kHz):** A/D 620 ms typical; D/A 310 ms typical

**Total Harmonic Distortion:** Less than 0.2% 20 Hz to 20 kHz, at +6 dB at 48 kHz sampling rate.

**Frequency Response:** +1, -3 dB 20 Hz to 20 kHz, at +4 dB into 600 ohms

**Dynamic Range (maximum level to noise level):** 94 dB typ. DA; 100 dB typ. AD + DA (using AX44)

**Effects:** Effect 1-39 types; Effect 2-40 types (high-quality Pitch-Shift for Effect 2 only)

**Power Requirements (from PC PSU):** +5 V (1.5 A max); +12 V (150 mA max)

**Maximum Power Consumption (from PC PSU):** 9.3 W

**Dimensions (H x L x D):** 125.92 x 187.95 x 21.59 mm (4.95 x 7.4 x 0.85 inch)

**PCI Raw Variable Height Short Card (5 V, 32-bit)**

**Weight:** 170 g (6 oz)

cataloged DF000000 to DF03FFFF), so it can fit into a PC with other sound cards, network interfaces, modems, etc. The result is a heavyweight DSP system that has a very light footprint. The addition of the optional AX44 adds to the number of simultaneous channels for recording (eight on 1/4-inch phone jacks) and playback (16) without any additional PC resources required (except internal power). The AX44 also includes a headphone monitor output and switchable mic-level gain for the first two inputs.

The combination of DS2416 and AX44 expansion units results in a practical multichannel interface with the AX44 input connections doubling as a studio patchbay. Each AX44 mounts like a CD-ROM drive in the half-height 5.25-inch bays at the front of the PC. Keep in mind that you should install the AX44 below your CD-ROM drive to prevent the cables from tangling in the CD tray. Each DS2416 card will support two AX44 I/O modules and can also be connected to a compatible digital interface on Yamaha's SW1000XG PCI audio/MIDI interface card.

There are eight mixing busses, in addition to the L/R master bus and six auxiliary busses within a single DS2416 card. These busses are cascaded digitally among multiple DS2416 cards to allow seamless integration of the additional processing and I/O offered by the second card. Patching can be handled within the applications (see sidebar) or from a small application provided by Yamaha. The long history of digital audio within Yamaha ensures that technical issues, such as processing latency, are carefully managed to prevent patching or processing from causing individual audio tracks to fall out of sync.

The onboard effects are based on the same processing and algorithms as the

popular Yamaha ProR3/REV500 outboard processors. These effects become DirectX-compatible plug-ins when using Cakewalk Pro Audio 8 with the DSP Factory. This demonstrates the flexibility and power of the processing, where even resource-intensive processing such as reverb or pitch shifting is handled by the DS2416, unlike "native" CPU-based processing common to DirectX plug-ins. Now you can really add lots of nondestructive effects, EQ, dynamics, and metering within your hard-disk recording/mixing application, without running out of CPU power.

Perhaps the DSP Factory's greatest weakness is also its greatest strength. The 3rd-party software allows the user to select a format for recording, processing, and mixing audio that suits his or her production style without having to compromise on audio quality. There are different levels of implementation in each of the applications (see sidebar), but, like all software, these will change in future versions. The off-loading of mixing and processing to the Yamaha DSP chips will also enable some applications to handle more audio tracks, especially on less powerful PCs. Other Windows 9X audio applications can access the DSP Factory, even if they do not support the DSP functions. For these applications, the DS2416 and AX44 I/O appear as a series of basic (albeit high quality) stereo sound cards and signal routing is handled by an application (free on the Yamaha Web site) called DS2416 Patch.

The Yamaha DSP Factory offers powerful multichannel recording, processing, and mixing on a hardware platform that has wide support from 3rd-party software developers. This is an exciting example of the synthesis that can happen when experienced hardware engineers are supported by creative software engineers. The result is an affordable platform for producing high-quality audio within a PC. Pick a software package that suits your needs and budget, while using hardware that performs almost invisibly in the background. The DSP Factory offers the power of mid-priced digital audio mixers while fitting the confines of even the smallest project studio.

*Wade McGregor is a principal consultant for Mc2 System Design Group, an acoustical consulting firm based in North Vancouver, BC. For more info, visit their home page at [www.mc-squared.com](http://www.mc-squared.com).*



## 3RD-PARTY SOFTWARE

The Yamaha DSP Factory is the hardware half of the package necessary to enable hard-disk recording, signal processing, and mixing. The other half is software. During the testing of the hardware, I also examined how each of the following Windows 9X software packages worked in conjunction with the DSP Factory. The following comments cannot extend to full reviews of these powerful, feature-laden, software packages, but is simply intended to compare and contrast the capabilities of each program as it relates to the Yamaha hardware.

**Cakewalk Pro Audio (V8.01):** A comprehensive MIDI and audio hard-disk production application, which supports many of the DSP Factory features, including access to the DSP effects through DirectX (see review in the last issue of *EQ*). The Console View provides convenient access to input selection, bus assignments, and output effects, and, unlike many such programs, allows you to do all your tracking and mixing from the Console View. Input assignment confusingly refers to channels in stereo pairs (I've never seen a multitrack with ch1 L/R, ch2 L/R, etc.). Unfortunately, inputs cannot access DSP effects or equalization (may crash V8.01) and the interface to the effects (on the output busses) are very clunky. Contact: Cakewalk, Tel: 888-225-3925; Fax: 617-441 7887. E-mail: sales@cakewalk.com. Web: www.cakewalk.com.

**Canam Computers Quartz Studio Pro for DSP Factory (V3.53):** A mixing and hard-disk recording application that has been highly adapted to the DSP Factory, this program provides very good access to the DS2416 features from a mixing-panel interface. The mixer display is well laid out and places the effects and processing in clear view. However, it does not resize and is extremely confusing to use as a hard-disk recorder through oversimplification (almost seems to be an afterthought to the lovely mixer design). The online manual and items in the interface include amusing use of Franglais (phonetic English) with terms such as "Peeking" filter (normally used on binoculars...). Contact: Canam Computers, Tel: 33-0-1-39961717. E-mail: info@canam-comp.fr. Web: www.canam-comp.fr/.

**C-Mexx C-Console (V1.0):** A complete mixing console implementation of the DSP Factory feature set. A very strict analogy to a conventional mixer, the knobs and faders (with metering) are color-coded to group sections (input attenuation, EQ, aux sends, pan pots, channel faders, and master faders) that make it easy to confirm settings and levels at a glance. The knobs demand a very tedious circular motion (not suited to a mouse — knobs were built for fingers!) to adjust many of the controls. Fortunately, holding the Shift key when selecting an EQ (or Aux) knob will open the EQ (or Aux) Editor window with graphic editing of the filters and sliders for the aux sends. Transport controls integrate with SEK'D Samplitude Studio, but this program can also be used as a mixing front end for nearly any multitrack software and includes beautiful patchbays, too. For contact info, see SEK'D below.

**Emagic Logic Audio Gold (V3.6):** A comprehensive MIDI and audio hard-disk production application that provides

very good support of the DSP Factory features and slick access to inserting DSP effects into audio channels in the Mixing window. It does have quirks, such as inserting filters, one type at a time, that seem a little too resource-conscious when all this DSP is available. This powerful program has been ported from the Atari and Macintosh, and this long history requires some cultural adjustment for new users on the PC. It, too, refers to inputs as stereo pairs, which is very confusing when you really have eight discrete inputs, not four stereo inputs. Contact: Emagic, Inc., Tel: 530-477-1051; Fax: 530-477-1052. E-mail: emagic@emagicusa.com. Web: www.emagic.de/.

**SEK'D Samplitude Studio (V5.11):** A comprehensive MIDI and audio hard-disk production application. While this program can make good use of the DSP Factory hardware, it does so in concert with the C-Console software (see above), which acts as the mixing and patching front end. As C-Console does such a good job of that, Samplitude Studio can then focus on being a very good MIDI and audio hard-disk recording program and the software hooks keep the two programs in sync with changes in mixing automation. Contact: SEK'D America (also distribute C-Mexx in USA), Tel: 800-330-7753. Fax: 707-578-2025. E-mail: info@sek.com. Web: www.sekd.com.

**Steinberg Cubase VST (V3.6):** A comprehensive MIDI and audio hard-disk production application. Comprehensive views of DSP Factory settings are available to view details of input channels, bus and auxiliary masters, effects editing (a bit clunky), and the output patchbay, including sample rates and S/PDIF word size. There is also a Channel View that shows every parameter for the selected input on a single graphic screen. Way too much attention on getting that analog mixing console look to each of these views (again, forces you to use a mouse to "turn" a knob) and they tend to visually blend a bit when overlaid. However, you can make it happen here and see the results. Contact: Steinberg North America, Tel: 818-993-4091; Fax: 818-701-7452. E-mail: support@steinberg-na.com. Web: www.us.steinberg.net.

### Not Tested (Yet...)

**Musicator:** People at Yamaha tell me this is a cool piece of software. I haven't seen it yet, so I don't know whether they own stock in the company or just like the way the program works. Check out their Web site at [www.musicator.com/dspf.htm](http://www.musicator.com/dspf.htm). Contact: Musicator USA, Tel: 530-759-9424; Fax: 530-759-8852. E-mail: musicator@musicator.com. Web: www.musicator.com.

**Minnetonka MxTrax for the DSP Factory:** This is an audio-only hard-disk production application rewritten expressly to use the DSP Factory software (the Mx51 surround mixing variation of this application was reviewed in *EQ*, February '99). Watch for a review of this version in an upcoming issue. Contact: Minnetonka Audio Software, Inc., Tel: 612-449-6481; Fax: 612-449-0318. E-mail: info@minnetonkaaudio.com. Web: www.minnetonkaaudio.com.

# TASCAM DA-45 *24-Bit DAT Recorder*

Will owning the only 24-bit DAT machine available change the sound of your recordings?

