

# E



MARCH 1994

## MIC PREAMP BUYER'S GUIDE

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ALESIS  
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STUDIO REFERENCE MONITOR

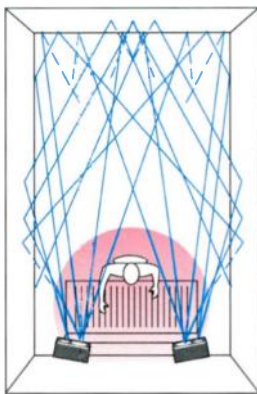
# The Truth From

The truth...you can't expect to find it everywhere you look, or listen. But when mixing music, hearing the truth from your monitors will make the difference between success and failure. You'll get the truth from the Alesis Monitor One™ Studio Reference Monitor.

## Room For Improvement

Fact: most real-world mixing rooms have severe acoustical defects. Typical home and project studios have parallel walls, floors and ceilings that reflect sound in every direction. These reflections can mislead you, making it impossible to create a mix that translates to other playback systems. Trying to solve the problem with acoustical treatments can cost megabucks and still might not work. But in the near field, where direct sound energy overpowers reflections, reverberant sound waves have little impact, as shown in the illustration. The Monitor One takes full advantage of this fact and is built from the ground up specifically for near field reference monitoring.

Working close to the sound solves the room problem but creates other problems, such as high frequency stridency and listener fatigue (typical of metal-dome and composite tweeter designs). Our proprietary soft-dome pure silk tweeter design not only solves these problems, but delivers pure, natural, incredibly accurate frequency response, even in the critical area near the crossover point (carefully chosen at 2500 Hz).



Does your living room double as your mixing suite? The pink area in the illustration shows where direct sound energy overpowers reflected waves in a typical mixing room. The Monitor One helps eliminate such complex acoustic problems by focusing direct sound energy toward the mixing position, instead of the love seat.

## The Truth From Top To Bottom

The Monitor One gives you all the truth you want in the mids and highs, but what about the low end? You probably know that the inability to reproduce low frequencies is the most common problem with small monitors. Most of these speakers have a small vent whose effect at low frequencies is nullified by random turbulence, or they're sealed, which limits the amount of air the driver can move. Such speakers give disappointing results in their lowest octave.

The Monitor One overcomes wimpy, inaccurate bass response with our exclusive SuperPort™ speaker venting technology. The ingenious design formula of the SuperPort eliminates the choking effect of small diameter ports, typical in other speakers, enabling the Monitor One to deliver incomparable low frequency transient response in spite of its size.



Alesis SuperPort™ technology gives you the one thing that other small monitors can't: incredibly accurate bass transient response. No, the SuperPort doesn't have a blue light, but it makes the picture look cool.

The result? A fully integrated speaker system that has no competition in its class. You'll get mixes that sound punchier and translate better no matter what speakers are used for playback. Whether you mix for fun or for profit, you want people to hear what you hear in your mixes. The Monitor One's top-to-bottom design philosophy is a true breakthrough for the serious recording engineer.

**ALESIS**  
**MONITOR ONE™**  
 STUDIO REFERENCE MONITOR

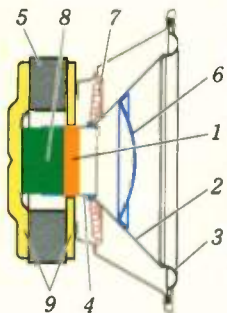
# Left To Right

## Power To The People

High power handling is usually reserved for the big boys. While most near field monitors average around 60 watt capability, the Monitor One handles 120 watts of continuous program and 200 watt peaks...over twice the power. Also, its 4 ohm load impedance allows most reference amplifiers (like the Alesis RA-100™) to deliver more power to the Monitor One than they can to 8 ohm speakers. That means the Monitor One provides higher output, more power handling capability, and sounds cleaner at high sound pressure levels. If you like to mix loud, you can.

## The Engine

Our proprietary 6.5" low frequency driver has a special mineral-filled polypropylene cone for stability and a 1.5" voice coil wound on a high-temperature Kapton former, ensuring your woofer's longevity. Our highly durable 1" diameter high frequency driver is ferrofluid cooled (costly, but it's the best way to cool a tweeter), to prevent heat expansion of the voice coil which inevitably leads to loss of amplitude and high



A cross section of the Monitor One's proprietary Alesis-designed 6.5" low frequency driver.

1. 1.5" voice coil.
2. Mineral-filled polypropylene cone.
3. Dia. pred linear rubber surround.
4. Kapton former.
5. Ceramic magnet.
6. Dust cap.
7. Spider.
8. Pole piece.
9. Front and back plates.

frequency response. Combined, these two specially formulated drivers deliver an incredibly accurate, unhypped frequency response from 45 Hz to 18 kHz,  $\pm 3$  dB. The five-way binding posts provide solid connection, both electronic and mechanical. We even coated the Monitor One with a non-slip rubber textured laminate so when your studio starts rockin', the speakers stay put. Plus, it's fun to touch.



The Monitor One's five-way binding posts accept even extra-large monster size, banana plugs and spade jags. Hookup is fast, easy and reliable.

## The New Alesis Monitor One™

You don't design good speakers by trying hard. It takes years and years of experience and special talents that only a few possess. Our acoustic engineers are the best in the business. With over forty years of combined experience, they've been responsible for some of the biggest breakthroughs in loudspeaker and system design. The Monitor One could be their crowning achievement. They're the only speakers we recommend to sit on top of the Alesis Dream Studio™.

See your Authorized Alesis Dealer and pick up a pair of Monitor Ones. Left to right, top to bottom, they're the only speakers you want in *your* field.

The Monitor One is the speaker for the Alesis Dream Studio™. Need more information about the Alesis Monitoring System? Call 1-800-5-ALESIS. See your Authorized Alesis Dealer. Monitor One, SuperPort, RA-100 and the Alesis Dream Studio are trademarks of Alesis Corporation. © Alesis is a registered trademark of Alesis Corporation.

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CIRCLE 03 ON FREE INFO CARD

# EQ

PROJECT RECORDING  
& SOUND TECHNIQUES  
VOLUME 5, ISSUE 3  
MARCH 1994



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EQ (ISSN 1050-7868) is published ten times each year by P.S.N. Publications, 2 Park Ave., Ste 1820, New York, NY 10016. Second class postage paid at New York, NY and additional mailing offices. POSTMASTER: Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. 1 yr. \$24.95, 2 yrs. \$39.95, 3 yrs. \$59.95. CANADA add \$10.00 per year for surface; other countries add \$15.00 per yr. for surface; All add \$30.00 per yr. for Airmail. Back-issues \$5. Printed in the U.S.A.

Cover: Frank Zappa by Lynn Goldsmith/LGI



It's nice to know an AKG studio standard isn't over anyone's head anymore.

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*Bean, from D'Cuckoo, whose new "Umaja" CD is on RGB Records.*

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A PSN Publication  
Vol. 5, No. 3  
March 1994

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EQ (ISSN 1050-7868) is published monthly except for July and November by P.S.N. Publications, 2 Park Avenue, Suite 1820, New York, NY 10016. Second class postage paid at New York, NY and additional mailing offices.

Send address changes to EQ, P.O. Box 0532, Baldwin, NY 11510-0532. SUBSCRIPTIONS: U.S. 1 yr. \$24.95, 2 yrs. \$39.95, 3 yrs. \$59.95; CANADA add \$10 per yr. for surface; other countries add \$15 per yr. for surface. All add \$30 per yr. for Airmail. Back issues \$5. All product information is subject to change; publisher assumes no responsibility for such changes. All listed model numbers and product names are manufacturers' registered trademarks. Printed in the U.S.A.

**LETTERS TO EQ**



**GOOD EYES: A real Tascam DA-88 setup?**

**GOOD EYES**

One item in your December issue bugs me. In your "Room With A VU" on John Tropea's studio, he is touted as enjoying three Tascam DA-88's. The accompanying picture shows one unit, which prompted me to look closer and I noticed that his DA-88 is sitting on top of a case of 2-inch tape! Bells and whistles went off in my brain!

What's wrong with this picture? Aside from the missing second and third DA-88's, no one in their right mind would set one of these gadgets on top of rolls of magnetic tape! Every review has noted the hefty nature of the power supply, and to set this right on top of magnetic tape is unthinkable. Physically, the perch doesn't look very stable either.

Just wanted to let you know that some of us are paying attention out here! Enclosed is a picture of my *real*, usually functional, DA-88 studio (see above).

*Ken Totten  
Sidestream Sound  
San Diego, CA*

*[Editor's Response: Tropea has two DA-88's in a second studio that he uses in Manhattan. The units float between his NJ and NY places. As for its placement, he explains that it was placed on the tapes because if it wasn't moved, it wouldn't have appeared in the picture at all.]*

**WIRELESS REMARKS**

We enjoyed Steve La Cerra's "Get The Most Out of Wireless Mics" in the January issue. However, the story contains one fact that needs to be updated. Steve writes that, "UHF systems start around the \$3000 mark." That

used to be true, but not anymore.

The Nady 301 UHF series offers state-of-the-art frequency synthesis with four user-switchable channels on the receiver and handheld, lavalier, or instrument transmitter. List prices for complete 301 UHF wireless systems start at \$799.95. Also worth noting, list prices for the Nady RW-3, a rack-mounting, four-channel UHF system with balanced XLR and unbalanced 1/4-inch output, start at around \$995.95

Nady Systems offers, at no charge, a noncommercial booklet that explains how to test a wireless system before you buy it. Send a SASE to "Selecting A Wireless," Nady Systems, Inc., 6702 Bay Street, Emeryville, CA 94608.

*Joe Territo  
PR Manager  
Nady Systems, Inc.*

**DEALING WITH DEALERS**

J.D. Sharp's NAMM opinion article (Jan. '94) makes a good case for supporting the local pro audio dealer. As Sharp writes, "the upfront info and after-the-sale support are part of the deal," and this more than makes up for any difference in purchase price. As we all are participants in a local economy, it only makes sense to support our local businesses as much as we can.

My unique situation: I own a recording studio in the Florida Keys, and

**WRITE TO US**

EQ wants to dialogue with you. Write to: Letters to the Editor, EQ, 939 Port Washington Blvd., Port Washington, NY 11050. Letters must be signed, and may be edited for clarity and space.

# Hard Disk Recording Doesn't Have To Be Hard On Your Wallet.



*"...in a price/performance comparison, the DR4d would be hard to beat. Thumbs up on this one." George Petersen, MIX Magazine*

*"...great sound, useful features, and friendly operation... technology that is sure to set a new standard in affordable recording" David Frangioni, EQ Magazine*

Ah, decisions, decisions. You want to buy a new multitrack recorder, and you want to go digital so that you'll get the best possible sound quality. And you'd like to buy a hard disk recorder, rather than tape, so you can get random access editing power. And finally, it's got to be something you can really afford. But there's a problem.... don't all hard disk systems require expensive add-in hardware and software, to already expensive computers? Not anymore!

The DR4d is the solution for those looking for an alternative to expensive, complex computer-based systems, or the limitations and mechanical uncertainty of tape recorders. It offers a perfect combination of hard disk recording benefits with an easy-to-use interface.

The DR4d can record up to four tracks simultaneously to standard SCSI hard disks, either internal or external drives. An optional 213MB internal disk offers 40 track minutes of recording (44.1kHz) right out of the box. To expand your recording time, simply connect external drives to the DR4d's supplied SCSI port.

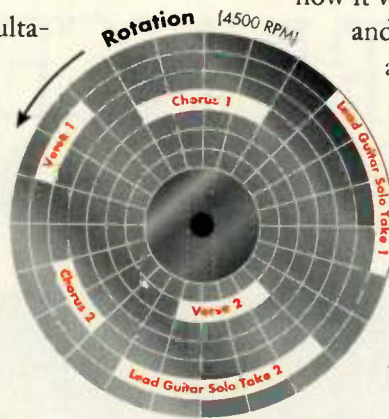
With standard tape machine-style controls the DR4d is by far the easiest hard disk recorder to operate, which means that you can get to work immediately creating music rather than setting up and operating a computer system. Punch ins/outs can be performed manually or automatically from the front panel, or by footswitch, just like you'd expect.

Now you can start to take advantage of the power of random access editing. You can cut, copy, and paste sections of audio with ease. Our Jog/Shuttle wheel lets you scrub through the audio at various speeds, forwards or backwards. Try out different arrangements. Create perfect

tracks by combining the best sections from multiple takes. Whatever. And you can edit with confidence, because if you change your mind you can instantly Undo your last edit - even after the power is turned off and on again! Imagine it. Do it. It's that simple.

Another DR4d advantage is not having to wait for tape to shuttle back and forth. You can instantly move to 108 memorized locations at the touch of a button, and these locate points may be entered manually or on-the-fly. It's also simple to set up seamlessly looping repeat sections, so it's easy to jam over tracks. No more wasting time on rewinding tape!

Of course, how the DR4d sounds is as important as how it works. Advanced 18-bit oversampling A/D and D/A converters insure crystal clear sound, and with a full 96dB dynamic range, the DR4d offers no-compromise specs. The four balanced 1/4" input and output jacks are switchable between -10 and +4 operation, and 2-channel digital I/O is included standard (AES-EBU and SPDIF) with two additional digital ports optional.



On a spinning hard disk, the various sections of music can be accessed almost instantaneously by the moving heads of the drive mechanism. This allows you to seamlessly output different parts in any order, with no time spent rewinding. Music can be moved and rearranged in ways not possible with tape!

Need more than four tracks? Four DR4d's can be linked to create a 16-track system. And for synchronization to other gear, just add the optional MIDI or SMPTE interfaces.

And best of all, the DR4d is an **affordable** reality: suggested list is only \$2495.00 (or \$1995.00 w/o hard disk)! Multitrack disk recording *is* within your reach, so see your Akai dealer today for a complete demo!

On tape, the sections of music are physically located far from each other, separated by many feet of the tape itself. Since you have to move all that tape past the heads to get where you want to go, it's impossible to jump instantly from one section to another. It wastes time, and limits creativity!

**DR4d** **AKAI DIGITAL**

P.O. Box 2344  
Ft. Worth, TX 76102  
(817) 336-5114  
Fax 870-1271

CIRCLE 01 ON FREE INFO CARD

Lead Solo Verse 2 Verse 1

Intro

Verse 1

Chorus 1



the nearest "local" pro audio dealer is well over 100 miles away. Outside of two small music stores that carry only guitars and small PA systems, there isn't anyone in the islands who has heard of MIDI, DAT, or ADAT. After-the-sale support and service diminish in value when accompanied by a 250-mile-plus round trip in South Florida traffic. I recently brought in a DAT recorder to my "local" dealer for service, and (surprise!) it had to be sent back to the factory anyway. I would be willing to pay for a knowledgeable sales staff and loaner equipment, but there isn't the customer base here in the Keys.

This is assuming, of course, that every pro audio retailer has a knowledgeable and courteous sales staff. I have had many experiences with one of the largest retailers in Florida (I'll call it "X Music"). As a buddy of mine who owns a music store himself says, "If you want to get a salesperson's attention in X Music, you have to wave at least ten \$100 bills in the air — and they'd better be crisp!" And when I finally get to talk to a salesperson, I usually find that I

know more about the product (from reviews and articles) than the store employee does even though the salesperson supposedly gets advance information and has hands-on experience. The upshot of this? I haven't gone into X Music in years, nor will I ever again make a purchase there.

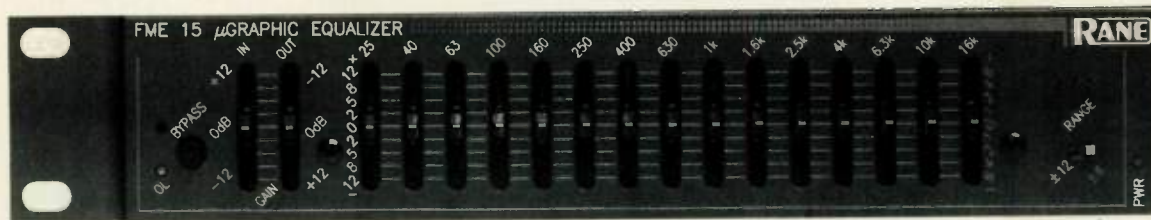
By contrast, I've received wonderful info and after-the-sale service from distant dealers — most notably Greg Vey at Sweetwater Sound. And yes, the prices are good, too. So when faced with the choice between a long drive, rude and ignorant salespeople, and questionable service, or a pleasant, knowledgeable voice just a phone call away, guess where I'm going. For some of us in the hinterlands, it's just not a matter of cost. And if pro audio dealers are seeing a



chunk of their business slip away, then perhaps they should reevaluate their operations from their customers' point of view.

*John Bartus  
Radio Active Productions  
Marathon Shores, FL*

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# EQ&A

## UNIDENTICAL COUSINS

**Q** Can you tell me what differences exist between the Fostex RD-8 and the Alesis ADAT digital recorders?

Art Howard  
Gloversville, NY

**A** The Fostex RD-8 is an ADAT-compatible recorder that differs from its Alesis sibling primarily in the areas of remote control and synchronization without the need for external hardware. The RD-8 also provides both 44.1 kHz and 48 kHz sampling frequencies.

The RD-8 incorporates a SMPTE/EBU timecode reader/generator that supports all frame rates. The connectors for timecode are XLR. It is important to note that striping tape with timecode does not result in the loss of an audio track. Timecode information is written into the subcode area of the tape.

Working in conjunction with the reader/generator is an onboard chase-lock synchronizer with offset capability. Locate master can be Absolute Time (ABS), Longitudinal Timecode (LTC), or VITC, while locate slave can be either ABS or timecode. The RD-8 provides front-panel LEDs to indicate the unit's current clock source (INT, WORD, TC, VIDEO), as well as the on/off and locked status of the synchronizer. The RD-8's synchronizer includes pull up/pull down functions for film-to-video transfers working with either sampling rate. Additionally, the track slip capability helps to

maintain sound-to-picture sync. Maximum range for track slip is 170 ms.

For those working with video editors, the RD-8 also provides an RS-422 port supporting Sony P2 9-pin serial control.

The RD-8 also incorporates MIDI Machine Control (MMC). By integrating the RD-8 with an MMC-capable sequencer, locate points, transport functions, track arming, loop operation, and numerous other functions can all be accessed via the computer. For the serious project studio owner, MMC enables one to use the computer as the focal point of an integrated tape/MIDI facility. For synchronizing MIDI sequencers to tape, the RD-8 outputs MIDI timecode.

For hands-free editing under microprocessor control, the RD-8 offers an auto record function that simplifies the punch in/out process. Punch points can be captured on the fly and fine-tuned via an easy editing process. Combined with the auto play and auto return functions, the entire process of rehearsal and take can be automated.

Roger Maycock  
Senior Product Specialist  
Fostex

## ANALOG ANSWER

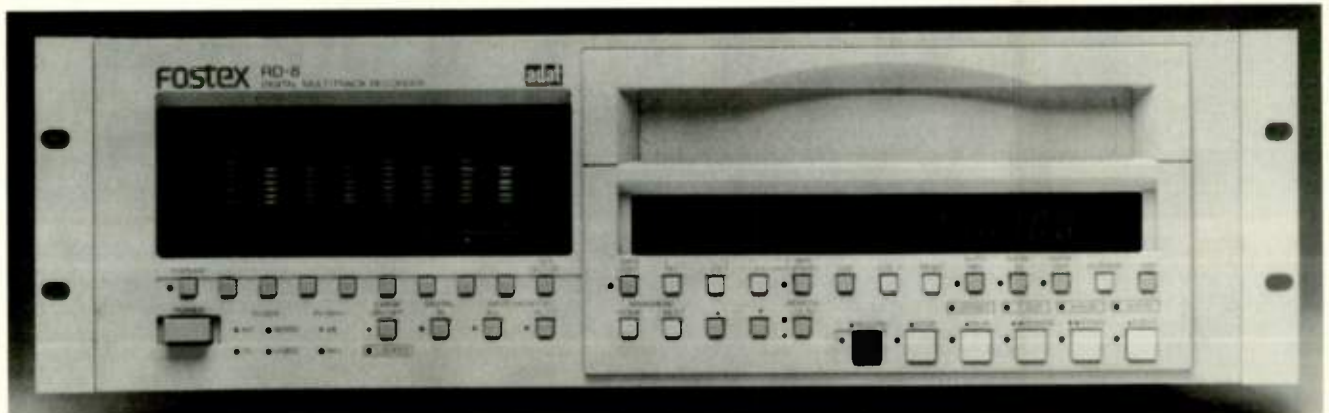
**Q** I would like to try the new, higher output tape formulations like 3M's 996, but I have heard that it is a tough process to realign narrow-format machines to handle the tape. Is this fact? Also, is it true that there is increased tape-head wear and tape shredding due to a greater abrasiveness inherent in the new formulations?

Zoe Redmond  
New Paltz, NY

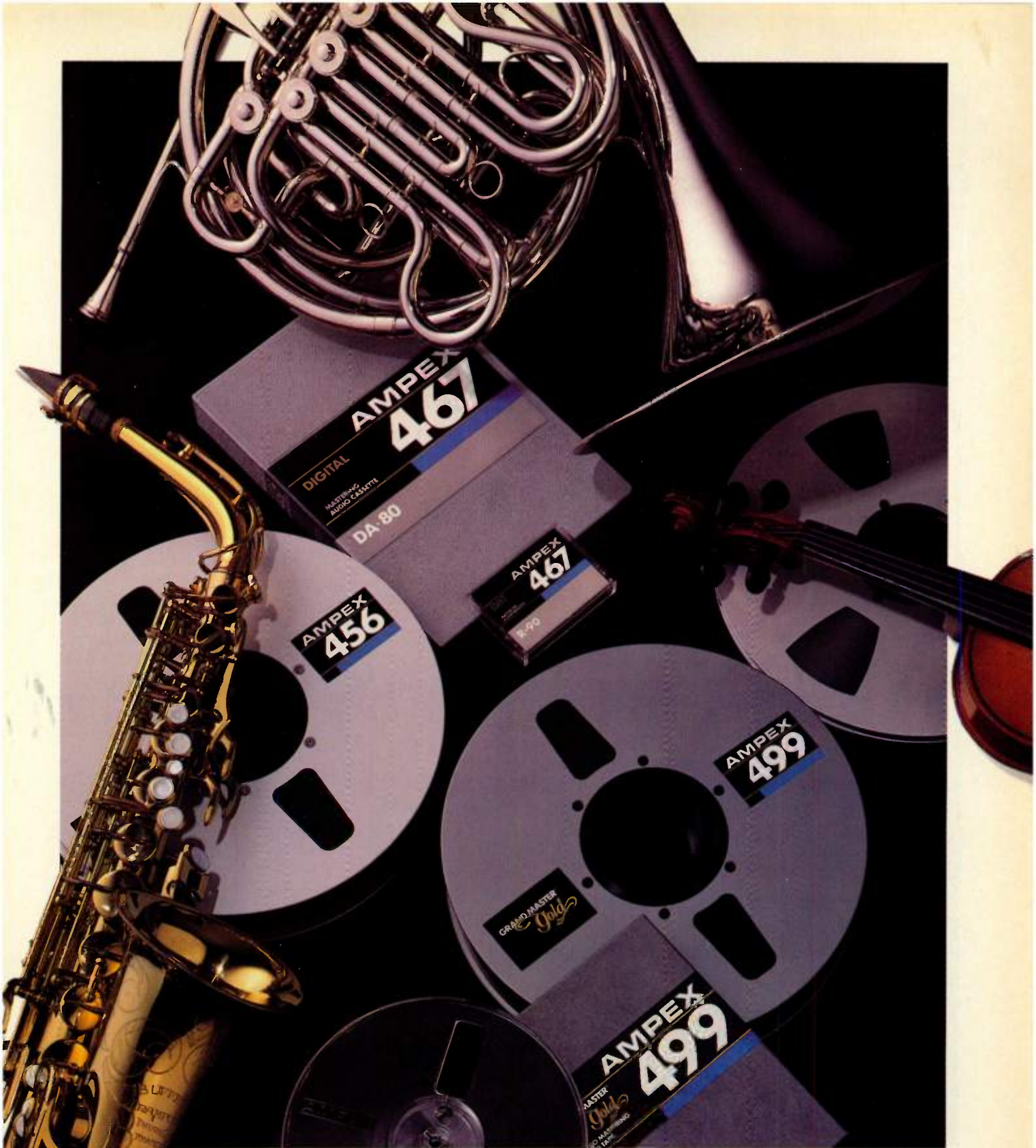
**A** Electrical alignment of a tape recorder can be a frustrating job if one doesn't keep clearly in mind what he or she is adjusting and doesn't make these adjustments in the proper order. This is true with any recorder, professional or narrow-format machines. Many narrow-track machines have the added burden of only being two-head recorders — where simultaneous recording and playback alignment cannot be done. Alignment requires five steps for each channel, so a 16-channel machine takes a lot more time than a 2-channel machine.

The five basic steps of recorder electrical alignment are: 1) Set playback gain using a calibrated level playback standard tape. 2) Set playback high-frequency equalization using the high-frequency tones on the playback standard tape. (Once these two playback steps have been done, *don't* change them again. Occasionally verify that they haven't changed with time and machine usage.) 3) Adjust the bias while recording and monitoring the playback. Use the techniques recommended by the manufacturer of the tape you plan to use. 4) Adjust the record level so that a midfrequency tone (500 Hz to 1 kHz) plays back at the same level as the input. 5) Adjust the record equalization so that the playback level of a high-frequency test tone is the same as the input level. 3M has a free technical bulletin, "Tape Recorder Alignment in Five Easy Steps," that discusses this process in a little more detail. It can be obtained through your local 3M magnetic tape dealer or direct from 3M, Audio and Video Markets Division, 3M Center Bldg, 223-5N-01, St. Paul, MN 55144-1000.

Regarding abrasiveness, this is a tough subject that is fraught with emo-



UNIDENTICAL COUSINS: How does Fostex's RD-8 (above) differ from Alesis's ADAT?



*More records go gold on Ampex than on  
all other tapes combined.*

**AMPEX**

Ampex Recording Media Corporation 401 Broadway, M.S. 22-02, Redwood City, CA 94063-3199 ©1993 Ampex Recording Media Corporation

CIRCLE 08 ON FREE INFO CARD



tion. The new generation of higher-output tape is not more abrasive than any of the commonly used mastering tapes on the market. When a manufacturer judges its product for abrasivity, it is on the basis of metal removal of the head-pole piece of material. Users may not judge products the same way. What we have found is that users have experienced problems with edge-track output stability and been told that the heads need relapping. This then is the

basis for the concern about tape-abrasivity characteristics.

In practice, all tapes wear the heads to some degree. In fact, some wear is better than very little wear. The new higher-output tapes tend to be stiffer than the older products and, as such, wear the heads in a pattern slightly different from that worn by the old tapes. This is because the stiffer tapes will not wrap the heads in the same way. If a head assembly gets two different wear patterns worn into it, there

can be tape-to-head contact problems that will result in output level variations. The fastest way out of this is to relap the heads. Given enough tape passing over the heads, the heads will be relapped by the tape stock itself. Less-than-ideal output uniformity, in the interim, is the price paid for this approach.

Tape shedding is a separate subject. It doesn't necessarily coincide with tape abrasivity. Some tapes that shed a great deal may have very low abrasivity characteristics, others very high. Shedding is a function of the basic design and nature of the coatings, and also of the durability of the coatings. Coatings that are not durable will scratch with use and will shed from this scratching. This is the reason for designing the tape with a "harder" coating, so that it is more difficult to scratch. "Harder" coatings will tend to be stiffer, and will therefore wrap the head differently.

What is today called shedding seems to refer to any debris that is found when the heads and guides of the recorder are cleaned. No tape will have zero shedding under all conditions. Sometimes tapes that run very clean on one recorder will run dirty on another because of factors such as misguiding in the tape path, or guides and heads with grooves in them that are "working" the tape edges. This can happen when a machine is worn in with one brand of tape and then another is put on that is slit slightly wider.

In the '50s, engineers cleaned the heads after each roll of tape was run. Today, it is more like once a day, or even less frequently. It is our opinion that the head-cleaning practice of the '50s needs to be reinstated. The minor amount of effort and time involved can yield big rewards if it prevents just one occurrence of a head-clogging problem on a major project.

Delos A. Eilers  
Senior Tech Service Specialist  
3M

## Sound Solutions

**ASHLY** has been building world-class equalizers for well over 20 years. Our new GOX-Series models take advantage of this experience with some true advances in the technology. Precision Wein-Bridge filters, and newly designed summing amplifiers, provide extremely accurate response, low noise, negligible distortion, and excellent immunity to magnetic fields. All filters exhibit true constant "Q" response, with absolute minimum ripple. The full-throw faders are a custom-manufactured metal-shaft type, with the center detented position being utilized as an "on/off" switch for that filter (to minimize any possible degradation in signal noise levels.) Combine these features with our full Five Year Worry-Free Warranty. It's obvious why **ASHLY** equalizers are the best solution to your equalization situation.



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**ASHLY**

This is where your questions get answered. Send your query with your name and address to:  
EQ Editorial Offices,  
939 Port Washington Blvd.,  
Port Washington, NY 11050  
Fax: 516-767-1745

# BELIEVE HALF OF WHAT YOU SEE & ALL OF WHAT YOU HEAR.



## dbx PROJECT 1



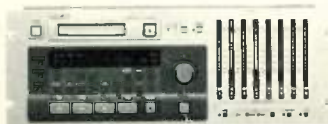
You hear sound curve as the notes take shape. You've heard our reputation in the business. We build great compressors. Chances are, you've got one in your rig now. We're introducing a Parametric Equalizer built and priced to keep our rep and your music intact. Keep an ear out for it.

### THE 242 NEW PARAMETRIC EQ. SHAPING YOUR SOUND.

H A Harman International Company ©1994 dbx, A Division of AKG Acoustics, Inc. 1525 Alvarado St., San Leandro, CA 94577 USA Ph. 510/351-3500 Fax. 510/351-0500  
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# EQ TIPS

EDITED BY STEVE LA CERRA

## RESOLUTION REVOLUTION

Using a sequencer without quantization can help preserve the feel of a musician's original performance. Players who use this technique, however, may find that upon playback the sequencer subtly alters portions of that performance. This is often related to the resolution of the sequencer. Every sequencer divides a quarter note into "ppq" (pulses per quarter note), but not all sequencers use the same number of ppq. More advanced software-based sequencers may use 460 ppq, which can give pretty fine resolution, but some hardware-type sequencers may use as few as 96 ppq. The higher the number of ppq, the more accurate the recording of your MIDI data. A sequencer with low resolution will "quantize" your performance even without use of the quantize function. This is because every note in the sequence must fall on a pulse.

By doubling the tempo at which you are working you can effectively double the number of ppq. You will now use a half note as your reference click, but since the tempo has been doubled it will sound like a quarter note. Any performance recorded into the sequencer in this manner (and without quantization) will be more faithfully played back because the resolution has been doubled. Do not use the quantization function as it will defeat the musician's feel. This technique is particularly useful when recording a live drummer via trigger to MIDI; the difference can be striking.

## SAMPLE EDITING

Editing long samples can be a real drag because most samplers require that you play the entire sample through in order to hear the end of the sample. On short samples (under 2 seconds) this is not a big problem, but as sample length gets longer, this process becomes more annoying. A time-saving solution is to edit the end of the sample first. Temporarily move the sample start point to

a location within 1 to 2 seconds of the end point. Now you can edit the end point of the sample without listening through the entire sample length. Once the end point has been determined, return the start point to its "real" location and edit the beginning of the sample. This operation is much faster than editing the start point first.

## COMPRESSED DELAY

Adding delay or reverb to a lead vocal can be a tricky process. Too much effect and the vocal loses intelligibility; too little and the effect will not be noticeable. The next time you need to add delay or reverb to a lead vocal try patching the output of the effect unit to the audio input of a compressor. Then patch the output of the compressor to an effects return. Set the compressor for fast attack and short-to-medium release times with a ratio of roughly 6:1. If the compressor has a sidechain (or "detector") input, use an auxiliary send to "tap" some of the vocal and route it to this input. When the vocalist is singing, the compressor will act on the delay via the sidechain and the level of the delay will be pushed downward. This helps maintain the intelligibility of the vocal. Once the vocal stops, the compressor will "let go" of the delay and allow it to get louder, thus making the delay effect more noticeable at the end of a phrase. This technique (known as "ducking") can also be applied to reverb and is very useful for creating a reverb explosion on a snare drum during ballads or for special effects. The best results will be obtained with a compressor that has a sidechain input, though it can be done (somewhat less successfully) with a compression unit that lacks the sidechain input.

