

MIX

Focus on Project Studios:

- Buying a Digital Audio Workstation
- Vocal Miking Tips
- Business Advice for Small Studios

PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

Directory:
Recording Schools and Programs

**An Introduction
to Audio Post-Production**

**Mr. Bonzai Talks
to Thomas Dolby**



*****5-DIGIT 91329
 MX SPIEGELBERG VP 1772 DIR
 JBL PROFESSIONAL 2200
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 NORTHRIDGE



The Alesis 3630...

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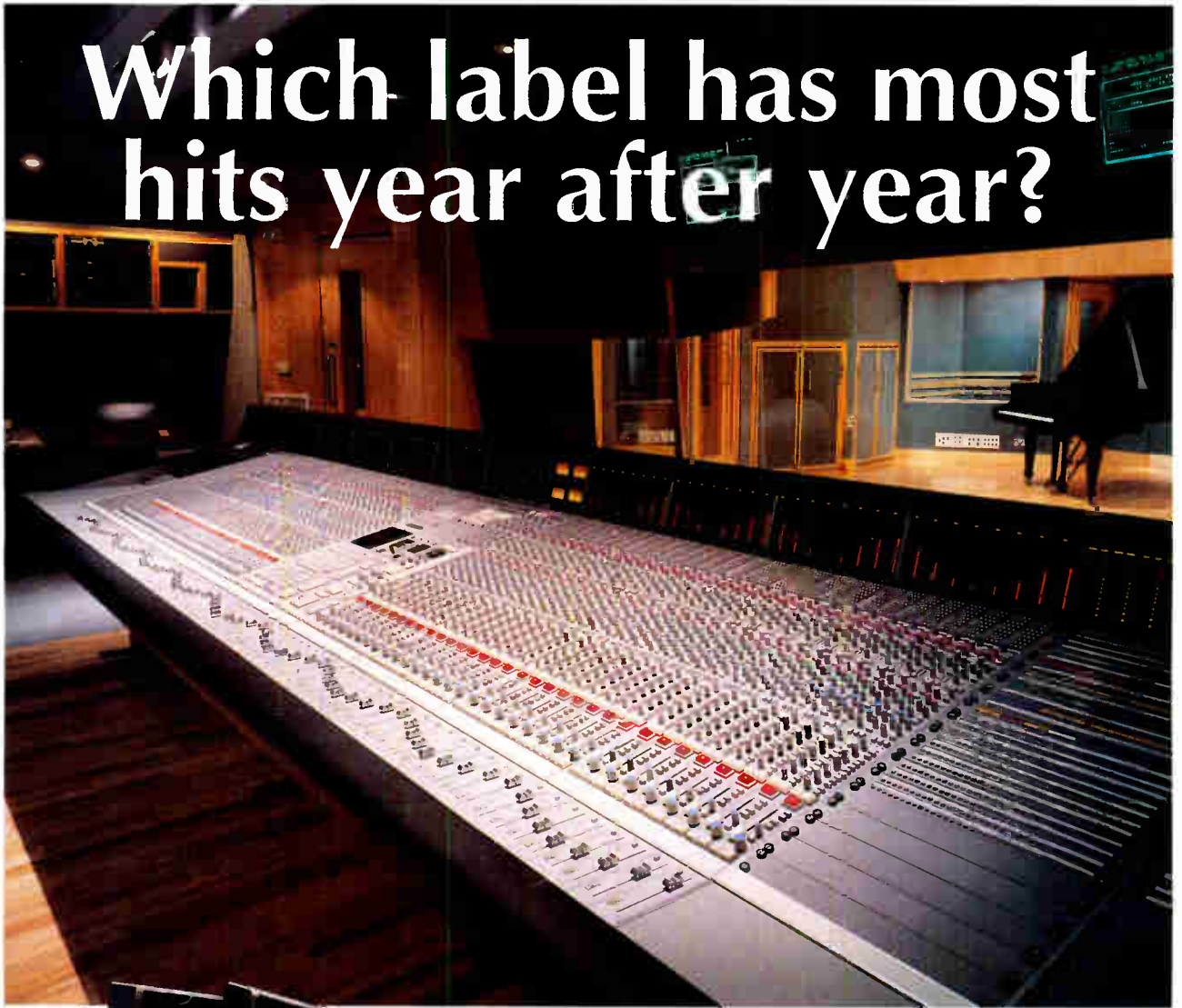
*Slightly higher in Canada

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Which label has most hits year after year?



Photographed at Abbey Road Studios, London



Billboard 1992 STUDIO ACTION

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CATEGORY	Produced on SSL consoles*	Produced on ALL other consoles
DANCE	94%	6%
R&B	79%	21%
MODERN ROCK	79%	21%
ADULT CONTEMPORARY	77%	23%
HOT 100	71%	29%
RAP	59%	41%
ALBUM ROCK	59%	41%
COUNTRY	56%	44%

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nine six one.two.three

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MIX

PROFESSIONAL RECORDING • SOUND AND MUSIC PRODUCTION

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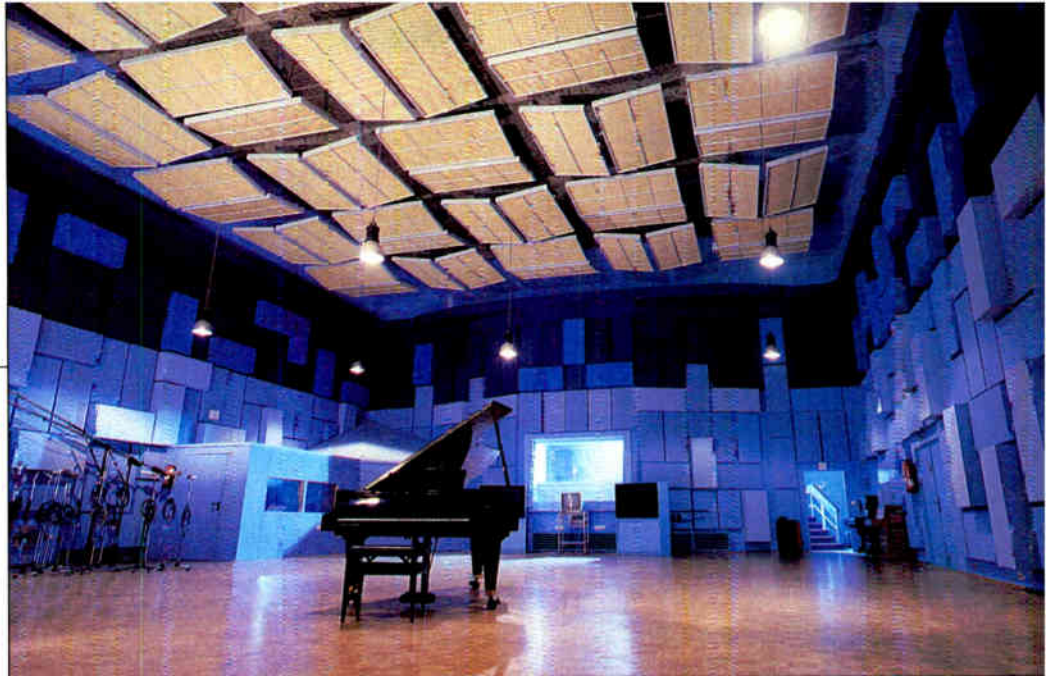
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Cover: Studio 4 in the new Hit Factory all-digital, nine-room facility in New York City. Designed by Neil Grant of Harris Grant Associates, the studio features the world's largest console, a custom-designed, 96-input SSL G Series with 112 Ultimotion faders and both G and E Series EQ.
Photo: Robert Lewis.
Inset photo: Leslie Burke.



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8 Tracks

RECORD INPUT 1 2 3 4 5 6 7 8



*The Choice of Professionals
Winner of Two 1992 TEC Awards
Recording Product of The Year
Recording Devices/Storage Technology*

Demos to masters. Creativity to tape. Dreams to reality. Magic phrases for those who want to make music that sounds as good as it feels.

The inspiration for these thoughts is the **Alesis ADAT Professional Digital Audio Recorder**, a technological revolution that tears down the walls to your creativity while delivering world class master recordings. Too good to be true?

Here's the concept. ADAT fuses a supersonic Alesis-designed very large scale integrated chip set with the proven reliability of an industrial grade S-VHS* tape transport and a logical, sensible user interface. The result is a digital tape recording system that exceeds the most demanding requirements of professional audio and that can be used by literally anybody. Hard to believe?

Here's some specs. Bandwidth 20Hz to 20kHz ± 0.5 dB. Total Harmonic Distortion plus Noise 0.009%. Wow and flutter unmeasurable. ADAT uses the professional standard 48kHz sample rate and delivers better than 92dB dynamic range.

Here's some features. ADAT uses the familiar tape recorder controls that you already know how to use so

recording is fast, intuitive, effortless. Connections are provided for balanced +4dBu levels on a single 56 pin ELCO** connector and unbalanced -10dBV signals on 1/4" jacks. And ADAT uses S-VHS tape because it's a proven, robust recording medium with wide 1/2" tape to solidly support ADAT's 8 recording tracks while delivering 40 minutes of recording time.

The best part. ADAT's Proprietary Synchronization Interface (Patent Pending) locks multiple ADATs, independent of the audio tracks, to single sample accuracy $\pm 5\%$ of 1/48,000th of a second! In other sciences this is referred to as 'air tight'. So multiple ADATs function in perfect mechanical and electronic unison: up to 16 ADATs without an external controller. That's 128 tracks!

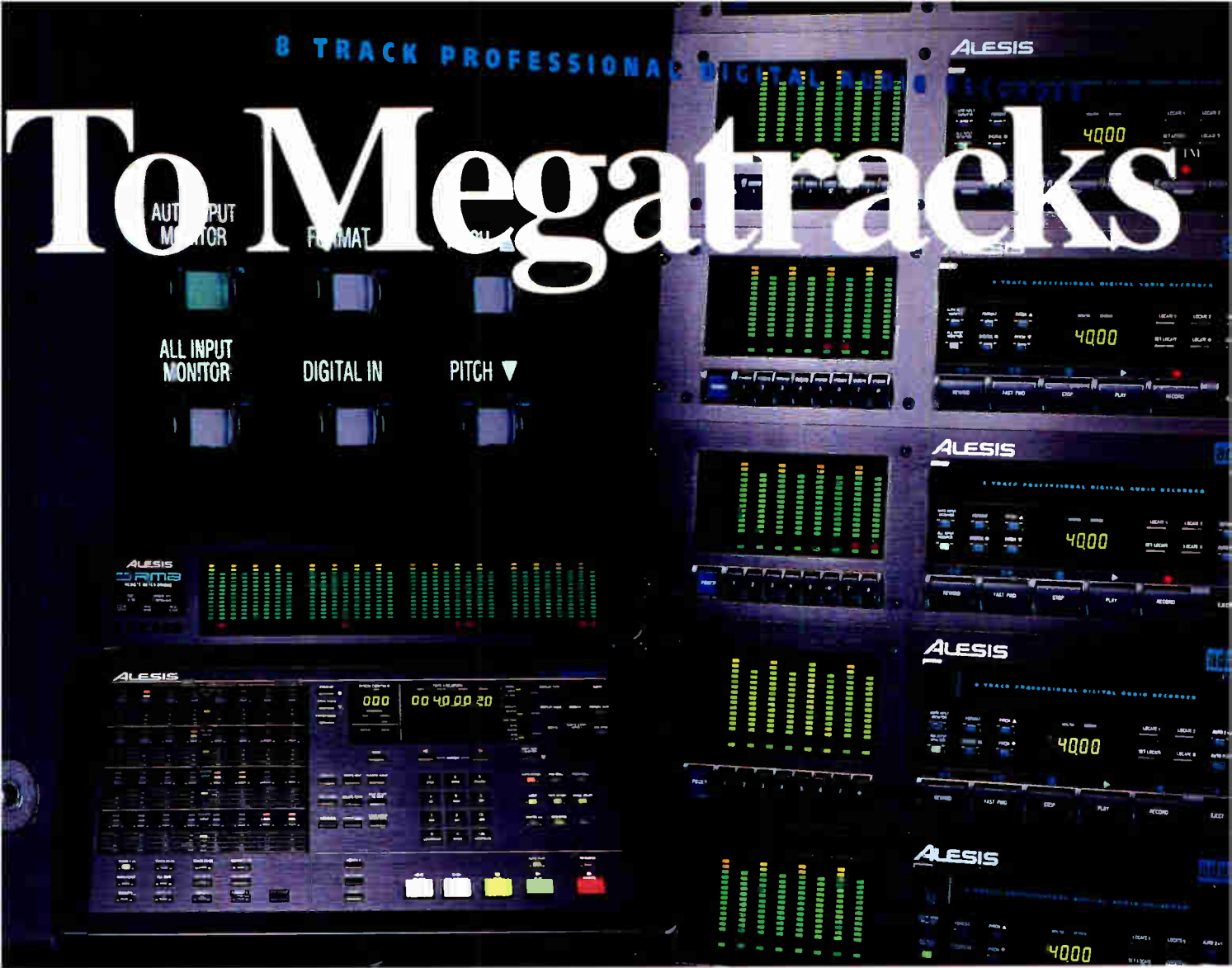
More best part. ADAT's Proprietary MultiChannel Optical Digital Interface (Patent Pending) simultaneously sends all 8 tracks of recorded information out the Digital I/O for perfect safety tapes and perfect track bounces.

Even more best part. The optional BRC Master Remote Control opens a whole other door to the ADAT miracle. With it you can control up to 16 ADATs (128 simultaneous tracks) with full transport functions, track offsets, machine offsets,

8 Tracks to Megatracks, Megatrack and ADAT Worldwide Network are trademarks of Alesis Corporation
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Also available: The AI-1 ADAT to AES, EBU and S. PDIF Digital Interface with sample rate converter.
RMB 32 Channel Remote Meter Bridge.
Call 1-800-5-ALESIS for information about the ADAT Worldwide Network.



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digital assembly editing via the Digital I/O, SMPTE and MIDI Time Code, Video Sync and more.

What does all this mean? Here's just a few benefits.

It's commonly known that many hours are wasted during expensive album projects while the artist, producer and engineer work in vain to reproduce the rhythmic feel and tonal nuance of demos. Demos that couldn't be used because they suffered from noise, limited bandwidth and overall sonic feebleness. Those days are over forever. ADAT's Sync and Digital I/O perpetually link your demos to your masters making them all part of the same creative process. Every track you record on ADAT is a master track that can be flown into any other ADAT recording, at any time. The best part is that ADAT can be there at any time to catch you at your best, flawlessly stored in the digital domain...forever.

Need more tracks? ADAT studios can be expanded at any time. The cost of a single ADAT is remarkably inexpensive and new ADATs can be added as budgets permit. Add the BRC at any time for more control and advanced editing. Producers please note: with ADAT, Megatrack™ recording is a reality.

Your favorite sax player lives in Idaho? No problem. Send 'Supersax' a formatted tape with a guide track of your song. You'll get back 7 tracks of burning solos you can fly back into your production. All in perfect sync, all in the digital domain. All dripping with soul. Want more tracks? Just send more tapes.

ADAT is not only a new recording medium, it is the new recording standard. Imagine a network of ADAT users from bands, composers and project studios to professional studios, video editing suites and broadcast production studios. All recording master quality tracks with full compatibility and no barriers between their creative disciplines. In fact, we're launching the ADAT Worldwide Network™ multitrack recording group to facilitate communication between ADAT studios.

In time we'll all start taking these little miracles for granted. Before that inevitable event, unpack your first ADAT and track a minute of single notes and chords on your favorite instrument. Play loud, play soft. Play it back and listen really close. It's always a good feeling to have your mind completely blown.

See your Alesis ADAT Dealer today and start Megatracking on ADAT.

FROM THE EDITOR

This month we look at education in recording and also focus our attention on the developing relationship between project and commercial studios, both in the U.S. and Europe. In preparation for the International AES convention in Berlin, we visit the recording world in Germany.

In assembling this issue we asked ourselves, once again, what differentiates a project studio from a commercial recording studio? Over the past several years, the distinctions between these two very different types of operations have become blurred. Some "private" studios tend to rent out time, while some "public" studios seem to become single-project-oriented for long periods. This haziness has left a state of confusion that makes it difficult for many to sense the true nature of today's industry.

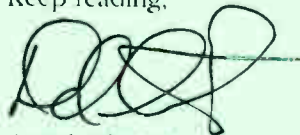
Project and commercial studios each have a different goal. For the project room, the purpose is *achievement*. Whether it's for making a soundtrack, a jingle, a demo or a master mix, the project studio is designed around its owner's creative needs to achieve an end product. How efficiently it is able to achieve that purpose is the measure of its value.

In contrast, the commercial studio has no particular attachment to the client's end product. What makes the commercial studio's mission complete is its *service*—its ability to serve the needs of the client—whether that involves supplying engineering expertise, musical assistance, cassette duplication, fruit salads or warm showers after seven hours of intense mixing.

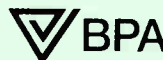
Over the past three years, a weak economy has coincided with the technical development of affordable recording tools that, when used skillfully, allow small studios to sound like big operations. Tension and distrust have resulted, as competition for decreasing budgets has put project rooms and commercial operations in opposition to each other.

This rivalry has been sad to watch, and as time passes it will perhaps be remembered as a somewhat ludicrous and confused period. There is no reason for anything but support and cooperation between honorably operating project and commercial studios. Rather than being seen as taking business away from each other, a more valid case can be made for the reverse. Referring work, sharing resources and farming assignments back and forth makes more sense than fighting. Working in cooperation, the whole can become larger than the sum of its parts. And the energies of the owners and operators can be channeled into more creative and profitable directions.

Keep reading,



David Schwartz
Editor-in-Chief



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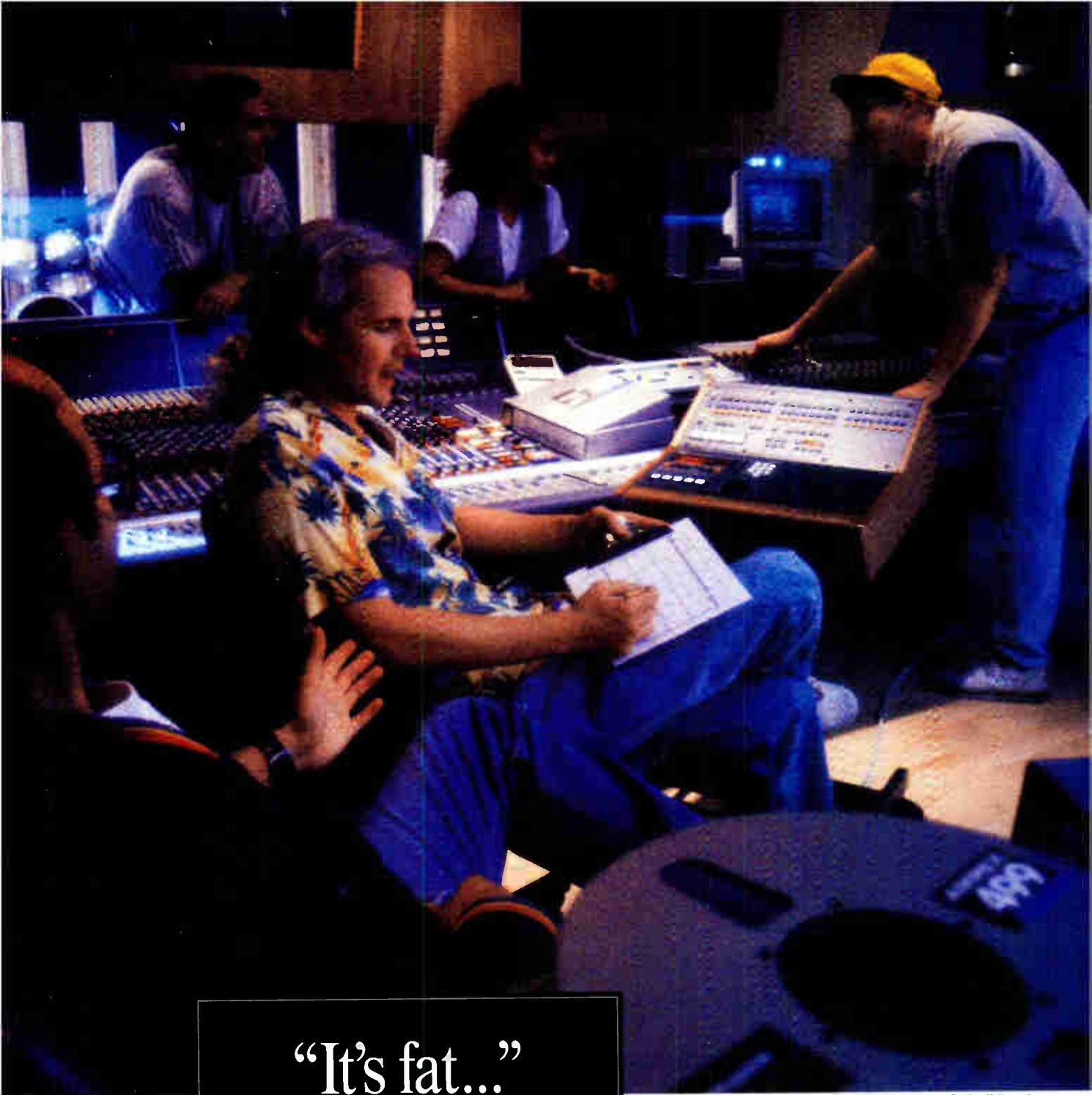
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Founded in 1977 by
David Schwartz and Penny Riker Jacob



Andra Studios, Hollywood

“It’s fat...”

We’re printing at 9 over 250 and it still doesn’t sog up.
I know, the harder you hit it, the better it gets.
Listen to that high hat.
It’s stiff.
Yeah, and it’s not squashed.
No, it’s not compressing at all.
That’s pretty amazing.

What’s amazing is the noise floor.
What noise floor? I don’t hear any noise.
Right!
Hey, this sound’s got everything I need.
It’s got depth all right. You can hear everything—way back in there.
Clarity, punch, depth—that’s it.

You heard it. Ampex 499.
I’d say it was audibly superior.
I’d say it just *sounds* better.



Ampex 499.
It just *sounds* better.

AMPEX



HOW TO PROJECT A MORE BRILLIANT CORPORATE IMAGE.

If you're looking for a brighter, sharper picture to bring your presentation to life, take a good look at the Sony RVP-6000Q MultiScan® projector.

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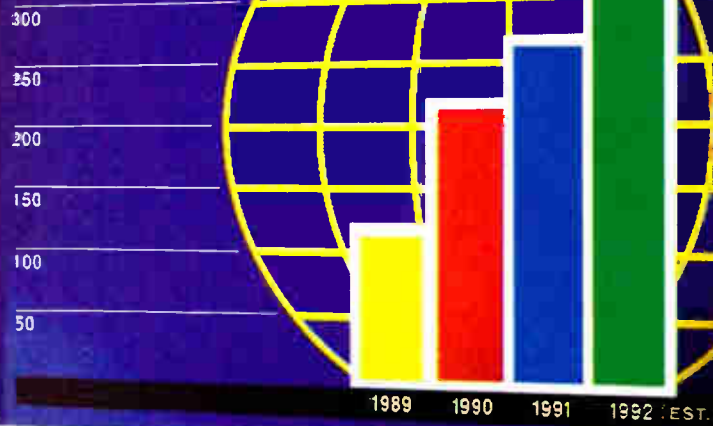
If you still can't see how Sony's RVP-6000Q can give you a great image, call 1-800-635-SONY, ext. 600. We'll show you—with a demonstration and more information.

*Actual, unretouched screen image generated on the Macintosh Quadra with Adobe Photoshop.

World Radio History

SONY

MultiMedia Presentation Systems Installed



SONY

CURRENT

MARK IV PRO AUDIO GROUP FORMED, EV DISTRIBUTES DYNACORD

As announced at NAMM, Mark IV Audio Inc. (Amherst, N.Y.) established a new venture called the Mark IV Pro Audio Group for U.S. distribution of products made by its subsidiaries Klark-Teknik, DDA and Midas. Mark IV is also the parent company of Electro-Voice, which now handles distribution of Dynacord music electronics products under the joint brand name EV/Dynacord.

"Dynacord has attempted to establish a position in the U.S. market for several years," says EV president Paul McGuire, "but without a ready distribution channel, the products haven't met with the success their quality merits. EV has the channels in place to bring Dynacord products to the pro audio market and to the working musician."

K-T, DDA and Midas were formerly distributed in the U.S. by Pinnacle Audio. Pinnacle's operations in this regard are officially expected to cease by March 1, 1993. Former EV Concert Sound marketing manager Ivan Schwartz was named general manager of the Mark IV Pro Audio Group, which will also distribute EV MT and DeltaMax concert speaker systems out of its new headquarters in Buchanan, Mich.

GML, FOCUSRITE END REP AGREEMENT

GML Inc. of Van Nuys, Calif., no longer represents the Focusrite Console line in North America, it was announced in December. "Our representing Focusrite has always been on a temporary basis," says GML's Cary Fischer. "When we signed the OEM pact for Automation Systems, Focusrite

was without representation, and we offered to help. Enough time has passed, and with current GML projects now consuming a great deal of our time, we can no longer afford Focusrite this opportunity." GML will continue to cooperate with Focusrite on the technology level. The OEM deal between the two companies still exists and will remain unchanged.

ing and observation direction. The data collected by this research will give acousticians information they can use to construct virtual environments, which allow them to audition the sound of a room before it is built.

The effort is being sponsored by companies in the acoustics community including Altec-Lansing, Ariel, Audio Precision, Hof-

TEC Awards Call for Entries 1993 Product Nominations Sought

The 1993 Technical Excellence and Creativity Awards nominating panel is currently accepting product nominations for the 1993 TEC Awards. To qualify for review, your product must have been released and in commercial use during the eligibility year of March 1, 1992, to February 28, 1993. The following are the Awards categories: Console Technology, Sound Reinforcement Console Technology, Musical Instrument Technology, Microphone Technology, Studio Monitor Technology, Sound Reinforcement Loudspeaker Technology, Recording Devices/Storage Technology, Signal Processing Technology, Tape/Disc Manufacturing Technology, Computer Software/Peripherals, and Ancillary Equipment.

Those wishing to nominate products should include the following information: product name and qualifying category, date first commercially available (proof of shipment may be required; beta test sites do not qualify), contact name and telephone number. Send information to TEC Awards, 6400 Hollis St. #12, Emeryville, CA 94608; Attention: Karen Dunn. All entries must be postmarked by Saturday, February 28. Late submissions will not be accepted. For more information call (510) 939-6149.

DISC RESEARCH INITIATIVE UNDERWAY

A new basic research initiative to establish a database of directional scattering coefficients for all commonly used architectural materials is underway. Called the DISC project, the research will yield data that will help acousticians to predict accurately a room's complex frequency response or impulse response.

Directional scattering coefficients define how sound interacts with the various absorbing, reflecting, diffusing/diffracting surfaces in a room, as a function of the incident direction and frequency, sample size, mount-

ing and observation direction. fend & Sons, IED, Lake DSP Pty. Ltd., RPG Diffusor Systems, SIA, Techron and Wireworks. For more information, contact research director Peter D'Antonio at (301) 249-0044.

SURVEY ON NONLINEAR EDITING SYSTEMS PUBLISHED

Independent consultants Sypha of London, UK, published the results of an extensive survey on the use of nonlinear systems for film and video editing in the USA and UK. The survey was sponsored by Avid Technology, Imp-

—CONTINUED ON PAGE 16

THEY DO
MORE.
THEY DO IT
BETTER.
THEY DO IT
FOR LESS.

A simple message that is not often easy to back up. But Behringer's European reputation for excellence in signal processing gives these words new meaning. Consider for a moment our latest interactive processors, conceived and engineered to deliver transparent performance for studio and live applications.

COMPOSER The Composer functions as a studio grade, automatic and manual controlled stereo Compressor, Expander, Gate and Peak Limiter. The automatic mode offers program-dependent attack/release times for inaudible processing.

Unique Interactive Knee Control circuitry combines the musicality of soft knee compression with comprehensive hard knee control. Special Interactive Gain Control Peak Limiter circuitry enables simultaneous Clipper and Program limiter functions while serving as a zero attack, distortion-free absolute gain threshold.

INTELLIGATE The Intelligate is an Expander/Gate/Ducker with Ultra Transient Response circuitry for instantaneous attack. Proprietary high performance Class A VCAs provide exceptional audio quality. Precise key filters permit frequency-sensitive keying.

Like the Composer, the Intelligate includes Interactive Ratio Control Expander circuitry to eliminate "chatter" on or around threshold. Both units feature servo-balanced Neutrik 1/4" and XLR inputs and outputs, precise metering and a 5 year warranty.

Behringer. When you listen, the message becomes clear.

THE PERFECT EAR.



Exclusively distributed in the U.S. by Samson Technologies Corp., P.O. Box 9068, Hicksville, NY 11802-9068 Tel (516) 932-3810 Fax (516) 932-3815

World Radio History

SAMSON 1992



THE LARGEST CONSOLE IN THE WORLD...

The CSII Digitally Controlled Analog Audio Mixing System provides facilities beyond the constraints of conventional designs but with the familiarity of a traditional in-line work surface. Add to this features such as the SnapShot Recall™ system, for instantly recalling all console settings, & Total Automation™ control and you have unequalled mixing power at your fingertips.

The new System Expansion Options™ and the CSII's modularity allow for up to 104 Totally Automated mono/stereo signal paths, each with Digitally Controlled Eq and Dynamics, 24/48 multitrack buses and up to 96 aux sends and mix buses. You can start with a 32 fader system and expand as your requirements change to end up with the largest audio mixing system in existence.



IS ONLY 7'4" WIDE.

The sleek, Digitally Controlled work surface, even for a 104 fader system, is only 7'4" wide. This allows you to sit at the center of the image while you adjust controls, so you can hear the changes.

The CSII represents a new generation of audio mixing system where you get much more, in a smaller space, for a lot less.

System configurations are available for Music, Film & TV Post, Broadcast, and Sound Reinforcement applications.

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**Euphonix**

INDUSTRY NOTES

Graham-Patten Systems of Grass Valley, CA, appointed Val Marchus as its new CEO. Marchus joins the company from The Grass Valley Group, where he served most recently as VP of manufacturing and customer service...Keith A. Bandolik was recently promoted to president of Switchcraft Inc. (Chicago)...Audio-Technica (Stow, OH) promoted Jacquelynn Hebrock to vice president of product development...Richard Snee was appointed director of product marketing at Digital F/X Audio Group (Mountain View, CA)...Harman Electronics promoted Kenneth Krenzela to senior manufacturing engineer...Apogee Electronics of Santa Monica, CA, hired Gary Hynds as principal engineer. Hynds' focus with Apogee will be on various aspects of digital design...Greg McLagan joined QSC Audio as Western regional sales manager...BSS Audio (Herts, UK) welcomed new sales manager Ralph Dunlop...Seattle-based Symetrix Inc. hired Steve Kawasaki as a product specialist...Producer David Foster was appointed to the board of directors of Spatializer Audio Labs Inc. (Los Angeles)...Todd Rockwell was named loudspeaker project engineer for Electro-Voice Inc. (Buchanan, MI)...Ampex Corp. (Redwood City, CA) restructured its sales management team: Richard A. Antonio now serves as VP/sales development, and Dick Miller fills Antonio's former position as the new VP/sales and customer service...Shalco Inc. is Ramsa's new representative in Michigan...Meyer Sound Labs (Berkeley, CA) is now offering SIM® System II training seminars to interested individuals and companies. Call (510) 486-1166 for more information...Laser-Pacific Media Corp. announced a new management structure at its Hollywood-based Pacific Video

division: Laser-Pacific exec. VP Leon Silverman became chief of operations at Pacific Video, and promotions included Jane Swearingen to VP/general manager and Holli Gailen to VP/operations...Sigma Media Center (Philadelphia) hired Steve Paino as sales manager...Freed International moved recently. The company's new address is 1121 E. Ocean Blvd., Stuart, FL 34996. Phone (407) 288-7200, fax (407) 288-7999...Innovative Quality Software moved to 27498 Enterprise Circle W., Ste. 3, Temecula, CA 92590. Phone (909) 695-1744, fax (909) 695-1747...L.A. Sound Co. moved to 7270 Bellaire Ave., North Hollywood, CA 91605. Phone and fax numbers remain the same...The former West Coast offices of New England Digital are now being occupied by Pacific Coast Soundworks, which can be contacted for more information at (213) 655-4771...International Jensen Inc. (Lincolnshire, IL) and Ferrofluidics Corp. recently formed a research partnership to develop noise reduction technologies for automobiles, aircraft and other products...The fourth edition of the "Video Industry Statistical Report" is now available from Corbell Publishing. The report covers video industry statistics for 1992/1993 and incorporates five-year statistical forecasts and projections. The price is \$295, plus \$15 for postage and handling. Call (310) 821-6675...AMS Industries plc (Bethel, CT) was awarded an Emmy for "Outstanding Achievement in the Science of Television Engineering Technology." New Siemens president John Gluck accepted the award...The sixth annual International Teleproduction Society Forum and Exhibition will happen July 8-12, 1993, at the Beverly Hilton Hotel in L.A. Call the ITS at (212) 629-3266 for more information.■

—FROM PAGE 12, CURRENT

Electronics OLE/Lightworks, Weynand Training International and Audio Visual and Broadcast Engineering, but the companies had no control over the method or results. Copies of the full report are available from Sypha or Weynand for \$350. To order a copy or get additional information, contact Sypha at (44) 81 761-8279 or Weynand at (818) 992-4481.

EXECUTIVE SEARCH FIRM REPORTS RISE IN TECHNICAL SEARCHES

Fink and Blakely Associates, a San Francisco-based executive search firm that services the audio and video industries, reports a 40% rise in technical search assignments over last year. Assignments for manufacturers have included engineering management, DSP engineers, GUI designers and embedded software people.

LICENSING FIRM BODY & SOUL OPENS

A licensing company called Body & Soul Inc. recently began operations out of its New York offices. The firm brings together under one roof the estates of legendary deceased musicians along with other stars who possess the heart, strength and commitment that the firm defines as the "Body & Soul" aura.

Estates represented include those of Billie Holiday, Benny Goodman, Dexter Gordon, Thelonius Monk, T-Bone Walker, Patsy Cline, Leadbelly, Howlin' Wolf, Robert Johnson, Big Joe Turner, Otis Redding and Bette Davis. To help perpetuate the legacy of these legends, Body & Soul will distribute a fixed percentage of yearly profits to support worthy music causes. Call (212) 967-4567 for more information.

CONFERENCE NEWS

Intermedia, the International Conference & Exposition on Multimedia and CD-ROM, is slated for March 30-April 1 at the San Jose Convention Center in San Jose, Calif. For more information call (203) 352-8254. ■



WHAT IS SPATIALIZER?

Spatializer is a real-time three-dimensional processor that allows placement, movement and scaling of individual tracks in space from two loudspeakers. The recording engineer has dimensional control of near/far, front/rear, and scale/size of the stereo image by intuitive joystick adjustments. **Blow Your Mind, Not Your Budget!**

Contact Audio Intervisual Design
213 845 1155

Spatializer is a registered trademark of Desper Products Inc.

Patents pending
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USE READER SERVICE CARD FOR MORE INFO



NEW! 8-BUS CONSOLES

**IF W
MACKI
HE'
OUR NEV**

Built-in, test-instrument-grade, ultra-low radiation **POWER SUPPLY** with toroidal transformer and external heatsink.

Two **TAPE OUTPUT SUBMASTER** jacks per bus (total of 16). Balanced or unbalanced.

+4dBu balanced TAPE RETURNS, switchable to -10dBV unbalanced.

Balanced **MIC**, balanced **LINE IN**, **PHASE** invert, **DIRECT OUT** & **CH. INSERT** on every channel.

All channels have Mackie's renowned discrete, wide-bandwidth **MIC PREAMP** circuit for ultra-high headroom & low noise. All mic inputs have **+48V phantom power** with switches in groups of eight channels.

Optional **METER BRIDGE**.

6 AUX SENDS with Solo and Solo LED.

MIX B/MONITOR section can be assigned to L/R Mix or used as direct out.

6 STEREO AUX RETURNS with 20dB gain. 1 & 2 are pannable; all have Solo and can be used in stereo or mono.

4-BAND EQ with "Expensive British Console Sound." Includes **TRUE PARAMETRIC HI-MID**, swept **LO MID**, shelving **HI & LO** plus 18dB/oct **hi pass** (lo cut) filter at 75Hz.

TWO SEPARATE HEADPHONE SECTIONS can be used totally independently of each other with source selection between Control Room & any combination of Aux 1, Aux 2, Mix-B or External source. Solo allows control room to hear what musicians are hearing in their headphones.

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

TALKBACK with assign to all Tape outs, Aux 1, Aux 2 or Phones.

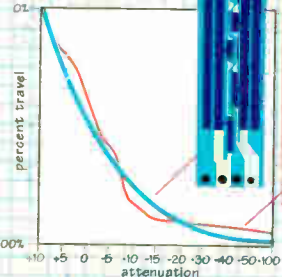
MIX-B/MONITOR section on each channel effectively doubles number of inputs during mixdown.

-40 to +10 bar graph LED DISPLAYS for each submix channel & Solo/Main (with **+20dB CLIP LED**s).

ALTHOUGH there are 8 buses, 16 tape outs are created by a second set of output jacks.

Built-in talkback MIC.

Conventional faders are overscreened with a second layer of resistive material in an attempt to create a 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 console faders (blue line on graph).



THANKS TO ADVANCES in component technology and quality, our ability to buy parts in large quantities — and a lot of fanatical Mackie engineering — you can “have it all” without hocking the proverbial farm.

BECAUSE WE SPECIALIZE IN MIXERS (and because we're probably a little crazy), we began the design of these consoles by first asking ourselves, “What is it that makes the finest British consoles perform the way they do? — And how much of that can we duplicate (using modern materials and methods) on far less expensive boards?”

YE OLDE ENGLISH SOUNDE. For example, older Neve consoles have much wider-band mid EQ than lower priced consoles — it really has an effect on overall sound quality. So we incorporated the same capabilities on our new 8-Bus Series (along with our trademark low noise and high headroom). This also enabled us to add the flexibility of a variable “Q” control for true parametric Hi Mid EQ. It was an expensive proposition, but well worth it in terms of sound quality. We also wanted the same kind of true logarithmic taper found only on mega-

Meter bridge additional. Equally phenomenally-low prices for the 16-B (**\$3195**) & the 32-B (**\$4795**). Neve is a trademark of Neve, a Siemens Company.

HADN'T THREATENED TO HIT GREG INSIDE THE HEAD WITH A RANCID SALMON, PROBABLY STILL BE ADDING FEATURES TO 2, 24 & 16-CHANNEL 8-BUS CONSOLES.

24 channels for \$3995! Finally, the "quality gulf" between \$20,000+ imported consoles and more affordable boards has been eliminated. No longer must budget considerations force you into compromise over questionable sound quality, poor EQ, hard-to-use layouts or unreliable mechanical designs. Only Mackie Designs could spawn values like these!



Full SUB-MASTER and MASTER inserts.

Rugged STEEL CHASSIS.

SEALED rotary potentiometers resist dust and liquids.

Two independently assignable HEADPHONE monitoring sections plus separate TALKBACK and SPEAKER sections.

DIMENSIONS (HxWxD):
16" 8, 6" x 26.7" x 28"
24" 8, 6" x 35.5" x 28"
32" 8, 6" x 44.3" x 28"

Retrofit: FULL-FADER/MUTING AUTOMATION, via MIDI or external fader packs, available in the future.

they have the sonic quality that's contributed to our smaller mixers' success. For example, our acclaimed discrete mic preamps that deliver -129dBm 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. Bottom line: For hard disk recording, ADAT or DAT, you've found your board.

OPTIMIZED FOR PA AND RECORDING. Along with elaborate monitor capabilities, balanced XLR main outputs

and 18dB/oct. hi pass filters, you get non-flexing steel construction, fiberglass thru-hole plated, horizontal circuit boards that minimize impact damage, gold-plated interconnects, sealed rotary pots and a built-in power supply. You won't find more rugged, compact PA boards anywhere.

READ ALL ABOUT IT. This ad can't possibly tell the whole story of the design innovations we've packed into these consoles. Call us right now toll-free for a comprehensive 8-page brochure, the name of your nearest Mackie 8-Bus Dealer... maybe even info on the type of salmon that we threatened Greg with.

In-line FLIP reverses tape and mic/line inputs. Incredibly nifty feature but hard to explain in an ad, so read our brochure to appreciate it.

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 ch. strip to ch. Mix B/Monitor send so you can build an effects mix to assign to phones during tracking.

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

Multi-purpose 18dB/oct. LO CUT filter @75Hz. Cleans up "mix mud," creates a "neo-peaking" bass control, cuts PA rumble, etc.

MIX-B (Monitor) section with pan, level & source. Functions as independent monitor section, extra stereo Aux send during mixdown or doubles number of inputs during mixdown.

Mix-B SPLIT EQ assigns HI & LO EQ to Mix-B. Constant power, buffered PAN pot for rock-solid panning.

Selectable SOLO with CHANNEL METERING: not only allows soloing in full stereo perspective but also displays soloed channel operating level on master L/R meters so input trims can be adjusted for optimum levels.

At last! HIGHLY ACCURATE 100mm FADERS on an affordable console! (See explanation at left.)

L/R MIX assigns channel directly to master L/R mix for ultra-quiet mixdown.

expensive faders - instead of the commonly-used, less accurate "D" taper. So we commissioned a totally new custom 100-mm fader with the same taper as the most expensive British faders, yet at a fraction of the cost.

DOUBLE THE INPUTS & MORE. Each channel has in-line monitoring that effectively doubles the number of inputs (48 on our 24" 8, for example). We also added features we personally find useful such as dual

independent headphone systems and separate MIX-B monitor section with Split EQ. The consoles' internal -10dBV to +4dBu level conversion allows use with semi-pro tape decks without the inherent noise penalty found in semi-pro mixers that operate at -10dBV internal levels.

BEST OF THE CR-1604. Though we designed these consoles from the ground up,

MACKIE.

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USE READER SERVICE CARD FOR MORE INFO

by Ken C. Pohlmann

MINIDISC TECHNOLOGY

PART 4: OPTICAL PICKUP AND MO RECORDING TECHNIQUES

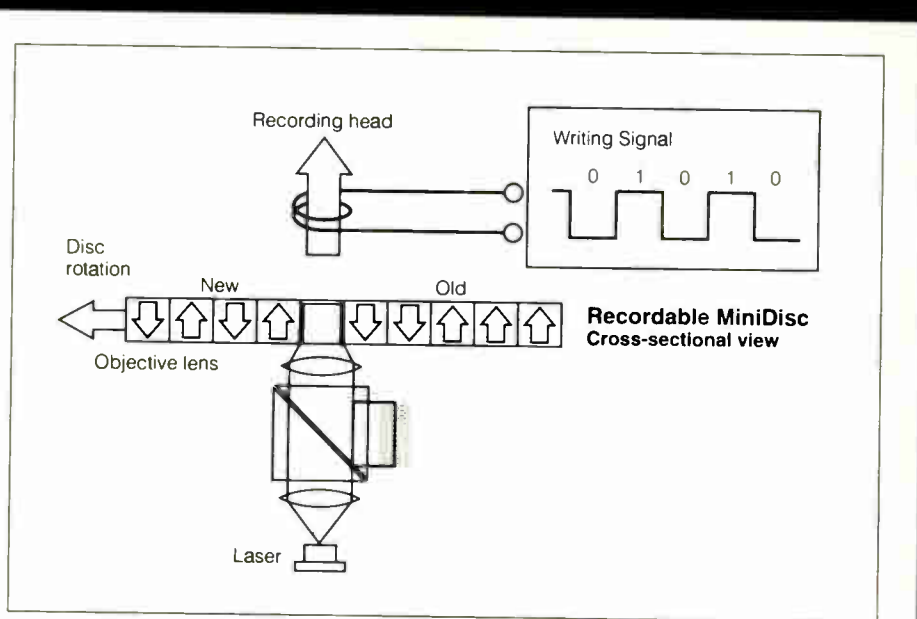


Figure 1

The MiniDisc format is designed to play back two types of discs: pre-recorded discs with a pit structure and recordable discs with a magneto-optical layer. Because these two disc types are quite different, they cannot be read by the same method, so Sony developed a dual pickup that responds to both types of discs, using different means. An MD pickup is thus more sophisticated than a CD pickup, because a greater number of elements are in the optical path; as with CD, an MD pickup must also supply focus and tracking signals. Fortunately, these tasks are met by a pickup design that is compact and easy to mass-produce.

Pre-recorded MDs are read with an optical system that is similar to that found in CD players; pits are detected by monitoring varying light

intensity that is reflected from the pit surface. A laser beam of approximately 0.5 mW of power is focused on the pit surface. Smooth land between pits largely reflects the light, resulting in high intensity at the receiving photocell. A pit largely diffracts the light, resulting in low intensity at the photocell. As with the CD format, the varying voltage output from the photocell is processed to form a binary signal.

Recordable MiniDiscs can be read with the same pickup, but the pickup must be modified because the data encoded on the magneto-optical surface does not present variations in the intensity of reflected light. The pickup must convert the stored magnetic signal into variations in light intensity. Specifically, a polarized beam splitter is used to detect differences in the polariza-

ZIP LOCK.



If you've ever dealt with a 2" 24-track whose synchronization was a design afterthought, you'll appreciate the speed and pinpoint accuracy of the TASCAM ATR-80. Its microprocessor-controlled transport is specifically designed for the repeatable locating you need for no-excuses, extra-fast lockup in synchronized operation. And the punch in/out precision you demand.

Built with legendary TASCAM reliability, the ATR-80 will continue to get the job done—session after session, project after project. It is also plug compatible with Dolby SR racks. Available in a higher capacity 32-track format. And, of course, accommodates 14" reels.

But, you be the judge.

To arrange for a personal demonstration of the rapid-response ATR-80, just call (213) 726-0303. Or write TASCAM, 7733 Telegraph Road, Montebello, CA 90640.

TASCAM II.

tion plane direction of light reflected from the MO surface.

Any optical disc contains vertical deviations in the focus direction and radial deviations in the tracking direction. In the case of MiniDisc, a servo actuator system is used to provide auto-focusing via an astigmatic detection method and auto-tracking via a three-spot detection method. A two-axis actuator physically moves the pickup's objective lens to maintain proper lens-to-disc distance and to track the data spiral. The auto-focus system must maintain a depth of focus that deviates less than ± 1 micrometer, and the auto-tracking system must track the 1.6-micrometer track pitch to within 0.2 micrometers.

Auto-focusing is accomplished (as in many CD pickups) by using a cylindrical lens to introduce astigmatism into the central beam. The beam is directed to a four-quadrant photocell; a round beam falling equally on all four photocells indicates an in-focus condition, an elliptical beam that falls more fully on two photocells indicates an out-of-focus condition. Whether the disc is too near or too far is determined by the physical rotation angle of the elliptical beam. In either case, a correction signal is generated and directed to the servo system; it mechanically moves the objective lens up or down, much like a voice coil moves within a loudspeaker.

MO RECORDING AND FIELD MODULATION

Data can be written to recordable MiniDiscs on the magneto-optical layer. Essentially, this is performed by bathing the data surface with the appropriately oriented magnetic field while heating the data surface with a high-powered laser. When the heating laser is withdrawn, the data is "frozen" in the MO layer. Moreover, this recording surface can be reheated, and new data can be written over the old. Importantly, these requirements are achieved by components with low power consumption, small size and low cost.