BY EDDIE CILETTI



You know a manufacturer has struck gold when a product creates enough of a buzz that people start calling this reviewer for an advance opinion. That's exactly what happened when the TASCAM DA-45 24-bit DAT recorder was released. The machine created that buzz because it captures information with 24-bit resolution. It does so while in HR, or "High Resolution," mode, where it runs at twice normal tape speed. The DA-45 records in standard 16-bit mode as well.

#### FREE TRADE AGREEMENT

Several of my friends, customers, and acquaintances purchased the DA-45

well before my review unit arrived. Like them, you will appreciate the three gifts, or advantages, that 24 bits of dynamic range delivers. One: the security of recording at lower levels — and knowing that resolution won't be compromised. Two: Conservative recording levels increase the "distance" between the signal and the digital

converters, TASCAM included a fan in the DA-45. The fan is a low-noise model by Panasonic, smaller but similar in design to the one used in the DA-88. Without the cover, it is actually very

over point. Now those extra headroom "bits" provide a margin of safety, in case the band gets a little rowdy. Three: The additional resolution that makes the stereo image deeper and more realistic.

#### FAN CLUB

Because of the heat generated by the

quiet. Nonetheless, for those who don't want any additional fan noise in their control rooms, TASCAM already offers a fix. You can contact TASCAM operational support 323-726-0303, ext. 617.

Like with the DA-88, the DA-45's fan doesn't draw clean air into the unit. Therefore, the original design will eventually draw airborne contaminants inside. While the converters may generate some heat, the more obvious source of heat is the unit's linear power supply, which could have been designed like

## EQ LAB REPORT

**MANUFACTURER:** TASCAM/Teac America, 7733 Telegraph Road, Montebello, CA 90640. Tel: 323-726-0303. Faxback: 800-827-2268. Web: www.tascam.com.

**APPLICATION:** Twenty-four-bit digital audio tape (DAT) recorder.

**SUMMARY:** Records 16-bit on standard 4mm DAT or 24-bit in High Resolution (HR) mode at double speed.

**STRENGTHS:** Twenty-four-bit conversion can be optionally dithered — triangular or rectangular — to 16-bit; provides consumer and pro I/O, both digital and analog.

**WEAKNESSES:** Interface could be more logical.

**PRICE:** \$2149

**EQ FREE LIT. #:** 131



that of the DA-88, where most of its heat could have been dissipated outside of the unit. The head motor does have to run at 4000 RPM in HR mode (double the normal speed), though I had no way of judging its operating temperature.

#### YEAH! AN ERROR RATE DISPLAY!

Using BASF DATmaster (49 minute) tapes, I made separate 24-bit and 16-bit recordings, each with very low error rates. Some users may notice a higher error rate while in HR mode as compared to SP (16-bit) mode, depending on the brand of tape being used. (In a future article, I hope to report on the performance of various popular tapes.)

#### MY TWO CENTS

The DA-45's interface is not that much different from that of its predecessors — machines such as the original DA-30. And, for some, that leaves room for improvement. That is, the machine could be more consistent in its user feedback. For example, when the drawer opens, the machine boldly displays "Tray Open!" A bit obvious, no? On the other hand, put in a previously recorded 16-bit tape, and you get the message "TapeMode NOR." (The machine will not go into record.) In the latter example, users could benefit from a message that explains and prompts, "This is a 16-bit tape. Overwrite in HR mode?" In essence, feedback from machine to user should be less cryptic and more consistent. The microprocessor in the DA-45 is equivalent to an Intel 8088, the heart of a DOS-era PC. There should be enough internal brainpower to drive a display capable of providing full English sentences. A point more manufacturers should note.

#### LA DIFFERENCE

The DA-45 uses the same ALPS mechanism that TASCAM uses in its DA-30 MKII, DA-P1 portable, and DA-302 dual-DAT recorder. It's not my favorite mechanism because it is mostly plastic and reel-drive "power" is via belt from the capstan motor. (Sony's transport in the PCM-R500, for example, has separate reel motors and an all-metal mechanism.)

Incidentally, as more manufacturers produce 24-bit machines, they should consider transports capable of handling thinner tape, such as a 120-meter data DAT. That way the tape could handle two hours of recording time in HR mode.

*continued on page 155*

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# Quested F11 Powered Monitor

Quested's powered speaker proves it can roll with the changes

BY BOBBY OWSINSKI

When auditioning studio monitors, it's easy to jump to a conclusion based upon a quick listen. What normally happens is we put a CD, DAT, or a tape up of something that we've done previously and inevitably decide right away whether we like the speaker or not. My experience with the Quested F11's gives rise to what I'm going to call Bobby O's #1 Law of Speaker Auditioning, which is (borrowing some references from our Biblical forefather mixers): "Thou shalt never judge a monitor until thou hast committed a mix on it."

But first, the specifics: The Quested F11 is a powered, two-way monitor featuring a 6.5-inch woofer and a 28 mm (1.12-inch) soft-domed tweeter crossed over at 2.2 kHz. The unit is bi-amplified with a 100-watt amplifier on the low end and a 35-watt amp for the highs, and forsakes any internal limiting that might interfere with the signal integrity at higher volume levels. The input is either by a separate XLR or 1/4-inch jack on the bottom of the rear heat sink shelf of the cabinet. The level is continuously variable by  $\pm 10$  dB in 2 dB steps thanks to a convenient top-mounted level control. Quested states that the frequency response is 65 Hz to 20 kHz  $\pm 2$  dB with a maximum SPL of over 100 dB at 1 meter with an input of 0 dBu.

The unit features a switchable high-frequency contour control, which sets the response to either flat,

+3 dB, or -3 dB above 3 kHz. Likewise, there is a corresponding low-frequency contour control with a similar flat setting, +4 and -6 dB settings below 300 Hz. Although the turnover frequency selection caused me to wonder a bit, the manual explained that the boost frequencies were chosen primarily for low-level listening (a loudness control, so to speak). When the contour equalizers are switched out, a subsonic filter of 18 dB/octave at 60 Hz and a supersonic filter of 6 dB/octave at 25 kHz are switched into the signal

path. I would have been happier if the contour selections were a little more modest (another position of  $\pm 1.5$  dB would have been perfect).

The futuristic, specially molded cabinet measures 8.5 x 12.5 x 11.75 inches and weighs 25.5 lbs. An interesting peculiarity is the three grille bars mounted horizontally across the tweeter. The manual indicates that these are for tweeter protection during transit and can be removed with a simple pull. Some nice additional features include full magnetic





## QUESTED H108 PASSIVE MONITORS

If you're not convinced about powered monitors yet, or already own a great-sounding and expensive power amp, then maybe a pair of Qusted H108's is for you.

The H108's feature a single 8-inch woofer built on a cast frame with double rear suspension and a 28-mm soft dome ferro-fluid cooled tweeter. The crossover is a custom design utilizing high-powered air core inductors and polypropylene caps that are

similar to those found in some of the best audiophile speaker systems. According to Qusted, the H108's can handle up to 200 watts, have a frequency response of 65 Hz to 17 kHz ( $\pm 1.5$  dB), and have a sensitivity of 90.5 dB at 1 watt at 1 meter. Each unit measures 9 x 15 x 9 3/8 inches,



weighs 26 lbs., and has a suggested retail price of \$890.

The H108's were especially designed to provide a tight, flat bass response when used on a console meter bridge instead of the slight hype that usually occurs due to console reflection and transmission. In fact, when I set them on stands behind the console, I felt that the bass was a tad light, which is exactly what one would expect to happen.

The H108's have a particularly detailed high end, enabling me to hear reverb trails better than usual, which allowed for easy tweaking of decay times and high-frequency rolloff. The mix that I did came out crisp and tight, indicating that the accuracy of the monitor is as sharp as the literature says it is.

—Bobby Owsinski

shielding; threaded mounting points for permanent installation via an Omnimount™ bracket; and a rubber mat on the bottom of the unit to aid in decoupling. A front-mounted green LED indicates when power is applied, and the LED glows red when the signal reaches .5 dB below clipping. The manual is adequate, covering installation, speaker alignment, different types of cable connections, and specs. The manual is, however, a tad too consumer oriented. The extra large type and illustrations and the section on hearing damage seemed a bit too entry level for a monitor of Qusted's heritage and caliber.

When I first played back a recent mix on the F11's as a reference, my impression was that these monitors had a hyped top and bottom end (especially the bottom end) similar to that of a very good hi-fi speaker. Had I stopped there, I easily could have dismissed a very good loudspeaker.

After doing a real mix on the F11's, though, my perception changed a lot. The mix came out quite contrary to what I had expected. In fact, it came out very big sounding (with a lot more bottom than I expected) and very detailed. Plus, I

found listening to the F11's very easy and pleasant, and the stereo imaging very wide and precise.

The monitor also has the very useful characteristic of maintaining its frequency response regardless of volume level. This is extremely important if you're like me and like to mix at different levels. I usually start the mix at a moderate level (around 82 dB SPL), crank it up to 95 occasionally to see how it feels, then finish off the balances at a very quiet 60 or so. Unlike some monitors that change their response with loudness, the F11's always sound the same.

Remember my Rule Number 1: Don't just listen to a monitor before you buy it; make sure you do a mix or two before you make a decision. My experience with the Qusted F11's proves the point well.

**MANUFACTURER:** Qusted Monitoring Systems, U.K. Distributed in the U.S. by QUSA, Inc., 462 N. Baldwin, Madison, WI 53703. Tel: 608-251-2500.

**PRICE:** \$980 each.

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# Water, Water *Everywhere...*



PHOTO BY STEVE JENNINGS

How to navigate  
the muddled seas of  
Internet music  
distribution for your  
own projects

**BY JON LUINI AND  
ALLEN WHITMAN**

Everyone in the music industry these days is fanatically signing on to the good ship "Successful Business Model for Secure Download Internet Music Company." In one corner, it's the Sharper Image-worshipping boy's club of the Big Labels. Over here, it's coke-addled industry has-beens waiting with the patience of parasites for another shot at being a Player. The whole tribe of 'em smell the ghost of 1970s excess and greed. It's a new world out there, and there's no map of Internet Incognita. Like poets and pickpockets in mid-18th century coastal cities of Europe, they're discarding all common sense and running away to sea. The dimensionless shores of networked digital disk space are littered with wrecks;

start-ups whose captain and crew were unwilling or unable to sail beyond the channel just outside their own harbors.