Send Your Analog and Digital Tips To:  
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STUDIO ELECTRONICS

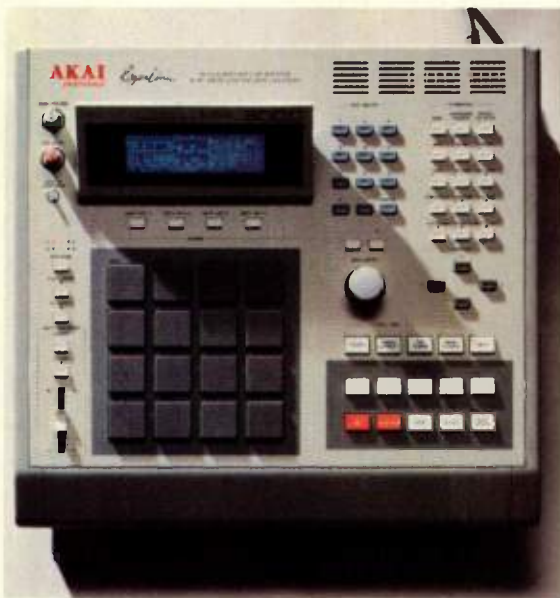
CIRCLE 04 ON FREE INFO CARD

# EQ PRODUCT VIEWS



## LISTEN TO THE BAND

**d**bx has expanded its Project 1 line of signal processors by adding the new 242 equalizer. The 242 is a 5-band, parametric EQ with three bands of fully parametric peak/dip equalization and two bands of shelving filters, each with a switchable shelf slope. Each band can be controlled independently with different cut/boost points, up to 16 dB boost and greater than 16 dB cut at any bandwidth setting. Switchable shelf slopes of 6 dB or 12 dB per octave on the high and low bands provide unique sound-shaping capabilities. Retail price is \$299. For more information, contact dbx/AKG, 1525 Alvarado Street, San Leandro, CA 94577. Tel: 510-351-0555. Circle EQ free lit. #101.



## MAKE MINE MIDI

**T**he new MPC3000 MIDI Production Center from Akai is a drum machine, drum sampler, and MIDI sequencer. It employs 16-bit stereo sampling technology at a 44.1 kHz sampling rate. Standard sound memory is 2 MB, expandable to 16 MB using industry-standard SIMM modules. The powerful CPU provides 3 to 4 times the processing speed of its predecessor, the MPC60. Among the new features are dynamic filtering, mono voice mode, cut-and-paste sample editing, a variety of effects, and a 64-channel send mixer. A new sound assignment system allows up to 24 drum sets to be held in memory simultaneously, each containing 64 sound assignments from a common bank of up to 128 sounds in memory. For more information, contact Akai, 1316 E. Lancaster Ave., Fort Worth, TX 76102. Tel: 800-433-5627. Circle EQ free lit. #102.

## PRIME PROCESSOR

**S**ony Electronics has expanded its project studio product line with the introduction of the HR-MP5 multieffects processor. This device features a 48k sampling frequency, twin A/D converters per input, intelligent pitch shifting, jog/shuttle, 100 factory presets, and 100 user-definable presets. Flexibility is assured with six instantly accessible processing blocks, and the ability to rearrange the order in which each appears in the processing chain. For hands-free operation, the RC-5, an eight-pedal MIDI remote controller, is available. The HR-MP5 retails for under \$700. For more information, contact Sony, 1 Sony Drive, Park Ridge, NJ 07656. Tel: 1-800-635-SONY. Circle EQ free lit. #103.





## DREAM ON

**A**lesis unveiled its "Dream Studio" at NAMM. The Dream Studio allows you to stay in a total Alesis environment that features the latest in digital and analog technologies. The Dream Studio is centered around the recently introduced X2 console. The X2 is a modular, in-line, 24-channel/24-monitor, eight-group output with Alesis Dynamic Mute Automation console, and is ADAT Sync compatible. Of course, the ADAT System is also an integral part of the Dream Studio. Included are the ADAT Digital Audio Recorder, BRC Master Remote, AI-1 ADAT to AES/EBU and S/PDIF Digital Interface and Sample Rate Converter, AI-2 Multipurpose Audio/Video Synchronization Inter-



face, and RMB Remote Meter Bridge. In addition, the new Monitor One studio monitors are included. Just introduced, these enclosures offer high power handling and wide frequency response. Musical creativity starts at the QuadraSynth 64 Voice/76 Key Master Keyboard. For further information, contact Alesis, 3630 Holdrege Avenue, Los Angeles, CA 90016. Tel: 310-558-4530. Circle EQ free lit. #104.

## SOUNDS ON TAP

**T**he new S-760 digital sampler from Roland has been designed to bring professional sampling within the budgets of the working class. It offers the sound quality and advanced editing features of the



S-770, SP-700, and S-750 Digital Samplers, but in a single rack space. With its built-in SCSI port, you can access the Sample Archive series, the new Project series, and the Composer series CD-ROM sample collections from Roland, as well as from third-party developers. Thirty-two-part multitimbral capability and 24-voice polyphony can handle complex musical or sound effects arrangements. You can expand the S-760's 2 MB memory up to 32 MB with standard memory chips for up to three minutes of stereo sampling at 44.1 kHz. Suggested retail is \$2595. For further information, contact Roland, 7200 Dominion Circle, Los Angeles, CA 90040. Tel: 213-685-5141. Circle EQ free lit. #105.

## MULTI-PURPOSE MIXER

**T**ascam has unveiled the M-2600 Recording Mixer. Although an analog device, the M-2600 has been designed to provide sonic quality to match that of digital recorders. It features a special design; new low-noise mic preamps; phantom power; and a very wide dynamic range operating level that has a low noise



floor and a lot of headroom. It also features Flip capability, which allows the tape returns to be assigned to the linear faders during mixdown without repatching. In addition, the M-2600

features split EQ with 4-band EQ and high and low shelving, midrange sweep, and EQ bypass switch. The M-2600 is available in 16-, 24-, and 32-channel versions at \$2999, \$3799, and \$4699, respectively. To learn more, contact Tascam, 7733 Telegraph Road, Montebello, CA 90640. Tel: 213-726-0303. Circle EQ free lit. #106.

## GET ON THE BUS

**S**oundcraft has expanded its popular Spirit console line with the introduction of the Spirit LC 8-bus recording console. Consoles are available in 16-, 24-, and 32-channel configura-

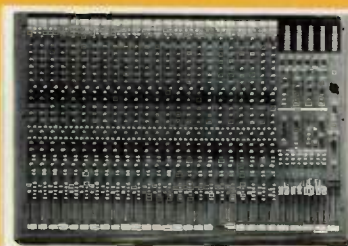
tions with up to 82 inputs. Studio LC utilizes an in-line design with both channel and monitor paths on each input strip, and a Fader Flip facility to allow switching of channels and monitor signals without repatching. Tape and send returns on each channel allow simultaneous recording on up to 32 channels. Neutrik connectors and Alps



pots and faders are used throughout. For complete details, contact: Soundcraft, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-895-3455. Circle EQ free lit. #107.

## GEM OF A CONSOLE

**T**opaz is a new 8-bus console from Soundtracs and is available in 24- and 32-channel versions. It features a dual-input, in-line design and excels in its class by offering full 4-band equalization with dual-swept mids and dedicated EQ on all tape



monitors. A "Floating Bus" design allows the board's eight group outputs to be routed to all 24 inputs of a tape machine without any repatching. Topaz is currently available for \$3995 (24-channel) and \$4995 (32-channel version). An optional meter bridge is available for \$850 and \$950 for the 24- and

32-channel configurations, respectively. For more information, contact Samson Technologies, P.O. Box 9068, Hicksville, NY 11802-9068. Tel: 516-932-3810. Circle EQ free lit. #146.

# EQ PRODUCT VIEWS

## ROLL 'EM

**M**iddle Atlantic's new AX-S System enables an entire bay of equipment to be rolled out along a caster track 48 inches long. The track is supported by adjustable service stands that range in height from 3 to 40 inches off the ground. For more info, contact: Middle Atlantic Products, P.O. Box 29, Riverdale, NJ 07547. Tel: 201-839-1011. Circle EQ free lit. #108.



## AN EMERGING PATTERN

**A**KG's new C3000 is a large-diaphragm, multipattern microphone designed for a wide range of applications. It features switchable polar patterns: cardioid and hypercardioid. There is also an internal windscreen. The housing is designed for ruggedness and contains an internal shock mount. The dual capsules are floated in a specially developed elastomer suspension. Other features include a switchable -10 dB preattenuation pad. List price is \$695. For more information, contact AKG, 1525 Alvarado Street, San Leandro, CA 94577. Tel: 510-351-3500. Circle EQ free lit. #109.



# IF SILENCE IS GOLDEN, THIS CO



*The D&R Orion. From its Hi-Def™ EQs to its fully modular design, from its custom-welded RFI-killing steel frame to its incredibly flexible floating subgroups, the handcrafted Orion is every bit a D&R.*

## LOUD AND LIGHT

**S**oundTech has introduced a new line of power amplifiers; the Power Source Series. These two-rack-space, lightweight amps are based on digital-switching power-supply technology. The first production model is the PS1300, a stereo amp capable of 650 watts into 4 ohms. The amplifier features dual extruded aluminum cooling tunnels cooled by twin variable speed fans. The rear panel contains all the controls except for the on/off switch. The



panel also contains all input and output connections as well as level controls for each channel, and the stereo/bridged mono selector switch. THD is 0.04 percent, signal-to-noise is 100 dB, and crosstalk is -80 dB. The power bandwidth is from 5 Hz to 65 kHz. At \$1300, retail price comes to a buck a watt. For complete details, contact SoundTech, 255 Corporate Woods Parkway, Vernon Hills, IL 60061. Tel: 708-913-5511. Circle EQ free lit. #110.

## HAVE YOU HEARD...

**Crown** is offering the IQ-P.I.P. v1.4 module, which provides amplifiers with standalone intelligence. Plug it into the back of any Crown Macro-Tech, Com-Tech, or Macro reference amp, and a wide range of settings and functions, such as gradual attenuation of input signals that exceed threshold levels without changing dynamics, can be performed with or without a host computer... **Penny & Giles** hit NAMM with a whole new range of digital hardware, including the MM16 MIDI Management System and the VCA16 Audio Control Module, along with its comprehensive line of precision faders and control devices, including the PGF 8000 and 3000 Series of linear faders, analog and digital T-bars, and E-belt digital controllers...

**KAT** is offering many new products, including the malletKAT PRO, a one-piece, 3-octave mallet controller; the proPAD, a 24-zone device that works with all trigger interfaces; rimKAT, a trigger pad for integrating electronics into your acoustic set-up; and flatKAT, which also operates within your acoustic setup while taking full advantage of triggering technology... **Digidesign** demonstrated its ADAT interface at NAMM. This interface provides Pro Tools and Session 8 users with eight channels of simultaneous digital audio transfer between an Alesis ADAT and a Digidesign DAW... **KRK** has introduced the Model 6000 professional studio monitor. It contains a 6-inch polyglass woofer and a 1-inch Kevlar tweeter...

**Yamaha** announced the arrival of a new version of its popular MT120 4-channel multitrack recorder. It can accept virtually any combination of input sources. A 5-band graphic equalizer is standard, as are flexible monitoring functions, switchable dbx noise reduction, and LED peak monitors.

# CONSOLE SHOULD COST 7486% MORE

Next time you audition a console, from anyone at any price, ask to hear a test for which we're well-known. It goes like this: We select 'mic' across the board, and assign every channel to the mix bus. We crank up the studio monitor amp, all the way. We push up all the channel and master faders, all the way. We turn the console's monitor level up. All the way. Next, we invite each customer to place his or her ear right next to one of the monitor's tweeters.

Gingerly, they listen, to not much at all.

Then, we bring the monitor pot down from what would be a speaker-destroying level to a merely deafening level. Before ears are plugged and music blasts forth, we invite one last, close listen, to confirm the remarkable: Even with everything assigned and cranked up, a D&R console remains effectively — and astonishingly — silent.

Of course, a D&R is much more than the quietest analog

board you can buy. So we equip each handcrafted D&R with dozens of unique, high-sonic-performance features. And we back each board with our renowned factory-direct technical support.

How much is all of this worth? Well, if silence is golden, then every D&R is worth its weight in gold.

In which case, until we raise its price about 75 times, the D&R console pictured at left is one truly impressive investment opportunity.

D&R ELECTRONICA B.V.

Rijnlaan 15B, 1382 GS Weesp, The Netherlands  
tel (-) 31 2940-18014 • fax (-) 31 2940-16087

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*D&R handcrafts consoles for recording, live sound, theatre, post-production and broadcast, for world-class to project facilities. "Weight in gold" comparisons based upon 11/93 market prices.*

CIRCLE 14 ON FREE INFO CARD

# The Serious

## THE TASCAM DA-88 THE DIGITAL MULTITRACK DECK FOR SERIOUS PRODUCTION

It's true. The first machine designed specifically for low cost digital multitrack production is now available. And it comes to you from the world multitrack leader, TASCAM. It's simply the most advanced, well thought out and heavy duty digital 8-track deck you can buy. The best part is, it's incredibly affordable.

The DA-88 is built for production. The integrity of TASCAM's design is evident in every facet of the deck. From its look and feel — to its exceptional sound, unsurpassed features and expansion capability.

## GOES FASTER, LASTS LONGER AND TAKES A BEATING

While we admit that it's an elegant looking machine, it's tough to see its finest asset. The tape transport. Designed and manufactured by TASCAM specifically for the DA-88, it's fast, accurate and solid. And that's what counts in production — in personal studios, project studios or in those demanding high-end facilities.

You'll notice it uses superior Hi 8mm tape, giving you a full 108 minutes of record time. What's more,

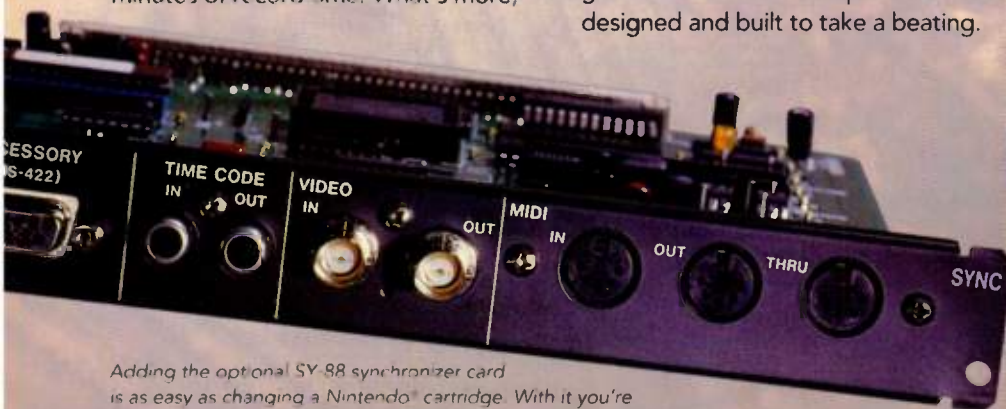
the transport is lightning fast and yet so quiet you'll barely hear it blaze through a tape.

We didn't stop there. Because production environments are notorious for constant, if not abusive, shuttling, punching, 24-hour operation — you get the idea — the transport was designed and built to take a beating.

Even more impressive is the transport's responsiveness. Take a look at the front panel. Notice the shuttle wheel? Turn it just a bit and the tape moves at one fourth the normal play speed. Turn it all the way and it flies at 8 times faster. Do it all night if you want. It's quick, smooth and it's precise. Need to get to a location quickly? Accurately? Shuttle a bit and you're there. The location is easily viewed on the DA-88's 8-digit absolute time display — in hours, minutes, seconds and frames. With the optional SY-88 sync card it displays timecode and offset, too.

## YOU ALREADY KNOW HOW TO OPERATE IT

Unlike other digital multitrack decks, the DA-88 works logically and is simple to operate. Like your analog deck. All functions are familiar and easily operated from the front of the deck.



Adding the optional SY-88 synchronizer card is as easy as changing a Nintendo® cartridge. With it you're SMPTE and MIDI compatible. And no matter how many DA-88s you have locked up, you need only one sync card. Other optional accessories include AES/EBU and SDIF2 digital interfaces allowing the digital audio signal to be converted for direct-digital interfacing with digital consoles, signal processors and recording equipment.

# s Machine



Take punching-in and out, for example. You have three easy ways to do it. You can punch-in and out of single tracks on the fly. Just hit the track button at the punch-in point. Hit it again to punch-out. You can use the optional foot switch, if you like.

Or, for multiple tracks, simply select the track numbers you want to punch, push play, and when you're ready, hit record to punch-in, play to punch-out.

Finally, for those frame accurate punch-ins, you've got auto punch-in and out. In this mode you can rehearse your part prior to committing it to tape.

No matter which way you choose, your punch-in and out is seamless and glitch free due to TASCAM's sophisticated variable digital crossfade technology.

That's not all, you also can set your pitch ( $\pm 6\%$ ), sample rates (44.1 or 48K), as well as crossfade and track delay times. All from the front of the DA-88.

## COMPLETE SYNCHRONICITY

There's more. Add the optional SY-88 synchronizer card to just one of your DA-88s and you've got full SMPTE/EBU chase synchronization. The best part is, you can record time-code without sacrificing one of your audio tracks. You also get video sync input, an RS-422 port to allow control of the DA-88 from a video editor, and MIDI ports for MIDI machine control.

## A DIGITAL RECORDING SYSTEM THAT GROWS WITH YOU

The DA-88 is truly part of a digital recording system. Start with 8 tracks today — add more tomorrow.



Adding tracks is as simple as adding machines — up to 16 for a total of 128 tracks. They interconnect with one simple cable, and no matter how many DA-88s you have, they'll all lock up in less than 2 seconds.

Controlling multiple machines is made simple with the optional RC-848 remote. With it you can auto locate and catch 99 cue points on the fly. It comes complete with shuttle wheel, jog dial, RS-422 and parallel ports, and it controls other digital and analog machines, too.

## LISTEN TO THE REST

Of course, the sound quality is stunning. With a flat frequency response from 20Hz to 20kHz and dynamic range greater than 92dB, it delivers the performance you expect in digital recording.

So get to your authorized TASCAM dealer now. Check it out. Touch it. And listen to it. Once you do you'll know why the TASCAM DA-88 is the serious machine for digital production. The TASCAM DA-88 is the choice of studios worldwide. And at only \$4,499, it should be your choice.



# TASCAM

Take advantage of our experience.

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CIRCLE 55 ON FREE INFO CARD

# 8-BUS SERIES

**DUE  
NEW  
GREG**

**6 AUX SENDS** with Solo and Solo LED.

**6 STEREO AUX RETURNS.** All have 20dB gain, Solo and can be used in stereo & mono. 1 & 2 are pannable & bussable.

**MIX-B/MONITOR** section can be used as an independent stereo out for PA monitor mix, 2-track recording, video/broadcast feed or assigned to L/R mix.

**TWO SEPARATE HEADPHONE SECTIONS** can be used totally independently of each other. Each features source selection between Control Room & any combination of AUX 3/4, AUX 5/6, Mix-B or External source. Solo allows control room to hear what musicians are hearing in their headphones.

**TALKBACK** assigns to all submasters, main mix, AUX 1, AUX 2 or Phones 1 & 2.

**SOLO** level adjust and ultra-rude LED.

**MONITOR** section with separate Control Room & Studio levels. Source selection between L/R mix, Mix-B, Tape & External. Can be switched to Mono.

-40 to +10 bar graph **LED DISPLAYS** for each submaster & Solo/Main (with main L/R +28dB CLIP LEDs).

**EXPANSION CONSOLES** let you add channels in banks of 24 to either the 24-B or 32-B. Expanders have their own internal mix amps so the main board only "sees" one extra channel per expansion console.

Built-in **TALKBACK MIC.**

Trick **BUS SOLO** switches send odd-numbered buses to the left speaker and even-numbered buses to the right speaker — unless you've pressed the respective MONO L&R button. When a bus has been mono-ed, SOLO sends the bus to both speakers.

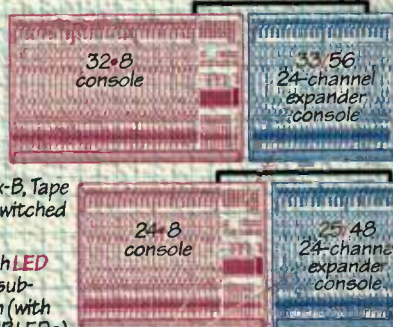
**L/MIX/R MIX & MONO L&R** buttons assign buses to main L/R stereo bus.

All channels have Mackie's renowned discrete, wide-bandwidth **MIC PREAMP** circuit for ultrahigh headroom & low noise. All mic inputs have RFI choking, ferrite beads and +48V phantom power (switchable in banks of 8 channels).

Optional tilt-up **METER BRIDGES** are globally switchable to see tape return preamps or channel output and include VU meters for main L/R output. **MB-24** meter bridge for 24-B console is \$799. **MB-32** for 32-B is \$899. Our soon-to-be-released **16-B** 16x8x2 console's meter bridge will retail for \$699.

Rugged, non-flexing **STEEL CHASSIS.**

**4-BAND EQ** with "Expensive British Console Sound." Includes **TRUE PARAMETRIC HI-MID**, swept **LO MID**, shelving **HI & LO** plus 18dB/oct **HI PASS** (10 cut) filter at 75Hz. Users are raving about the sound quality.



Option stand \$295

**Y**OLDE ENGLISH SOUNDE. Greg started out by asking "What is it that makes the finest British mixing boards perform the way they do?" For example, "classic, older English consoles have much wider-band midrange EQ than lower-priced consoles — it really has an effect on overall sound quality. So we incorporated the same capabilities on our new consoles. This also enabled us to add the flexibility of a variable bandwidth control for true parametric HI-MID EQ. It wasn't easy to engineer in the expensive circuitry necessary and still keep our consoles affordable, but we did it.

You'll like the increase in both sound quality and versatility.

We paid the same kind of attention to fader quality. Instead of less-accurate D-taper faders, we commissioned a totally new custom 100mm fader with the logarithmic taper found in mega-expensive consoles.

**EVEN THE FEATURES HAVE FEATURES.** Naturally each channel has in-line monitoring with split EQ. But our MIX-B Monitor section also has a SOURCE switch to tape off the channel (pre-fader) to create independent mixes for taping, broadcast feeds or headphone mixes. Dual independent headphone sections offer the ability to switch between Control Room and any combination of AUX 3/4, AUX 5/6, MIX-B or External sources. Tape inputs and outputs feature internal

\*Suggested Retail Price. Your act.

+4dBu balanced **TAPE RETURNS**, switchable to -10dBV unbalanced in banks of 8 returns.

Balanced **MIC**, bal./unbal. **LINE IN**, **MIC/LINE** switch, **DIRECT OUT & CH. INSERT** on every channel.

Three **TAPE OUTPUT** jacks per bus (total of 24). +4dBu balanced, switchable in banks of 8 to -10dBV unbalanced.

# TO THE UNEXPECTEDLY HIGH DEMAND FOR OUR 8-BUS CONSOLES, WE WON'T EVEN LET MACKIE HAVE ONE YET.

**HE WORKED. HE SLAVED.** He created the 8-bus console HE always wanted to own. In fact Greg kept adding features until we threatened to whack him upside the head with a rarrid salmon. Now the first notices are in from 8-Bus owners: "It's so quiet I had to check to see if it was on" and "Blows away my old board that cost \$20,000." In other words, Greg really DID succeed at creating the first affordable high-headroom, low noise, feature-laden 8-bus consoles. Unfortunately, we can't build them fast enough to meet demand. Unlike our competitors, Mackie can't just order up consoles by the container-load. Instead, we build each 24•8 and 32•8 at our factory in Woodinville, Washington. Even though we're working day and night (and shipping more and more each week), there's still a waiting list at Mackie dealers. Even Greg hasn't gotten one yet! Serves him right for designing so much performance into consoles that retail for \$3995\* and \$4995\*. Read on for the deliciously explicit details.

220-watt, Class A **POWER SUPPLY** with enough juice to also power a meter bridge.

+4dBu to -10dBV level conversion so you can use semi-pro tape decks without the inherent noise penalty found in mixers that operate at -10dBV internal levels.

**MACKIE'S SIGNATURE MIC PREAMPS.** At the urging of regions of satisfied TR-1604 and MS1202 users, we didn't mess with a good thing. Our 8-Bus consoles' mic preamps deliver -129.6dBm E.I.N. at 0.005% THD with a 300K bandwidth, yet can handle +14dBu inputs without a pad. The consoles' working S/N is 90dBu with 116dB internal headroom. For my application where noise is especially noticeable (such

as hard disk or multi-track digital recording), you've found your board — for as little as \$3995\*!

**SOME OF THE FEATURES GREG ADDED SINCE WE FIRST ANNOUNCED OUR 8-BUS CONSOLE LINE:**

- External 220-watt, Triple-Regulated, Low-Ripple Power Supply
  - Mix/Line switch on every ch.
  - "Triple-bussed" tape outputs
  - +4/-10 tape inputs & outputs (switchable in banks of 8)
- \*Before we threatened to whack him upside the head with a rarrid salmon if he didn't stop.

the expander and your 24•8 or 32•8 board. External fader and muting MIDI automation will also be available soon.

**OPTIMIZED FOR PA AND RECORDING.** Along with elaborate monitor capabilities, balanced XLR main outputs and 18dB/octave

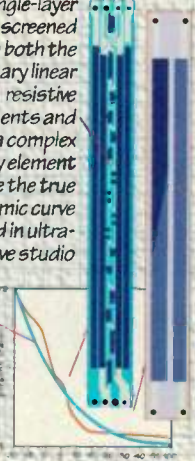
hi pass filters, you get non-flexing steel construction, fiberglass thru-hole plated, horizontal circuit boards that minimize

impact damage, gold-plated internal interconnects, sealed rotary pots and a rugged 220-watt, super-regulated power supply. You won't find more roadable, compact PA boards anywhere.

**READ ALL ABOUT IT.** Call us toll-free and we'll ship you a comprehensive brochure including application hookups. We think you'll be impressed enough to be willing to wait a little while before you get your 24•8 or 32•8. After all, Greg is still waiting for his.

Conventional faders have a second layer of resistive material that attempts to approximate logarithmic taper. Our **PRECISION NETWORK FADERS** are

single-layer screened with both the primary linear resistive elements and also a complex auxiliary element to create the true logarithmic curve found in ultra-expensive studio console faders (blue line on graph).



In-line **FLIP** reverses tape and mic/line inputs between channel strip and Mix-B/Monitor section.

**AUX SENDS 1-2** PRE button selects pre-fader/post EQ or post-fader/post EQ.

**AUX 3-4/5-6** SHIFT changes 3-4 to 5-6.

**SOURCE** selects signal source of AUX 3-4/5-6 from channel strip to channel's Mix B/Monitor send so you can build an effects mix (pre or post-MIX-B level) to assign to phones during tracking.

True parametric, 3-control **HI MIDEQ** that has seasoned engineers swooning (quotes and raves on file... we're not kidding). Ultra-wide 500-18k frequency sweep range; bandwidth can be adjusted from a very wide 3-octave width to a very narrow 1/2-octave width. 15dB boost/cut.

**LO MIDEQ** with ultra-wide 45Hz-3K sweep, 15dB boost/cut. ±15dB shelving HI (12kHz) & LO (80Hz) EQ.

Multipurpose 18dB/oct. **LO CUT** filter @75Hz. Cleans up "mix mud," cuts PA rumble, creates a "neo-peaking" bass control when used with LO shelving boost.

Independent **MIX-B (Monitor)** section with pan, level & source. During mixdown, use as extra pre-fader stereo AUX send or double your inputs.

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**MIX-B SOURCE** can route the monitor section to an extra stereo output for 2-track taping or broadcast feed during live mixing.

Constant power, buffered **PAN** pot for rock-solid panning.

**Overload LED** and **Hyperactive -20dB Signal Present LED**

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CIRCLE 33 ON FREE INFO CARD





Photo by Julian Jaime

**REMIXERS GO HOME:** Bobby Guy (right) and Ernie Lake keep in the black with their Long Island, NY-based project studio.

## HOMeward BOUND

### Remixer Redux

"If it's necessary [to remix songs], it's best for the remixers to have their own studio so that they can be more creative and take more time on a mix without the pressure of an eight-hour session."

There was a period in the late '80s when major labels would routinely hire street-wise New York-based remixer/producers to reconstruct and often lengthen singles for dance floor consumption. Working in fairly pricey Manhattan studios, their mission was simple: restyle an artist's song to appeal to various segments of the club music spectrum.

When the brunt of the recession hit the music industry around 1991 and alternative rock and rap groups began to cross over to the money-making pop plateau, corporate priorities were reshaped. Labels began licensing proven hits from Europe — complete with mixes *du jour* — and started reducing staff at less profitable dance departments. In some cases they eliminated personnel and remix projects altogether.

While remix mania isn't over by any means — a mix for a mainstream pop act from revered knob twiddlers such as Robert Clivilles and David Cole (who, incidentally, have built their own facility complete with an SSL 4072 G Series console), David Morales, Frankie Knuckles, Todd Terry, or Masters at Work can still reportedly command upwards of \$30,000, and upcoming remix teams such as DJ EFX & DJ Digit, Murk, and MK are busier than ever — the indus-

try trend toward the dwindling of remixes has led many beatmasters concerned with quality and the bottom line to build their own project studios.

According to George Maniatis, director of A&R for PolyGram-owned imprints London and ffr, many labels prefer working with producers who have their own studio setups. Says Maniatis, "If it's necessary [to remix songs], it's best for the remixers to have their own studios so that they can be more creative and take more time on a mix without the pressure of an eight-hour session. In this way, it keeps the costs down and creativity high."

The effect of this recent phenomenon has been a sales boon to manufacturers of mid-priced consoles, samplers, drum machines, keyboards, and sequencers. The flip side, however, has been a dramatic loss of business for studios in Gotham. "At one point we did a tremendous amount of dance



## THE WORLD'S 10 BUSIEST DANCE REMIXERS

Remixing jobs may be harder to come by these days, but you wouldn't know it when looking at the schedules of the following mix masters:

1. Masters at Work (Bjork, Terrence Trent D'Arby, Keith Sweat)
2. Frankie Knuckles (Luther Vandross, Diana Ross)
3. David Morales (U2, Aretha Franklin, Ce Ce Peniston)
4. Marc "MK" Kinchen (Pet Shop Boys, Jody Watley)
5. Roger S. (Michael Jackson, Juliet Roberts, M People, Tom Tom Club)
6. Todd Terry (Ultra Nate, House of Gypsies)
7. DJ Digit & EFX (Sting, RuPaul, Uncanny Alliance)
8. Murk (Madonna, Deee-Lite, The Beloved)
9. CJ Mackintosh (Whitney Houston, Janet Jackson)
10. Tommy Musto (Cyndi Lauper, Jon Secada, Celine Dion)

work," acknowledges David Lowtin, who runs the 11-year-old D&D Studios situated in midtown Manhattan. He says that remix work "has completely dried up for all the studios [in Manhattan] because labels just don't have budgets anymore. I guess that [the decision by labels to reduce remixes] all comes down to focusing on what's happening at retail, and right now that's rap music."

For the Long Island, NY-based production team of Bobby Guy and Ernie Lake — whose credits include SWV, Chubb Rock, Carleen Anderson, East 17, and their own group, Soul Solution — building their Real Tyme project studio equipped with a 24-track Soundtracs Quartz console with 32 inputs splittable to 64 was a necessity if the duo was to continue working profitably. Other peers around New York, such as Roger Sanchez, Junior Vasquez, and Fred Jorio, have gone the same route.

"For the kinds of budgets smaller labels have to offer," says Fred Jorio, "you have to have your own studio. I've worked at 48-track consoles, and for making dance music, project recording gear is getting closer in quality."

"Studio prices weren't dropping around the time we set up our own studio," explains Guy. "We were paying \$50 per hour to do our own demos at a lot of studios, and we thought that the best alternative was to have our own space. [Robert] Clivilles and [David] Cole have the budget to go into a place where they charge \$150 to \$200 per hour to work on an SSL. We don't."

Even worse economic news for recording studios in the Big Apple is that there's little, if any, work coming from independent dance labels. Established underground imprints such as Cutting and Strictly Rhythm, as well as hot newcomer Eight Ball,

have opened their own private production facilities.

"Studio costs are the most expensive part about producing or remixing a record," says veteran remixer/producer Louie "Balo" Guzman, who's spiked and edited tracks for Ride Committee, U.N.I.T.E.D., Matt Wood, Loni Clark, and Joi Cardwell. Guzman has a 16-track MIDI room complete with an Akai S950 and Juno SP1200 that he privately contracts out exclusively to Eight Ball. "Most of the times a studio makes more [in fees] than the producer. It wouldn't even pay for us to do a production at a pricey place. By working at our own studio, there are now ways to get around those costs."

With many predicting that remixing will remain in the project studio — that is, aside from huge affairs funded by major labels — commercial recording facilities have wisely shifted gears to stay in business, capitalizing on the dollars being allocated to rap projects.

"We made the transition into rap because that's what is going on here in New York and that's where the industry is at," says D&D's Lowtin. He's refurbished his place to include a looser graffiti decor, larger lounges, and a pool table to accommodate hip hop acts and their crews. At his studio where business is booming, top-notch groups such as Black Moon, Gang Starr, Black Sheep, Nice & Smooth, and KRS-One have brought full-length projects, thus ensuring that blocks of time are booked at a clip. "At this point, it's unusual for us to do something that's not hip hop."

As club music tries to pull itself up by its bootstraps, studio owners can't afford to wait around for its comeback. In almost a case of what can be deemed as economic Darwinism, Lowtin is happily embracing his new clientele. "This is New York," he says, "and you have to go with the flow or you'll go out of business."

— Darren Ressler



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CIRCLE 10 ON FREE INFO CARD

# Fusing with Nature



Photo by Paul Haggard

**JAZZMAN TOM COSTER HAS IT MADE IN THE SHADE WITH HIS BAY AREA PROJECT STUDIO**

**STUDIO NAME/LOCATION:** Shady Oaks Studio, San Francisco, CA

**HEAD HONCHOS:** Tom Coster (owner/artist); Tom Coster, Jr. (producer), Wally Buck and Tom Size (engineers)

**ALBUM CREDITS:** Albums recorded at Shady Oaks include Tom Coster's *Gotcha!* and, most recently, *Let's Set The Record Straight*, both on JVC. Other recording projects include Frank Gambale's *Final Frontier* and Joe Satriani's *Time Machine*.