In magneto-optical recording, a small area of the magnetic recording layer is heated with a focused laser beam; coercivity is inversely propor-

tional to applied temperature. When the material's Curie temperature (180°C) is reached, the coercivity of the material is so diminished that only a very weak field is needed to magnetically orient the material. When a weak magnetic field is applied to the material, the small heated spot magnetically responds by orienting perpendicularly with either the north or south polarity of the applied data signal. As the area moves away from the beam, the area cools below the Curie temperature, the applied magnetic field is withdrawn and the data is retained.

In conventional MO systems, data must be erased prior to writing new data; effectively, the data surface must be heated and all areas uniformly aligned (erasing old data) before new data is written. In practice, this can be performed with two lasers, one for erasing and one for writing. Alternatively, one laser can be used, and the discs make two revolutions, one for erasing and one for writing. The former method adds cost, while the latter slows writing time. Both methods are relatively complex to implement.

In the MiniDisc system, a Magnetic Field Modulation Overwrite (MMO) method is employed that directly writes new data over old by modulating the magnetic field at high speed, creating specific orientations to represent the applied data signal. This direct overwrite method is illustrated in Fig. 1. The system uses a magnetic head on one side of the disc and a 4.5mW laser beam on the other side. The size of the recorded magnetic areas is determined by the magnetic flux reversal, not by switching the laser on and off. As the laser beam is continually radiating during both reading and writing (at different power output levels), optical head design is simplified.

The MMO method provides the same linear velocity as CD (1.2 to 1.4 meters/second), provides the same density as CD (0.6 microns/bit), and is compatible with the 13.3-millisecond wobble addressing used in recordable MDs. The CD recorders used to cut the glass masters used for CD replication employ a 460-nanometer wavelength argon gas laser, yielding a spot diameter of 0.4 microns. However, consumer MD recorders em-

ploy a semiconductor laser of 780-nanometer wavelength, yielding a spot diameter of 0.9 microns. Experiments showed that this type of optic system resulted in block error rates of 200 per second, marginal relative to the CIRC minimum of 220. Clearly, conventional modulation would not permit CD density in the MD format. With MMO, however, block error rates dropped below 20 per second at a linear velocity of 1.2 meters/second. In other words, it was demonstrated that MMO could successfully perform direct overwriting, at CD density and velocity, using consumer optics.

While MMO is suitable for MiniDisc, it is not easily applied to computer storage because of the higher data transfer rates demanded in these systems. To achieve sufficient rates, a computer MO system might employ linear velocity speeds of 10 meters/second or more, and the magnetic field might be switched at rates of 10 MHz or more. This places constraints on the magnetic head design, diminishing the applicability of MMO, although the process is ideal for MD's relatively slow linear velocity (1.2 to 1.4 meters/second) and magnetic reversal frequency (as low as 720 kHz). MMO only permits single-sided recording to the disc; however, MD's use of data reduction gets around this drawback and achieves the 74-minute playing time suitable for most consumer applications.

Despite the fact that the magnetic head touches the disc surface during recording (as in other magnetic media) the MO record/erase cycle is long-lived. Estimates based on accelerated age tests have projected the write/read cycle to be 1 million times; for example, a three-minute song could be written and read continuously for 12 years. The read cycle is projected to be 10 million times; the same song could be continuously replayed for 60 years. In aging tests, the block error rate started and ended at about 15 block errors per second—well under the CIRC threshold. ■

Ken Pohlmann is author of Principles of Digital Audio, The Compact Disc Handbook, and co-author of Advanced Digital Audio, all available from the Mix Bookshelf. Read them and reap.

Power Users Prefer Sonic

BOB LUDWIG

Gateway Mastering Studios, Portland, ME

"In the high pressure world of mastering where time is money, my clients expect me to offer the capabilities of the Sonic system, PreMaster CD, and NoNOISE. I considered all the systems, and I wouldn't dream of opening my new studio without the Sonic."

"Whether I'm editing new material or using NoNOISE to rescue a track, our clients are always impressed. The Sonic system incorporates the best features of the other systems along with the most complex and versatile editing tools."

Magno Sound, New York

PAUL MICHAEL

DAVID SMITH

Sony Classical, Hamburg + New York

"At present, the Sonic system is the only means available to edit 20 bit recordings without being forced to redither those recordings to 16 bit precision while editing. The Sonic systems play a major role in Sony Classical's 20 bit front line and archival reissue programs."

"The SonicStation is completely expandable and offers an extremely wide range of functions. Our system has been booked to 100 percent capacity since the day it arrived; we use it for soundtrack and radio production, album mastering, and audio for video."

Soundstage I Recording, Kalamazoo, MI

JIM CUMMINGS



SONIC SOLUTIONS 1891 East Francisco Blvd. San Rafael, CA 94901 Tel. 415 485-4800

World Radio History

USE READER SERVICE CARD FOR MORE INFO

by Stephen St. Croix

2-D OR NOT 2-D? THAT IS THE QUESTION

Y

ou baby boomers (and a lot of you who came before) might remember the incredible state of national awareness that surrounded you as you grew up. Back then, way before the English language evolved into the English that we actually speak today, many words were spelled quite differently. Take for example, oh, I don't know...let's pick a few words at random. I pick arithmetic, writing and, um...reading. Yeah, these will do nicely.

Back when I was in school, *all three of these words actually started with the letter "R"*! In fact, they were rammed down our throats (by the

American government and its Board of Education) as, of all things, reading, writing and arithmetic: the three R's! So! Ketchup *is* a vegetable after all.

With this in mind, I guess that we can forgive ourselves for producing the "music" of the '70s.

Well, we don't hear about the three R's anymore. Now I want to tell you about the three D's. I know that you are reading ahead and are pretty sure that I'm going to come up with something on the order of Digital Direct to Disk. Wrong.

I want to talk about *the* three D's: 3-D, the three dimensions that we use



ILLUSTRATION: JAMES J. JAMES © 1993

YES!



The AudioEngine
Digital Audio
Workstation

TO MUSIC PRODUCTION

- Lock to your favorite MIDI sequencer regardless of computer platform? Yes No
- Track live audio onto 16 channels, upgradable to 24, and punch in/out on the fly? Yes No
- Auto-mix hundreds of tracks, plus unique fades and volumes for each listed music event? Yes No
- EQ and digital signal process in real-time internally, & patch external via digital or analog? Yes No
- Scrub smoothly and precisely, back and forth, with a mouse, trackball, or scrub wheel? Yes No
- Pitch shift and time compress/expand an entire song, musical phrase, or just a single note? Yes No
- Create seamless vocal or solo composites from an unlimited number of takes? Yes No
- Copy and paste song verses, choruses, or just phrases or riffs to build a finished piece? Yes No
- Easily align downbeats in cross-faded or over-dubbed music tracks? Yes No
- Quickly reorder CD mastering song lists complete with cross-fades and segue effects? Yes No
- Customize the interface to match your working style? Yes No
- Show clients a great looking work environment that does their job every time? Yes No
- Create on the most flexible, most complete system in the world for less than going analog? Yes No

YES!

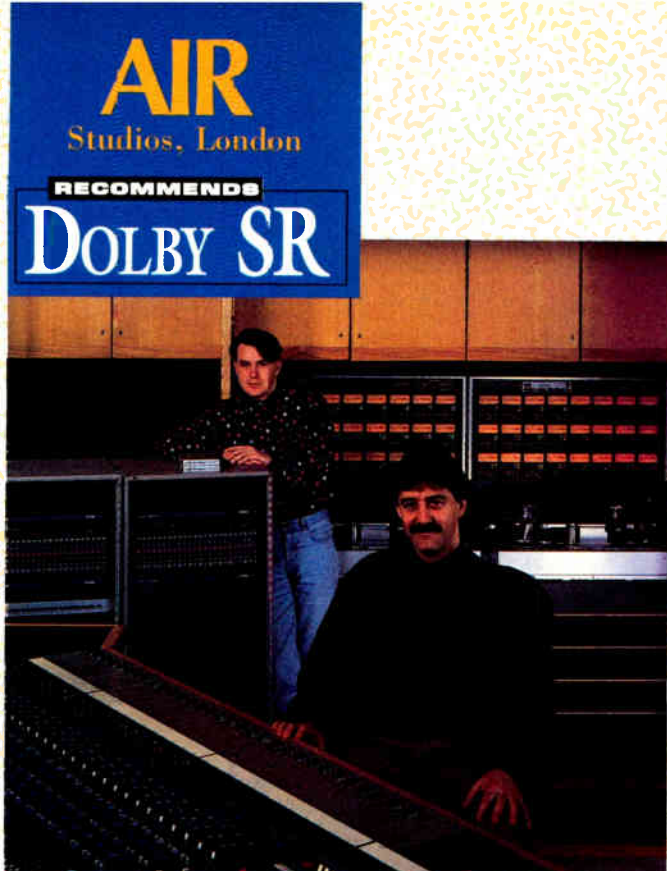
YOU CAN! Just say YES to SPECTRAL, the system of choice for tracking and editing music, and you'll be able to say YES to almost any audio job. The most flexible, most cost effective system combined is upgradable to 24 tracks, 24 channels of I/O, and can also be configured for mastering, radio production, film and video post production, signal processing, sound design and more.

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Nik Milner

“Our clients insist on Dolby SR.”

“We provide our clients with the very best as a matter of course. That’s why we offer Dolby SR on our analogue tracks.

“I was startled by the absence of tape modulation noise. From the looks on their faces, so were my engineers!

“Dolby SR allows analogue recording to compete with digital without a cost penalty.”

Malcolm Atkin, Studio Manager

“With Dolby SR, you hear what you should hear: good warm low end, no muddiness in the top end, and no noises. Analogue with Dolby SR is definitely my preferred mastering format.”

Lance Phillips, Chief Engineer

*Built by the legendary George Martin,
most of the famous names in music
have worked at AIR Studios, London*



Contact Dolby or your Dolby professional audio dealer for more information.

to describe local daily space—height, width and depth.

Have you ever heard a choir in a large church? The way the human voice blends in harmony, combined with the incredible way that complex vaulted stone chambers reverberate, produces an experience that goes right through your skin to your very bones.

There is an amazing organic warmth that spreads out from in front of you, moves around the sides and over your head, and finally comes back from behind to envelop you in a warmth not unlike a heated pool on a cool fall night.

That space, that field, that *feeling* is what I am talking about. I miss it in most of the recorded music on the streets today. I’m not saying we need to use more reverb—if anything, I’m asking for *less* reverb and more skill. I am certainly not asking for more stupid sucker “3-D” bullshit signal processing. (You know who I’m talking about.) Nor am I requesting more of that trendy out-of-phase snare reverb.

What I *am* talking about is a more open, more carefully constructed three-dimensional stereo image.

We have all talked about “imaging” and “fields” and other concepts of three-dimensional audio for decades now. We have become much more careful about L/R phase integrity; we have learned that electronic accuracy is mandatory in each channel of a multitrack recording chain if there is to be even the least hope of such simple things as accurate L/R *placement* of the various musical components.

We have become so adept at listening for image problems arising from differences in frequency response, transient response, distortion artifacts and phase problems between the final left and right channels in our analog world that we tend to forget that all this is only *part* of the story.

And with the advent of digital recording, we were forced to train ourselves to sense new problems that attack stereo image stability, such as phase or clock jitter, L/R interleave delay (offset), severe low-level nonlinearities in both A/D and D/A conversion, and much more.

It is a temptation to feel that you

Hear Tomorrow

today



M5000 Digital Audio Mainframe

Reverb and much, much more! Leading edge technology (at a cost half what you might expect), engineered to deliver legendary TC Electronic quality, the M5000 is a software-based digital signal processor capable of interfacing with your world the way you want it to: AES/EBU, SPDIF, optical I/O; analog I/O; real time MIDI; SMPTE; serial remote; standard RAM card slot; optional 3.5" floppy drive, SCSI interface, and LAN port; slots for up to four totally independent true stereo DSP cards—all in a 2U 19" rack unit.

Algorithms include reverb as only TC Electronic could do it, pitch/harmony effects, and unmatched chorus/flange/delay effects. Other algorithms are already under development by TC Electronic and third party programmers. Since the M5000 is software based, updating or adding new algorithms is as simple as loading in a RAM card or floppy disk.

Thanks to its open architecture, software-based design, and over-the-top specification, the M5000 will never be obsolete. A dream machine today, the M5000 has many futures—this is just the beginning!

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have made the effort toward image integrity once you have tackled all of these problems in your studio, but have you really?

After all those months spent comparing converters to find the one that collapsed your image the least, that shortened your reverb and removed the ambience the least, not to mention going through your console and replacing those aged and shifted capacitors...

On the day you sit back in that \$900 chair behind the console and say to yourself, "Well, I have cleaned up my audio chain as much as can be done given today's state of technology—no one else has any better imaging," all you actually did was clean your tools.

Now. What do we *do* with our nice, shiny, clean tools? Not much, usually. I mean, *come on*. If we *forget 3-D*, totally ignore the front-rear axis, and laugh at the up-down axis, that leaves the left-right axis. How do we control imaging on that one axis? Basically, we don't.

If we record an event such as an orchestra or even a single musical instrument in a real-world acoustic environment, and we mike it in stereo, and we really know what we are doing, *and* if the entire record-playback chain has exceptionally high integrity, we might end up with a convincing stereo image. But not if the listener's left midrange driver has slightly looser (or slightly longer) voice-coil windings than the right. Oh well.

While this type of stereo recording is certainly going on somewhere, it does not make up the bulk of today's popular work. Usually it's multitracked, and "placement" of each of these multitracked components is arbitrary. Even when stereo sub-recordings are included in the mix, their images are often offset or their spreads collapsed or modified in some way.

Let's get on to a real example of how silly we are when it comes to stereo image placement. We spend our days attempting to place mono single-track components into the stereo field with two stupid controls that have absolutely *nothing* to do with reality: volume and panning. Ha! What is this?

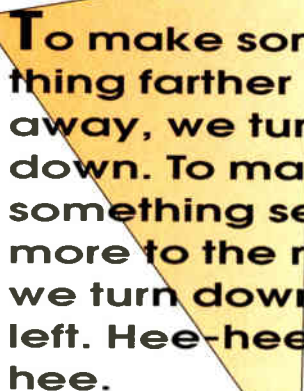
To make something farther away,

we turn it down. To make something seem more to the right, we turn down the left. Hee-hee-hee. Mixers in other parts of the galaxy must find us irresistibly cute. Sort of like when a kitten who doesn't have a clue how to hunt jumps on a toy mouse.

Maybe it's time we had a look at how things really work.

On Earth, when a sound-generating source is farther away, the inverse square law assures that its amplitude level will be less than if it were in your face, but that's only part of it. We live and listen in a sea of air. This air does very complex, serious things to sound, and the more air the sound has to travel through to get to you, the more pronounced the effects.

Air absorbs different frequencies at different rates. This effect can be as severe as 10 dB of loss per hundred feet, depending on variables such as temperature and humidity. As you might guess, high frequencies are



To make something farther away, we turn it down. To make something seem more to the right, we turn down the left. Hee-hee-hee.

usually most affected, though not on a simple curve as you might expect.

Perhaps more interestingly, air transmits different frequencies at different rates! This means that transients become disassembled into their components more and more as the emanating source becomes more distant. This frequency-selective time shift effect can be as much as 5% to 10%.

If you really want to build convincing distance (front-rear spread) into your mixes, experiment with dialing some of these factors in. You can figure out ways to abuse your existing equipment enough to try these ideas out, I'm sure.

Now panning. This is truly the most used (and the most stupid) knob that we have. It just doesn't work like that, and you know it! We have two different ears (in two different places) for a reason. We need

the amplitude delta data, of course, but we also use binaural time delta to locate sound sources. You know this. But as the angle of the source becomes more extreme in a real-world reflective environment, another effect comes into play. The closer ear hears more of a direct signal, while the other ear, in the "shadow" of your head, as it were, hears a softer, less direct, more ambience-influenced version. It makes sense, doesn't it?

So again, if you really want to show left-right placement in a way that more closely follows the model of reality, you should dial in these additional components.

I have, and the results can be amazing.

I trust you understand that I am not even touching on the complex frequency-response notches and recursive resonances imposed on each channel of audio by pineal interference as it enters your ear. No, I'll leave that to the major snake oil salesmen and the one or two small exotic companies working on honest approaches.

Oh yeah. I also leave it to you to make your own decisions concerning mono-compatibility when you try this stuff out. I have developed some serious tricks to get this stuff into my mixes and not have them turn to hollow mush when crushed to mono, so it *can* be done.

Okay. We have covered one part of 2-D: *static* left-right and front-rear. But what if something moves? How horrible. Each of these factors must dynamically change, *and* you must add the proper Doppler effect. This effect must, of course, follow the laws of nature: that is, realistic nonlinear acceleration and deceleration curves, as applied to the moving emanating source referenced to the distance deltas to the (hopefully, static) listener. Yeah, right. I know. We can both stop for a breath now.

So whaddya gonna do? I'll be listening... ■

Mr. St. Croix has been spending the last three weeks modeling in virtual reality 3-D graphic environments, which has made him acutely aware of how silly our current state of affairs is with virtual audio environment recordings. He feels that all future recording should be at least ray traced and enviro-mapped before release.

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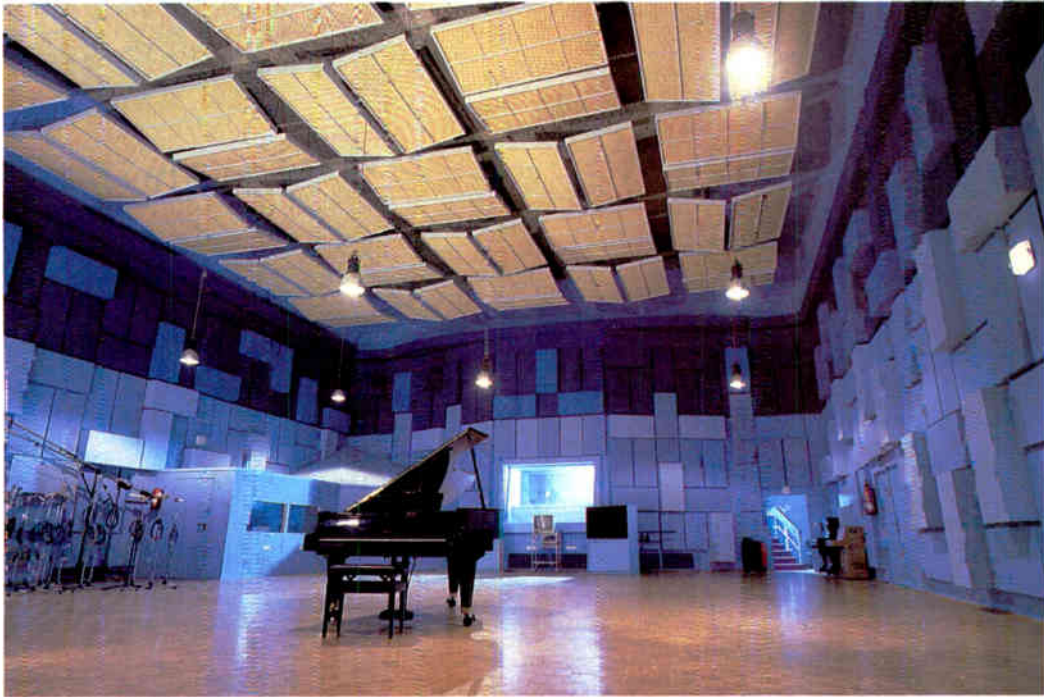
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Arco Studios in Munich

BY PAUL TINGEN
IT'S ONE OF THE GREAT CLICHÉS OF MANKIND THAT THE GERMAN people are efficient and well-organized. And indeed, nowhere else do trains run so punctually, roads appear so well-maintained, sidewalks seem so clean and houses so tidy. The German studio world reflects this attitude. Technically, German studios are world-class. Of course, as in every country, there are exceptions downward; but by and large, the equipment is extremely well-maintained, spotlessly clean and of amazingly high standard. What's more, German studios are incredibly cheap.

So far, those facts are clear. But try to unearth other kinds of information about the German music world and a confusion of tongues emerges, enough to give a journalist—or anyone else for that matter—a headache. A round of talks with a variety of German studio managers and owners offers plenty of conflicting information and opinions.

The subject of the recession is a source of disagree-

ment. “The recession isn’t half as bad here as in the UK or U.S.,” assert most, adding that they’re “doing all right, even though business has been better.” One of the reasons given for the difficult-but-not-a-crisis situation is that there isn’t such an oversupply of studios, unlike in the UK, where times are extremely difficult. Yet somebody else laments that there are too many studios in his area (Munich) and that his studio can only keep its head above water because it is sponsored by the record and publishing company that owns and uses the studio—a common construction in Germany.

Maybe Germans don’t like to hang their dirty laundry out in the open, or maybe they genuinely are in a better situation than the British, or maybe they have a different mentality in the face of adversity. Whatever the truth, the reality is that in recent years several studios have indeed gone under, or have closed part of their operation.

Among now-defunct studios are famous names: The

Hansa Tonstudios, Studio 1, in Berlin

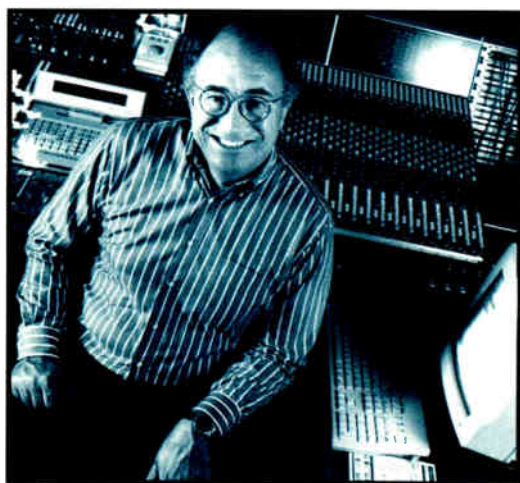


The city center of Berlin at night



PHOTO: HANS WOLFF/IMAGE BANK

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Randy Thom

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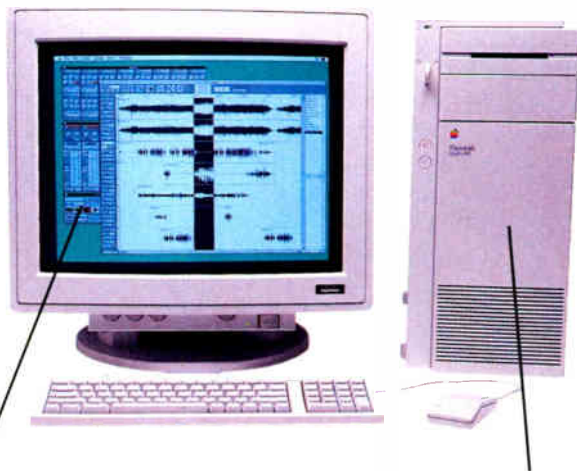
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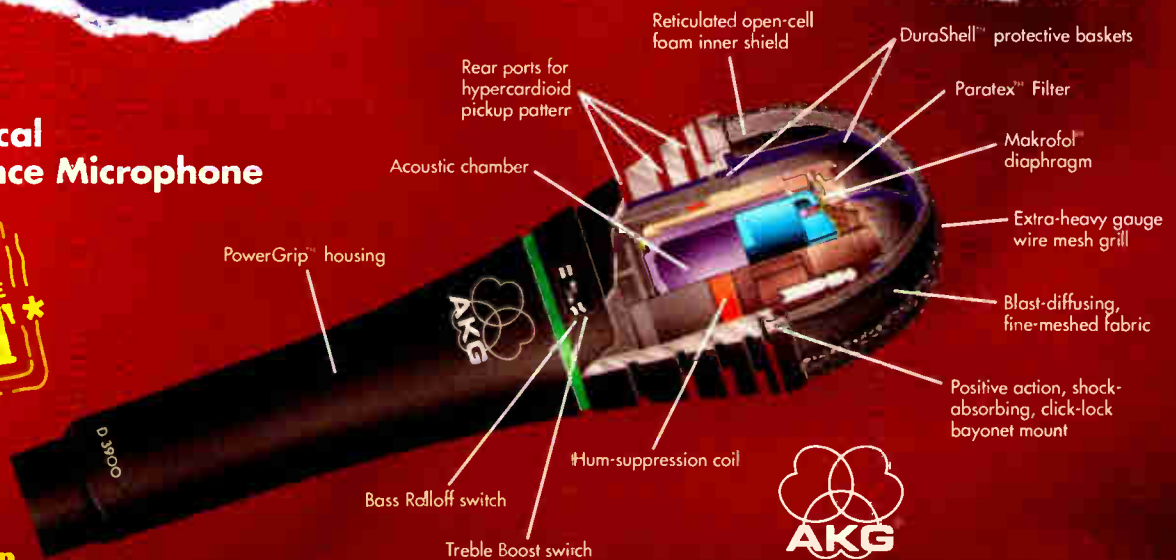
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A Brief Look at Eight German Studios

BERLIN

Hansa Tonstudios is Germany's most famous studio, since the demise of Musicland in Munich. It was here that David Bowie and Brian Eno set a trend in the late '70s, and since then artists like David Byrne, Depeche Mode and U2 have recorded here. Sadly, the legendary Studio 2 is now closed for renovation. What remains is one state-of-the-art mixing/overdubbing room and an extensive pre-production and MIDI programming room. Hansa is residential and can cater to about six people.

Equipment: Main studio—SSL

4000E 64-channel, Total Recall (with G Series computer); (2) Studer A800 24-tracks w/Dolby SR, Otari DTR-900 digital 32-track; Quested Q412B main monitors. MIDI studio—German-made, 40-channel ADT console; Studer A827 24-track w/Dolby SR; GJ Acoustic and Tannoy 295A monitors. Contact: Matthias Härtl, Hansa Tonstudios, Köthener Strasse 38, D-1000 Berlin 61, Germany. Tel: (49) (30) 261-1811; fax: (49) (30) 262-8806.

Lunapark is another well-known Berlin studio, owned by the band Alphaville, who were successful throughout Europe in the late '80s. Lunapark is an upper-midrange studio that receives much work "because of

—CONTINUED ON PAGE 37

legendary Musicland Studios in Munich, trendy with tax-exiled Britons like the Rolling Stones, Deep Purple, Uriah Heep and Led Zeppelin in the mid- and late '70s, closed its doors in 1992. And Hansa in Berlin, famous for Bowie's recording spell there in the late '70s and recently honored by U2 and Daniel Lanois with a two-month visit during the making of *Achtung Baby*, has closed its large and famous Studio 2. Studio manager Matthias

Härtl says it was closed "because the building needed renovating." But he doesn't know whether it will be reopened, "because the ground prices in Berlin have gone through the roof since the unification." Hansa has closed down two other studios, too, reducing their operation from five to two studios.

Add to this the fact that another trendy Berlin studio, Preussen Ton, has closed down one of its two stu-

The Bellamy Brothers: Ich Bin Ein Country Singer, Y'all

by Dan Daley

While there has been a lot of talk lately about taking the country music boom international, one act has quietly been doing exactly that for three-and-a-half years. The Bellamy Brothers, who were in the thick of the country-pop phenomenon in 1976 with "Let Your Love Flow," have been making country records in Germany since 1990.

Well, German country, anyway. "We've been living this dual

life, making country records for the U.S. in Nashville and making country records for Germany in Munich," says David Bellamy.

Setting the stage for this situation was "Let Your Love Flow," an international hit that garnered heavy airplay in Europe and introduced the brothers, David and Howard, to the German pop audience. The brothers have included Germany on their tour schedule for the past 16 years, and after leaving MCA Records in 1987, a mutual friend introduced them to German pop hitmaker Ralph Siegal. From Olympia Studios in Munich, Siegal has a long string of producing/engineering successes, the best-known stateside being

—CONTINUED ON PAGE 40

dios, and things cannot be all roses. It's certainly a fact that the fall of the Berlin Wall and German unification in 1989 have had a dramatic impact on the nation's consciousness and economy, affecting Berlin deeply. With property and land prices in Berlin soaring and studios now catering to the whole of former East Germany (which has only a few studios, all of minor importance), Berlin studios are in a position that is both very threatening and promising.

Geographically, it is clear that there are five principal recording regions in Germany: Berlin, Munich, Hamburg, Cologne, and, to a lesser degree, Frankfurt. This is a more confusing situation than in the UK or France, where London and Paris are focal points, or the U.S., where New York and Los Angeles clearly lead the pack. In Germany, there's no such clear-cut hierarchy; instead it's filled with a multitude of medium-sized cities all working in relative isolation. (Some studio managers who weren't from Munich weren't aware that Musicland had closed, for example.) Maybe this isolation is the reason the German studio industry doesn't have an industry trade organization, like Britain's APRS or France's ASF.

Most interviewed agreed that Berlin, Hamburg and Munich are the most important centers for film and audio-visual work. Yet Cologne is regarded as the media center because most TV companies are located there. For this reason, several record companies have moved their offices from Hamburg to Cologne over the last couple of years.

The high technical standard of German studios is stressed quite matter-of-factly by all studio owners and managers. It's confirmed by objective outsiders like Richard Manwaring, a British producer/engineer who's worked with Talking Heads and Van Morrison and who records regularly in Germany, who says, "German studios are certainly on a par with UK and U.S. studios, and I've always found the staffs extremely helpful.

"The only problem I've found working in Germany is that they have no idea about mastering," Manwaring continues. "They make everything sound the same. The thing to do is record and mix there and master it somewhere else, or be sure that you're there when they're mastering it."

Conversely, German producer Zeus B. Held (Nina Hagen, Transvision Vamp), who's lived and worked in London since he was 10 years old and who owns a top studio there called Eastcote, thinks, "that German midrange studios are probably technically better than UK ones, because the Germans are generally a bit more obsessed with having the latest technology, and there's a bit more money to go around. The recession there is nothing compared to [London]. They're still spending money and buying their BMWs and Mercedeses like nothing."

Malcolm Luker, an Englishman



Lunapark studios in Berlin

who works as chief engineer at Arco Studios in Munich, offers a third "outsider" angle. Luker, who trained in London in the early '70s and has also worked extensively in the U.S. and

Australia, asserts that in terms of experience top German studios are on a par with their U.S. and UK counterparts: "You have to be, otherwise you cannot attract the kind of client who wants things to be perfect."

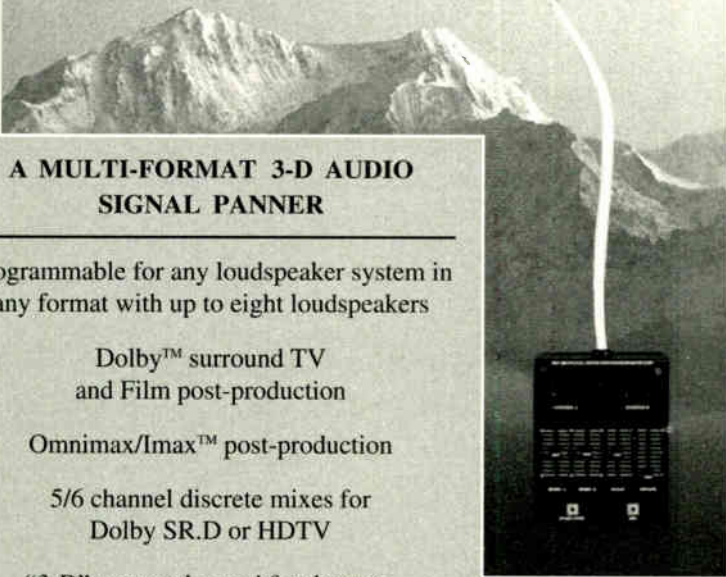
Still, the attitude toward recording in Germany is more continental and differs slightly from that in the UK and U.S. German recording is much more of a 9-to-5 job, and a studio is a place where one goes to work, distinctly separate from one's residence, rather than an all-encompassing creative environment. In part, that explains why there are few residential studios in Germany. Nevertheless, most major German studios are very service-oriented and have arrangements with local hotels for foreign and faraway guests. In-house catering and recreational facilities aren't unusual, either; there is simply a different emphasis.

Of course, whether or not one likes Germany as a country is a matter of taste, and the time when it was fashionable to record there is long gone. "There are loads more exotic places that one can go to if one is in tax exile," remarks Luker dryly, while emphasizing that Munich is "a fun place to be." Most American artists tend to land in German studios while they're on tour there, like Stevie Wonder who recorded two tracks for his *Woman In Red* album at Loft Studios in Hamburg. Still, many German cities have their own distinct charm: The beer and food are excellent, and most Germans speak English well and are very friendly and open.

There is, however, one overwhelming reason why more and more American artists and productions might find their way to this nation thousands of miles away: the low rates German studios charge. Luker reckons, "The total costs here for orchestral projects, including recording and flights, are about half of a top L.A. studio." With some stu-

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dios offering SSL/Neve with a Sony 48-track digital machine for around DM2000 (\$1,250) per day (all outboard gear included, and excluding special deals for long-term projects), his statement starts looking less extreme than it seems.

And that raises another puzzling question: How *do* they afford those wonderful Mercedes and BMW automobiles? ■

Writer/musician Paul Tinggen lives in East Sussex, England, but travels more than most of us.

—FROM PAGE 35, EIGHT GERMAN STUDIOS
our large, good-sounding live area," says manager Frank Rosmann. The studio has seen artists like Eurythmics and Roger Waters within its walls.

Equipment: DDA AMR24 36-input desk, 84 channels for mixdown, System 4 automation; Sony PCM-3324 24-track digital, Otari MTR-90II 24-track w/Dolby SR; Quedsted QMS412 monitors. Contact: Frank Rosmann, Lunapark Tonstudios, Mehringdamm 32-34, D-1000 Berlin 61, Germany.

Tel: (49) (30) 251-8035; fax (49) (30) 251-5144.

Preussen Tonstudio is a midrange studio where, apparently, a lot of the more progressive music is recorded in Berlin. Owner/manager/producer/musician Uwe Hoffmann describes the interior as "a little psychedelic, with lights, oil projections, lava lamps and wall paintings."

Equipment: Tascam M700 56-channel console with Optifile automation; Otari MTR-100 and Tascam ATR-80 24-tracks w/Dolby SR; Quedsted Q412 monitors. Contact: Uwe Hoffmann, Preussen Tonstudio, Hasenheide 9, D-1000 Berlin 61, Germany. Tel: (49) (30) 693-3062; fax: (49) (30) 692-6888.

HAMBURG

Loft Tonstudios, formerly Brunwey, is without a doubt one of Germany's most royal facilities. Co-owner Andreas Drewling manages this complex that consists of three studios, two of which are post-production rooms for AV and film. The main studio has a large live room and has "all the outboard gear possible." Loft Studios was established

12 years ago and has counted Stevie Wonder, Erasure and Depeche Mode among its international customers.

Equipment: Main studio—SSL G Series, 60-channel; Sony PCM-3348, Studer A800. The two AV post-production rooms both have SSL desks and analog 24-tracks. Contact: Andreas Drewling, Loft Tonstudios, Stresemannstrasse 375, D-2000 Hamburg 50, Germany. Tel: (49) (40) 89-68-66; fax: (49) (40) 89-50-20.

COLOGNE

Can Studios is one of the most unusual studios in Germany, if not the world. This may not be a surprise, as it bears the name of the well-known 1970s German avant-garde rock group and is still co-owned by former Can member Holger Czuckay. The studio is housed in a former cinema, without any separation walls. Originally a situation forced upon them by lack of money, it is now the studio's most attractive feature and a concept that has been copied by Peter Gabriel in Real World Studios. On top, Can Studios owns a custom 56-channel desk, made by Michael

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Zehl, which, says studio manager/engineer and co-owner René Tinner, "has never broken down since it was installed in 1982." Can Studios is residential.

Equipment: Michael Zehl 56-channel custom console with fader and mute automation; (2) Otari MTR-90 MkII 24-tracks w/Dolby SR; Audio MI and JBL 4435 monitors. Contact: René Zimmer, Can Studios, Köllner Strasse 101A, D-5354 Weilerwist, Germany. Tel: (49) 2 254-7902; fax: (49) 2 254-6366.

Hillside is a midrange studio just outside Cologne, where (as with Can Studios) much adventurous music is

recorded. Features include a recording area large enough to record an orchestra, natural light and "a real working atmosphere where people get a lot done," according to owner/engineer Dierk Hill

Equipment: TAC Magnum 30-channel console with Optifile automation; Otari MTR-90 24-track; Tannoy Red and Genelec monitors. Contact: Dierk Hill, Hillside Studios, Hauptstrasse 133-139, D-5090, Leverkusen, Germany. Tel: (49) (214) 307-2749.

MUNICH

Arco Studios is a large three-room

complex, well-known for its orchestral film work, even though it also caters to rock and MIDI-based projects. Studio 1 is graced with an enormous recording area. Arco chief engineer Malcolm Luker does a lot of film work for U.S. projects through his company Cue Music Ltd., like Madonna's new movie *Body of Evidence* and the TV series *Young Indiana Jones*. Given that luminaries like Marvin Gaye and Giorgio Moroder have found their way to Arco, this is surely one of Germany's top facilities.

Equipment: Studio 1—60-channel SSL 4000 G Series console; Sony PCM-3348 digital, (2) MCI JH-24 24-tracks; Boxer Four, UREI film surround monitoring. Studio 2—Cadac C.A. Audio 48-channel console with Westwick Audio automation; Mitsubishi X-850 digital 32-track, (2) MCI 24-tracks. Studio 3—Studiomaster 32-channel desk; MCI 24-track w/Dolby SR; Westlake BBS-10 main monitors. Contact: Agnes Forsthofer, Arco Studios, Kreillerstrasse 22, D-8000 Munich 80. Tel: (49) (89) 434004/434005/432287; fax: (49) (89) 431-0634.

Pilot Studios is one of Germany's most exciting and prestigious studio ventures. It was started in 1988 by producer Armand Volker, drummer Curt Cress and Jürgen Thurnau of Mambo Records. They aimed at combining the latest technology with their experience as producers and musicians to create a facility that would "incorporate all that we found good, and avoid all that we found bad in other studios over the years." The result is a stunning three-studio complex that has been visited by the cream of German, Austrian and Swiss artists, but which is still relatively undiscovered by foreigners.

Equipment: Studio 1—56-channel SSL 4000 G Series with Total Recall; Studer D820 digital 48-track; custom Quested monitors. Studio 2—Harrison Series 10 console with 110 channels (!); Studer D820 48-track digital, Otari DTR-900 32-track digital, Studer A820 24-track w/Dolby SR; custom Quested monitors. Studio 3—Sony S500 32-channel console; Studer A820 24-track w/Dolby SR; custom Quested monitors. Contact: Hans Menzel, Pilot Studios, Rumfordstrasse 15, D-8000 Munich 5, Germany. Tel: (49) (89) 296396; fax: (49) (89) 299891. ■

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—FROM PAGE 35, BELLAMY BROTHERS

the disco anthem "Fly Robin, Fly." Siegal also interned as a young man in a Nashville publishing house, where he developed a passion for the twangy stuff.

As it turned out, Siegal's techno-pop inclinations were just the ticket to make the Bellamy's country-pop palatable to German listeners. What began as a few cuts on their 1990 *Neon Cowboy* LP blossomed into two full albums, released on Siegal's own BMG-distributed Jupiter Records in Germany. (The Bellamys record on their own label in the U.S.)

The modus operandi that the Bel-

lamys and Siegal have developed would be considered alien to Nashville, but it works for the trans-Atlantic transpositions. Siegal puts his musical ideas together on a Synclavier, sends them to the Bellamys at their Florida homes, where they develop lyrics for the songs on a pair of Akai 12-tracks linked through a vintage Soundcraft console. "The Germans don't always get the wordplay of country lyrics," says David Bellamy, the man who wrote "If I Said You Had a Beautiful Body Would You Hold It Against Me." "The music relies more heavily on melodies than lyrics. But Germans do speak a lot of

English, so that helps."

Once the songs are composed, the Bellamys and Siegal head into his 48-input SSL E Series-equipped B room at Olympia Studios on Hochlstrasse in Munich. They lay warm country harmonies into Neumann U67 and U87 microphones over the 32-track digitally recorded techno-country tracks that Siegal has preprogrammed. "Country ABBA, we call it," says Bellamy, referring to the Swedish pop group that used to sing in English phonetically. Additional players on the records are all German, and Bellamy says that thanks to the wide disparity of musical styles that comprise the *schlager* (pop) music done in Germany, the musicians are at home in a variety of idioms. There is even a German pedal steel player, Frank Baum.

The differences lie in the texture of the arrangements, as well as the lyrics, Bellamy explains. "Nashville is more organic-sounding. The snares are fatter, and there's more band-in-the-room in the sound. The German production is more electronic-sounding. But I personally like the contrast." Enough so that the Bellamys—who've never been purists about their brand of country, combining it in the past with reggae and rap—are contemplating integrating a couple of German cuts from *Beggars and Heroes* (the latest German release) on the Bellamy's next U.S. release.

Ed Seay, who engineered and coproduced "Cowboy Beat" with the Bellamys, says it's still country no matter where it's done. "We do it one way in Nashville, with the band in the room; they do it more like a pop record in Germany," he says. "But as long as the elements are all there, it's country."

Nonetheless, it's not always as easy as following the formula. "Once," recalls David Bellamy, "I was singing in the studio and Ralph [Siegal] and Howard [Bellamy] were in the control room. We came to this line in 'Neon Cowboy' that goes, 'In the valley of the sun...' I sang it a couple of times, and Ralph kept rolling the tape back. I just kept singing the same line over and over. I don't have perfect pitch, but I can tell when I have hit something right, usually. Finally [Siegal] got on the talkback and goes, 'It's *walley!*' He was absolutely positive that the word was pronounced 'walley.'" ■

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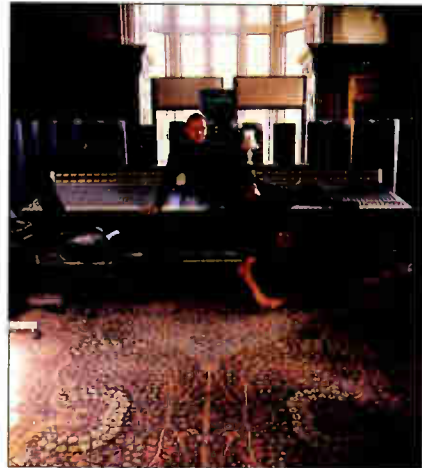
World Radio History

by Adam Beyda

STING'S PORTABLE STUDIO

New York-based rental company Steerpike, owned by Sting, recently purchased the new SSL Portable Studio, the world's first fully portable 48-track digital recording studio. Based around an SSL 4000 G Series console, the modular system takes the concept of the project studio to new heights: With a movable setup, artists can have a personal studio without being tied to any one location. The system can be quickly packed up and taken anywhere in the world.

Many artists who spend a lot of time recording and mixing albums choose to build professional-quality studios in their



homes, and though it sounds ideal, this situation has its disadvantages. As Sting says, "I never wanted a studio in my house; it would sit idle most of the time, making me feel guilty that it wasn't being used. At



Clockwise from above: Sting and producer Hugh Padgham lounging around Sting's house with the SSL Portable Studio. The Studio unpacked and deployed. One third of the 4000 G Series console folded into its flight case.

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the same time, it is very pleasant to make a record in a homey environment, rather than the slightly sterile environment of the average studio. The SSL Portable Studio allows me to work at home and, when the project is finished, have my house put back to normal within a day. The whole system packs away neatly into flight cases and can be set up and taken down very quickly." Typically, the complete system can be assembled by two people in half a day.

Everything, including the console, packs into flight cases, the largest of which is only 66x31x61.5 inches. The 64-channel SSL 4000 G Series console, with Ultimatum and Total Recall, breaks into three sections and folds up into its flight case bases. On arrival at the recording location, the three sections of the console are lowered to the horizontal position but remain permanently mounted on the flight case bases. The three bases are then locked together to form one unit.

Other flight cases contain the patch bay, G Series computer, power supply and a Sony 3348 digital multitrack. Outboard equipment, including digital effects and processors from Lexicon, Eventide, TC Electronic, Sony, Yamaha, Klark-Teknik, dbx, Drawmer, AMS and UREI, is housed in five 19-inch racks. Another 28U, 19-inch rack houses a number of 2-track machines—in Steerpike's case, a Sony CD player, two Sony DAT machines, two Apogee stereo A/D and D/A converters, and two Tascam cassette machines. All of the units are linked by multipin connectors to allow rapid assembly and packing.

Power for the entire system is supplied by auto-sensing, self-tapping power conditioners, allowing the system to run on mains supplies from 90 to 260 volts without retapping of power supplies or outboard equipment. The console and all outboard equipment run at 120 volts. Total power consumption is between 5 and 8 kW, depending on the choice of multitrack and outboard equipment.

A number of user-specifiable options are available for purchasers of the Portable Studio, including most normal console operations. In addi-

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tion, extra 48-way break-out boxes and additional multicores can be specified. A complete system integration service, which includes loading and testing of all outboard equipment, interfacing tape machines etc., is also an option.

Steerpike's first client for the Portable Studio is, naturally, Sting, who used it on his as-yet-untitled new album, due out this month. "The current recording was done in an old dining room in my country house," Sting says. "At night we would put the log fire on—very atmospheric—and you could walk around the garden if you weren't needed. Having the studio in the house also meant seeing more of my family than I normally do when making a record.

"The system is as comprehensive and up-to-date as any," Sting adds, "and there were no technical disadvantages as far as the recording went. Everything was done in the same room as the desk, and although the drums were a little loud, everyone felt very connected, both to the project and to each other. Communicating ideas between musicians and engineers was easy. The whole process was very enjoyable, and this is reflected in the music, which is surprisingly happy."