Thankfully, the intrepid independent can still take advantage of what the music industry feudal states would dearly love to control. Here are some navigational aids for the explorer who wishes not to rule the entire ocean, but only to rule oneself.

## **A HIGH-QUALITY MP3 ENCODER FOR THE MACINTOSH**

The Macintosh version of the Xing AudioCatalyst MP3 encoder has arrived. While the front end (or GUI) isn't as polished as the Windows version (understandable for a first release), the engine is every bit as bitchin'. You can encode to MP3 from CD, AIFF file, or live from an external audio input. Some useful features in the Windows version are curiously absent from the Mac release: setting start and end times of a track to encode (useful for those 30-second clips) and an extremely configurable automatic file-naming interface. Also, the CDDB interface (Web-based CD name and song title search) is a bit nonintuitive, requiring you to add songs to your playlist before requesting a CDDB fetch (which must be done each time you change the list). There were some playback glitches, but they turned out to be problems with earlier versions of the MacAmp player we were using. If you use MacAmp, make sure to have a recent version (MacAmp Lite 1.0b7 or later). If you are using Xing's player, there should be no difficulty.

Our FezLab test results (Macintosh 8500/150 with 80 MB RAM and 4X CD-ROM) show that encoding direct to MP3 from CD takes approximately 50 percent longer than real time. Not as fast as our Windows machine, but for the convenience of being able to use your Mac, it's well worthwhile!

This is a good product; quick, dependable and fairly priced at \$35 (currently available discounted at \$30 via online purchase). There are many free or shareware MP3 encoders (try a search!) that perform to various degrees of satisfaction (some take up to 40 minutes to encode a single song from CD). What may be extra useful about the Xing encoder is the tech support. After

all, when you buy something, you buy the right to bug them if it doesn't work to your satisfaction. This first release of the Xing AudioCatalyst MP3 encoder for Macintosh rates 2 1/2 Fezzes. We're eagerly awaiting the second version. (Find out more at [www.xingtech.com/mp3/audiocatalyst/](http://www.xingtech.com/mp3/audiocatalyst/).)

## **A LOT OF MONEY**

In a clear indication of the seductive qualities of new media on the old cigar-chomping broadcasting club, an astounding \$100 Million dollars has been earmarked by CMGI (an Internet-focused venture capital company with members like Intel, Microsoft, and Sumitomo) to create a startup company that will seek to be the Rupert Murdoch of streaming media. CMGI and Neil Braun (former president of NBC television) are hellbent on building the perfect beast: an Internet broadcast company bigger than God. Will streaming media become more popular than television? Remember how AM radio used to be huge? You don't? How old are you anyway? Check out the hyperbole: [www.cmgi.com/press/99/braun.htm](http://www.cmgi.com/press/99/braun.htm).

## **STAY SHARP...**

Tom Petty joins the slowly growing ranks of "signed to a major" musicians losing the DIY abilities the Internet provides. Petty's label (like the labels of the Beastie Boys and Public Enemy) forced the musician to pull MP3-encoded files off the Web. Seen by label execs as direct competition to physical sales of plastic discs, the MP3 files have caused a growing storm in the already volatile realm of musician/label relations. In a possibly apochryphal tale, Petty is said to have attended a meeting of execs some years back and, finding himself unhappy with the proceedings, pulled out a switchblade and pointedly cleaned his fingernails. Whether the action improved the endgame of his negotiation is unclear. What is clear is that paranoia and control rule the day in corporate boardrooms.

## **HERE IN MY CAR...**

Still think you're wasting your time encoding music files because people can only listen on big computers in their home or office? What started as a drib-



ble of mobile playback devices for MP3-encoded music is sure to become a torrent. Check these toys out and keep putting your music online: [www.empeg.com](http://www.empeg.com), [www.mp3car.com](http://www.mp3car.com), and <http://utter.chaos.org.uk/~altman/mp3mobile>.

**REDMOND...WHAT ARE THEY DOING HERE?**

Microsoft joins the fray (along with AT&T's a2b music, IBM, Sony, and a host of others) to be your ever-truly digital music delivery player. The megacorp fired a \$15 million salvo at Reciprocal, Inc., a company that provides "digital rights management, enabling copyright protection, distribution, usage of, and payment for music and other digital content." Yeah, there's a lot of money to be made, and your favorite U.S. government whipping boy (after people who smoke pot) is gonna be there. To be fair, MP3.com (the industry upstart ruffling the major labels' feathers) received \$11 million from Silicon Valley venture capital company Sequoia Capital. Does this make MP3.com part of the solution or part of the problem? Time will reveal all.

It should be noted that Reciprocal, Inc. is a member of SDMI (Secure Digital Music Initiative). That makes them a player in the Internet music power struggle.

**MORE MUSIC!**

Tired of only getting 74 minutes of music on standard Red Book CD audio? Well: how about *four hours* of music? An Athens, GA-based band named Day By the River has released an album on CD-ROM, with four hours of MP3-encoded music. WinAmp, MacAmp, and FreeAmp MP3 players are included in the disk. This is great as long as people don't really think MP3-encoded audio is CD quality. It's not, but as long as you realize this, what the hell? Check out [www.daybytheriver.com](http://www.daybytheriver.com) for more details.

**THE BEASTIE BOYS KEEP UP THE PRESSURE**

Capitol Records-affiliated label Grand Royal (Beastie Boys, Luscious Jackson) teamed with SHOUTcast, a network of amateur Webcasters to be: "next to the kid Webcasting from his bedroom rather than part of some NBC or CNN enterprise." So says Lisa La-Cour, Grand Royal's head of new media.

SHOUTcast Webcasters are invited to carry Grand Royal's streaming audio, thus increasing the number of simultaneous listeners. It's free promotion. By using SHOUTcast, Grand Royal puts its faith in a streaming network that has, until recently, been labeled "pirate radio." Find out more at [www.grandroyal.com](http://www.grandroyal.com) and [www.shoutcast.com](http://www.shoutcast.com).

**LETTER TIME**

*I saw your brief on Amazon finally waking up to the indie scene, and wanted to point out that they are actually ripping off indie acts with their distribution 'commissions.' In the interest of full disclosure I run [www.BandThings.com](http://www.BandThings.com). Amazons payment scheme is:*

Amazon Price .....	Artist Gets
\$10.99 .....	\$4.95
\$12.99 .....	\$5.85
\$16.99 .....	\$7.65

*This is over a 100 percent markup! By contrast, BandThings markup is 25 percent, CDBaby is about 50 percent, etc. It nuy be worth mentioning to folks what they are really paying, if for no other reason than to get them comparison shopping before signing out of desperation or ignorance of their options. Selling indie music over the 'Net just got a lot easier in 1999; there are a lot of options that people should be aware of. It would also help us "indie" Internet sites who are now in competition with a humongo corporation like Amazon. —Thanks, Jeff*

Dear Jeff, Fair enough. Musicians absolutely should know exactly what the dollar breakdown is on any deal and should make a habit of asking before signing. Hopefully nobody is signing out of desperation! You bring up several important points:

1. Amazon.com's deal is still way better than the majors. Mechanical royalty rates on typical contracts hover around the \$1.25 range, after the often enormous recoupable expenses are met. Few musicians ever see mechanical royalties through standard distribution channels. Of course, good luck getting tour support!
2. The musician selects the retail price that Amazon.com will charge and can cancel the deal anytime for any reason.
3. It's only a rip-off if someone is being forced to sign. If you don't like it, don't sign. If no one signs, an unfair business usually fails.
4. Amazon.com's successes may offer a strong comfort level for some. Maybe Amazon.com's experience with e-commerce and tech support makes them attractive.
5. As a start-up, Amazon.com had to fight the humongo corporations (still do), just like you.
6. Thank you for aggressively promoting yourself and the importance of shopping around. You're a perfect example of the Internet Audio Rebel Alliance. Keep the faith!
7. The FezGuys neither recommend or condemn Amazon.com's practices (there's a shocker).

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## STUDIOMIX

continued from page 33

format. For working to picture, StudioMix provides simultaneous chase-lock synchronization of both audio and MIDI tracks to an external SMPTE clock source.

### THE FINALE

The system requirements for all of this are quite modest by today's standards. You'll need a PC running either Window 95, 98, or NT 4.0 with a 120 MHz Pentium processor or higher. For Windows 95/98, 16 MB of RAM will get you going, while NT 4.0 users will want 32 MB. StudioMix hardware and software work with Windows-compatible sound cards/MIDI interfaces. A sound card is required for digital audio record and playback. To install the program, you'll need a CD-ROM drive.

After all that, you can see why the StudioMix system was quite the buzz on the NAMM show floor. Peavey and Cakewalk are both strong, viable players in our industry, and their combined efforts have produced a system that certainly merits the attention of anyone in search of a new recording system.

MSRP is \$899. For more information, contact Cakewalk at 888-CAKEWALK or visit them on the Web at [www.cakewalk.com](http://www.cakewalk.com). Circle EQ free lit. #133.

## OPCODE TECH TIPS

continued from page 36

recommended drives have a speed of 7200 RPM, have an access time of 10 ms or less, and support asynchronous I/O.

3. RAM. The more the better. For professional applications, we suggest at least 64 MB of RAM. RAM allocation is very important. RAM assigned in the Buffer Size window is taken from the RAM left over after the System software and SVP get what they need. The higher the size and number of buffers, the less often SVP will need to access your disk, leaving power to run more audio tracks and VST plug-ins. SVP itself seldom needs more than 30 MB; use the leftover RAM for File Buffers for maximum performance.

4. Other tips. Turning off any inputs or outputs you're not using and reducing the number of available Audio Instruments (in the Audio Instruments and Routines window) will free up CPU power. And, if you're EQ'ing a channel but need only some of the available bands, bypass the unused bands. **EQ**

## THEE JOKER

continued from page 79

those who favor scratching, it becomes a very personal style.