**CONSOLE:** DDA DMR-12

**MONITORS:** Tannoy System 15's for main monitors; Yamaha NS-10m nearfields; and Genelec 1031-A self-powered nearfields

**MULTITRACK RECORDER:** Otari 24-track MTR 90-III (with remote CB-120 auto locater)

**AUTOMATION:** 44 Channels-JLCooper Magi Automation system using an Apple Macintosh IIci with color monitor and 160 MB hard drive

**DAT MACHINES:** Panasonic SV-3700 [2]

**AMPLIFIERS:** Crown Macro Reference for mains; Bryston 3B for nearfields

**OUTBOARD GEAR:** Lexicon 300 digital effects system; Yamaha SPX-90; Sony M7 and R7 sound processor; Ibanez SDR-1000 digital effects unit; Moog 12-stage phaser; Korg A-3 digital effects unit; dbx 165A compressors [2]; Eventide Ultra-Harmonizer Model H3000 SE; ART Power Plant and DRX Multieffects unit; Roland Vocorder SVC-350

**KEYBOARDS:** Kurzweil Horn Expander; Yamaha TX-816 rack and C-3 Conservatory Grand Piano; Roland D-550 [2], T-2, T-3, MKS-20 Digital Piano, and JD-900; Korg 01/W rack, 01/W Pro, Wavestation SR, Wavestation AD [2], M3-R [2], and M1-R EX [4]; rack-mounted Mini Moog by Studio Electronics; Yamaha TX-7, DX-7, and DX-7 IID; Memory Moog; Oberheim Expander; Roland U-220 [2] and JV-800

**SAMPLER:** Akai S900

**DRUM MACHINES:** Korg S-3 Drum Machine; Roland TR-808 with MIDI; Kat Pads

**EQUIPMENT NOTES:** Coster states: One of my main concerns as a keyboardist with lots of gear was inputs. The DDA DMR-12 is a quiet and clean sounding board, and it has a ton of inputs with various routing options. With 44 channels of automation, we were able to mix the latest project here also, which makes the project totally "in house."

**STUDIO NOTES:** Coster remarks: The studio is 22' x 22'. Approximately half of the studio is glass, allowing for a beautiful view outdoors. I didn't have an isolation room built since I didn't want to have the musicians experience that closed-in feeling. Instead, I had tie lines run to different rooms in the house, and when I need to isolate an instrument, we simply move it to another room.

# Accept no substitute (there isn't one)

There is no other console like BIG in the world. For a moderate price, we deliver a comprehensive audio system with full-specification AMEK automation and Recall.

BIG's audio architecture has complete facilities for all types of creative audio production.

**✔** Dual-path modules in the 28 or 44 position chassis provide 56 or 88 inputs.

**✔** The standard console includes 4 stereo line inputs and 4 stereo FX inputs.

**✔** 12 busses selected to 24 outputs, Direct outs and 8 Aux sends provide massive routing flexibility.

**✔** EQ is similar to the famous and much-loved AMEK ANGELA 4-band device.

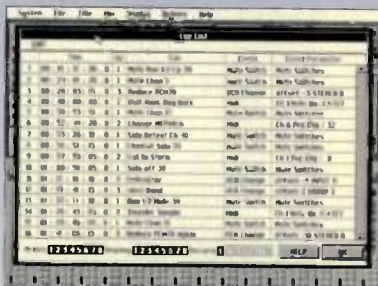
AMEK SUPERTRUE automation is a powerful part of BIG's equipment and is one of the world's leading systems with a user base of over 600 installations.



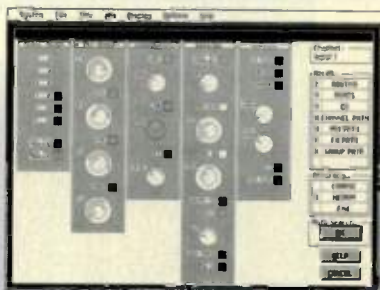
**✔** SUPERTRUE gives complete SMPTE-locked control over faders and mutes; up to 10 VCA groups can be configured.

**✔** Extensive automated solo modes allow additive and subtractive mixing using mutes and solos in various combinations.

**✔** SUPERTRUE has a range of on- and off-line editing systems including the forthcoming Mix Processor which allows Mix Data to be Spliced, Merged, Shifted, Erased or Extracted and Channel Data to be Swapped, Copied or Trimmed.



**✔** The Cue List allows a range of Events both inside the console and externally (via MIDI) to be triggered from time code.



Unlike any competing product, BIG has a Recall system which allows you to store the positions of module controls. This means you can reset the console surface at some later time, allowing you to recreate and modify mixes as required using the graphic screen display or the unique Voice Prompt, which talks you through the console.



Finally, AMEK VIRTUAL DYNAMICS is an option. This proprietary software-based envelope shaping system allows you to select a digitally-controlled Dynamics device, such as a Compressor, Gate, Limiter, Expander or Autopanner to each VCA fader from a menu.



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# AMEK

# The Sony C-37A

Up close and personal  
with Sony's  
classic condenser

**MICROPHONE NAME:** Sony C-37A

**TYPE OF MIC:** Condenser

**FROM THE COLLECTION OF:** Jim Webb

**SERIAL NUMBER:** Unknown—ID ring was lost when mic was recabled

**CURRENT VALUE:** Between \$400 and \$800

**POLAR PATTERN:** Unidirectional cardioid or omnidirectional patterns

**FREQUENCY RESPONSE:**  $\pm 2$  dB; 20 – 18,000 c.p.s. (cycles per second)

**OUTPUT IMPEDANCE:** 200 ohms

**SIGNAL TO NOISE:** More than 55 dB for signal of 1 microbar at 1000 c.p.s.

**HISTORICAL NOTES:** Sony's first condenser mic circa 1955. Rugged, and primarily used for broadcast purposes.

**SONIC QUALITIES:** Jim Webb states: Very flat response, low distortion with an interesting midrange quality.

**USER TIPS:** Webb continues: Can be a little noisy — microphone doesn't have a great deal of output. So you need to pay close attention and make sure that what you want to record is on the mic's axis.

**FIELD NOTES:** Engineer Tom Jung states: The C-37A is a great piano mic. I also used it as a single overhead on drums, strings, woodwinds, and it was great. At that time there were great mics around — the U47's, M49's — but I fell in love with C-37A's smoothness, as opposed to the peakiness of the high end of the others.

With the advent of digital, I found the C-37A too noisy. The Sony C-800, however, is a new version with the same capsule and a low, digitally compatible noise floor. It's my all-time favorite sax mic and I use it on vocals too. I like the C-37A (C-800) better than the C-38 (C-800G) because of its mechanical polar pattern switching and because it's more natural.

[For more information on Tom Jung's miking techniques, as well as the techniques of other famed audio professionals, turn to page 38.]

**FUN FACT:** Very popular mic with a lot of mixers in the '60s and used especially a lot on strings. **EQ**



Photo by Ed Colver



Suggested retail list \$329.

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But Behringer also wanted to make the AUTOCOM incredibly easy to use. So he developed an intelligent "AUTO" processor that automatically sets attack and release times based on the dynamic content of the program material, without any "pumping" or "breathing."

He also included manually adjustable attack/release times for more sophisticated control over the

compression. And a switchable Soft/Hard Knee function that lets you vary the AUTOCOM from softer, "musical" compression to a harder, limiter-type effect.

For added flexibility, the AUTOCOM operates in dual mono or true stereo. Endowed with Behringer quality down to the smallest detail, it features servo balanced inputs and outputs and a five year warranty.

The new AUTOCOM from Behringer. The Ear for musical compression.

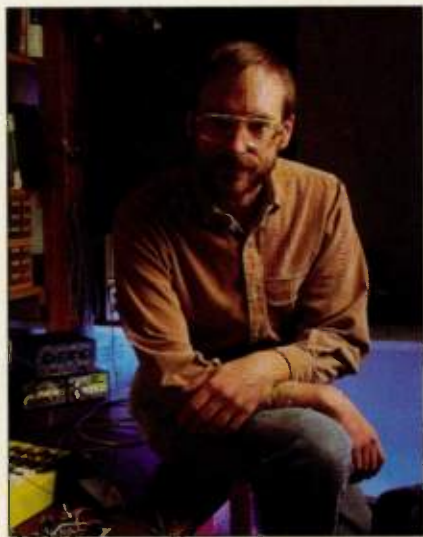


### THE PERFECT EAR.

For more information about Behringer Signal Processing, please call 1-516-932-3810 or write to Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068.

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# Better, Faster, and Cheaper



Delaying that inevitable computer upgrade with some helpful cost-effective advice

BY CRAIG ANDERTON

Computers — you gotta love 'em. What else has a depreciation curve that falls off a cliff and becomes “obsolete” in two to three years? Yet they do make our lives easier (most of the time), and they certainly can make it more fun — as anyone who has played “Pinball Fantasies” on the Amiga can attest.

When it comes to computing, the biggest problem is that it's hard to keep up with rampaging technology. My Mac is like a delicately balanced house of cards: update one program, and all hell breaks loose. Throw one more Extension into the Extensions folder, and it's often time to play “chase down the conflict.”

It took several months before things quieted down on the Mac front after 32-bit addressing came around

(some cool programs never did get updated). And getting everything as stable under System 7 as it had been under System 6 took me several months, as well as costing me several hundreds of dollars for software upgrades.

So do you really think I'm really going to take my friendly Mac IIci (probably the best 68030 computer Apple ever made) and trade up to a 68040-based machine that I will probably use for less than a year before the pressure is on to upgrade to Power PC status? No way. Let's look at some alternatives.

## ENTERING THE UPGRADE ZONE

There are both simple and complex ways to stay competitive a little while longer before the inevitable major upgrade occurs. Although the following advice leans toward the Mac, the general concepts apply to a variety of computers.

Both hardware and software upgrades can boost performance, but they may also introduce problems. Stay focused on the task at hand: make the computer faster and more efficient. Avoid “upgrades” that add cutesy customized scroll bars or that fly toasters around on the screen. Every unnecessary piece of code hanging around your system file is a potential problem waiting to happen.

## HARDWARE ACCELERATORS

It seems too good to be true: plug a 68040 board into your older Mac and you'll have a Quadra. Well, yes and no.

Processor model upgrades can be risky operations that invite software incompatibilities (speed upgrades within the same processor model are different; we'll cover them next). The ideal candidate for a processor model upgrade relies on only a few programs — for example, a postproduction editor who mainly uses a sound-editing program. Buy the accelerator from a place that gives a 30-day money-back guarantee, test it with the programs you use, and, if all is well, you're upgraded with a minimum of sweat.

Those who use lots of different applications will have more problems, because the odds of trouble increase

geometrically with the number of variables. Factor the cost of obtaining updates into the total upgrade cost, and remember that some programs you use might not be available in updated form.

An alternative is to add a faster version of your existing processor, for example, to replace a 25 MHz 68030 with a board that uses a 50 MHz 68030. Accelerators that upgrade processor speed tend to be less expensive than ones that upgrade the processor model. I bought the DiiMO 50 MHz card with RAM cache (on the recommendation of Steve Ellison at OttoMix) and have had zero compatibility problems. The only difference is that everything runs faster (except, of course, for operations where I/O is the bottleneck).

## MORE MEMORY

Memory provides a different type of speed increase, since programs like Sound Tools and Alchemy process whatever's in RAM (Sound Tools can treat a hard disk as virtual memory, but this is a slow way to move sound around — RAM is much faster). More RAM also lets you open more applications at one time and has the side benefit of reducing the number of “out of memory” and “this program has quit unexpectedly” messages.

RAM prices fluctuate, and right now it's expensive. RAM can be a decent investment, however, if you have an instrument that also uses RAM. For example, when I upgraded my IIci from 8 MB to 20 MB, the four unused 1 MB SIMMs (memory modules) went immediately into my Peavey SP — kind of a fringe benefit upgrade. The adapters that let you use 30-pin SIMMs with 72-pin sockets (as found in many PCs) are another hedge against obsolescence.

For a software solution, the Mac program OptiMem simulates the effect of more memory for around \$100. It more efficiently manages the memory you do have, mostly so that you can run more programs at the same time and have more memory available to them.

As to expanding a hard drive, there are two options. The first is to buy a new



# DHP33



## Intelligent Harmony For Every Musician



When compared to the DigiTech DHP-33, all competitive pitch-shifters at its price-point are just plain stupid. At the head of its class, the DHP-33 is the only *intelligent* harmony processor available at this low price.

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The DHP-33 offers musicians who may not need the recording features of its powerful big brother, the DHP-55, an opportunity to utilize *intelligent* harmony effects in live applications, for the price of just a dumb pitch shifter.

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hard drive and replace your old one. This isn't necessarily easy, but any technically oriented computerphile can do it. The second and less expensive choice is data compression software. These types of programs can cut file sizes dramatically — often by 50 percent.

However, relying on compressed files for backup can be dangerous. If the file gets corrupted, there will be few, if any, ways to restore it. Be particularly careful of utilities that do

"background" compression.

I use StuffIt Classic (which I like better than StuffIt Deluxe) to compress archival material; it's not the sexiest data compression software around, but it works and doesn't do weird things without your permission.

**UPGRADE VIA UTILITY**

The goal of an upgrade is speed, and several utilities can buy you time without the expense of a hardware mod. For example, Now Utilities'

# Never before



**4x4** Four noise gates, two compressor/limiters and two high & low filters in 1U rack space. Filters individually assignable to either noise gate for frequency-conscious gating or compressor for de-essing. High speed 5µS gates with external bypass. Switchable compressor side-chain. Gate output can be switched to compressor input for gated compression. True stereo linking. **LA Audio 4x4 Suggested Retail Price \$499**

# has so much been



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## APHEX AURAL EXCITER "DRY DEFEAT" MOD



The Aphex Type C<sup>2</sup> (reviewed in the February 1993 EQ) is great for adding sheen and bottom end to a sound, but as

shipped from the factory, it's designed as an in-line device that always sums the straight and processed signals. This is fine if you're enhancing a stereo master, but if you want to use the Type C<sup>2</sup> with a mixer's effects send/returns, you need to mute the straight signal so that only the processed sound returns to the mixer.

Fortunately, there's a simple mod that does just that; all that's needed is to locate and short out two capacitors. There are two main limitations to the mod: your warranty disappears into a black hole (this is neither sanctioned nor approved by Aphex), and you'll lose 6 dB of level. The latter doesn't seem to be too important, though, because you're generally not adding huge amounts of the processed signal anyway. To do the mod:

1. Unplug all audio and power connections from the unit.
2. Remove the screws that hold the top cover in place, then remove the cover.
3. Locate disc capacitors C109 and C209. Each cap is located approximately halfway between the Tune pot and rear panel.
4. Bend the capacitors over slightly to give good access to the parts of the leads that extend above the circuit board.
5. Using a low-power soldering pencil and 60/40 rosin core solder, solder a jumper wire across each set of capacitor leads (fig. 1). Use a sparing amount of solder and work quickly.
6. Check your work carefully to make sure there are no solder blobs or other problems.
7. Put the cover back on, test it out, and you're ready to go.

Incidentally, it is possible to modify the Type C<sup>2</sup> so that you don't lose the 6 dB of gain, but it's a more difficult mod that requires cutting a circuit board trace. This mod takes only about 15 minutes, and might be just the thing to make your Type C<sup>2</sup> useful for a lot more than just processing final mixes. —C.A.



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## MI INSIDER

Super Boomerang will save you hours finding files in the Mac environment (Norton Utilities' Directory Assistance II provides similar functionality). Simply changing your monitor mode from gray to black-and-white speeds up screen updates, as does using small windows and keeping unneeded windows closed.

Macro-maker utilities initially take time to set up, but save hours overall. These let you make up keyboard equivalents for any series of mouse movements or key presses, as well as string together sequences of macros. If there's something you do often, automate it with a macro (for example, set up a macro to instantly enable or disable a sequencer's software MIDI thru function, or turn the numeric keypad into track record enable keys).

I use QuicKeys for the Mac (CodeKeys is the Atari equivalent). All things considered, mastering a good macro program will probably save you more time overall than adding an accelerator, and a macro program costs far less.

### BUYING TIME

If you're going to upgrade, wait for the next computer show and take advantage of the many show specials you'll typically find. One example: at the Macworld Expo, the DiiMO accelerator I mentioned earlier was going for \$485 — almost \$100 under the best street price. Software was usually half-price or better.

What all this means is that for around \$1000 or less, you can probably upgrade your existing computer to the performance level of a new computer that costs twice as much, without the kind of compatibility and software-upgrading problems that inevitably occur when you get a new machine. If a \$1000 upgrade can keep you competitive for another year and a half, then you're only paying about \$50 a month to keep up with the Joneses — and that can be a good investment indeed. **EQ**

*Craig Anderton coauthored the ultracool, brand-new book Digital Projects for Musicians. He has also written a dozen other books on various aspects of musical electronics.*



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# Of Mics and Men

Top engineers share the secrets behind their most valued tool of the trade



Photos by Julian Jaime

Clockwise from upper left: Tom Jung, David Smith, Frank Filipetti, and Kooster McAllister

Now in its fifth year, the annual AudioTechniques “Microphone Month” is becoming a New York recording scene institution, offering an opportunity for some of the recording industry’s top engineers to gather to swap secrets, exchange coveted techniques, and talk shop. Moderated by Doug Cook, president of AudioTechniques, and Hamilton Brosious, founder and marketing director of AudioTechniques, engineers David Smith, Tom Jung, Kooster McAllister, and Frank Filipetti recently talked about their favorite new technologies and gave fresh insight

into setting up microphones for a variety of applications, including remote and studio recording. Here’s some of the answers to questions posed by Cook, Brosious, and members of the audience.

**Q. If you had to choose one single all-purpose mic for your type of work, which one would you choose?**

**DAVID SMITH:** I’d side with the most recent Neumann capsule, the TLM 170, which seems to do everything pretty well. If I had to choose a tube mic, it would be a Micro Tech Gefel Capelum 92S, and for a classic it prob-

ably would be a Neumann M49I. With any of the microphones that I mentioned, you can do an orchestra, a piano, solo vocal or instrument, and drum overheads. They work pretty well for almost anything.

**TOM JUNG:** I’d probably have to go with a Sony 800, which is a tube remake of the Sony C-37A. To me, this microphone has tremendous tonal balance, and harmonically it’s very correct in a lot of situations. I really like that mic; the 800 is a much more refined, quieter version of the C-37A.

**KOOSTER MCALLISTER:** My take on this is going to be a lot different from that of the other guys. [My choice is] a Shure SM57. It’s a universal microphone, and in my line of work [live recording] I have to deal with microphones that not only sound good to me, but also ones that PA companies can deal with. If you start putting a lot of condenser microphones on the stage, you’re going to have some unhappy monitor mixers. For me, I would have to say a universal microphone would be an SM57. You can use it just about anywhere and make it work.

**FRANK FILIPETTI:** Same for me. When I go in to do vocals, I’ll generally throw in a tube mic, and if I’m going for overheads, I’ll use a condenser. But if I had to have just one microphone, I don’t think there’s anything for the sound I’m looking for that’s as versatile [as the SM57]. It has an interesting sound in its own right, aside from being durable and hammerlike. On a guitar, it’s the only mic that actually works. It’s used universally on the snare drum, and it also gives a great vocal sound.

**Q. What is the one thing you will almost always do when you start out to mic a session?**

**TOM JUNG:** I use a pair of B&K 4004’s, which are small capsule 130-volt microphones. I felt that the capsule was very happening, but I wasn’t very excited about the box that comes with it, which supplies 130-volts of power and then tries to cram the signal down a couple of 5534 op amps that I try to avoid at all costs whenever I can. A friend of mine that I used to work with in Minneapolis builds some very good high-end Hi-Fi equipment, and he

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When the champagne wore off, cooler heads prevailed. After all, the new Aural Exciter Type C<sup>2</sup> with Big Bottom<sup>®</sup> sells for under \$350 ... a lot less than air fare to L.A. So we compromised (something usually unheard of at Aphex).

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But the idea of showing off our heritage was still on our minds. So, we will draw from the names of people who get a T-Shirt\*. One lucky winner will come to L.A. with a companion as VIP guests of Aphex. Then we get to brag about how great the Aural Exciter is ... how our patented process has often been imitated, but never duplicated.

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To get your free T-shirt you must purchase an Aural Exciter (your choice of Aphex Models) by March 31, 1994 and send in the warranty card. Other details are in the tiny print. Hint: you don't have to buy an Aural Exciter to be eligible to win the L.A. trip or *Aphex Bucks*. All you need to do is write to us or see your Aphex dealer for details. Join the Celebration and visit your Aphex dealer today!

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built a microphone preamp that's all discrete and pure Class A with a quiet 130-volt supply. He put it in a box, and I use that with the microphones — and that's my piano rig. I hate getting in ruts in terms of just doing one thing, so with just about every Warren Bernhardt project that we do, I'll dig something out and try something new. Invariably we're back to the B&Ks, because for me they really work.

**KOOSTER MCALLISTER:** A lot of times I have to mic a grand or a baby grand piano in a rock & roll environment, which means that I have to keep the lid closed. I use a pair of AKG 414's taken out of their holsters, and I make a gaffer-tape sling between the bridges. I'll do one on the bottom toward the back of the piano, and one on top. Next I'll use a small microphone like a Shure SM98 right on the little sound holes. Usually, between the three microphones I can get what I want and still have the amount of rejection I need of the amplifiers, drums, and everything else.

Another thing that I do a lot is to

take a PZM up to the hammers of the piano and tape it onto the lid to get the attack. Sometimes you have to screw around a little bit with the phase to get to where everything is working right, but generally it's a trick that works for me — a pair of 414's and a PZM, and I'm pretty happy with what I get on the piano.

**FRANK FILIPETTI:** There's a mic setup that I use with guitars. I've worked with Mick Jones (Foreigner), Kiss, MSG, and lots of different bands, and they all have different sounds. When I go in, I'll start with a three or four mic setup on the amps — the SM57's — and I usually put a 57 and a 67 very close together on a speaker. Then I'll take a Sennheiser 421 and put it on a second speaker. I even use an AKG 414 and move it back a foot and use it as a different phase mic. Sometimes with a guitar when you're doubling and tripling it in an attempt to get a big guitar sound, you'll find that a simple thing like EQ doesn't work. I find that I'll come in with a set idea on setup, but I invariably find myself running



back and forth between the console and the studio area changing mics and trying different things. What works for one person almost never works exactly the same for someone else.

**Q. For a [live] session, would you use mostly dynamics in the drum kit, or a mixture?**

**KOOSTER MCALLISTER:** I generally use 414's for overheads if the band will let me. My hands are tied a lot of times, and I end up using what I'm given. Usually, if a band has been touring for three months, they don't want someone to come in and change the way that they normally do things. The monitor mixer is very set in what he's doing, as is the front-of-house guy. If

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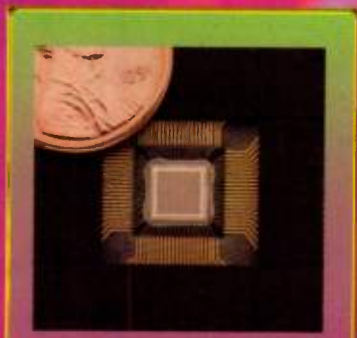


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## TECHNIQUES MIKING

you're doing a remote properly, you come in and the crew doesn't even know you're there. If they're happy, then I've done my job right.

**DAVID SMITH:** As you mic a piano, you can get real close to it and make it sound as though your head is under the lid. You can also back off, and there's a fine line at which you're taking an acoustical picture of the piano and it just fills the picture. In other words, the microphones can see a tiny bit around the edges of the piano — what's a little bit behind and in front of it — but it doesn't sound although you're at a tremendous distance from the piano.

**Q.** Can anyone recommend a good technique to capture the feel of a country fiddle?

**FRANK FILIPETTI:** You don't want to get too close to the instrument. I think that's something that a lot of people make a mistake about, mikingwise — especially when it comes to string sections. Whether it's in a classical or a

pop date, people tend to mic the things too closely and a violin or a fiddle sounds more ghostly the closer you get to it. It's amazing to me that the violinist hears an awful sound when he's playing his violin. The warmth and the beauty of the strings come out as you get farther away. There's a point of diminishing returns, but I find a couple of feet overhead, somewhere over the sound-hole is best, and I generally may get just a little bit in back. The microphone I like is the Neumann KM86, which works really nicely for strings. I like a Neumann 89 as well, and the 414 is sometimes not a bad instrument. I generally tend to go with a condenser microphone under circumstances like these, as opposed to a dynamic.

**DAVID SMITH:** If I could add something quickly to that — we do violin soloists in front of orchestras and also by themselves, and we wind up using the Neumann KM84 at about five or six feet off. Sweeter than a Schoeps, sweeter than an AKG, sweeter than anything that is just like an 86.



**Q.** Frank, in regard to the Macauley-Schenker Group song you recorded, what kind of mic did you use on the bass, and what's your technique for positioning in order to get the attack? Also, please go over the multiple-miking technique that you use for guitars.

**FRANK FILIPETTI:** Well, on the bass, what I found with rock & roll and some pop songs is that you can't go with just a direct bass. You have to go with the amp as well, because most of the sound's grit comes from the amplifier. The problem with using the direct and

### ABOUT THE PANELISTS

Tom Jung is a pioneer of digital audio recording, having conducted many of the first experimental multitrack sessions in Minneapolis for 3M. Since that time, he developed a minimalist and esoteric approach to maximizing sound quality on a CD with his work on his dmp jazz label.

Frank Filipetti is recognized for his production work with some of the great contemporary female vocalists; he is primarily associated with work for Carly Simon, but most recently has recorded new records by Mariah Carey and Cindy Lauper. He has also recorded Kiss.

Kooster McAllister is owner-operator of Record Plant Remote. He's worked with Bob Dylan, Aerosmith, Michael Bolton, and Emmy Lou Harris through his extensive live audio work concentrating on film and television.

David Smith is director of technical operations at Sony Music's classical division responsible for all remote, TV, archival, and soundtrack scores. His most recent credits include *Schindler's List* and Disney's *Fantasia Continued* due in 1997.





the amp sound is that you invariably have to add some direct sound — the amp alone doesn't have enough bottom end to give you what you want. You have to end up using a combination. The only technique that really works for me is combining the two of them, but this introduces some phase distortion that often works against you. You'll find that on certain notes the bass is there, while on other notes it goes away. The problem is that your direct line is coming in electrically and your mic signal is coming in from 7 or 8 inches from the cone. By the time that's all converted, you have a millisecond or more of phase differential between the signals. So, what I ended up doing on this particular Michael Schenker song was to take the direct signal and delay it slightly. I find it works at somewhere between a millisecond and three milliseconds, generally through a very good delay



line. Combine them and listen, and you'll find a signal where things really seems to work well.

As far as the bass mic is concerned, we used a Neumann U47 for that, at about 5 or 6 inches from the center of the cone. Many people say: "Don't mic directly down the center of

*continued on page 106*

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# Practicing Safe Sequencer Sys Ex

System exclusive data is a wonderful concept: you can save a device's operational status down to the last parameter, then send the data back into the device later on to restore that particular status. Although system exclusive data is standardized, that doesn't mean the medium holding the data is standardized. If you need to exchange sys ex information, or transport it to another studio, what do you use? DataDisk? MIDI Streamer? Sys ex storage in a keyboard workstation's disk drive?

One possible "common denominator" is to use a sequencer that can record sys ex, such as Opcode Vision, Steinberg Cubase, or MOTU Performer, etc. As long as the people on the other end have the same sequencer, they can play back your sys ex data.

First things first: make sure that the sequencer (and interface, if appropriate) are enabled to record sys ex, since sequencer MIDI record filters generally default to ignoring it. Also, if you have a "fast" interface like the MIDI Time Piece II, set it (and any associated software) to the standard 1 MHz mode. In my experience, fast mode works only for short sys ex bursts, such as a single synth program.

Here's the step-by-step procedure for saving sys ex into Performer 4.1 or 4.2, which has been the most requested format for sys ex storage in my work with others. Even if you're not a seasoned Performer pro, just follow these steps and you'll be fine.

## TO STORE:

1. Boot the program and open a new file.
2. Select MIDI Configuration from the Windows menu.
3. Select Add Device from the MIDI Configuration minimenu.
4. Select the device (default is Device 1) by clicking on it to highlight it.
5. Select Edit Bulk Dump from the MIDI Configuration minimenu. A sys ex editing window opens.
6. Initiate a sys ex dump from the device whose sys ex you want to store (the bulk dump window should show a bunch of hex code). Do not record any other MIDI data; dedicate the sequencer to the sys ex.

7. After the transmission is finished, click on OK.

8. Save the file. If Performer reminds you that you haven't saved a configuration file, just click on Stop Asking.

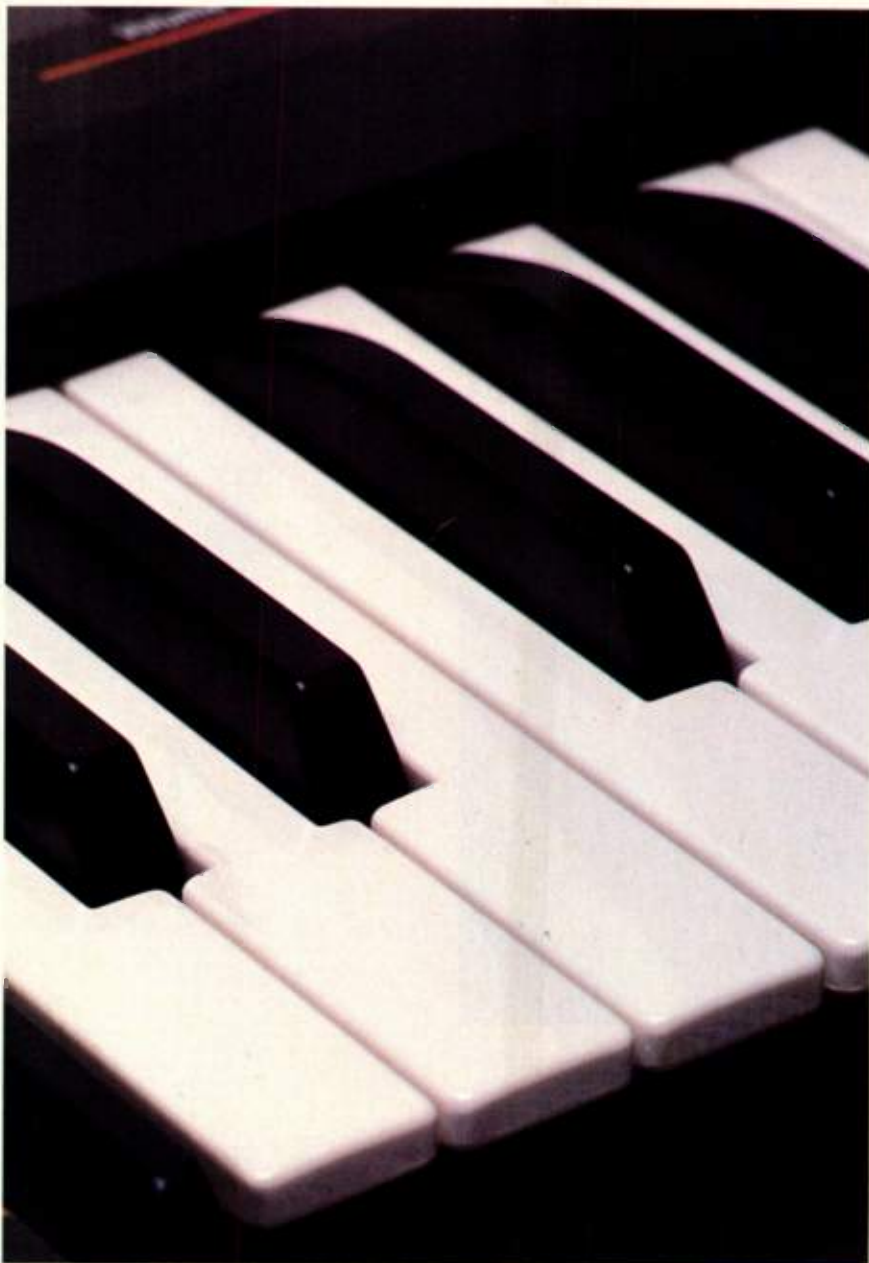
To play back a sys ex file:

1. Open Performer.
2. Open the file containing the sys ex.
3. In the MIDI Configuration menu, select the device by clicking on it.

4. Select Send Bulk Dumps from the MIDI Configuration minimenu.

5. The target device should receive the dump. If not, check your connections, and reread the hints given toward the beginning of this article.