"The great thing is that everything is fully connectorized," says producer Hugh Padgham. "Once the flight cases arrive, the system can just be plugged together, and you're ready to roll. We worked in fresh air and daylight—and we didn't have to send out for pizza!" ■

BITS AND PIECES

EUROPE

France's music TV channel, Metro-pole Television 6, is undergoing a significant revamping of its technical facilities in central Paris. The overhaul is scheduled for completion by June of this year. According to Sony Corp., the station wants to centrally automate its program transmission and plans to do so using Sony's Integrated Broadcast Operation, which features the totally digital master presentation switcher DVS-M8000C...Jurgen Tepper was named vice president and general manager of European operations for Radius...Europe Audio Rent, based in Maarsen, Holland, took delivery

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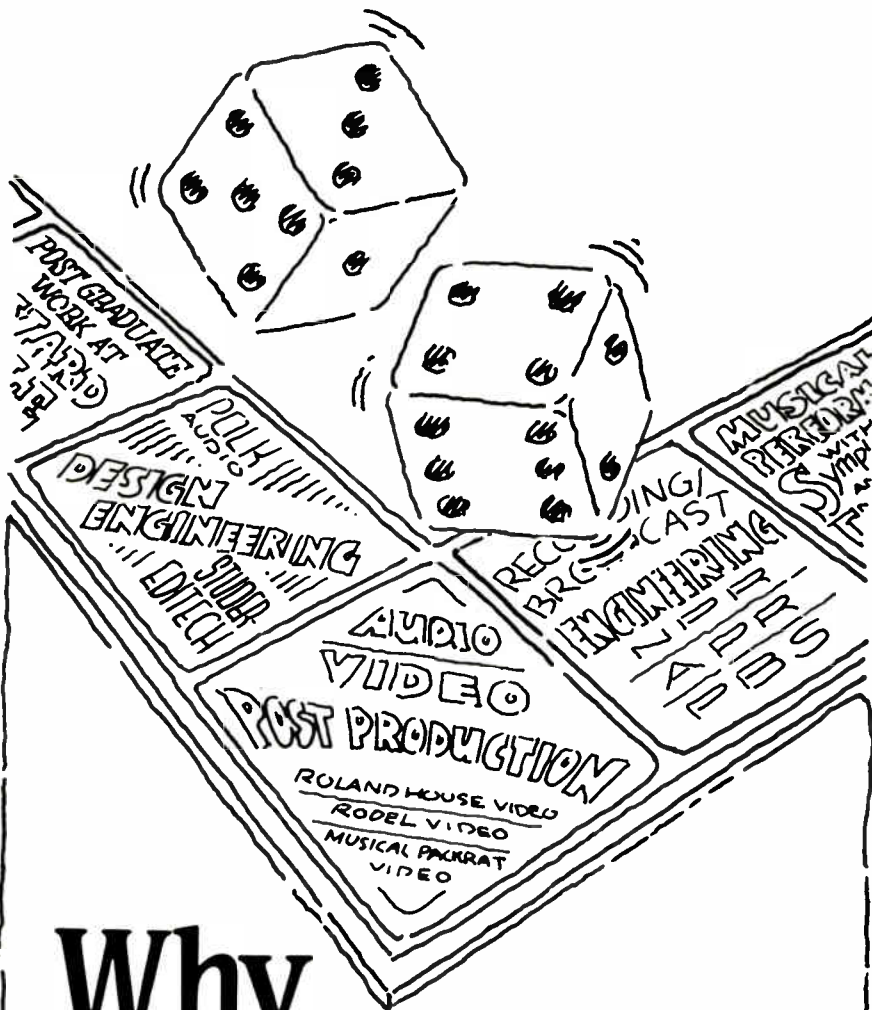


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of a 24-track Sony PCM-3324S... Audio Equipment srl is now the exclusive distributor of Digital Audio Research's SoundStation and DASS 100 products throughout Italy... Czechoslovakian company Slovak Television ordered two Solid State Logic ScreenSounds and two SoundNets. The Bratislavan-based STV has six post-production studios, with plans to place the new equipment in a seventh... Also in Bratislava, a distribution company was formed by Audiosales, whose main office is in Austria. The Czechoslovakian Audiosales is run by Drahomira Hovlandova and Ing. Miroslav Paciga. Its address is Nad Dunajom 6, 841 04 Bratislava, Czechoslovakia; telephone numbers are (0042) 7 722 249 and (0042) 7 726 809.

CANADA

Toronto's Pizazzudio Recording Studio installed a 48-track D&R Avalon mixing console... Media One Communications (Calgary) signed a three-year agreement with Wave Sound Recorders of Los Angeles, designed to provide a fiber-optic network to link sound studios worldwide. Sixteen cities are currently on the network, and six more are in negotiation... Changes at Magnetic North (Toronto): Doug McKenzie will now handle sales in addition to his duties as commercial project manager, and a Sony PCM-7030 R-DAT will answer any audio layover needs.

ASIA

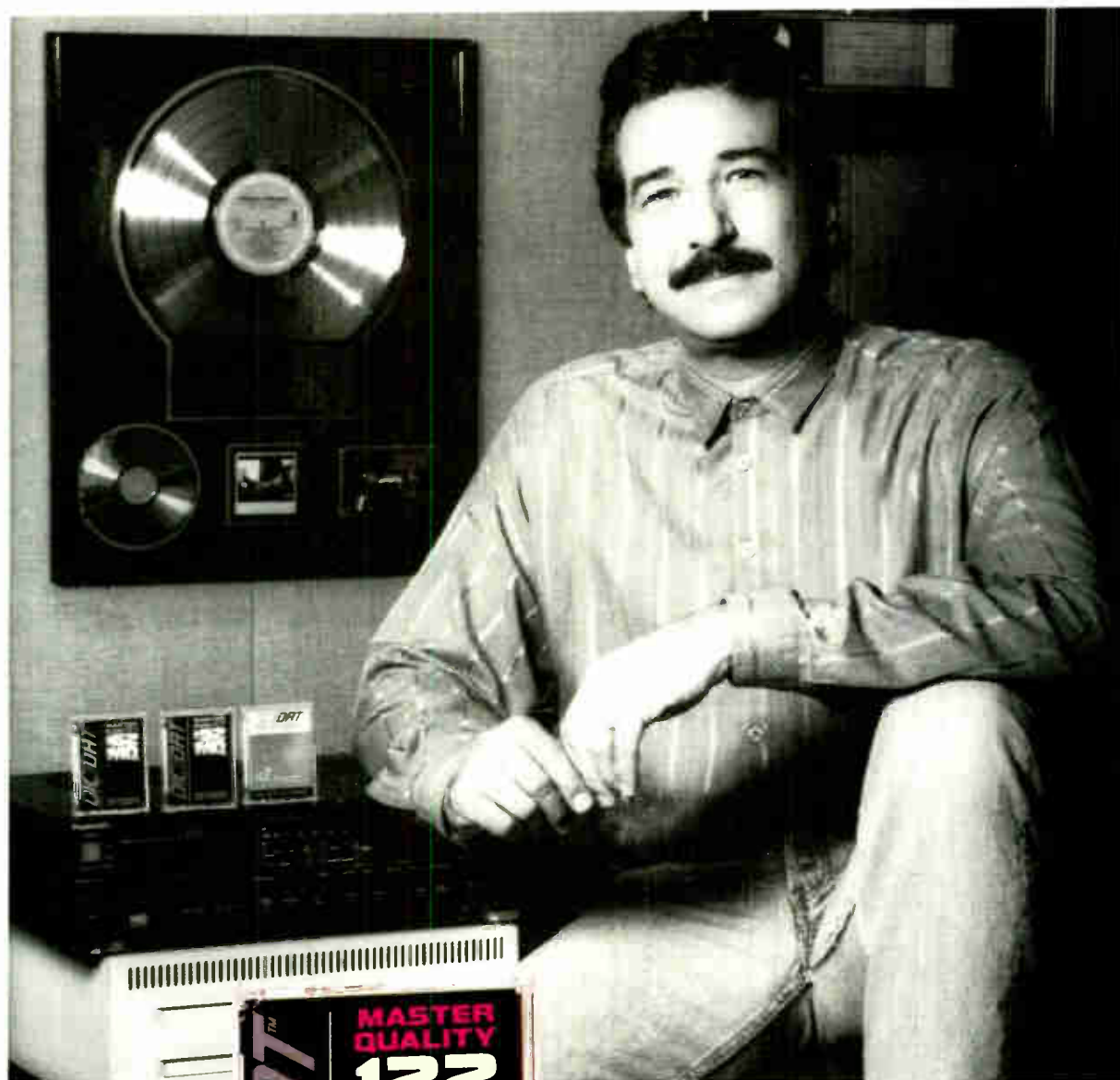
Leading Japanese broadcaster NHK Osaka has a new studio facility for TV programming, HDTV production, radio drama and music recording. A DAR SoundStation SIGMA with WordFit will be installed in the studio. Other purchases have not yet been revealed... Satellite television broadcaster STAR TV (Hong Kong) chose a Solid State Logic ScreenSound for the station's new audio post-production facility.

UNITED KINGDOM

SOS Management moved to new digs in London. Its address is now 81 Harley House, Marylebone Rd., London NW1. The telephone number is (44) 71 486-8794; fax is (44) 71 486-5722. ■

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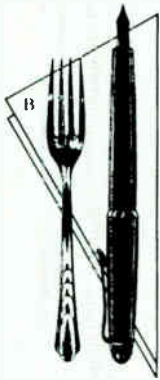
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THOMAS DOLBY

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Way back in the Dark Ages of music video (circa 1982) there was a very bright piece of work: "She Blinded Me With Science." The composer, singer, synth-pioneer and director was Thomas Dolby. 'Twas weird fun, inventive and even danceable, the work of this Englishman let loose in the music labs. Following his debut album, *The Golden Age of Wireless*, came 1984's double-Grammy-nominated *The Flat Earth* and a worldwide hit in "Hyperactive."

During the next year, Dolby coproduced Joni Mitchell's *Dog Eat Dog* and composed his first film score, under the supervision of Quincy Jones, for *Fever Pitch*. Other film projects include the orchestral score for Ken Russell's *Gothic* and a rap number performed by Robin Williams for the 1992 animated feature, *Ferngully, The Last Rainforest*. Dolby has also added his touch to historical musical events, including Live Aid with David Bowie, and

Roger Waters' Berlin concert of *The Wall*. In 1988 he brought us his album *Aliens Ate My Buick*, sold out tours and appearances on TV ranging from *Soul Train* to *The Muppets*.

The '90s Dolby, a surprisingly expressive singer/songwriter, gives us *Astronauts and Heretics*, with guest appearances by Jerry Garcia and Bob Weir of the Grateful Dead, Ofra Haza, the cajun band Beausoleil, Eddie Van Halen and relative unknown Eddi Reader. He is collaborating and meshing with organic precision, but this warmer Dolby is still taking the fabric of sound and tearing it into new pieces, twisting it into new shapes, and stretching it to new limits.

We met at his L.A. workshop and got wired on strong Cuban coffee, a souvenir from a recent music video shot in Havana...

Bonzai: It's been awhile since your last album, four years?

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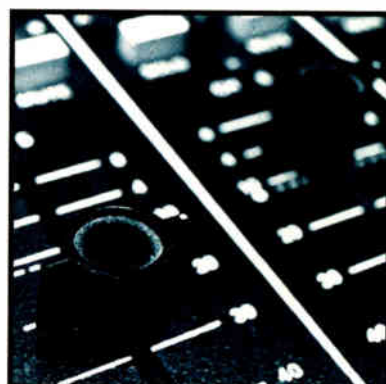
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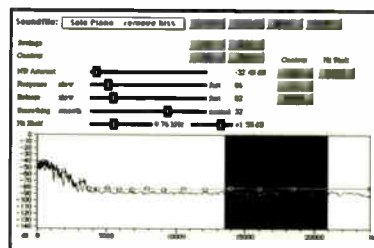
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Dolby: Yes, which raises a lot of eyebrows, but I don't see any law written in stone that says you have to churn one out every 18 months. In fact, when I was growing up, a lot of my heroes—people like Van Morrison, Joni Mitchell and The Band—often made you wait a few years. With them, I never knew what position they would get to in the charts, how many units they were shipping, how old they were, what clothes they wore or what format they fit into. They were just individuals and in a way, it was very precious to me that the people I was listening to were outside of the mainstream, that they weren't public domain.

My aspiration was to work in the same field as those people, but it's not something that you can achieve just by snapping your fingers. The world has to make up its own mind about you and decide that you are worthy of that kind of adulation. So, the most important thing with my records, given that I've always been outside of the mainstream, is that it is fresh, almost perverse in the context of the other stuff out there.

It's important that I launch headlong into each album that I do, that I am not under any pressure of time or economy. I've continued with the other sideline projects that I've always done—production, film work, songwriting—and by the time I was ready to get back to this solo album, I was really hyped up and ready to go. I had a lot of ideas bursting to come out.

Bonzai: There's a healthy collaborative element on this album, guest artists revving up for you. Did you initially have that in mind?

Dolby: Well, I wanted to be excited at every stage of this project, and over the years it has become less easy to be excited by the twiddling of knobs. When I started out, there were relatively few people using electronics in pop music, so at every juncture I felt like a bit of a pioneer covering uncharted territory.

These days, as an explorer, I feel like I am seeing footsteps in the snow, like somebody else has been there first. The use of electronic technology in music is so much more widespread, and what has always been unique to my music is the way I have been able to mesh

lots of styles and influences into something very individual. So, I decided as time went on that I would take this route. Also, because of those juxtapositions in music, it used to be enough of a jolt for me to hear how a Mini Moog bass sounded through a fuzz pedal. These days, I need to go further afield. I need to take a sequenced groove and layer a bunch of cajun guys on top in order to get a similar charge. That was the way it came about.

Bonzai: How did you come across this cajun influence?

Dolby: An old friend of mine is a

writer from New Zealand who moved to New Orleans. He invited me down, and I was taken with the atmosphere, the food and the music. I was especially taken with cajun instrumentation and the soul of cajun music. Unlike most country and western and folk music, it had a very raw edge and a sense of longing about it. It just connected with me, and I was reminded of one of my favorite songs, "Acadian Driftwood," from *Northern Lights and Southern Cross* by The Band. They used cajun instrumentation and told the whole story of people coming down from

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Canada, in Robbie Robertson's immortal words. It was fascinating to me, because it was something I couldn't synthesize in a million years.

Bonzai: I know you like to use Studio Vision software. Has this opened up a lot of opportunity for you?

Dolby: Well, the key to it is that you don't think of it as a multitrack recorder. You think of it as an ability to make the same creative decisions about song structure that we've been blessed with by MIDI sequencers. Since the advent of the sequencer, you have been able as a writer to postpone a lot of decisions about the structure of a song, about tempos, keys, about the choice of instrumentation. You can put something down in rough, with let's say a piano sound, and decide later on what sound and instrument is going to play that part. But you've got the notes in your sequencer. It's more like a word processor vs. a yellow pad covered in scrawled notes.

The first thing that I did when I got back from Louisiana was to convert everything they had done into Studio Vision and then carry on writing the song.

Bonzai: How does this conversion work?

Dolby: I would just record it on hard disk from the DAT tape into Studio Vision so that alongside my MIDI sequence I had recordings of all of the takes of everything I had recorded.

Bonzai: What other gear do you have in your arsenal these days?

Dolby: Well, I still have my ol' Fairlight, which makes a very nice coffee table and does a good job of holding up my plant pots. It's a very expensive way to play back samples. The elite few of us who were lucky enough to buy a Fairlight originally—including Mark Mothersbaugh, Peter Gabriel, Kate Bush and a few others—knew that within a few years there would be something available for a tenth of the price that could do the same job.

Sure enough, I have a SampleCell card that slots into my Mac, costs a couple of thousand dollars, and does pretty much the same job as my original Fairlight did for a hundred thousand. But at the same time, when we bought into that technolo-

gy, we knew that we would be part of an elite who were exploring this new territory. I still have a soft spot for the Fairlight: There are still some things it does better than anything else. The only problem is that it has a format, which doesn't convert to anything else. If I put something in, that is the only place where it resides, forever, until one day the hard disk crashes or my tape shreds and then it is gone.

The nice thing about the more up-to-date sampling system that I have, which is in the Mac, is that I



can, for example, record some music by Beausoleil into Studio Vision. It exists there as a digital file that I can open later in SampleCell and play as a sample. Or I can open it in Sound Designer and edit it there. Open it in ProTools and move it around. Convert it to AIFF and play it with an Akai or a Roland sampler. It's permanently available to me, and when I'm writing sequences in the Mac, if I am looking for a sound effect or a real instrument, I can instantly call up my whole library of digital samples right there in the Mac and get access to any of them and use them as a writing tool.

Bonzai: Do you feel that you are one of the musicians in the vanguard leading to a new era?

Dolby: Difficult to say. More and more people are working at home. But a lot of the ways they are working at home, at the moment, are with MIDI and with sequencing. This is a perfectly good way to make a record, but people who want to

work with live instruments are still basically doing it in somebody else's studio, for a few hundred dollars an hour. I think that in the next stage it will be as easy to work with real instruments at home as it is with MIDI.

Having said that, if you've got an instrument that needs miking up, or several instruments and players who need miking up, I still feel there is no better place to do that than in a professional recording studio. You need the right mics, you need the right sound environment, you need miking technique, you need compressors and mic amps and EQs, foldback for all the players. And you don't want to waste any time with the players, dicking around with technical stuff. That's what studios are very good at.

Bonzai: It sounds as if you like to have the freedom to "offline" and play around, bend and distort, until you get it to the finished state. Do you then go into the full-fledged studio for the mix?

Dolby: I like to do that, because I like the mix to be an event. I'm also slightly a retro fan when it comes to sound boards. My favorite place to mix, where I've done the last two albums, is a place called Smoketree, which I think has closed down commercially. It had a tricked out Neve 8078 board, and the old Neves are really my favorites, soundwise. Once you've been hooked on them, it's hard to go back to a modern desk.

Bonzai: How did Eddie Van Halen come into the recording of this new album, and were you the engineer?

Dolby: Well, over the years I bumped into him a few times, and we then found that our spouses knew each other, because they are both actresses. He lives in the hills not too far from here, so we got together socially, and he showed me his studio and played some new stuff he had done with Van Halen.

He has a lot of keyboard equipment and a Mac, which tends to frustrate him because he's a man who likes to just plug in, turn up to 11 and blast. The whole process of doing keyboard and sequencing stuff is endlessly frustrating, although he loves the artistic possibilities; he has another side to his musical imagination that he likes to use, as well as the guitar playing. I helped him out with a little bit of that, and in return, he was kind enough to play on

a couple of my tunes.

For the recording, we slapped my multitrack tape onto his machine and just picked a few tracks and he recorded. Once again, I took it away and worked with it at home.

Bonzai: Did you manipulate his playing, in the sense that he wouldn't recognize the finished product?

Dolby: He would recognize it, but I used it in an unusual way. In fact, it's interesting that you should mention it, because at one point we had recorded the solo in "Eastern Bloc," and I wanted a little bit more on the last few bars of the song, a little bit of lead. He disappeared to another room to make a business phone call, and I was sitting in there for about half an hour. I didn't have any of my equipment there, but his guitar was going through an AMS digital delay, which you can sample with. I was listening back to the solos he had done in the middle and hit the "lock" switch and had a five-second sample of one of his licks. I wound the tape to the end section, and I just manually punched it in, so that I had a bit of a lead guitar solo from a

take that I wasn't going to use.

I thought it fit rather nicely, but when he came back and I played it, he said, "Who is that?" I said it was a bit from a solo he had done and realized at that point that I had to be careful in order to maintain the integrity of his work. We had a listening party for the album, and I think he was pleased with the final results.

Bonzai: What else is on your mind these days?

Dolby: Well, when I start my next album in a few months, it will really be the first time that it's been thoroughly possible to make a digital album at home, do what I need to do in a recording studio, and have the formats be completely compatible. I think this Alesis ADAT—and its various imitators that will come out in the next year—are a great step forward for that. If the ADAT becomes standard, where every musician and every studio has one, then it will be a great opportunity for people to take their work back and forth from the recording studio to their homes and yet have the possibility of it all ending up on a record—unlike analog tape, where

the quality would never really be good enough for that to happen. You often had people saying the demo sounded better, if only it didn't have all that noise on it.

ADAT is a great step forward, but it's thrown up a crucial issue that I think the hardware manufacturers must get together and address, and probably won't. An artist, say Joni Mitchell, for years has been involved in her own production, but has gone out to somebody else's studio and explained and articulated her production ideas by saying to an engineer, "I want some points of light in here." The engineer would then say, "Okay, I've got track 19 open. I'm going to plug this Prophet 5 into this direct box, bring it through this tieline, route it to track 19 and monitor it up here on channel 32. It's going to need a bit of EQ, a bit of top on it, so I'm going to add +3 dB at 8 K." Joni says, "Yeah, set it back a bit in the mix." The engineer responds, "I'll add a bit of Aux 1, which is my Lexicon 480 on the Hall setting."

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ins and outs of a recording studio, who knows what's going on knob-wise and channelwise, translating Joni's creative ideas, making those decisions and then playing it for her and saying, "How about this?" and she goes, "Yes, that's perfect, let's put some of that down."

Now the technology becomes available so that Joni can, in her spare room, have a multitrack digital recording studio the size of a coffee table. Anything that she does, in terms of doodles in the middle of

the night, can end up on her records because it's in the digital format. Yet what the manufacturers want to sell Joni is a miniaturized representation of a 48-track digital recording studio and a 76-input console, either represented graphically on a computer screen or in a miniaturized box where you have eight faders and eight knobs, which you can assign to any number of different parameters by flipping through them.

But, in order for Joni to work in that way, she's going to need to know all of that technical stuff that an engineer used to do before. Ei-

ther that or she will have to bring that engineer into her spare room and still talk to him in the same way. And the hardware that they are selling her could bypass all of that stuff. That hardware doesn't need to know about channel assignments, doesn't need to know about free tracks. That hardware has an amount of available memory, and yet the interface that they are providing, with that amount of digital memory, is one that is a clone of the antiquated way in which we have been working in studios for years.

It's a language that Joni doesn't speak, except via an operator. She probably understands more about it than most people, but a young artist coming through, who sits at a piano and writes songs and has never been in a recording studio, definitely doesn't know any of that stuff. But that writer is the target market for those manufacturers. It is a great opportunity for those manufacturers to do away with that interface altogether and say, "You can talk to us in these terms. You can say, 'Give me some free space and an input.'" We don't have to worry about what we are putting in. It could be a guitar, a microphone, a keyboard, a drum machine or a sequence. We don't have to worry about what track it's going to record to, what channel we are monitoring it on. All I need you to know is that I am going to record something, so give me some input.

The machine can do all of that, and you don't need an operator. If I want to make a change, I can say, "Where's that hi-hat part that I recorded last Tuesday?" I listen and I say, "I want to fatten that up a bit, take some top off." So, I wind off some top and turn a knob until it feels right. An artist can deal with all of that without having to know all of the technical background.

The hardware manufacturers should be designing musical interfaces that don't require all of that technical knowledge. When I suggest this to the people in the market who sell these boxes to people who are going to be making albums at home, they say, "Yeah, great idea, but you are a dreamer. You are not in the business of selling hardware. If we go to Roger Nichols and suggest this, he says 'great idea, but when I sit down to mix I want to

—CONTINUED ON PAGE 176

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AN INTRODUCTION TO THE

AUDIO

POST-PRODUCTION

PROCESS

"When I finished at USC in 1975, I think we were in an era when film sound had fallen behind

other recording arts," says sound designer Ben Burtt, a seminal figure in the post-production renaissance that has been steadily gaining momentum over the past 15 years. "If you worked in [that field], you were working with relatively primitive equipment and technical specifications compared to music recording." Thanks to the example set by Burtt and many others who shared his commitment to improving the technical and artistic quality of soundtracks, film and television "post" now attracts an ever-increasing number of students fresh out of recording arts programs as well as audio professionals from other

fields looking for new challenges.

Nevertheless, audio post-production remains a relatively little-understood and under-appreciated process. Even those who feel drawn to post by the quality of the soundtracks being produced today often have only a vague notion of how a soundtrack comes into

being. "I get a lot of people applying for work here with a music or production background," says Michael

Bertram, chief audio technician at Skywalker Sound in Northern California. "A lot of them come in and say, 'I want to work in sound.' That's all they tell me, because they don't really know what's

involved [in post]."

To help demystify the process, the following pages offer some in-

sider viewpoints on many of the key phases of the audio post-production process. A number of accomplished practitioners were asked to share their personal perspectives on the work that they do. The reader must bear in mind that these very brief vignettes

by
**John Michael Weaver
& Pete Elia**

INSIDER

VIEWPOINTS ON

THE MANY LINKS IN

THE FILM SOUND

CHAIN.

ILLUSTRATION BY CHARLIE POWELL

are neither definitive nor exhaustive but should be seen as starting points for further investigation into an extremely complex subject.

Before moving on to specifics, however, it is worth noting that if there is a single word that captures the essence of audio post-production it is "selection." People unfamiliar with the process often assume that putting together a soundtrack is simply a rote, mechanical endeavor. In practice, however, the decisions made about the content and form of a soundtrack are often just as carefully considered as those regarding how a set should be decorated, what color a character's costume should be or where the camera should be placed in a given scene. From the point at which the film is "spotted" to determine which sounds on the original production track need to be replaced or augmented, all the way through to when the final mixes are complete, critical technical and artistic choices occur that have a dramatic influence on a soundtrack's effectiveness.

How are these rather subjective judgments made and who actually

makes them? Supervising sound editor Mark Mangini (*Star Trek IV, Beauty and the Beast, Kafka*) of Weddington Productions in North Hollywood says that it is generally the director who provides the overall aesthetic vision for a soundtrack. At the same time, he emphasizes that the type of input and guidance given to the team responsible for realizing that vision varies radically. "There are directors who want to hear absolutely every single sound that's going to be in their movie before it's put into a track, and those who feel as though their time is better spent elsewhere," he says.

Mangini recalls that one director communicated what he had in mind for a particular scene by simply saying, "I want it to sound like a Jackson Pollack painting." From Mangini's point of view, this type of metaphorical description "can be equally as powerful as saying, 'What I want to hear is a slowed-down baby cry. Also, cut a horse scream with it and maybe some wind.'" In my experience, the really great directors are the ones who allow the craftsmen in all areas to do their

thing, and they gently guide them with trust and faith."

DIALOG EDITING

Director Richard Brooks occasionally had to remind people on his set that, "This is a sound movie. It's 50 percent picture and 50 percent sound. Please, don't make any noise!" Unfortunately, though, picture usually takes priority over sound during the production phase of most projects. Thus, a dialog editor's job is to attempt to salvage the often less-than-perfect "production sound" recordings he or she is presented with. "You try to get out the offending noises that don't belong in the drama," says sound editor Kay Rose (*Ordinary People, On Golden Pond, The Prince of Tides*) of Bluebell Sound in Los Angeles. "Who wants to hear the arc lights popping and clicking in the middle of a love scene?"

In a profession full of unsung heroes, dialog editors are perhaps the most unsung of all. Rose thinks that this is because what they do doesn't add anything obvious to the original soundtrack. "The only thing you're

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'adding' is a lack of annoyances," she explains, "so that you don't lose the audience."

Extraneous noises produced by equipment or people on the set are a common source of such distractions. If these occur *between* lines of dialog, they can often be extracted and replaced with background sound stolen from another part of the same scene. However, when noises are produced *while* an actor is speaking, the situation becomes much more complicated. For example, Rose had to go to great lengths to preserve the original performances given during the filming of a scene for Graeme Clifford's *Frances*. Splicing together bits and pieces of dialog from various takes, she was able to rescue partially unintelligible words like "can't" by using a "c" from one take and a "t" from another, sometimes even borrowing a "t" from another actor. The trick in such situations, says Rose, "is to make it sound like it was shot that way."

ADR

During "automated dialog replacement," actors watch themselves on a screen and reperform some of their lines in the relative silence of a recording studio. Only a limited amount of ADR is actually done to improve performance, however, says Charleen Richards (*The Big Chill*, *Who Framed Roger Rabbit?*, *Basic Instinct*), ADR mixer at Skywalker South in Santa Monica, Calif. Most ADR (or "looping") is necessitated because of problems on the set, like an airplane flying overhead during a scene that supposedly takes place during the Civil War, a special effects explosion that obscures an actor's voice, or an off-mic reading of an important line.

"I think most directors and actors would rather keep all of their original dialog, whenever possible," Richards says. "ADR is uncomfortable for many actors. A lot of them come in thinking, 'I've already done this.' It's not anybody's favorite thing." For this reason, Richards emphasizes that "people skills" are nearly as important as technical expertise on a looping stage. "You just try to make sure everyone is comfortable, that everything is going smoothly and that the re-recording mixers are going to get something they can work with," she explains.



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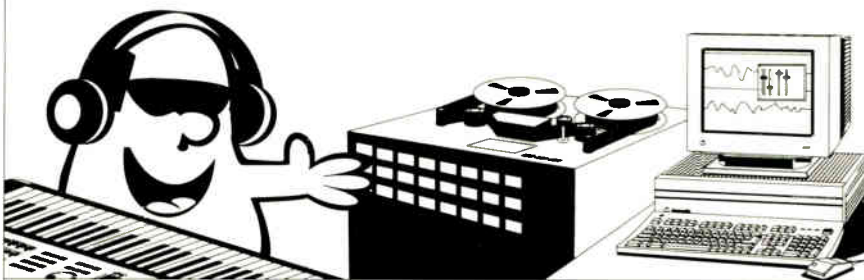
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On a technical level, a big part of Richards' job is to get the looped lines to integrate with the production sound as much as possible. To accomplish this she tries to match vocal timbre and perspective through mic choice and placement, and by finding ways to help the actors duplicate their original voice projection. For example, while looping the scene in *The Empire Strikes Back* where Luke Skywalker balances Yoda on his feet, Richards recalls that "we propped Mark Hamill up and he stood on his head for the ADR."

Besides replacing existing elements, ADR can also involve adding narration, voice-overs, additional lines of dialog, applause, laughter, coughs, clearing of the throat and taunts from ringside during fight scenes. Occasionally, an actor is brought in to entirely reperform a part originally performed by another actor—or even an animal. "On *Raiders of the Lost Ark*, the little monkey was all revoiced to accentuate the fact that he was a Nazi spy," Richards reveals. "They were afraid he sounded too cute and that kids would be upset when he ate the poisoned dates and died. So, an actor who specializes in animal sounds redid all the monkey's sounds to make him sound a little more sinister and nasty."

SOUND EFFECTS EDITING

Recording intelligible dialog is usually the number one priority of the production sound team. Thus, on the most basic level, a sound effects editor's job is to augment or replace some of the incidental and environmental sounds that weren't satisfactorily captured on the set, such as door slams, gunshots or birds singing in the trees. "We're trying to create the illusion for the viewer that *this is real*, this is taking place," says Scott Gershin (*Born on the Fourth of July*, *The Doors*, *JFK*), sound effects editor with Soundelux in Hollywood. However, he adds, if a listener says, "Wow, what a great effect," then you've taken the audience away from the illusion. When they get totally sucked in and can't tell exactly what is getting them excited, then it's the perfect illusion."

Gershin points out that while most of us "spend a great amount of our lives tuning out our surround-

ings, just because there is so much to hear," a sound effects editor must be hyperaware of the subtle differences between similar sounds and be able to recognize which sound is the most appropriate choice for a given situation. "It's not that sound effects editors have better ears than anyone else, it's just that we've spent time focusing our ears to hear things that most people don't. Sound effects is a language. The more you've listened, the greater your vocabulary is." Ironically, some of the most believable and evocative sounds are often generated by unexpected sources. For example, while working on a Michael Jackson video being shot on an animal preserve, Gershin noticed that "camels kind of sound like bad mufflers." Since then, he says, "I can't tell you how many times I've used camel sounds for sputtering car or plane engines."

A well-chosen effect can also appeal to an audience on a deeper psychological level. For example, "If you hear a steel door slam at the right moment," says Gershin, even if it has nothing to do with what is happening visually in a scene, "it has an emotional impact."

FOLEY

Foley effects, named after Jack Foley, the man whose name has become synonymous with the process used to create them, include sounds like footsteps, clothes rustling or a chair being pulled out from a table. Mary Jo Lang (*Unforgiven*, *Under Siege*, *Aladdin*), staff Foley mixer at Warner Bros. Hollywood Studios, says that a lot of directors see Foley, like ADR, as a necessary evil. "They'd rather use whatever got picked up on the production track when they were [shooting]." In many cases, however, this just isn't possible, and a significant portion of the effects we hear on a typical soundtrack were produced on a Foley stage.

A Foley stage is a specially designed recording studio that contains a variety of surfaces (wood, concrete, sand), a substantial number of props (car doors, furniture, old guns) and a movie screen or video monitor. A Foley performer studies a character's actions on the screen, then tries to duplicate them exactly while the Foley mixer records the accompanying sounds. To do the

job well, Foley mixers must have the ability to recognize when an effect will be convincing to an audience. This means that "you have to hear things in a detailed way," Lang says. "When you go to a basketball game, for example, you're very conscious of the way the players' feet squeak on the floor and the way it sounds when they throw the ball to each other. When I'm confronted with something new, I think, 'I have to remember the way this sounds in case I ever have to use it in a scene.'"

Lang adds that the most dramatically effective Foley tracks are those

that actually do more than just replicate natural sounds. Often, she says, "you're trying to establish certain sounds for certain characters or locales. Even with footsteps we try to make people sound nasty or sexy by using different types of shoes."

MUSIC EDITING

Typically, a music editor participates to some degree in every phase of the creation of an original musical score. Involvement usually begins when the initial decisions are being made about where music is needed, continues throughout the composing and recording process and isn't fin-

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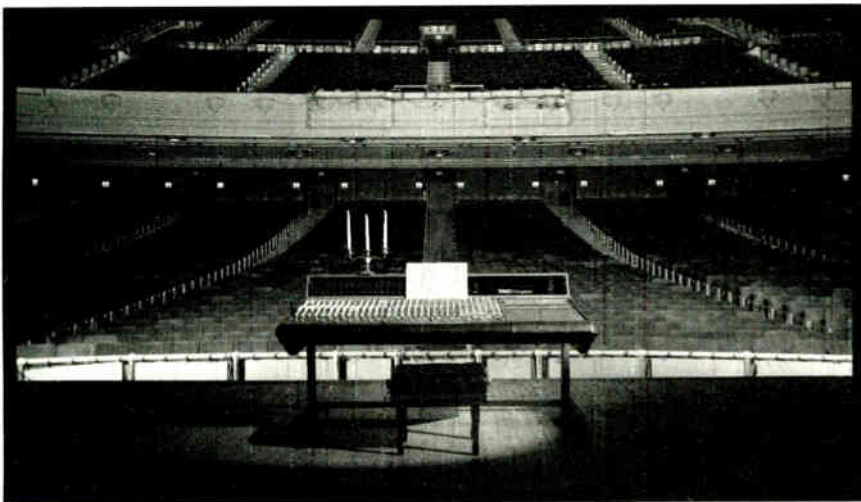
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ished until the score has been integrated into the final mix. "It is very helpful to have a musical background," says music editor/supervisor Dan Carlin Jr. (*Days of Heaven*, *Steel Magnolias*, *Last of the Mohicans*) of Segue Music in Los Angeles, but in-depth formal training is not an absolute requirement. "I have always maintained that if you can dance, you can cut music."

Before a composer actually begins writing music, the music editor prepares detailed notes on the scenes to be scored. "If a cue starts at point A and ends at point B, everything that happens between A and B is logged on timing sheets—every piece of action, every line of dialog," explains Carlin. This information helps the composer determine the appropriate tempo, rhythm and dynamics for that segment of the score. During the recording sessions, the music editor specifies which instruments should be pre-mixed or put on separate tracks and carefully logs information on each take.

In most cases, "the music becomes the responsibility of the music editor once the composer has finished recording it," Carlin says. "We want to make sure that what the composer intended is delivered to the dubbing stage." For instance, if the timing of a cue was a bit off when it was recorded, the music editor will compensate when synchronizing to picture. In the final analysis, however, Carlin says that he has "never worked on a film where the score went into the movie [exactly] the way the composer designed it," because a film often remains in a state of evolution throughout the post-production process.

SCORING

In many ways, the job of a scoring mixer is similar to that of a record engineer, says Shawn Murphy (*Edward Scissorhands*, *Dances With Wolves*, *Hook*), staff scoring mixer at Todd/AO's new stage in Burbank, Calif. "You make all the decisions a recording engineer would make, such as choice of studio, recording format, microphones, outboard effects, seating." However, unlike the way most multitrack albums are made, "in film mixing you usually are recording something *and* making a final version of it at the same moment or very soon thereafter. So,

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there isn't much time to reflect."

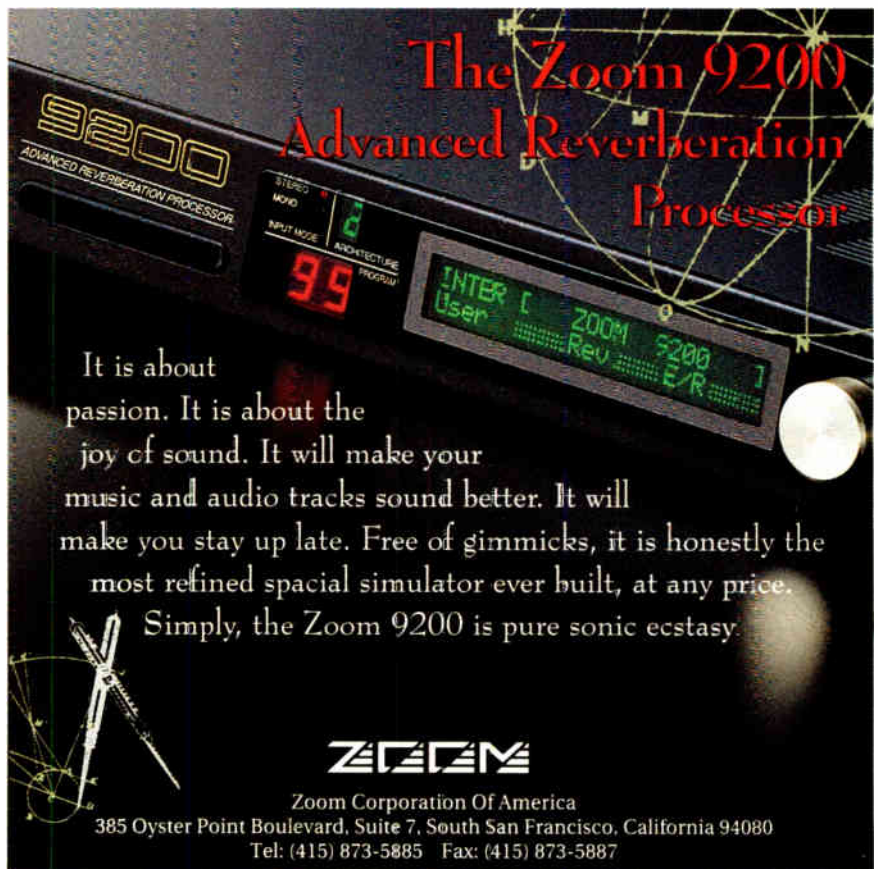
A scoring session can be a particularly crowded, hectic and stressful environment. To maintain his focus, Murphy tries to take most of his cues from a single individual, most often the composer. This is especially important, he says, "if you get into a situation where you have a director, a producer, maybe an editor, and they all have opinions and they all start voicing them [directly] to me." In order to avoid working at cross-purposes, Murphy feels that the composer must always be brought into any such discussion.

A typical recording session for an orchestral score can involve as many as 80 to 90 highly skilled, highly paid musicians. Thus, the ability to work quickly and effectively under pressure is a prerequisite to being a successful scoring mixer. While the conductor is in the studio rehearsing the musicians, Murphy works in the control room to establish the proper balance between the various parts of the ensemble. By the time the conductor is ready to record, "I'm ready with all of my moves," he says. In setting up a mix, important individual instruments are often split off to separate tracks to provide the re-recording mixers with more options later. Many times, though, Murphy's "live" mix ends up being the one heard in the final soundtrack. "That hinges on my ability to know what the composer wants and to operate efficiently, so that we don't have to go back and remix anything," he explains.

RE-RECORDING

A re-recording or "dubbing" stage is the place where the numerous individual elements that make up a finished soundtrack are finally integrated into a coherent whole. Tom Fleischman (*Do the Right Thing*, *Goodfellas*, *The Silence of the Lambs*), re-recording mixer at Sound One in New York, says that the multitude of tracks that have been meticulously prepared for mixing "finally have to wind up in one soundtrack that we hope will sound like someone put up a microphone and everything [you hear] was there."

In Hollywood, it is common to find three mixers at the console during the re-recording of a major feature film. Fleischman, however, is usually the only mixer on the pictures he does. He begins by balanc-



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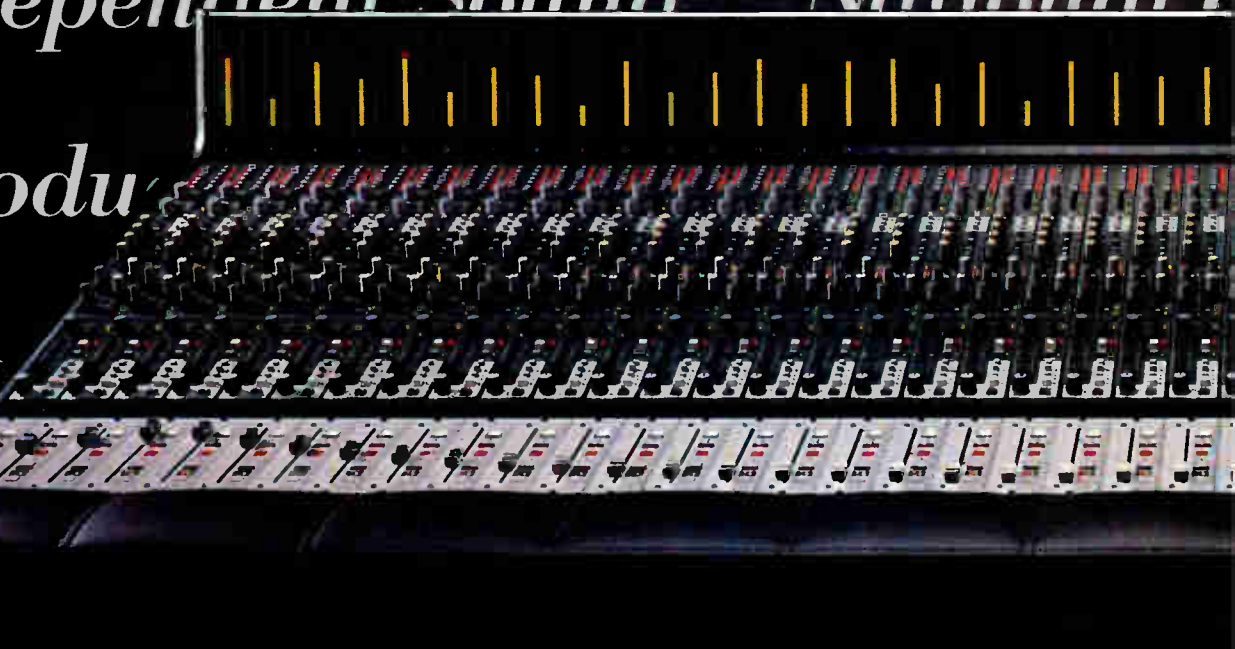
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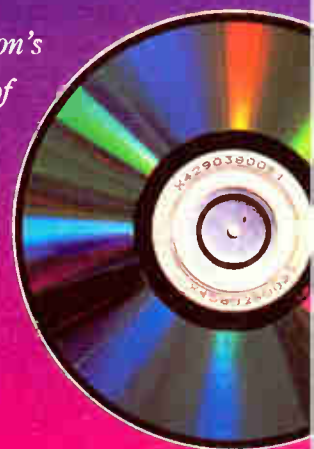
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ing the dialog against the ambience tracks, then adds specific effects and, finally, mixes in the music. "The thing that I really take pride in is not the snazzy, flashy big effects sequences, but the dialog work. It is probably the most dreary, tedious, painstaking work that there is, but from my point of view there's nothing more important in a film soundtrack than the dialog. If you don't understand what people are saying, you're not going to be involved in the story."

Fleischman likes to get reasonably familiar with a film before it reaches the dubbing stage, but he also believes that it is extremely important to maintain a fresh perspective. "I've trained myself to look at something over and over again," he says, "and still see it as an audience might be seeing it for the first time." Although some people regard re-recording mixers as "technicians" doing a "technical" job, "My main concern is what's happening on the screen," stresses Fleischman. "Is the scene working? Is it scary? Is it funny? Is it sad? Is it moving? Is this music cue helping or hurting us? Is it more important than the sound effects that are under it? Obviously, I pay attention to the equalization on dialog and making stuff sound clean, but that's all really secondary to making the film work for the audience."

SUPERVISING SOUND EDITING

A supervising sound editor is usually hired by a director to oversee the entire audio post-production process, both administratively and artistically. "Basically, the directors speak to us about everything," says Skip Lievsay (*Barton Fink*, *Cape Fear*, *Malcolm X*) of C5 Inc. in New York. "No matter what it is—a footstep, an out-of-sync take—you name it, I claim it. For example, Martin Scorsese is very comforted by our relationship because he can speak with me about anything that's happening in the track, including the music, and know that I will take responsibility for it and get something done."

Although post-production crews in New York are generally smaller than those found in Hollywood, their duties are basically the same and their schedules equally tight. To meet this challenge, Lievsay has come to rely heavily on digital recording and editing systems. "Be-

fore we got the computers," he says, "with mag [film] it was virtually impossible for one person to edit all the material." Although traditional technologies and methods continue to play a role in many of his projects, working in the digital domain allows Lievsay to edit all the sound effects and backgrounds by himself in certain cases, such as the Coen brothers' *Miller's Crossing*.

Whenever the situation allows, Lievsay avoids the potentially "inefficient and wasteful" practice of creating numerous versions of any given sound element, then postponing a commitment to any of them

until the mixing phase. From an aesthetic point of view, Lievsay feels that by selecting and editing sounds himself, he can help give a soundtrack focus and minimize what he calls "veto sound editing, where [during the final mix] you listen to the first three alternates, pick one and don't even open the other four."

SOUND DESIGN

The title "sound designer" is the most ambiguous and controversial of any being used today in audio post. Depending on the particular person and project, the sound designer's responsibilities may be as broad as

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putting a personal stamp on an entire soundtrack or as specific as creating exotic, "nonorganic" effects.

Gary Rydstrom (*Cocoon*, *Terminator 2*, *Rush*), sound designer at Skywalker Sound, says that his role in a project is similar, but not identical, to that of a supervising sound editor. While he does oversee the sound effects editing and Foley, he doesn't usually assume all the broad administrative responsibilities of a supervising sound editor. On the other hand, Rydstrom says that "there are some things that I do that are not traditionally a part of a supervising editor's job." Among these are providing input to the director during pre-production, personally creating special sound effects and actually mixing the effects portion of a soundtrack himself. "Even though my emphasis is on sound effects," he adds, "I certainly have some say in how the soundtrack is structured and how the music, dialog and effects all play together."

Rydstrom believes that the work of a sound designer has a lot in common with that of a production designer or cinematographer. "We're always looking for ways to use sound effects to support what's going on dramatically within a scene," he says. In Ron Howard's *Backdraft*, Rydstrom combined coyote howls, monkey screams and human belches with realistic fire sounds to help give the fire-fighting scenes more emotional impact. "Anytime the fire would retreat behind a door," says Rydstrom, "I put in a backward laugh and other sounds that were not recognizable but had a subconscious effect on the audience." However, he adds that effective sound design can be "as simple as your choice of crickets. There are a billion different cricket sounds, and it comes down to making a choice of one that might be nerve-wracking and tense vs. one that is soft and warm. A lot of the decisions you make are those types of decisions." ■

John Michael Weaver is head of Loyola Marymount University's recording arts program. Pete Elia is on staff at Ground Control Studios in Los Angeles. Maria Briggs provided research assistance. Special thanks go to Bill Varney at Universal Studios for his input and suggestions.



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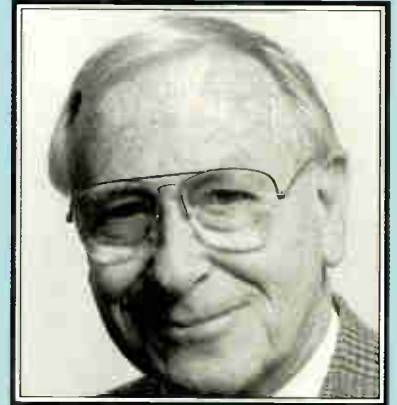
ANTICIPATING THE FUTURE

SAN FRANCISCO STATE'S MULTIMEDIA STUDIES PROGRAM

The integration of digital media on desktop computers has made remarkable progress over the last couple of years. Among the most significant advances is the QuickTime standard for digitizing video and audio on the Macintosh, and in November QuickTime for Windows opened this technology up to the public as never before. While we can expect to see "standards skirmishes" over consumer playback platforms for several years, the lack of standards has not prevented The Voyager Company (Santa Monica, Calif.), Compton's New Media (Carlsbad, Calif.) and a

host of smaller multimedia-oriented companies from bringing products to market. And companies like these will soon be crying out for people who have the background and training in multimedia production. At least that's what Professor Robert Bell believes.