There are also DJs, called "turntablists," who do nothing but scratch records and "beat juggle." For example, if I move the crossfader back and forth quickly enough, I can "juggle" the bass kick from one record and the snare from another record, creating an entirely new beat.

### SOMETHING SPECIAL

There even are specialty records that contain a variety of tools created specifically for DJs, such as loop or "battle" records — so named because they are used by turntablists when competing or "battling" against other DJs in contests. (This explains performances and CD titles such as *DJ Groovemeister vs. Power Scratch*.) These contain tracks with instrumental loops, various sound effects, and vocal samples that can be manipulated by the DJ to add textures and the live equivalent of "overdubs."

There are also "lock groove" records, which contain a single bar of music at exactly 133.333 BPM. Each rotation of the record is an exact loop of the bar; as the records are manufactured with a "locked groove" (i.e., one that doesn't cause the needle to progress closer to the center of the record, but stick in one groove), the music will loop until the DJ decides to stop it.

It is also possible to manufacture a record with multiple locked grooves, so a variety of loops, and even musical styles, can exist on a single record. For one example of this, check out *Cologne Cyclez*, a double-record set of locked grooves that has around 200 loops. There are even locked groove records where scratches are added on purpose to create rhythmic effects.

### THE FUTURE

Admittedly, some traditional musicians still don't "get it," and look down on DJs based on outmoded ideas of what DJs do. But this is definitely not the same world as that of the guy who segued Barbra Streisand songs at your sister's wedding.

What makes the field really exciting is the continued growth and change. At a marathon DJ fest at the Roxy club in Cologne, Germany, some DJs were playing synthesizer along with records, or even doing vocals against music that was more punk than dance. More electronically oriented musicians like Cirrus, Dr.

Walker, and many others are incorporating "DJ thinking" into what they do, courtesy of samplers and all-in-one boxes like the Akai MPC3000. The paradigm of "two turntables and a microphone" can now include variations such as "two turntables, a sampler, and a microphone," or even "a sequencer, a guitar, a MiniDisc, and a microphone." The variations are endless, and the art of the DJ is still comparatively new.

The Rock 'n' Roll paradigm of guitar, bass, drums, and vocals got kick-started about 45 years ago. Where will the art of the DJ be in another 25 years? It will be interesting to see where it all goes, but, take it from me, it's even more fun to participate.

*Thee Joker (e-mail: [joker@2600.com](mailto:joker@2600.com)) is a New York Hip-Hop/Breakbeat DJ and producer currently recording and playing in Europe. Songs on his latest demo, All I Did Was Point and Click, range from minimal Trip-Hop to Hyperbreakbeatdistortedfunkclassicalambientsamplehappynoise, and will be released in the spring on various labels.*

## USER OPTIONS

continued from page 82

the gain, you can talk through them. The sound quality is, at the very least, unique.

• **Sony MZ-R30 Recordable MiniDisc Player:** I love this machine because you can record extremely long loops, and there is virtually no memory limitation (74 minutes of stereo audio on one disc). I use it to layer spaced-out, non-rhythmic sounds that can loop for minutes at a time on top of an already-existing mix. This can give a groove a "fake" sense of linear motion. The cool thing is that there is no sync, so you have to work toward a feeling rather than a specific rhythm or melody. Also, you can combine different MiniDisc loops with different loops from the other samplers, making more user options.

*Classically trained orchestral timpanist Frank Heiss changed his musical direction after using a digital sampler. An electronic composer/producer/remixer who divides his time between Cologne, New York, and Boston, he has recorded for labels such as Home Entertainment/Liquid Sky NYC, Harvest/EMI, and Syncom Productionz/Cologne. He also writes articles and does workshops on beat programming.*




## SAME LANGUAGE

continued from page 88

OMFI as a way to have the audio and video rooms communicate seamlessly. Mackewich comments, "OMFs allow us to go right to the mix by transferring files quickly without having to reconfirm. We have all our rooms tied together using a network that runs audio, video, timecode, and machine I/Os through ELCO connectors (a system designed by Rob Fleischacker), allowing us to quickly plug in a session and get to work. OMFI really blurs the lines between mixing and editing."

Gizmo Avid editor Paul DiNatale recalls using OMFI to help cut a The Doors' *Legends* show: "I created an 8-channel audio layout that included my fades, cuts, timecode, and media information. Once all the elements were in place, I then created an OMF file of the finished sequence. I exported it to our house drives so it could be sweetened in Pro Tools." Engineers Sean McAuliffe and David Glaser then easily created the Pro Tools session from DiNatale's OMF Avid output. From there, they sweetened the audio mix, and laid the final to D-2 for airing.

The use of OMFI to stay compatible across different platforms has certainly proved its value to those who use it daily. With more and more formats and standards entering our workspace, we can only hope all the manufacturers look at the success of OMFI and realize we all need to speak the same language. 

## BEYOND SOLO

continued from page 88

overlays structure to what I do, while I encourage him to take more chances. The Nord Modular rack was used specifically to filter the tabla sound. To do this, I connected the Eurorack's control room output to the Modular's stereo input. This setup allows selecting each channel independently with the mixer's PFL buttons, making it easy to insert the tabla (or anything else, for that matter) into the filter.

The Studio Quad has four effects (usually set up as reverb, 4X delay, 16X delay, and pitch shift), which return as a stereo signal. These feed mixer channels 19/20, which allow for equalization. The processing is an important part of the overall sound, specifically because the synchronized delays add rhythm and "space" at the same time.

I think the most important aspect

about choosing a setup for live performance is to have as much freedom as possible. This means that you can react, not just act. Simply knowing how to use the hardware does not make a good live (electronic) musician; it's more the feel, and being able to produce the right kind of music for what an audience is feeling at that particular moment. In a way, the technique of playing sounds is less important than choosing the most suitable sound, loop, or effect at the right time. If you can place the least amount of restrictions on yourself, and have the confidence that you will, through whatever means, play what works for the moment, that's the key to being an effective live performer.

*Irwin Leschet is working on an MPC-CD-ROM for the Wizoo company, contributed a track to the new Battery Park 2-CD audio compilation, and has done some loops for the lock groove loop record Cologne Cyclez. Contact him at: audiokunststoff@gmx.de.*

## GROUP THERAPY

continued from page 122

compressor back to the same channel.

Depending upon how many auxes and channels are available, you could use this technique to create a bunch of extra subgroups. Using the input list found in the sidebar as an example, we could create the following groups:

Sub 1/2: Stereo drums

Sub 3/4: Stereo keys

Sub 5/6: Vocals

Sub 7/8: Stereo effects

Aux 5 to channel 31: Bass group

Aux 6 to channel 32: Compressed kick/snare

Aux 7 to channel 33: Guitars left

Aux 8 to channel 34: Guitars right

This still leaves 4 auxes available for effect sends, and can definitely make mixing the show easier. Note that it's not specified whether the vocal groups are stereo or mono. This really depends upon the taste of the engineer. Some engineers will pan the backing vocals out to the left and right, leaving the lead vocal in the middle. Other engineers will leave all vocals panned center on two groups, using this "double assignment" to give the vocals more power in the mix. Either approach works well, and you still have the convenience of subbing the vocals.

*In addition to being the senior editor of EQ Magazine, Steve "Woody" La Cerra is the live sound engineer for Blue Öyster Cult. Though he often needs lots of subgroups and lots of sleep, he rarely gets either. He may be reached via e-mail at WoodmanEQ@aol.com.*



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# Blame Somebody Else

How to deal with manufacturer warranties



BY MARTIN POLON

We have apparently entered a new era in professional audio. The failure of a piece of equipment under warranty — whether a computer or a piece of studio audio gear — is now sometimes construed (by that equipment's maker) as being the province of some failure in judgment or poor decision making. All of this, of course, on the part of the equipment buyer. Date of purchase has nothing to do with it — the warranty validity (at least as to actual dates) has never been the issue of contention.

What users are hearing from "customer service" (frequently a real misnomer) are some of the following commentaries:

- From a major and well-known computer maker upon trying to configure a new computer for cable modem functionality in the studio: "If you or your cable professional installs a 10-base-T Ethernet card in your computer, you will void the computer's warranty no matter who does the install." Customer service, when asked why the built-in PCI slots were provided if they could not be used, commented, "It's part of our corporate policy and I have no local control over it."

- From a well-known maker of audio power amplifiers: "You should not have used the amplifier to feed a 2-ohm load. Therefore the problem is your causation and responsibility."

- A premiere maker of condenser microphones, having evaluated a recent return, commented: "Your artist expected so significantly that the liquid

shorted out the capsule, and, therefore and therehow, the repair will not be under warranty."

- A computer printer maker's customer service department told a confused new purchaser that he had the wrong printer drivers in the box and that he was missing his printer operating manual. They offered to replace the drivers (so the user could actually use his new printer) for only \$6 per driver and \$8 for the manual. And, oh yes, the phone call to customer service was charged at \$10 per occurrence! And all of this under the name of warranty service!

What has happened to the old story of a "warranty is a warranty is a warranty, so help me God and til death do us part?" Apparently there is a new reality of warranties that "fool some of the people at least some of the time!"

It is clear that, for some companies, there are indeed a new set of rules as to how they perceive their warranty responsibilities. The following rules could be helpful to studio owner/operators trying to conform to the new realities of obtaining warranty service for their equipment.

1. Make sure that you obtain a written copy of the warranty for each piece of equipment you buy.

2. File each warranty by alphabet. Make a copy of each warranty and file by date of warranty expiration.

3. Have a copy of the warranty in your hands when you communicate with customer service about the piece of equipment in question.

4. Assume that, although the contact experience with customer service could be difficult at best, the realities of both Federal law and Federal Trade Commission

practices has not changed, and therein lies the proof of the pudding.

5. In each State of the Union and in such jurisdictions as the European Community, there are other rules and regulations covering warranties and warranties service that also mandate protection for the buyer.