That's all there is to it — unless you want to edit the data before sending it out. But that's another story for another time...  
—Craig Anderton



**PRACTICE SAFE SYS EX:** You have to be careful when transporting your files to another sequencer.



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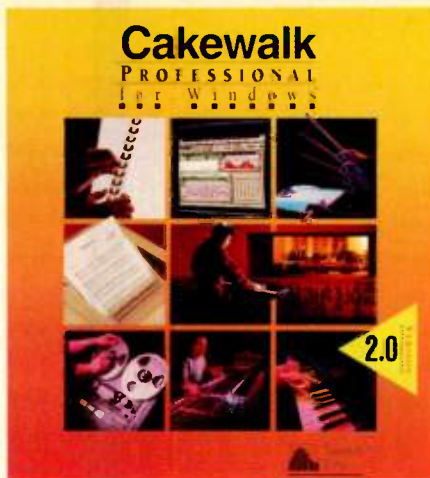
## DECKED OUT

**O**SC is offering the Deck II digital audio workstation for the Macintosh, featuring a 16-bit, multi-track nondestructive, hard-disk recording, real-time, moving fader automation system. Deck II has 24-bit resolution, timeline-style multitrack waveform editing with track-slip, continuous SMPTE synchronization to all SMPTE formats, simultaneous MIDI-file and digital audio playback (synchronous playback with MIDI sequencers on a single Macintosh), unlimited digital track bounce, synchronous audio and digital QuickTime (for multimedia users), video playback direct from disk, and more. Deck II allows you to maintain as many virtual tracks as you want, while swapping between track versions or takes instantaneously. You can record and edit audio, build fades and crossfades, and automate level directly in Deck II's track window, and you can always tell what will play, and when, with a quick glance at the screen. For complete details, contact OSC, 480 Potrero Ave., San Francisco, CA 94110. Tel: 1-800-343-DECK. Circle EQ free lit. #148.



## SOFTWARE OF NOTE

**T**welve Tone Systems has released Version 2.0 of their Cakewalk Professional for Windows. This upgrade adds almost 50 new features and enhancements. Among the new features are: staff notation printing of up to 16 staves; a Play List for live performance; real-time editing; an enhanced Faders View, which includes 16 sliders and 32 knobs assigned to any MIDI controller; and Interactive Punch, which allows multiple recording segments without stopping playback. For info on all the new capabilities, contact Twelve Tone Systems, 44 Pleasant Street, P.O. Box, 760, Watertown, MA 02272. Tel: 617-926-2480. Circle EQ free lit. #147.



## MIDIMAN TO THE RESCUE

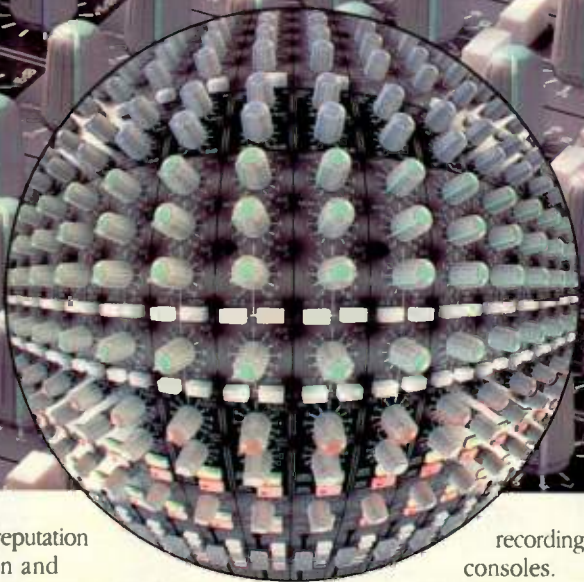
**M**idiman has broken the cost barrier for video postproduction. VideoSyncman is a VITC (Vertical Interval Timecode) reader and writer. With VITC, all you need is just a VCR and a MIDI sequencer setup, and you can score videos. In addition, VideoSyncman can read and write LTC (Longitudinal audio Timecode) and MTC (MIDI Timecode) as well as translate any of these three timecode languages into the other two, simultaneously. For complete details, contact Midiman, 236 West Mountain Street, Suite 108, Pasadena, CA 91103. Tel: 818-449-8838. Circle EQ free lit. #149.



## HAVE YOU HEARD...

**Digital Audio Lab's** EdDitor for Windows has been given new features and a new name: EdDitor Plus. It takes advantage of the new hardware features of The CardD Plus. You can record one stereo soundfile while listening to another. It plays the file in the bottom waveform display window, and records the new sound into the top window...The new L-CDP Project Series CD-ROMs from **Roland** are affordable additions to the *Sample Archives* library for Roland S-Series samplers. Each contains approximately 150 MB of samples of specific types of instruments and each disc is specific to individual instrument types...**Jupiter Systems** has released the Multiband Dynamics Tool, a unique DSP plug-in for **Digidesign's** Sound Designer that gives you optimum control over the dynamics of your recordings. You can change the relationship between the input and output signals, in real time, in up to five independently adjustable spectral bands...Version 1.8 of LOGIC and LOGIC AUDIO from **EMAGIC** — software programs for the Macintosh — allow for making music with integrated MIDI sequencing, notation, and digital audio...**Sonic Science** has introduced Sonic Search. It's a Media Management System designed to take the leg and guesswork out of the SFX lay-up procedure. Sonic Search includes a one-million word thesaurus and allows you to search a database of virtually all sound effects manufacturers' libraries by typing a single word...Cubase Audio 2.0 from **Steinberg** supports Digidesign Audio Engine on the Mac platform...**E-mu** has made the Emulator IIIx operating system software version 2.0 available. It features time compression/expansion and Transform Multiplication functions...New dance, rap, funk, techno samples, sequences, sound effects, loops, and grooves from France are available on three new CD-Audio sampling discs from **Q Up Arts**. They retail for \$99 each...**KAT** has premiered several new products in its line of electronic percussion, including *Ditto Disks*, a CD-ROM for the Akai S1000 that features dozens of drum set sounds, orchestral and melodic percussion, and *The TV and Film Percussion of Michael Snyder*, also a CD-ROM for the Akai S1000, as well as the S1100.

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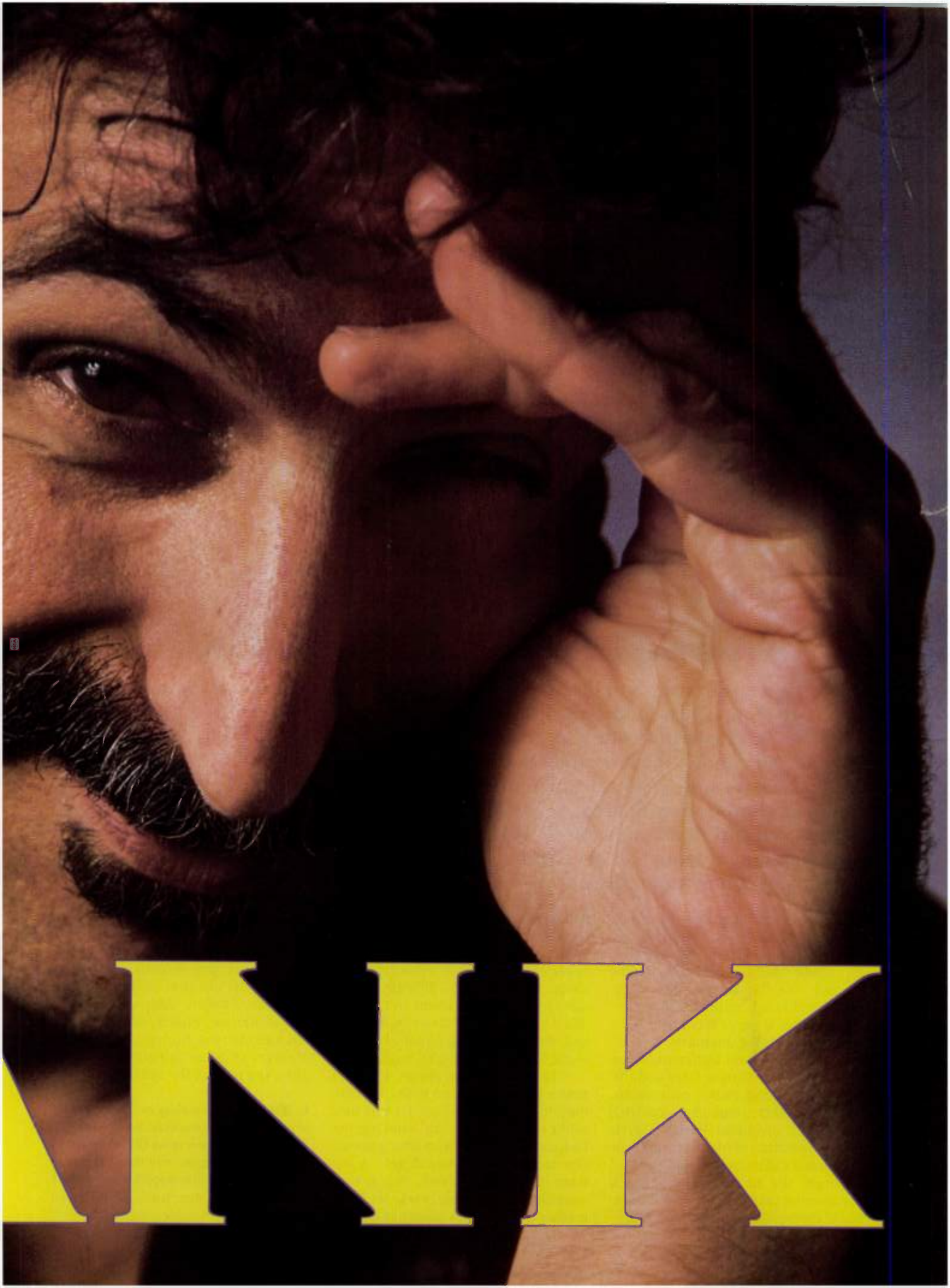
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03

**ANK**



ver the course of his 52 years on Earth, Frank Zappa was often accused by his detractors and admirers alike to be not of this planet. After all, how many mere earthlings could conquer the world of avant garde, classical, and pop music as a singer, producer, composer, conductor, record mogul, actor, and movie producer? And Zappa did so with a wry sense of humor, and accented all his endeavors with a healthy flavoring of contempt for the norm.

As an integral member of the '60s ensemble Mothers of Invention, as well as during his solo work over the last three decades, Frank Zappa scoured the landscape on many fronts, including musical and political, selecting areas of focus and then fearlessly exploring uncharted territories. While national headlines told us of his bouts with Tipper Gore and the PMRC in fighting music censorship, and of his entrepreneurial activities with Czech president Vaclav Havel, they said nothing of his adventures on the frontiers of recording and sound.

From the one-of-a-kind 5-track tape recorder used in Studio Z in the late '60s, to the 6-channel concert sound sys-

tem devised for *The Yellow Shark* concerts in Frankfurt two years ago (available on Rhino Records), Zappa loved to tweak existing technology to yield new strains with unknown, different — and often interesting — results. In the early '80s, he put down his revered Gibson SG and discovered a brand-new audio tool — the New England Digital Synclavier.

To someone who always strived to render his musical ideas with precision, the Synclavier opened up a whole new world of possibilities for handling the frequently highly complex arrangements that often defied human fingers. A few months before his death, Zappa substantially upgraded his Synclavier 9600, making it the world's largest integrated

composition, sampling, and production system for digital recording. With the addition of six 64 MB MegaRAM sample memory cards and a custom expansion chassis for 32 additional voices (both from The Synclavier Company), Zappa's uber-Synclavier boasted 128 voices and 384 MB of sampling RAM.

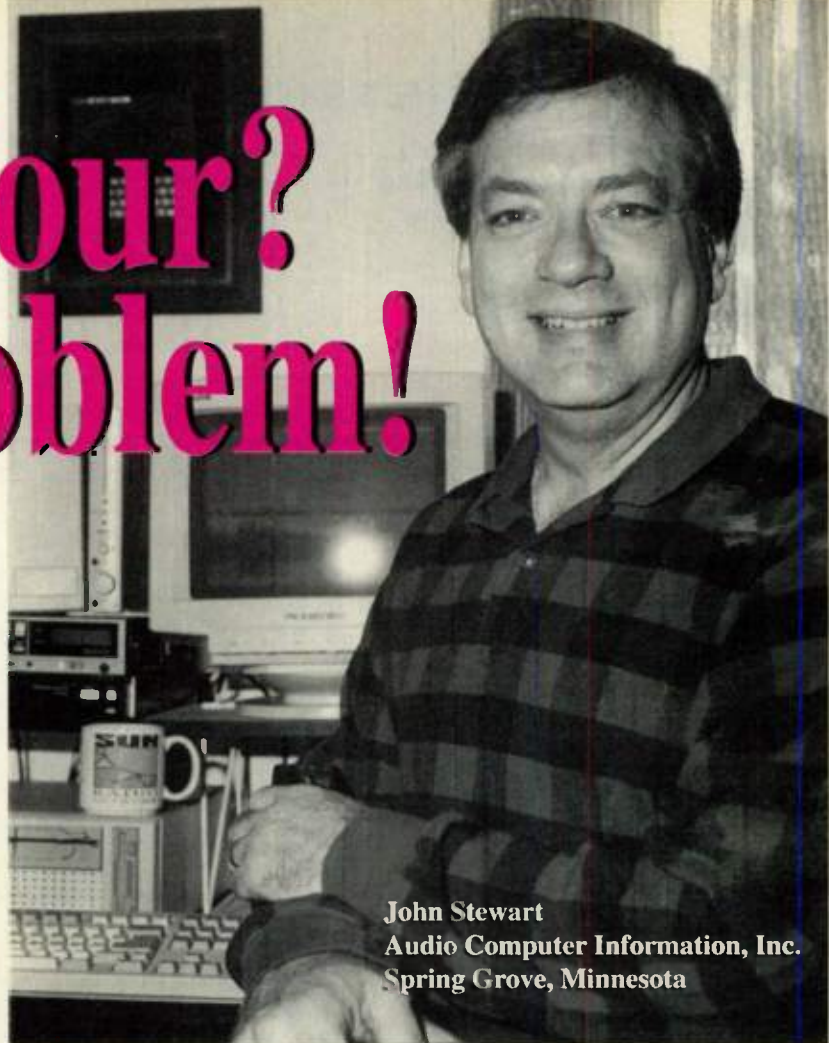
Zappa not only used the Synclavier as another instrument, he took advantage of its vast digital sampling and recording capabilities. In fact, his 1988 album, *Jazz From Hell*, which was composed on the Synclavier, won Zappa his only Grammy for best rock instrumental performance.

In this unpublished interview conducted at the Utility Muffin Research Kitchen, Zappa's L.A. project studio, he candidly discussed the old and the new, from recording early Mothers of Invention albums to juggling samples on the Synclavier.

**Q.** When you were working on the remastering of unreleased live material for the *You Can't Do That on Stage Anymore* series CDs, what sorts of problems did you have with the early analog masters in making them compatible with digital?  
**A.** That stuff came from all different kinds of audio sources, starting with 7



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# FIRST IMPRESSIONS

**Joe Chiccarelli, Zappa's early engineer, reflects on recording some of the legend's biggest albums.**

I heard Frank and appreciated what he had done on *Apostrophe* (1974), but I wasn't a die-hard fan when I was asked to take over the recording and mixing duties on *Sheik Yerbouti* in '77. I quickly realized, however, that I was working with a true innovator, an individual whose basic philosophy was to never resort to clichés or proven methods. Frank's whole approach was to push the envelope, and I can remember him always saying to me, "Make things sound stupid." He thought that when things sounded too Hi-Fi, they were unoriginal. He tried to make songs sound quirky or kitschy, so they would stand out from other records.

In addition to *Sheik Yerbouti*, I engineered for Frank during *Joe's Garage* ('78) and *Shut Up And Play Yer Guitar* ('81). Actually, Frank knew enough about technology for him to have engineered himself if he wanted to, but he let everybody in the studio do their own thing. He was always very vocal about what he wanted, though. Frank was a conceptualist, if you will.

The thing I remember most about those days was doing a lot of 2-inch tape editing. We would cut tapes together from various live performances to create different musical inventions. Frank would tell me to cut on the weird beats — spots that you would not make edits on — and in all cases, they worked. We came up with some really brilliant things that were man-made and would never have happened if the musicians were told to play them.

A lot of tape editing was done for *Shut Up And Play...* because Frank was uptight about his guitar solo performances. He never thought he did his best takes in the studio; he felt that when he was live, in front of an audience, he did his best work. So I suggested that he tape

his solos live on the road, and when we got into the studio we could edit them in.

He used to have a huge set-up on stage — four Marshall bottoms — that was actually much louder than the live band. In order to isolate and record his solos during live gigs, all we had to do was stick a couple of Electro-Voice RE-20's up against the speakers and record them using a 2-track Nagra recorder.

When we got into the studio, we would create jam sessions that didn't happen in real life. There were many occasions in the studio when Frank would tell (drummer) Vinnie Carlucci to play in a certain time signature, and Frank would manually start the tape of his solo. Some real magic was created through this technique because the drummer didn't know what was going to happen next and things would come about just by accident.

## Mixed Nuts

Mixing for that whole *Sheik Yerbouti* album was pretty nuts. We were using a 24-track machine (back then, we worked on either an API or Trident console), but 18 out of the 24 tracks had two or three different instruments on them. Sometimes, there may have been as many as 40 tracks on a song. It was a crazy time, but not as crazy as the time Stevie Nicks visited the studio and her four dogs broke loose and began trampling over equipment.

Frank should be remembered as somebody who really followed what he heard in his head and did it his way. He wasn't about to go with the system in any way, shape, or form — his integrity was what was important to him. He took things so far that the majors didn't even want to deal with him and he had to start his own label. Unfortunately, Frank Zappa may be remembered by most as an outsider, but in the end, he'll also be recognized as one of the most influential musicians of this century.

—Joe Chiccarelli

1/2 ips stereo — on one of the discs there's even a cut that's mono. You have to match level, you have to match EQ, and you have to control peaks on some of it. It's the same thing you would do if you were putting together any other kind of anthology, except you're dealing with live tape.

**Q. I recall reading that in the digital process you're much more aware of miking problems. You also mentioned that noise is much more of a problem with digital.**

A. Well, since the digital has no noise of its own, any noise that's there is either coming from the mic, from the board, or from a bad amplifier on an instrument.

**Q. Just to turn back the clock a bit, can you discuss the recording of some of the early Mothers of Invention albums in the late '60s? I heard it was quite primitive. What sort of setup did you have at the time?**

A. We had eight microphones and an 8-track Shure mixer that was stuffed into a briefcase — and also a portable Uher recorder. A guy named Dick Kunc used to sit by the side of the stage with earphones on and try to get a balance while we were playing. On "Weasels Ripped My Flesh," for example, there are several cuts that were done using that equipment. I'd say that was fairly primitive.

**Q. Back when you bought Pal Recording in Cucamonga, CA, from Paul Buff and turned it into Studio Z, Buff (who invented the Kepex noise gate) was experimenting with some fairly innovative audio equipment. What's the story behind the 5-track recorder that he made?**

A. He took a Presto deck and made his own head stack. I don't even remember what kind they were, but he bought a bunch of heads and machined this stack that was about six inches across. And the heads weren't stacked on top of each other, they were staggered, because at that time there was no material that could give you enough isolation between the heads if you stacked them one on top of another. So he had five heads in a row that were erase heads, and then five more in a row that were record and playback, so it wasn't like three distinct groups of heads — it was two distinct groups. Because of this unique arrangement with the heads stacked in a diagonal way, those 5-track masters can't be played on any head other than the original, and it's all worn now.

**Q. Where is the 5-track now?**

A. I don't know. I lost track of the deck, but the head stack itself is probably in a box of garbage someplace down in the vault.



**FRANK'S FACTORY:** Zappa's Utility Muffin Research Kitchen, which houses his mega-Synclavier setup among other things.

**Q. What other things did Buff pioneer?**

A. Well, he had the first fuzztone I ever saw. He had taken the preamp from a phonograph and he was running a Sears-Roebuck bass through it. And it was a great fuzz bass. That was the first time I ever saw anybody do a direct fuzz on a recording.

**Q. On *We're Only in It for the Money*, the Sgt. Pepper's parody released in 1967, there're some creepy whispered lines which say, "Frank Zappa, there he is in the control room. And I sin-**

**cerely don't care..." What was that all about?**

A. That's Gary Kellgren, who was actually the engineer on *We're Only in It for the Money*. And he was a funny guy — a suffering individual during those days, because he had a studio (Mayfair) that had the only 8-track in New York City at that time. It was kind of a homemade rig, and he was recording 18 hours a day, and he had no private life, no social life. He was just run down. We had to get our album done and we were forced to work with a guy where I knew that

just by our going and doing our session we were making his life more miserable by the minute. He would do, maybe, three or four bands per day, and it was just grinding him down.

He was living on leapers and beer, and so I decided one day to just let him blow off a little steam: I put him out in the studio — I became the engineer and let him talk into the microphone. That's where all that creepy whispering comes from.

**Q. What's all that backwards stuff on the end**

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of that album? Why is it there?

A. It was in the original. Well, some of it was put in because we were forced to. One of the lines was, "Shut your fuckin' mouth about the length of my hair" (from the song "Mother People"), which MGM made us turn around. Other things were just done for audio effect.

**Q. What was it like recording side 4 of the first Mothers' album *Freak Out*, the cut "Son of Monster Magnet," with all manner of freaks scurrying about the recording studio?**

A. What was it like? It was kind of interesting. [slightly sardonic chuckle]...I wouldn't say it was a landmark

of my career. That was certainly one of the things that the engineer at that studio will always remember, that's for sure. And Tom Wilson, who was the producer on that session, admitted to me several years later that he has taken acid that night, so he was in there in the control room turning the knobs on acid. And I didn't even know. So he must have had some kind of a weird experience.

**Q. Why have you found the Synclavier to be the best way for you to have maximum control over your music?**

A. Simply because of what it allows you to do. You have control over the pitch-

## THE UMRK MIX

It was Christmas Eve, 1980 and Frank Zappa needed some help with rough mixes on tapes from his last tour. I soon discovered that he loved to edit. I mean he *really* loved to edit! In fact, Frank had already done major surgery on the tour's 24-track masters. One song might have three or five or more edits from different venues with each section usually having a vastly different ambience, level, and EQ. These "roughs" became the *Tinseltown Rebellion* album and took months to complete.

Frank's workday was about 26 hours long, going to bed later each day. As the daily tasks of the Utility Muffin Research Kitchen (UMRK) went on, he would work on his book or screenplay, edit mixes, spend endless hours at the Synclavier, handle family tasks, watch Larry King, direct the staff on multiple tasks, and consume vast quantities of the studio "rocket fuel" coffee and smoke Winstons.

Several tours and many albums later, better methods evolved for mixing stacks of tapes from the road and the vault. For the 1988 tour, with over 200 hours from 79 venues to choose from, we wanted to avoid the headaches of the *Tinseltown* approach. Our solution was to mix the songs from selected venues to sound like one specific venue. This allowed Frank to use the chorus, for example, from one show, the verse from another, and the solo from yet another. By using UMRK's Lexicon 224-XL's, live chambers, stereo audience tracks, and stage mics, the ambience could be significantly altered. Frank assembled these mixes in "the basement" to produce the sequenced masters. I did the final level and EQ adjustments with Steve Marcussen at Precision Disc Mastering on a Neve DTC. *Broadway The Hard Way* and other releases from the 1988 tour were mixed and mastered the same way with no overdubs or track replacements.

Frank Zappa's unique talents and perspective were irreplaceable and will be deeply missed. —Bob Stone

ADVENTURES



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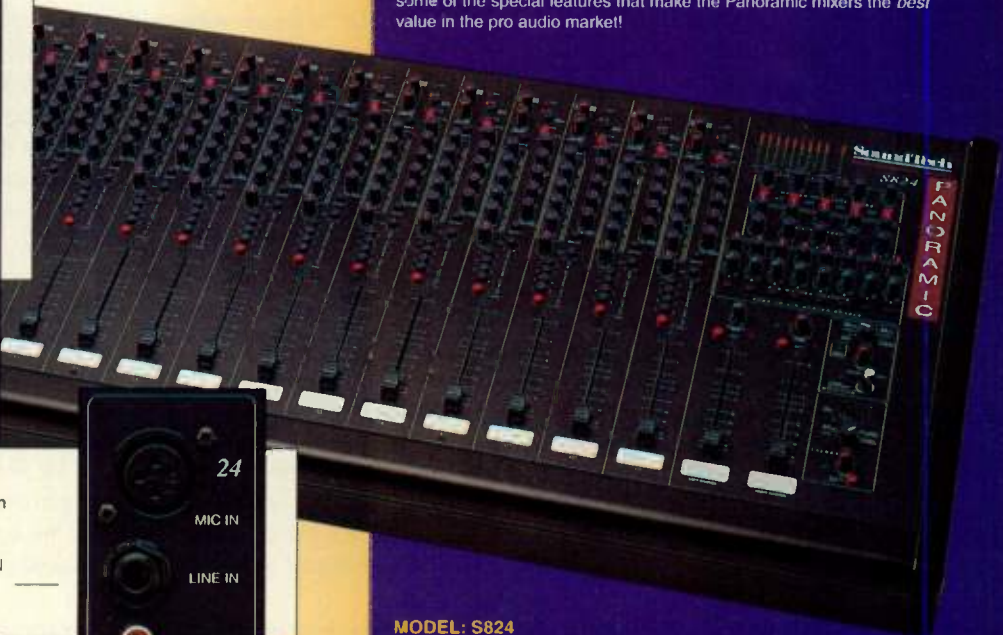
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es, durations, amplitude, speed, octave, and phrasing. It allows you to be a composer and a conductor at the same time, as well as a performer, so that's about as flexible as you can get.

**Q. How much has your Synclavier setup changed since you worked on your 1988 Grammy-winning album, *Jazz from Hell*?**

A. It's completely different. [N.E.D.] has not only had major software updates, but major hardware updates in the system, as well, and we've pretty much kept up with it. For example, when *Jazz from Hell* was made, the system I had did not have velocity. In other words, all the notes of all the parts of the tunes were at 100-percent volume. The only way you could get any dynamics was by moving the fader during the mix. And now we have velocity capability, giving you individual volume control over every note. What you can do with the machine now is a lot more realistic and expressive.

**Q. One last question, Frank. You're working on a project with N.E.D. entitled *Samples from Hell*. What's that all about?**

A. I'm converting my sample library into an optical disc package that will be available to Synclavier owners. It's a very time-consuming process. Before it goes onto the optical disc, each of the samples has to be cataloged and captioned. So when you push the button on the screen to call up a sample, it tells you exactly what it is. Each sample is categorized into different catalogs. For example, all the percussion samples of a certain type go in one catalog, the wind and guitar samples in another, and so on. It's a big project. You're constructing a really specialized database, so that when a person buys the optical disc, he's really getting a complete library. [Although *Samples from Hell* was never released, it may still come to fruition with *The Synclavier Company*.]

—Joe Spiegel

## THE YELLOW SHARK SESSIONS

As a collection of concerts recorded in late 1992, *The Yellow Shark* serves as both a symbol of technological ingenuity and a triumph of the artistic spirit. While showcasing a side of Frank Zappa that bespeaks a serious dedication to the nuances of orchestrated music, *The Yellow Shark* also supports what many have been saying about Zappa for years — the man loved sound. To prove this point, the Father of Invention set up a series of technological firsts with the recording of *The Yellow Shark*, the first of which was to bring together an international coalition of classically-trained musicians to perform music in the same technical environment as that of an arena rock concert.

In order to ensure maximum sound quality at the live concerts (performed in various venues around Europe), the music was carefully mixed and balanced with each orchestral player receiving an individual monitor for his or herself. According to the official *Yellow Shark* log, each work was arranged specifically for a six-channel sound system that engineers David Dondorf, Spencer Chrislu, and Harry Adronis utilized for each concert hall. Zappa actually "placed" instruments in desired six-channel configurations by sampling and mixing them in his home studio, the Utility Muffin Research Kitchen. These same mixes were then recreated and recorded — live.

"We had to design a system that would take into account the unique needs of the compositions," says David Dondorf, the stage monitor engineer and technical coordinator for *The Yellow Shark* performances, "the configuration of the venues, the monitoring needs of the artists, and the requirements of a 48-channel digital audio recording, as well as multicamera live broadcast video."

Zappa once again showcased his considerable talents as a composer who relishes the little surprises that can make a musical piece a larger-than-life experience. "The concert's not that loud that it's blowing people away," enthused Zappa, "It's clear and the musical detail is in your face. The sound of the instruments has not been electronically tweezed in any way. It's a Hi-Fi experience to the Nth degree."

—Jon Varman



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TUBE-TECH  
MICROPHONE  
PREAMPLIFIER MP 1A  
LYDKRAFT DENMARK

CHANNEL 1



GAIN

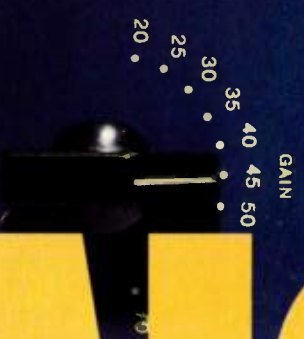
LF cut



Phantom Power



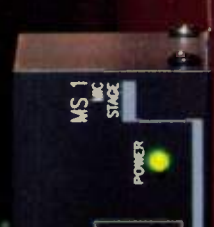
GAIN



LF cut



Phantom Power



# MIC BUY

FMI 14 MIXER INPUT

48V PHANTOM POWER ON/OFF

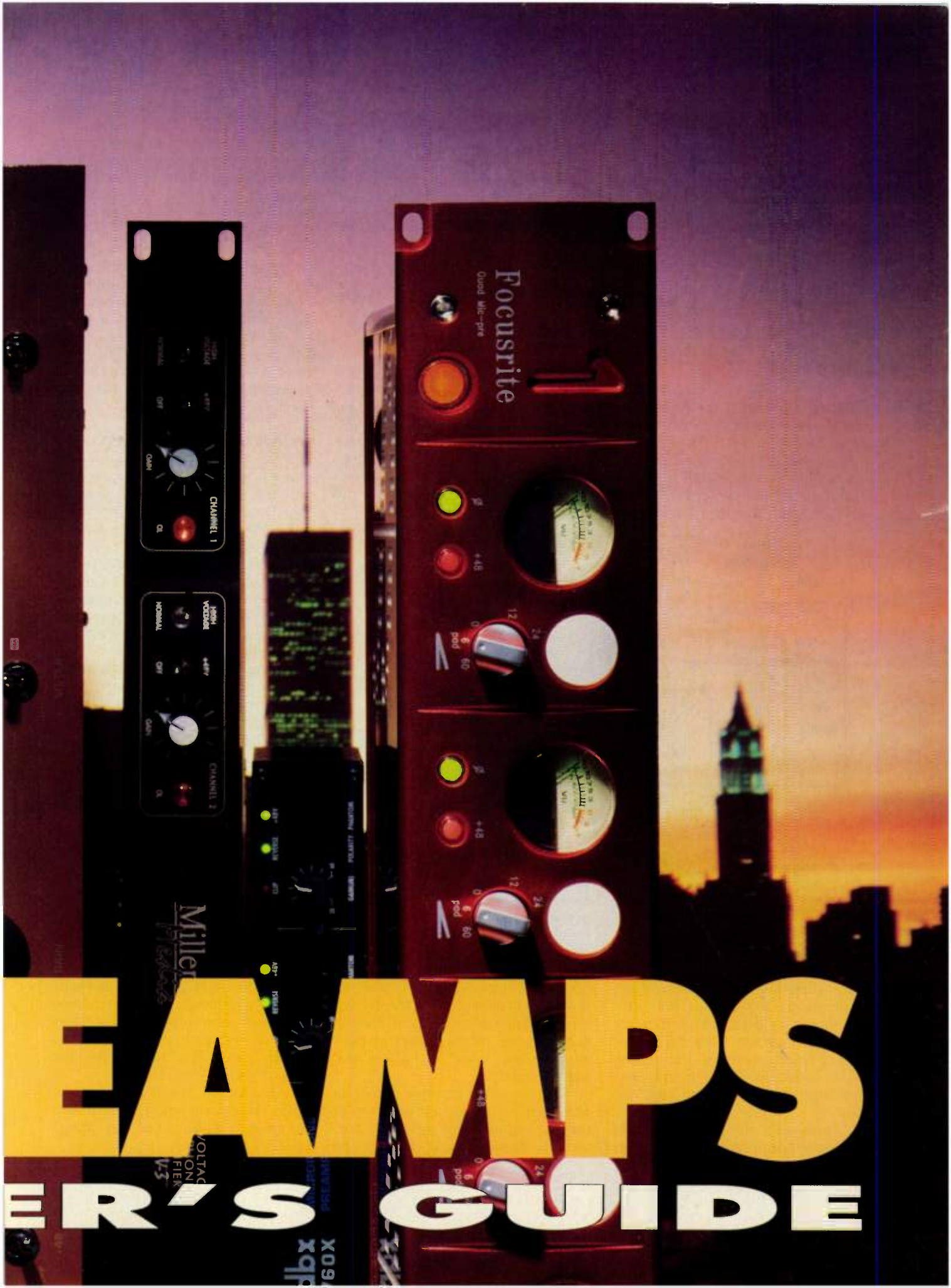
EQ: HI (20K), MID (1.2K), LOW (100Hz)

PRE EQ, PRE FD, PST

MASTER

© 1998





Focusrite  
Dual Mic-pre

CHANNEL 1

LOW CUT OFF

PHASE

48V

OFF

GAIN

CL

CHANNEL 2

LOW CUT OFF

PHASE

48V

OFF

GAIN

CL

MILLER

AMP

48V

PHASE

OFF

GAIN

# HEADAMPS

## USER'S GUIDE

X091  
xpb

**T**he outboard microphone preamp is hot...again. End users need mic preamps and manufacturers have responded with a wide range of products that embrace both old and new technology. This recent rise in preamp popularity closely parallels the legitimization of MIDI and the rise of affordable digital recording.

MIDI's potential for generating virtual tracks has shifted the primary emphasis of console design away from recording to mixing. And digital's ability to capture audio without saturation places more emphasis not only on sonic integrity, but on the

already know the importance of that first stage of amplification. If, however, your studio cup does not runneth over, selecting an outboard preamp can be a tough task. What follows will shed some light on what's under the hood.