Bell's testament to that belief is the Multimedia Studies Program at San



This cutaway, 3-D view of the Multimedia Center in downtown San Francisco was created by Adam Noble of CADP in Oakland, CA. The original floor plan is courtesy of Shorenstein Company. Above: Robert Bell of San Francisco State University.

Chip Shots

CREATIVE LABS SOUND BLASTER AND WAVE BLASTER

Creative Labs (Milpitas, CA), makers of the Sound Blaster multimedia card for IBM PC/compatibles, has announced that product will support QuickTime for Windows. Apple's cross-platform multimedia software. Also announced is Wave Blaster, an add-on daughterboard that uses E-mu Systems' Sound Engine digital sample-based audio technology. The daughterboard is used with Creative's new Sound Blaster 16 ASP 16-bit multifunction board. When coupled with Wave Blaster, Sound Blaster 16 ASP has the ability to play 32 different 16-bit sounds simultaneously, with extensive programmability.

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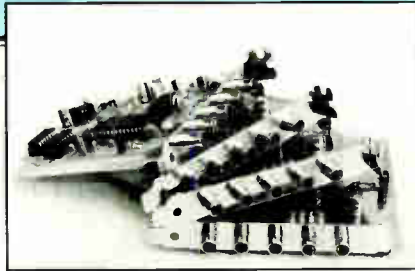
TitleMan is a PostScript title generator customized by Digital F/X (Mountain View, CA) for converting desktop publishing type fonts and graphics into a clean, high-quality video signal. It consists of a frame buffer that plugs into a NuBus slot in a Macintosh for display and frame grabs; integrated software for creating titles and rendering and anti-aliased PostScript titles and graphics; and an external, rack-mountable chassis that takes black-burst reference in and puts RGB, linear key and sync out.

It uses standard BNCs to connect with a transcoder for YUV output; to an encoder for composite output; or directly to a component switcher. TitleMan is priced at \$7,995 for NTSC format or \$9,995 for PAL format. The system requires a Macintosh II computer with a NuBus slot, a minimum of 16 MB of RAM and System 7.

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ESE PC FAMILY CARDS FOR VIDEO PRODUCTION

ESE (El Segundo, CA) unveiled



the PC Family, a set of four PC cards for use in video and audio-for-video production. The PC-219 is a five-output black-burst generator (\$175); the PC-207A is a 1x4 video distribution amplifier (\$145); the PC-217 is a 1x4 audio DA (\$95); and the PC-237 is a 1x4 wideband 120MHz video DA (\$295). All ins and outs are made with RCA connectors accessible via the rear-mounted card guide bracket.

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ANTEX MODEL Z1 SOUND BOARD

Now shipping from Antex Electronics (Gardena, CA) is the Model Z1 digital audio adapter. The card, which complies with the MPC standard, provides 16-bit, broadcast-quality stereo with multiple compression formats, including 4-bit ADPCM,



DVI, CD-I, MS-ADPCM, 8-bit PCM and uncompressed 16-bit PCM. Other features include user-programmable DSP, optimized data transfer, and MIDI and SCSI ports. The Model Z1 is priced at \$595.

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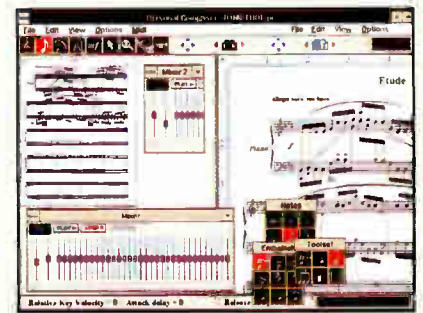
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PERSONAL COMPOSER FOR WINDOWS

Personal Composer (Seattle, WA) has released a Windows version



of its music notation software. PCW provides sophisticated page layout and typesetting features, as well as comprehensive access to MIDI. Suggested retail price for PCW is \$395.

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PRISM INTERACTIVE AV 100 AUDIO COMPRESSION AND DEVELOPMENT PLATFORM

PRISM Interactive Corporation (Glen Ellyn, IL) announced the availability of its AV 100 peripheral board for PC-AT and compatible motherboard running DOS 3.1 or higher. It is said to provide CD-quality audio and can be used for CD-I and CD-ROM-XA applications. Audio compression results in a minimum dynamic range of 90 dB, with an S/N ratio of 87 dB. The product is targeted to professionals who need a cost-effective audio development platform.

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Francisco State's Division of Education. Offered in alliance with the SFSU School of Creative Arts, the program is designed for artists, teachers, writers, media producers and others intrigued with the possibilities inherent in the new world of integrated digital media.

Although the Multimedia Studies Program was only recently instituted, it's already growing fast. A new facility was scheduled to open this month in downtown San Francisco, with triple the previous amount of space available for classrooms and labs. The fall semester's enrollment of 130 students was expected to double or triple this spring.

Besides offering a certificate in Multimedia Studies in the future, the program will soon allow students to enter a degree program. However, Bell confides, "That's a bit more complicated, because the standards for a degree in this field haven't been established like they have for anthropology or film."

Certainly Bell should know about film. Prior to the emergence of digital technologies, he focused on narrative and avant-garde cinema. He has produced, written and/or directed more than 100 motion pictures of all kinds. From 1948 to 1966 he was the concurrent president of four film companies: On Film, Filmsmiths, On Screen and Prometheus. In 1969, he became professor of film in the Cinema Department of SFSU, where he has taught film writing, production, aesthetics, semiotics, finance and distribution.

About three years ago it became clear to Bell that the computer was playing an increasingly important role in film production. "Initially, I saw it happening in the development phase," he says, "in terms of scripting software, as well as in the post-production editing phase. Then into the production process itself—particularly pre-production budget analysis. It was also clear to some of us that it would soon invade all five of the separate, but interrelated film business activities: development, finance, production, marketing and distribution."

Around this time Bell went to Eastman Kodak in Rochester, N.Y., and met with James McKay, manager of marketing programs and director of

worldwide communications. McKay encouraged Bell to bring together the principal parties to discuss the implications of computer technology on the film business. "I organized an international conference called TAPE 1, which was held at Dominican College in Marin County," Bell explains. We had a remarkable group of people attend, and the short- and long-term implications of digital technology were discussed. While it was a great success, it became clear that we needed to go beyond the conference to achieve some kind of continuity.

"I came back to San Francisco State and spoke to Peter DeWees, the

"Multimedia is a slippery word. It's easily defined, but it doesn't really deal with the heart of the issue: interactivity."

—Robert Bell

dean of extended education, and Marci Manderscheid, the director of continuing education, about this," he continues. "We wanted to come up with a curriculum that would provide training, education and experience for people who were already practicing in the professions—that is, the developers who are concentrated in the San Francisco Bay Area.

"The question was," Bell recalls, "How do you prepare those people who are involved in traditional media, as well as address the needs of people who are already practicing as multimedia developers? We needed to get some agreement about what should be taught and how to teach it with the best teachers available. And that's what has taken place here over the last year-and-a-half."

And who has been answering the call of multimedia? "We are seeing surprises in terms of what we expected our enrollment profile to look like," Bell says. "We started with two experimental courses. One covered electronic music and multimedia in terms of presentation: that is, the introduction of graphics and sound for theatrical presentations—not unlike what George Coates has been doing over the last several years. The other

course was on multimedia and computers. We got a wide spectrum of participants. They ranged from a few [multimedia] professionals to doctors, lawyers, teachers, musicians and bike messengers.

"Now we're seeing an increasing number of professionals and would-be professionals," he adds. "We're getting video people, filmmakers, graphic artists, people from the communications departments of businesses. There are more and more career changers who have no previous experience with multimedia. And 40 percent of the people who come into our program come from some audio background. Now it's early to say that is a trend, but I hope and believe that audio will not be an afterthought in this technology, as it has been with film. It will be an integral part of the development process and will be considered early in the process."

The curriculum seems to bear this out. Several instructors come from an audio background, including Buzz Hays, director of engineering for the LucasArts THX Division of LucasFilm, Ltd., Randall Packer, founding artistic director of New Music Theatre in San Francisco, and *Mix* contributing editor Linda Jacobson.

"We're also enormously interested in the young people—in high school and middle school—who have cut their teeth on games," Bell says. "They have been swept away by the interactive nature of that experience, and they have a familiarity with manipulating and controlling that information. We're looking for that talent, and we hope to be the trainers of the developers of tomorrow."

ROLE OF INDUSTRY

Bell believes that Hollywood's writers, directors, cinematographers, set designers and so forth are not going to make the transition from conventional to interactive films in large numbers. "People coming out of the conventional practice are the ones who direct a linear progression," he says. "It's very difficult to give that up if you've been practicing it for many years. Your mind is set. The new communicators will have to incorporate the conventions of the previous media and develop a new aesthetic, yet unclear, in order to be able to deal with the distinction between traditional narrativity and cognitive

activity.

"When you go to the movies, you pay money to surrender yourself, to get a massage," he elaborates. "You go with it. The interesting problem is how do you incorporate cognitive activity where one makes rational choices without interrupting the massage? How do you create an oscillation that will allow us to both have the object of our desire—that dream experience—and at the same time, to be able to make choices? You have to start with a new set of folks who figure out how to do this.

"That basic assumption—that people *want* that experience—is the *only* thing that will make this go. There's no evidence yet, because we're at the very beginning of the development of the technology. But visionaries like Steve Arnold (formerly of ILM and newly named president of Bill Gates' Continuum Productions) believe that multimedia databases, encompassing anything that interests you with no problem in accessing it, will allow this new interactive experience to take place.

"Multimedia is a slippery word. It's easily defined, but it doesn't really deal with the heart of the issue: interactivity. If there's anything that is different, it is the fact that the user becomes the author, or the director, the constructor of the experience.

"Many of the alternative models to the popular Hollywood film were dealt with in the first part of this century by the avant-garde filmmakers," Bell continues. "The experimental film *Andalusian Dog*, by Bunuel and Dali, contained many interesting features. One of them was the displacement of time and space, where we would see a particular scene with a subtitle referring to another time that bore little, if any, relationship to that scene. This technique provided a way to break down the idea of continuity in the illusion of time and space. Another feature was exemplified by a scene where ants crawled out of a hole in someone's hand. These, and other powerful images, are rife with Freudian symbolism. The images are riveting. Their ambiguity makes you want to know more. Wouldn't it be great to be able to stop the film and explore the meanings and the derivations of these images? The very nature of this

film invites exploration of its mysteries in whatever way you want. My hypothesis is that future films will be increasingly designed with more ambiguities. And that ambiguity will help us with the issue of interactivity."

Bell believes the existing developers of multimedia titles are going to need help. "We've got 20 or 30 companies right here in the San Francisco Bay Area that are busy: Haukom Associates, Graphica Multimedia and The Hypermedia Group. They are already reaching into the freelance community, much like the film and video companies do. And ad agencies are going to be involved in

"I hope and believe that audio will not be an afterthought in this technology."

—Robert Bell

interactive production. They're going to have to have a base of filmmakers, composers and so forth. Whatever employment opportunities exist now will be multiplied many times as a result of the proliferation of this form of communication, not only in the professional community, but in corporations, schools—it will be everywhere."

Bell is in the process of setting up equipment relationships with IBM, Apple, Sun Microsystems, Silicon Graphics, NeXT and many software manufacturers. "The people we will be training are the people who will be buying and using their equipment. We want to cooperate with every hardware and software manufacturer that wants to integrate its equipment into this matrix."

With respect to interactive media, Bell feels we're about where we were with cinema in the early 1900s. "The model that was chosen at that time was the theatrical model, and it has continued to be the model until today. Actually, it was just by chance that the cinema we know today was not the cinema of the plastic arts. There actually was a real affinity between the nature of cinema and music and sculpture and painting. Those arts heavily influenced the di-

rection of avant-garde cinema, which might just as easily have become the dominant model.

"The difference between then and now is an increased consciousness. The Multimedia Studies Program, representing the initial phase of what is planned to be the Institute for Interactive Media, will attract the best scholars from all over the world, who will examine what is being produced *as it is being produced*—not ten years after the fact. We will establish a library, a permanent collection of multimedia works. We will start writing the history of this developing phenomenon and construct theories about what the texts mean and how to talk about them."

The Multimedia Program's alliance with the School of Creative Arts, and its interaction with Broadcasting and Television, the Cinema Department, the Art Department, as well as the schools of education and business, make the environment a fertile one for interaction. And a newly forged alliance between the Multimedia Studies Program and the International Interactive Communications Society is worth noting. "IICS is interested in establishing San Francisco as the center for multimedia production and development, and working closely with the University will ensure that there are professional opportunities for our members and the community at large to advance their skills," says Nicole Lazzaro, co-chair of professional development for IICS-SF.

Bell is a strong endorser of San Francisco State as the site for a program like this, "because its population of 26,000 students—as well as the city itself—is so heterogeneous. We have a great opportunity to reach out for this diversity and make this new information-age process available to all people, and to do it economically. You can take some multimedia-related courses at other places around the country, but you must spend \$1,200 to take three courses. Here you get 30 hours of courses for about \$300." And the Bay Area stands to benefit as well, since more than 50% of its work force is made up of people who are involved in some aspect of information production, distribution or management. ■

Paul Potyen is a Mix associate editor.

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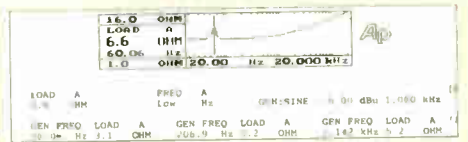
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WITH ALL
THE
COMPETITION,

BUYING A **W**ORKSTATION FOR A PROJECT STUDIO

Not so long ago, buying equipment for a project studio was easier. You simply bought the tools that had always served you well in the past—and whatever else you could afford—knowing that your talent could make up the difference.

BY TED PINE

The sudden proliferation of digital audio workstations has changed the equation. It is difficult for first-time buyers to judge what works because the technology is so new; and it is tough to define what *affordable* means because of hidden costs such as reliability and the learning curve.

The situation is further complicated

**NOT SO LONG AGO,
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ILLUSTRATION
BY BURRELL DICKEY

by a super abundance of choice. The Digital Audio Product Directory in last July's *Mix*, for example, listed more than two-dozen disk-based editors. With all the competition, it's truly a buyer's market. But as always, the buyers who get the best deals are the ones who do their homework.

THE EDUCATIONAL SYSTEM

Manufacturers and users agree that educating yourself on the entire DAW market can take weeks, months and even years. A first-time workstation buyer should therefore budget research time into the weekly schedule and develop an organized approach to information-gathering.

Parsons Audio pro audio dealer Mark Parsons, whose Boston-area company specializes in workstation sales, notes, "It's a complicated study, because hard disk editors present a different conceptual model of how to work. It takes time to get your bearings, and you have to fight the natural tendency to believe you've 'got it' before you actually do."

Fortunately, there is no lack of information. Magazines, product brochures and manuals, dealers,

IT'S TRULY
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MARKET.
BUT AS
ALWAYS,
THE BUYERS
WHO GET
THE BEST
DEALS
ARE THE ONES
WHO DO THEIR
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trade shows, user recommendations, and manufacturers are all valuable sources. But no single source can tell you everything—and there's an art to knowing where to turn when.

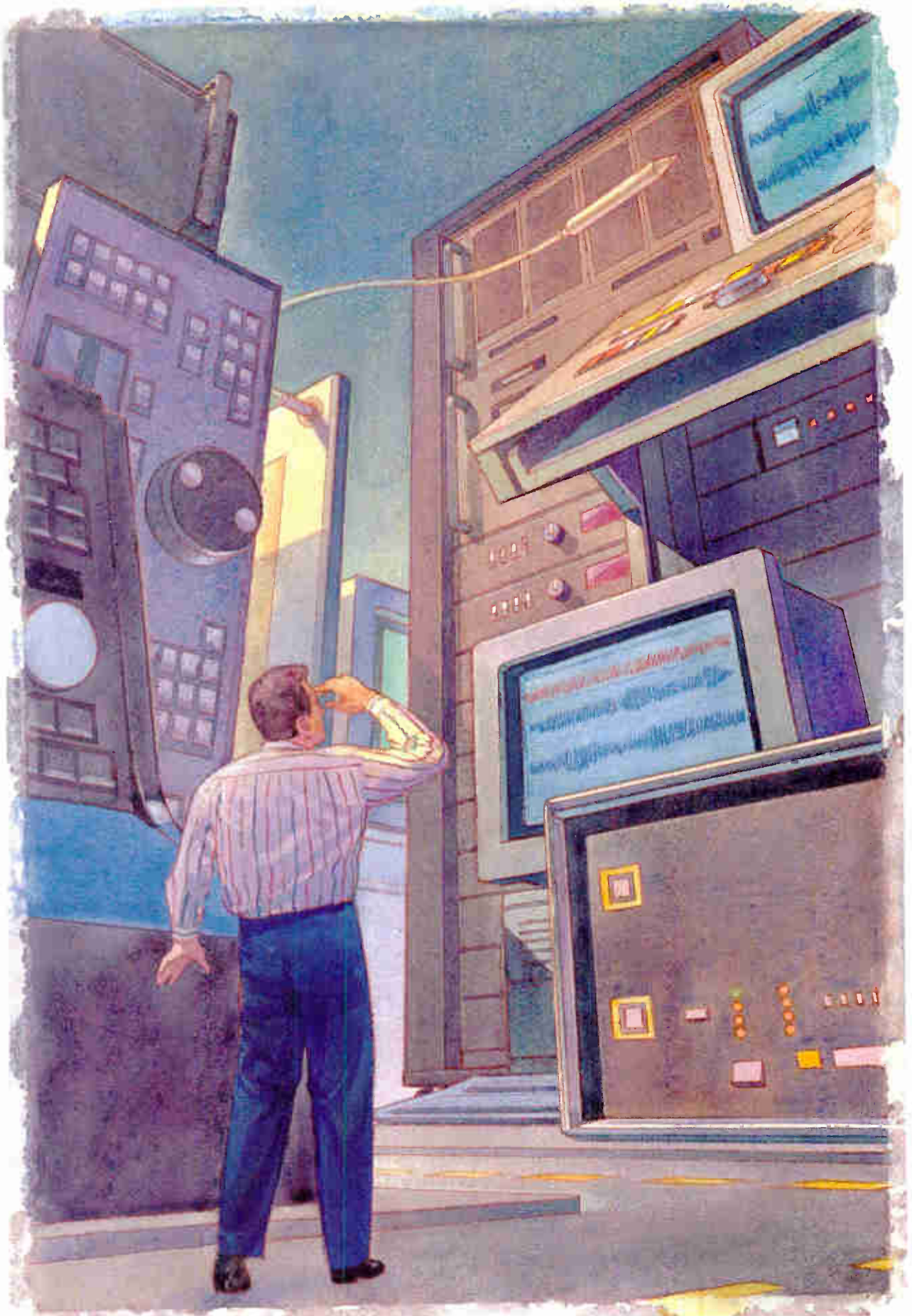
Windsor, Vermont-based commercial producer Peter Acker, who put in several hundred hours of research before purchasing a Micro Technology Unlimited MicroSound system for his Radioland Productions, began his search by reading everything he could.

"Product reviews let you know what's out there," he says, "but you have to take them with a grain of salt because reviewers have limited time to learn each system. Still, they let you know what's real, which brochures don't necessarily do."

Parsons cautions, "Remember, the literature goes out of date quite rapidly because the systems are continually being updated. Chances are many of the features that may affect your purchase decision may be undocumented. So I would encourage people to start getting demos early on."

DEALING WITH DEALERS

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Figure A. 27x27x10 in.

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to the cautious buyer. But take heart: There's a new breed of salespeople who understand that disk recording is a new world and that you need time and attention. To find one, simply ask for recommendations from people who would know recent purchasers of systems. Then be sure to schedule an appointment.

If possible, select a dealership that represents several disk recording systems so that you get a more balanced point of view. Be prepared to make several visits. A thorough demo on each system should last at least an hour or two; as soon as you feel your eyes glaze over, stop and come back another day. Also, keep in mind that not all manufacturers sell through traditional dealers—you may well have to broaden the hunt later on.

How many systems should you expect to look at? New York City-based composer, Michael Levine of Michael Levine Music, now a Digidesign Pro Tools owner, recalls, "I looked at the product literature on 12 or 13 systems and probably got a demo on seven or eight of them. I gather that I looked more deeply than many, but less than some."

Parsons cautions against narrowing the focus of your search too quickly: "Understand that you tend to be wowed by the first system you comprehend. This doesn't mean that this system is the best or the fastest. It may just mean that after a few demos, the light has come on. Keep looking at other systems, or at least revisit the systems you demoed before you had your breakthrough."

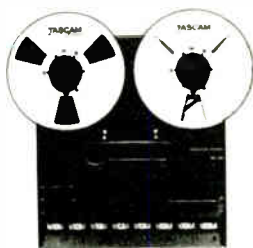
HITTING THE ROAD

One effective way to see what's out there is to attend the manufacturers' "road shows" that make the periodic rounds of pro audio and electronic music dealers. These events provide an opportunity to see a demonstration of the latest software by a company insider, usually including a Q&A period, which may provide an opportunity to get a "hands-on" answer to a specific question.

Trade shows such as AES and the SPARS Shootout can also be an efficient means to survey the field—particularly those manufacturers that sell direct or through non-dealer sales representatives. Remember, though, these are high-stakes affairs for the manufacturers, and some may be focused more on selling you

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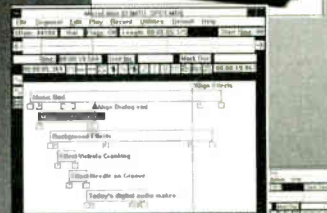
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rather than furthering your education. Also, guard against being blown away by "vaporware." A company's future product direction is valuable information, but you can't make reliable comparisons based on promises.

In fact, any information you get at a trade show, particularly when the source is one manufacturer discussing the shortcomings of another's product, should be double-checked. On the positive side, a major trade show can be your best shot at meeting executives and engineers from the companies whose products interest you.

SETTING PRIORITIES

After you've reviewed the literature and sat in on a few demos, you should start to get a handle on price and performance—what \$10,000 of disk recording buys vs. \$15,000. Now's the time to narrow the focus of your search. The way to begin, says Acker, is by making a sober appraisal of your business.

"I looked at the economy and concluded that any workstation I bought would have to pay for itself

out of my current business by increasing my speed and efficiency," Acker says. "Based on that, I decided I needed capabilities like event layering, virtual mixing, unlimited crossfades, high-quality scrubbing and a simple user interface—all of which I felt would help me work faster."

Pasadena, Calif.-based sound editor Bill Schlueter established his priorities based on an opportunity to expand his studio, Turnkey. "I was convinced that if I could edit and premix all within the computer, thus minimizing expensive time required on the mixing stage, I could get the business of younger directors who want to work digitally. I knew I needed a multichannel system with onboard mixing, in addition to the usual random access editing functions."

The relative merits of Macintosh vs. IBM clones vs. dedicated controller systems should be weighed as well. In the experience of Chicago-area electronic music dealer Gary Gand of Gary Gand Music, "If you feel you have problem with using a mouse and a keyboard, you should

be looking closely at the systems with dedicated controllers, like Roland's or Korg's. On the other hand, if you're a novice who wants the flexibility of a computer, chances are you will pick one of the Macintosh systems."

Schlueter avoided such systems because of the premium price Macintosh CPUs command. "There's just no way I was going to pay \$6,000 for a front end," he says. "So I started by looking at the [Digital FX] ADAP-II, which uses an Atari computer, and then at the IBM systems. I ended up paying \$1,600 for the front-end 386 computer for my Spectral Synthesis workstation."

Acker remembers, "I originally looked at Macintosh systems only, believing that was the state of the art. But with each of the Mac systems I saw, you had to go through too many windows to accomplish certain basic things. For this reason, I started to consider IBM systems."

Cost is an important consideration, but take care to choose your computer platform on the basis of its software, not the other way around. A cheap computer with software that

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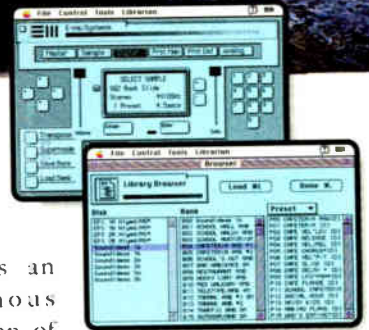
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NETWORKING (USERS, NOT SYSTEMS)

One of the keys to making the transition from weighing the alternatives to making a purchase decision is talking to current users. There are many sources: colleagues, acquaintances, dealers, even user names from the industry trades.

"I was reluctant to take people away from their work, so I would start each call by asking, 'When would be a good time to spend 15 minutes talking about your system?'"

says Acker, who began with a list of references he received from manufacturers. "Generally, that 15 minutes would turn into a half-hour or more. During each call I would try to get the names of other users that the manufacturer hadn't recommended, looking for people who might be somehow dissatisfied."

Levine maintains that current users have a vested interest in talking to prospective buyers. "If you have something that works well for you, you want it to become a standard. I found that people were very willing to talk, and now that I'm a Pro Tools user people are calling me."

If current owners have a stake in promoting the adoption of their particular systems, doesn't that also mean there's a tendency to hide any problems? Levine answers to the contrary: "I was looking at one high-end system that in many ways was the best I'd seen. But after the tenth call with a disgruntled owner, I lost interest." The best advice is to get the broadest view possible by calling as many references as you can.

FINANCIAL CONSIDERATIONS

At a certain point it all boils down to the question, "How much would you pay?" For Schlueter, the financial decision was based strictly on available cash. "I had \$15,000 in capital to spend," he says. "I either found a system that met my criteria at that price, or I had to wait."

Acker, who set his guidelines by taking a look at business trends, says, "I couldn't count on raising my rates in a down market, and I couldn't realistically count on booking more than 20 hours a week. Running the numbers, I arrived at \$10,000 as what I could comfortably pay."

If you require financing for your dream machine, help is now available from a once unlikely source: the dealer. "Today it's the responsibility of a good salesperson not only to find the right system for the customer, but to find the money to buy it with," Gand says. "For example, if it's a start-up situation and the customer doesn't have two years of financial history, we can help put together the kind of information that leasing and credit companies want to see."

According to Gand, one of the biggest mistakes first-time buyers make in setting their budgets is underestimating the total cost of buying a workstation. "Buyers tend to forget about the 'must-have' accessories," he warns, "such as a backup drive, or an uninterruptible battery power supply, or the appropriate cabling and cases."

There is no standard industry practice regarding pricing. Some manufacturer base prices are "all-in," including disk drive, CPU and monitor, I/Os, and everything else needed for turnkey operation. Others include only the audio processing card in the base price, with everything else extra. Be sure you are receiving



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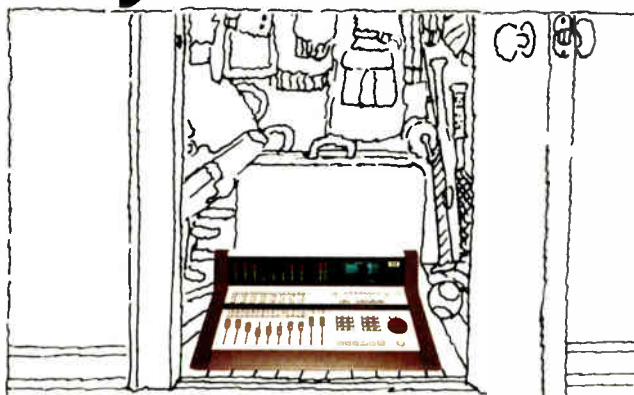
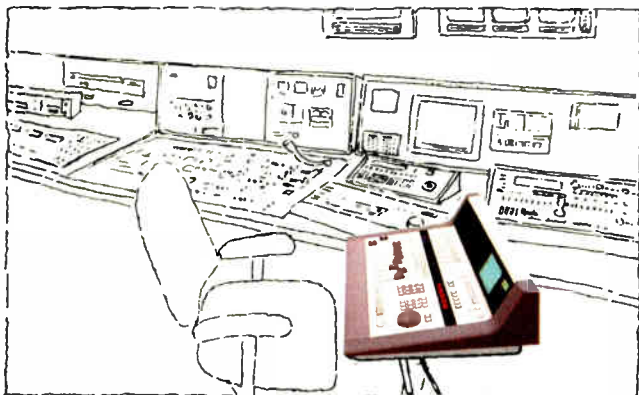
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a quotation based upon the same exact configuration of storage and I/O channels, or your price comparisons may be meaningless.

Future upgrade costs should also be factored into the pricing equation. Find out what it costs to upgrade the system to the next level of track, time and I/O capacity. Avoid, if you can, a system with a cheap entry cost that penalizes you for expanding later on.

THE TEST DRIVE

When you're getting ready to buy, it's time for a true test drive—one where you lead with your questions and actually benchmark the system's speed on the functions that are critical to you. One of the best ways to measure performance is to bring in a project that you've worked on with your current setup.

"We'll put you on a system with a skilled operator and give you as much time as you need," pro audio dealer Parsons says. "We encourage customers to resist the temptation to take the controls, though. Because of the learning curve, you will not get as accurate a representation of how fast a system can perform a certain operation as you will with a knowledgeable user."

Your test procedure should incorporate those operations you perform routinely. Some parameters you may want to benchmark include backup and restore times, time required to set up the system for recording, time required to internally bounce four channels to a stereo pair, scrolling speed for a playlist containing hundreds of segments, and time required to perform a long crossfade from one stereo pair to another.

Some buyers take the concept further and perform an actual job on their system of choice. If it's paying work, however, dealers will generally direct you to one of their customers to book a session, so as to avoid any conflict of interest. Hopefully, the opportunity to work with an experienced operator is well worth the investment in studio time.

Finally, if you're an established customer and need to test the compatibility of the disk editor with your own room, many dealers and manufacturers will be willing to bring the system to you—provided you meet certain qualifications. Says Gand, "By qualified, I mean that we've worked through the evaluation

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THE COMPANY YOU KEEP

When you've finally found the system you want to marry, it's time to meet the family: the company that stands behind it. Dealers should be happy to make the connection for you. Gand advises, "We always like to get the manufacturer together with the client before the sale. The customers want the security of a relationship with the company after the sale, and they don't want to feel like a number."

If it's feasible, a visit to the company can tell you just about everything you need to know. Chances are, however, you'll be making your presale contact with manufacturers over the phone. A company that's too busy to answer your questions may be understaffed or preoccupied by internal troubles. A lack of responsiveness before the sale does not bode well for ongoing support

afterward.

Generally speaking, a music or pro audio dealer will handle training on the inexpensive systems, and the manufacturer will provide training on the high-end systems. You get what you pay for: less training the less you pay, and vice versa. If you're leaning toward an inexpensive system, make sure it's one that's easy to learn.

Most manufacturers offer a one-year warranty covering parts and labor. But what differentiates good service from bad is how the manufacturer or dealer responds when problems occur—and they will. Bill Schlueter offers some reassurance: "I once had a card replaced on a Sunday morning at 9 a.m. Service is not a problem with Spectral." Gand states simply, "If something breaks, we provide you with a loaner until we fix it. Period." Excellent service is becoming the rule. If you suspect a company is not committed to it, seriously consider looking elsewhere.

INVEST IN YOURSELF

The least expensive professional-quality disk recorders cost as much

as a small car. The most expensive can cost as much as your home. This is not a casual purchase. But if you've done all your homework and come up with a system and a company that meet your qualifications, and you're *still* nervous about investing, consider these words to the wise from one who has recently dared, Michael Levine.

"As far as disk recording goes, we are at about the level of the first Mini-Moog," he says. "This is an industry in its infancy, and there are going to be rapid and dramatic changes in the next five years. Yes, you will probably have to throw away what you buy today within five years, but that shouldn't stop you.

"Buy what you're reasonably sure you can pay for in that time, and focus on the long term. You are investing in a knowledge path, and what you're learning now can be the foundation for the rest of your career." ■

Ted Pine is a partner in The Signal Group, a management consulting firm serving the audio, video and multimedia industries.



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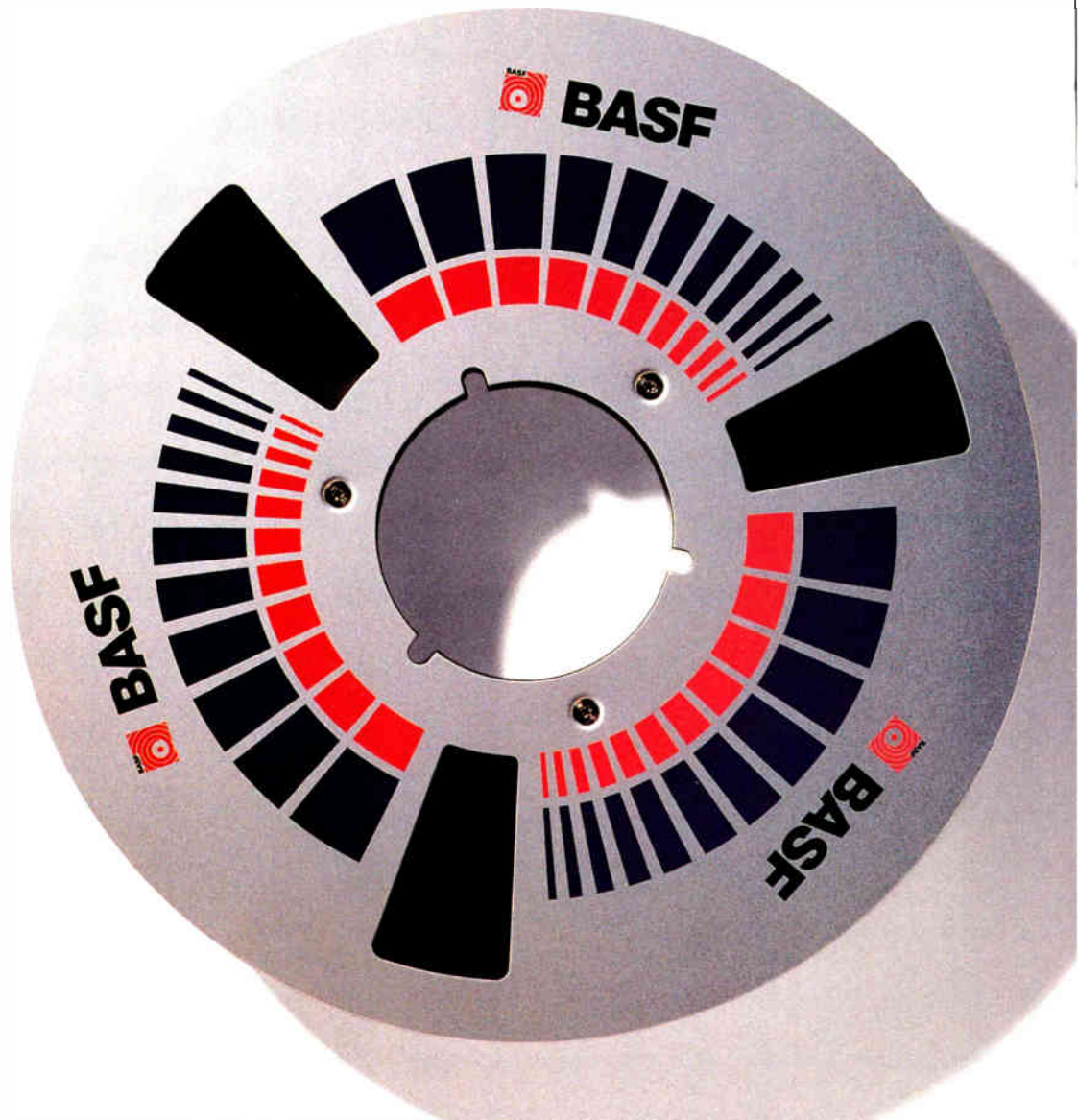
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World Radio History

by Chris Stone

TIPS FOR THE SMALLER STUDIO



With the emergence of home and project studios, and with the growing importance of multimedia, it is time to redefine the market. Small studios are an increasingly important part of the audio industry, and they need not compete directly with larger studios. Rather, each has its own niche, and the two can also work with one another. It makes sense for the big studio to offer services like mixing, duplication or tech maintenance in exchange for the small studio's outside business. Larger studios, too, might want to consider a small studio as part of a diversification strategy.

The small studio starts up because the operator believes he or she may be able to perform certain services and functions better or for a lower price than the competition. That formula never changes, but a lack of understanding the business aspects can prevent a creative person from doing it right. And a one- or two-room operation with a single key client must comply with the same rules of business and the same restrictions and regulations as the big ones. It's just on a different scale.

So let's look at the business side of running a one- or two-room studio. Once you have decided you want your own small studio, you have your space and your equipment, the questions are:

How do I run this place like a business and still have enough time to do my thing? How do I know I am buying at the right price? What about insurance? Leasing vs. purchase? How do I hire the right people, and what does that mean in terms of what I have to do to be legal? How do I find a part-time tech so that my studio works around the clock? How can I compete with the big studios, if I want to, on my small budget? How

should I affiliate with someone I can trust to furnish me with the services that I cannot (or economically should not) provide for myself? What about bookkeeping and accounting, marketing and PR? What will it cost, and how do I know when I need help? What other services do I need, such as tech support, janitorial, staff en-

Operator Tip Of The Month:

When you do a personal financial statement for your banker/creditors, make sure you emphasize your assets and minimize your liabilities. Tell the truth, and have it prepared by an accountant/bookkeeper. Recognize that the maximum amount your lenders will advance you in credit or cash is usually 75% of the net worth of your business and your personal assets. Expect to personally guarantee any debt you incur—it's a fact of small-business life.

gineers? What will it cost?

This is an overwhelming amount of information to consider, so here we'll look more closely at operations and finance. What exactly is necessary to be professional on a small budget? Here are some basics:

1. Comply with local zoning and business laws.

portunity" to do what you do best and make a multiple of the amount you must pay this person. The result is more revenue in the same amount of time for your company.

To save money, how much of a gamble are you willing to take to make that multiple? You have to decide whether this should be an employee or an independent contractor (a janitorial service rather than a janitor, for example). Each has its legal intricacies. Independent contractors and their hidden pitfalls have been recently discussed in these pages (October, 1992), so I will discuss employees.

When you hire employees, you must deal with a number of government agencies and reports. Call the I.R.S. (OmyGod!) and your local state income tax or sales tax agency. The I.R.S., for example, has Circular E, "The Employers' Tax Guide," which along with "Publication 334—Tax Guide for Small Business," will answer many of your questions. Your state tax agency, through the same kind of available instruction booklet, will tell you all of the licenses you must have to do business in your state. They will also advise you of all the rules and regulations you must conform to and may even tell you that you need to contact your city government for more permits. Welcome to the employers' club! Next, decide whether you hire a part-time bookkeeper, an outside payroll service or a business manager to take care of these details for you.

All of the above information is designed to make you aware of the costs of doing business in your area. With the forms in place, you are ready to think about a business plan and a budget.

A business plan is a road map for your business. It tells a potential investor, banker or business manager what, who, why, where and how much it will cost to operate your business, where the revenue will come from, and who the competition is. It will include return on investment, which is revenue minus cost, expressed as an annual percentage of the investment made in the business. This return on investment should be compared with the interest rate you could earn by simply putting your money into some safe, conservative money fund at little or no risk. This is the benchmark your invest-

2. Determine if you need professional acoustic help in the design of your room or recommendations about equipment, based on what you expect to accomplish in your studio (e.g., electronic vs. acoustic recording and matching the competition).

3. Create a realistic business plan and conservative budget tailored to your situation and updated as you grow by your professional experts (bookkeeper/accountant or business manager/lawyer).

4. Find a source of financing, such as a credit line, that you know will be there in troubled times. Or you may need to buy a major piece of equipment that will pay its way through increased revenue and allow you to stay competitive. (Only fools or rich people pay cash. Leverage is the American way.)

5. Speak with your accountant, business manager, insurance broker or banker/leasing expert for answers to financial questions. If you do not have one, get one. First, get recommendations from people you respect in the music business.

6. Decide exactly what your niche is—what you do best. And stick with it.

7. Find out which services you can buy for less than you can furnish them. (The key factor here is how much profit you can make.)

8. Hiring and firing. Learn to be a good manager so you can attract and keep good people.

9. Develop a marketing plan to promote your specialty and bring in clients. Base it on what you can afford to spend and what you must do to make yourself and your studio a recognized and trusted entity in your market.

OPERATIONS: WHO DO YOU TRUST?

The first fact to consider when you become an employer is that you are hiring somebody because it is less expensive in terms of time and/or money than doing it yourself, and you can reasonably trust him or her to get the job done. This includes all kinds of "opportunity costs"—meaning that sometimes you could do a particular job better (sweep the floors, messenger the tapes) but decide to hire somebody to do it for you. This decision gives you the "op-

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tors/bankers will use to see if your business makes sense as an "investment."

A budget is how much revenue you project that you can pull in from your marketplace—and the amount you must spend to get it. Cash flow is a 12-month chart showing when you will receive your revenue and how you will spend it during your fiscal year. Fiscal year is the 12 months from the beginning to the end of your business year, after which you must file all year-end income tax reports. After you have this together you will be able to analyze what chance you have to succeed, based on your conservative estimates of revenue and cost and how many people you will have to hire. Now you must decide if it is really worth going into business for yourself!

THE BANKER, THE LAWYER, THE ACCOUNTANT AND THE MONEY

Once you decide to take the plunge into the sea of professional entrepreneurship, you will need the help of some outside experts. If you have a business manager, he or she will take you to a banker. If not, ask for banking referrals from fellow studio

owners. The first thing a banker is going to ask to see is the business plan, the budget and your personal financial statement. The way you present this information will make all of the difference in a banker's perception of you and your chances for success. What you want is a line of credit that you can "take down" on those rainy days when your cash flow lets you down.

Remember that studios are a cash-flow business. That means that you list all operating revenue first, all direct costs second, and the difference is your "operating profit" or "positive cash flow." The lender will look at how much extra cash you have to pay off loans and leases and/or invest in making your business better. Before a bank lends you money, you must prove your ability to pay back the loan; positive cash flow is the proof. Non-cash costs such as depreciation are normally not considered in determining your ability to pay unless they are a significant amount. The ideal situation is where you have positive cash flow and minimum tax liability, based on the depreciation schedule for your equipment.

You also need to get a referral for a lawyer and accountant/bookkeeper from your friends in the industry. Make sure these experts are familiar with the recording studio business. If not, the training you will have to give them is usually not worth the effort.

Our industry is a small, tightly knit clique. Everybody should know who the "movers and shakers" are in the club. Networking with them to find the least expensive way to accomplish these strange business functions is mandatory if you don't want to be ripped off, overcharged and messed with. Consult a studio organization such as SPARS for assistance from their regional VP in your area. That person should be able to give you the proper referrals to help you out.

So, you are off and running and are now known as a "studio owner." Have faith and do what you do best. Leave the rest to the experts and the employees/contractors you have determined you can trust to save you time and money. ■

Chris Stone, a pro audio consultant and former studio owner, is president of the World Studio Group, a global studio-booking agency.

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by Dan Daley

ONE MIC ONE ROOM

GETTING INTIMATE WITH A MICROPHONE

I

first encountered the idea of doing vocals in a control room years ago in a conversation with Peter Gabriel's drummer. He recounted the ex-Genesis vocalist's method of setting up a mic in the control room with the speakers turned on very low. Since then, the growth of one-person personal and project studios has made this concept an everyday reality out of necessity, if not choice, for many. Even with the luxury of a separate isolation space for microphones, the inability to be in two places at once puts a crimp into things when you're both the vocalist and the engineer. It's somewhat easier to mike an amplifier or acoustic instrument in the same room, but that also has its attendant problems.

Two main areas have to be considered in this situation: ergonomics and sound. Comfort aimed at getting a good performance has to be combined with the ability to easily operate the equipment. A remote is the first order of business—as full-function as possible—and placing it on a stand is the best bet. However, a momentary-type switch that can be held in the hand for punch-in/out is also a good idea because you won't have to change positions for those events. A vocalist's tendency to move the head slightly away from the microphone at the end of a line in order to hit the remote has added time to countless one-person sessions.

Monitoring is a bit more cumbersome. Peak meters are a big help because they'll hold the highest-input reading for a second or two, allowing you to glance over and check your own levels during vocals. Positioning the microphone

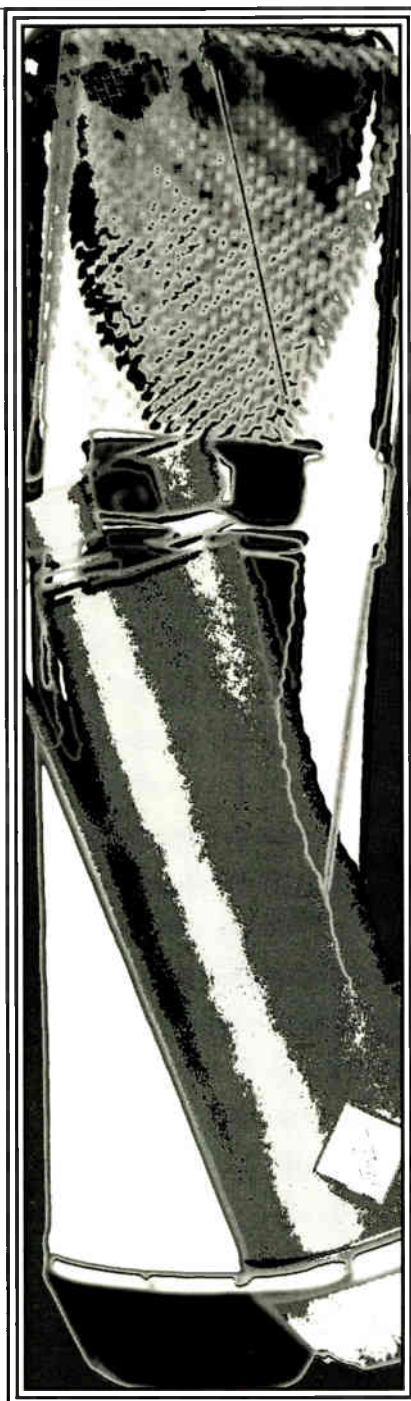


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However, if you just want to get practical about the whole thing, you can look at it this way, too. The CD Autochanger makes audio programming so absolutely efficient and error-free that your life will be made easier and your business could become more profitable. Which makes it seem rather impractical not to find out more.

Call Pioneer and ask about the CAC-V3200 Compact Disc Autochanger. You'll find it to be a simple decision that deserves a big hand.



 PIONEER

also merits consideration. You'll want some sort of surface in front, either reflective or treated for absorption, depending upon your taste, but that may mean facing the microphone away from the console. The best compromise appears to be a 90° angle away from the desk, allowing proximity to a wall and still letting you peek out of the corner of your eye to check the meter. This arrangement also works well for group vocals with a vocalist/engineer.

You're most likely working off headphones with the speakers switched off. It's a good idea to lay a line or two to tape and listen back over speakers to compare them to what's being heard in the cans. I also like to listen back to a completed vocal in solo mode to check for the gremlins that are common to single-room project studios—anything from car horns to irate neighbors banging on the pipes.