6. It is also important to remember that the vast majority of audio/studio equipment makers are both reputable and committed to servicing their legitimate customer base. Even those equipment makers who preoffer annoyance at calls for help may reflect only a warranty service manager who really does not speak for the rest of the company.

7. It is also important for studio equipment customers to see what is happening on the other side of the street. Infrequently, customers will phone in for warranty service on products bought "off the truck" or from "a friend." The most anyone can expect from customer service in that venue is a service call from the FBI.

Using and receiving manufacturer's warranty service is very much an interactive relationship. If the customer reacts to the customer service entity with intelligence and humility, most, if not all, requests will be met with complete satisfaction. If, on the other hand, a customer allows his or her rage about a piece of equipment to dominate the

conversation, the outcome may still be the same, but it will take a lot longer to get there and much less pleasantly. This is not to say that there are not "bad apples" that throw blame back at the customer, but if we all start on the nice side of such contacts, the outcome will frequently be a lot easier to resolve!

*If the customer reacts to the customer service entity with intelligence, most, if not all, requests will be met.*



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\* monitor, mouse & keyboard sold separately



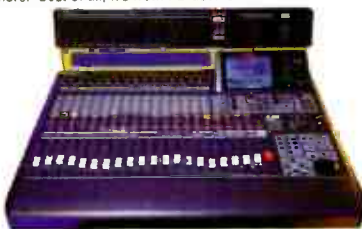
### WR-DA7 Digital Mixing Console



Stop dreaming about your digital future, it's here! The Panasonic WR-DA7 digital mixer features 32-bit internal processing combined with 24-bit A/D and D/A converters as well as moving faders, instant recall, surround sound capabilities, and much more. Best of all, it's from Panasonic.

#### FEATURES-

- 32 Inputs/6 AUX send/returns
- 24-bit converters
- Large backlit LCD screen displays EQ, bus and aux assignments, and dynamic/delay settings.
- 4-band parametric EQ
- Choice of Gate/Compressor/Limiter or Expander on each channel
- 5.1 channel surround sound in three modes on the bus outputs
- Output MMC
- Optional MIDI joystick



\* meter bridge optional

## TASCAM

### TMD1000 Digital Mixing Console

You want to see what all the digital mixing buzz is about? The NEW TMD100 from Tascam will have you smiling & automatin' in no time. It features fully automated EQ, levels, muting, panning and more in an attractive digital board with an analog 'feel'. Your digital future never looked, or sounded, so clear.

#### FEATURES-

- 4 XLR mic inputs, 8 1/4" balanced TRS inputs.
- 20-bit A/D D/A conversion, 64x oversampling on input, 128x on output
- Store all settings, fully MIDI compatible.
- **Optional IF-TD1000** adds another 8 channels of TDIF and a 2-channel sample rate converter.
- **Optional FX-1000** Fx board adds another 4 dynamic processors and another pair of stereo effects.



## DIGITAL RECORDING



### Lexicon Studio Recording System

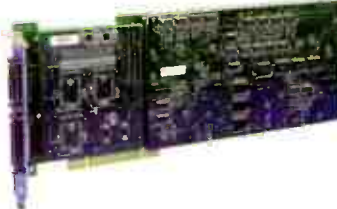
The Lexicon Studio System interfaces with your favorite digital audio software for a complete hard disk recording package. Supporting both PC and Mac, Lexicon Studio can be expanded up to 32 voices from a variety of I/O options. For recording, editing, mixing and DSP, Lexicon Studio is here.

#### FEATURES-

- The Core-32 System PCI-Card is capable of supporting 32 audio streams simultaneously. It can also be used as a time code or clock master or slave.
- The PC-90 Digital Reverb daughterboard attaches to the Core-32 providing 2 discrete stereo reverbs.
- The LDI-12T delivers up to 12 channels of simultaneous I/O supporting analog (+4 XLR and -10 RCA), s/pdif, and ADAT.
- Direct support of Steinberg Cubase VST and many other software programs.

#### OPTIONS

- The LDI-16S provides 8 channels of +4 XLR balanced analog I/O, and 8 channels digitally through TDIF. 3 option packages are:  
 AES-8, 8 channels of AES/EBU digital I/O  
 ADT-8, 8 channels of ADAT digital I/O and sync  
 STC-1, Post option including read and write of LTC, read and generate of VITC, Window-burn, House Sync and a General Purpose Interface for triggering external devices from the system).



## EFFECTS PROCESSING



### Finalizer Express



The Finalizer Express is a fast and efficient way to turn your mix into a Professional Master! Based upon TC's Multi-Award winning Finalizer Mastering Technology, it delivers the finishing touches of clarity, warmth and punch to your mixes, putting the world of professional mastering within your reach.

#### FEATURES-

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- Connections include AES/EBU, S/PDIF, Optical Toslink & MIDI I/O's.
- High Res LED Metering of I/O & multi-band gain reduction

### M3000 Professional Reverb



Incorporating TC Electronic's new VSS-3 technology, the M3000 is a great sounding, versatile reverb that is easy to use. Combining ultimate control of early reflections with a transparent reverb tail, the art of reverberation is brought to a new level. Whether it's a phone booth, cave or concert hall, the M3000 delivers high-quality ambience.

#### FEATURES-

- VSS-3, VSS-3 Gate, C.D.R.E. & REV-3 reverbs as well as Delay, Pitch, EQ, Chorus, Flanger, Tremolo, Phaser, Expander/Gate, Compressor and De-Esser
- 300 high-grade factory presets including Halls, Rooms, Plates, Ambience, Gated Reverbs, and more

- Up to 300 user presets in internal RAM and 300 more using an optional PCMCIA card.
- Dual engine configuration featuring 24-bit A/D/D/A's.
- Connections include AES/EBU, Coaxial S/PDIF, Optical Tos-Link/ADAT & analog XLR I/Os, MIDI IN/OUT/THRU, Clock Sync and External Control.



### MPX1 Multi-Effects Processor



The MPX-1 is truly an outstanding multi-effects device. Using Lexicon's Lexchip, it offers outstanding reverb or ambience as well as a separate processor for effects for awesome power in the studio or on the road.

#### FEATURES-

- Intuitive user interface for easy editing, built-in help.
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## COMPRESSORS



### ACP88 8 Channel Compressor

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#### FEATURES-

- 8 separate compressors/gates with individual controls.
- Servo balanced or unbalanced inputs & floating balanced or unbalanced outputs.
- Individual side chain jacks for spectral compression and a separate sidechain jack for gate processing.

- Each channel boasts full gain reduction metering, compression threshold indication & gate open/close.
- Front panel buttons include hard/soft knee compression, peak/auto compression, bypass, gate range and link.
- Link feature uses a unique summing bus for multiple combinations of master/slave link setups.

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The new Silver Series introduces a 2 vacuum tube circuit design making the 566 no ordinary compressor. Loaded with features including custom designed analog VU meters that monitor tube level, gain reduction, or output levels. Full sidechain functionality, including sidechain monitor, Contour function allows low frequency material to pass through the threshold without triggering un-musical compression effects.



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- 20-bit A/D D/A converters
- 2 optional 24-bit stereo effects processors (VS8F-2) provide up to 8 channels of independent effects processing.



- New EZ routing function allows users to create and save various recording, mixing, track bouncing, and other comprehensive mixer templates for instant recall.
- 10 audio inputs: 2 balanced XLR-type inputs w/ phantom power, 6 balanced 1/4" inputs, and 1 stereo digital input (optical/coaxial)
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## CD RECORDERS

**Fostex**

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#### FEATURES-

- Converts any input signal to CD 44.1kHz standard
- Uses both Professional and Consumer CD formats
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- AES/EBU In, XLR Balanced Ins, Unbalanced Ins & Outs
- 5 Record Modes, Records To Red-Book Standards



- IDs Recorded Automatically
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- Full-function Remote Included

## STUDIO DAT-RECORDERS

**TASCAM**

### DA-45HR Master DAT Recorder

The new DA-45HR master DAT recorder provides true 24-bit resolution plus standard 16-bit recording capability for backward compatibility-making this the most versatile and great sounding DAT recorder available. With support for both major digital I/D protocols plus the ability to integrate the machine into virtually any analog environment, the DA-45HR is the ideal production tool for the audio professional.

#### FEATURES-

- Word Clock
- 24-bit A/D and 20 bit D/A with dither
- XLR balanced and RCA unbalanced analog I/O
- AES/EBU and S/PDIF digital I/O



- Word Sync In/Thru
- Alphanumeric data entry for naming programs
- Independent input level adjustment capability
- Output trim for XLR balanced analog output
- Optional RC-U45 Remote Controller

## DIGITAL MULTI-TRACK RECORDERS

**TASCAM**

### DA-88 Modular Digital Multitrack

The standard digital multitrack for post-production and winner of the Emmy award for technical excellence, the DA-88 delivers the best of Tascam's Hi-8 digital format. Its Shuttle/Jog wheel and track delay function allow for precise editing and synchronization and the modular design allows for easy servicing and performance enhancements with third-party options.

#### FEATURES-

- 1-48 minutes record time on a single 120 min tape
- Expandable up to 128 Tracks using 16 machines
- User-definable track delay & crossfade
- Shuttle & Jog capability
- Auto punch with rehearsal



- SMPTE, MIDI and Sony 9-Pin sync capability
- Options include RC-808/848 Remote Controllers, IF-88AE/IF-885D digital interfaces, MU-Series meter bridge, MMC-88 MIDI machine control interface, SY-88 Sync Card

### DA-38 Digital Multitrack for Musicians

Designed especially for musicians, the DA-38 is an 8 track digital recorder that puts performance at an affordable price. It features an extremely fast transport, Hi-8 compatibility, rugged construction, ergonomic design and sync compatibility with DA-88s.



**ALESIS**

### ADAT M20 20-bit Digital Audio Recorder

The M20 represents Alesis commitment to meeting the high-standards of world-class audio engineers, producers, studio owners and high-end video and film post production studios. A new professional digital multi-track, the M20 records 20-bit for outstanding sound quality. Combined with a host of production features like SMPTE/EBU, the M20 is a powerful tool.