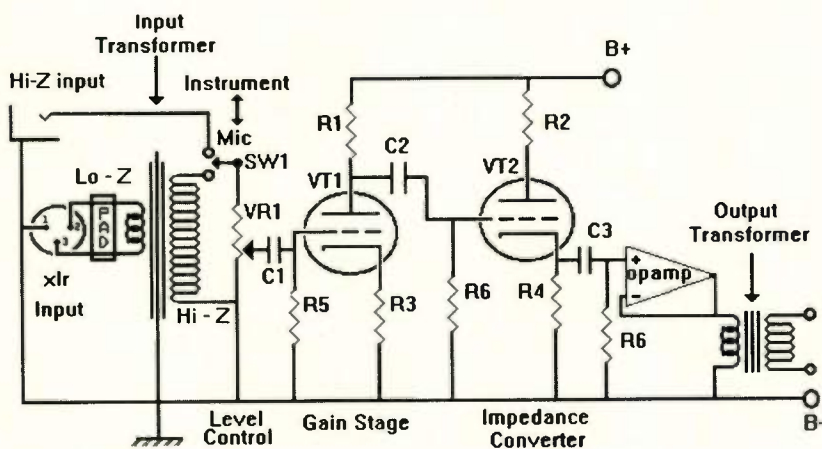


Figure 1

mic preamp as a signal processor — where it becomes as much a part of the total sound palette as a microphone, an equalizer, or a compressor.

A good-quality mic preamp must deliver high gain; low circuit noise (hiss); high Common-Mode Rejection Ratio (CMRR, the ratio between signal gain and interference rejection); freedom from Radio Frequency Interference (RFI) and Television Interference (TVI); and freedom from ground-induced hum and buzz.

Those with the good fortune to have a plethora of mics and preamps

#### SCRUTINIZING THE CONSOLE PREAMP

No longer the default choice, the mic preamps found in recording consoles (both budget and upscale) are being challenged daily. Despite advancements in manufacturing and technology, it's impossible for console designers to deliver lots of features for an affordable price without making compromises. As consumers we can't have it both ways: low prices and highest quality.

For a perfect example of market compromise, check out the receipt for that feature-laden mixer you purchased. Based on our survey, the

average cost of a high-quality preamp is about \$750 per channel. If you multiply that times the total number of inputs on your mixer, the answer will become quite clear. (About \$18,000 for 24 inputs!) This same test can also be applied to the equalizer.

It should be easy to understand why the preamps in many mixers might be less-than-pristine. Maybe you don't need 24 amazing mic inputs, but a few high-quality outboard preamps should be on hand for those special vocal and acoustic parts.

Incidentally, be sure to audition several preamps before making a purchase. Don't assume that an outboard preamp is always better sounding or quieter.

#### TRANSFORMER OR TRANSISTORS

Before active balancing amplifiers existed, transformers appeared at both the input and output of all audio gear. Naturally balanced, they reject noise induced into audio wiring. A well-designed transformer is nearly transparent. Some contribute to the sound color and all are greatly affected by circuit design. Input attenuators (pads), common on preamps with input transformers, prevent saturation at high signal levels.

At the secondary winding of the transformer, the signal becomes unbalanced and is then fed to the first gain stage. In order to bypass both the transformer and the additional circuitry contained in a direct box, some preamps include a switch for selecting between the transformer and a high-impedance musical instrument input. This feature increases your chances of getting a good, clean signal.

Transformerless circuitry utilizes either discrete transistors or a preamp IC. (A preamp IC is basically the discrete transistor circuitry in monolithic form.) A minimum of two transistors, selected for low noise, serve as the first stage of amplification. Additional pairs can be paralleled, but to guarantee improved performance, the devices must be pretested and matched. You wouldn't want four different types of tires on your car, would you?

In addition, transformerless preamps rarely have musical instrument inputs or require input attenuators (pads).

BY EDDIE CILETTI AND HECTOR G. LA TORRE

# TANGLE-FREE SOUND OF

# WIRELESS MICS

Your girlfriend  
(or boyfriend), your momma,  
your boss—face it, you've got enough  
things to tangle with. Fortunately,  
thanks to our new, great sounding,  
super clear wireless mics, your  
microphone doesn't have to  
be one of them.



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## SPILLING THE GUTS

Passive devices (resistors, capacitors, transformers, and inductors) modify sound. Vacuum tubes and transistors are active devices that require power to operate and are capable of amplification. Voltage amplification is a familiar concept: it makes sound louder. A power amplifier is capable of making a signal strong enough to move a speaker cone. This is a good example of current amplification.

To improve performance, manufacturers of high-octane preamps prefer to employ amplifiers of their own design, built from discrete, solid-state components. (Discrete is a term that applies to both active and passive components. It indicates that each device is recognizable to the eye. Solid-state is a reference to the silicon material from which transistors, a.k.a. semiconductors, are made.) A monolithic integrated-circuit (IC) consists of

microscopic devices grown on a single silicon crystal. Hybrid circuit packages are built from a combination of discrete components and surface mount technology (SMT). They may also incorporate ICs. SMT devices are highly miniaturized components with minimal, if any, leads. (Anyone got a pair of Zircon-encrusted tweezers?)

An operational amplifier (op-amp) is the fundamental audio building block. It allows designers great flexibility because a minimum of external components are required to get "up and running." When built from discrete components, the increased component size (compared to that of ICs) increases the current-handling capability.

The input transformer converts impedance from low to high — typically about 1500 ohms at the primary and approximately 15,000 ohms at the secondary. The primary input impedance must be optimized to get maximum signal transfer and flat frequency response from the microphone. The impedance of the secondary winding is optimized for the amplifying circuitry that follows. (Op-amps, in this example.) The primary-to-secondary impedance change also yields a voltage gain. This is an added bonus since the transformer, being a passive component, requires no power.

The function of the output transformer is to balance the signal. A one-to-one ratio between the primary and secondary windings will yield an equal signal level on both sides of the transformer. Changing the ratio can increase the output level, provided the impedance of the output stage is sufficiently low. (This is not the case with IC op-amps unless they are buffered by discrete circuitry.)

## VACUUM TUBES AND TRANSISTORS

Of course, no discussion of preamplification would be complete without mentioning the vacuum tube (VT). The greatest advances in VT circuitry are improvements to the supporting cast of passive circuit elements. Input and output transformers have extended bandwidth and improved transient response. Low-noise resistors extend dynamic range and high-quality signal capacitors improve sonic integrity. Modern solid-state power supplies contribute less noise and offer a greater degree of stabilization.

The warmth associated with tubes is not exclusively theirs. Well-

designed solid-state circuitry is equally capable of complementing music and sound. At least one modern VT preamp features a discrete output amplifier, combining the best of both worlds.

The popularity of recycled solid-state electronics from the late '60s and '70s gives every indication that the transistor can be equally magical. Once again, the sonic accolades bestowed upon these period pieces should not diminish the contribution made by the input and output transformers. Though transistors are considerably smaller than tubes, circuitry from that period is very concise, even minimal. The resulting sonic qualities

are similar to the Fender "Tweed"-era amps: clean when not taxed and quite musical when cranked.

## PLAYING THE FIELD

**CATEGORY ONE: Under \$500.** If voiceovers are your thing and all you've got is a shoestring, welcome to the ground floor! All preamps in this category are transformerless. A single pair of discrete transistors or a preamp IC followed by an IC op-amp are the two circuitry options. Many are 2-channel units, with designs similar to those found in consoles costing \$35,000. The primary improvement over mixers in the under \$5000 category should be



Opening spread photo by J.R. Rost

# MICROPHONE PREAMP PRODUCT GUIDE

COMPANY NAME	MODEL #	INPUT DEVICE	PRIMARY AMPLIFICATION DEVICE	OUTPUT DEVICE	PRICE	FEATURES	PHONE	LIT. #
API Audio Products	512B	Reichenbach RE115KE Transformer	Custom Discrete Op Amp 2520	1:3 ratio Custom API steel core Audiotype	\$749	A, B, D, F, LED input meter, mono module	703-455-8188	125
	3124	Reichenbach RE115KE Transformer	Custom Discrete Op Amp 2520	1:3 ratio Custom API steel core Audiotype transformer	\$2095	A, B, D, E, LED input meter, 4-channel		
	212L	Reichenbach RE115KE Transformer	Custom Discrete Op Amp 2520	1:3 ratio custom API steel core audiotype transformer	\$579	B, D, F, LED input meter; mono module		
BEC Technologies	MP 16 Preamp IC	Burr-Brown INA 103 preamp IC	Burr-Brown INA 103 IC Op Amps/Crystal CS3310	Analog Devices SSM 2142 Buffered IC Op Amps	\$5500	A, B, D, splitter, 16-channel 32 outputs	407-855-8181	126
CKB Electronics	MPA-4	Reichenbach RE-16A Transformer	Jensen/Hardy 990 Discrete Op Amp	Reichenbach RE-11 BMCF transformer	\$500 per chan.	B, C, D, E, F, 4-channel; D3M Tynitel output jacks	614-773-0356	127
dbx	760X	Input goes directly to primary amplification	Analog Devices SSM 2017 low noise mic pre IC	5532 IC Op Amps (2 per output)	\$349	B, C, F, XLR and 1/4" output, 2-channel	510-351-3500	128
Demeter	VTMP2b	Jensen Transformer	2/12AX7A vacuum tubes	2/12BH7 vacuum tubes	\$1750	A, B, C, D, pin hot select, low-cut filter, 2-channel	818-986-7103	129
Drawmer	1960	25B737 Transistors	12AX7 and 12AV7 vacuum tubes, NE5532 Discrete Op Amp	NE5532 IC Op Amps	\$2699	A, B, 50/100 Hz Pass Filter Comp. Limiter	508-435-4243	130
D.W. Fearn	VT-1	Jensen Transformer	12AV7 vacuum tube	transformer: Jensen, vacuum tube: (unbalanced)	\$2000	B, C, D, Lo Z mic matching (transformerless mic), 1-channel	215-793-2526	131
Focusrite	Red 1	Transformer, Transistors	IC Op Amps	Transformer	\$3600	B, C, D, output level meter, 4-channel	516-249-1399	132
	ISA215	Transformer, Transistors	IC Op Amps	Transformer	\$4750	B, C, D, equalizer section, line input, 2-channel		
Gaines Audio	MP-2	Reichenbach RE 115KE Transformer	Analog Devices OP-275 and Signetics 5532AN	Signetics NE5532AN IC Op Amps	\$599	B, C, D, 2-channel, LED bargraph meters	716-266-0780	133
GML	8302	GML 8501 Discrete Instrumentation Amplifier	GML 8501 Discrete Instrumentation Amplifier	GML 8802 Discrete Op Amp	\$2400	A, B, D, F, 2-channel, needs 8355 power supply	818-781-1022	134
	8304	GML 8501 Discrete Instrumentation Amplifier	GML 8501 Discrete Instrumentation Amplifier	GML 8802 Discrete Op Amp	\$3500	A, B, D, F, 4-channel, needs 8355 power supply		
John Hardy	M-1	Jensen JT-16-B; Mic Input Transformer	Hardy 990A 24V Discrete Op Amp	Hardy 990A-24V Discrete Op Amp	-	B, C, VU-1 meter, gold-plated XLRs, 1-4 channel	708-864-8060	135
Jensen Transformers	Twin Servo 990	Jensen JT-16-B mic input transformer	990-C Discrete Op Amp patented by Jensen	Jensen JT-11-BM Output Transformer	\$1650** \$2650***	B, C, source switch for using 20 ohm mics	213-876-0059	136
Langevin	All Discrete Dual Mono	Sawter Custom Transformer	All Discrete Transistors	All Discrete Transistor Capacitor Coupled	\$1475	B, mono	909-627-4256	137
	All Discrete AM 16 45dB	Sawter Custom Transformer	All Discrete Transistors	Sawter Transformer	\$1375* \$2075**	B, 1-4 channels		
Manley	40 dB	Sawter Custom Transformer	Vacuum tube 6072, 6414	Lo Z Mitcap Capacitor Coupled Vacuum Tube	\$1600	B	909-627-4256	138
	Dual Mono	Sawter Custom Transformer	Vacuum tube 6072x2, 6414x2	Lo Z Mitcap Capacitor Coupled Vacuum Tube	\$2400	B		
	60 dB	Sawter Custom Transformer	Vacuum tube 6072, 12AU7WA, 6350	Lo Z Mitcap Capacitor Coupled vacuum tube	\$2200	A, B, C		
Millennia Media <sup>1</sup>	HV-3	TM-8 Proprietary Transistors	Proprietary Buffered IC Op Amps	Discrete Op Amps	\$1595	B, 8&K 130-V DC option, 20-bit A/D option, 2-channel	916-363-1096	139
	HV-3M	TM-8 Proprietary Transistors	Proprietary Buffered IC Op Amps	Discrete Op Amps	\$995	B, 8&K 130-V DC option, 20-bit A/D option, mono		
Rane Corp.	MS1	Analog Devices 2017	Analog Devices 2017	Analog Devices Hybrid Cross Coupled 2142	\$189	B, C, D, F, mono, one output	206-355-6000	140
	FM114	Analog Devices 2015	Analog Devices 2015	Signetics 5534 IC Op Amps	\$349	A, B, C, D, F, 3-band EQ mono, four outputs		
Studio Technologies	Mic PreEminence	Proprietary Monolithic Transistor Array	Analog Systems MA-332 IC Op Amps	Analog Systems MA-332	\$799	B, C, D, F, dual 5-segment, 2-channel	708-676-9177	141
Summit Audio	TPA 200B	Summit Audio Custom Transformer	Summit Selected Vacuum Tube	Summit 990 Discrete Op Amps	\$2100	A, B, C, D; overload & overdrive indicator, 2-channel	408-395-2448	142
	M210	Summit Audio Custom Transformer	Summit Selected Vacuum Tube	Burr-Brown IC Op Amps	\$595	B, C, D, F, clip indicator, mono		
	M230	Summit Audio Custom Transformer	Summit Selected Vacuum Tube	Burr-Brown IC Op Amps	\$650	B, C, D, F, selectable distortion network, overdrive, mono		
Symetrix	SX202	Preamp IC	IC Op Amps	IC Op Amps	\$299	B, C, D, F, mono sum output, 2-channel	800-288-8855	143
Sytek Audio Systems	MPX 4A	Transistors	IC Op Amps	IC Op Amps	\$982	4-channel	312-588-4477	144
	MPX 4D	Transistors	IC Op Amps	IC Op Amps	\$1190	4-channel		
Tubetech/Lydkraft	MP-1A	Tubetech TR-201-1 Transformer	Golden Dragon 2 ECC82/4 ECC 83 tube	Tubetech TR-142-1 transformer	\$2222	A, B, D, 2-channel	212-586-5989	145

Key: Features — A: Hi-Z Input; B: Phantom Power; C: Phase Reverse Switch; D: Input Pad; E: Battery Operation; F: External Power Supply; \* \$1225 to \$1717 (2-channel), \$1925 to \$2909 (4-channel). \*\*1-channel in 1 U rack with P.S.; \*\*\*2-channel, \$3650 (3-channel), \$4650 (4-channel), \*\*2-channel; °4-channel; †LARK portable and quad versions also available.

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ON HAND FOR THOSE SPECIAL  
VOCAL AND ACOUSTIC PARTS.**

reduced susceptibility to electronic interference.

The weak link in these preamps often occurs at the fringe of maximum gain, typically between the gain pot's rotational position of 3 and 5 o'clock. Here the noise floor rises at a rate higher than the increase in gain. Use with loud sound sources or choose a high-output microphone.

**CATEGORY TWO: \$500 to \$1000.** Here, significantly greater options start with a stereo IC preamp that features high-quality input transformers. The input transformer improves noise immunity and helps to lower the electronic noise floor. The active balanced output circuitry is also IC-based. At the upper price limit is a transformerless single-channel model with a hybrid front end and discrete output circuitry. In the middle of this category emerge modular preamps with discrete op-amps. In addition to wider dynamic range, the discrete circuitry is more sonically robust than its IC counterparts. It is also much less sensitive to output cable or destination impedances.

Note: modular preamps require a home and a power supply. At \$1000, the prerequisite card cage and integrated power supply temporarily bump these preamps out of this category. If, however, you needed ten of them to feed a hungry digital multi-track, the per-channel price puts them back in line.

**CATEGORY THREE: \$1000 to \$2000.** At this altitude, most of the preamps have discrete op-amps and, if transformerless, custom hybrids. Dual-channel units and portability are the additional features offered in this category. One unusual entry is a capacitor-coupled, transistorized, dual-mono preamp. Vacuum tube preamps emerge in this category. Most are single-channel models. Card cages and an expandable chassis

option allow you to add channels as necessary.

**CATEGORY FOUR: \$2000 and Up!** The preamps in this category (some still mono) offer additional gain stages, even lower noise, and more channels. All of the transformerless models are completely discrete and one offers optional built-in A/D converters. A transformerless, 16-channel, combination preamp and splitter (with optional remote control) is included for use in live and recording applications.

### SUMMARY

That last category must have created a giant sucking sound from your wallet — especially for those who paid a similar amount for a mixer! Designing a preamp that delivers gain in excess of 60 dB requires attention to minute details — wire dress, grounding, component selection, power supply type and location — all contributing to the quality of amplification, and to the cost.

Choosing technology appropriate to your sonic requirements may require the assistance of a local dealer or equipment rental service, and a comparative listening session remains the best way to go shopping for your tools. Your style — clean, grunge, classical, rock, funk, jazz, audiophile — is the determining factor. Your ear will make the final decision. **EQ**

*Eddie Ciletti eats spaghetti, repairs DAT machines, and polishes fiber-optic cable ends in his spare time. His America Online address is EDDIEAUDIO*

*Hector G. La Torre sits and thinks. Having lived in N.Y.C., he never wants to be online again.*

DELAYS

ECHO

Alex

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SO LITTLE MONEY.

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HALL  
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HEARD IN ALL THE RIGHT PLACES

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Ten additional stereo inputs, 4 with EQ, allow for a variety of line inputs, effects returns etc . . . to be connected. Both RCA and 1/4 inch (pro) inputs have been provided on the 4 equalised stereo inputs, (2 with RIAA) and are switchable from the front panel allowing you to easily select between line sources at the 1/4 pro inputs and Hi Fi sources such as CD's, tape, turntables, etc . . . at the RCA inputs.

Additional features and specifications include inserts, channel mutes, input swap switching, dual 2 track tape facility, overall bus mutes for tape and stereo line inputs, PFL/ solo in place, a loudness button for the head-phone bus and more . . . Dual half/rack ports add to the overall flexibility of the STAR SYSTEM allowing for the insertion of exclusive STAR SYSTEM audio processors including a stereo compressor, stereo gate, parametric EQ, digital reverb and digital delay.



The STAR SYSTEMS' comprehensive facilities and incredible audio specifications are typically found on consoles costing considerably more and make it an ideal choice for digital multi-track recording, keyboards, sound reinforcement and broadcast. Compare for yourself!

Superb audio specifications include:

Dynamic range:	108dB
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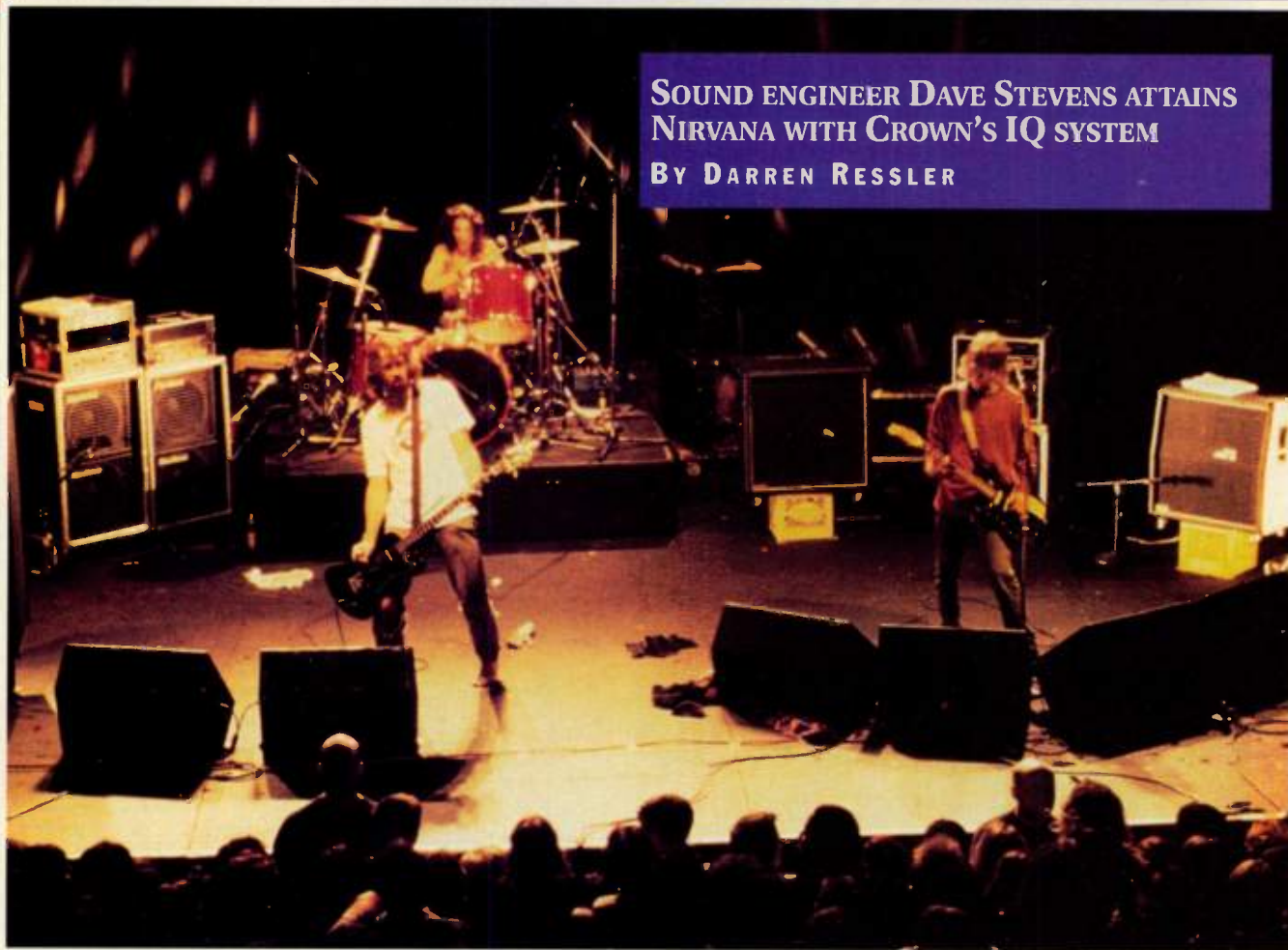


GIG GEAR  
PAGE 78

LIVE SOUND FOR THE GIGGING MUSICIAN

SOUND ENGINEER DAVE STEVENS ATTAINS  
NIRVANA WITH CROWN'S IQ SYSTEM

BY DARREN RESSLER



## CROWNING ACHIEVEMENT

■ WITH 14 YEARS of experience under his belt, and having crisscrossed the globe with bands such as Heart, Pearl Jam, Emerson, Lake & Palmer, Divinyls, Public Enemy, and Gipsy Kings, soundman Dave Stevens has

seen and heard it all. So when Proshow U.S.A., the Seattle-based touring company Stevens works for, was enlisted to provide main and monitor systems for the first leg of Nirvana's tour supporting their much-heralded

recent release, *In Utero*, all involved knew that a definite challenge lay ahead.

But for an unpredictable band that is notorious for playing at exceedingly high volume (108 to 115 dB) — not to mention for their

proneness to smashing guitars, annihilating entire drum kits, and tossing microphone stands — Stevens says the tour went without a hitch.

"We knew well in advance what we were get-

Photo by Cheryl Pendleton



**ON THE ROAD AGAIN:** Dave Stevens reaches Nirvana.

ting into, and we were prepared for some undue wear and tear on the input devices on stage and knew that a couple of mics might get knocked over," explains Stevens.

Combined with the trio's dedication to putting on an excellent show nightly, Stevens says that a prime contributor to the tour's smoothness was the incorporation of computer con-

trol in the form of TOA's SAORI digital signal processor and Crown's IQ System version 1.4 software. Linked to the IQ-P.I.P. modules on the rear of the Crown Macro-Tech amplifiers (a total of 70 of 'em in the main and monitoring system!), the application ran on an Apple Macintosh SE/30 that was situated behind the house mix position.

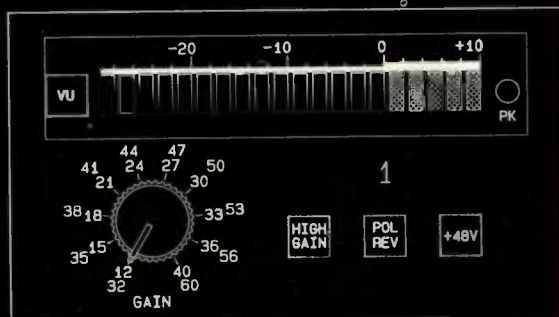
"At Proshow U.S.A., we've had a considerable amount of experience with the IQ System, and we've designed quite a few large scale, very involved control systems for some stadium installations," explains Stevens. "We wanted real-time monitoring, an ability to trim levels, error detection, and complete flexibility in the touring system. The IQ System gave it all to us."

Implemented by Proshow U.S.A.'s Allan Bagley, the front-of-house control application had several tasks totally automated for crew chief Stevens. By using a remote, constant trips to and from the amp rigs to make adjustments were eliminated. Additionally, the IQ System provided the crew with constant data and gave them complete confidence in the PA system.

"This was probably one of the most stripped-down arrangements we've done, as all we had were amplifiers on the network. On other installs, we've had IQ drones, FMX mixers, and MPX mixers," says Stevens. "The touring PA was used to get back to basics and for real-time monitoring. Nirvana demands a lot out of the system in terms of SPL and driving the rig. You need to have really accurate monitoring information if you're going to let them take it to the edge; otherwise you can smoke ten 18-inch speakers a day because you're double-powering the speaker. The sound is loud

*continued on page 95*

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Standard equipment: illuminated push-buttons, shielded toroidal power transformer with 6-position voltage selector switch, silver plated XLRs, ground-lift switches, phantom power, polarity reverse and gain controls. Options include the Jensen JT-11-BM output transformer, VU-1 meter (shown), PK-1 meter, gold plated XLRs.



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CIRCLE 57 ON FREE INFO CARD

# LIVE AND IN SURROUND

■RAINDROPS on the roof this morning? No, it's more serious. Sleet. Great. Guess I'll stay in the office and record some tapes for my friends.

As I start to record, I realize that the music is coming from two rooms. A pair of speakers in the office and another set in the adjoining living room that I've forgotten to turn off. This oversight makes the sound a little fuller and it seems to fill the house.

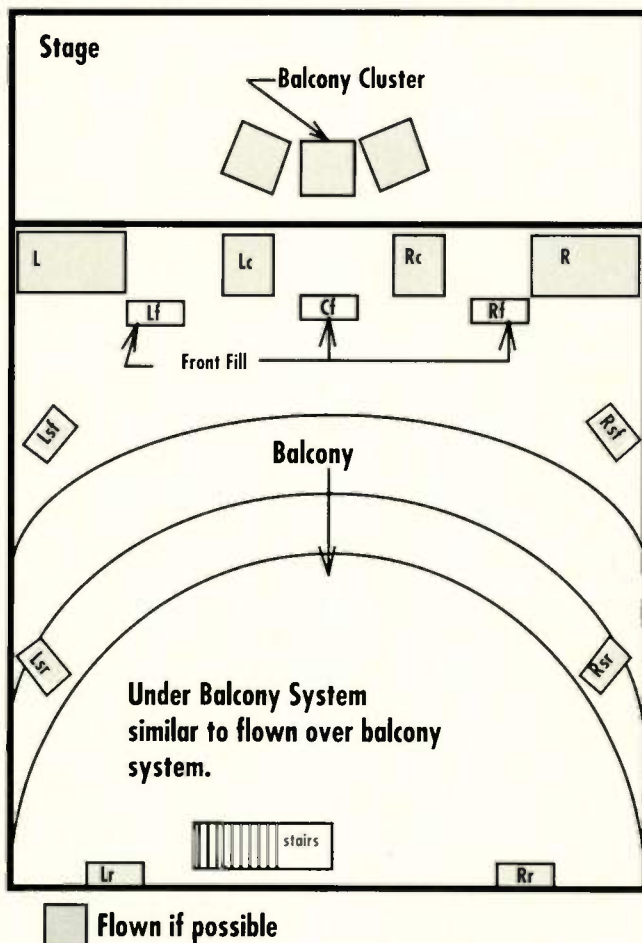
I also become aware that the sound of sleet is coming from above and that the additional speakers add a sound source behind me. Hmmm, any attempt to recreate this effect of having sound coming from 360 degrees would involve the use of multipoint speaker arrays.

While there are some devices for recording a 355-degree audio environment (you can't hear through your feet so you lose a few degrees), most playback of this material will be in a dual-radiating-point system, a.k.a. stereo.

In nature, sounds tend to be localized to one point in space, but that point can lie in any direction and can move over time — unlike your typical home stereo or live stereo reinforcement systems that project from fixed locations.

In the live environment of sound reinforcement there are many variables — such as crowd noise and reflections from wall, ceiling, floor, and other surfaces. This whole is viewed as an acoustical space. Any form of Quad or multipoint speaker placement is an attempt to use this space for creative effect.

New-music or modern-music artists use multipoint



The Theater 8 to 12 Point System.

sound because they feel they can use the space that encloses the audience. And they can! Instead of just vibrating those little air molecules down by the stage, causing them to bump into each other until you hear the stuff way back in the last row, they can cause the whole front row to be the back row, and vice versa.

The possibilities are virtually limitless.

The most common use of multipoint is the delay stack that provides a uniform volume over a desired area. Most large venues will have a main stacks, front fills, and delay fill systems for the rear so that a fairly constant volume output can be maintained.

There are also many other systems to deal with, including balcony fills, underbalcony fills, front row fills, long throw clusters, subwoofers, and communications.

If you are doing multipoint sound, the important thing to realize is that the F.O.H. (Front of House system) is more like a monitor system or recording setup than a standard live one. Instead of summing all your inputs into two master buses you will be sending audio to many different places. This is similar to recording tracks, making an individual monitor mix for a musician, or routing for other destinations such as broadcast or distribution.

For this reason, you should try to use a console that has a matrix section installed (any input able to go to any or many outputs). Or at least one with lots of auxiliary sends.

There are many variations of multipoint sound. The three I will briefly discuss are Club/Shed Standard 4 Point Quad, Modern/Electronic Music 6 and 8 Point Systems, and Theater 8 to 12 Point systems.

## STANDARD 4 POINT QUAD

Standard Quad output has one set of submasters feeding the front in stereo L-R and one set of submasters controlling the rear fill set, which are also stereo L-R. You can assign any input to these.

Pink Floyd tribute bands such as The Machine bring in processing such as EQ's, compression, expansion, and effects, along with amps and speaker stacks to accommodate this layout.

## 6 AND 8 POINT SYSTEMS

Six and 8 point systems are used for modern music or

**LAST ISSUE WE COVERED SURROUND SOUND IN THE STUDIO. NOT TO LEAVE THE TOURING SOUND PERSON OUT OF THE FUN, HERE'S A LOOK AT SURROUND SOUND BAND-IN-A-VAN STYLE.**

**BY JON LANG**

# Can You Find the Best Value in Effects Processors?

Look closely at the image above to find the answer. Or keep reading and look again when you're done.

We've used this image to make a point: the DP/4 Parallel Effects Processor stands out from the crowd in flexibility, quality, and value.



**To find the hidden 3D image:**

Diverge your eyes as if looking at a distant object. The two dots will fuse, forming a third central dot. Allow your eyes to "space out" and gaze through the image. Now relax and hold your gaze steady while observing the rest of the image in your peripheral vision. When you hold the patterns overlapped and fused long enough your brain will decode the computer-created image in the patterns.

**Or:**

Hold the image so close to your eyes that it touches your nose. Relax your eyes and allow them to space out looking through the image. Slowly move the page away from your face, holding it level. When the image is several inches away you'll sense depth in the picture. Relax, staying spaced out as you gaze through the image. The 3D image will develop like an instant photo.

**Four processors in one**

Only the DP/4 has four independent 24-bit processors, with the flexibility to combine them to fit any situation. If you need four different reverbs for a mixing session, you've got them. Need a fast digital compressor for a bass track? Just dial it in. From reverbs, chorus, delays, pitch shifting and EQ to multi-effect chains for guitar or vocal processing — the DP/4 has it covered.

**No-compromise sound**

No matter what effect or combinations you use you'll always get the highest fidelity sound. Never again compromise sound quality by choosing some

effects from column A and some from column B. It's why reviewers say "sounds amazing"<sup>1</sup>, "so perfect that no further processing was necessary"<sup>2</sup>, and "I love this box, I love this box, I love this box."<sup>3</sup>

**Much more for less**

Along with four effects processors (with four inputs/outputs), the DP/4 has a built-in digital patch bay and submixer — for a fraction of the cost of separate gear. You can instantly change setups — for example, from enhancing a single instrument with all four effects to processing up to four separate signals at once. And use advanced MIDI control to automate changes from your sequencer or MIDI keyboard. It's an obvious value when you look at how many "budget" effects processors you'd have to buy to get the same result.