A basic dynamic microphone is the best place to start. There are plenty out there to choose from at

reasonable prices. One thing to be aware of in the small-room setting, though, is the proximity effect—encountering extra low end when using the microphone up close. Some mic types come with built-in bass roll-off attenuators. That's a good thing, but through experimentation and playback (again, in solo mode) this problem can be overcome, usually by rolling off some bottom on input or distancing yourself from the microphone by using a stand-held windscreen. The first order of business is simply to be aware of the potential for the problem.

Joe Ciaudelli encounters one-room vocal situations regularly at his CP Studios in Montville, Conn. (Ciaudelli is a technical manager at nearby Sennheiser, so he has a slight advantage.) On his upcoming self-made production, Ciaudelli found that a convertible sofa turned on end and opened up made a perfect go-bo: easily adjustable to accommodate one or more singers. He also prefers omnidirectional microphones for vocals, saying that they inherently reduce popping and that omnis

in general have an extra octave of low end available, down to as low as 20 Hz.

Miking instruments in the single-room setting also presents obstacles. Anything you can do to achieve some isolation—working out of a closet, a bathroom, etc.—is desirable, but sometimes that simply isn't possible. The main point is that you'll again be working off headphones. In a single room, working the preamp for distortion is better than going for speaker distortion, which is more dependent on amplifier volume. The louder the sound in the room, the more difficult it becomes to be sonically objective in the headphones. You might also try combining a microphone and a DI from the back of the amp and then mixing them.

Some interesting solutions have been devised to address the unique challenges that one-person operations present. John Trevethan, technical director at 16th Avenue Sound in Nashville, was asked to create a one-person punch capability for a Studer A80 multitrack deck after a client was told by Studer that it

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couldn't be done. "The studio manager at the time, Barry Sanders, suggested a parallel switch right off the remote control unit, and that's just what we did," says Trevethan. "We used two switches—one for record and play, and one for play to punch-out—built into a footswitch, and it worked out perfectly."

Not nearly so offbeat is Scott Baggett, a Nashville producer/engineer who actually prefers microphones in the control room for vocals. "A control room is no different from any other room in that it's supposed to sound good," he says. "But some people have a psychological barrier about using microphones in them. In project studios, you usually don't have much choice, and there's no reason vocals can't sound as good as they would in a vocal booth."

Baggett stresses that "there are no secrets; what sounds good to you is what sounds good." Start with a corner, he suggests, first accounting for ergonomics by making sure that the punch control/remote control is easily accessible. Then be aware of the acoustics. "Make sure that there are no weird reflections or slap-backs on the vocal by recording some dry and listening back," he explains. Once you find that spot, consider making it a semipermanent microphone area by running cable along the wall and applying some sort of absorption treatment on the corner walls. "But listen to the sound first," Baggett cautions. "If it sounds great as is, don't mess with it."

Investing in a couple of small baffles isn't a bad idea, either. They'll be useful for guitar amplifiers and acoustic guitars. "The baffles will help control the acoustics and the sound pressure levels so that if you're doing a loud guitar part in the same room and wearing headphones, you won't overpower the headphone mix while trying to get the right sound out of the amplifier," Baggett says.

As project studios proliferate, so will same-room microphone techniques. The best approach includes a combination of ergonomics and acoustics. And it doesn't take too much of either to produce a good result. ■

Dan Daley is the Mix East Coast editor.

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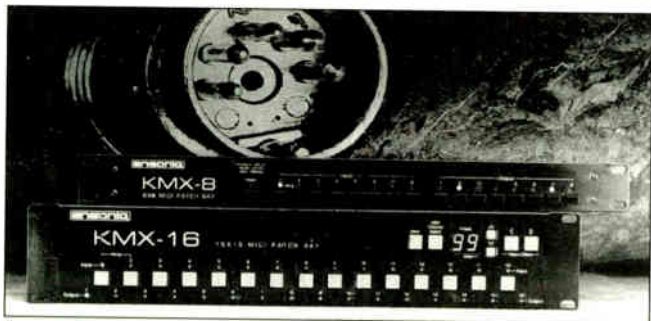


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NEW PRODUCTS



ENSONIQ MIDI PATCH BAYS

Ensoniq (Malvern, PA) introduced two programmable rack-mount MIDI patch bays, the \$295 KMX-8 (30 presets, eight inputs and eight outputs) and the \$579 KMX-16, with 15 inputs, 16 outputs and 99 presets. Both include Mac and Atari visual editing software that allows the user to name presets and all the MIDI devices in their systems, then simply draw lines between the devices to make connections.

Circle #228 on Reader Service Card

LEM DIGITALLY CONTROLLED MIXER

Generalmusic (Bensenville, IL) is now importing the European-made LEM line of pro audio products. New to the line is Sound Engineer, a programmable, MIDI-controllable mixer housed in a five-rack-space frame with front-panel disk drive and rear-panel connections. Mixing functions are controlled from any MIDI controller or via graphic display software on an Atari Mega ST or upward computer; software for PC Windows and Macintosh are also planned. In multitasking mode, software such as Notator or Cubase can run simultaneously. A 32-channel system (A/B-switchable for up to 64 inputs) is \$9,995; features include 3-band EQ, SMPTE time code read/generate/sync, four aux sends, balanced inputs, VU meters, noise gating and external, rack-mount power supply.

Circle #230 on Reader Service Card

SPATIALIZER

Spatializer, distributed by Audio Intervisual Design (Los Angeles), is a real-time processor that allows the placement and movement of individual sounds within a three-dimensional space. Spatializer can be used at any time during the recording/mixing/post-production process and requires no decoding, using standard stereo playback. The effect is said to be mono- and surround-sound-compatible. The system is expandable (up to 24 channels) and consists of a rack-mount processor and compact remote control, with joysticks and individual MIDI, mute, mode and solo buttons for each channel.

Circle #226 on Reader Service Card

TUBE-TECH HEADPHONE AMP

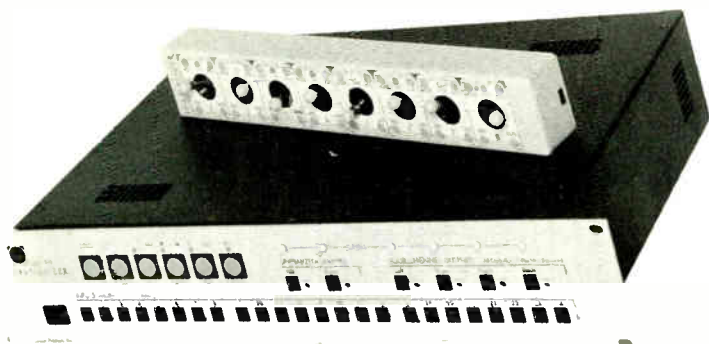
Distributed by AudioTechniques of New York City, the Tube-Tech PA 6 tube amplifier is designed specifically for studio headphone monitoring, with a dual-power triode output stage working as a push-pull Class A device. For design symmetry from the single-ended input to the output, the input and driver circuit also use dual triodes. The PA 6 can be used either in the control room as the headphone amp or for powering the studio cue system, with one input and four headphone outputs. Output power is 5 W/ch; frequency response is 5 Hz to 80 kHz; list is \$1,905.

Circle #227 on Reader Service Card

TDK PRO DAT LINE

TDK (Port Washington, NY) has introduced an all-new line of high-durability DAT cassettes for professional use. Available in 16/60/90/120-minute lengths, the tapes feature Electron Beam Cured binders (using a high-energy particle beam to keep the Super Finavinx metal particles in place) and an improved cassette mechanism for stable performance.

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SENNHEISER HD 440 II HEADPHONES

New from Sennheiser (Old Lyme, CT) is the HD 440 II, which at \$79 is the least expensive full-sized headphone in the company line. The HD 440 II features a comfortable, supra-aural (open-air) design; the large radial-bead diaphragms provide a frequency response said to be 20 Hz to 20 kHz, with THD under 0.9%.

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TANNOY PBM 5

Combining a 5-inch, long-throw woofer and 3/4-inch soft-dome tweeter is the PBM 5 compact reference monitor from Tannoy/TGI North America (Kitchener, ON, Canada). Housed in a 11.4x7.6x6.9-inch ported cabinet, the PBM 5 features five-way, gold-plated binding posts and removable front grilles. Frequency response is stated as 65 Hz to 20 kHz; sensitivity is 90 dB 1W/1m; and power handling is rated at 100 watts. Retail is \$295 pair.

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SOUNDTRACS JADE

Distributed by Samson Technologies (Hicksville, NY) is Soundtracs Jade, a multitrack recording console available in frame sizes from 24 to 48 channels. Jade's amenities include dual inputs on each module, along with fader and mute automation and dynamic gate processors on every channel. The board features FdB™ equalization, which is said to overcome the problems of the nonlinearity of human hearing. All inputs, outputs and buses are balanced, and available options are TT patch bays, stereo modules and transformer balancing.

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RAINDIRK SYMPHONY LN2 CONSOLES

UK-based Raindirk Audio (distributed in North America by Sascom Marketing of Pickering, ON, Canada) is now shipping its Symphony LN2 consoles with the new LN2 module. The LN2 features a 4-band EQ (with two fully parametric midbands) that can be switched into or out of the monitor path, pre/post-EQ channel-insertion point, eight simultaneous aux sends, standard PFL/AFL, and the ability to combine the output of the monitor and channel fader to the routing matrix, thus expanding the number of mic inputs.

Circle #232 on Reader Service Card



NEUMANN U67 RETURNS

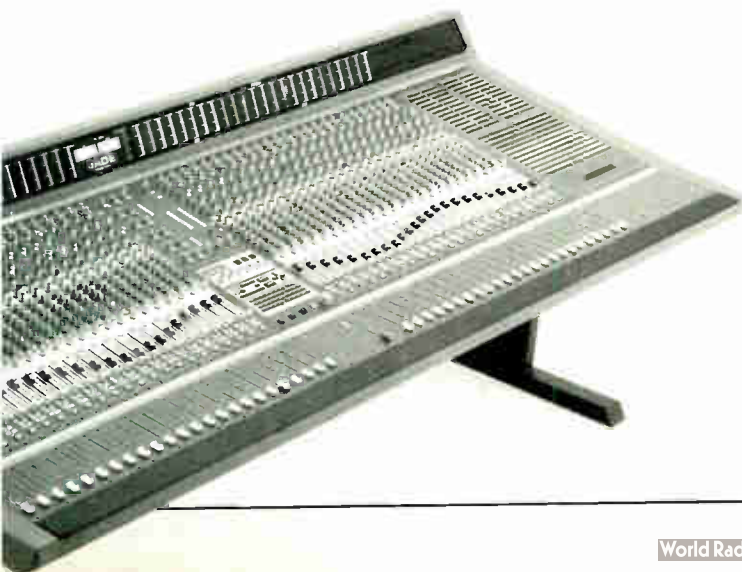
Georg Neumann GmbH (distributed by Neumann USA, Old Lyme, CT) has produced a limited number of the classic Neumann U67 tube microphones. The reissues will be identical to the original, with the same EF 86 tube, capsule and transformer, and all come complete with power supply, suspension, cable and rosewood box.

Circle #234 on Reader Service Card

MASTER TAPE GUIDE

Disc Makers (Philadelphia) has published the Guide to Master Tape Preparation. Written in a practical and nonpromotional style by mastering engineer Dave Moysiadis, the 46-page book includes tips and techniques with useful advice on how to prepare your master tapes when submitting materials to a record, CD or tape duplication plant. It's available free by calling (800) 468-9353 or (215) 232-4140.

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EUPHONIX CUBE

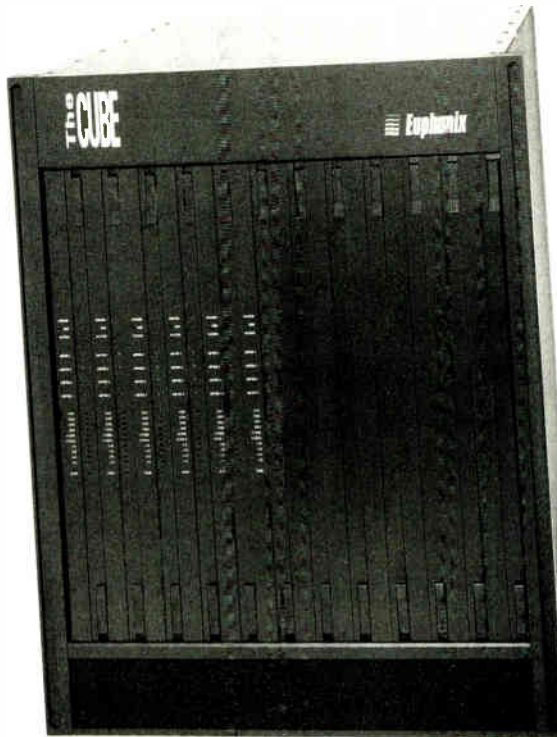
The first in a series of expansion options for the CSII digitally controlled analog mixer from Euphonix (Palo Alto, CA), the CUBE™ is a routing device that allows users to specify an almost infinite number of custom console configurations. As a simple computer-controlled routing matrix, the CUBE could replace an input patch bay, or the system could be fitted with DCAs to provide up to 48 auxiliary sends. Other applications include additional mix or multitrack buses, I/O cross-point switching matrices, multi-channel film mix or monitor buses, speaker output matrixing for sound reinforcement, and broadcast mix-minus matrixing. The CUBE software is compatible with the CSII's Snap-Shot Recall™ automation, and multiple CUBEs can be combined for larger routing requirements.

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DIGITECH TSR-24

The TSR-24 from DigiTech (Salt Lake City) is a programmable reverb/effects unit based on an expandable hardware/software system. Standard features on the \$800 unit include true stereo inputs and four discrete outputs; an optional PPC-100 card doubles the TSR-24's memory and processing power, while the PPC-200 offers five times the RAM of the standard model. All effects and parameters can be continuously controlled via MIDI, and effects can be placed at any point in the chain.

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**HOT OFF THE SHELF**

Penny & Giles E-Belt precision endless-belt fader controllers feature an optically derived digital output and internal 20-LED bar graph display that indicates the relative positioning of the belt. Call (310) 393-0014...**The Fresh Production Music Library** has released the "Quick Shot Directory™" a single CD with a short selection of each music theme in the 14-disc library. CDs are buyout-priced (individually at \$45 or in sets—all 14 are \$395); the directory CD is free on request. Call (800) 545-0688...Speaking of demos, a demonstration version of the Euphonix CSII digitally controlled analog console (built into flight cases) is available for facilities that want to audition the system in their own studio. Call (818) 786-1666 for info...**Two new Switchcraft 1/4-**

inch plugs are available: the 187 is a rugged connector for speaker applications; the 580 is an alternate version of the popular model 280, with the Switchcraft name molded into the metal handle. At your dealer or call (312) 792-2700...**BGW Systems** has extended the warranty coverage on its entire amplifier line to three years from date of sale by simply registering the purchase with the factory. In addition, a three-year warranty extension is available for \$100. Call (310) 973-8090...**A full line of Flux Magnetics replacement heads for Ampex recorders** made over the past 30 years is available, with most in stock for immediate delivery. Call JRF Magnetic Sciences at (201) 579-5773...**Tripp Lite UPS (Uninterruptible Power Supply)** products now include Ultimate Life-

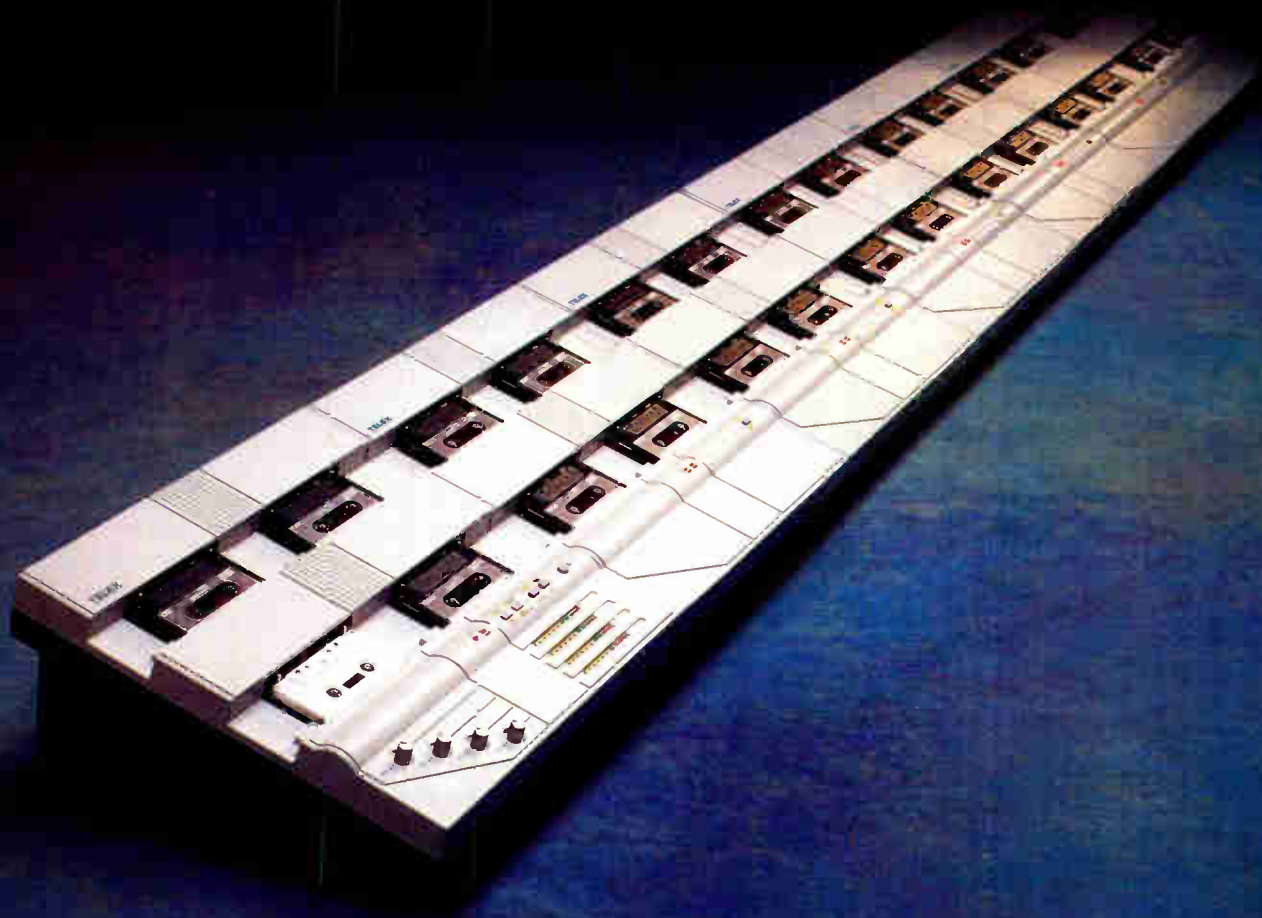
OTARI DISKMIX 2+

Otari (Foster City, CA) has updated its successful DiskMix 2 VCA automation; features of the new DiskMix 2+ include Version 4.0 PC software (the same used in DiskMix 3 VCA and moving fader automation), high-resolution, high-speed fader display, improved off-speed time code operation (now -50% to +20%), and two-frame data resolution. DiskMix 2+ is priced at \$6,995, including all software, hardware and documentation for fast installation; users of earlier DiskMix 2 systems can trade up for \$2,995.

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time insurance, providing the repair or replacement of any equipment (up to \$100,000) damaged by a power surge, including direct lightning strikes. Call (312) 329-1777...**A series of Acoustic Pressure Equalization (APE) adapters** are now available for **Bruel & Kjaer 4003 and 4006 omnidirectional mics**. These slip-on accessories increase directionality above 2 kHz, while increasing presence in the upper midranges. Call TGI at (519) 745-1158...**Q Up Arts** released a library of drum samples featuring Tommy Lee of Motley Crue, Alan White of Yes and studio ace Jim Keltner, with over 400 dry and ambient sounds digitally recorded at top studios. The library is available on CD-Audio, E-mu E-IHX CD-ROM and Akai S-1000 formats. Call (408) 688-9524.

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by George Petersen

PRODUCT

CRITIQUES AND COMMENTS

SP PL VITALIZER

From Sound Performance Laboratory in Niederkruchten, Germany, comes the Vitalizer, a 2-channel "psychoacoustic equalizer" offering a wide range of tricks and tools from a single-rackspace chassis. The unit combines dynamic equalization, phase-shift manipulation, harmonic enhancement and stereo-width contouring—all specifically designed to act in a way that corrects for the nonlinearities in the human hearing process; hence, the "psychoacoustic" in the product's name.

The Vitalizer employs analog equalization, with each channel hav-

ing), sub-bass, mid-high and harmonics. A single stereo-width knob adjusts such processing for both channels, and "process solo" control allows the user to hear only that part which is being added to the original signal. I found the latter to be invaluable when tweaking sounds, although cranking up your studio monitors while listening to the soloed processing and then forgetting to turn your system down when you switch back to the full-spectrum is a mistake you'll make only once. Ouch!

Besides the back panel's XLR-balanced inputs and outputs (which,



ing five interactive filters in a feedback loop design where the output of one filter controls the dynamic input of the next. Processing one part of the audio spectrum alters the other filters, so all frequencies are processed simultaneously. This is radically different from the traditional approach to equalization, so it takes a bit of practice to become accustomed to using the Vitalizer.

The front panel has the two channels laid out side by side, with each having controls for bypass, output level, process depth (wet/dry mix-

thankfully, are Pin 2 hot) and a ground lift switch, the unit also provides a five-way level switch for precisely matching operating levels to -10/0/+4/+6/+8 dB. A version with unbalanced 1/4-inch jacks, as well as a broadcast version (with switches for selecting impedances and Pin 2/3 hot preferences on each of the balanced inputs and outputs) is also available.

Low frequencies are tailored by a combination of a "deep bass" switch and a center-detented "sub-bass" control, marked as "soft" (counter-

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Today's recording studio has evolved into a multi-function facility which simultaneously addresses the specialized needs of music recording, film and video post, and radio production. In this environment, where the most critical listening often occurs in the final mix, close proximity monitors are often more important than the mains. The problem: most console top monitors, unfortunately, were designed for the living room not the control room. Until now.

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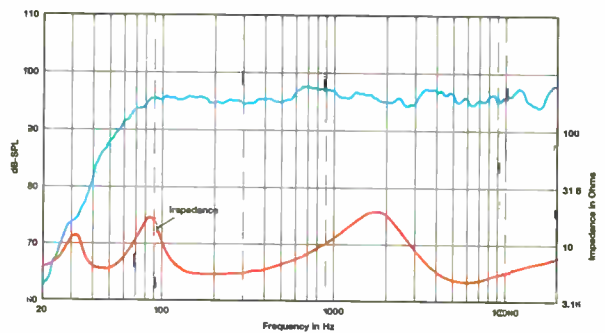
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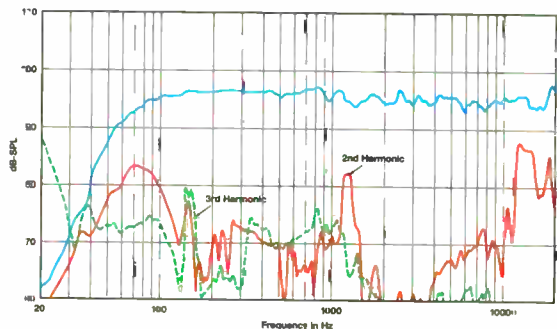
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Frequency Response (Model 4206): 96 dB at 1 m, typical console listening levels



Distortion vs. Frequency (Model 4208) 96 dB at 1 m, typical console listening levels (distortion raised 20 dB)

clockwise rotation) and "tight" (clockwise rotation). Turning the control in the soft direction increases amplitude of the signal, while varying the phase response from 0° to +6°. Rotating the knob in the tight direction also increases amplitude, but varies phase response by 0° to -6°.

Placed in series after the sub-bass section, the mid-high tune control is a wide-ranging, fourth-order filter operating from 1 kHz to 22 kHz. Those frequencies above the mid-high filter setting are boosted; a recessed trim pot allows changing the Q (bandwidth) of this filter.

Now things get complicated. The harmonics filter is made up of cascaded fourth-order filters, fed from a phase-inverted sidechain taken from the first filter of the sub-bass network. The setting of the mid-high control inversely sets the starting frequency of the harmonics filter: When the mid-high is set to its minimum, harmonics action happens at the highest frequencies; with the mid-high knob set to 22 kHz, harmonic enhancement begins at 1 kHz. Confused? Don't worry, I was too, but fortunately, the Vitalizer is a lot easier to operate than describe.

In using the Vitalizer over a period of weeks on rock, pop, new age and jazz sessions, I became mildly addicted to the device. The high-end enhancement is smooth, adding a nice snap to mixes or individual tracks without becoming harsh or edgy. Factory-set at a gentle ratio of 0.5, the Q control can be increased to a setting as high as 3.0 for corrective surgery on audio tracks, if necessary. In such high-Q settings, the mid-high controls operate like a reverse notch filter. In this application, the Vitalizer is perfect for bringing certain elements up in the mix that otherwise might have been lost, especially acoustic guitars, percussion, cymbals and hi-hat. I also liked adding a bit of high-end sheen to broadcast mixes, to compensate for that dullness when mixes are over-compressed in the broadcast chain.

The sub-bass control is hip, pro-

viding the ability to contour bass instruments—such as kick drum and bass guitar—without apparent muddiness or that mush that standard EQ techniques can add to a track. Despite the fact that the Vitalizer is actually manipulating the phase of the LF components, its $\pm 6^\circ$ effect is subtle enough to avoid any audible cancellation or mono-compatibility problems.

The stereo enhancement effect can be used in conjunction with the equalization/harmonics controls or by itself. The effect of this control can range from barely noticeable to truly bizarre, so a deft touch on the knob works best in most cases.

Generally, I found myself using the Vitalizer on stereo tracks, and adjusting the controls identically on both sides can be a chore. Perhaps SPL would consider making a stereo-only version of the unit in the future with a single set of knobs controlling both channels.

Overall, the SPL Vitalizer is a handy tool for any audio rack, whether it be in a recording studio, mastering suite, film/video sweetening room, broadcast facility or sound reinforcement venue. This is one high-quality, great-sounding unit that offers a lot for its \$1,500 price. Check it out.

Distributed by Sascom Marketing, 635 Weyburn Square, Pickering, Ontario, L1V 3V3 Canada; (416) 420-3946.

MARANTZ CDR-600 CD RECORDER

A compact disc recorder is a wonderful thing, and with the growing availability of the compact disc-recordable format, things in professional audio will never be quite the same. In the studio, clients love leaving the session with a CD version of mixes to check out at home. In the mastering facility, CD-Rs are invaluable references for the client and/or record label, for the purpose of approving edits or EQ changes before a project goes to press. In broadcasting, no high-quality medium is as universally accepted as a compact disc, and a CD-R is ideal for storing jingles, IDs, promos and commercial spots. In sound reinforcement and



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AUDITIONS

live theatrical applications, a CD-R simplifies the use of playback music or effects cues, especially in a complex production.

While CD-Rs offer all these advantages, the cost of hardware has been prohibitively expensive—until now. We checked out Marantz's CDR-600 (at \$6,500, the least expensive recorder on the market), a stand-alone design requiring no computer. Of course, the CDR-600 records 16-bit linear audio at 44.1 kHz.

First, some basics. Like other CD recorders on the market, the CDR-600 is a write-once player/recorder that conforms to the Philips Orange Book standard. During recording, a temporary table of contents is created, allowing start/stop recording or removal of the partially recorded disc until a later session. Once the recording is completed, a "fix-up" process rewrites the temporary TOC to a permanent location, so the disc can be read by any CD player. However, once the fix-up process is complete, the disc is no longer recordable.

The CDR-600 is a three-rackspace unit that, at first glance, resembles a consumer CD player. This is partly because the CDR-600 co-evolved with a Marantz consumer CD-R design; its inclusion of features like "shuffle" play (rarely required in most professional applications) bears testament to this fact. On the back panel are analog transformer-balanced XLR and unbalanced RCA inputs/outputs, IEC 958 Type II RCA and optical inputs/outputs and 1/4-inch microphone inputs (!). However, the CDR-600's consumer lineage also provides for a unit that is extremely simple to use: insert a disc, select an analog or digital input source, press "record" to set analog levels (or verify that the digital source is okay) and then press "play" to begin recording.

The CDR-600 is straightforward and easy to operate. There are a few annoyances. The track-advance increment button is quite small and non-strategically placed in the center of the unit. The analog/digital input select automatically reverts to the analog setting whenever the digital datastream is interrupted, as is the case when repatching the digital feed or when powering down the

source machine temporarily. Also, the unit does not automatically convert incoming DAT index numbers (start ID markers) to CD-R track increment flags. Fortunately, HHH Communications Limited and Audio/Design now offer CD-R indexing accessories, designed expressly for this task and compatible with the Marantz, Carver, Apex, Studer and other units on the market.

In its auto-tracking mode, the CDR-600 successfully reads incoming track-advance data from a CD player equipped with an S/PDIF output. Such a player/recorder combination provides a handy package for fast, short-run CD duplication, whether copying from a commercial CD or from a previously recorded CD-R. The CDR-600 automatically starts recording a CD-R blank on Track 1, so when copying CDs, the playback CD's first track-advance flag would begin each recording on Track 2 of CDR-600! I got around this by starting the recording with the CDR-600's track-advance button set to "manual." Once the recording begins, the button can be set to automatic and everything worked fine.

The fix-up procedure (for writing a permanent TOC) takes approximately four minutes and requires the pressing of two separate buttons, to avoid the possibility of prematurely writing a TOC on an uncompleted disc. Before writing a permanent TOC, the user has the option of inserting "skip" commands so that the player will bypass certain tracks (false starts, bad takes, etc.) on playback.

Due to certain ambiguities in the Orange Book specification, 74-minute discs are currently incompatible with *some* CD players (particularly earlier-generation models), and a number of hardware and software manufacturers are meeting in Japan this month to address this issue. I tested the CDR-600 using 63-minute CD-W12 discs from TDK. Priced at \$30, the TDK discs proved to be reliable, affordable and readily available. (For more info, call TDK at [800] TDK-TAPE, ext. 200.)

At \$6,500, the Marantz CDR-600 is a solidly built, simple-to-use and great-sounding machine. For those who may want a bit more, the company plans to release the CDR-610, an updated version with parallel remote port, AES/EBU digital I/O and

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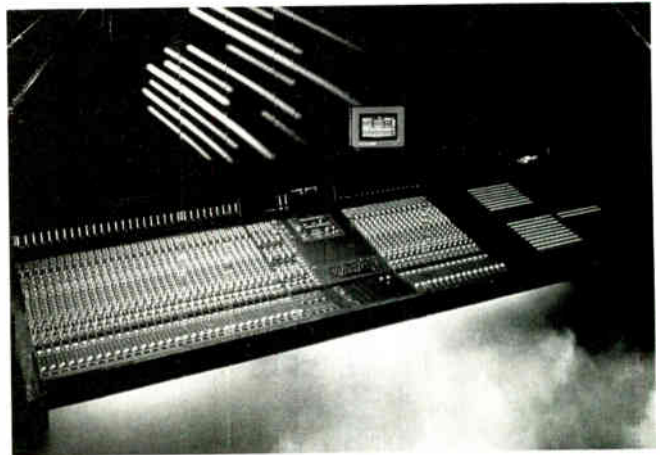
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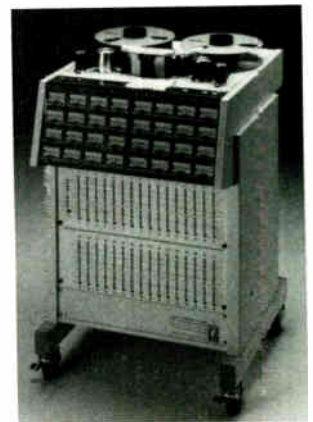
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hand-wired remote controller in the months to come.

Marantz Professional Products, a division of Dynascan, 700 North Commerce, Aurora, IL 60504; (708) 820-4800.

EV/DYNACORD DRP 15

Over the years, Dynacord has manufactured a full line of solid, high-quality professional products, most of which are seldom seen in North America. However, one obvious exception is Dynacord's signal processing, and now that Dynacord products are distributed by Electro-Voice, we should be seeing a lot more of Dynacord in the months to come. The latest product from Dynacord is the DRP 15, a single-rack-space multi-effects processor featuring 16-bit audio clarity and 24-bit arithmetic processing.

The DRP 15 has a large numerical LED display for program number, a 2-line/16-character LCD readout for program names/editing parameters, large rotary data wheel and buttons for page up/down, mode select, and "compare." Activated only in edit mode, the latter allows an instant means of comparing two versions of a sound being edited. The front

panel as one could ask for. You won't need to spend months poring over the manual to get this unit up and running. Creating new presets is a simple matter of copying one of the 99 factory settings to one of 128 user slots; push the edit mode switch, page through to the parameter you want to change, and spin the rotary wheel to get the setting you want. Press the store button and you're done.

The DRP 15 has stereo inputs and outputs, and like most other products in its price range, it has a single processor that creates effects from a summed component of the left and right inputs. So unless you are using the DRP 15 as an in-line device (to process a true stereo signal), the unit should be considered a mono-in/stereo-out device. This is not to say that the DRP 15 doesn't create stereo effects—it can and certainly does excel in this regard—but in most studio applications only one effects send to the DRP 15 is required.

For those seeking audio fun, the DRP 15 has plenty of tweakable parameters. The main reverb program provides control of reverb level, room size (up to 142,990 cubic meters), nine reverb types (room, plate, etc.), up to 20 seconds of reverb time, HF/LF damping, 100ms of pre-



panel also provides status LEDs, an LED input level meter and—in what is an appreciated touch—seven LEDs that indicate any of seven active effects algorithms (up to six can be used simultaneously).

The back panel has unbalanced 1/4-inch inputs for line- or instrument-level signals, switchable-level (-6dB or +4dB) 1/4-inch stereo outputs, remote footswitch control jacks, ground lift switch, and an AC socket for the internal power supply. None of that save-a-buck/use-a-wall-wart stuff here, thank you. MIDI in/out/thru jacks provide access to controlling program changes and certain effects parameters via a sequencer or other MIDI controller.

Perhaps one of the most impressive things about the DRP 15 is its user interface, which is about as sim-

ple as one could ask for. Up to six programs (reverb, EQ, modulation, pitch shift, delay and dynamics) can be combined for new sounds. There is a minor language problem, however. What Dynacord refers to as "dynamic" effects are actually guitar distortion, voice filter and effects level settings. Sorry, there is no LA-2A hidden inside, but the guitar distortion stuff is quite usable.

From the names of some of the programs ("See the Stars," "Life is Life," "One More Beer," etc.), it is obvious that the folks at Dynacord enjoy their work, and this is evident in the quality. Checking out the DRP 15 by listening to Denon's *Anechoic Orchestra* #PG-6006 (a CD of a 100-piece orchestra performing classical selections, recorded in an anechoic chamber), it was obvious immediately that the reverbs are dense, rich

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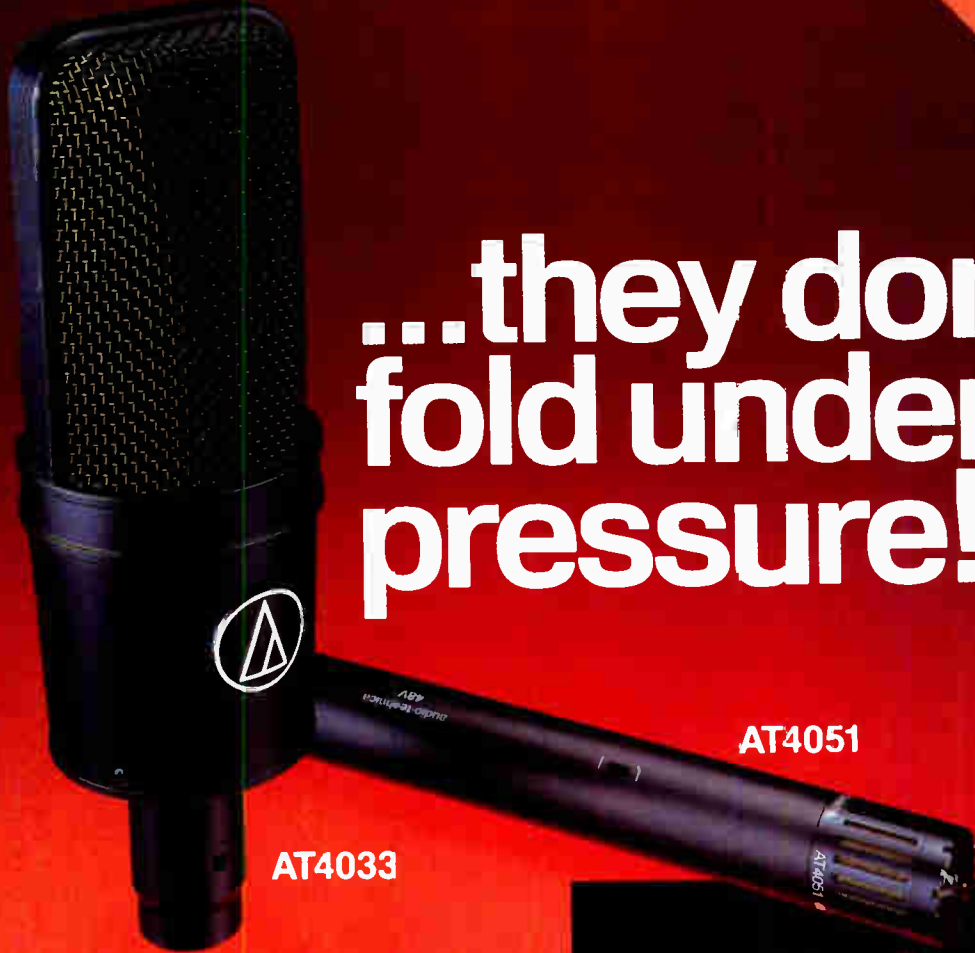
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Jeff Giedt (standing), Josh Leo (center, seated), Steve Marcantonio (standing), Larry Lee (seated, far right)

Josh Leo *Producer*

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I've got to stress the flexibility of the 4051. It's so clear and present on the acoustic guitar and piano, yet it gave us the grit and honest sound we wanted from the Marshall. We must have tried a million microphones, but on both power chords and leads the 4051 held up better than any other.

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and full—great stuff. With very few exceptions—"Wet Drums" and a couple of the guitar settings—the audio is remarkably clean, with clear, transparent highs. The pitch shifting is average, with some audible splices on program material. However, used as a slight detuning, or mixed in with other effects, the pitch shifting is fine and gets the job done. Given Dynacord's leadership in rotary speaker simulation, I was not surprised by the DRP 15's top-notch modulation effects, with a fine selection of rotors, chorus, flanging and phase sounds.

If you're in the market for a mid-priced reverb, the Dynacord DRP 15 is a more-than-able contender at \$1,084. And if you consider its high-quality audio, ease of programming and wide selection of usable studio effects, the DRP 15 becomes a sensible choice, either as a primary reverb in the project room or as an alternate in the larger facility.

Distributed by Electro-Voice, 600 Cecil St., Buchanan, MI, 49107; (616) 695-6831.

RASTEROPS MEDIATIME

by Paul Potyten

The MediaTime Display Adapter from RasterOps is a graphics display board for Mac II and Quadra computers that combines 24-bit color with live video and 16-bit stereo sound. The MediaTime board is unique among the current line of video digitizing boards in that it incorporates Digidesign's AudioMedia hardware for recording 16-bit digital audio on the card. It's an attractive alternative for anyone interested in getting into 16-bit digital audio and QuickTime video production.

But first let's talk about the video side. MediaTime supports Apple's high-resolution 13-inch or compatible monitors at 640x 460 pixels. It accepts video input from any NTSC, PAL or SECAM source, in either Composite or S-Video format. MediaTime can sense whether an interlaced or non-interlaced monitor is selected and adapt itself. As with other video display

adapters, it can be used in place of or in addition to your existing video card.

MediaGrabber, the software application that comes with MediaTime, plays live video in a window on your screen, and you can use it to record QuickTime movies and capture still images in 24-bit color. To do this you must also have 32-bit QuickDraw, which is inherent in

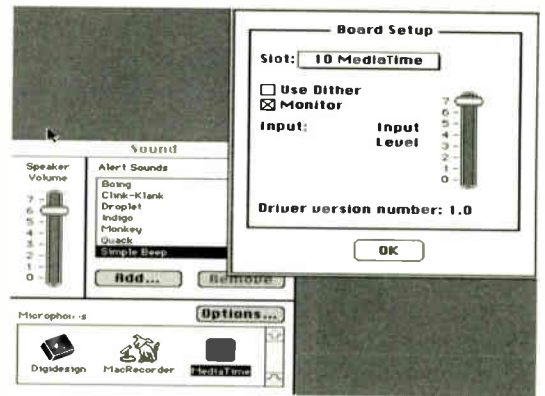


Figure 1

System 7 and built into the firmware of the Quadra, Ixi and IIfx.

The MediaGrabber software has

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powerful video controls that allow you to tweak color (fig. 1), either on the signal that is coming in or after it's already recorded to hard disk. The program lets you choose among three recording options: video only, audio only, or audio and video.

A MediaTime Audio/Video box connects to the MediaTime card via cable. The A/V box employs RCA jacks for its video input as well as stereo audio ins and outs. An optional RasterOps Video Expander (\$599) allows you to send color video output to a VCR in NTSC or PAL, with the ability to genlock to an external source.

Having the AudioMedia ability on the MediaTime card is good. Sooner or later, QuickTime will support CD-quality audio (it was rumored that Apple would introduce a 16-bit sound output driver before the end of the year), and the MediaTime board will be ready. Until then, any QuickTime movie that includes audio will be recorded and played back at 8 bits and either 22 kHz or 11 kHz mono through the Mac speaker. What this means is that the MediaTime board will give you stereo audio at high resolution *only* when you record using the "sound only" option offered by the Media-Grabber software. And if you want to edit your audio—in any resolution—you will need additional software, such as Sound Designer or Opcode's AudioShop.

Despite these drawbacks (which are mostly caused by Apple's current QuickTime architecture), the MediaTime board and bundled Media-Grabber software are a good bet for multimedia producers, offering video features exceeded only by dedicated QuickTime editing packages such as Adobe's Premiere. And it is the only board with built-in 16-bit audio capability. RasterOps MediaTime Adapter is priced at \$1,999. The company also has introduced MoviePack, a daughterboard for MediaTime, which offers full-motion video compression (see "The Byte Beat," January '93).

RasterOps, 2500 Walsh Ave., Santa Clara, CA 95051; (800) 729-2656 or (408) 562-4200. ■

Mix product editor George Petersen lives with his wife and two musical dogs in a 100-year-old Victorian on an island in San Francisco Bay.



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World Radio History

by Paul Potyten

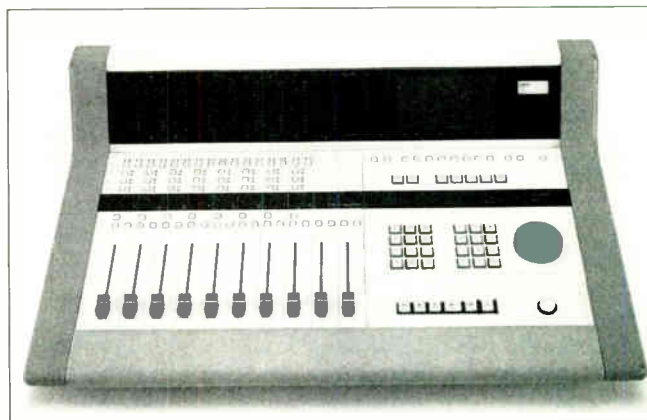
KORG SOUNDLINK

Korg has delivered some pretty impressive products to the MI market over the past few years. The MI Music Workstation and the WaveStation, to name two, have been very well-received by musicians and recording facilities. Now, with its introduction of SoundLink, Korg has landed solidly with both feet in the middle of the professional audio industry. One look at the back panel of SoundLink's main unit and it's clear that this system is designed for serious professional use.

SoundLink is an 8-track random access digital audio workstation especially well-suited for audio-for-video and video post-production. The basic turnkey system consists of a recording/mixing console, a QWERTY keyboard, a rack-mountable CPU with the DSP electronics

devices (which generate considerable fan noise) in a remote location; a SCSI cable is also included for connecting the two rack-mount components.

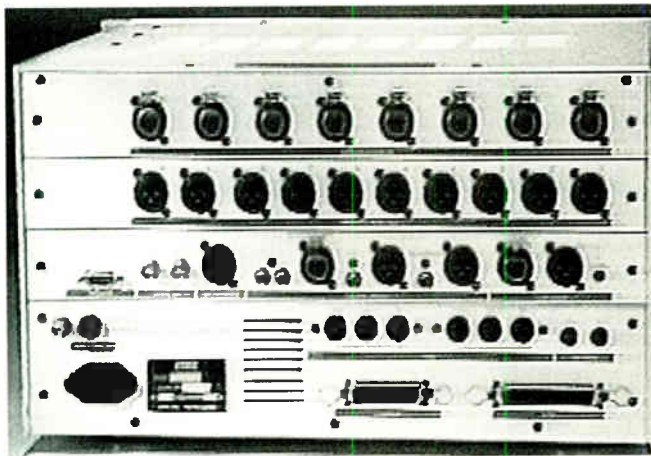
Optional Korg equipment consists of additional 670MB hard disks (two of which will fit in the storage



unit), a console stand and an expansion chassis for up to two additional hard disks. The system uses a maximum of five Hitachi DK 515C-78 SCSI drives, for a maximum of about ten hours of recording time. No substitutions, please. However, future plans call for compatibility with MO drives and 1.6GB drives.

Both the CPU and the storage unit are beefy 5U beasts, and Korg recommends that they be separated by at least one rackspace for better ventilation. Front panels on each are uncluttered, with power switches and, in the case of the storage unit, activity status lights and the 8mm tape backup transport with an eject button. The rear panel of the storage unit is equipped with two SCSI connectors, one for the CPU and one for additional hard disks. All audio connections are made to the rear of the CPU. They include eight bal-

Above: Korg Soundlink's hardware controller is logical and straightforward. Photo at left (A frame blowup from the Soundlink instructional video) shows the back panel.



and I/Os, and a rack-mountable storage unit with one 670MB hard disk and an 8mm Exabyte drive. A/D is 16-bit linear, 64x oversampling at 44.1 or 48kHz sample rates, and D/A is 18-bit linear, 8x oversampling. A 60-foot console cable lets you set up the two rack-mount

anced XLR analog inputs and ten balanced XLR analog outputs. Digital inputs are both XLR and RCA, selectable to either S/PDIF or AES/EBU from the software settings on the console, as are track assignment of the incoming digital signal and track outputs from the console to the digital outputs. Other connections are LTC time code in and out, BNC video reference and VITC in, 9-pin serial out for controlling VTRs using the Sony protocol, word clock sync, and two sets of MIDI in/out/thru connectors.

The console is compact and well laid out and can be divided into seven sections. At the top are ten audio level meters, with one per channel and a pair for the master stereo. Below the meters are 16 MIDI track status and eight audio track status keys. The signal-routing section is located below these, with Record Select (between either the corresponding input or the bus signal from the internal master) and Channel Select keys (between input and hard disk) for each track. Below this section is the digital mixer, with Read, Write, Mute and Solo keys for each fader. To the right of the eight channel faders are a MIDI fader (for adjusting the level of all MIDI instruments) and a master fader (for the stereo master bus).