#### FEATURES-

- SVHS Recording format - up to 67 minutes recording.
- 18-XLR connections (9 in and 9 out) as well as a 56-pin ELCO connection.



- 24-bit, 64x oversampling recording, 20-bit, 128X oversampling playback
- Digital I/O
- Includes LRC remote and a digital cable.

### ADAT XT20 Digital Audio Recorder

The New ADAT-XT20 provides a new standard in audio quality for affordable professional recorders while remaining completely compatible with over 100,000 ADATs in use worldwide. The XT20 uses the latest ultra-high fidelity 20-bit oversampling digital converters for sonic excellence, it could change the world.

#### FEATURES-

- 10-point autolocate system
- Dynamic Braking software lets the transport quickly wind to locate points while gently treating the tape.



- Remote control
- Servo-balanced 56-pin ELCO connector
- Built-in electronic patchbay
- Copy/paste digital edits between machines.

### ADAT LX20 Digital Audio Recorder

The most affordable ADAT ever made, the new LX20 features true 20-bit recording at a price you won't believe. Compatibility with all other ADATs and digital consoles, the LX20 provides the same sync options and digital inputs as the big brother XT20 at a lower price point.

**Fostex**

### D-15 Pro Studio DAT Recorder

The new Fostex D-15 features built in 8Mbit of RAM for instant start and scrubbing as well as a host of new features aimed at audio post production and recording studio environments. Optional expansion boards can be added to include SMPTE and RS-422 compatibility, allowing the D-15 to grow as you do.

#### FEATURES-

- Hold the peak reading on the digital bargraphs with a choice of 5 different settings
- Set cue levels and cue times
- Supports all frame rates including 30df
- Newly designed, 4-motor transport is faster and more efficient (120 minute tape shuttles in about 60 sec.)
- Parallel interface • Front panel trim pots in addition to the level inputs



### D-15TC & D-15TCR

The D-15TC comes with the addition of optional chase and sync capability installed. It also includes timecode reading and output. The D-15TCR comes with the further addition of an optional RS-422 port installed, adding timecode and serial control (Sony protocol except vari-speed)

**SONY**

### PCM-R500

Incorporating Sony's legendary high-reliability 4D.D. Mechanism, the PCM-R500 sets a new standard for professional DAT recorders. The Jog/Shuttle wheel offers outstanding operational ease while extensive interface options and multiple menu modes meet a wide range of application needs.

#### FEATURES-

- Set-up menu for preference selection. Use this menu for setting ID6, level sync threshold, date & more. Also selects error indicator.
- Includes 8-pin parallel & wireless remote controls



- SBM recording for improved S/N (Sounds like 20bit)
- Independent L/R recording levels
- Equipped with auto head cleaning for improved sound quality.

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## TUBE MICROPHONES



### SOLIDTUBE TUBE MICROPHONE

The SOLIDTUBE combines the best of solid state and tube technology to provide a "warm" sounding microphone suitable for professional recording applications.

#### FEATURES--

- Large diaphragm condenser
- Integrated pop screen surrounds the capsule, reducing excessive pop noise
- ECC 83 (12AX7) vacuum tube which provides perfect transfer characteristics
- Includes elastic shock mount
- Low-cut switch, Ground lift switch



### audio-technica. AT4060

Combining premium 40 series engineering and vintage tube technology, the AT4060 delivers a versatile and competent studio microphone. Low-noise and high SPL capabilities make the AT4060 a premier vocal mic as well as strings, guitars and other demanding applications.

#### FEATURES-

- 20 - 20,000 Hz freq response
- Dual gold-vaporized large diaphragm elements
- Includes the AT8560 power supply, AT8447 shock mount, rack mount adapters and case.



## MICROPHONES

### SHURE KSM-32

The new KSM32 side-address microphone features an extended frequency response for open, natural sound reproduction. Suitable for critical studio recording and live sound production, Shure steps up to the plate with another classic.



#### FEATURES-

- Class A, transformerless preamplifier circuitry for improved linearity across the full frequency range.
- Exceptionally low self-noise and increased dynamic range necessary for highly critical studio recording.
- 15 dB attenuation switch for handling high SPLs.
- Switchable low-frequency filter to reduce vibration noise or to counteract proximity effect.
- Great for vocals, acoustic instruments, ensembles and overhead miking of drums and percussion.
- SL model also features an elastic shock mount which greatly reduces external vibrations.

### BPM CR10

Hand-crafted in East Berlin, the BPM CR10 Studio Condenser Mic features a full frequency response for competition against the best of the best.

#### FEATURES-

- 1" Gold diaphragm
- Suitable for most guitar and vocal recording applications.
- Includes Custom Aluminum Road Case, XLR-cable, wind screen and elastic suspension.



## SAMPLING

# AKAI



### \$5000 & \$6000 Studio Samplers

Akai is proud to announce its next generation of samplers with the introduction of the S6000 and the S5000.

Building upon Akai's legendary strengths, both machines feature up-to 128-voice polyphony and up-to 256 MB of RAM. They use the DDS disk format and .WAV files as the native sample format allowing standard PC .WAV files to be loaded directly for instant playback - even samples downloaded from the Internet into your PC may be used. And of course, both the S6000 and S5000 will read sounds from the S3000 library.

#### FEATURES--

- OS runs on easily upgradeable flash RDM.
- 2x MIDI In/Du/Thru ports for 32 MIDI channels
- Stereo digital I/O and up to 16 analog outputs.
- 2x SCSI ports standard
- Wordclock connection
- Optional ADAT interface provides 16 digital outputs
- .WAV files as native sample format

#### \$6000 ONLY FEATURES--

- Removable front panel display
- User Keys
- Audio inputs on both the front and rear panel allow you to wire the S6000 directly into a patchbay from the back and override this connection simply by plugging into the front.



E-MU

## E-mu Systems, Inc.

### E6400 Professional Sampler

The e-6400 from EMU features an easy interface that makes sampling easy. Automated features like loading, normalizing and more allow you to flexibly create your own sound palette or access any of the 400 sounds provided on 2 CDs for unlimited sound creation. It is upgradeable to 128MB of RAM (4MB standard) and features 64 voice polyphony, 8 balanced analog outputs, SCSI, stereo phase-locked time compression, digital re-sampling and more. A dream machine.



## MIC PREAMPS

### Focusrite Green 3 "Voicebox MKII"



The Voicebox MKII provides a signal path of exceptional clarity and smoothness for mic recording, combining an ultra-high quality mic amp, an all new Focusrite EQ section optimized for voice, and full Focusrite dynamics. The new MKII now includes a line input for recording and mixdown applications.

#### FEATURES-

- +48V Phantom power, phase reverse, and a 75Hz high-pass filter.
- Mute control and a true-VU response LED bargraph are also provided
- Includes a Mid-Parametric band with controls especially designed to enhance vocal characteristics.

- Single balanced Class A VCA delivers low distortion and a S/N ratio as low as -96dBu
- Dynamics section offers important voice processing functions such as compression and de-essing combined with a noise reducing expander.

### dbx 586 Vacuum Tube Mic Pre

The DBX 586 Vacuum Tube Dual Mic Preamp uses hand selected and matched premium 12AU7 vacuum tubes ensure ideal characteristics for a warm, distortion free signal path.

Custom designed analog VU meters monitor tube level insert path or output levels well. Line/Instrument and mic inputs make the 586 versatile enough to use with virtually any input source.

#### FEATURES-

- Mic or line/instrument inputs on each channel.
- 3-Band EQ with sweepable frequency
- +4/-10 operation.
- Optional TYPE IV Conversion System outputs
- Drive control for a wide variety of great tube effects
- Separate 1/4" insert send/return on each channel



### JOE MEEK VC1 Studio Channel

The Joe Meek Studio Channel offers three pieces of studio gear in one. It features a transformer coupled mic pre, compression and a professional enhancer together in a sleek 2U rackmount design!

#### FEATURES-

- 48V phantom power, Fully balanced operation
- Mic/line input switch
- High pass filter for use with large diaphragm mics
- Extra XLR input on front makes for easy patching
- Compression In/Out & VU/Compression meter
- Enhancer In/Out switch and enhance indicator
- Internal power supply 115/230V AC



## MONITORS



### M6000/S Studio Monitors

The KRK M6000/S are designed for close-field monitoring. A smooth frequency response in a compact size make these units portable and efficient.

#### FEATURES-

- High power handling
- 62Hz - 20kHz, ±3dB
- Compact and portable
- Low distortion
- Smooth frequency response
- Custom Gray finish.



### Hafler TRM-8

#### Powered Studio Monitors

Winner of Pro Audio Review's PAR Excellence Award in 1997, Hafler's TRM8s provide sonic clarity previously found only in much more expensive speakers. They feature built-in power, an active crossover, and Hafler's patented Transnova power amp circuitry.

#### FEATURES-

- 45Hz - 21kHz, ±2dB
- 75W HF, 150W LF
- Electronically & Acoustically matched



## MACKIE

### HR824

These new close-field monitors from Mackie have made a big stir. They sound great, they're affordable, they're internally bi-amped. "What's the catch?" Let us know if you find one.

#### FEATURES-

- 150W Bass amp, 100W Treble amp
- Full space, half space and quarter space placement compensation
- Frequency Response 39Hz to 22kHz, ±1.5dB



### TANNOY Reveal

The latest playback monitor from Tannoy, the Reveal has an extremely detailed, dynamic sound with a wide, flat frequency response.

#### FEATURES-

- 1" soft dome high frequency unit
- 100g throw 6.5" bass driver
- Magnetic shielding for close use to video monitors
- Hard-wired, low-loss crossover
- Wide, flat frequency response
- Gold plated 5-way binding post connectors





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## TASCAM DA-45

continued from page 135

### THIS IS A TEST: PLEASE STAND BY

I made several simultaneous test recordings with the DA-45 and an SV-3700 (using their internal converters). The original analog source (the mic preamp output) was also compared to the digitally converted signal. The performance and recording both sounded quite good. I made sure the levels were within 0.025 dB, changed cables, and modified the test several times to help further reveal resolution. Still, something in my monitor chain is impeding my overall ability to perceive a major difference. What I'm saying here is that you shouldn't expect resolution miracles from a 24-bit DAT machine. There are other factors and equipment in the monitoring chain that will affect what you perceive in the final playback. Your playback system also has to be up to the task.