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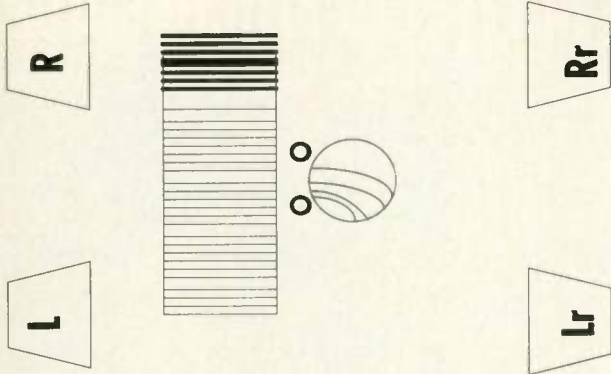
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<sup>1</sup> EM, December 1992  
<sup>2</sup> Sound on Sound, October 1992  
<sup>3</sup> EM, September 1992



The Standard 4 Point Quad System.

new music. Some of the better-known artists who write and perform music with this type of setup are John Cage, who passed away last year, and Stockhausen, who is still performing complex production pieces.

A setup usually consists of an 8-track machine, 1-inch or 1/2-inch, playing into 8 channels of a standard 24- or 32-channel x 8

submaster console, along with a live performer (often a singer or flute player, although I have heard many other instruments being used). Generally no delay is used, as in the context of a delay stack at a concert. Effects tend to be nonexistent, or just the most outrageous stuff you've ever seen and heard. Remember, this type of gig is most often performed by a very creative artist with University backing, though this is not always the case.

In addition to the standard console, other developing favorites seem to be the Yamaha DMP-7 and 11, or newer digital mixing consoles that allow you to automate EQ, panning, and level control to a certain degree.

One of the elements that the early electronic musicians liked to manipulate is phase. They used different phased tones to create harmonics that panned in response to an operator at the console.

Interestingly enough, there seems to be a difference between East Coast, West Coast, and European artists in the way they lay out the fader to speaker location. If you ever provide or work on a system for these types of performances, it is important to lay the faders to the speaker placement according to the person who will mix the show. (F.O.H. can require up to three engineers for a run of a show.) Also, if there is a score available, that will tell you what the composer wanted (sometimes).

**8 TO 12 POINT SYSTEMS**

Theater 8 to 12 Point Systems are full-blown theater rigs that often use computer control because of the complexity of the cues and because the artists want repeat performances to be as consistent and quiet as possible.

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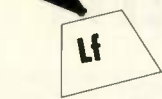
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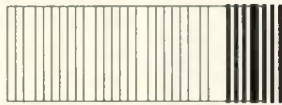
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#1 West Coast Counter Clockwise rotation



#1 East coast Clockwise Rotation



The 6 and 8 Point System

The choice of speaker arrays depends upon the sound designer's goals and the physical limitations of the room (and, of course, upon moola). A standard theater setup should be able to at least have effects that follow the actors' movements (i.e., crossing stage footsteps, proper stage placements, entrances, etc.)

There is often an orchestra pit with 10 to 35 inputs; a wireless system for stage actors' voices with up to 25 inputs; floor mics for backup and for capturing certain specials such as dance; and machine playback (usually 4 to 8 channels); and effects inputs. Often a dual 40-channel

console with a 12-channel matrix, or more if possible, such as a Cadac E-type that has a computer for storing fader status and MIDI cues, is used.

As you can see, Quad and multipoint sound reinforcement systems can go from small scale 4-point club rigs to systems that take large numbers of inputs and output them to any number of destinations at the correct time. The great thing about multipoint is that it opens up a whole world of audio space experimentation to the artist, sound designers, rental companies (who get to supply a good portion of the required goodies), FX manufacturers, and you. ♪

**IF YOU ARE DOING MULTIPOINT SOUND, THE IMPORTANT THING TO REALIZE IS THAT THE F.O.H. (FRONT OF HOUSE SYSTEM) IS MORE LIKE A MONITOR SYSTEM OR RECORDING SETUP THAN A STANDARD LIVE ONE.**

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**MIC STANDS:** Short boom stands [4]; standard boom stands [5]; straight stands; drum clamps [2]

### LIVE RECORDING SYSTEM

**CHIEF ENGINEER:** James McLean  
**PRODUCTION MANAGER:** Ed Greer

**MIXER:** Ramsa WP-T820B

**TAPE RECORDERS:** Panasonic SV3700 DAT [2] and SV3500 DAT; Sony TC-WR690 dual recording cassette decks [4]; Alesis ADAT

**LOUDSPEAKERS:** Meyer HD-1 [2]

**SIGNAL PROCESSORS:** Sony DPS-R7; Lexicon LXP1 digital reverb; Korg SDD 1200 dual DDL; Symetrix 522 dual dynamics processor, SX208 stereo compressor, and SX206 dynamics processor; Aphex exp/gate and Aural Exciter C

**STEREO HOUSE MICROPHONE:** Curom "ORTF" coincident stereo PZM array

**DIGITAL EDITING SYSTEM:** Macintosh Ilei w/20 MB RAM; 1.2 GB hard drive; Digidesign Sound Accelerator II Audio Interface

### HOUSE SYSTEM

**MIXER:** Allen & Heath GL3 24x4x2

**AMPLIFIERS:** Crest 1001 (low); Crest PowerLine 300 (mid); AB International 900A (hi)

**EQUALIZERS:** White 4660 1/3-octave

**MONITOR WEDGES:** Electro-Voice 1502 [2]; JBL Cabaret 12-inch [3]

**MONITOR AMPS:** Crown Power-Tech (375W x 2)

**MONITOR EQUALIZERS:** White 4660 1/3 octave; Rane GE27 1/3-octave; Rane SP15 [2]

**SPEAKERS:** Adamson mid+high subwoofers [2]; AX300 crossover

**SIGNAL PROCESSORS:** Alesis Midiverb II; Microverb II; DeltaLab Effectron II ADM1024 delay; Audio Logic MT66 dual compressor

**MICROPHONES:** Shure SM57 [4] and SM58 [4]; AKG D112 and C451EB; Audio-Technica ATM11R, PRO25 hypercardioid dynamic, and PRO35 mini [4]; Neumann KM84 cardioid [2] and KM83 omni [2]; Sennheiser MKH 40 and 409; Countryman Isomax II mini hypercardioid [4]; Crown PZM12SP [2]



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WRN





# BAND IN A BLUR



**BAND NAME:** Blur

**MEMBERS:** Damon Albarn, vocals; Graham Coxon, guitars/vocals; Alex James, bass; Dave Rowntree, drums

**LATEST RELEASE:** *Modern Life Is Rubbish* [SBK-ERG]

**WHERE THEY'VE BEEN:** Europe, Japan

**WHERE THEY'RE GOING:** Touring across America and then back into the studio

**HOW THEY GET AROUND:** Planes, MiniVans, and taxis

**SOUND ENGINEER:** Gary Joseph Roberts

**CONSOLE:** Yamaha PM 3000 (32x8x2)

**RACK:** dbx 160X; BSS gates; Klark-Teknik DM 360 graphic EQ; Yamaha DDL, SPX900, SPX1000

**SYNTHESIZERS:** Ensoniq EPS 16

Plus keyboard (including memory expander modules); Solina String Ensemble

**EFFECTS:** Eventide HP3000s; Lexicon PCM70 [3]; Rat distortion [2]; Boss vibrato and tremolo; Crybaby Dunlop Wah Wah; Alesis Microverb  
**LOUDSPEAKER SYSTEM:** Turbo-sound TMSB

**AMPLIFIERS:** Crest; BSS; Marshall 100-watt Super Lead MkII and 1960/AV 4x12 cabinets; Ampeg SVT-II bass amplifiers and SVT 8x10 cabinets

**OTHER GEAR:** Lap steel guitar

**BEST LIVE EXPERIENCE:** Graham Coxon recalls: The Reading Festival 1993, because things went really well, it was a brilliant day, and the audience was equally brilliant.

**WORST LIVE EXPERIENCE:** Coxon continues: The Boston Riot, 1992. Damon was throwing water out onto the audience — as he always does. The promoter was getting worried that they were going to blow the system and electrocute themselves, so he turned the electricity off. The crowd went wild, and we were attacked by the bouncers.

**TOUR TECH TIPS:** Keep it clean, and treat it mean. ☺

## ROAD WARRIORS



Photos by Julian Jaime

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loudspeaker, the Xp200 controller, and the Sb120a (powered) or Sb120 (non-



Electro-Voice Sx200

powered) bass module. The Sx200 is a 300-watt, 12-inch, 2-way speaker in a trapezoidal, arrayable, and mountable enclosure that has a frequency response up to 25 kHz. Sensitivity is 101.5 dB. Bass performance extends below 80 Hz via an EVM 12S Pro-Line woofer. The Sb120a is housed in the same cabinet and incorporates a 400-watt power amp that only adds three pounds for a total weight of 34 pounds. The controller features a unique low-frequency profile circuit and a 40 Hz, 24 dB-per-octave high pass filter that keeps bass output of the Xp200 speaker systems very tight and clean by eliminating excessive cone excursion caused by infrasonic frequencies. For more information, contact Electro-Voice, 600 Cecil Street, Buchanan, MI 49107. Tel: 616-695-6831. Circle EQ free lit. #118.

## TRI-AMPING

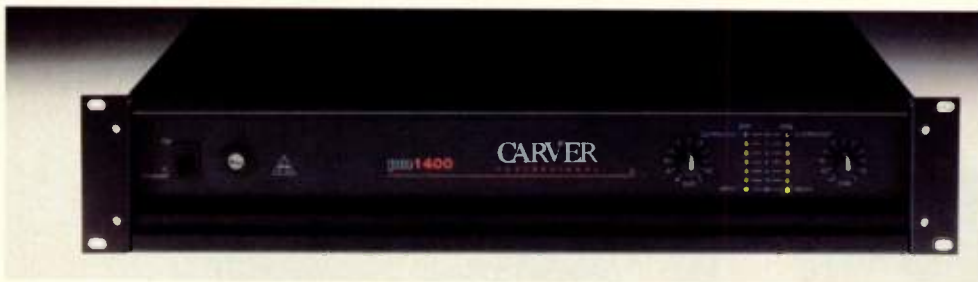
Carver's offering three new models in its popular PM Series of power amplifiers. The PM-700, PM-950, and PM-1400 are specifically configured for use in musical instrument, club sound, and DJ applications. PM Series amps may be equipped with Carver's new PowerLink computer module. Running under MediaLink network protocols, PowerLink provides comprehensive monitoring

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of nine circuit parameters and remote control of six key amplifier functions. For more information, contact Carver, P.O. Box 20121 48th Avenue, Lynnwood, WA 98046. Tel: 206-775-1202. Circle EQ free lit. #117.

## COMPACT POWER

Electro-Voice's new System 200 is a full-range, compact, and modular sound-reinforcement system. It consists of the Sx200 portable



Carver PM-1400 Power Amplifier

## YES SR!

JBL has added a new model to their acclaimed SR Series of power amplifiers: the SR6670A. It has been designed to be an efficient, lightweight amp, disposed toward the rigors of touring. It features a switching power supply and new cooling

techniques. The SR6670A offers 600 watts of long-term current capability into



JB: SR6670A

4 ohms. Balanced XLR and 1/4-inch inputs and Neutrik Speakon outputs connect the amplifier to the sound system. The SR6670A weighs under 35 pounds and occupies 2 rack spaces. For more information on the SR6670A or another model in the SR Series of power amplifiers, contact JBL, 8500 Balboa Blvd., Northridge, CA 91329. Tel: 818-893-0358. Circle EQ free lit. #119.

## HAVE YOU HEARD...

**ProSystems** has released a new high-power tweeter, the APS-40HF. This diffraction ring "bullet" achieves 5 kHz—25 kHz frequency response and will handle 40 watts with efficiency of 110 dB...The WEM250 from **Sennheiser** is a wireless system designed for stage monitoring. Its dual transmitter can operate as a single stereo mix or two mono mixes...**Doc's Proplugs** is a pre-formed, ready-to-wear earplug that is designed to protect your hearing when on a gig or anywhere sound pressure levels become dangerously high. Available in six sizes, it attenuates dangerous high frequencies without frequency distortion. Proplugs are \$8 a pair...**Crest Audio** has introduced the 9001 amplifier. The 3-rack-space unit incorporates Crest's Power Density engineering philosophy, which offers several advantages, notably its "power-to-size" ratio. The 9001 exceeds 3000 watts at 2 ohms from 20 Hz—20 kHz...**Electro-Voice** has introduced a new headset microphone named the HM1. Designed for use with E-V's MS-2000AB wireless bodypack transmitter, the HM1 has a miniature, noise-canceling electret condenser element with a cardioid polar pattern and comes with a slip-on windscreen.

## RIDING THE CREST

The just-introduced Crest Series LM 8+4 and LM 20 monitor consoles are the newest entries in the company's modular lines of mixers. The LM 20 offers up to 20 discrete mono mixes from up to

52 inputs. The Century LM 8+4 provides 8 stereo and 4 mono mixes. The dual-mono inputs on the LM 20 can be combined with the stereo outputs of the LM 8+4 to offer any desired output configuration. Both consoles include a passive microphone splitter system. For more information, contact Crest Audio, 100 Eisenhower Drive, Paramus,

NJ 07652. Tel: 201-909-8700. Circle EQ free lit. #120.



Crest LM 8+4 and LM 20

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# LA AUDIO 4X4 DYNAMIC SIGNAL



■THE LA AUDIO 4X4 is a new dynamic processor using FET technology to emulate the sound of tubes in the application of gain reduction. This design favors even-order harmonics over odd-order harmonics and may be responsible for the 4X4's smooth sound, even in heavy compression. The unit also includes a number of ways to link and swap processing controls, all from the front panel.

The 4X4 4-channel dynamic signal processor is built by SCV Electronics, a British company recently created by SCV Audio France to manufacture a wide range of audio equipment in London and to include SCV's newly acquired LA Audio subsidiary. The designer of the 4X4, Guy Martin, is known

for his cost-effective and feature-laden designs, including the digitally controlled dynamic processors built into some of the newest Soundtracs mixing consoles.

The 4X4 is a single-rack unit device that includes two noise gates and two compressor/limiters. Two filter sections can be independently assigned to either the gate or the compressor sidechain. Audio connections can be made to each of the four dynamic processors (gate/compressors) can be cascaded to provide comprehensive dynamic control of an instrument. A Link switch connects the sidechains of the compressors (or gate/compressors with the Gate In switch) to provide

stereo processing.

The front-panel controls are divided into sections with 20 differently colored knobs to improve the distinction between the gate (blue), filter (grey), and compressor (green) controls. The layout and legends make operation straightforward and clear. All 18 push-button switches are the same color, but are clearly associated with each section, except the power on/off switch, which is so close to the compressor B bypass switch that it could be accidentally pressed during use. Each processing section is demarcated by thin vertical lines. The filter section is placed between the gate and compressor sections and has a switch that assigns it to either of the sidechains.

A nine-segment red LED meter displays gain reduction in 2 dB steps. Unfortunately, there is no indication of the compressor threshold being reached until 2 dB of compression has been attained. The 0 dB indicator acts as the power-on light, instead of displaying when the compressor threshold has been reached. The gate has a simple green LED to indicate when the gate is open. This LED goes out immediately when the threshold is crossed and therefore doesn't indicate the rate of release currently set.

The rear panel provides two-conductor 1/4-inch

phone jacks for the unbalanced input, for the output of each of the four processor sections, and for key inputs to each gate. The sidechain inputs are three-conductor jacks that insert an external signal or processor into the sidechain of each compressor, sending on the ring, and returning on the tip of the phone jack. There is also an AC fuse and IEC power connector on the rear panel. All connectors are clearly labeled, as is the fuse rating.

This is a cost-effective processor, but all the most important controls are provided. The gates have continuous controls for threshold, release time, and range. There are switches for selecting the external key-input, sidechain listen (for tuning the filters or listening to the external key source), auto attack or fast attack times, and bypass the gate. The Auto mode varies the attack time according to the frequency content of the signal and is very effective in preventing audible clicking as the gate opens on program sources without major transients. On percussive sounds, the auto setting is too slow, clipping off the beginning of the note. The fast-attack (Auto off) setting is best suited to percussion, where the click of the gate opening blends with the attack of the instrument.

The threshold of the

## ROAD TEST

**MANUFACTURER:** SCV Electronics, London; distributed in the U.S. by Promusica Sales, 800 Park Avenue, #109, Keene, NH 03431. Tel: 603-352-4831.

**APPLICATIONS:** Dynamic processing for studio or live-sound applications where cost and control are important considerations.

**SUMMARY:** Four channels of versatile frequency-selective gating and compression capable of a range of modes from four separate processors to one stereo unit.

**STRENGTHS:** Integrated filters and signal patching allow easy switching between different applications.

**WEAKNESSES:** Stereo linking is cumbersome and filters are not steep enough for precise tuning.

**PRICE:** \$499

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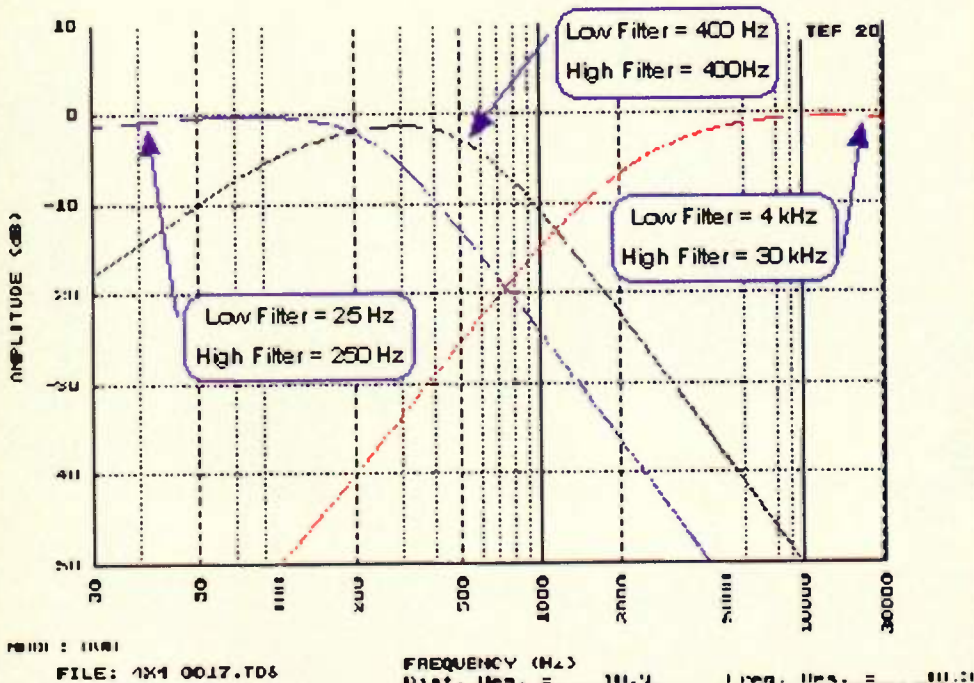


Figure 1: Frequency response for three settings of the Sidechain Filters. Call-Outs: Blue Line — Low Filter = 25 Hz High Filter = 250 Hz; Black Line — Low Filter = 400 Hz High Filter = 400 Hz; Red Line — Low Filter = 4 kHz High Filter = 30 kHz.

gate is variable between -54 dB (just about everything but mic-preamp noise opens the gate) to +20 dB (almost nothing short of clipping opens the gate). Release is variable between 5 ms and 4 seconds. The range can be set anywhere from 0 dB (always open) to -80 dB (very tightly closed). While excellent for removing unwanted noise and leakage from mics and recorded tracks, the gate also has more subtle uses. When range control is set to make only slight differences in level, this can create accented parts, such as a bass guitar boosted when keyed by the kick drum or horn stabs boosted when keyed by snare shots. The gate has a 4 dB offset (specified to be 12 dB) between the threshold of the gate closing and reopening to prevent chattering, and a fixed 60 ms hold-time to prevent false retriggering on low-frequency signals.

### SQUEEZE BOX

The compressor has all of

the usual controls for attack (20 microseconds to 20 milliseconds), release (20 milliseconds to 4 seconds), and ratio (1:1 to 20:1). These controls, and the soft-knee style of compression, give the unit enough flexibility to operate as a subtle vocal compressor or a hard limiter. The switchable sidechain access allows the unit to function as a ducker, to track the dynamics of another audio signal, or to include external sidechain processing such as parametric equalization.

The unit is well designed for use as four separate dynamic processors or as two cascaded gate/compressors, but the stereo configuration is problematic. In stereo operation (using the Link switch) the sidechains of the compressors are connected, and if the Gate In switch is depressed, the gates are also connected through their sidechain. The compressors link the VCA control voltage of the two channels and the gates

simply link threshold settings.

I prefer a stereo compressor to behave as exactly that, with the master channel (A) controlling all parameters. In the 4X4, all controls may be active depending on their setting in relation to the other channel. This becomes extremely cumbersome when experimenting with settings. But there is a work-around that fixes all that. The compressor Bypass switches disable the front-panel controls, but the audio still passes through the VCA. With one channel bypassed, the unit continues to function as a stereo compressor. Although the input and output controls remain active on the bypassed channel as level controls, the master (non-bypassed) channel controls all of the compression settings (including threshold) and makes stereo compression quite handy.

### REACHING THE THRESHOLD

There are two approaches to threshold setting on

compressors. I have always preferred the threshold to be set without affecting input gain. This allows me to change the threshold of compression, especially when limiting, without changing the gain structure. With many compressors, including the 4X4, it is necessary to adjust the input and output levels together when trying to make this change. It is especially difficult in stereo mode, where four adjustments must be made to change the threshold while maintaining the same level (below threshold). The use of input gain and threshold combined on one knob does have the advantage of maintaining a constant level on signals once they have reached the threshold.

I consider the output control on a compressor to be the make-up gain, compensating for the gain reduction during compression. On the 4X4 this control and the input/threshold control affect the signal in bypass so if you adjust for make-up gain, the compressed signal cannot be set to match the level of the bypassed signal. Pushing Bypass could cause significant level changes and make any comparison of the compressed and uncompressed signals difficult.

The filter sections of the unit use two controls (Lo Filter and Hi Filter) to tune the sidechain discrimination. This is useful for keeping microphone leakage from opening a gate at the wrong time or making the compressor more sensitive to sibilance (de-essing). The two controls are conveniently configured so that many typical filter settings could be made by matching the positions of the two knobs, i.e., 25 to 250 Hz (7 o'clock), 100 to 500 Hz (12

*continued on page 95*



# Isn't That Spatial

Respected engineer Ed Cherney explores the use of PRO Spatializer 3D audio processing on the new Bonnie Raitt album, *Longing In Their Hearts*, coproduced by Raitt with Don Was. Cherney, who has successfully moved into production as well as engineering over the past year, chanced upon Spatializer while visiting engineer Dave Reitzas at L.A.'s Record Plant. Reitzas, who earned a Grammy for his work on Natalie Cole's *Unforgettable*, has been using Spatializer for the past year.

"Dave was mixing with Spatializer and it sounded pretty interesting," recalls Cherney. "I decided to use it, but sparingly, on Bonnie's record. For instance, instead of doing split stereo with pitch shift and delay, I used Spatializer on synthesizer pads to make the image wider. For percussion, I found that I could spread the sound out so that it seems to come from beyond the edge of the speakers."

Cherney describes the new Bonnie Raitt album as "Straight ahead and underproduced — mostly live performances, live vocals, with very few overdubs, as if the moment just happened and we were there to capture it. We worked with great musicians and the emotion really comes through — the feeling is very natural and immediate."

Perhaps the most critical test for Spatializer was in the mixing of vocals. "With Spatializer I could pull the lead vocal forward out of the speakers a little," explains Cherney. "It was very effective because I could get more space and definition in the

mix, but it wasn't noticeable that I was doing anything."

With regard to specific songs on the new album, Cherney describes how he used Spatializer:

## "LOVE SNEAKIN' UP ON YOU"

"This is the first single from the album and the first song I used Spatializer for. In the middle of this track there is a breakdown section where the song changes with a totally new feeling and emotion coming through. With Spatializer I was able to split open the entire stereo image and on one particular instrument, the harmonium, I took the mono feed, split it — basically panned it forward — and widened it. We also have a jawbone and some interesting percussion in this section and I was able to get the sound to appear as if it was coming from beyond the left and right speaker boundaries. After opening up the stereo image with Spatializer, I then collapsed it back down to support Bonnie's solo on the slide guitar for a nice dramatic touch."

## "COOL, CLEAR WATER"

"This song has a reggae feel with sort of a psychedelic section in the middle and at the end. We've got a penny whistle, an Indian sounding guitar, and Bonnie scat-singing, so I took those elements and with Spatializer I was able to create a totally different feeling, really opening up the soundfield and making it more dramatic and enhancing the psychedelic texture."

## "SHADOW OF DOUBT"

"This is the last song on the album with just Bonnie's vocal, acoustic guitar and Charlie Musselwhite's blues harp. On this song I used Spatializer on Bonnie's vocal to bring it forward out of the speakers a bit so that it seems as if she is in the room with you. Very intimate."

"Overall, I used Spatializer on Bonnie's vocals to make them appear to come forward and create a different dimension from the other instruments. In doing this, I was able to make the vocals apparently louder without adding amplitude and without overpowering the music behind her." **EQ**



Ed Cherney works Spatializer at the Record Plant's Neve I suite.

Engineer Ed Cherney uses the Spatializer 3D audio processor on Bonnie Raitt's new album

# IN REVIEW

## RSP Technologies Circle Surround



**MANUFACTURER:** RSP Technologies, 2870 Technology Drive, Rochester Hills, MI 48309. Tel: 810-853-3055.

**APPLICATION:** Surround sound for audio and video applications.

**SUMMARY:** Encoder, Decoder, and Controller are great "fun" generators.

**STRENGTHS:** The first affordable surround system for music mixing.

**WEAKNESSES:** Joystick might be more effective with detents; a front mute switch on the decoder would facilitate calibration of the input signal; no MIDI.

**PRICES:** Encoder: \$898; Decoder: \$469; Controller/joystick: \$799      **EQ FREE LT. #: 122**

theater-style systems and components. The primary difference is that the Dolby system includes various DSP functions.

### THE ENCODER

RSP's Circle Surround Encoder accepts four balanced inputs: left, right, center, and surround. In addition, a multipin connector receives information from the Circle Controller. All this information gets distilled into two channels.

For the music tests described later in this piece, I fed my mixer's stereo bus output into the left and right inputs of the Encoder. (Aux sends fed the surround and joystick inputs.) Since center detented panpots are not always centered electrically, connection to the center input, though

I ENJOY LISTENING to music in surround. Not just for fun, but because it also gets you inside a mix. Surround sound is growing in the project studio marketplace, but if you haven't checked it out yet, RSP's Circle Surround is sure to arouse your curiosity — and your imagination.

Circle Surround consists of three single-rack space units: an encoder; a controller; and a decoder. All operate in the analog domain. Fundamentally, Circle Surround is very similar to Dolby Surround and Dolby Pro Logic, in fact, Circle Surround is compatible with all



optional, is provided to precisely distribute signal to both the left and right channels. This facilitates the decoding process, keeping center information out of the rear speakers.

Getting information to the rear speakers is not exclusively the function of the surround input. Hard panning will have a similar effect, and a combination of both is facilitated by...

### THE CIRCLE SOUND CONTROLLER

Four joystick panners make up the remote control for the Circle Sound Controller. It provides four balanced inputs plus an expansion port for additional controllers. When used in conjunction with the decoder's steering circuitry, a sound source can be rotated 360 degrees. The rear-channel information is actually a mono signal being fed to both speakers. A little artificial intelligence in the Decoder, however, can direct the rear signals a few dB in either direction — enough to

fool your ear into thinking there are four discrete channels.

### THE DECODER

RSP's Decoder has two inputs, labeled Left "T" and Right "T." From these two channels it outputs left, right, left rear, right rear, center, and subwoofer information. Front-panel level controls are provided for center, rear, and master. On the rear panel, both RCA and 1/4-inch unbalanced connectors are provided, as well as an input balance control. You only need two stereo amplifiers and four speakers to get started. A third stereo amplifier can be used to power the optional center speaker and subwoofer.

### HOOKING IT UP

I wired the Decoder, Encoder, and Controller into my patchbay, which has a common ground. During the wiring process I uncovered some discrepancies. First, the Encoder and

Controller have balanced 1/4-inch and XLR connectors. In addition, the documentation did not specify whether the Decoder's inputs were balanced or unbalanced. (Both 1/4-inch and RCA connectors are unbalanced.) Finally, when connecting the Controller to the Encoder, a ground-loop hum occurred. Fortunately, since these inputs are balanced, the hum was easily chased by flying the shields at the Controller's inputs. It is possible that the version with XLR connectors may not have this problem.

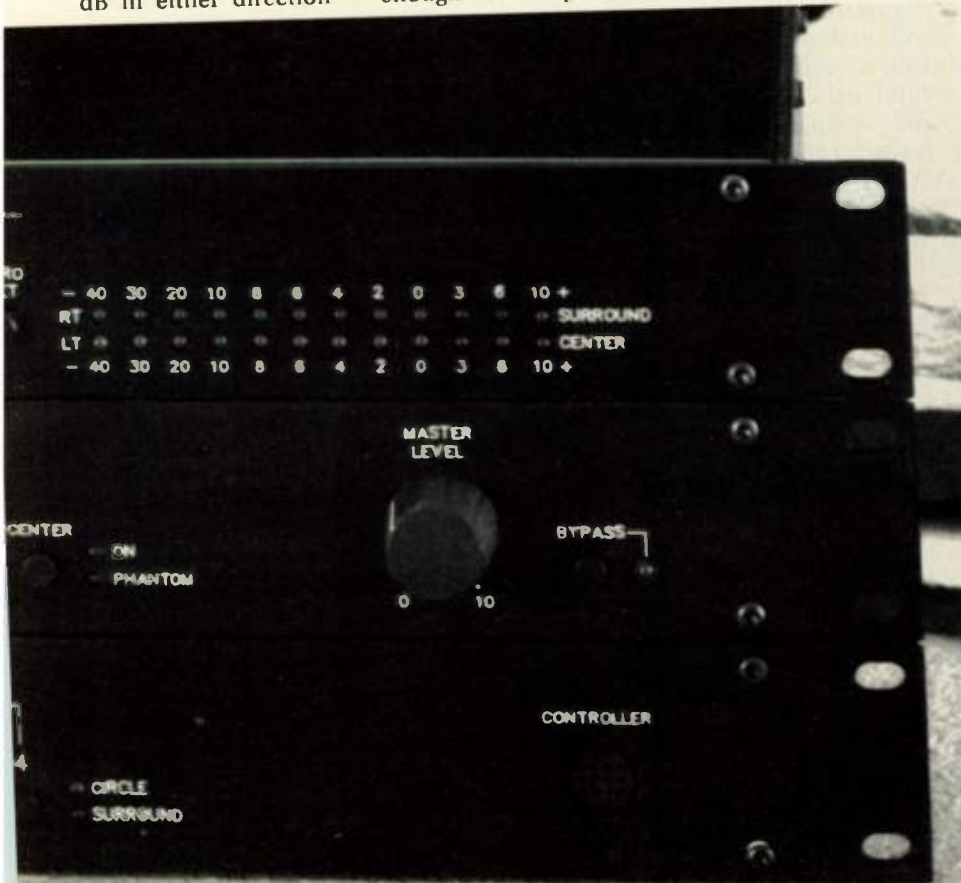
### GETTING CALIBRATED

RSP includes a set-up cassette with bursts of pink noise to facilitate balancing the left, center, right, and rear speakers. The azimuth on their cassette did not match that of my deck, blurring the results of this test. Tweaking the azimuth while listening either in mono or to only the center

### GETTING SURROUNDED

Surround is a method of encoding spatial information into a stereo mix. The decode process is capable of extracting as many as six channels. In addition to the traditional left and right, an optional center channel improves localization when augmenting video. A subwoofer output is available if none of the satellites are capable of reproducing low-frequency information.

Surround is the result of mixing left and right channels out of phase. (In algebraic terms: left minus right.) The in-phase information cancels, leaving the rear signal; all of what's different between left and right. This mono signal is directed to the two rear speakers. Signal processing, in the form of expansion, can "steer" the rear information a few dB left or right to give the impression of real separation, even though none actually exists. It is a mix of algebraic and psychoacoustic sleight of hand.



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output cleared things up. Après tweak, I transferred the cassette to DAT for repeatability.

The best way to calibrate the decoder to the incoming signal is to mute the front speakers. (I dead-patched the signal at the patchbay, but a front-panel "mute" switch would be a welcome addition.) Then, while listening to the rear speakers, the balance control, located on the rear panel, is adjusted to null (minimize) the center channel information. (The Decoder's balance control should be located on the front panel.) RSP, genuinely bent on making improvements, was receptive to all my suggestions.

### THE ODD TESTS

I made three live recordings direct to DAT, experimenting with placement, phase, and various microphones and configurations. My goal: to recreate a sound field realistically through four speakers. The first attempt was with an X-Y microphone pair straight into the recorder. An M-S configuration was next, connecting a cardioid mic into the encoder's center input and a ribbon mic, with its figure-eight pattern, into the surround input. The final test combined the X-Y mics (this time connected to the left and right Encoder inputs) with a cardioid mic, facing in the opposite direction and connected to the surround input. In each case, I walked 360 degrees around the mics while describing my position.