Farther to the right is the edit section, consisting of the LCD and a set of 20 keys used to navigate through the various modes and pages of setup and editing tasks. More about this later. Next in line is the edit/locate section, which includes a location display, readable in either hours/minutes/seconds/frames/subframes or cue#/measures/beats/ticks; two 12-key keypads for various locating and editing functions; and a multifunction dial, which, when used with an Edit key, modifies parameters displayed in the edit window, or, when used with a Locate key, changes the "in" point of your session for playback, recording, scrubbing or editing. Finally, the transport section contains the familiar "stop," "play," "record," "rewind" and other functions, as well as a Store Mark key.

A stereo headphone jack and volume control are available on the front of the console unit, as is a con-

trast knob for the panel display. Rear terminals allow connections to an optional QWERTY keyboard and either RGB or composite video monitor for display of the LCD information and location.

The edit section of the console is by far the most complex. If you're familiar with Korg's popular M1, you're ahead of the pack, as the SoundLink editing architecture is organized in much the same way, with its Page+/Page- buttons, Up/Down buttons, and lettered buttons located under the display. The two mode buttons on the far left—Misc and Disk—are used for setting up your

**If you're
familiar with Korg's
popular M1, you're
ahead of the pack.**

session files and parameters such as clock source, sampling frequency (44.1 or 48 kHz), etc. They're most likely to be used at the beginning or the end of a session. The next five mode buttons—Audio, Mixer, Effects, MIDI and Mark—are where you'll be spending most of your time during a session.

Audio mode lets you view a representation of your tracks on a scrolling time line. From here you can easily switch to Scrub mode after selecting one or more tracks to be scrubbed. For each mode, the functions of the set of lettered keys (A through H) located under the screen will change. For example, in page 1 of Audio mode, buttons A, B and C determine preset values for ramps and crossfades at the beginning and the end of segments. These values can be edited at any time for individual segments, with a maximum fade time of 250 ms. Pressing button G and entering a value determines what track(s) you wish to scrub, and pressing button H puts you into Scrub mode.

Once in Scrub mode, the function of buttons A through H change. The scrub feature is well-implemented, allowing you to zoom in/out and play to/from the present "tape head" location. It makes locating to a pre-

cise edit point an elegantly simple procedure. Pages 2, 3 and 4 of Audio mode allow you to move, copy, trim and delete audio segments and sounds. (Korg makes the following distinction between the two: Sounds are raw audio data, as originally recorded into the SoundLink; segments are pointers that instruct SoundLink to play a particular sound starting and ending at particular points. Sessions consist only of segments, although it's possible for a segment to represent the entire length of a sound.)

Mixer mode allows you to prepare tracks for automated mixing, create and take snapshots of your track EQ, and enter/edit EQ and mute snapshots into an automated cue list. Eff mode lets you roll your own reverb settings from room, hall or plate presets—with a maximum time of ten seconds—and control damping, reverb EQ, predelay, reverb and early reflection predelay and ambience. A maximum of 200 reverb snapshots are possible; a similar compressor/limiter page also holds up to 200 snapshots.

MIDI mode allows you to record directly into SoundLink from either a MIDI controller or an external sequencer. The onboard sequencer allows real-time and step recording—as well as editing—of up to 16 MIDI tracks, and a maximum of 20 sequences can be saved to disk. However, the 96ppqn resolution makes it less than an ideal sequencer for MIDI. My hunch is that its most common uses will be for triggering sound effects and synchronizing to external MIDI sequencers, since it does implement MTC in and out.

Mark mode lets you edit the location of as many as 100 marks you've made with the Store Mark button. This feature is easy to use and very useful in locating different sections of a session quickly. The Dial/Step key on one of the two 12-key keypads lets you choose either seconds, minutes, segments, frames or marks, so that you can use the dial to locate to any of these resolutions. A handy feature, indeed.

SoundLink offers an abundance of powerful features such as nondestructive editing, continuous fader automation, 3-band customizable EQ with snapshot automation, noise gates, compressors, three types of tweakable reverb with snapshot au-

tomation—the list goes on. For those who prefer to use external signal processors—such as the Korg A1 or Lexicon 300, which are equipped with digital I/O ports—SoundLink has a digital aux bus that is switchable for AES/EBU or S/PDIF applications.

In order to offer such features at a relatively attractive price, Korg chose to implement them via a less-than-ideal user interface. The small (2.75x5 inches) onboard LED display can be augmented by connecting SoundLink to either a larger composite video or VGA computer monitor. This is a definite plus, although it does not entirely solve the problem of accessing the depth of control offered by the seven edit modes, with as many as eight pages for each mode. And each page can contain many editable parameters.

For example, here's how to select a reverb setting and add it to a track: Press the Eff mode button (one of the seven mode buttons); push the Page+/Page- buttons to select Page 1; push the Up/Down buttons to get to the set of available reverbs (numbered from 000 to 199); push the Edit button above the wheel, and turn the wheel to enable the reverb setting you want to use. To assign this setting to a track, push the Mixer mode button; push the Page+/Page- buttons to select P3; push the Up/Down buttons to select the Reverb Balance parameter; push the A or B buttons to select the channel you want; make sure the Edit button above the wheel is still active, and use the wheel to add the desired amount of reverb. Now that's a lot of button pushing, and those of you who are used to tweaking a reverb pot on your console might find this a bit daunting. It's not as difficult or time-consuming as it sounds, but it's not a trivial task, even if you *know* what page to look at. I found some tasks, such as moving, trimming and copying tracks, to be equally complex.

Other tasks are downright intuitive. For example, I was able to set up the system, record a couple of pairs of tracks through the analog inputs and automate a mix with surprisingly little time spent buried in the large, somewhat intimidating manual. Next, I successfully brought a pair of tracks from a DAT into SoundLink after using Misc mode to

assign the digital inputs to a pair of channels.

Korg is aware that SoundLink is a complex system to master, and the company is doing a lot to help new users get up to speed. A SoundLink Quick Reference Guide, written by Michael Haprov, Korg's West Coast technical support person, provides clear instructions for performing some of the most basic tasks. And new customers are provided with two full days of training on SoundLink before they go out into the world. Once they're out there, tech support is a phone call away. Applications engineers are armed with voice mail/pagers to facilitate quick response to problems. A nice touch, and while I haven't tried it at 2 a.m. on Sunday morning, I got prompt help whenever I called.

SoundLink will certainly find a home with audio-for-video producers, particularly in digital video production, where it can handle audio manipulation entirely in the digital domain. It's among the most flexible of the new generation of workstations, with the ability to be a controller or slave when used with external devices via LTC, VITC or MTC. In the former, you can use the SoundLink's transport controls to operate on Sony 9-pin protocol. The audio editing features are especially well-suited for use in that environment, although music-only facilities may find it equally valuable as an all-digital turnkey system, either on its own or as an adjunct to an existing analog or digital 24-track setup.

I found the Version 2.0 software to be solid, and I got a sneak preview of Version 3.0, which will include even more features, such as autofades and threshold recording. I suspect that the basic price tag of \$37,000 is going to limit SoundLink's mass appeal. But this system offers powerful features: random access 8-track digital recording, automated mixing in the digital domain, onboard signal processing, video sync and MIDI sequencing—even a tape backup drive is included. I'm unaware of any other turnkey random access digital audio workstation that offers the same features at this price point. Oh yeah, need I say that it sounds great?

Korg Professional Audio, 89 Frost St., Westbury, NY 11590; (516) 333-9100. ■

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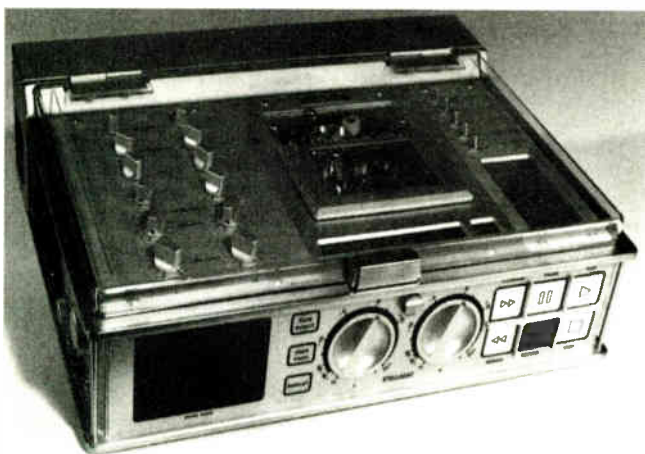
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POST PRODUCT SPOTLIGHT

Stellavox StellaDAT
Now available and distributed exclusively in the U.S. by Audio Services Corp., North Hollywood, CA, is the Stellavox StellaDAT portable digital recorder. StellaDAT's modular design allows

er with matching bodypack and/or handheld mic transmitter and carry case.

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users to custom-configure the deck with a variety of input, powering and time code modules to suit any production needs. The deck retails at \$11,972 (the time code option is \$2,300), and features include AES/EBU and S/PDIF digital ports, large electroluminescent data display, and a lightweight (6.5-pound), all-metal body.

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Beyer ENG Mics

BeyerDynamic (Farmingdale, NY) has announced two field-use mic packages designed for production or rental applications. The ENG 86 includes an MCE 86 shotgun mic with pistol grip, windscreen, shockmount and case. The ENG 170 kit combines a TE 170 VHF mini-wireless receiver

time" operation and interfaces for personal computer control of the system.

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Doremi Labs DAWN II

The all-digital version of the original DAWN workstation, DAWN II from

Doremi Labs (Covina, CA) offers eight balanced XLR analog and eight AES/EBU digital inputs/outputs. The Macintosh-based system is expandable in 8-track increments and operates in direct-to-hard disk or RAM modes; additional storage devices can be added to the system



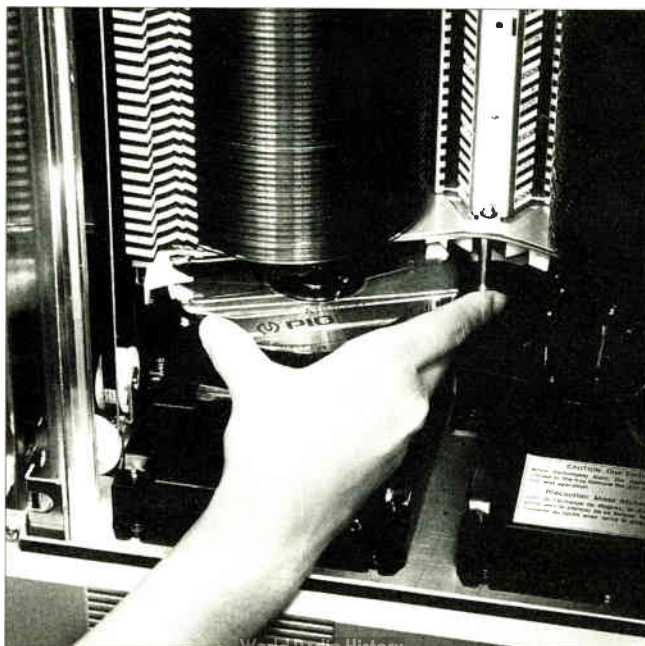
via SCSI. Now available is the ability to import EDLs and cue lists in CMX, Sony or Grass Valley formats and auto-conform the SMPTE edit points while DAWN controls the tape transports containing the dailies. Recently unveiled was the ADX hardware controller, with a full-function autolocator, programmable softkeys,

Pioneer 300-CD Changer

The CAC-V3000 from Pioneer Laser Entertainment, Long Beach, CA, is a broadcast-quality CD changer with a 300-disc capacity. The unit features two separate playing heads for "zero wait

scrub wheel and large time code display.

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Fiber Options Series 241D

The Series 241D Audio/Video Transmission System from Fiber Options (Bohemia, NY) simultaneously sends audio/video data over a single optical fiber in A/V routing and distribution applications. The compact transmitter/receiver system includes level-loss indicators for determining received optical power and an automatic optical gain control circuit that eliminates the need for system adjustments after installation.

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transports for both VHS and 8mm. We tried them both. In fact, tests show 8mm to be superior for digital audio multitrack recording. That's just the start. The 8mm format is superior in many ways. Like "Auto Track Finding" (ATF)—an innovative technology that ensures consistent, error-free operation by imbedding important control information during the helical scan. This maintains a perfect relationship between the tracking and program signals on your tape. What does that mean? Precise editing for punching in and out as well as the ability to exchange tapes between musicians and studios without synchronization concerns.

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by David (Rudy) Trubitt

SOUND CHECK



The U2 Outdoor Broadcast crew near the end of their U.S. stadium leg. Pictured left to right are Steve McCale (monitors), Jo Ravitch (system engineer), Joe O'Herlihy (house mix), Jimmy Hores (house tech), Robbie Adams (house effects mix) and Dave Skaff (monitors). See July '92 Mix for a profile of the arena leg of Zoo TV.

WINTER BUSINESS UPDATE

Winter is again upon us. Competition for the season's tours was again expected to be fierce, with a number of desirable gigs up for grabs at press time. By the time you read this, most will have been awarded, but here's a partial overview of what's going on out there.

Electrotec's Pierre D'Astugues says, "I see it as a steady winter. I certainly think that this is going to be comparable to the winter of '91, but much better than the winter of 1990, which was a dreadful year." The Canoga Park, Calif., company is currently out with Def Leppard, Damn Yankees, Tesla, Alan Jackson, Randy Travis and Alabama, and will be supplying Guns N' Roses with a control and monitor system for their tour of Japan, the Far East, Australia and New Zealand. Electrotec also covered several New

Year's Eve shows, including the Las Vegas Hilton and the Red Hot Chili Peppers and Ice Cube at San Francisco's Cow Palace.

Maryland Sound Industries tours (fielded primarily by the East Coast office) include new client Billy Ray Cyrus, the Pointer Sisters, Sheena Easton, En Vogue, George Benson, the Beastie Boys, Julio Iglesias, Neil Young, David Sanborn, Neil Diamond, Dolly Parton, Gloria Estefan and a scheduled New Year's Eve gig at Madison Square Garden with Michael Bolton.

MSI's West Coast Operations have moved into new facilities at 9745 Independence Ave., Chatsworth, CA 91311; phone (818) 764-5222, fax (818) 993-1202. The new 8,800-square-foot facility is laid out for fabrication and engineering for MSI's permanent-installation group, which

—CONTINUED ON PAGE 123



Elton John

Referred to as "The Riser of Doom" by the crew, Elton's rig is shown from his, and the audience's perspective.



Performer

Elton John

Venue

Oakland Coliseum,
October 30, 1992

Rental Company

Clair Brothers, Lititz, Pa.

FOH Mixer

Clive Franks

Monitor Mixer

Keith Carol

System Engineer

Mike Wolf

Crew

Cliff Downey (P.A.),
Tom Foehlinger (stage)

Clive Franks mans the house controls for Elton John's current world tour, a post he has held for all but two of Elton's outings over the past 20 years. (Franks is also well-known for mixing The Who and Peter Gabriel, among others.) His approach is a decidedly mu-



Left above: System engineer Mike Wolf and house mixer Clive Franks. (Note new PM4000). Right above: Monitor mixer Keith Carol behind his Harrison monitor desk.

sical one. "Don't get too bogged down technically," Franks advises. "I've stood on the sidelines of stages where the sound has been incredible and the band was cooking. But you get out front and something isn't right—the energy doesn't get across to the audience, and that's a shame. I'm not saying that it's bad sound. You can have good sound but not get a feel for the music. That's the whole thing—to be able to get that energy across.

"I don't believe in a lot of ef-

fects," he continues. "The more you add in a live situation, [the more] you can just get yourself into trouble. So many engineers spend so much time worrying technically that they lose out on the real meaning of what's happening onstage. Your system has to be fine-tuned, but once that's done, you've got to let go and just listen to the music. If the band suddenly goes in a different direction, you don't want to just carry on mixing and not listen to the music. If the voice

isn't loud enough, I won't push it up. I'll pull everything else down to create another dynamic. With Elton, it's great because there's a lot of room to create dynamics and moods in his songs. I seem to anticipate what they're going to do sometimes—especially with Elton. I guess

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after 20 years you do get in tune."

Elton's current tour began in Europe last May and came to the States in August. (Several of the European and U.S. gigs were double-bills with Eric Clapton and Showco). Following the U.S. leg, it was off to South America and Mexico, and after the holidays, on to New Zealand. The tour may continue into the summer with another U.S. and European leg. Sound is provided by Clair Brothers.

Mike Wolf is Clair's system engineer for the tour. He's worked with Elton and Franks for ten years and mixed the '84 tour while Franks was off the road. "We're carrying 72 S-4s with us right now," Wolf explains, "and we had 128 in Europe. We take out what we need and leave as much in the truck as we can." Sixteen of the S-4s are P-type cabinets, the company's long-throw configuration. No subwoofers are used in the rig.

Wolf describes a new flying configuration being used this time around. "This is the most bumpers I've had attached together per side of the stage," he explains. "By connecting it all together and having double motors on it, you can steer it where you want to. I can wrap right around the upstage corners, so the back bars just have to cover directly behind the stage.

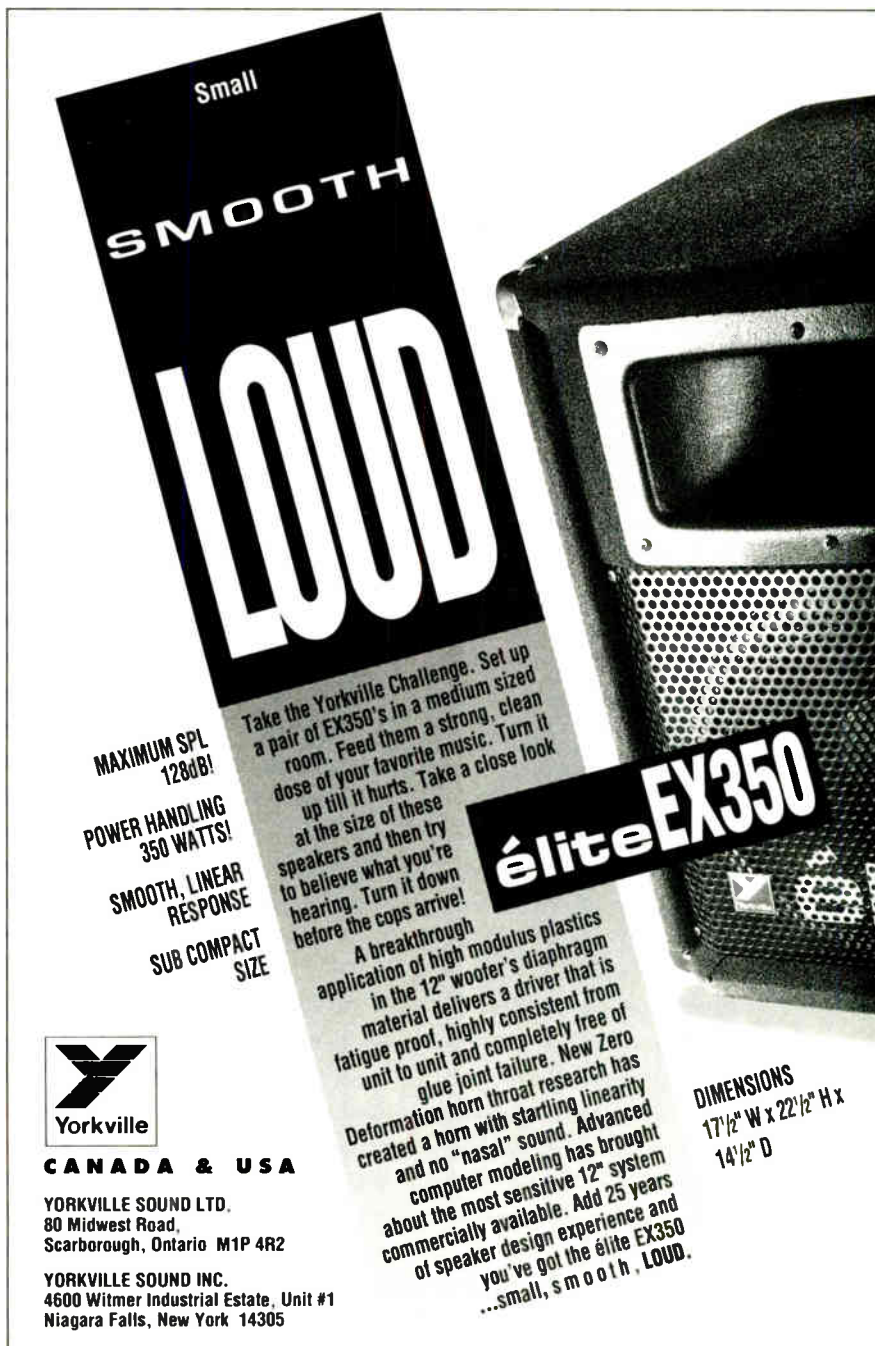
"Front fill is always a problem, no matter what you do," he continues. "Hang it from the stacks above you and it sprays the stage too much, unless you've got real narrow horns, which create their own problems. If you put something high enough on the side to cover the center, you still have spill on the stage, plus you're blocking sight lines from the side. And production doesn't want you to put anything in front because it blocks their set. But the people up front are the people the band sees. If you make the show sound better for them and they have a good time, the band does the same."

This tour's solution is to use Clair's P-4 piston cabinets lying flat on their sides between stage wedges. "They're the same

height as our 12AM monitors," Wolf notes, "which are very small. They're spread out across the front, and they do a good job filling in. They're turned way down to not hurt the people who stand up right in front of them—safety first. They blend in, and the set designers aren't that worried about them. It'd be nice to be able to get two more up there, but production won't let us!" (On the other hand, the tour's production manager scored some audio points by

skipping the originally proposed metal grates that would have covered the monitors.)

Once the system is up, final tuning is left to Franks, who relies in large part on the sound of his voice booming throughout the empty hall. "This is a tough room when it's empty; it should be better when the people come in," he says. "There's a lot of rumble all through the spectrum. I'll keep sounding the room out until it sounds smooth, then walk around. I try to get every-



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thing from the house graphic. I'll do all my work there, and I find that I need very little EQ on the board. But my graphic looks like, "No room can be that bad, surely!"

New on this tour is a Yamaha PM4000 console. "Basically," Wolf says, "it has everything the 3000 did plus additional things that make it more flexible. It's been reliable, and it's been working out real well. The biggest advantage is the stereo input chan-

nels—it comes with four and we added another eight. We started with a PM3000 and a side board for effects returns, and we're now down to one console with some open channels."

"We thought we'd have the 4000 at the beginning of the tour in Europe," adds Franks, "but it wasn't quite ready. When it did come out, [Clair] kept the 3000 just to make sure I was happy, because we were changing it in the middle of the tour. But it was great—it felt comfortable

straight away. It's a little bit bigger to accommodate the extra channels. The EQ is so much better. It's still very sharp, but I can fine-tune it now and just get right in and pull out frequencies.

"I like working on the VCAs," Franks continues. "They're right in front of me in the right spot. It's comfortable, and that's the way I mix. Luckily, within this band, everything fits nicely onto its own submix." (The eight VCA groups are assigned to lead vocal, piano, guitar, one for each of the two other keyboard players, backing vocals, bass and drums.)

As might be expected, the focal point of the show is the artist and his piano. In contrast to past tours, which used acoustic grands, a Roland electronic piano is John's ax this time around. "It took us 18 years to get a great piano sound, and then he ditched it!" quips Franks.

Elton's seat at the keys also marks the focal point of cooperation between house and monitor systems. Keith Carol handles monitor duties. This is his second tour with Elton but, "this is our first time working together," says Carol, referring to himself and Franks. "It's a very complementary [relationship]. What I do can drastically affect the vocal sound. On the other hand, except for the keyboardist and bass guitarist, I'm not using any big low end—I'm getting all that from the P.A. So I depend on how Clive tunes the P.A." Carol runs 13 band mixes in addition to meeting Elton's needs from a Harrison desk with a TC Electronic motorized EQ system.

Elton's stage position is atop a circular platform (see photo), which can move upstage and downstage, as well as lift eight feet into the air and rotate 360°. Carol provides Elton with four monitor mixes—stereo vocal and instrumental, spread between two pairs of monitors held in place by a welded aluminum frame. Clair 12AMs are used on top for vocals, with older Clair single 15-inch/2-inch wedges for the music. While the rigid frame and fixed mic position keep the

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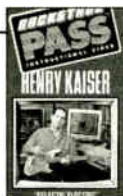
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spatial relationship between mic and monitors consistent, Elton's exceedingly high monitoring levels and heavy vocal effects processing keep Carol and Franks on their toes.

"I cannot sit down and tap more than a few keys—it's pretty loud. I know what it should sound like and what frequencies should close my ears down," Carol says. "During 'Saturday Night's All Right for Fighting,'" adds Franks, "the guitarist and the bassist run up onto Elton's riser. Every night, back in the dressing room they say, 'Jesus! We wanted to get off as soon as we got on!' And Elton's just pumping away. It's amazing that we've got such a tight sound—that mic (a Milab LC25 condenser) helps immensely. It is not necessarily the mic that I wanted to use, but it's the best for rejection."

"He used to use an SM58," says Carol, "but he grew to dislike the sound of it. We tried an

SM57, some Sennheisers, some Beyer stuff. The Beta 58 has the peak frequencies that he likes to hear, and that really suited him for a while. But he wanted something different for this tour." (Beta 58s are still used by the three female backing vocalists.)

Even with the tight rejection pattern of the Milab, there are still times when Franks will ask Carol to pull back certain troublesome frequencies in Elton's monitors. Sometimes it works, but sometimes... "You can't fool him," says Carol. "You think you can get away with a little bit, but then you get your wrist slapped! But that's good. I prefer working with people you can't fool because we can talk on a more equal basis. He knows what he wants. He's demanding, but he's also understanding. If there's something that can't be done right this minute, as long as we can make it right in a given space of time, it's okay. It's nice to have that relationship, rather than there being a problem and you find

out from the tour manager, or you wake up on the bus one morning and there's this guy out there—'Here's your replacement.'"

Sound at the Oakland Coliseum show was quite good. In a few spots, I might have preferred a slightly more intimate vocal sound, but having stuck my head upon the riser of doom after soundcheck, I can well imagine the difficulty presented by the monitor level at Elton's mic. What caught me by surprise was the emotional impact the show had on me, no doubt due in part to Franks' emphasis on the musical aspects of his job. Given the choice, I'd pick emotional satisfaction over technical details every time.

"The thing for me that makes this one so special," concludes Carol, "is the respect that I get back from the artist. We have real feedback with each other, which I don't always get with some artists. Everybody's got a different aura about them, but this is the one I enjoy most." ■

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COLD WEATHER TIPS

While weather prediction is an inexact science, it's a safe bet that it's going to be cold this winter. With that in mind, here are a few tips on working in chilly conditions.

"There's not a lot you can do," says Paul Baker of Canada's Rocky Mountain Sound, which, among other cold gigs, provides sound for ski events. "Everything does work at those temperatures—we've never had a piece go down due to cold temperatures, and we've done shows in -50 degree conditions."

The Rocky Mountain crew manages to keep everything running once it's set up. "We leave everything on all the time," Baker says, "and with the amps not having to go on and off, everything stays liquid—kind of flowing all the time. The biggest hassle is the console and other equipment that is completely open to the environment. All you can really do is keep them well-covered."

Regardless of your sonic preferences, it's clear that horn-loaded systems have an advantage in foul weather. "I have a horn-loaded system," says Jack Boessneck of Eighth Day Sound, Cleveland, Ohio. "Unless I turn it on its back, I don't really have to worry about it." Baker seconds that, noting that the company's Adamson system is not particularly susceptible to moisture due both to its horn-loading and the Kevlar rather than paper cones it contains.

Cabling and connectors are another source of concern. Eighth Day provides sound for the Cleveland Browns home

games, with load-in the night before. "Cables tend to be stiff, and they never really un-kink," Boessneck says. "And there's nothing you can do about a frozen cable. You also have to remember to wrap connectors in plastic if you're laying things in snow. It's not like water, which lays under the connector—the snow will be all around it eventually."

Metal connectors can also be a problem. "The problem we have with metal connectors, like EP4s and 1/4-inch 280s," says Baker, "is that the metal sleeve and jacket can actually freeze together. We find that the Neutrik Speak-On connector is very good. It's plastic, and we worried at first that it might degrade in the cold, but it's not breakable, even in extremely cold temperatures."

It's also worth a reminder that the speed of sound changes with temperature. Ignoring other environmental considerations such as humidity, the nominal speed of 1,130 feet/sec assumes a balmy 72°F. At freezing, it slows to 1,086 feet/sec, and at 0°, to 1,050 feet/sec (according to a formula in Davis and Davis' *Sound System Engineering*). Baker also notes a cold-induced tonal shift. "The difference in sound is that the high end gets very brittle-sounding in the cold. You can actually hear the difference, and I find it a bit irritating."

Finally, gear with tightly spaced controls presents one final hurdle. "Mixing with three pairs of gloves," grins Boessneck, "is always a challenge!" ■

—FROM PAGE 116. SOUND CHECK has been keeping busy with some high-profile theme park work. "We're handling touring, one-nighters and permanent installations here," says Mike Stahl. "We're also going to staff a

[touring] sound system and leave it out here." In addition to the move, MSI West added George Douglas to the staff as the West Coast director of sales. Douglas was previously marketing director at Meyer Sound and

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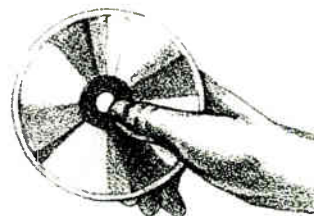
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brings with him a strong theme park background. "It's a big addition for us [and will help] to continue to land big sales for the P.I. division," Stahl adds.

Showco (Dallas) is carrying 16 tours, including country acts Vince Gill, Reba McEntire, Clint Black and Willie Nelson. On the rock side Showco is out with Kiss, Megadeth, Extreme, the Black Crowes, Alice in Chains, Joe Satriani, Ozzy Osbourne, James Taylor, the Moody Blues, Genesis, Ron Wood and Keith Richards, and Ministry. Paul McCartney is in rehearsals.

Audio Analysts (Colorado Springs) will be out with Emerson, Lake and Palmer in the U.S. starting in January. Additional Springsteen dates were under negotiation, along with two other tours at press time. The company is also engaged in a variety of local work, including a month-long large Christmas show for the five-star Broadmoor Hotel in Colorado Springs.

Clair Brothers (Lititz, Pa.) was carrying a busy roster of acts last fall and this winter, including U2 Outdoor Broadcast in stadiums, which will be moving on to Mexico (see photo) after finishing its U.S. leg. Michael Jackson moves from Europe to Japan, while Elton John (see related story) will have finished his U.S. dates and moved on to Mexico, South America and Australia. Clair also provided sound and a full festival crew for last fall's Bob Dylan 30th anniversary show from Madison Square Garden. Other tours include Bon Jovi doing a warm-up for their '93 road show, Indigo Girls, Bad Company, Young Messiah, Kitaro and Prince, who is in rehearsals.

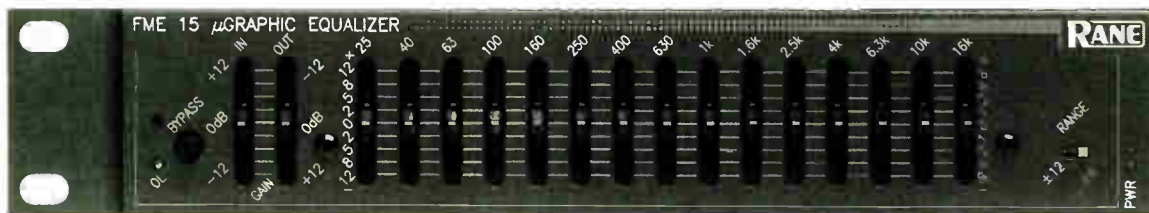
dB Sound (Des Plaines, Ill.) is out with Metallica and Faith No More, in addition to a mix of corporate and local Spanish-market shows. The company recently completed an install for VH-1's upcoming live acoustic soundstage, which will seat 200.

That system includes a Midas XL-3 console and a full EV monitor and DeltaMax house system. dB is also engaged in ongoing R&D.

"We're working with EV and Chris Beale from SSE on a new top end for the MT Series cabinet," says dB's Harry Witz. "The MT is very powerful, but some have commented that they don't like the top end. In working on it over the past few months, we found up to 6 dB masking at the top end due to phase cancellation in the manifolds." A modification followed, resulting in a cabinet now referred to as the MT-HQ. Several changes have resulted in a 3dB broadband increase in output, as well as 9 dB extra in the top 10kHz to 20kHz octave.

Witz notes that the changes are not the result of any new technology. Rather, they represent a deeper understanding of why the system sounds the way it does. "It's very breathy," says Witz of the new design. "We're

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really excited to show it to the people who didn't like the top end [of the original MT-4]. The new boxes should be out with dB/Metallica and Simply Red/SSE by the time you read this. Other dB experiments include the use of Yamaha D2040 digital crossovers to perform array steering and preliminary evaluation of digital fiber-optic snakes by Opto Digital, BEC Technologies and Lester Audio Labs.

Eighth Day Sound (Cleveland, Ohio) is keeping busy with a mix of corporate and touring work. Bands include Erasure, Jethro Tull, The Ramones, Jesus and Mary Chain, Frank Sinatra and David Sanborn. Corporate events include Columbia Gas Co., Tupperware and other corporate theater and benefit gigs. Eighth Day bought a lot of gear in 1992, including several Yamaha PM4000 consoles, Yamaha D2040 digital crossovers, Crown amps, a Midas XL3 console and several trucks.

Delicate Productions (Camarillo, Calif.) supplied audio for both the Tangerine Dream and Black Sabbath tours (see photo). Tangerine Dream's system consisted of 20 Martin F2 cabinets and a Yamaha PM3000 console, with a Ramsa WR-S840 monitor desk and Martin F1 and LE600D sidefills and wedges. Engineers were Steve Venezia (house) and Eddie Siedler (monitor).

SOUND REINFORCEMENT EDUCATION

An audio education program focused specifically on sound reinforcement opened in Anaheim, Calif. The California Institute of Concert Sound Engineering will maintain close ties with manufacturers, sound contractors and sound reinforcement companies to ensure that basics required for employment in the field are being taught.

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sound theory, sound-system maintenance and troubleshooting, small- and large-scale sound-system setup and operations, digital processing, and transducer technology.

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churches. For more information, contact Jim Paul at (714) 634-4131 or write to 1733 S. Douglass Rd., Ste. F, Anaheim, CA 92806. The program was previously offered through Orange Coast College (see *Mix*, May 1992, for related story). ■

Having grown up in Hawaii, sound reinforcement editor David (Rudy) Tribitt only recently learned not to lick the metal edge of a road case in subzero weather.

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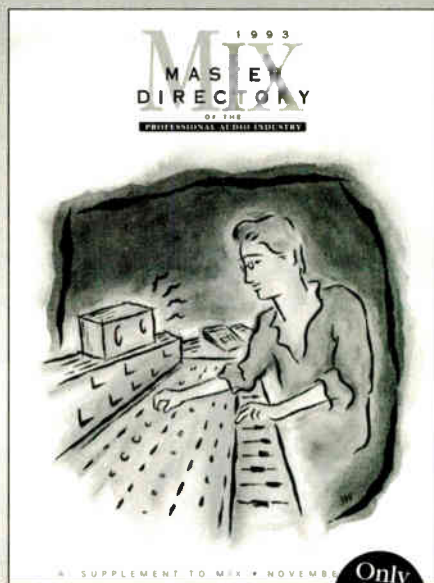
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**SOUNDCRAFT EUROPA
AUTOMATION**

Soundcraft (Northridge, CA) has unveiled an option for the Europa console, providing scene-set automation control of channel muting, VCA assignments, aux and EQ on/off, and insert in/out routing. Snapshots can be changed from a small keypad remote, external serial control or via MIDI program change commands; mix data can be stored on internal or external RAM cards, or dumped to an IBM-compatible computer. Options include moving fader automation and external control of signal-processing devices or switches.

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TOA WT-780 WIRELESS

New from TOA (South San Francisco) is the WT-780, a single-channel, non-diversity wireless system operating in the 168-216 MHz VHF band. Priced from \$498 and available with a variety of transmitters (including a hand-held Shure SM58), the unit has a double-squelch system to reduce RF interference and a companding circuit to increase dynamic range. The compact receiver has a telescoping antenna and 1/4-inch output; the transmitters are said to provide over 12 hours of operation from a single AA battery.

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The CSX58M from Community Light & Sound (Chester, PA) is a low-profile, three-way, high-performance design with dual 12-inch woofers and a one-piece molded horn assembly with an inset supertweeter and a 1-inch, titanium-diaphragm compression driver mounted on the rear. The internal passive crossover has PowerSense fuseless protection from overcurrent and thermal overload. Specs include a power handling of 200 watts continuous pink noise (500W program), 102dB SPL 1W/1m sensitivity, with a maximum output of 125 dB. The unit is priced at \$747; the black-carpeted cabinet, foam-covered steel protective screen and limited five-year warranty are standard.

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Able to deliver up to 6,000 watts in a four-rackspace package are the Professional Series power amps from Crest (Paramus, NJ). The functional equivalent of two 8001s in mono-bridged mode, the new model 10001's 20-20k Hz FTC power ratings are said to be 1,500 watts/channel into 8 ohms, 2,500 W/ch into 4 ohms or 3,000 W/ch into 2 ohms. Bridged-mono specs are 5,000 watts at 8 ohms or 6,000 W at 4 ohms. Also in the series is the 10004, a four-rackspace, 4-channel amp rated at 1,200 W/ch into 4 ohms. Both models feature a variable-bias circuit for reducing idle current draw and distortion, variable-speed DC fans and modular construction.

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Engineer Eddy Trabanco: On Recording the New Bebop (and Other Jazz)

For the past two decades, Carl Jefferson's Concord Jazz label has been putting out music by some of the finest jazzers around, both old and new. The company has generally tilted toward bebop and mainstream jazz, and Jefferson's philosophy has always been to capture great performances in the studio as cleanly and efficiently as possible, emulating, one supposes, the feel of records by the acknowledged masters.

This has its good and bad sides, according to

Manhattan-based engineer Eddy Trabanco, who has been recording Concord Jazz sessions for nearly 15 years, first at Sound Mixers studio and more recently at Penny Lane Studios, where he is also a vice

the old stars they emulate had pretty fixed ideas, like limited miking and a lot of room sound. So when you give some of the older *and* younger players any less than that, and when you start miking them



PHOTO: HOWARD SHERMAN

president. "I think of Concord as sort of a bebop label, and the beboppers have real preconceived ideas of what jazz should sound like," Trabanco says. "I'm sorry to say that

closer and more direct, they start getting uptight; they think you're impinging on their sound and their ability to communicate. Over the years, what

—CONTINUED ON PAGE 131

Down in Monterey: Remastering for the Pop Festival Box

Monterey Pop was the first and, some believe, best of the big '60s rock festivals. It came at a time—June, 1967—when music was undergoing a stunning transformation: Dylan, the Beatles and a few others were making popular music that was intelligent and adventurous in ways it never had been before; the psychedelic warriors of San Francisco rock, influenced by everyone from Coltrane to Ravi Shankar, were stretching the

form at the same time they were expanding minds; and a vital new crop of both black and white blues and R&B players was tapping into the raw power of America's roots.

For many years, D.A. Pennebaker's superb documentary of the event, that rich slice of musical and cultural nostalgia known as *Monterey Pop*, has been the major artifact of the festival, despite the appearance of various live albums culled

—CONTINUED ON PAGE 131



Janis Joplin

Dr. John: Back to New Orleans with Stewart Levine

by Iain Blair

Producer Stewart Levine has acquired a unique and impressive list of credits over the past four decades. Starting off in the late-1950s as a jazz horn player, he went on to produce The Crusaders, B.B. King and Sly & the Family Stone. In recent years, he's scored big with Simply Red and the latest release from Dr. John, *Going Back To New Orleans*, which was still in the Top Ten of *Billboard's* jazz chart as we went to press in December.

Sitting in his home studio in the Hollywood Hills, surrounded by framed gold records, Levine talked about the Dr. John project, which is

shaping up as the most successful ever for the New Orleans great.

Mix: How did you get involved with the new Dr. John album?

Levine: We go back a long way. When I was recording with Hugh Masekela in 1967 at Goldstar Studios in L.A., which was the home of Phil Spector, Sonny & Cher and Herb Alpert. Dr. John was in the other room recording *Gris Gris*. We met in the halls and we both thought we were making mainstream albums [Laughs]. And we became friends.

We worked together a few times over the years—we did a movie soundtrack, and then I did a great



PHOTO: SINDY BYRD

album with B.B. King in the early '80s called *There Must Be A Better World Somewhere*, and I got Dr. John to co-write the whole

album with the late, great Doc Pomus, and Mac [Rebenack, Dr. John] played piano. So we kept in touch.

Anyhow, one day Mac did a public service announcement for my wife about recycling, and we were talking about Doc and how one day we

—CONTINUED ON PAGE 133

Kotoja's African Tracking

by Jeff Forlenza

Kotoja is an infectious danceable group that blends African highlife and juju with American funk and R&B. Led by Nigerian master-bassist Ken Okulolo (formerly with King Sunny Ade), the San Francisco Bay Area world beat band recently signed with Mesa Records following their successful indie debut, *Freedom Is What Everybody Needs*. The new Mesa release is entitled *Sawale*, and it's more of the stuff that keeps dance halls bouncing.

Recorded and mixed at

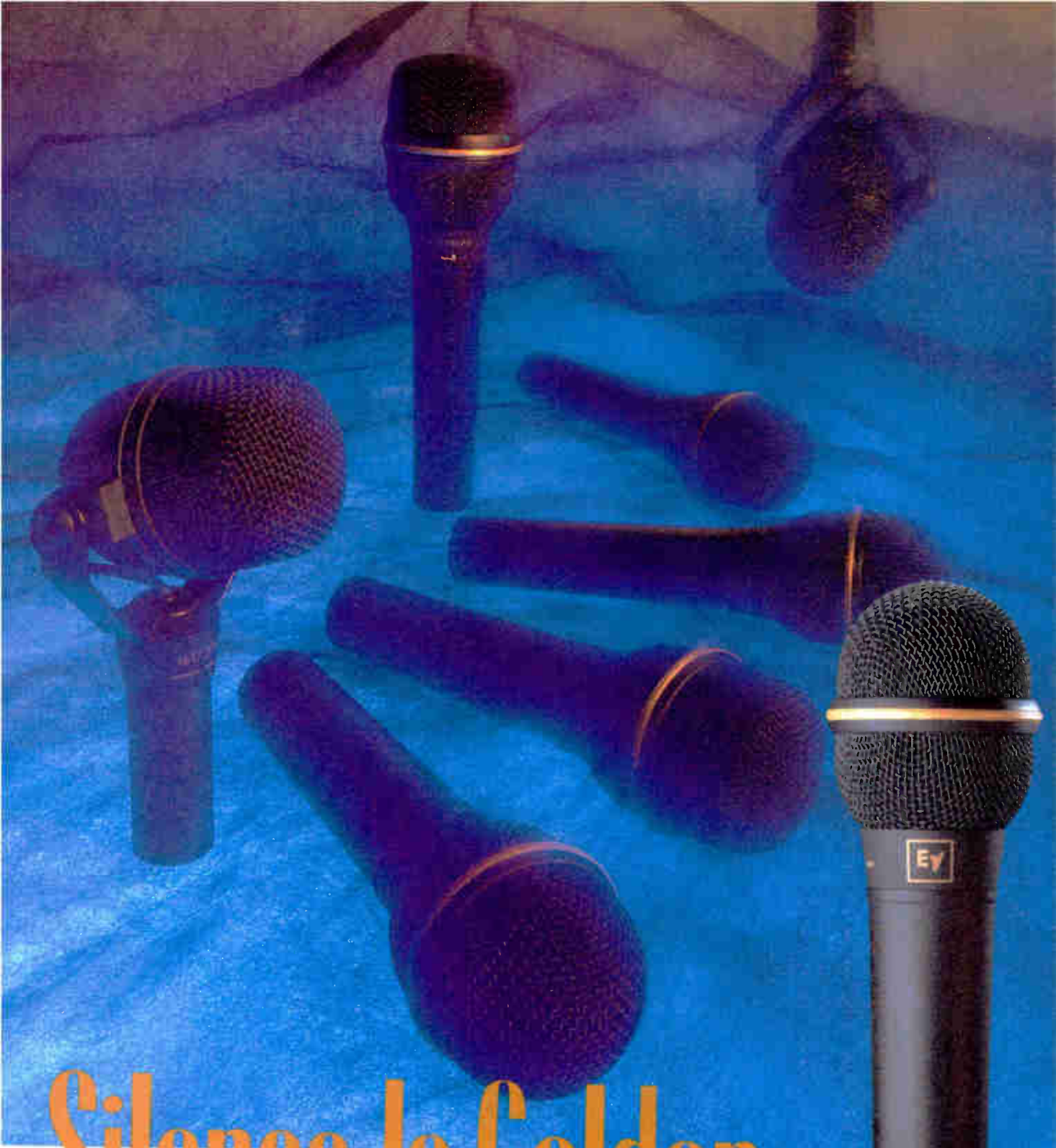


PHOTO: REBE YOUNG

Music Annex in Menlo Park, Calif., by staff engineer Patrick Coughlin. *Sawale* features bass, guitars, drums, horns, percussion and vocals—yet there is no clutter or crowded mixes. And since the groove carries the message, the listener must feel it. On this CD, Okulolo's bass subtone is felt and heard, while lyrics are intelligible and clear.

Okulolo co-produced the project with Coughlin, who mixes the band's live gigs, in an effort to re-create the energy that made the band such a favorite of Bay Area clubgoers. The disc was cut live—except vocals, solos and percus-

—CONTINUED ON PAGE 136



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—FROM PAGE 128, ED TRABANCO/NEW BEBOP

I've been trying to do is allow them to see each other but get some microphone isolation.

"I can see where they're coming from," he continues. "It's such a personal art form that they really do have to see each other and hear each other to be able to make moves together and feel the flow. That being the case, they don't want to be too far from each other, and that makes it very hard to isolate them. Also, bebop is so spontaneous and flexible that they don't like to predetermine what they're going to do. Most of the time I have no idea how long a solo is going to be, for instance. But that's part of what keeps it so interesting."

Trabanco has been part of the New York recording scene for 20 years now, working in a succession of small and large studios, doing both music and commercial work. Today, he still devotes much of his career to Penny Lane's booming commercial business, but it's clear that his heart lies in the jazz that has become his specialty. "I'm a rock 'n' roll kid, but I've loved jazz for years, and it's been a thrill to work with so many great players," he comments. His work has put him in the studio with veteran greats like Stan Getz, Tito Puente and Rosemary Clooney, as well as young lions like the incredible alto player Jesse Davis, one of the shining stars of Concord's current roster.

According to Trabanco, in recording jazz dates, "Most of the time the setup is the thing. I blanket the piano heavily, because the piano is one of those instruments that draws everything in the room. A lot of times the piano player is the leader of the group and needs to have good eye contact with the drummer. At Penny Lane we have a drum booth which, even though it's not glassed, gobos up to about your chest. So I have to lean the gobos on their sides so there's some visual contact between the piano player and the drummer. If I have my druthers, or somebody is real specific about a sound, I like to put the bass in a booth because then the drums sound real pure and EQ gets on the tape. I usually like to use a mic on the bridge of the bass, and I always ask the bass player if he has a direct mic, because the combination of the two will usually sound

good. Horns are real easy because the mics now have such good hypercardioid patterns.