As an aside, I recently heard the Prism 24-bit converter side by side with the Panasonic SV-3700 (at Studio Consultants in New York). The Prism came close to matching the analog source, while the SV-3700 clearly revealed its age. As I mentioned earlier, it's a matter

of imaging. Of the people I know who are using the DA-45, one is especially particular about resolution, and, consequently, uses external converters while utilizing the DA-45's ability to capture 24-bit data. (Note: the Prism AD-124 and Dream DA-1 are \$5120 and \$5630, respectively.)

The DA-45 is an affordable, transportable 24-bit DAT machine, designed to store all those extra HR bits you've collected. And it's the only 24-bit DAT available. So, assuming you've captured reality, it can now be stored on a TASCAM DA-45 without compromise. **EQ**

## ACROSS THE BOARD

continued from page 162

The proper connection method is to use an adapter that includes a transformer, such as the AES3id converter made by Graham-Patten. Remember that these connection methods will only work if the software in the devices connected will allow it.

The second consideration is the data differences between AES and S/PDIF. S/PDIF is supposed to contain bits for copy protection so that you can-

not copy from a second-generation DAT tape. Most professional DAT machines and outboard gear with digital interfaces ignore the copy protection bits. Sometimes the data is actually AES format, but the connector is S/PDIF. Some DAT decks, like the Panasonic 3700 series, have multiple connectors on the back for S/PDIF and AES. They will refuse to allow the wrong format into the wrong connector. There is a switch to select the desired input format. Sometimes all of the connectors are fed all of the time, and all with the same data format that is selectable in software. Such is the case with TC Electronic's Finalizer Plus. Also, keep in mind that AES can contain 24-bit audio, but S/PDIF can only contain 20-bit audio because the extra bits are used for the copy protection and sample rate flags.

Finally, remember that the sample rates among all of the digital devices must match, or your reverb will sound like an explosion in a Rice Crispy factory.

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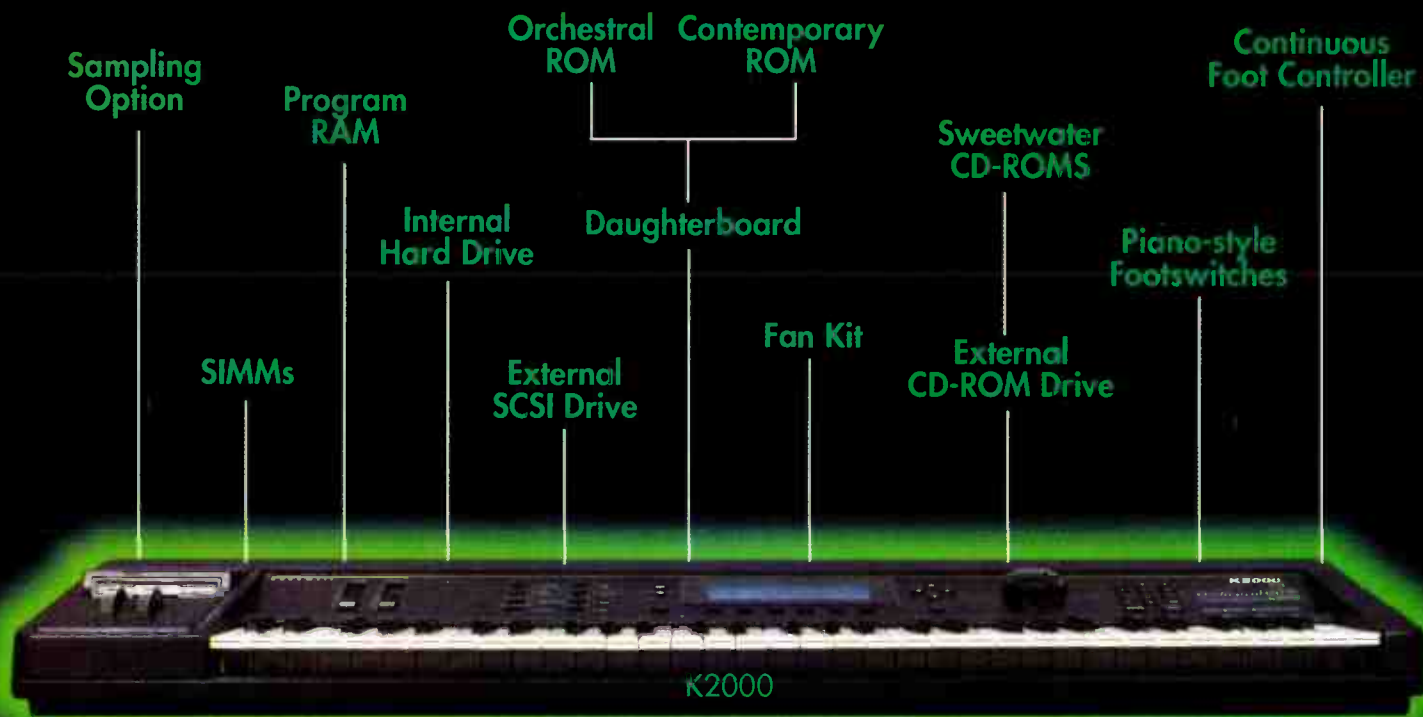
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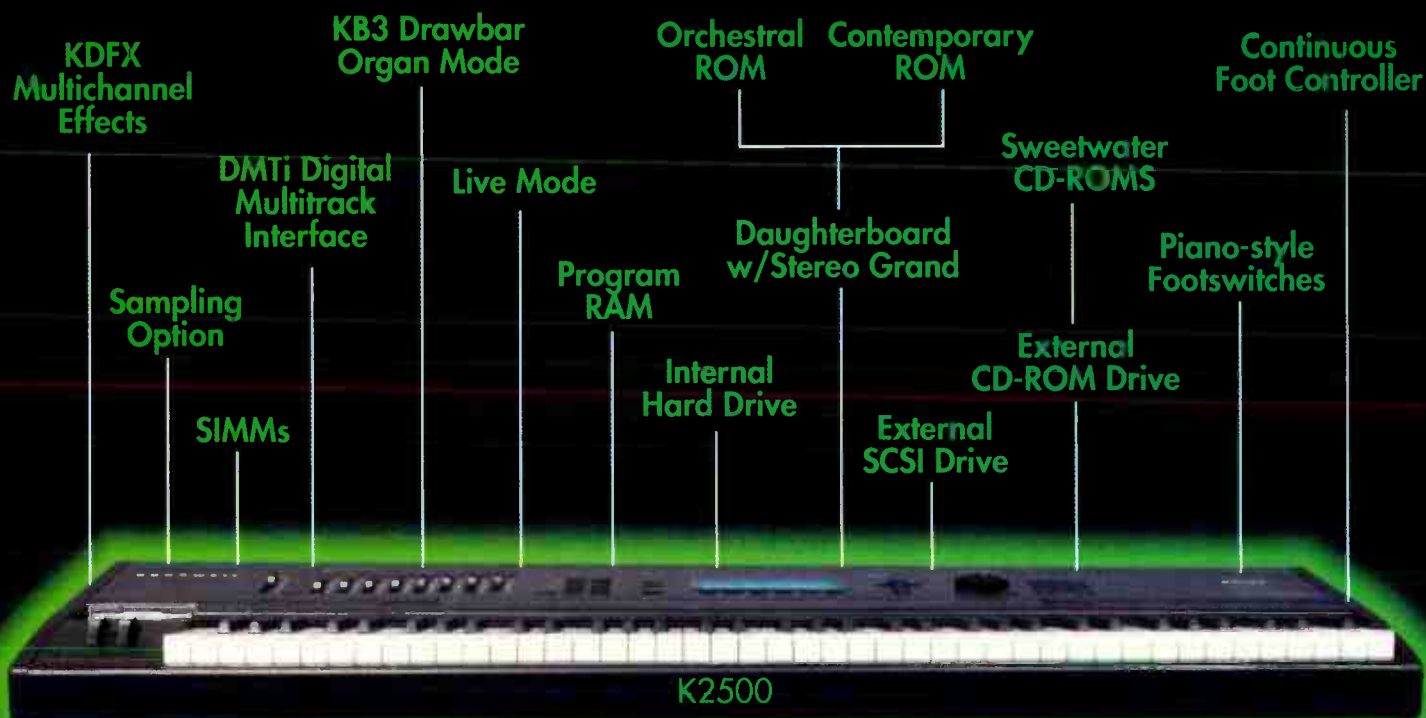
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- Step 3:** Combine with software from Steinberg, Sonic Foundry, BitHeadz, Waves, and Antares.
- Step 4:** Complete with a robust Glyph hard drive, DAT backup, and CD-Burner.
- Step 5:** Serve hot and enjoy astonishing power!



# We do Windows ...together



## Auto-Tune Pitch Corrector—Now for Windows!

When Auto-Tune first hit the market as a TDM plug-in just a short while ago, the response was truly amazing. Delivering intelligent intonation correction without robotic side-effects, Auto-Tune was so good, folks were purchasing \$8,000 systems just to run it! Now the full version of Auto-Tune is available as a DirectX plug-in to use with your Windows audio rig. Correct intonation problems in vocals or solo instruments in realtime, without distortion or artifacts, while preserving all of the expressive nuances of the original performance. Auto-Tune gives you both Automatic and Graphic Modes to fine-tune your fine-tuning! And the pros all love Auto-Tune because the only sonic difference between what goes in and what comes out is the intonation.

"Holy Grail of recording"—Recording Magazine



## Sonic Foundry Mastering House

While Mastering House is an incredible collection of professional mastering tools, that's just the beginning. It also brings you brilliant creative capabilities you can use at every stage of the recording process. This new bundle saves you a bundle as well! Let's step inside:

**Sound Forge 4.5**—Your host? The award-winning Sound Forge Audio Editor of course! It slices! It dices! It sets the standard for editing Windows audio. Great with the 2408 or any Windows soundcard. MC Sound Forge also serves up steaming loops and DSP effects.