All of the tests yielded positive results. More interesting than my voice were the ambient sounds: a dripping faucet, clanging steam pipes, and street sounds from an open window. Hey, I had great fun! Even greater flexibility could be had by recording to multitrack first, then encoding in a controlled environment afterwards. In addition, a more precise mounting arrangement would increase both accuracy and repeatability. (The CALREC Soundfield

microphone, which features four mic capsules in one housing, might be very well suited for this purpose.)

### THE INTENDED USE TESTS

I recorded my voice describing the various features. Then on playback I created the surround effects, patching the dialog track to one of the joysticks and swirling it around the room. (Everybody needs to do this at least once!) Then I patched my voice into a mult, sending feeds both to the center input and to a digital delay followed by a high-pass filter. The filter output was then patched to a joystick. As the dry voice appeared dead center, the telephony echo effect

was rotated to each speaker. It was more fun than humans should be allowed to experience.

Mixing music in surround will surprise you. Even simple panning is more responsive. Stereo reverb immediately fills the rear speakers. Direct sound

comes distinctly from the front, while the "hall" fills the rear. All this before using either the encoder's surround inputs or the joystick panner.

One of the most distinctive musical effects I was able to create started with a pair of tracks. These were a composite of background vocals and hand claps, panned hard left and right. The stereo background vocals filled the left and right speakers, both front and rear. Via aux send, hand claps (on the left track only) were fed to a stereo reverb, a joystick panned left rear, and a delay panned right rear. On each beat the claps appeared from the left rear, while the delayed claps tickled the right rear. The reverb filled in the space in between.

When the music track became busier, the rear separation got less distinct. Remember, the rear separation isn't real, it's enhanced by analog circuitry in the Decoder. Here, percussive effects will always stand out best. When mixing for picture, background

*continued on page 107*

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## Yamaha MT8X 8-Track Recorder



**MANUFACTURER:** Yamaha, 6600 Orangethorpe Ave., Buena Park, CA 90620. Tel: 714-522-9011.

**APPLICATION:** All-in-one, cassette-based mixer/8-track recorder designed for cutting demos, recording rehearsals, and general recording projects (jingles, radio spots, etc.).

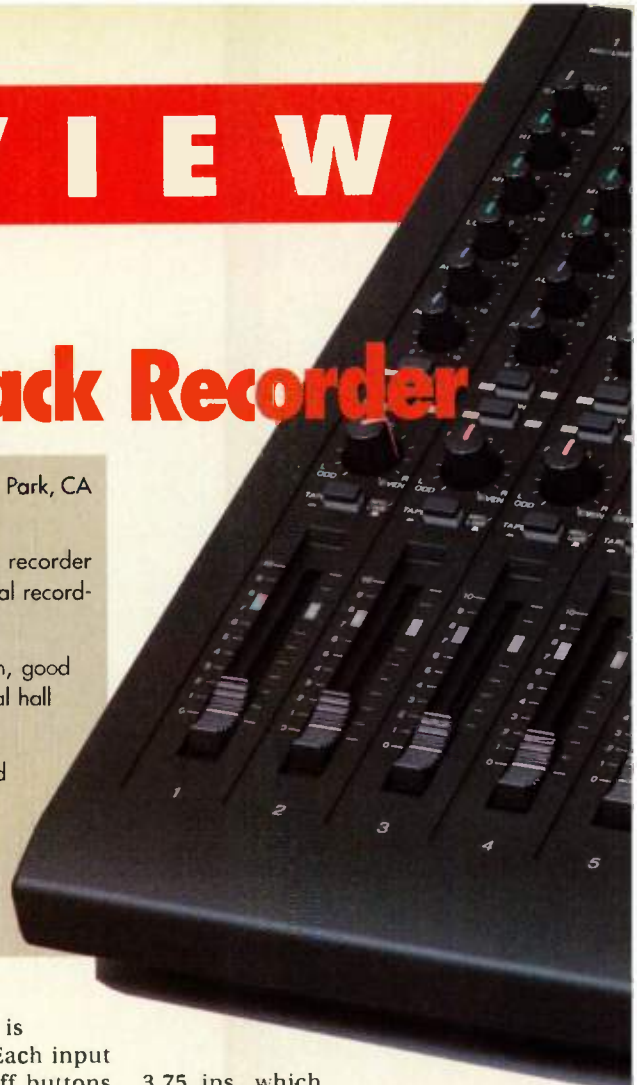
**SUMMARY:** Especially considering the cost, the MT8X offers simple operation, good sound quality, and a full complement of functions for the bedroom or rehearsal hall studio.

**STRENGTHS:** Easy to learn, hook up, carry around, and use; low media cost; good fidelity.

**WEAKNESSES:** Faders are somewhat sticky; knobs don't feel very solid; nonstandard detachable power cord (better get a spare!).

**PRICE:** \$1679

**EQ FREE LIT. #:** 123



ALTHOUGH MODULAR DIGITAL multitracks are getting all the attention, 8-track cassette-based gear continues to evolve. A prime example is Yamaha's MT8X, billed as a "studio in a box" that delivers a lot of well thought-out features in a very economical package. It's extremely easy to use; this is one piece of gear that passes the "3+3" test (i.e., you can operate it at 3 A.M. after drinking three beers).

### MIXER FACTS AND SPECS

The "features" aren't bells and whistles, but rather utilitarian refinements of important functions for an all-in-one recording package. For example, inputs 1-4 are mic or line, whereas 5-8 are line only (switches for each of the 8 channels also let you select between tape or source). For a bit more flexibility, however, inputs 1 and 2 include insert jacks, and 8 is a stereo input. All jacks are 1/4-inch phone except for the monitor outs, stereo outs, and mixdown deck ins, which are RCA phono types.

Channels 1-4 have mic preamps with clip LEDs, along with 3-band EQ — high (10 kHz), mid (1 kHz), and low (100 Hz), with  $\pm 12$  dB range. Channels 5-8 have high and low EQ only.

Group operation, for mixing several inputs together on one tape track

or assigning particular inputs to particular tracks, is handled in the usual way. Each input has two group assign on/off buttons (1+2 and 3+4); the panpot pans between the odd and even groups, and each group has a master level control.

For signal processing, there are two aux send controls per channel, both with stereo aux returns. These also feed group assign buttons and have level controls (but no panpot), so they can function as two additional stereo inputs.

Other tricks: eight tape out jacks carry the tape out signal (necessary for sending sync to other devices, among other things) during playback, or the tape input signals while recording; eight short-throw sliders set up a mono cue mix for the tape tracks. Monitoring allows one to listen in on any or all of the following: group 1+2, group 3+4, stereo output bus, 2-track in from mixdown deck, and cue outs from tape. A master monitor level controls volume at both the monitor and headphone jacks, and of course, there's a master volume control for the stereo bus.

### THE TALE OF THE TAPE

The MT8X runs high-bias cassettes at

3.75 ips, which is twice the normal speed. You can't play standard cassettes or cassettes from other 8-tracks on the MT8X due to the different head format. The noise reduction system uses dbx, which may not be quite as sexy as Dolby S, but is a known quantity and helps keep the price in line. A dbx defeat switch for channel 8 promotes more reliable sync operation with FSK sync signals, which don't get along with noise reduction (however, SMPTE synchronization works better with the dbx left in).

You can record on up to four tracks at once, and these can be contiguous. There is no problem bouncing to adjacent tracks. Other features include pitch control ( $\pm 12$  percent) with fixed/variable switch, a useful and easy-to-read fluorescent display for metering and function status, soft-touch controls, and quiet operation.

### THE AGE OF AUTOMATION

There's the now-standard punch footswitch jack and a connector for an optional controller (the Yamaha RCM1). It's the automated record and location processes, however, that real-



ly speed up recording.

Auto-punch lets you program punch-in and -out points; to check if the punch points are set correctly, a rehearsal mode goes through all the record motions except actually going into record. (Because you're dealing with an analog recorder, there is about a 500 ms gap when punching out.)

The MT8X can memorize two tape location points, which you shuttle to by pressing an associated button (there's also a Return-To-Zero button and a Check button that shows the counter setting associated with each location point). Pressing Repeat sends the tape to the first location point, plays to the second location point, then rewinds back to the first point and starts all over (up to 16 times maximum). Of course, you can record at any time during the repeat. But get this: in a fine example of idiot proofing, these points remain at the same tape loca-

tions even if you reset the counter — you have to actually press Clear to get rid of the memorized locations. And if you press Check, it compensates for these changes and shows the new numerical values.

One other very cool trick: a power-on procedure lets you bring the head block and capstan forward (out of their usual hiding place) and into a position that allows for easy cleaning.

#### OPINIONS

I was very pleasantly surprised at how well the MT8X combines user-friendly features and value. You can almost operate this recorder without thinking, and that's the way musical equipment should be — it prevents derailment of the creative process. In fact, if you're familiar with recording, you can figure out 90 percent of the

unit without opening the manual. (Speaking of which, the manual is okay, but not great; fortunately, a little experimentation will make any of the murky parts clear.) About the only corner-cutting seemed to occur with the knobs, which wobble in their recesses, and with the faders, which are a bit sticky. As a point of comparison, the feel is comparable to an Alesis 1622 mixer.

#### CONCLUSION

Sound quality is equal to or better than what you'd expect for a narrow-band, cassette-based multitrack with dbx noise reduction. Just remember to use high-quality tape, clean and demagnetize the heads, and learn how much you can push the levels before quality starts to suffer. Sure, you won't have the nice, sparkly high end associated with digital decks, but you will have several thousand dollars left in your bank account, and find yourself equipped, in the bargain, with bullet-proof technology. For many people, that tradeoff makes a lot of sense.

— Craig Anderton

## StuDiomaster STAR System



**MANUFACTURER:** StuDiomaster, Inc., 3941 Miraloma Avenue, Anaheim, CA 92807. Tel: 714-524-2227.

**APPLICATIONS:** Eight-track project studio mixing, routing and monitoring, DJ mixing, or sound reinforcement.

**SUMMARY:** Comprehensive facilities to make a complete audio control center for 8-track studios.

**STRENGTHS:** Excellent audio performance, compact size, and convenient operation with modular processing options.

**WEAKNESSES:** One-piece design complicates servicing and an intimidating range of facilities for first time users.

**PRICE:** \$1895

**EQ FREE LIT. #:** 124

THE UNCONVENTIONAL STAR (StuDiomaster Audio Recording) System is a fine example of design following function in a mixing console, and not just a matter of adding two new features to someone else's design. The vertical format of the System is a departure from the usual thin and flat style of current console construction and reminds me of a portable Neve console I used in the mid-'70s. This

design keeps the controls within view and easy reach at all times — a good thing, considering the complexity that StuDiomaster has offered for signal routing within the console. This mixer can be pushed a little farther back on the table, leaving room for writing notes, while still keeping within arms reach for every single control. Another advantage of this design is the removal of a large flat surface in

between you and your nearfield monitors. After all, the reflections from the top of a mixer can have serious effects on the frequency response of your loudspeakers.

The shape of the STAR System is not its only unusual aspect. StuDiomaster has included a comprehensive switching system that should allow many 8-track studios to plug in all of their sources, recorders, and monitors and never have to repatch again. The mixer is also split so that mono sources, eight mic or line inputs, can be fed to the Left and Right outputs with the choice of also including the eight Line B (multi-track playback) inputs and/or ten stereo inputs. The Line B and/or Stereo inputs can be monitored directly without including them in the Left/Right output mix. This offers the users some very powerful options. Obviously, monitoring the Line B mix will create a typical overdub monitoring situation. The choice of monitoring the stereo inputs separately allows for reverb and effects or virtual-tracks (MIDI instruments sequenced in sync) without printing these signals to tape. Then, with the push of a button (Stereo to L-R), all these inputs can be routed to the Left/Right output during final mix-down. If you also push the Line B to L-R button, a total of 36 different sources (16 mono and 10 stereo) can be controlled in the final mix. Not bad for a mixer that uses up less than 18 by 24 inches of your desktop.

The rear panel includes more patch points than nearly any mixer in this price range. Inserts are available on all eight mono inputs, four stereo inputs, and the main Left and Right bus. The two single-band parametric equalizers, providing comprehensive control [see fig. 1] over center-frequencies between 30 Hz and 12 kHz, are normalled to the main outputs, but can be patched into any of these other inserts or even external equipment. There are main and auxiliary





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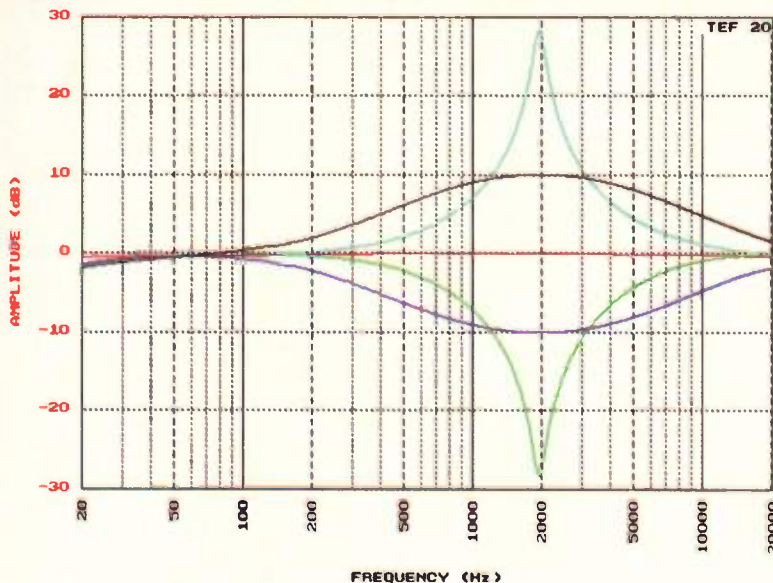


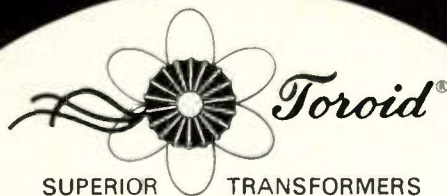
Figure 1: Parametric EQ set to 2 kHz comparison of full boost/cut with Q set to 10 and 0.35

bus access jacks for adding a sub mixer without using up inputs and

output connectors for two 2-track mastering recorders that are fed from

the main output. These 2-track recorders can be switched to the monitors and even include switching to dub between these decks without repatching. Two optional signal processors can be plugged into the STAR System and patched to any insert on the mixer from the rear panel.

The review unit included the first two of the optional signal processors Studiomaster has planned for this mixer. The SFX-02 is a stereo noise gate (\$210), which, although basic, operates very effectively and includes a sidechain input for ducking or other effects. The SFX-03, a stereo compressor (\$210), also has a sidechain input and includes a small but effective three-color LED to display the amount of compression. These units may not replace all your external rack-mount dynamic processors but, at this price,



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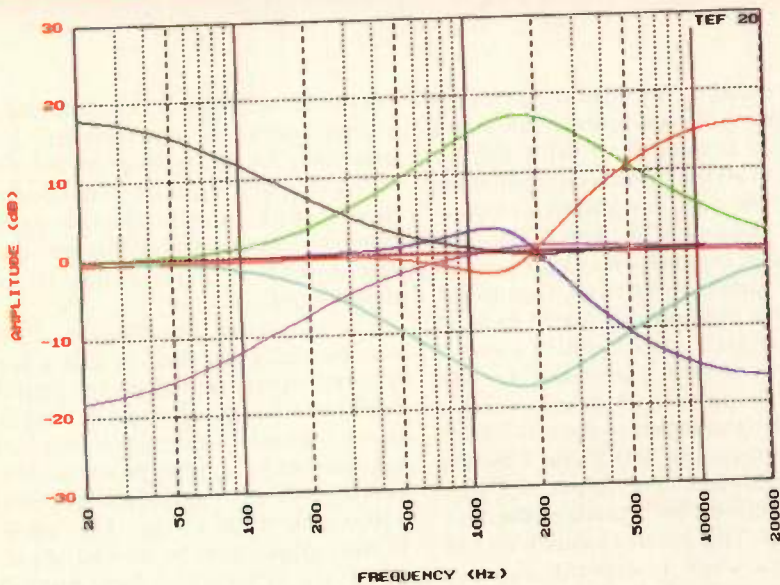


Figure 2: Mono Input Three-band EQ showing each band set at the extreme boost and cut setting.

a worthy addition to the console's facilities. Other processors planned include: a stereo dynamic noise filter; parametric equalizer; auto-panner; digital delay; and digital reverb.

Small mixers with a large number of features often compromise the operation by placing the knobs too close together and by using short-throw faders. The unusual layout of the STAR System has side-stepped this problem, providing lots of room to grab controls and full-size 100mm

faders. The faders operate smoothly and the legend is accurate and clearly visible. A scribble strip is positioned above the faders, where writing won't end up smeared onto your hand. The first four stereo inputs also include 100mm stereo faders. The other six stereo inputs consist simply of a rotary level control and a Listen button. All the Listen buttons on the console have an LED indicator and also light the pre or post LED in the monitor section when in use.

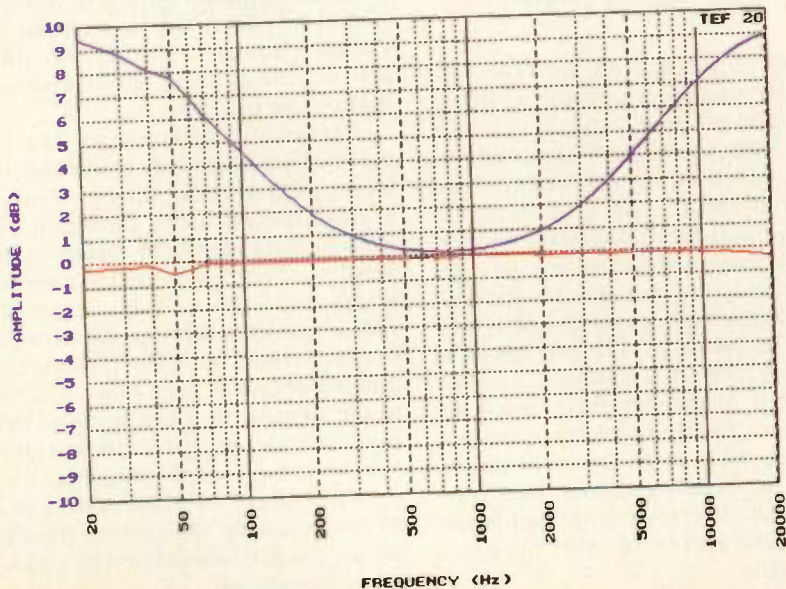


Figure 3: Loudness Equalization on Monitor Output (switchable)



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Another feature uncommon in this price range of mixing consoles is the EQ-bypass switches on the eight mono inputs. Considering the tremendous range of the EQ on this mixer, these switches are a very good idea. The 3-band channel EQ offers very broad strokes to the tonal palette [see fig. 2] and would probably be used very sparingly in most situations. Stereo inputs one to four lack the mid-band EQ.

Monitoring is well thought out and, in addition to accessing the 2-tracks, there are Listen (solo) buttons on all mono and stereo inputs, the Stereo bus, Line B bus, and auxiliary masters. The listen mode can be switched between prefade (mono) and postfade (stereo) modes. This allows a form of in-place stereo monitoring. There are separate controls for the studio monitor and headphone output levels.

The Loudness button is a very unusual feature in a studio mixer. Boosting the bass and treble [see fig. 3] in the monitor outputs, it emulates a feature of many home stereo systems, but may be of questionable value in most studio applications (unless you want to hype the band during a playback?) and is potentially dangerous to your monitors, especially when cueing a tape or soloing a kick drum.

To save having a patchbay for your 8-track recorder inputs, this mixer has a Bus Assignment switch on each of the mono inputs. This switches the direct out from each input between just that input and the Left/Right main bus. This is a handy way of skipping around the lack of subgroups and also making track bouncing very simple, as each input can also be switched from Line A to the multitrack tape return Line B with a button labeled Swap. Line input A now appears on the monitor mix bus. This allows the multitrack tape to be assigned to the large faders for bouncing tracks or mixdown and still provides eight other line inputs to the final mix.

The four auxiliary busses also include some interesting ideas for the

project studio. The eight mono inputs have two postfade sends (AUX 1 and 2) and a prefade send (AUX 3). The first four stereo inputs feed auxiliaries from two pots, switchable between AUX 1 and 2 or AUX 3 and 4. The Line B monitor inputs have a single send to AUX 4 (prefade). The Left/Right masters have two controls (each) to send to either AUX 1 and 2 or AUX 3 and 4, which is a very handy way to add reverb to an overall mix or send a complete stereo mix to the musicians' headphones. The AUX 3 and 4 busses are combined at the output of AUX 3 unless connection is made to the AUX 4 output. This creates a quick way of sharing a single reverb unit between overdub and track playback when recording tracks dry.

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to plug in all of their sources,  
recorders, and monitors and never  
have to repatch again.**

All connectors on the STAR System are phone jacks (two- or three-conductor), except the mic inputs (XLR with phantom), four switchable Hi-Fi stereo inputs (RCA), and Two-Track B (RCA). The 8-track inputs and outputs are individually switchable between  $-10$  dBv and  $+4$  dBv. This makes the unit suitable for project studio multitracks of nearly any type, including ADATs and DA-88's. Two of the Hi-Fi inputs can be switched to provide RIAA equalization for directly connecting turntables for those retro-DJ applications. This mixer could combine your project studio operation with your home stereo and still leave room for guest musicians.

The lack of input modules makes

servicing this type of console more cumbersome: the channels are not externally modular. They are, however, internally modular. To do any kind of work on them, the rear panel must be removed and the pot that you intend to service has to be demounted.

The optional processing modules can be easily installed in just a few minutes. The external power supply does not have any indicators (they're on the console), simply two switches for main and phantom power; an IEC power cord; and captive six-foot console-connecting cable. The small power supply can be placed somewhere out of the way, where it won't induce hum into the audio cables or circuitry.

With all of the busses inside this console, noise, and crosstalk are considerations; but Studiomas-ter has achieved very good crosstalk (greater than  $-80$  dB, typical) and noise performance (greater than  $-91$  dBu). My tests confirmed that the mixer met and usually exceeded its specifications. Although the manual is still in preliminary form, it does include the most comprehensive performance specifications I have seen in some time. The specifications go beyond the usual ins and outs to include the noise contribution with one channel routed ( $-94$  dB) to the main output, all channels routed ( $-90$  dB), etc., that are indicative of the performance of the console in action.

Assuming Studiomas-ter has set out to create a complete control center for the project studio, then the STAR is a great success. They have gone to extraordinary lengths in designing the STAR System to minimize the need for external patchbays. This not only speeds up the routine operation of the project studio, but also reduces the number of connections that could fail in the signal path. Combining all this signal routing with quiet mic preamps, clearly color-coded controls and smooth faders, the STAR System is a shining example of creative console design sharply focused on the task of 8-track recording.

—Wade McGregor

## LA AUDIO 4X4

continued from page 82

o'clock), and 1 kHz to 4 kHz (3 o'clock) are all matching positions. The filters are too shallow to allow tuning to the pitch of a single drum [see fig. 1]. I would prefer very sharp filters that allow me to pull the floor-tom boom out of the kick-drum thud on a kick mic that has too much leakage. Higher order filters would also be useful when using compression to smooth out a hot note in a bass part. Keep in mind, however, that the filters are an added convenience and shouldn't be compared with higher-cost filters.

### GETTING PHYSICAL

The construction of the 4X4 is solid and well-finished, but the unit is a little cumbersome to dismantle for repair. The faceplate and all the phone jacks must be demounted from the rear panel before the unit can be opened up. Inside, the high-quality fiberglass printed-circuit boards are well laid out with screened-on component designations throughout. The

main PC-board is attached to the top of the unit using plastic pop-rivets. I'm not sure if these will stand up to multiple removals of this board for service. All connectors, switches and pots are PC-mounted. The only other PC-board holds all the pots. It is connected to the main board with two ribbon cables, which are the only wires inside the unit. I found the review unit to have a few pots that were difficult to turn due to their binding on the front panel.

The 4X4 is a complete gate/compressor/limiter whose versatile design does not compromise control while squeezing four processors into one rack space. The sound quality is very good and, except for the stereo (link) mode, operation is quick and intuitive. The 4X4 may surprise you with the amount of compression it can achieve without sounding muddy. The inclusion of many of the most sought-after features in the 4X4 make it a very competitive device in its price range. With the current tendency toward discrete dynamic processing of nearly every input to the mixing console, processors need to be very cost-effective, and the 4X4 is definitely that. **EO**

## NIRVANA LIVE

continued from page 68

and thick, but you have to know how far you can take it, and that's where the big savings has been here."

Both main and monitor systems featured Crown Macro-Tech power amplifiers. Each rack of amplifiers was loaded with an MA-1200, and MA-2400 and MA-500VZ driving two Electro-Voice MTL-4A and two MTH-4A concert speaker systems. Macro-Tech MA-24 x 6 amplifiers drove the high-intensity stage monitoring system so that the engineers didn't have to walk back to the amp racks to make adjustments.

Another benefit of the IQ System was that it provided stability and versatility, enabling Nirvana to stretch out or ditch their prearranged set list at whim, without confusing the sound crew. The results was pure bliss for their fans. "They have good heads on their shoulders, and they're not just thinking about being rock stars," says Stevens of the trio. "And they're still just a bunch of *real* guys from Aberdeen, WA, who just happen to have some of the biggest selling albums right now." **EO**

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# First Aid For Loudspeakers, Part 3

The last word on how to get the most out of your beleaguered speakers

BY CALIX LEWIS RENEAU

I know, only computer nerds read the fine print. But the rest of us should be checking the fine print, too. In an attempt to make their products as competitive as possible, it doesn't help that speaker makers fudge their specs just a bit more than your average used-car salesman. I've seen soft dome tweeters for home applications rated as high as 1000 watts at 5 kHz; although the salesman declined my offer to buy a pair if he'd let me first test the spec in the store.

A true case of driver failure due to too much power is more rare than you might think. Still, don't send your

speakers more than they can handle. There's no law that says you have to push your speakers as hard as they can go. Most loudspeakers and amplifiers fall off their frequency response specs at the outside limits of their power handling capabilities. You should, however, feed your speakers the power that they need.

## AVOID TOO LITTLE POWER

There are many variables that kill speakers. When I worked as a speaker reconer, nine out of ten drivers were damaged by clipping.

What's clipping? Clipping is when the top of a waveform is cut off. Visually, it is when a sine wave flattens off at the top. If the sine wave gets even hotter, the amplifier will turn it into a square wave. One other point: power in an AC circuit is seen as the area under the voltage/current waveforms, so a clipped output pushes much more power than the normal sine wave. This produces a DC voltage at peak.

Another problem would occur by introducing a DC offset, so that the zero crossing doesn't happen at zero volts. If this happens, you can clip either the top or the bottom of your output waveform. Speakers are designed to handle lots of audio, which is alternating current, but a couple of volts of direct current continuously applied will quickly burn the coil wire in two. There's only one time when DC is useful to the driver: when trying to figure out which lead is which on the woofer. Touch a 9-volt battery across the input terminals (where the speaker wires connect). When the "+" on the battery is on the "+" of the driver, the cone will move out; in reverse, the cone moves in. Don't do this when the driver is wired to the speaker cabinet, and don't hold the battery on the terminals for more than a second or two or you can clip your voice coil.

A clipped driver is usually a dead driver, but there is one little trick that could save you a reconing job. If your speaker isn't making any noise, pull the driver out of the cabinet and hook a low-level signal to the terminals. At this point, a 9-volt battery will work just



Photo courtesy of EAW

fine. If the driver moves when you touch the battery to the terminals, the problem is elsewhere (probably in the crossover network in the cabinet). If the driver is still dead, hook up a low-level audio signal — less than a watt or so — to the terminals. I've got a cord that goes from 1/4-inch mono on one end to alligator clips on the other end. At this point, phasing doesn't matter, but I always have the red clip tied to the tip and the black tip tied to the sleeve.

There are two wires running from the terminals to the coil. These wires are actually made up of cloth with silver or another flexible highly conductive material woven into them. That's because these leads need to be highly flexible to follow the excursion (in and out motion) of the cone. Usually they poke through the cone from the back. On the front you should be able to find the two black lines where these wires come through and run down to the voice coil, under the dust cover. Hook your clips onto the terminals with your low signal on. Reach into the frame and lightly tug on the terminal wires one at a time. If you're lucky, the driver will work when you keep pressure on one of the two leads. This means that the open, or clip, is at solder joint on the face of the driver. If you're adventurous, you can fix this yourself.

Carefully dissolve the black glue from the offending driver lead on the front, taking care not to soften the cone too much. With a light-wattage soldering iron, disconnect the lead from the voice coil wire, clean both, and resolder them. Check to make sure the driver works properly (with no pressure on the lead) then glue the wire down. Either epoxy or white glue will work.

This simple repair helps show why DC in your audio line is not a good thing. Drivers are designed so that the motion of the voice coil in the gap cools the coil while it works. In smaller drivers, particularly tweeters, this cooling is enhanced by a viscous liquid, sometimes called ferrofluid. With a clipped signal, the driver spends more time at the outer ends of its travels and tends to overheat more. That is also why the leads often burn at the junction on the cone face. There, the

fine wire is covered with glue and doesn't get the motion-cooling that the rest of the voice coil does. It's a good idea to make sure that the insulation in your cabinets doesn't close off the air circulation to your woofers.

#### ANY TIME, ANY PLACE

Clipping can happen anywhere in your audio chain where the levels are incorrectly set. For example, a graphic equalizer can be viewed as a set of frequency-specific amplifiers. If your signal is already hot at 1 kHz, boosting it on your graphic will cause clipping. The same is true anywhere you have an amplifier circuit. So the most dangerous source of clipping is your main amplifier.

Remember, though, just because you have 250 watts doesn't mean you have to turn the amp up all the way. Leave it, better, with a reserve of power so that transients don't distort the speakers. If you're running your amp flat out and the drummer puts a little extra kick in the bass, there's no power to amplify it properly. Buy an amplifier with enough power to drive your speakers at a comfortable listening level and still leave enough headroom, then use restraint in not nudging the volume up that extra bit.

One more hint on amplifiers: they're expensive, particularly the good ones, especially for the power you'll need. If you want to save a couple of bucks on your amp, buy the most efficient loudspeakers you can get. A speaker rated at 90 dB at 1 watt/1 meter will need about 10 watts to hit 100 dB; one rated at 95 dB at 1 watt/1 meter will only need about 4 watts. Since you double the power for every 3 dB increase, every 3 dB increase at the speaker efficiency end saves you a step on the logarithmic scale.

Designing loudspeakers is a complex and arcane process, relying as much on subjective opinion as on hard fact. But maintaining your loudspeakers is simply a matter of simple rules and your common sense. Oh, there's another rule of thumb as well. It's the famed computer GIGO factor: "garbage in, garbage out." If you want good sound, first take care of your speakers. The rest is up to you. **EQ**



## COMPUTER QUANDARY

**Q** I've installed various program updates to my Mac and wish I hadn't. Now I can't even get the thing to start up properly unless I disable all extensions. But this is very inconvenient, and I often want to run more than one program at a time. What's the answer?

Joseph Konig  
Kansas City, MO

**A** Some extensions do conflict, and the order in which they load can be important. Generally, extensions relating to system functions (e.g., Mode 32) should load first. Extensions load alphabetically, so you can change the order by renaming the extension. Spaces are alphabetized before letters or numbers; the more spaces in front of an extension's name, the higher it jumps on the list.

A more complete solution is extension manager software, such as that included with Now Utilities. You can change the order in which extensions load merely by dragging them in place on a list, and can create sets of extensions that exclude problematic extensions.

If this doesn't solve the problem and you have a cartridge drive, take a blank cartridge and reinstall the system (upgrade to 7.1 while you're at it; I find it much more stable than 7.0.1). Now reinstall the program you use and restart. If all is well, reinstall a second program and restart. Keep doing this until you load a program that crashes the Mac on start-up, and you've found the culprit. Call the company and see if there's an update available.

A rare cause of start-up problems is a corrupted preferences file. If you isolate one program as causing a problem, trash its preferences file (generally found in the system folder). Then call up the program and "save preferences" to generate a new preferences file (some programs will rebuild the preferences file on their own).

Finally, remember that some programs just don't get along. The manufacturer can often tell you what does and doesn't work with a given program — and always read any "read me" files that come with software, since these often mention problems discovered since the manual was written.

Craig Anderton  
West Coast Editor  
EQ

# CD Distributor In A Box, Part 2

The age of accessing recorded music via a network is closer than you think

BY MARTIN POLON



The concept of direct downloading of recorded music — either to retail locations in the near term, or to the home via interactive cable or telephone company networks in the longer term — is viewed by most in the record industry as a kind of all-consuming plague. There are certain advocates of this retail technology, however, who view as a positive development the prospect of accessing a relatively complete catalog of, say, 10,000 or 15,000 different record titles without having to carry the concomitant stock.

The problem facing the major record companies is that privately, there is strong interest in this potential source of additional revenue flow. The public posture is another story since the major record chains view in-store downloading as a source of unfair competition, as well as the possible precursor of the demise of conventional record retailing. So the record labels will maintain a stiff upper lip in dealing with their retail customers who pay their bills — at this point in time. As downloading technology improves, the loyalty of the record labels in one direction or

another will depend upon the bottom line. Ask those who run the major record stores and you will generally find no illusions about their principal product suppliers — the record companies.