"Anything with a hypercardioid is a wonderful tool for me. I love the [AKG] 414. If I could only have one type of microphone, I'd get as many 414s as I could. But I also like a [Neumann] KM84 on drums; any Neumann is a wonderful microphone. When I was at Sound Mixers, we had a lot of Sonys that were fabulous, but I'm not familiar with the recent ones at all. I like the [AKG] 451 for some things. We also have a couple of B&Ks that are breathtaking—as far as flat is concerned, they're perfect. But ours, which are some earlier ones, tend to pick up everything in the room, so I have limited use for them."

Typically, he says, players have preconceived ideas of how their instruments should sound, "and I try to give them what they want, make the adjustments they want, so long as it doesn't violate the overall sound. I have a tendency to record piano fairly bright, and most piano players want me to make it warmer; in fact, they want me to back off a little on the top end, so I'll do that in the monitor and let them feel more comfortable with what they're hearing. The bass players are almost always concerned about hearing too much pickup. Most drummers relate to me pretty fast because I'm a drummer and we can communicate. Horn players like to hear a little echo in their monitors. Basically, each needs a workable balance that feels good so they can make the best musical decisions they can make—regardless of how it's going down to tape."

He describes Penny Lane as a "wonderful" room for jazz dates. "It's all wood with a great natural sound for big or small groups. It's got a TSM Trident console, which has a very transparent top end, very nice for jazz." For the Concord projects, Trabanco records 24-track with Dolby SR. "Actually, I love digital," he notes, "but that's not their format, and SR is the next best thing." Mixing on all of Trabanco's Concord dates is done by Phil Edwards in the San Francisco Bay Area, where Concord Jazz is located. "He's a great mixer, incredibly musical," Trabanco states. "When I give up the tapes, I know they're in good hands."

Most of Trabanco's jazz sessions

are fairly straightforward—and fast. "They usually get it within four takes," he says. "Sometimes they get it in one. My job is to get the sounds right and make them feel comfortable. Jazzers are very dedicated people. Most of them have come up against so much adversity through the years that they come into a session kind of skeptical. They think they're not going to get a sound they like. But once they find out I'm on their side and that I really want to give them what we all want—a great-sounding performance—they usually lighten up a little and we can joke around and have a good time."

Still, Trabanco is slowly but surely trying to nudge the music into the modern age, sonically speaking. "I'm a firm believer in the idea that if you took old bebop jazz and made it have the sound quality of new rock 'n' roll, you'd open up huge avenues of new fans. I'd love to be able to isolate more and really work each individual sound and not be so afraid of putting a synthesized or digital ambience behind the individual instruments. The beboppers don't think that's legitimate, but I disagree. I think you can have modern-sounding music played by cats who play from the heart." ■

—FROM PAGE 128, MONTEREY POP REMASTERED
from the performances (Jimi & Otis, Mamas & Papas, Ravi Shankar). But now we have *the box*—a four-CD set from Rhino with the rather forbidding title, *The Monterey International Pop Festival*. It contains nearly five hours of music by 20 groups and a spectacularly beautiful, album-sized, 96-page booklet of stories and photos assembled by Stephen K. Peeples, who co-produced the set with Geoff Gans.

Most of the artists represented get several songs to strut their stuff—Big Brother, The Byrds, The Who, Otis, the Butterfield Blues Band and Hendrix (whose *entire* set opens disc four) are treated very generously. Others only get a frustratingly short song or two (Country Joe, Steve Miller, the Blues Project). And, alas, there were a few bands who chose not to appear on the box—50 lashes with an incense stick to the Grateful Dead, Quicksilver and Buffalo Springfield, to name three notables.

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—FROM PAGE 131. MONTEREY POP REMASTERED

The original 8-track tapes of all the performances were made by Wally Heider and Bones Howe in Heider's mobile truck, but were mixed down to 2-tracks by Lou Adler (who also had a supervisory role on the box) and John Phillips shortly after the festival, while Pennebaker was assembling his film. Twenty-five years later, these 2-tracks, rather than the master 8-tracks, became the source tapes for compilation producers Peebles and Gans, who ultimately selected the performances. Bob Fischer, who has worked on a number of Rhino projects, including the acclaimed *Kerouac* and *Beat Generation* boxes, handled the tape clean-up and digital remastering.

"In general, I'd say the tapes were in pretty good shape," comments Fischer, a one-time musician and multitrack engineer who learned mastering at the right hand of Bill Inglot and Ken Perry at K-Disc and A&M. "The sound of the 2-tracks leads me to believe it was done at 7-1/2 ips, especially due to the fact that they were trying to get long sets recorded, and I'm pretty sure they weren't running parallel machines in those days. You have to remember that the festival happened at the absolute infancy of outdoor concerts, of mobile recording and of 8-track recording, so there were indigenous technical problems that come along with that.

"Being 7-1/2 ips, there's no top end to speak of," Fischer continues. "It goes to a certain point and then it stops and becomes tape hiss, so if you try to grab for more top end, you're actually bringing up hiss. There were the usual problems of people tripping over chords, technical beeps and buzzes. Apparently, some sets weren't recorded in their entirety, which limited the choices somewhat."

From a technical standpoint, Fischer's greatest challenge came in eliminating the buzzes and ticks that riddled certain portions of the tapes. "Fortunately, most of that sort of thing occurred between songs, so I was able to bypass them by tightening up the tracks, which I did using Sound Tools Sound Designer. I do all my mastering using Sound Tools—all the editing and crossfading.

"The biggest problem we encountered was some intermittent static, which was particularly bad on the Otis Redding set," he continues.

"We have no idea what generated it, but it's apparently on the multi-tracks, too. Now, usually I can deal with static ticks just interpolating them by hand on Sound Tools. Then, if it gets too dense, you can usually pop it onto the Sonic System or CEDAR, and those will do it automatically. In this situation it was tricky because when I got the pops and ticks up on the screen and looked at the sound waves, it was actually a slow static discharge that was quite long in duration, as opposed to unique ticks that you can easily work on with the [Sound Tools] pencil tool when you can see where the wave is going. Here, the ticks distorted the sound waves so much you couldn't actually tell where the sound waves were supposed to be under the long crackle.

"There was even a part of the Otis Redding set that was unlistenable," he adds, "so I took it to Doug Schwartz over at Audio Mechanics in Burbank, where they have a Sonic System. The ticks were so long that when I set up the Sound Tools for them, it thought snare hits were noises and thought they needed treatment, too. In the end, even the Sonic System had trouble with it. Doug had to set up [the Sonic System] to undo the snare drum hits. It ended up taking him six hours to do a six-minute passage. But the result is it sounds pretty good now."

Fischer says the Monterey box was "the most time-intensive project I've done to date. I had about 30 reels of tape to go through to get things out, and I think I ended up spending about 20 hours per disc, which is quite a lot. Fortunately, a lot of the concert was very clean and needed only minimal work."

Sonically, not all of the performances on the box are up to the level of the best; a couple, like the Blues Project's "Wake Me Shake Me," frankly sound pretty awful ("I'm with you on that one," agrees Fischer). And, of course, Fischer, Peebles and Gans can't be held accountable for the occasionally sloppy harmonies and out-of-tune guitars. This was the psychedelic '60s, after all. But generally speaking, the box is a jewel, loaded with bright, unexpected pleasures (Canned Heat, Lou Rawls and Booker T., among others).

"Since I work in the reissue and vintage music business," Fischer says, "I face sonic limitations all the

time, and I've learned how to cope with them. When I was originally making the transition from being a multitrack engineer to being a mastering engineer, my thought was always to try EQ to bring out something that I wanted to hear more of, but I realized that many times when you do that you're being detrimental to something else in the performance. What I've learned is that if the sources you have are the best you can find, you have to be satisfied with them or you'll never sleep again. In general, our approach at Rhino is a documentary one—we like to give history back the way it came to us." ■

rock record, which ain't my turf, so I didn't want to do that either. Then one day I was taking a walk and it suddenly came to me very clearly exactly what we should do—a New Orleans album, a complete history of New Orleans. I saw it and heard it in my head, so I immediately called Lenny Waronker, and he said, "That's great, let's do it." So then I called Mac and asked him what he thought, and he said, "Man, I've always wanted to do that," so that was it.

Mix: Did you spend long on pre-production?

Levine: Talk about pre-production, he was a genius at it. He started by making these little homespun demos, and we even brought in a young guy to do some research and bring in songs, because even though Mac knows a lot of it, he doesn't know all of it. So Mac made all the demos at home, sometimes with a small rhythm section, sometimes alone at the piano, and they were all good. He lives between New Orleans and New York, so half were done in New Orleans and the rest in New York. Then he sent me a tape

with about 15 songs, and they were great. There were about eight tracks that were perfect for the album. Then he made another tape with about ten songs. I didn't like any of them, and he said, "Neither do I." So then he went back down to New Orleans and demoed another dozen, and I liked all of them. We met back in Manhattan on Labor Day, and that was the only time we sat down together to discuss it in person. The rest of it was done on the phone. We sat down and decided on the five songs, the arrangers, the musicians and everything else in about five hours.

Mix: How were you able to select all the musicians in just five hours?

Levine: Because he knows the music and musicians so well, and I just left that up to him. When Mac tells you something about a musician, you'd better listen. This guy is an American treasure, and even though a lot of people know him and respect him, he is by far the most knowledgeable American musician I know. He's a walking encyclopedia—the real item. Someone said to me the other day, "He's the

—FROM PAGE 129, LEVINE/DR. JOHN

should make an album together, but I couldn't figure out exactly what we should do. I thought the album he did with LiPuma, *In A Sentimental Mood*, was great and it brought him around a bit, but I didn't want to do part two of that. At the same time, he'd talked about making a record with Jimmy Vaughan, a sort of hard

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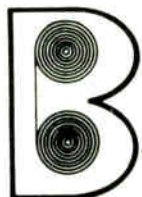
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blackest white guy I ever met." And I said, "No, he's the whitest black guy you ever met." He's also clean now you know. He'd been a junkie for 30 years, and he's not unproud of it—it can be printed. He's so disciplined now it'll get you crazy.

So we went through these long lists of musicians, and we both agreed that we didn't want a hodge-podge rhythm section—we tried to stay with the same people and get the groove going. Then we used two or three different horn sections, the who's who of the best in New Orleans, and then the background vocals were done by the Neville Brothers and a couple of other New Orleans singers, Chuck Carbo and Shirley Goodman, who comes from the '50s.

We also used Pete Fountain, one of the great traditional Dixieland clarinet players, Al Hirt, Uganda Roberts—a great percussionist who worked with Fats Domino and Professor Longhair—and Eric Traub. Everyone loves Dr. John, so the whole town came out for him.

Mix: Musically, it's a pretty ambitious album.

Levine: Yeah, it's loosely an attempt to present one hundred years of New Orleans music. We go from the first song, which is the "Litanie Des Saints," an invocation to the church based on themes by Louis Gottschalk, the first American classical composer in the 1850s. And then we take you through the late 1800s with songs like "Careless Love." I heard Bessie Smith perform that, and I never knew it went back to the 19th century. Then we go through tracks like "Didn't He Ramble," which was sung when they'd be returning from the burials, right up to Fats Domino, because that was really the end of the great R&B period. Without being stuffy or academic or even educational, it'll take you through all the great street music of New Orleans.

Mix: How did you record the album?

Levine: Basically, it was a massive chore that we did very casually, and everything was done live with very few exceptions. We did some vocal overdubs only because Mac had a sore throat the first few days and we had to patch them up a bit. He also overdubbed a little organ and guitar,

and we added the backgrounds later, but all the rhythm tracks and horns were live.

Mix: Where did you record?

Levine: A little funky studio in New Orleans called Ultrasonic. There aren't too many choices down there, and this one has a good live room and a couple of isolation rooms, which suited our needs perfectly.

Mix: Who engineered?

Levine: I brought down Al Schmitt, a six-time Grammy winner and a friend of mine who also loves Dr. John. He can make anything sound good. He's a genius at just positioning mics right, and he only uses condenser mics—Neumanns and Telefunksens and [AKG] 414s and 421s. It's all in the placement and the levels, and then we brought in 16 Neve preamp modules so that we never did use the board, which was an MCI. We just used the monitor and then brought all the mics through the Neve modules, and then took the signal direct to the tape machine and bypassed the desk completely.

Mix: Did you use any special equipment?

Levine: No, no outboard gear at all. Al Schmitt is unbelievable, and when it was over, I said to him, "This EQ is great," and he said, "We didn't use any EQ." He doesn't use it at all, which amazed me. But he goes back to making those great Sam Cooke records and the late-'40s and '50s. He's the youngest 61-year-old I've ever met. Al also mixed the album at Bill Schnee Studios in Hollywood, and it just sounds fantastic. As Lenny Waronker says, "It's got that great low-hi-fi sound." We didn't want to make a pastiche or a record that sounds like it was recorded back in the '30s or '40s—in fact, some of the tracks were written long before recording was even invented—so to try and make it sound old-fashioned was stupid and corny. We just tried to make it sound as natural as possible, the way it was being played and performed.

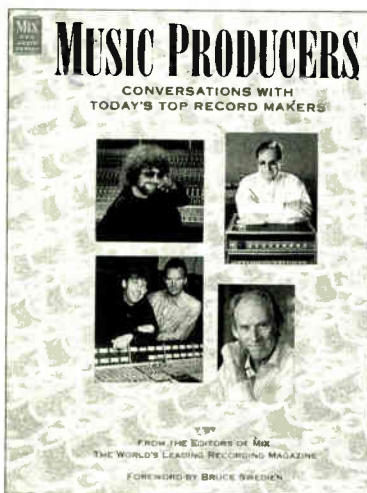
Mix: How would you rate this album in terms of all the records you've produced over the years?

Levine: I love the results, and I think it's one of the best I've done. I honestly can't remember enjoying the playback of a record more than I did with this, and every time I listen to it I enjoy it more and more. I think it's a tour de force—Dr. John at his peak. He's clean, on the track

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and doing music that he really understands with people that understand it. And it's the first time he ever recorded in New Orleans. Isn't that bizarre? So it's a return to his home and roots in all senses. ■

Artist's Studio: Ray Kennedy Finds Room & Board in Nashville



PHOTO: DON PUTNAM

Although he has yet to really break through to the masses, Ray Kennedy has all the earmarks of the type of Nashville artist who *will* find his niche in the booming country market once he gets that first hit single on the radio. He has put out two excellent albums on Atlantic Records—*What a Way to Go* and the recent *Guitar Man*—that show him to be a solid songwriter with a classic country voice, and a highly imaginative and tasteful guitarist. It doesn't end there, either—Kennedy is also a producer and engineer; in fact, both of his albums have been made primarily at his own recording studio.

"My studio has been growing and expanding for about ten years," the bright, affable Kennedy says. "It was in my house up until January of 1992—that was Skyline Studio, where I did my first album. Then I moved it into a space that was formerly the B room at Norbert Putnam's Digital Recorders. Some friends of mine moved into the A room and called it Midtown Tone &

Volume. I took about a month to customize and wire everything, and around the same time I was doing pre-production for the second record."

Actually, being a singer cutting his own records is relatively new to Kennedy, though he has years of studio experience. "I've spent most of the last 12 years here in Nashville as a songwriter, guitar player, engineer and producer," he says. "I've dabbled in nearly every aspect of the business, from writing jingles to working as a background singer. I fell into engineering as a matter of necessity, because I found myself occasionally working with people who couldn't give me what I wanted in the studio."

He made his first album essentially alone, playing most of the instruments and producing and engineering himself, but for *Guitar Man* he brought in a coproducer, Monty Powell, one of the owners of Midtown Tone & Volume. "We initially got together and wrote a few songs and hit it off real well creatively, so we cut most of the basics—drums and bass—at Midtown, mainly to utilize their big room. For the basics I didn't go through a console. I own a bunch of API stuff, so everything went straight from API mic pres to tape, and I rented an API package of EQs. Then we moved over to Room & Board, and I spent a couple of weeks doing all the acoustic and electric guitars, some mandolin and keyboard overdubs, some steel, and my vocals. I ended up mixing most of it in Room & Board." This time around he had the assistance of an engineer, Jim Dineen, whom he describes as "real flexible and into my whole angle of recording. I have a lot of my own gear that I've accumulated over the years, and I've pretty much figured out what works for me on guitar and vocal sounds." Mike Clute, one of the owners of Midtown, also worked on the basics.

Room & Board houses a CAD Maxcon II console equipped with Megamix automation. "Of all the consoles I've worked on," Kennedy comments, "it's probably the most transparent. I know that probably sounds like hype, but because of their servo-controlled architecture, when you pass a signal through it, it comes out the other end sounding

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like it really sounds. I use the console mainly to monitor, although the mic pres are really good. I did some things through the mic pres on this album, but in general I tried to keep the API mic-pre integrity throughout the whole recording process."

He used an Otari MTR-90 and MX-80s as his main recorders, "and then we dumped that to a DTR-900, which I rented, partly to get more tracks." Kennedy likes to record completely dry, with no reverb at all on guitar or vocals. "The mixdown is where you can embellish, but even in mixing I don't use much reverb or effects. I used to use more, but I've

come to believe that there's something real personal about hearing things more dry." His vocal mic of choice is a customized Neumann U87 with a Fred Cameron conversion; for guitars (vintage Strats, Teles and Martins, mainly) he likes to stick an SM57 in front of his amp. Other favorite pieces of gear include LT Sound's CLX2 Limiter, the dbx 160 compressor, Neve 1081 mic pre (for vocals), and API 550A and B equalizers.

"I got a reputation after my first album of being a sort of high-tech hillbilly," Kennedy says. "I just enjoy working with sounds, and I love

being able to have my own place to work in. I like not having to look at the clock." ■

Blair Jackson is managing editor of Mix.

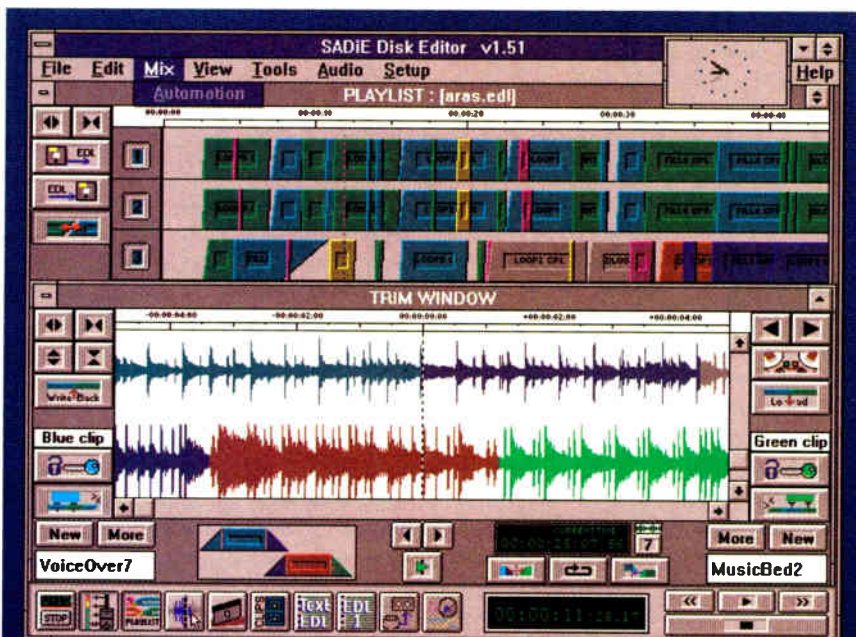
—FROM PAGE 129, KOTOJA'S AFRICAN TRACKING
 sion—in Music Annex's large Studio A. While the nine-piece band was jamming, Coughlin tracked them on a vintage Neve 8036. The initial tracks were recorded to a Studer 827 with Ampex 499 2-inch tape, and then mixed onto Ampex 499 1/2-inch with SR.

Music Annex's "Rock Room," a bright, all-concrete space, was used for Kotoja's horn section. Drums and Okulolo's bass amp were placed in iso booths, and guitars were goboed off to prevent bleeding onto other tracks. Sightlines were always maintained between band members to ensure visual communication.

One of the main differences between live and studio gigs with Kotoja is "the expanded mic selection," Coughlin notes. "On drums we used the usual array of [Sennheiser] 421s and AKG 535 overheads. On congas we had 421s. For vocals we used various tube mics. We had [Neumann] U47s on trumpet and trombone, [Neumann] U67 on sax, and [Shure] SM57s on guitars."

For mixing it was over to the Annex's Studio C and its Soundcraft 3200 console with built-in gates and Diskmix II+ automation. One production secret Coughlin shared was his use of some hard-to-find processing gear: "I used Levy tube EQs on kick, snare, bass and percussion. They're English-made gear. Dan Alexander found them in Germany and turned me on to them. They're similar to the Pultec EQs, but the Levys sound better and have more gain."

Keeping the vocals clear in a dense mix was quite a task. "Since the vocals are in another language—and it's going to Africa—it was difficult and yet very important to keep the lyrics intelligible," Coughlin explains. "I placed the vocals in the center of the mix and used Neve compressor modules on all the voices." After Coughlin and Okulolo were satisfied with their mixes, the project was off to Future Disc in L.A. for mastering. ■



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by Philip De Lancie

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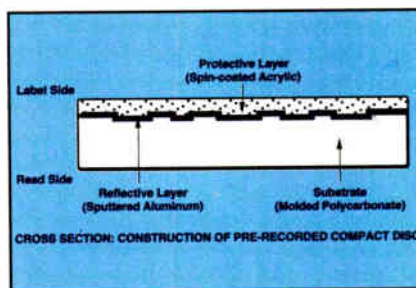
FOR A MULTIFORMAT WORLD

As companies like Philips and Sony develop their long-range strategies for wooing the consumers of tomorrow, much of their focus will be on marketing: "What kind of consumers do we want to reach, and what capabilities and features will attract them?" But if they've learned anything from recent consumer electronics history, they will also be taking into account how the software carriers for their new devices will be manufactured.

Consider, for instance, the case of DAT. In terms of fidelity—which one might assume (naively) to be the most important "feature" of an audio carrier—DAT has generally scored high marks. But DAT's rotary-head recording technique poses substantial difficulties in high-speed duplication. Without the capacity to mass-produce software quickly and cheaply, the format has never won the support of the major labels.

In contrast to DAT, the two newest audio carriers might be termed "mass-production-friendly." The true cost of Digital Compact Cassette duplication has proven to be somewhat of a nasty surprise, but at least the format was designed from the outset to be duplicated at high speed. The discussion in the duplication world now focuses on if, when and how the transition to large-scale DCC production will take place, and how "convertible" existing dupe gear will be.

Similarly, though prerecorded MiniDisc replication is a process only slightly different from making CDs (see "Insider Audio," p. 20), MD raises questions about how replicators can best prepare for a world in which new formats and applications for optical discs seem to be proliferating



Production of recordable MDs is significantly more complicated than prerecorded CDs because the finished product has both more layers and more parts.

rapidly. Should they insist on equipment designed to replicate multiple formats, or are they better off with dedicated lines for each disc type? Does it make sense for replicators of prerecorded discs to venture into the manufacture of blank media such as CD-R and recordable MD, or should



Bill Turner, Musician & Producer

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they stick to CD-Audio, CD-ROM, prerecorded MD and similar variants?

These questions affect replicators, the music industry and consumers because the ease with which a product may be manufactured influences its price, which in turn influences demand (no demand, no product). To get a feel for how easily the replication industry can adapt to MD and other new optical disc formats, we solicited the thoughts of four replication equipment manufacturers and "system integrators" (who combine various makes of equipment into complete replication lines).

ART LE BLANC

First Light Technology

The replicated products are changing fast, and the replicator is making millions of dollars of investment. So you have to maintain flexibility for future formats. The way we have approached that is to design a platform that is flexible enough to handle different modular process stations, each of which handles a specific process. The system can then be modified in the field as we come up with process improvements or develop modules for new products. But the platform remains the same.

The platform includes a method of controlling the individual elements in the machine—and the software for doing that—as well as the clean environment for replication. The process modules drop into the platform, and they have connectors that hook to the electrical, pneumatic, exhaust and vacuum interfaces.

At the start of a new product cycle, people will not dedicate an entire line because the volume won't be there. In the beginning of MD, for instance, the machines will be used on a more flexible basis, with fairly minor process module changes. But as the market matures and MD takes off, you could envision dedicating one line to MD. And as the market matures still further, you will see optimized systems for MD that do things like handling two discs at a time. These will involve more significant changes to the process modules.

The first test of our system's flexibility was with the 80mm [3-inch] CD. That was handled without any problem. People didn't want to dedicate a machine to just that product.

They might have wanted to leave the line in a given mode for as little as a few days, so we had to build it so that it was easily reconfigurable.

It should take no more than a few hours to convert a line from one product to another. The biggest process change is the mold itself, which typically takes two or three hours to change. In the metalizer you do a mask change, but those are done anyway as part of normal production. Similarly, the spin-coater requires a drop-in replacement of a component part. Also, from the beginning we designed the printing and inspection systems to handle 80mm, as we have now done for 64mm (MD). And our disc-handling systems give complete programmability of all motions, including where discs are positioned and their velocity. All the handling and process parameters for different types of discs can be stored in memory in the machine.

As far as blank MDs, the magneto-optical coatings bring in a whole new realm of technology to the typical replicator. It's our goal to take this high-technology process and bring it out of the lab into the production environment, where it will be accessible to the regular CD industry. But there are already 47 companies in Japan that have experience with magneto-optical coating, and they have not had great success in the computer industry. They probably see MD as a way of leveraging their experience and technology into a consumer market.

DAVE PUSHIC

Optical Disc Manufacturing Equipment

We don't think that the capability to do changeovers between multiple formats is going to be a trend, one reason being that the applications for the discs are similar. In the same seasons that the demand for CD-Audio goes up, the market pressure for product on MD will go up, too. So I don't think you are going to have a line where you would pull out three or four basic modules and slide in different modules to make a completely different disc format. The realities of production requirements don't lend themselves to switching back and forth between major product groupings. It makes more sense to have dedicated pieces of equipment

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once the volumes get high enough.

That said, our current CD customers will be interested in making MD or the substrates for recordable CDs. So there is a market for equipment that is flexible enough in *how* it's doing what it's doing, and there is nothing in the basic technology prohibiting the manufacture of various disc types. It's the possibility of adapting equipment to a particular application that is important, not the ability to have it change over at the flip of a switch.

You have differences in the molds depending on the exact size and structure of the disc. And you have variables like the amount of material, mold temperature and cycle times. In anticipation of these requirements, we have gone to more programmable control systems for the injection molding. There won't be anything that is outside the range of programmability of our existing machines. We can develop standard profiles that fit standard products, and they get stored as presets in our PC-based controller.

For recordable discs, whether CD or MiniDisc, the market hasn't yet grown to the point where most of the manufacturers of the replication hardware have done anything other than preliminary investigations. In general, the bulk of these discs will probably come from those who are already in the industry of supplying recordable media. But some people who are doing prerecorded may want to have the option. So the next question is how you process the molded substrates for recordable vs. prerecorded formats.

The prerecorded formats—MD or CD—are very similar, except with MD you need to attach a metal hub and insert it into a cartridge, which is done offline in a batch process. But for the recordable discs, there are no real standards yet for the materials used in the recordable layers. For each type, you have to build specific equipment into your line to apply the materials as needed. So once you know what your customer needs, it is most efficient to provide them with a dedicated machine on a custom basis.

PATRICK PHILOSOPHE

Nobler Technologies

The process for prerecorded MD

will be similar to making a prerecorded CD. So it would make sense to be able to switch, though only between prerecorded formats. For example, if you start with MD, your orders aren't going to be nearly as much as for CD. There is no sense in having equipment sit idle because you have dedicated it to a particular product.

The first thing you need to change is the mold size. The second is the metalizing. You don't metalize the entire disc because that becomes a problem when you put on the protective layer. So the size of the masking area has to be changed. Also, the size of the carrier that transports the disc changes, so you have to modify some automation.

We make a quick-change carrier so that you can change the carrier and change the mask, and it will take just a little longer than changing a stamper on a molding machine. By the time you have the mold changed, you have everything else changed as well. Then you tell your control computer that you are doing a new format, and it changes the parameters on all the pieces of equipment on the line.

For recordable discs, the technology is a lot more involved. The magneto-optical layers require RF sputtering, so they couldn't be done with our metalizer, which does DC sputtering. But you still need an aluminum layer and a lacquer layer. Let's suppose that you are already equipped to do prerecorded discs, and you get an RF-sputtering metalizer to make recordable discs. When you are ready to put on the reflecting layer, you could transfer the discs to your existing "prerecorded" line and run them through normally. That would be a temporary approach until the demand grows enough to dedicate a line. It's a way for us as equipment suppliers to provide options to our customers that they can use right now.

MICHAEL HILL

Multi Media Masters & Machinery

It would be great to be able to offer a machine where you throw a couple of switches and say, "Today it's MD, tomorrow it's MD-recordable and the next day it's CD-ROM." But from a practical standpoint, it's not possible, especially if you want to keep the investment costs of the pro-

duction line to a minimum. Perhaps there will be something like that in the future, but at the moment that is not the direction we are going.

The basic considerations involved are the size of the disc and what layers you want to put on it. When a customer purchases equipment, they specify up front what type of disc they are going to manufacture. If they later want to make something else, some modification will be required. Not all equipment is capable of doing that, but we offer an upgrade kit so that someone who buys CD equipment knows that a year from now it could be converted to prerecorded MD. It's a simple case of retrofitting the hardware, and it takes a matter of hours.

The next question is whether it makes sense to be switching back and forth between formats. Half-day changeovers are possible, but in a manufacturing environment one of the most critical elements is up-time. If you stop your equipment for five hours to make a change, it takes away from your overall efficiency. Also, when you start up again, you may have to optimize the equipment before running production. In any process you need to reach a certain stability, and if you are always stopping and starting, there is some inconsistency. The ideal situation for consistency is to turn the system on and never stop it.

I don't think that the audio replicators will really be interested in getting into recordable media. The problem is that you need several different layers, some of which are very sensitive. So the equipment is very expensive. Until Balzers recently designed a metalizer for in-line use, you needed these huge laboratory machines.

The exception to this is Sony because of their interest in MD. Sony will probably use a dedicated line for the recordable. And they like to do a lot of things in-house, so they have developed equipment for internal use. It is not available on the open market because Sony wants to keep tight control of the technology. They won't give out any information on how they manufacture their blank MDs. ■

Philip De Lancie is a mastering engineer at Fantasy Studios, Berkeley, Calif.

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Tape & Disc News

DCC HITS THE STREET

Just over two years since officially acknowledging development of a new digital cassette format, Philips has begun its U.S. launch of DCC. It's too early to gauge consumer response, but it is clear that the long wait hasn't created any pent-up demand for the configuration. While DCC has been widely discussed within the audio industry, it remains largely unknown to the average consumer. Philips is trying to change all that with television advertising and sponsorship of a U2 special on Fox and MTV.

Until the media campaign works its magic, interest in the new format will remain, as expected, limited to the so-called "early adopters," consumers who keep up with the latest technology and have the cash (or credit) to pay a premium for being first on the block. "I don't think the people who don't know anything about DCC are going to buy it in the initial wave," says Mike Munson, manager of the Whole Earth Access Electronics store in Berkeley, Calif. "It's going to be the people who come in looking for it, which is always the case with a new product."

Munson is upbeat about DCC, saying he thinks it will eventually "win the digital format wars. DCC is friendly and familiar. Customers don't like change, and when it comes they like to hang onto something, like the fact that they can play their old analog tapes." Still, two weeks after getting DCC in stock, just one unit had sold. The store has used no promotional display so far, but Munson says he plans to move the machine and feature it more prominently.

At a Tower Records store across town in Berkeley's student quarter, assistant manager Tim Barrett reports a similarly sluggish demand for pre-recorded DCCs. The store is stocking 25 to 30 titles at \$14.99 each, the same pricing as front-line CDs. The DCCs are displayed at the front reg-

ister along with a pamphlet that explains the new format.

According to Barrett, four or five DCCs sold in the first two weeks, never more than one at a time. "The machines are very expensive," he says, "and I doubt many of the college students are going to have a player. So I would imagine that most people are looking at this and saying, 'Wow! The new wave! I think I'll wait until it gets cheaper.'"

According to one Philips representative, looking at the number of units sold in the initial period is beside the point. "I think it's way too early," he says. "The advertising campaign is just getting started, and a lot of the in-store stuff is still being put into place. The intention now is to make a strong first impression. I don't think the company was expecting to sell a whole lot. They were expecting to get it out there and get people aware of it. Next year we'll worry about selling."

ITA CONFIRMS REPLITECH COSPONSORSHIP

Confirming earlier reports ("Tape & Disc News," December 1992), the ITA reached an agreement with Knowledge Industry Publications to co-sponsor Replitech International in Santa Clara, Calif., June 15-17, 1993. Like last year, the duplication/replication industry event will combine an exhibition with a conference program covering four basic subjects: video duplication, audio duplication (including DCC), optical disc replication and floppy disk duplication.

The ITA also announced the launching of the 1/2-inch Videotape Worldwide Market Intelligence Service. The service will provide subscribers with special reports featuring analyses of industry products, technologies and issues.

OTARI RESHAPES U.S. OPERATIONS

King Instruments, the Otari-owned tape-loader manufacturer, has been consolidated into a new division along with the Otari Console Products Group. King's Westborough, Mass., facilities will be part of the Otari Manufacturing Corp. The change will have no effect on the line of loaders built in Japan by Otari Inc.

BENEFIT SAMPLER FOR AIDS

Good samaritans in the music, duplication and broadcast industries have

teamed up to raise money for AIDS education, prevention and care. The *Sampler for AIDS Relief*, produced by San Francisco radio station KKSF, features 14 selections by artists including Bonnie Raitt and Sting. Artists, record companies and publishers waived all royalties for the project, which is available on CD and cassette. Duplication services were donated by Music Annex in Fremont, Calif., with materials donated by BASF and Michelex Industrial Group. Two previous samplers have netted almost \$400,000 for the San Francisco AIDS Foundation.

SPLICES

Ampex Recording Media added the 619/620 chromium dioxide (IEC Type II) formulation to its line of professional duplicating tapes. The 619 tape, for C-60 applications, comes in pancakes of 8,300 and 10,500 feet. For C-90s, the 620 tape is available in lengths of 11,500 and 13,500 feet... **Saki Magnetics** (Calabasas, CA) is expanding its line of heads for in-cassette duplicators. The company is developing and testing a series of ferrite replacement heads for Nakamichi, KABA, Telex and Sony machines. Saki also signed an agreement to supply master and slave duplicating heads to Globe Precision Products in Singapore... **Gauss** (Sun Valley, CA) announced sales of high-speed cassette duplicating equipment to Da-Ya in Taipei, Taiwan and the DJ Standard Group in Bangkok, Thailand... **Versadyne** (Campbell, CA) sold a 1500 Series bin-loop duplicator to Sound Advice of Irwindale, CA... **Ke-wall Real Time Duplicators** is now offering high-speed duplication at its facility in Bay Shore, NY. The company also has "full production CD packages" available... **Technicolor Video Services** announced the purchase of 24 HSP-800 Sprinters and 3,700 Sony SVO-960 real-time VHS recorders from Sony. The bulk of the SVO-960s, equipped with SVCC-960 automatic cassette changers, are for Technicolor's facility in Newbury Park, CA, with location of the remainder yet to be determined... Sony real-time VHS duplicating gear is also being installed at **Vidfilm** in Glendale, CA. The turnkey Sony Select system includes 96 SVO-960s... **CD Associates** is now offering the Quick Test one-sixth real time CD analysis system for software-selectable mea-

surement of any three of nine error types, as well as parameters including crosstalk, pit symmetry and HF modulation. Systems include player/analyzers, PC, interface boards, software and rack enclosure...Enterprise Corporation (Des Moines, IA) is offering two new CD CATS QC systems. The SA3 is an analyzer supporting up to eight players simultaneously for testing all CD types for compliance with standards and specifications. The ST1 is a stamper tester based on the CD CATS SA2...Michael Strange has been promoted to direc-



Yamaha YPDR601
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tor of customer service at Digital Audio Disc Corp. in Terre Haute, IN. Strange will oversee processing operations for all CD, CD-ROM and laserdisc orders...Yamaha announced the TC601 Timecode Package, allowing SMPTE-based preprogramming and external control of its YPDR601 CD-R recorder...New York mastering house Sterling Sound chose NXT Generation of Greendell, NJ, to refurbish eight of the facility's Sony PCM-2500 DAT machines...Dynaudio-acoustics M-3 speakers have been chosen for monitoring at New York mastering facilities CBS/Sony and Hit Factory...Oceanview Digital (Los Angeles) reports mastering work on the new Fleetwood Mac box set, albums from Freddie King and Emerson, Lake & Palmer, and a Beach Boys single...Trutone in Hackensack, NJ, mastered projects from Oscar D'Leon, Van Lester, Orquestra De La Luz and KWS...San Francisco's Rocket Lab had John Lee Hooker in to master his latest for Virgin/Point Blank Records.

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C O A S T

L.A. GRAPEVINE

by Fred Jones

Hi! I'm the new guy. I want to thank Amy Ziffer for the help and encouragement she offered in my taking over this column. I hope I will be able to handle it as well as she has, and I want to wish her well in her new endeavor (more about it when I hear from her).

Well, let's get right to it. There seems to be a mood on the street that 1993 will be a very good year for the business (after a few more studios fall prey to the recession). And if the following is any indication, we just might be slowly coming out of the fog.

In Hollywood, the Record Plant's new SSL room ("SSL 1") is now open. The 96-input SL-8000

—CONTINUED ON PAGE 147

Hollywood's Andora Studios' new room complete with Neve 80 Series console.



RECORDING SCHOOL ROUNDUP

by Jeff Forlenza

So you wanna learn to mike, mix and record? Well, there are a lot of options when it comes to audio engineering programs. And there are plenty of things to consider when choosing a school. To quote a slick salesperson, "How much do you wanna spend?" To quote Danny Elfman and Oingo Boingo, "Who do you want to be?" To quote your local travel agent, "Where would you like to be?" Once you address these quandaries, consult the recording school directories in this issue, and call for more information on programs of interest. We corralled six schools across the country and roped them into telling us their job placement procedures for graduates.

The Recording Workshop in

Chillicothe, Ohio, is an intensive seven-week program that offers a certificate of completion and a tape resume of recording, mixing and editing projects to graduates. Jim Rosebrook, director of the program explains the placement services: "We start while students are actually here—teaching them strategies for finding that first job, resume



Studio A at The Recording Workshop (Chillicothe, Ohio)

preparation and studio etiquette. After graduation, we maintain a database of graduates telling their performance here, what they specialize in and where they would like to work. We do direct placement from leads that come in from around the country. When we get those leads, we go through our database to find high performers in that area of the country and send five candidates for the job to meet the criteria. Regardless of our resources, the student has to be assertive. What I can do most effectively is widen that opened door that the students got their foot into. After a first interview, I'll call the employer as an active reference."

At Full Sail Center for the Recording Arts in Winter Park, Fla., students receive a specialized associate's degree after a year of coursework in one of two programs—recording arts and

—CONTINUED ON PAGE 147

C O A S T

NASHVILLE SKYLINE

by Dan Daley

Nashville will host the 1993 summer NAMM show, it was announced in late November. Dates are July 17 and 18, at the Downtown Convention Center.

Hollywood-on-the-Cumberland: Denny Purcell has built a THX screening room in the basement of Georgetown Masters. The nine-seat theater opened in January, complete with popcorn machine, and is aimed at both video and film dailies screenings. It can handle both VHS and 3/4-inch video. Purcell said that record label response to the idea has been "very positive."

In a move that reflects the emergence of technologically engendered niche markets, two Nashvillians, Rick Cobble and Van O'Dell, have started Disc & DAT, Nashville's first full-service CD-R operation. Using a Philips CD-R recorder and a pair of Panasonic 3700 DAT decks, they're targeting clients from producers to record companies to publishers. "You can really make this niche work as long as prices are reasonable, more so than what the local mastering houses, who are the only ones who now offer this service, are charging," said Cobble. Disc & DAT is charging \$100 per 74-minute CD. Contact them at (615) 297-9737.

You don't have to go to Church anymore. At least, not to Church Street. Church Street Studios moved from its five-year abode into a newly purchased house on Music Row and reopened in November. The house, formerly Wrayton Jennings' office, had its basement renovated and part of the first floor removed to accommodate the new facility, now called Matrix Recording, an Otari 24-track Soundcraft room with three iso rooms around a small main room. Design was a joint

effort between owner Randy Harris, freelance engineer Rocky Schnaars, Matrix manager Jack Howell and contractor Michael Hite. Harris stressed that this wasn't a new studio in an increasingly overcapacitized market, but a renewed room that is aimed at the mid-budget record market, which he said is burgeoning in Nashville.

Javelina Recording has added several iso booths in its huge former RCA-owned studio on the Row. Studio owner Warren Peterson said that the booths' design was done in consultation with Russ Berger. "When I first moved in here a little over two years ago, I didn't realize how much work was going to be needed in the control room," he said. "Now that that's done, we're getting around to finishing off the main room." Javelina has Nashville's largest tracking room, and its design is similar to that of the recently closed RCA Studios in Manhattan, a combination of tile and bentwood wall treatments.

Sound Stage Studio is remodeling the open-design Tom Hidley control room in its Front Stage studio. George

—CONTINUED ON PAGE 148

N.Y. METRO REPORT

by Dan Daley

It took a prolonged, major labor strike and the closing of one of the city's oldest and largest studios, but the New York City government is finally realizing the economic contribution that recording studios have made to the city and that the industry needs the same sort of help afforded other businesses here. On October 28, Angela Hendrix Terry of the NYC Economic Development Corporation (EDC), an official municipal organization, along with two assistants, met with Lee Murphy, representing the local SPARS chapter, to discuss economic help for New York recording studios. Murphy, owner of West Side boutique post facility, Brigg's Bakery, characterized the meeting as informal but very productive.

"In the wake of the film strike

—CONTINUED ON PAGE 149

Jon Lucien (right) working on his latest PolyGram release at NYC's Eastside Sound with engineer Lou Holtzman.



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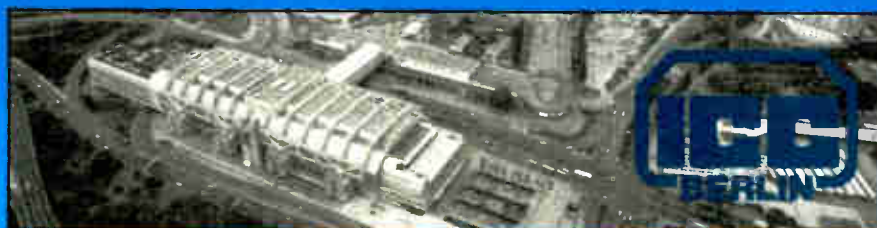
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—FROM PAGE 144, L.A. GRAPEVINE

G Series mega-console, with Ultimotion, is now installed, and Prince and his engineer are busily remixing his latest tracks there. This new console has the distinction of being one of the two largest SSLs to be installed in an audio facility.

According to Record Plant president Rick Stevens, "We have already received a remarkable amount of interest in the new room from artists around the world." He goes on to relate that he could have already taken at least a dozen bookings much sooner than now but decided to wait until the room was just right. By the way, the acoustic design is by studio bau:ton.

Oh, and just in case you think they are resting on their laurels, the construction crew was given only enough time to down a glass of champagne before being sent back to work on the other new room, "Neve 1." (I hope they were given the chance to sober up before going back to work!)

Speaking of Neve consoles, Andora Studios (Hollywood) also is finishing up a new room with what could be the largest Neve 80 Series in the world. (I'm sure someone will let me know if I am wrong about it.) Studio B will feature two 8078s combined into one large board. It has been modified so that each channel will have ten sends on each channel of the monitor section, along with 32 Neve 1073 Class A mic pre's with 3-band EQ. They have also outfitted it with GML Moving Fader automation. The new room will also feature Genelec 1035 monitors.

Since this is my first column, I have decided to introduce a new feature under the title of "Quick Bits" for things that need to be mentioned but that I don't have a lot of detailed information about. Here goes:

Gary Black Studios in Burbank has been sold to Hollywood Records to be used as an in-house production facility...The former New England Digital L.A. headquarters is now being occupied by new tenants, Pacific Coast Sound Works. In case you wiped it from your memory, the address is 8455 Beverly Blvd., Suite 500. The number is (213) 655-4771...Audio Rents now has a Philips/Marantz CD-Recorder for rent. For more info call Bob Burton at (213) 874-1000...Baby'O Studios was sold to Landmark Studios in Hollywood and is now open and online with vintage Neve gear. Call Chris Clayton at (213) 957-5103.

Also new to the column is "Overheard at the Hamburger Stand." The first tidbit is that a very big new video and audio, all-digital, super-duper facility with an engineering staff of superstars will be opening very soon. I'll let you know what happens.

I would like to close my first column with a personal invitation to contribute *anything* you like to my little list of stuff. I especially love rumors and funny things. Or if you just want to say "hi" and introduce yourself, you can fax me at (818) 506-1071 or write me at 859 Hollywood Way #128, Burbank, CA 91505. ■

—FROM PAGE 144, RECORDING SCHOOL ROUNDUP

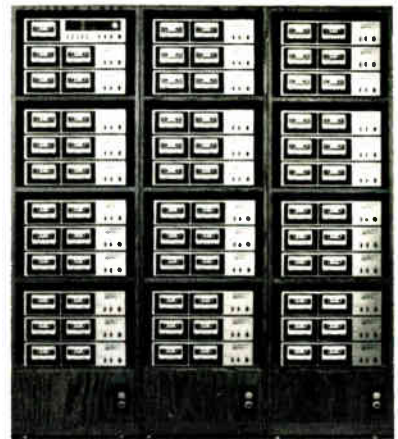
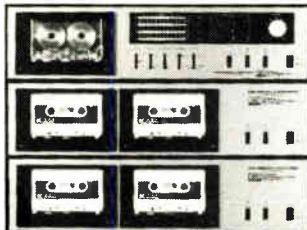
video/film production—or a new "super course," which is a combination of the two programs with graduation in a year-and-a-half. Full Sail placement director Tammy Gilbert notes, "We typically spend the last two months of the student's education working to focus his/her efforts: specific region where they want to work, specific area in the industry. We also offer lifetime placement. That means if a student graduates in good standing, we can offer job listings in their area and information on production companies. They also have access to our hotline,

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said. "And that's good, because this is something we've been working toward for a long time."

Sound On Sound's new room is getting closer to reality. As we reported here several months ago, owner Dave Amlen had the rug pulled out from under him by his bank, putting construction in limbo. Last fall, Amlen secured financing from an alternate source and put the project back on track. The new room, upstairs from the existing studio, designed by John Storyk, is expected to be online by April with a Neve VR72 console.

Meanwhile, Amlen is actively accumulating an arsenal of classic gear to complement the new equipment he's buying. High on his list have been old AKG and Neumann tube microphones and RCA ribbon mics, as well as older dbx 160 "Little Mother" compressors, LA2, LA3 and 1176 units, and EMT plates.

An update to the report in last November's Metro column on Hit Factory's new studios: The third of the facility's four rooms went online Friday, November 13. The two studios on the main floor have already hosted dates for Cyndi Lauper, Laura Branigan (Phil Ramone producing), Bon Jovi, and the audio posting for September's Bob Dylan tribute at Madison Square Garden.