**CD Architect**—Who's spinning the tunes? Why it's CD Architect! Design and build your own audio CDs with speed and precision. You'll rave about the drag-and-drop playlists. Exacting control of crossfades, track markers, EQ, compression, and support for both SCSI and ATAPI/IDE burners help you perfect your master CD.

**XFX 1 & 2**—Take your sound out of bounds with the XFX 1 & 2 collections of amazing audio plug-ins. Noise Gate, Multi-band Dynamics, Compression/Expansion, EQ, Reverb, Time Compression, Pitch Shift and Chorus effects — whew! From tracking to mixing to mastering, you'll use these processors day in and day out.

## More Sonic Foundry Software & Plug-ins

**ACID**—"The coolest, easiest way to remix," proclaims acclaimed remixer Doug Beck. "True innovation," says Craig Anderton in EQ magazine. Feeling the fervor even further is Jeff Mac of Audio Media magazine who writes, "ACID is an absolute godsend." But Jeff, how do you really feel? Electronic Musician magazine took the easy way out and simply awarded it a 1999 Editor's Choice Award. No matter how you try to describe it, ACID burns through your preconceptions about creating music with a battery of realtime tools. Seamlessly mix & match tempos and pitch from drastically different loops without dropping a beat!

**Noise Reduction**—Got 60-cycle nasties, annoying clicks & pops, or horrible hums & rumbles? You could spend the rest of your natural life redrawing waveforms by hand. Or you could simply reach for Noise Reduction. It works wonders restoring "damaged" audio. About the only thing Noise Reduction can't quiet down is our enthusiasm for it!

**Acoustic Mirror**—Tired of the same old Reverb? Acoustic Mirror adds the acoustical coloration of real environments and sound-altering devices to your recordings with uncanny realism and stereo imaging. Simulate everything from large concert halls to vintage tube mics, or generate new effects. It includes an extensive library of high-quality acoustics "signatures" from a wide variety of environments.







**24 I/O, ADAT, TDIF, S/PDIF, Word Clock, and more—under \$1,000!**  
Sweetwater Sound has installed more 2408 systems than any other company in the world. Want to get the most out of your 2408? Take advantage of our experience with configuring and operating this amazing recorder for maximum performance, whatever software you choose.



### Unity & Retro—Superb Sampler & Software Synth!

BitHeadz is storming the sound module world with unrivaled software sampling and synthesis. Using the power of your Windows computer, Unity and Retro simply blow away hardware approachs when it comes to both features and price/performance. These are some of the most exciting products we've encountered in a long time. And with the multiple high-quality outputs of the MOTU 2408, you get everything you need to make Unity and Retro really sing! Both are ASIO and Direct Sound compatible.

**Unity**—The power and convenience of a full-screen software environment combined with awesome 24-bit, phase-locked stereo sampling! Imports 16 or 24-bit, WAV, AIFF, AKA, S-100, CD Audio, SoundForge 2.0, Sound Designer I/II, Sample Cell, W and more. Cross-stitch up to 128 samples per note.

Simultaneously loads from disk while playing. Built-in digital audio editor. Includes over 250MB of sounds with instruments, loops & GM bank.

**Retro**—Transforms your computer into perhaps the most powerful analog synthesizer ever devised. You get three oscillators per voice (plus LFOs with any of 9 continuously variable waveforms. That's simply unrivaled flexibility! Use the 2 filters with 13 filter types in series or parallel. Includes Frequency and Cutoff (Poly Mod) modulation. Enjoy realtime control of every parameter simultaneously with MIDI. You even get 1,000 classic analog patches to get you going right away.



### Native Power Packs

Waves is the most respected name in audio processing plug-ins. Once available only to the fortunate few, they've brought their delicious line of processors to Windows native audio in

two great Native Power Pack bundles. Get both for a comprehensive collection of extreme fidelity software processors. Compatible with all the top Windows audio programs including Cubase VST, Sound Forge and WaveLab.

#### Native Power Pack I—Legendary Waves processors:

- TDR60—Virtual front-end reverb and distance processor!
- Q10—Parabolic Equalizer—the "Swiss Army knife" EQ!
- C1—Compressor/Gate—frequency-specific compression!
- S1—Stereo Imager—for "wide" stereo enhancement!
- L1—Ultimate Limiter—industry standard mastering limiter!

#### Native Power Pack II—acclaimed Renaissance plug-ins:

- Renaissance Compressor—warm sound and simple operation!
- Renaissance Equalizer—an amazingly musical, transparent EQ!
- MaxxBass—the ultimate bass enhancer!
- De-esser—dedicated de-esser, high-frequency reduced!



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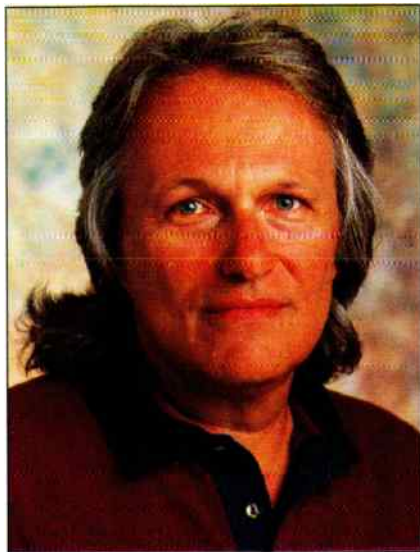
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(world radio history)

# I'm No April Fool



Answers to those  
questions you've been  
asking me

BY ROGER NICHOLS

This month I am going to answer a few questions that have shown up in my in-box.

*Q: I just listened to the new Bela Fleck album and noticed it was recorded and mixed using Pro Tools<sup>24</sup>. I'd be very interested to know if you used a lot of plug-ins, or if you used outboard gear, or both. Do you have a list of equipment/plug-ins used? Did you use plug-in reverbs, or did you digitally route to external dedicated reverb units? What's your take on plug-in reverbs?*

*I'm interested in your opinion on these topics. If you could let me know, I'd appreciate it. Thanks for your time and consideration!* —Blair Leishman

A: First of all, thanks for the e-mail, but I didn't find the attached \$20 bill I was expecting. On the Bela Fleck CD (which just won a Grammy, and brings Bela's to-

tal to three!), mixing completely in Pro Tools was great. We used both outboard and plug-in reverbs. The outboard reverbs were various Lexicons connected digitally via AES connections on the 888/24 I/O boxes. When we called up a mix, we would recall the appropriate named memory in each reverb and Bingo — exactly where we were the last time that song was up. We did use plug-in reverbs on occasion. As with any reverb, we would try different reverbs on each instrument until we found the right one for the job. Sometimes we would have to switch reverbs around because the PCM-90 sounded best on the sax, but we were already using it for drums. We would then send the drums to the PCM-80 to see if that worked all right.

Bela mostly used plug-ins for compression and EQ. A lot of attention was paid to the blend of instruments during the recording process, so there was not a lot of EQ needed in the mixes. The entire recording was done absolutely flat, with some monitor reverb, but no EQ. If Bela wasn't happy with the sound of an instrument, we would change mics, change mic position, or try another mic preamp.

*Q: Dear Roger Nichols (you will always be my Audio Hero): I was wondering if you knew a formula or conversion chart for converting tempos to milliseconds in order to dial up the correct delay setting on an effects processor. I would appreciate any help you can give me. Thank you.* —Cesar Mejia

A: Hey, this is a smart guy! I may have to get one of those superhero suits with a red cape. You can make your own chart using Excel or some other spreadsheet program, or you can easily calculate the delay time whenever you need it. The formula is:

$(60/\text{tempo}) * 1000 =$  the quarter-note delay in milliseconds.

The rest of the note values can be figured out from there. An eighth note would be half as much. A dotted anything would be 1.5 times the delay of the undotted note. A triplet would be 2/3 of the delay value.

I always carry around a pocket slide rule to calculate delay times. Since I disconnect the speedometer on my rental cars, I use the slide rule to calculate my

highway speed by measuring the time delay between mile markers. Maybe someone should build a metronome that reads out in miles per hour.

*Q: Bonjour Mr. Nichols. I'm a great fan of your articles in EQ magazine, and I've gotten a lot of your favorite gear in my project studio. I've recently bought an AES EBU card (one slot format) for my 02R in order to remain in digital domain with an external digital reverb unit. There is no problem with the Sony V 77, except that I have to buy the optional cordon, but how could I connect the Lexicon PCM 90 and the Roland R-880, which are both S/PDIF, to this AES EBU card? Is it as simple as connecting pin 2 cold with pin 1 ground? What sort of wire should I use for the connection: coaxial 75 ohms or 110 ohms wire. Thanks in advance.* —Laurent Siboni

A: Good work! Digital connections to all of your outboard gear are the best way to go. There are two separate issues to consider when mixing AES and S/PDIF.

The first one is the physical format difference. AES/EBU is balanced 1.5 volts, 110 ohms, connected with XLR-3's. S/PDIF is unbalanced .5 volt, 75 ohms, connected with RCA-type pin jacks. When making a XLR-to-RCA adapter for audio connections, it is common practice to connect ground and pin 3 together and connect them to the ground side of the RCA. This unbalances the signal, but you still get your audio because the center-tapped audio is present on the ground lead. AES signals are not configured the same way. The ground is only a shield and carries no signal information. If you use an audio adapter cable, you will get nothing. The signal will be shorted to ground, and nothing will come out the other end. In an emergency, you can make an adapter, but you must connect pin 2 and pin 3 of the XLR to the RCA connector and leave the ground on the XLR disconnected. Make sure the cable is short. For cable lengths of about three feet, it won't matter whether you use the 110-ohm or 75-ohm cable, and never use audio cable for permanent connections. For the RCA-to-RCA wire you can use video cable like the ones used for copying between video decks.

*continued on page 155*





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