Record label executives have waxed enthusiastic in the past about an ideal sales mechanism that didn't involve the manufacturing, labeling, cataloging, storing, distributing, transporting, accounting, and taking returns of what is virtually an intermediate plastic storage medium for their real product — music.

Comments by a retired label executive illustrate the duality between record-label current commitments and future aspirations. "All of the major labels have had significant intellectual intercourse with the major players in direct in-home delivery of entertainment, education, and information. The labels have chatted with all of the major cable operators, AT&T and its seven regional Bell Telephone operating companies, and with just about anyone who will get them into the home or into new retail environments in the future."

As to the consumers of recorded music, any number of recent studies have confirmed what record merchandisers have known since the era of the 78 rpm LP: that consumers overwhelmingly prefer to buy their music by browsing through open stock and examining the jewel box art work and other notes on the CD. Record buyers like to "touch and feel" the merchandise — kick the tires, if you will.

In the past, other attempts at downloading from a central hard-disk system, such as the Personics, which produced customized cassettes with user selected tracks, have eventually faltered as consumers returned to conventional music shopping modes after the novelty of a new toy wore off. People who are willing to buy a recording sight unseen from a list are already doing so via mail-order record clubs. With their membership, they receive a substantial discount, often free recordings upon joining, bonus recordings with purchases, and periodic special offers. Also, let's not for-

get the club's greatest bonus, which is convenience, since members never have to leave their homes to shop for music.

For the rest of the record-buying public, a kiosk in a Blockbuster or similar store with a download system will offer the convenience of purchasing a recording when they rent a movie. Still, recorded music is an impulse buy and a tactile one at that. Record buying has been described as "a tactile response of virtually all the senses. The eyes take in the cover art, the hands grasp the jewel box as a possession, the ears behold the music, the nose detects the fresh, clean, slightly chemical smell of a new CD and its case." People want to see the merchandise and handle it, and they want to do it now — before they decide to buy it. Aside from the six-minute download time — which may kill any impulse buying — you are going to have myriad customers who will change their minds after the download.

The real bottom line is whether this collaboration is for real, or whether it is what computer users have been labeling for years as "vaporware." The record community may be accurate in dismissing this kind of system at this point in time, but perhaps that's due more to consumer purchasing habits than to anything else. But the reality of downloading is one the record industry is going to have to contend with sooner or later. This technology is no threat to well-run and amply stocked record shops that go out of their way to service their customers. But for the mall record stores — usually housed in cramped spaces, and with less-qualified employees and limited stock — the electronic future could be very grim indeed!

EQ

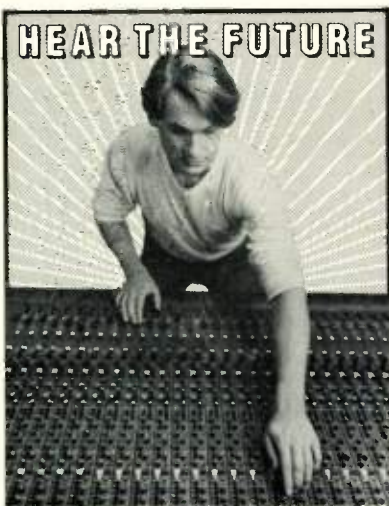
*Martin Polon is the principal of Boston-based Polon Research International (PRI). PRI forecasts the electronic entertainment industry for the financial community.*



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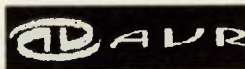
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## OF MICS AND MEN

*continued from page 43*

the cone because it's a terrible sound there and there's no depth to it and stuff." I don't agree with that. I mic it right down the center of the cone with the 47, and I mix that in with the direct sound. As far as the guitars go, it was a combination of sounds. Michael Schenker was playing through two different amplifiers. On some songs and on some parts we liked the sound of the old Marshall 50-watt through a Marshall bottom, and on other parts of the same stack we'd end up using a Soldano [amp] through the same Marshall bottom. The miking scheme was pretty much the same on both of them — a 67 and a 57 right down the center — and then a 421 or a 414, about 6 inches farther back, combining the signals together in a way that made sense.

**Q. Can you recommend some great vocal microphones, as well as some basic vocal miking techniques?**

**FRANK FILIPETTI:** For me, my favorite vocal mic is a really good tube Neumann U47, but there aren't too many of those left. I also like the Neumann U67. Of the current mics available, the one I feel best about is the Sony 800. We used it on Mariah Carey. I find it's a wonderful-sounding mic, but surprisingly, I don't hear a lot of stuff about it.

For vocal miking, some people like it farther back, but I like the microphone pretty close to the singer. At an opera we just did, however, I had to mic the vocalists much farther back because, one; they overloaded the shit out of the mics, and two; you just don't want that kind of proximity with the opera voice. With pop singers, however, I find that when you have huge drums, huge guitars, huge bass, etc., the only way a singer is going to come across huge is to have the mics up close. You have the proximity effect working for you. In addition, nine times out of ten I won't use the standard stocking unless the singer has a real problem. I generally like the singer to go right into the mic. On the few "p's" that pop, I find it better to remove those in the end.

**Q. Once you find the perfect microphone for a vocalist, do you ever experiment with any others?**

**FRANK FILIPETTI:** Well, with this question, I'm reminded about a vocal miking experience I had with Carly

Simon. I did an album with Carly, a standards album called *My Romance*, and I was using a wonderful old tube mic on her voice — an AKG C12. After mixing and putting out the album, we got such a good response to it that we did an HBO special of the same album. We rented a space, made a nightclub out of it, put up a band, and recorded over two shows. But, because it was a live situation and so forth (you have rejection problems and all that), I ended up using a Shure Beta 58, instead of a C12, on her voice. When we finally mixed it and did the whole thing, many people — including me — thought that the vocals sounded better than the ones we had laid down in the studio with the C12. It's a tricky situation, the vocal thing. I mean, if you know what you're doing and the singer has a good vibe, a 57 or a 58 can sound just as good as a C12 or a 269. I just don't think that it's as important as people make it out to be.

**Q. Kooster, what were you using when you were miking Bob Dylan? Elton John?**

**KOOSTER MCALLISTER:** I have to deal with microphones that will work in a PA environment and that will work on a loud stage. My current favorite microphone is the new Shure Beta 87, which is a condenser microphone. It's extremely smooth and it has amazing rejection characteristics. On this [live club date] Dylan project we did over the last three days, we started out with a Beta 58. That lasted about two songs. We then went to a Neumann 87, which we liked the sound of, but, unfortunately, it was something the PA could not work with. Then, due to a lot of insistence on my part, we tried the Beta 87 and it delivered a very smooth response. It's very pleasing. I was turned on to it when I was doing Elton John. It's an inexpensive microphone and I've only used it on vocals so I don't know how generic it is as far as other instruments are concerned. Right now, though, it's my current favorite vocal mic that works well in loud PA applications. Also, to me, an SM81 is basically a condenser 57; it's one of those mics that works everywhere. It works well on acoustic guitars, and it's something the PA companies can deal with.

**Q. Kooster, I was wondering what pattern you put your 414's on inside the piano — if you leave them on cardioid or put them on omni since they're so tight? Also, in general, how does everyone pan the piano? Does everyone pan it classicalwise, with the highs on the left,**



*the lows on the right? Do pop and jazz people do it from the player's perspective?*

**KOOSTER MCALLISTER:** I generally use it in a regular cardioid, not the hyper-cardioid pattern. For all my miking I always do audience perspective, because most of what I do is with film or video where the perspective is that of sitting in the house, and you want to come across with the feeling that you're there. Just out of habit, I always do low on the left and high on the right when it comes to the piano itself and then generally place the piano in the mix based on where it was sitting on stage. I use the PZM, an omni-microphone, and that sort of fills in the areas that the 414's don't pick up. I use the PZM to get the percussiveness of the hammers.

*Q. Tom, how tight do you mic the B&Ks on your piano?*

**TOM JUNG:** High and to the right. The problem with the B&K is it's fairly long and by the time you put an XL connector in the cable coming out of it, it's hard to get it away, but invariably I'll have it just about touching the lid, an eighth of an inch off the lid where the cable comes out of the microphone. I wish the mic weren't so long and I could get a little further away. It's basically at a 60-degree angle at the piano. If the mic were shorter and I could get the capsules away and move a little closer to the lid, I'd be happier.

*Q: I wanted to ask a question about sticking a drum [rim] vs. someone moving down to the snare, and then, finally, to move on to the combined snare-rim shot and the dynamics involved.*

**FRANK FILIPETTI:** With drummers in the pop field, I get very annoyed when I hear this tiny click for a stick and then this nice, big, fat snare, because generally what people do is end up with mic on the snare and then just hope for the best snare when it comes to the cross-stick. Part of it is the drummer — the drummer has a lot to do with it. There are some guys who are great at cross-sticking, but I've found that invariably I need to have a second microphone. I find a very small capsule microphone and bring it up underneath the tom if I can and get it as close to where he's sticking as possible. Then I'll leave that mic shut off up until the moment when the sticking happens. At that point, I'll go to the sticking and then back to the snare mic again.

The only other alternative I have

is this: When it looks as though I've had a good-enough signal on the cross-stick, I'll bring it to a second fader in the mixdown process, take that same mic, bring it to a second fader, EQ it in as a stick and then switch two faders on the mix so you have one thing EQ'd for the stick sound. At that point, you can mic compress it as well. **EQ**

## RSP TECHNOLOGIES

*continued from page 86*

music (no matter how busy) will be lower in the mix so that the placement of effects will be easier to control.

### JOYSTICK REPORT

The joysticks do work, but panning is a little jumpy from speaker to speaker. I suspect this is due to the internal calibration of the system. RSP was not able to supply a service manual or schematics, but I did see VCAs and a few trim pots inside, so there must be a calibration procedure. Some of the adjustments might be more accurately tweaked if, for example, the joysticks could be positioned via detent. I also suspect that a better grade of potentiometer could be used in the joystick assembly.

Rather than searching for each corner or in-between area, I think a detented joystick would also help users to feel the sweet spots, without the need to look. There are certainly enough distractions when mixing.

### SUMMARY

A surround decoder and four speakers are my preferred enhancement devices. With this device alone, your existing signal processors will be enhanced. (Stereo image enhancers will have an even greater effect when decoded.) Think of Surround as an aural phase meter. Half of what comes out of the rear speakers is out-of-phase information. An indication of this condition can be helpful when attempting to create either a mono-compatible mix or a totally wild surround piece.

RSP has incorporated many clever and useful features into Circle Surround and protected them with robust steel cases. The manuals, while a little shy on technical info, give much useful information on all the various configuration possibilities. Your most creative ideas, plus Circle Surround, equal the fun factor.

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CIRCLE 26 ON FREE INFO CARD

# Doing Windows, Part 1

This two-part feature is excerpted from a 22,000-word chapter in the author's *Windows Configuration Handbook* (New York: Random House, 1993). In that chapter, the Media Vision PAS-16 sound card was used as a typical component in a multimedia system.

In Windows 3.1, the Control Panel icon in the Main Group Window provides access to still other icons that in turn allow the user to configure various Windows components. Although some of these icons appear in all Windows systems, others show up only if a related device is correctly installed. For example, the MIDI Mapper icon described here provides configuration access to a MIDI device installed in an MPC (Multimedia Personal Computer) system. If a MIDI Mapper icon does not appear in the Control Panel window, a sound card with MIDI support has not yet been installed. Install the necessary hardware and drivers and then reopen the Control Panel, which should now show the icon.

## THE MIDI FILE FORMAT

The complete structure of a general MIDI file is described in the *Standard MIDI Files 1.0 Specification* published by the International MIDI Association in Los Angeles, CA. In addition, the *Multimedia PC Specification version 1.0* (jointly developed by Microsoft, Media Vision, Creative Labs, and others) includes specifications for extended-level and base-level synthesizers.

Much of the background information presented here is derived (and sometimes translated into English) from these and other MIDI-related

documents. Although no attempt is made here to explain MIDI in its entirety, there should be sufficient information to allow the Windows beginner to survive basic MIDI configuration and troubleshooting sessions.

**Channel Assignments.** Any MIDI file intended for interchange between MPC-compliant systems usually adheres to a dual-level standard in which the same musical composition is recorded in two versions on 14 of the 16 available channels. Channel assignment within the file is as follows:

SETUP CHANNELS	FOR USE BY
<i>Extended Level</i>	
1-9	extended multitimbral synthesizers (melodic)
10	same (percussion)
11-12	unused in base- & extended-level files
<i>Base Level</i>	
13-15	base multitimbral synthesizers (melodic)
16	same (percussion)
<i>General MIDI</i>	
1-16	complete 16-channel MIDI system

## MIDI MAPPER OVERVIEW

As part of the regular Windows setup procedure, the MIDI Mapper applet is configured to support several popular MIDI hardware systems. If you subsequently install a sound card that supports MIDI, the MIDI Mapper can be

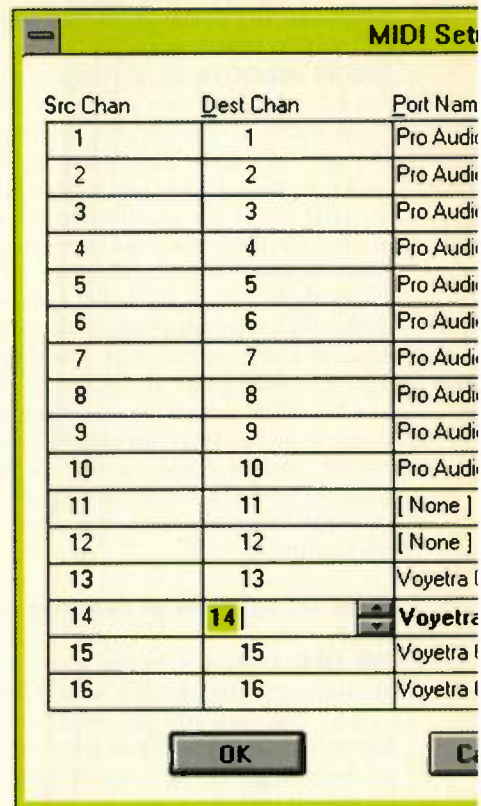


Figure 2

reconfigured during the setup procedure for that card. In either case, the configuration information is stored in a MIDIMAP.CFG file, and the purpose of the MIDI Mapper applet is to reconfigure that file as required. Therefore that file is introduced first, followed by a look at the MIDI Mapper itself.

The MIDI Mapper Configuration File (MIDIMAP.CFG). The MIDIMAP.CFG file contains the configuration data required to support the installed MIDI Mapper setups. The file is not, however, in a text-only format

## MIDI Mapping in Windows 3.1

BY JOHN WORAM



Figure 1

**Pro Audio'**

Patch	Map Name	Active
IDI Output	[ None ]	<input checked="" type="checkbox"/>
IDI Output	[ None ]	<input checked="" type="checkbox"/>
IDI Output	[ None ]	<input checked="" type="checkbox"/>
IDI Output	[ None ]	<input checked="" type="checkbox"/>
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IDI Output	[ None ]	<input type="checkbox"/>
IDI Output	[ None ]	<input type="checkbox"/>
Synth	[ None ]	<input checked="" type="checkbox"/>
M Synth	[ None ]	<input checked="" type="checkbox"/>
Synth	[ None ]	<input checked="" type="checkbox"/>
Synth	[ None ]	<input checked="" type="checkbox"/>

Help

OPC MIDI Outp  
3 FM Synth

MT32  
Prot/1  
Prot/1 Perc  
MT32 Perc  
[ None ]

such as that used for most Windows INI files. As a result, MIDIMAP.CFG editing chores must be done via the MIDI Mapper applet. If a configuration change necessitates updating the MIDIMAP.CFG file, you will be prompted to restart Windows. When you do, the file will be rewritten as required.

**MIDIMAP.CFG Revisions During an Upgrade Procedure.** Any software upgrade that affects MIDI operations will probably modify the existing MIDIMAP.CFG file, sometimes with disastrous results. The usual procedure is to toss out the existing file and replace it with a new one, which may or may not preserve the existing configuration information that you don't want to lose. Therefore, it's not a bad idea to make a backup copy whenever you have a MIDI configuration that you don't want to lose forever. Make a new backup as often as required to maintain a current version for recovery should the need arise.

Some well-behaved upgrades will rename your existing MIDIMAP.CFG file and then add a new one in its place. In this case, you can review the new file,

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## WORKSHOP MIDI

then rename the original back to MIDIMAP.CFG and incorporate the new information into it. Or vice versa, of course. But don't count on it. In case of doubt, make your own backup before installing anything that might misbehave.

### MIDI MAPPER CONFIGURATION

To review or revise the current MIDI configuration, double-click on the MIDI Mapper applet icon to open its dialog box, both of which are shown in fig.1. The component parts of the dialog box are described later in this article and, next month in Part II.

**Show MIDI Configurations.** This section of the dialog box contains three buttons for selecting one of the options described here. As each button is clicked, the name and description (if any) of the currently selected item are displayed in the dialog box. (see Name: and Description:, below). After selecting the desired item, refer to the appropriate MIDI Mapper Dialog Boxes section for a description of the related configuration options.

**Setups.** A MIDI Setup is simply (if that word can be used) a listing of the configuration settings for each of the 16 separate MIDI channels.

**Patch Maps.** The General MIDI specification has assigned a specific instrument name to each of 128 potential MIDI sources. Each channel in a MIDI file is mapped to one of these sources. If you know the source to which a specific file channel is mapped, you can remap it to some other source via the Patch Map, which will be described next month in the PATCH MAP dialog box section.

**Key Maps.** The General MIDI specification defines the octave in which each melodic note is to play and also specifies the percussion instrument sound for each percussive note. Use the Key Map to change these specifications.

**The Name: Box.** Depending on which Show option is selected, the Name: box lists the item currently available for editing. Make sure you make a note of the current name before changing it, because once you access the drop-down list, the Cancel button disappears. Therefore, if you should want to return to the previous item but can't remember what it was, you'll just have to take a guess at it.

The names listed in the Name: box are read from the MIDIMAP.CFG file in the System directory.

**Description.** This line gives a description of the item selected in the Name: box, if one has been written into the MIDIMAP.CFG file. Table 1 lists the descriptions of the MIDI configurations in the Windows version of MIDIMAP.CFG.

**Edit.** If you want to edit an existing MIDI configuration, click on the desired radio button and then on the Edit button to open the dialog box (described below) for editing.

**New.** To create a new configuration, again click on the desired radio button and then on the New button. Depending on which button is selected, a dialog box with one of the following titles will appear: New MIDI Setup...; New MIDI Patch Map...; New MIDI Key Map...

Regardless of which item was selected, a dialog box will ask for the following new information: Name; Description.

After entering a descriptive name (required) and description (optional), click on the OK button to open a new dialog box for that item. Edit the columns in that box, then click on the OK and Yes/No/Cancel buttons, as desired. If you do save your configuration, the name, description, and configuration data are appended to your MIDIMAP.CFG file.

#### THE MIDI MAPPER DIALOG BOXES

The MIDI Setup dialog box is briefly described here. (Patch Maps and Key Maps are described next month.) To open any dialog box and display the desired configuration data, first click on the appropriate radio button. The name and description (if any) of the currently installed item appear in the dialog box. Click on the Down Arrow to select some other item and then on the Edit button, or just click on the New button to begin editing.

**Setup.** Figure 2 shows the MIDI Setup dialog box. The information in columns 2-4 can be edited as described in the sections that follow.

**Source Channel (Src Chan).** This column simply lists the 16 channel numbers within any MIDI file. If you click once in this or any other MIDI Setup row, Arrow buttons appear in columns 2-4 for that row, as shown by the example in Row 14.

**Destination Channel (Dest Chan).** This is the channel in your synthesizer to which the source chan-



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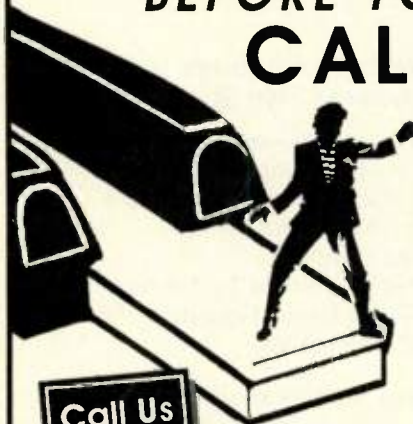
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## WORKSHOP MIDI

nel is routed. By default, the destination channel matches the source channel, but it can be changed by typing a new channel number, or by clicking on the Up/Down arrows.

**Port Name.** The entry in this column specifies the MIDI port to which the Destination Channel signal is routed. Click on any Port Name box to view a drop-down list of available ports, as shown at the bottom of fig. 2. For a port to appear on this list, the appropriate MIDI driver must have been loaded via SYSTEM.INI, and there must be a corresponding description in CONTROL.INI. If both criteria are met, the appropriate name appears in the Port Name box. That name, however, may not quite match the CONTROL.INI description, since it is read from within the cited MIDI driver.

**External Port Name.** Note that in fig. 2, extended-level channels 1-10 are all assigned to the Pro Audio/CDPC MIDI Output port. If this or some other output port is listed, these channels are routed to an external MIDI device that may or may not be physically available. If it is not, then no sound will be heard from these channels.

**Unassigned Port.** Channels 11 and 12 are unused in MPC-compliant MIDI setups, as indicated by the word "None" in the Port Name box.

**Internal Port Name.** Figure 2 also shows that base-level channels 13-16 are assigned to the Voyetra OPL-3 FM Synth(esizer). This device is built into the Media Vision sound card installed in the computer used here, and so the base-level channels of any MIDI file will be heard if this configuration is selected.

**Patch Map Name.** Double-click on any box in this column to open the list of available patch maps, as shown by the example at the bottom of fig. 2. The four patch maps in the Windows MIDIMAP.CFG file are listed in the box. These or other patch maps can be edited by clicking on the Patch Maps radio button, as will be described next month.

**Active Check Box.** An "X" in this box indicates that the MIDI channel is active. Clear the check box if you wish to disable the signal on that channel. **EQ**

*John Woram is the author of the best selling PC Configuration Handbook and the recent Windows Configuration Handbook, both published by Random House.*

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## ACROSS THE BOARD

continued from page 114

wouldn't really work out. Four percent up from 98 bpm is 101.92 bpm, and the parts would drift out of sync. With the new tape up 2 percent, we were at 99.96 bpm. If we moved the demo down 2 percent from 102, we would also be at 99.96 bpm. Close enough.

A new wrinkle. The keyboard part was transferred from the 3M machine (50 kHz sample rate) to a Fostex D-20B timecode DAT through Apogee converters. (OK, so I was in the analog domain for a second. I won't tell anyone, if you don't.) Since the DAT only holds two tracks at a time, I made a few passes to get the tracks I needed. On one pass I got the SMPTE and the machine snare drum. On the second pass I got the stereo keyboard (with SMPTE also going to the DAT timecode track).

With the new tape running 2 percent faster, so was its SMPTE track. If I tried to lock up the DAT machine, it would go faster than 102, not slower. Enter the Digidesign SMPTE Slave Driver. There is a Macintosh control program that is used when you want to

stripe SMPTE generated by the Slave Driver. There is a unique feature that allows you to VSO the SMPTE timecode. You can select 30 nondrop for the frame reference, and then slow it down by whatever amount you want. In this case, 2 percent. I printed a pass of 2 percent slow SMPTE on an empty track of the new tape. I then fed that SMPTE to the Fostex DAT machine. The Fostex dragged along with the new tape, but at the new tempo of 99.96. I transferred the snare drum from the demo as a reference, and then the stereo keyboard.

I know what you are thinking now: "Sure, he locked them up and transferred the demo stuff analog." Wrong you are, analog breath. Just because the new machine is VSO'd up to a sample rate of 48.96 kHz and the Fostex DAT is being pulled down to a sample rate of 47.04 kHz doesn't mean that I can't transfer the keyboard digitally.

A company in Florida called Z-Systems Audio Engineering has just come out with a new sample-rate converter that can not only convert optical, consumer, or AES digital signals between any two normal sample rates, it can reference the output sample rate to an external reference. I fed an AES output from the 24-track into the ref-

erence input of the Z-Sys converter. I fed the digital output from the Fostex DAT to the input, and routed the output to the AES input of the 24-track. Without even so much as a hiccup, I was sample-rate converting from 47.04 kHz to 48.96 kHz. (The Z-Sys machine is very nice, and I will be including it in my sample-rate converter review.)

Oh, I almost forgot. The keyboard was now out of tune, remember? I fed the digital output from the sample rate converter into a t.c. electronics M-5000 DSP processor. I put it into stereo pitch-shift mode, and cranked up the pitch by 34 cents. The digital output was then fed to the AES input of the 24-track. Now that wasn't so bad, was it?

I didn't go to all this trouble because it was a part that couldn't be easily replace. I did it because a year from now I didn't want Walter to say: "You know, it's too bad you couldn't get that keyboard off of the demo. It would have made this track feel so much better."

And you know, it didn't take that long to do, either. It took about as much time as it would take you to read this column through two pieces of wax paper while riding as a passenger in a dimly lit VW microbus driving through Baja at night. **EQ**

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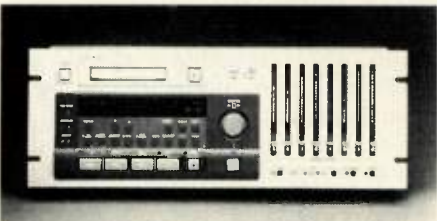
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# Caveat Corner



Let the buyer beware  
when it comes to entering  
the digital domain

BY ROGER NICHOLS

**T**his month I want to touch on a couple of things. One is the underhanded advertisements that prey on the digital-hungry masses. The other is another synchronization hell that I stumbled into like a deer stumbling into the headlights of an oncoming Greyhound (bus, not dog).

What if you saw an ad that said, "Guaranteed 32-bit CDs. Why stop at 20 bits or 24 bits when you can have 32 bits." Down at the bottom, in the fine print, it says: "Bit rate is per sample when the source is mono. Both halves of the 32 bits per sample may contain the same information." What the hell does that mean?

Not all of the ads for digital services or equipment can be dismissed as easily. I noticed a flyer from a budget producer of CDs. It stated that they have a new process that will turn your

DATs from crappy, overloaded 16-bit recordings into beautiful sounding, 24 bit state-of-the-art CDs with hotter levels and less noise.

"Fix all of your digital problems by letting us run your digital material through our exclusive process." Some of the claims that they make are downright ridiculous. If you read some claims in a flyer or magazine ad that seem "too good to be true," they probably are. Particularly when it comes to digital recording, it is pretty easy to pull the wool over somebody's bits. If you have any doubts, ask around. Send a letter to *EQ* or one of the other magazines and ask some questions, or call one of the big recording studios near you and ask someone there, or call a mastering facility and ask them. When companies start making bizarre claims that cause problems down the road, everybody suffers.

## ANOTHER CHINESE PUZZLE

Walter Becker decided to start over with one of the tunes we were working on. The original version was recorded on the 3M 32-track digital machine as a demo almost two years ago. Since that time, we have recorded the song with two different groups of musicians and it never felt quite as good as the original. Over the Christmas holidays, Walter decided to use the original sequence with updated samples. We dragged out the old Vision sequence and noticed that the tempo was set at 98 beats per minute (bpm). We printed the drums and guide bass at that tempo and booked a studio in Los Angeles to do guitar overdubs with Dean Parks.

Walter has two Sony 3324S 24-track digital machines in his studio. Signet Studios in L.A. has two Sony 3348 48-track digital machines. Since both the 24-track and 48-track units are DASH machines, the tapes are interchangeable. If you play a 48-track tape on a 24-track machine, the second 24 tracks are invisible. They are located in the spaces between the first 24 tracks. If you play a 24-track tape on the 48-track machine, however, the tracks show up on the first 24 tracks — leaving you an extra 24 tracks for overdubs.

After we finished the guitar overdubs on the three tunes we took to L.A., we would roll in the second 48-track machine and make a copy of the "now 48-track" tape. The two machines connect using a pair of 24-channel digital cables. If we swapped the cables at one end during the transfer we would have two identical 48-track tapes except that tracks 25–48 of the first tape would show up on tracks 1–24 of the copy. When we locked them up on the two 24-track machines, bingo, the 48 tracks were spread across the two machines. It works, I promise.

On the plane bound for L.A. Walter asked me if I could get the keyboard part off of the original demo and fly it into the new track. I said, "No problem." Looking back, what I should have done was ask the stewardess if they could just let me get out of the plane at 37,000 feet over the Pacific, and I'd walk the rest of the way to L.A.

When we started work in the L.A. studio with Dean, we needed to refer to a DAT of the original demo to refresh memories as to the guitar part. After about two bars we realized that the demo was faster than 98 bpm. It turned out to be at 102 bpm. Walter decided that the demo was a little too fast and the new track a little too slow. We cranked up the VSO by 2.0 percent to get a new tempo of 100 (99.96 for those of you with calculators), recorded all the guitar overdubs at this setting.

On the way back to Hawaii, Walter asked me if there was any possibility of salvaging the old keyboard part. I said, "Of course not." He said, "Good, call me at my house when you get it done."

## THE FUN PART

The keyboard part had tremolo on it that burbled in tempo with the 102 bpm demo. I would have to slow it down to 100 to get the tempos to match. But if I did that, it would be out of tune (flat) to the track. The easiest way to go was to slow down the keyboard and then pitch-shift it back up after the parts were synchronized. I couldn't speed the new tape up the rest of the way to 102 bpm because it

*continued on page 113*



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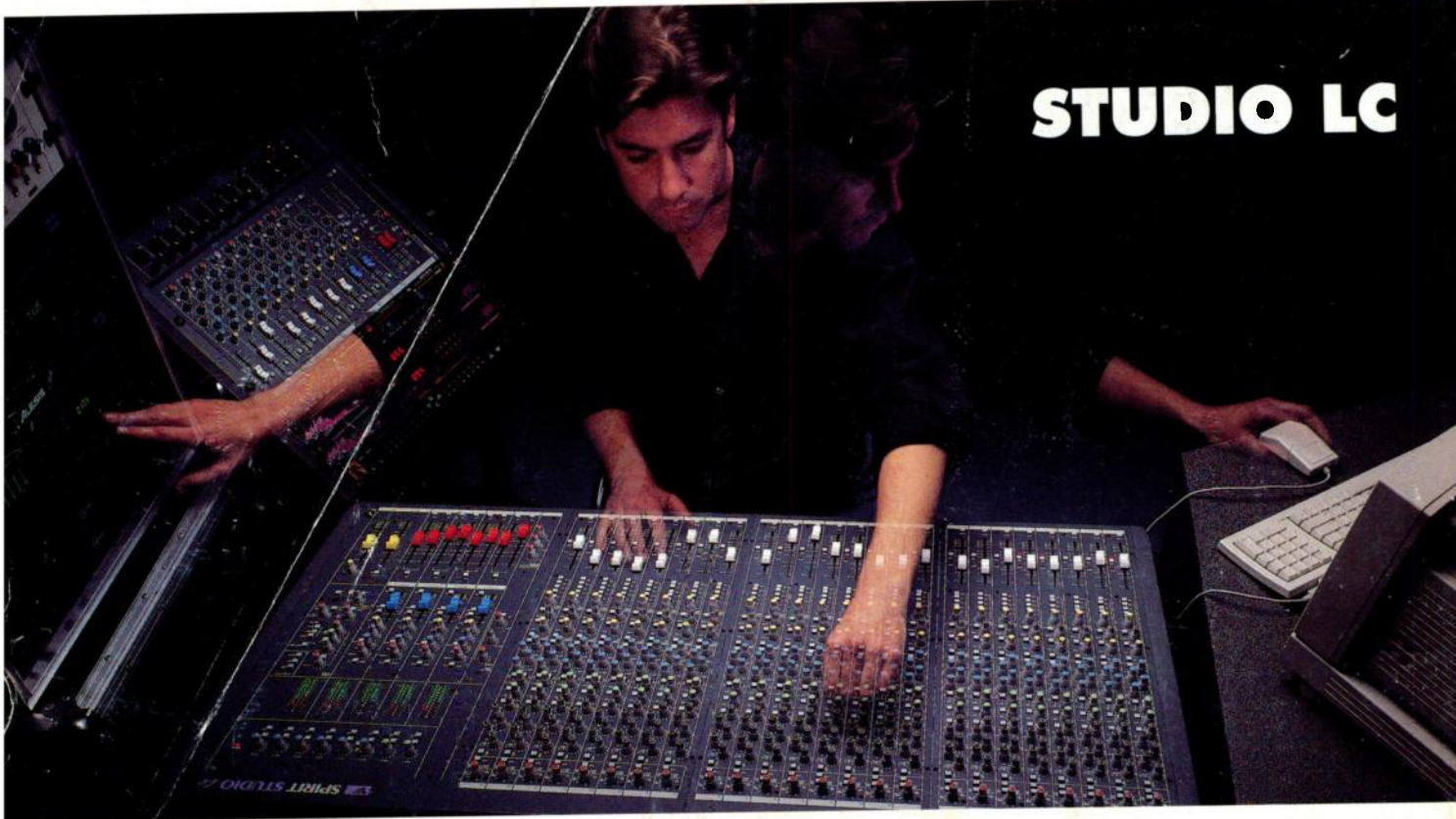
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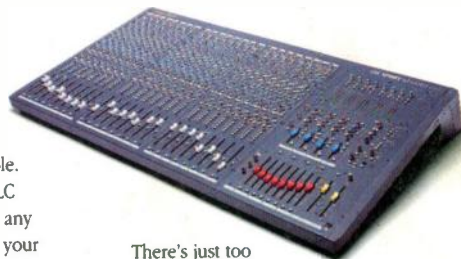
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