The Hit Factory's soundstage on the sixth floor, which has now been fitted with trusses for video shoots, was expected to go online in early December. The four rooms hold two SSL and two Neve consoles, one of the former being a 96-input G Series and one of the latter comprising two vintage 8068 consoles joined together with new wiring. Four mastering rooms are nearly ready to open, and a fifth is virtually complete, ready for possible future expansion. The Hit Factory offices moved officially on December 4 to the new location at 421 W. 54th Street.

Ed Germano said that the rate structure for all the new rooms except the soundstage will be \$2,660 per day, including digital multitracks and out-board gear. He plans to be firm with that rate, noting that the amount is lower than what the original studio charged based on an hourly rate of between \$165 and \$215 per hour in 1979 for a full day's recording. Germano also denied ever participating in the rate wars that have characterized New York's recording scene for years. "I'm not worried about the dollars," he said. "In the past, our approach has been to work with people to make music. The dollars always followed the music." ■

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Recording Schools

SEMINARS & PROGRAMS

Following is a briefly annotated list of schools and programs with offerings in the areas of audio and music education, compiled from questionnaires received from those institutions earlier this year. The courses vary greatly in scope, intent and cost, and we urge those interested in attending any program to investigate very carefully before making their decisions. *Mix* claims no responsibility for the accuracy of the information provided by the institutions.

EASTERN

ALABAMA STATE UNIVERSITY

Program Name: Music Media Technology. 915 S. Jackson St.; **School of Music; Montgomery, AL 36101; (205) 293-4341.** **Chief Administrator:** Dr. Thomas Hager, Dean, School of Music; Scott M. Martin, coordinator. **Program:** The Music Media concentration is an educational option for those interested in pursuing a music career. The Music Media concentration combines a traditional performance music education with music technology leading to a Bachelor of Arts degree in music. Selected specialized coursework offered: Beginning and Advanced Recording, Physics of Music, Audio Production for Video, Digital Signal Processing for Musicians, Television Production Techniques and Recording Practicum. Internships and Scholarships are available. The Music Media digital production facility is housed in the School of Music, featuring equipment by most major audio and MIDI manufacturers.

ALPHA WAVE RECORDING STUDIOS

Program Name: Music Career Management Courses. 5042A West Chester Pike; Edgemont, PA 19028; (215) 353-9535. **Chief Administrator:** Ken Myers. **Program:** An intensive 40-week program that concentrates on five primary areas of study: 24-track recording engineering, computer music operations, music business understanding, music production and media production. Class sizes are limited to seven students per section to ensure maximum hands-on learning. Students will study all aspects of multitrack engineering, basic and advanced sequencing, programming, and composing techniques. The Music Business Understanding course examines publishing, contract analysis, record and concert promotion, artist management, radio and airplay playlist interpretation, placing material and copyrighting. Classes are intensive, individualized learning experiences taught by professional engineers and industry representatives. The program is designed to increase your answers in all aspects of the music business. Courses are conducted on a standard semester format with special summer and winter sessions. Choose one or all five courses. Total tuition: \$4,400. Fee covers registration, textbooks, tapes, floppy disks and all studio incidentals. Call for brochure and curriculum outlines.

THE AMERICAN UNIVERSITY

Program Name: Audio Technology. 4400 Massachusetts Ave. NW; Washington, DC 20016-8058; (202) 885-2743; (202) 885-6000. **Admission.** **Chief Administrator:** Romeo Segnan. **Program:** The American University Physics Department offers a Bachelor of Science degree in Audio Technology. It concentrates on technologies of electronic sound recording and production. It is multidisciplinary and utilizes other departments for courses in mass media, music, theater production, business and computer science. The department also offers a degree in Music and Technology, in collaboration with the Performing Arts and Computer Science departments. The program's faculty consists of three full-time and several adjunct pro-

—SEE PHOTOLOGO TOP OF NEXT COLUMN



THE AMERICAN UNIVERSITY
Washington, DC

fessors providing individualized guidance for students. The adjuncts are drawn from the community of professional practitioners in the Washington area, many of whom are graduates of the program. The main studio has a 24x16x2 TAC Scorpion mixing console, Studer A80 Mark III tape deck, Panasonic SV-3700 DAT mastering deck, two Revor 2-track mastering decks, a complete complement of microphones, and a full range of analog and digital signal processors. Our two electronic music labs have various analog and digital synthesizers, samplers, MIDI controllers, IBM, Mac and Atari computers, 8-, 4- and 2-track tape recorders, and mixing consoles. We also host a student chapter of the Audio Engineering Society. Program acceptance demands at least 2.0 GPA; unlike other programs, no audition is necessary. Internships and Cooperative Education are available.

THE ART INSTITUTE OF ATLANTA

Program Name: Music Entertainment Management. 3376 Peachtree Rd. N.E.; Atlanta, GA 30326; (800) 275-4242. **Chief Administrator:** Louis L. Lewow.

THE ART INSTITUTE OF PHILADELPHIA

Program Name: Music and Video Business. 1622 Chestnut St.; Philadelphia, PA 19103; (800) 275-2474. **Chief Administrators:** Daniel A. Levinson, Robert Crites.

THE ART INSTITUTE OF PITTSBURGH

Program Name: Music and Video Business. 526 Penn Ave.; Philadelphia, PA 15222; (800) 275-2470. **Chief Administrator:** Constance A. Clark-Moore.

THE ART INSTITUTE OF FT. LAUDERDALE

Program Name: Music and Video Business. 1799 S.E. 17th St.; Ft. Lauderdale, FL 33316; (800) 275-7603. **Chief Administrator:** John T. Mirin.

THE SAM ASH MUSIC INSTITUTE

Program Name: Audio Engineering Certificate Program. 1077 Route #1; Edison, NJ 08837-2904; (908) 549-0011; FAX: (908) 549-3463. **Chief Administrator:** Jack Knight. **Program:** The Music Institute is offering a 106-hour engineering program, which includes all of the vital material needed in today's job markets. Using the Institute's 24-track recording studio and several fully equipped MIDI production labs, the student will receive basic theory and "hands-on"

training in the following courses: Introduction to Audio, Audio Engineering I, Advanced Mixing Techniques, MIDI Systems I, MIDI Recording Techniques, and two required electives. All courses are given within 8-week semesters, and all courses can be taken individually if desired. Once all courses have been completed, the school will award a certificate to the student. Program highlights include: Basic Sound Principles, Console Theory and Operation, Patch Bay Theory and Operation, Tape Machine Theory Operation and Maintenance, Microphone Theory and Application, Effects and Signal Processing, MIDI Theory and Equipment Operation, Computer Recording with Time Codes, Equipment Programming and hands-on recording sessions.

AUDIO RECORDING TECHNOLOGY INST.

Program Name: Theory & Practice of Audio Recording. 440 Wheeler Rd.; Hauppauge, NY 11788; (516) 582-8999; FAX: (516) 582-8213. **Chief Administrator:** James Bernard. **Program:** A comprehensive, hands-on course in the theory and practice of audio recording. The program consists of four levels: Basic Audio 101, Advanced Audio A201, Recording Workshop A301 and MIDI Technology M401. Each course is 10 weeks, 3 hours per week, and provides extensive experience with the studio equipment. Audio Recording Tech Inst. (ARTI) was established in 1969 and maintains very limited enrollment per class; it also offers affordable tuition with financing and realistic employment opportunities. Initially, qualifying graduates may use all ARTI studios for their own private sessions as a member of the Recording Engineers Association. This exclusive Association offers the graduate important, professional studio experience in preparation for eventual employment in the industry. Presently, ARTI has one school location in Long Island, NY, a location in Anaheim, CA, and the newest location in Orlando, FL.

THE AUDIO WORKSHOP SCHOOL DIV. COMMUNICATIONS RESEARCH GROUP

Program Name: Studio and Stage Sound Production: SSP 300 + 400 Series. 119 Fresh Pond Pkwy.; Cambridge, MA 02138; (617) 547-3957; FAX: (617) 876-5159. **Chief Administrator:** Steve Langstaff. **Program:** New England's oldest audio school has been guiding aspiring engineers, producers and musicians since 1972. We offer comprehensive training in theory and techniques of sound engineering in collaboration with top 24/32/48-track Boston studios. Four-month program meets weekday evenings and weekends in classes that are small and personal. Program covers Acoustics, Hearing and Perception, Microphones, Analog and Digital Media and Processing, Mixing, Automation, MIDI, SMPTE, Studio and Location Production of Music, Commercials, and Audio Post for Film, Video, Vinyl and CD, Equipment Interface and Maintenance, Sound Reinforcement, Audio Business and Finance. It includes 24-track student projects. Harvard-educated instructor Steve Langstaff is a respected music and acoustical engineer, consultant and producer, and a member and former chairman of the New England section of the Audio Engineering Society. Noted guest instructors include Paul Lehrman, Walter Lenk and Stuart Cody. No prerequisites for SSP-301. Licensed by the Massachusetts Department of Education.

BARTON COLLEGE

Program Name: Department of Communication, Performing and Visual Arts. **College Station; Wilson, NC 27893; (919) 399-6486; FAX: (919) 237-4957.** **Chief Administrator:** John Hancock, Dept. Chair. **Program:** Barton College is a four-year liberal arts school offering the Bachelor degree of Science in Music Recording Technology in the Department of Communication, Performing and Visual

—LISTING CONTINUED ON NEXT PAGE



Recording Schools

SEMINARS AND PROGRAMS

—LISTING CONTINUED FROM PREVIOUS PAGE

Arts. The program requires music study including music theory, music history, ensemble participation, private lessons on a major instrument, and conducting. The technical courses include electronic music, acoustics of music, sound synthesis, recording techniques, production techniques and studio management. The program concludes with an eight-week internship in an established studio. For more information, contact Dr. Gayla Turk, Director of Music Recording Technology, Music Division, Barton College, Wilson, NC 27893. Phone: (919) 399-6486.



BELMONT UNIVERSITY
Nashville, TN

BELMONT UNIVERSITY

Program Name: Music Business. 1900 Belmont Blvd., Nashville, TN 37212-3757; (615) 386-4504; FAX: (615) 385-6455. **Chief Administrator:** Robert E. Mulloy. **Program:** Established in 1973. The program leads to a Bachelor of Business Administration (BBA), a professional degree. Students who complete the degree requirements graduate with a major in Music Business. The program stresses a strong liberal arts emphasis and is not a "trade school" program. Forty-eight courses offered allow for electives to determine the industry direction of the student. The program discourages the "glamour and glitter" concept. A 9,000-square-foot Center for Music Business houses two state-of-the-art control rooms and studios; a pre/post-production MIDI room; six practice writer rooms; a 10 station Music Technology classroom; an all-purpose classroom; a central machine room; engineering shop and storage. The facility is available to Music Business majors. An industry intern program complements the academic work. An active Music Business Board of Advisors from the Nashville Music Industry serves as an advisory system for the program. The program stresses the real world application to the academic classroom setting. Seven full-time and 12 adjunct professors.



BERKLEE COLLEGE OF MUSIC
Boston, MA

BERKLEE COLLEGE OF MUSIC

Program Name: Music Technology. 1140 Boylston St., Boston, MA 02215; (617) 266-1400. **Chief Administrator:** Don Puluse, Chairman of Music Technology Division. **Program:** The Music Technology departments of Music Synthesis and Music Production and Engineering offer extensive hands-on experience and education in audio engineering, production, sound design and the use of synthe-

—SEE LISTING TOP OF NEXT COLUMN

sizers and computers in writing, recording and performing music. Facilities include an array of multitrack studios, a digital/video post production and editing suite, three synthesis labs with 30 individual work stations and MIDI-equipped ensemble/recital rooms. In addition to receiving a four-year degree or diploma, the Berklee student benefits from a rich and diverse musical environment, as well as from cultural exchange with our large body of international students. Music Technology alumni are employed throughout the world in companies such as BMG, CBS, CEMA, PolyGram, Digidesign, Mark of the Unicorn, Opcode, Roland, Yamaha, Young Chang-Kurzweil and major US studios including Conway, Hit Factory, Power Station and Unique.

CAYUGA COMMUNITY COLLEGE

Program Name: Audio Production, A.A.S. Degree. 197 Franklin St., Auburn, NY 13021; (315) 255-1743. **Chief Administrator:** Steven Keeler.

COLLEGE OF ST. ROSE

Program Name: BS in Music, concentration in Studio Music. 432 Western Ave., Albany, NY 12203; (518) 454-5278; FAX: (518) 438-3293. **Chief Administrator:** M.A. Nelson. **Program:** The College of Saint Rose's Studio Music program leads to a BS degree in music with a concentration in studio music. The studio music component focuses on strong musical performance, writing, arranging and improvisation, as well as studio production, recording engineering, MIDI and television production. The Music Department also offers minor concentrations in Music Business and Music Technology. Admission is by audition. Catalog and application information: CSR Admissions Office, (518) 454-5150. **Program Director:** Mary A. Nelson, (518) 454-5278.

DUQUESNE UNIVERSITY

Program Name: Bachelor of Music in Sound Recording Technology. 600 Forbes Ave., Pittsburgh, PA 15282; (412) 434-6080. **Chief Administrator:** Dean Michael Kumer; Thomas J. Kikta Jr., dir. Rec. Arts; Francisco Rodriguez, tech. dir. **Program:** Duquesne University's four-year program fills a void in existing offerings by combining the artistic and technical aspects of today's musical fields into a single, comprehensive package. In addition to instruction on their major instrument, students will gain exposure and hands-on experience in such areas as electronics, acoustics, recording theory, music production, MIDI, computer sequencing and notation, digital audio and music management. Duquesne University is the official U.S. training site for C.E.D.A.R. (Computer Enhanced Digital Audio Restoration). Students will also complete traditional elements of the music curriculum such as piano studies, music theory, solfège, eurythmics, composition, conducting, and music history and literature. All recording training takes place in Duquesne's Studios, the School of Music's multitrack/MIDI facility, which houses a 24-track studio as well as a PCM-1630. For additional information and equipment list, please contact the Sound Recording Technology Department at (412) 434-5486 or by fax at (412) 434-5479.



ELIZABETH CITY STATE UNIVERSITY
Elizabeth City, NC

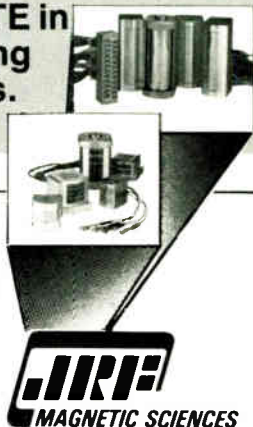
ELIZABETH CITY STATE UNIVERSITY

Program Name: BS Music Industry Studies w/concentrations in: Music Business Administration, Music Engineering & Technology. Elizabeth City, NC 27909; (919) 335-3377. **Chief Administrators:** Dr. Scott Fredrickson, Barry R. Hill. **Program:** Elizabeth City State University has developed an innovative curriculum designed to prepare students for today's music industry. As an alternative to the strictly traditional music degree program the BS degree in Music Industry Studies combines a traditional music curriculum with industry-related courses and experiences to prepare well-rounded graduates who are knowledgeable in all aspects of the music industry. The Music Business Administration concentration focuses on music business, management, marketing, sales, publishing, record production, retailing, promotion, and live concert production. The Music Engineering & Technology concentration is based on state-of-the-art 24-track recording and MIDI/electronic music studios. Studies include studio recording, production, digital audio, MIDI/electronic music, computer application, acoustics and studio design. The professionally equipped production studios enable students to produce, record, and market actual products as a major component of the instructional process. ECSU offers low in-state and out-of-state tuition (\$691/\$2,928 per semester).

FINGER LAKES COMMUNITY COLLEGE

Program Name: Music and Music Recording. 4355 Lake Shore Dr., Canandaigua, NY 14424; (716) 394-3500; FAX: (716) 394-5005. **Chief Administrator:** Dr. Susan Matteson.

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Recording Schools

SEMINARS AND PROGRAMS



FIVE TOWNS COLLEGE
Dix Hills, NY

FIVE TOWNS COLLEGE

Program Name: Audio Recording Technology, 305 North Service Rd., Dix Hills, NY 11746; (516) 424-7000; FAX: (516) 424-7006. **Chief Administrator:** Dr. Martin L. Cohen. **Program:** Five Towns College offers accredited two- and four-year degrees. Our unique three-point programs were developed to provide students with the tools needed to succeed as engineers and producers of music or film/video soundtracks. In this "triple threat" program, students receive intensive instruction in audio recording, a comprehensive music education and through our extensive internship and job placement program, students can take advantage of the college's proximity to New York City. Facilities at our new 34-acre campus include five John Storyk-designed recording studios in formats from 8 to 48-track, including a hybrid digital/analog control room complete with an SSL 4048G Series console with Total Recall, a 24-track MIDI suite with Pro Tools, video editing suites, soundstage, and a large collection of industry-standard outboard and microphones including a Lexicon 480L, Eventide H3000, TC 2290, Tube Tech EQs, etc.

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FRANKLIN INSTITUTE OF RECORDING SOUND TECHNOLOGY
Program Name: "One-on-One" Studio Engineering & Design, PO Box 1121; Franklin, TN 37064; (615) 794-3660. **Chief Administrator:** Danny M. Hilley.



FULL SAIL CENTER FOR THE RECORDING ARTS
Winter Park, FL

FULL SAIL CENTER FOR THE REC'G ARTS

Program Name: Recording Arts Specialized Associates Degree/Video & Film Specialized Associates Degree, 3300 University Blvd., Winter Park, FL 32792; (407) 679-0100; (407) 679-6333; (800) CAN-ROCK; FAX: (407) 678-0070. **Chief Administrator:** Jon Phelps, Ed Haddock, Garry Jones. **Program:** Degree programs in audio and/or video and film cover the major aspects of the respective industries, including recording engineering, record production, post-production, the tapeless studio, digital recording, music video production, concert sound and lighting, MIDI music, music business, cinematography, set design and special effects. Over 2,700 contact hours of training are offered with more than 1,350 hours of hands-on labs utilizing equipment including Neve, SSL, Sony and Tascam consoles; Studer, Otari and Ampex recorders; Studer Dyaxis II Workstations, Synclaviers and Direct-to-Disk digital recorders;

—SEE LISTING TOP OF NEXT COLUMN

Montage II, CMX, Chyron, Sony and Ikegami video gear. Programs offer optional six-week externships where students choose the facilities/locations whenever possible. Short courses are available. Full Sail is the winner of the 1989, 1990 and 1991 TEC Awards for Recording School/Program, the official training center for New England Digital, Neve, Montage and Studer Dyaxis. Full Sail is nationally accredited by CCA and offers financial aid to those who qualify. Call and tell us about your career goals. We take your dreams seriously.

GEORGIA STATE UNIVERSITY

Program Name: Music Industry Program, School of Music, University Plaza; Atlanta, GA 30303-3083; (404) 651-3676; FAX: (404) 651-1583. **Chief Administrator:** Dr. Richard Koehler, director. **Program:** The Music Industry Program is part of the School of Music and offers the Bachelor of Music degree with a concentration either in music management of studio recording. The purpose of this four-year degree is to prepare students for careers in the music industry that range from artist management to studio production. The recording concentration offers hands-on experience in analog and digital technology at a designated recording studio; it includes courses in MIDI and electronic music. The music industry program requires a musical audition for admission. The internship program places students with recording studios, record companies, and a variety of other music industry locations throughout the nation. All instructors are active professionals. If interested, please write or call for more information.



INSTITUTE OF AUDIO RESEARCH
New York, NY

INSTITUTE OF AUDIO RESEARCH

Program Name: Recording Engineering & Production (REP) Program, 64 University Pl.; New York, NY 10003; (800) 544-2501; (212) 777-8550 (NY, NJ, CT.). **Chief Administrators:** Albert B. Grundy, Miriam Friedman. **Program:** Nominated for the 1991 TEC Awards, the 650-hour REP Program offers both the in-depth technical knowledge and hands-on skills needed to begin a career in the recording industry as an assistant recording engineer or an entry-level audio technician. The program gives the student real, practical experience working on recording projects with professional bands in a state-of-the-art recording studio—from the initial tracking to the final mix—and a strong fundamental technical background. Special emphasis placed on the cutting-edge of music technology, including MIDI (Musical Instrument Digital Interface), synthesizers, sequencers and sampling. IAR offers its students a unique training opportunity through its cooperative program with Solid State Logic. IAR students receive special training in signal flow and console operations on the SSL console. Advanced training is also available in both operations and maintenance for working engineers. Students intern at world-famous New York recording studios like Power Station, The Hit Factory and Platinum Island, and lifetime graduate placement assistance is provided. IAR students work effectively in other audio settings as well, including audio-for-film, video and television, audio-for-video post-production, live sound, broadcast audio, satellite communication, corporate communications and other areas.

IONA COLLEGE-YONKERS CAMPUS

Program Name: Radio/Television, 1061 N. Broadway; Yonkers, NY 10701; (914) 378-8024. **Chief Administrator:** Ann Huntington.

LEBANON VALLEY COLLEGE OF PENN.

College Ave., Annville, PA 17003-0501; (800) 445-6181. Chief Administrator: John J. Uhl. **Program:** The Sound Recording Technology program at Lebanon Valley College is a comprehensive course of study combining the art, science and philosophy of recording. The students follow a variety of disciplines involved in the field of audio engineering, including: recording technology, music, physics, electronics, mathematics, computer science, business administration and selected courses in the liberal arts. Emphasis is placed on student usage of equipment in laboratory and practicum courses. All applicants to the program must pass a musical audition for acceptance. The degree conferred is a Bachelor of Music: Sound Recording Technology and meets NASM standards.

LOYOLA UNIVERSITY

Program Name: Recording and Electronic Music, College of Music; 6363 St. Charles Ave., Box 8; New Orleans, LA 70118; (504) 865-2773; FAX: (504) 865-2773. **Chief Administrator:** Sanford Hinderlie.

JAMES MADISON UNIVERSITY

Program Name: Music Industry—Multi-Track Recording Techniques, Music Department; Harrisburg, VA 22807; (703) 568-6197; FAX: (703) 568-6920. **Chief Administrator:** Robert W. Smith.

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MEDIA ARTS CENTER

Program Name: Modern Recording Techniques. 753 Capitol Ave.; Hartford, CT 06106; (203) 951-8175. Chief Administrator: Jack Stang, producer



MEMPHIS STATE UNIVERSITY
Memphis, TN

MEMPHIS STATE UNIVERSITY

Program Name: Commercial Music. CFA 232; Memphis, TN 38152; (901) 678-2559; FAX: (901) 678-5118. Chief Administrator: Larry Lipman. Program: Memphis State offers the Bachelor of Music in Commercial Music with concentrations in Recording Technology and Music Business. Fully accredited by NASM. CMUS majors won the prestigious NARAS Student Music Award in the Jazz/Big Band category. Our program stresses a thorough understanding of fundamental concepts, yet places equal emphasis upon developing the student's ability to quickly adapt to new practices, technologies and creative directions. Our instructors possess a broad knowledge of music industry practices and are actively involved in today's commercial music industry. Modern production facilities include a comprehensive 24-track studio, video production suite, electronic music lab, and digital audio workstation. (See Southeast Studios Directory for complete equipment list.) The Memphis arts community offers a dynamic environment, providing students with diverse cultural opportunities and a rich assortment of internship possibilities. Scholarship funds are available for exceptional students, and many states offer financial assistance through the Academic Common Market. A commitment to personal attention and quality instruction requires that enrollment be limited and based on selective procedures.

MIAMI SUNSET SENIOR HIGH SCHOOL

Program Name: Electronic Music/Television Production. 13125 SW 72nd St., Miami, FL 33183; (305) 385-4255; FAX: (305) 385-6458. Chief Administrator: Daniel Sell. Program: Sunset offers a four-year curriculum in television production and electronic music (recording engineering). Students in television work in a four-camera color studio with computer-assisted editing, computer graphics, telecine and inter-format dubbing. Students produce commercials, live closed-circuit broadcasts, daily news, and record schoolwide events including multi-camera remotes. Students involved in audio use the 8-channel Tascam/Tapco studio complete with dbx and many outboard accessories. Students also study sound reinforcement using the school's Yamaha P.A. system. Most projects include combining television, recording and sound reinforcement equipment. These programs are open to all students enrolled at the school.



MIAMI-DADE COMMUNITY COLLEGE. KENDALL CAMPUS
Miami, FL

MIAMI-DADE COMMUNITY COLLEGE KENDALL CAMPUS

Program Name: Sound Engineering. 11011 SW 104 St., Rm 8242; Miami, FL 33176; (305) 237-2265. Chief Administrator: Harold Harms, Director of Sound Engineering. Program: Sound engineering studies at Miami-Dade Kendall are associated with the Music Department. This is a natural relationship because sound engineering students require a wide variety of sound source to sharpen their skills in the production of professional music. Successful sound engineers have musical backgrounds coupled with technical skills and a broad range of practical experience. Sound engineering course work is only part of the picture at Miami-Dade Kendall. The Sound engineering program is set up to provide students with opportunities to gain practical experience. Students gain "hands-on" experience doing multitrack recording for student projects, sound reinforcement for campus events and "on location" recording for music

department programs. These combinations of activities provide sound engineering students at Miami-Dade Kendall a wealth of opportunities for the application of job-related skills. On-campus studio features 4-, 8-, 16-track recording, MIDI workstations, 2-track analog and DAT mastering together with a full complement of professional microphones and outboard gear.

MIDDLE TENNESSEE STATE UNIVERSITY

Program Name: Recording Industry. PD Box 21; Murfreesboro, TN 37132; (615) 898-2578; FAX: (615) 898-5682. Chief Administrator: Dr. Richard Barnett. Program: The Recording Industry Department offers a Bachelors degree program with emphases in audio and business. Offering 29 different courses, the program covers all areas of the industry. Minors are available in Mass Communications, Music Industry, Entertainment Technology, Electronics, Business Administration and Marketing. On-campus facilities include 3 recording studios (1 with Dolby Surround, two with digital multi-tracks), two DAW platforms, a 10 station MIDI lab, a digital editing suite, video production and post-production studios. Thirteen full-time faculty are on campus to assist students who come from over 35 states and several foreign countries. This program has received 8 TEC award nominations and the NARAS Student Music Award. Current tuition, per semester full time in state \$740. Out of state \$2,541. Residents of certain Southern region states qualify for in-state status. —SEE PHOTO/LOGO TOP OF NEXT COLUMN

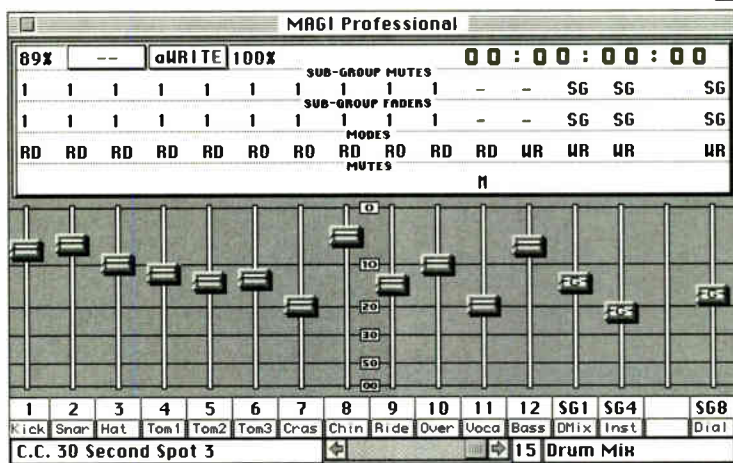


MIDDLE TENNESSEE STATE UNIVERSITY
Murfreesboro, TN

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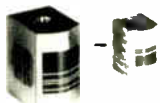
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Recording Schools

SEMINARS AND PROGRAMS

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Program Name: Doing Music & Nothing Else: The Music Business Week. 87 Lafayette Rd.; Hampton Falls, NH 03844; (800) 448-3621; (603) 929-1128. Chief Administrator: Peter C. Knickles. Program: Celebrating its 7th anniversary, MBS, Ltd., with sponsorship from *Musician* magazine, presents "Doing Music & Nothing Else: The Music Business Weekend Seminar." The program is a weekend-long, classroom-style, multimedia educational experience presented in 35 major cities each year. The curriculum is designed for men & women of all ages, all styles of music, bands and soloists, who are pursuing a career in original music songwriting, recording and/or performing. Learn how to establish appropriate goals, attract a songwriting or recording contract, book profitable gigs, raise capital, and more. Aftercare Opportunities include toll-free telephone counseling with instructor, two free directories (A&R and T-100), PAN membership, etc. Seminar is also available on audio tapes with workbook. This is the only music business seminar in the U.S. with a 100% No-Hassle, money-back guarantee. Call (800) 448-3621 for FREE 2-year subscription to quarterly journal and seminar brochure/schedule.

NEW SCHOOL FOR SOCIAL RESEARCH

Program Name: Audio Engineering Certificate Program. 66 West 12th; New York, NY 10011; (212) 229-5873. Chief Administrator: Fred Williamson, director. Program: The Certificate Program in Audio Engineering is a five-course sequence that examines and explains the equipment, procedures, techniques and underlying theoretical principles of contemporary multitrack recording. The curriculum combines hands-on studio experience with lectures and classroom study, culminating in an internship for those who successfully complete all course requirements. Classes meet in outside studios. All are taught by established professional engineers who present state-of-the-art knowledge in a relaxed, informative atmosphere. While focused on providing students with the skills needed by recording engineers, the program is open, and of great use, to any and all musicians/writers/arrangers/producers who recognize that the increasingly technological nature of contemporary music demands knowledge of, and the ability to function within, the modern recording studio. All courses offered three semesters yearly. Tuition & Fees: \$1,940-\$2,060. Certificate registered with State of New York.

NEW YORK UNIVERSITY

Program Name: Music Technology. 35 W. 4th St., Rm. 777; New York, NY 10003; (212) 998-5422. Chief Administrator: Kenneth Peacock. Program: NYU's Music Technology track prepares students for careers in Recording Engineering, Production and Post-Production, Audio/Video Mastering, Audio Maintenance and Repair, Computer Programming and Software Development. The facilities include two recording suites, four computer music laboratories, an AV and film music editing studio, an analog synthesis studio and two research and development facilities which use Macintosh, IBM, and NeXT computers. The Arts & Media Laboratory gives students exposure to advanced computer music and multimedia platforms. Students may participate in a wide-ranging internship program, spending a semester in a professional environment such as a record company, recording studio or publishing house. Students may earn a Bachelor of Music degree in either Music Business or Music Technology, or a Master of Music degree in Music Technology. Honors students may participate in the new Stephen F. Temmer Tonmeister program. All degrees are fully accredited through the National Association of Schools of Music.

JOSH NOLAND MUSIC STUDIO

Program Name: Introduction to the Art of Recording. 760 W. Sample Rd.; Pompano Beach, FL 33064; (305) 943-9865; FAX: (305) 943-9865. Chief Administrator: Josh Noland.

NORTHEAST BROADCASTING SCHOOL

Program Name: Recording Arts. 142 Berkeley St.; Boston, MA 02116; (617) 267-7910; FAX: (617) 236-7883. Program: The Recording Arts Program at the Northeast Broadcasting School is designed to develop the specialized skills and creative techniques students need to pursue careers in music recording and audio engineering. The Recording Arts Program features intensive studio instruction, internship programs and life-long professional placement assistance and career planning. Applicants for the Recording Arts Program must have a high school diploma or its equivalent. As well, they must submit an admissions application and participate in an admissions interview. Tuition for the day division is \$8,100; the evening division is \$7,100. Financial aid assistance is available to students who qualify. The Northeast Broadcasting School is accredited by the Accrediting Commission for Trade and Technical Schools of the Career College Association. Classes begin in the winter, spring and fall.



THE OMEGA STUDIOS' SCHOOL OF APPLIED
RECORDING ARTS AND SCIENCES
Rockville, MD

THE OMEGA STUDIOS'

SCHOOL OF APPLIED RECORDING ARTS AND SCIENCES

Program Name: Studio Techniques, Advertising Production, MIDI, Music Business. 5609 Fishers Ln.; Rockville, MD 20852; (301) 230-9100; FAX: (301) 230-9103. Chief Administrator: W. Robert Yesbek. Program: The Omega Studios' School, presently in its 15th year, offers a Basic Program (32 hours, \$595), an Intermediate Program (32 hours, \$795), an Advanced Program (40 hours, \$995), an Advertising Production Program (24 hours, \$695), a Basic Electronic Music and MIDI Program (32 hours, \$795), an Advanced Electronic Music and MIDI Program (40 hours, \$995), a Music Business Program (24 hours, \$595), a Studio Assistant Program (46 hours, \$1,695) and an Audio Maintenance Program (240 hours, \$3,995). The courses include lectures and workshops covering acoustics; microphone, signal processor and tape machine theory (both 24/48-track analog and 32-track digital); console operation (taught on SSL, API, Neve and Audiotronics consoles); computer sequencing; synthesizer operation and programming; basic electronics; advanced electronics/techniques; digital electronics; audio-for-video; jingle production and voice-over techniques; direct-to-disc digital recording and editing; and music business. All engineering programs include extensive hands-on training in all of Omega's control rooms, classrooms and studios. Approved by Maryland Higher Education Commission and approved for veterans training, and certain courses are available for accreditation by the American University in Washington, D.C.

ORACLE RECORDING STUDIO

Program Name: Beginning Recording Techniques. PO Box 464188; Lawrenceville, GA 30246; (404) 921-7941. Chief Administrator: Gene Smith.

PEABODY INSTITUTE

JOHNS HOPKINS UNIVERSITY
Program Name: Bachelor of Recording Arts and Sciences. 1 East Mt. Vernon Pl.; Baltimore, MD 21202; (800) 368-2521. Chief Administrator: Alan P. Kelauev. Program: The Recording Arts and Sciences department of the Peabody Institute of The Johns Hopkins University offers a five-year program of training culminating in a Bachelor's of Music degree. The program combines the musical strengths of the world-famous Peabody Conservatory of Music with the technical expertise of the electrical engineering program at Johns Hopkins. Approximately ten students per year meet the qualifications for acceptance into this prestigious program that requires a musical audition and high math SATs. Students are trained in the Conservatory's automated analog/digital 24-track recording studio with a variety of music. From classical string quartets through high-intensity techno-popular styles, hands-on training and in-studio lectures are combined with the classwork in music and engineering to produce highly qualified recording engineer/producers whose technical abilities match their musical expertise. Scholarship aid is available, and all students are employed by the studio during their course of study.

PENNSYLVANIA STATE UNIVERSITY

Program Name: Sound and Recording Workshop. 220 Special Services Building; University Park, PA 16802; (814) 863-2911; FAX: (814) 863-2574. Chief Administrator: Peter Kiefer.

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GREENVILLE COLLEGE

Program Name: Contemporary Christian Music, Recording Emphasis. 315 East College; Greenville, IL 62246; (800) 345-4440; (800) 248-2288 (IL); FAX: (618) 664-1748. **Chief Administrator:** Ralph Montgomery. **Program:** The Contemporary Christian Music program is a four-year degree program in which students may elect an emphasis in studio recording. Studio A is a 24-track MCI room equipped with a JH-600 Series console, fully automated, and a Digidesign Sound Tools II Digital Audio recording system. The program covers acoustics, mixing consoles, automation, MIDI, SMPTE, live sound reinforcement and media writing and production. Engineers, producers and artists from the contemporary Christian music industry speak with students each month. For an emphasis in studio recording with a Christian liberal arts education, contact Greenville College.

HOUSTON COMMUNITY COLLEGE SYSTEM

Program Name: Northwest College; Audio and Recording Technology. 901 Yorkchester; Houston, TX 77079; (713) 468-6891; FAX: (713) 468-0925. **Chief Administrator:** Scott Whitebird. **Program:** Fully accredited college offering two-year associate and certificate programs in recording technology. Cost of instruction is extremely competitive. Emphasis placed on practical hands-on experience. Students have access to four fully equipped multitrack studios, each with a variety of professional microphones, Mac II computer, and MIDI/SMPTE software. Studio A features an MCI 536-C automated console, Dolby A-equipped MCI 24- and 2-track recorders, Panasonic DATs, outboard equipment from Lexicon, dbx, UREI, Aphex, Eventide, and ADR, and monitors from Yamaha, UREI, Fostex, JBL, and Auratone. Additional equipment includes an Akai sampler and a hard-disk recorder/editor from Digidesign. Twin studios B and C contain Tascam M-520 20-channel consoles, Tascam 8- and 2-track recorders, and outboard equipment from Alesis and Symetrix. MIDI studio D contains a Tascam M-520 console, Fostex 16-track, Panasonic DAT, Akai S-950, Alesis drum machines, and keyboards from Roland, Yamaha, Korg, Kawai, Moog, E-mu, and Oberheim.

HUTCHINSON TECHNICAL COLLEGE

Program Name: Audio Technology, 2 Century Ave.; Hutchinson, MN 55350; (800) 222-4424; (612) 587-3636. **Chief Administrator:** David Igl. **Program:** Two-year intensive technical audio program, AAS degree option. Extensive hands-on training in audio electronics, studio and remote recording, systems design and installation, acoustics, signal processing and sound reinforcement for pro sound market. Lab and practical applications prominent. Personalized instruction allows students to enter throughout year, receive credit for previous experience and work at accelerated pace. Students active in AES. State school, low tuition. Graduates available throughout year. Extensive cooperation with employers for internships and supervised work experience. Our graduates have the mix of technical skills and applications for today's pro sound market.

INDIANA UNIVERSITY

Program Name: Associate of Science in Audio Technology/Bachelor of Science in Audio Technology. **School of Music;** Bloomington, IN 47405; (812) 855-1900; FAX: (812) 855-4936. **Chief Administrator:** Dr. David A. Pickett. **Program:** The IU Audio Department offers two degrees. The Associate of Science in Audio Technology, lasting approximately five semesters, offers training in audio recording, reinforcement and media production, with emphasis on classical music recording and multitrack studio techniques. Applicants must demonstrate an interest in the musical activities of the School. The Bachelor of Science in Audio Recording is a four-year program that offers training in audio recording and reinforcement, with emphasis on classical music engineering and producing. Applicants for the Bachelor's degree must demonstrate a keen interest in classical music and aptitude for core music studies. Performance not required. Classes in recording techniques, electronics, acoustics, maintenance and musical styles. Professional recording equipment includes 2-track digital with hard disk editing and 2, 4, 8 and 16 track analog. Students record all official concerts ranging from solo and chamber music through symphony, jazz ensembles and opera. In total, about 1,000 performances are produced annually in a 500-seat recital hall and the 1,460-seat Musical Arts Center. University financial aid and some work scholarships are available. Departmental assistance offered in job placement.

INTERLOCHEN CENTER FOR THE ARTS

Program Name: Recording Services Technical Internship. PO Box 199; Interlochen, MI 49643; (616) 276-9221. **Program:** Experience the "Magic of Interlochen"! We offer one-semester internships in recording services at our world-renowned Arts Academy, plus summer internships at our Fine Arts Camp. Duties include, but are not limited to, recording and/or sound reinforcement of concerts, lectures and seminars. Requires basic recording skills and the ability to work in teams. A good knowledge of classical/jazz music plus sound reinforcement skills very helpful. Accreditation is dependent upon school requirements. To become part of our exciting environment, call or write for an application.

MCLENNAN COMMUNITY COLLEGE

Program Name: Audio Technology/Commercial Music. 1400 College Dr.; Waco, TX 76708; (817) 750-3578; FAX: (817) 756-0934. **Chief Administrator:** David Hibbard. **Program:** Broad-based program offering three degrees (A.A.S.) in Audio Technology, Songwriting/Composition, and Performance, with a new degree pending in Music Industry Management. Full-time faculty are all active professionals in the areas of recording, performance and composition. About 100 student majors with over 20 ensembles actively performing and recording music in all styles of contemporary and traditional music. Program is housed in the Performing Arts Center and has a 24-track recording studio and a fully equipped MIDI facility.

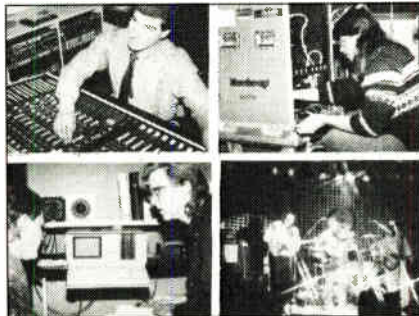
The audio technology curriculum requires the development of skills in performance, composition and management in addition to the areas of production, engineering and maintenance. As part of their course work, students must successfully plan, develop, record and manage recording projects.

MIOLANO COLLEGE

Program Name: Commercial Music/Audio Technology. 3600 N. Garfield; Midland, TX 79705; (915) 685-4648; FAX: (915) 685-4714. **Chief Administrator:** Robert Hunt.

MOORHEAD STATE UNIVERSITY

Department of Music; Moorhead, MN 56563; (218) 236-2101. **Chief Administrator:** Dr. Robert Pattengale, Dept. Chair; Mike Coates, Recording Studio Director; Dr. Mark Fasman, Electronic Music Curriculum Director. **Program Name:** The Department of Music offers NASM-accredited Bachelors degrees in Performance, Music Education and Music Industry and Master degrees in Music and Music Education. Introductory-Advanced Audio Production and Electronic Music classes are offered sequentially with instruction in analog and digital recording, synthesis, and MIDI technology. An annual recording project, "Dragon Tracks" (available upon request), features student engineers, composers, ensembles and musicians. Hands-on training and work study is also available for location recording and sound reinforcement in both commercial and classical music applications. Three studios are used in the course sequence, with Studio A featuring a large performance room, isolation booth, and LEDE control room. Equipment includes a Soundcraft 600 mix desk, analog and digital recorders, extensive outboard processing equipment and a full complement of professional microphones. A complete array of sequencers, synthesizers and samplers is augmented by extensive software for sequencing, composition and printing on the Macintosh computer.



NORTHEAST COMMUNITY COLLEGE
Norfolk, NE

NORTHEAST COMMUNITY COLLEGE

Program Name: Audio and Recording Technology. 801 E. Benjamin; Norfolk, NE 68701; (402) 644-0506. **Chief Administrator:** Timothy Miller. **Program:** Northeast Community College offers a two-year Associate of Applied Science in Audio and Recording Technology. The Audio and Recording Technology program is a balanced mix of audio theory, studio techniques, electronics, hands-on lab experience, concert sound reinforcement, T. E. F.™, concert lighting, music, music theory, MIDI and digital audio. Our on-campus facilities include a Sonic Solutions digital audio workstation. New classes start each August. Tuition for the two year program is \$2,430. Northeast Community College is accredited by the North Central Association of Colleges and Schools and the Nebraska State Department of Education.

OHIO UNIVERSITY

Program Name: School of Telecommunications—Audio Production Sequence. 253 Radio-Television Bldg.; 9 South College St.; Athens, OH 45701-2979; (614) 593-4860. **Chief Administrator:** Jeff Redefor. **Program:** The four-year program in Telecommunications leads to the Bachelor of Science degree in Communications. This is a broadly based liberal arts curriculum with an emphasis on media studies. The Audio Production Sequence incorporates coursework in multitrack recording, music production, media production, music, electronics, film, hearing and speech sciences, computer applications in music, as well as many other related courses. Audio courses stress technical theories, practical skills (with much hands-on training) as well as artistic considerations. Teaching facilities include a multitrack studio featuring a 24x8 Soundcraft 400B console, Digidesign Pro Tools 4-track digital recording and editing package with Macintosh IIx (810 meg H.D.), Opcode Studio 3 MIDI interface and synchronizer, Otari 505 8-track machine, TEAC 80-8 eight track machine, Otari 5050 2-track machine, Tascam 122 MKII cassette deck, Sony CD player, outboard gear by Lexicon, Yamaha, dbx, Symetrix, Rane & UREI. Microphones by AKG, Sennheiser, RCA, Shure and Neumann. Monitoring is by JBL and Yamaha. Other campus facilities include a Synclavier studio, file sound re-recording studio and a 16-track production studio with lock-to-picture. In addition to in-class experience, students gain experience through one of Ohio University's public radio or television stations and through an extensive internship program. Admission is highly competitive, and financial aid is available to qualified students.

OKLAHOMA STATE UNIVERSITY

Program Name: Music Technology Workshop, June 3-5, 1993. Seretean Center, Rm. 132; Stillwater, OK 74078; (405) 744-6133; FAX: (405) 744-7074.

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Recording Schools

SEMINARS AND PROGRAMS



RECORDING INSTITUTE OF DETROIT
 East Detroit, MI

RECORDING INSTITUTE OF DETROIT

Program Name: Recording Techniques. 14611 E. 9 Mile Rd.; East Detroit, MI 48021; (313) 779-1380; (800) 683-1743. **Chief Administrator:** Robert Dennis. **Program:** Established in 1976, The Recording Institute of Detroit offers an extensive, 351-436 clock-hour program in recording, MIDI and music technologies (38-45 weeks). The school offers three 24-track studios and classroom facilities. Equipment includes Solid State Logic 4030 G Series, API and DCA consoles; Lexicon 480L, 224X plus 22 with delay/reverb units, including actual EMT plates; 12 tape machines including 24-track, digital and DAT units; 24 synthesizer/sound modules/sampler units; including Emulator III, sequencing on Amiga and Macintosh computers and Akai MPC 60; loads of additional onboard gear. Tascam 688 workstations for home recording training and MIDI programming. Students attend a minimum of 9-10 hours per week with an additional 25 hours per week provided for additional help or exposure at no charge. The school publishes its own text and recording/music industry magazine. The end of the program features individual student engineering with instructor feedback on results. Our self-paced music theory classes feature computer-assisted songwriting. Our study skills training uses Hubbard Study Technology, which helps students self-learn equipment from manuals and use new equipment more fully. Internships are included in the program and job placement assistance is available (over 90% placement rate 1991-92). Tuition is \$3,397 for entire program or \$799 for first class.



THE RECORDING WORKSHOP
 Chillicothe, OH

THE RECORDING WORKSHOP

Program Name: Recording Engineering and Music Production Program. 455-X Massleville Rd.; Chillicothe, OH 45601; (800) 848-9900; (614) 663-2510. **Chief Administrator:** Jim Rosebrook, director. **Program:** An intensive seven-week, 300-hour program designed to prepare entry-level recording personnel—the original “hands-on” school for students seeking concentrated training in the creative operation of professional recording equipment. Over 200 hours are spent in-studio. This experience includes session setup, mixing techniques, recording, mixing, studio etiquette, song production, commercial and audio-for-video production, editing, and equipment maintenance. In lecture, students receive a broader study of audio engineering and music business practices. Our six-studio recording complex features two automated 24-track studios, two 16-track studios, an 8-track media production studio with Digidesign Pro Tools,

a hard disk digital editing/DAT mastering studio and a conventional editing lab. In-studio class size is three to six students, lecture class size is 48. We have internship and job placement services. We offer low-cost, on-campus housing. Financial aid is available. The Workshop has been a TEC Award nominee and is approved by the State Board of Proprietary School Registration. Please call for a free brochure.

SMITH/LEE PRODUCTIONS MEDIA SCHOOL

Program Name: Basic Recording Techniques, Advanced Recording Techniques. 7420 Manchester Rd.; St. Louis, MO 63143; (314) 647-3900. **Chief Administrator:** David Smith. **Program:** Smith/Lee Productions is a professional 24-track studio offering Basic Recording Techniques and Advanced Recording Techniques. The Basic Recording Techniques course is designed to prepare students with the proper theoretical foundation in audio and magnetic recording, while providing key instruction in the operation of professional audio recording equipment. The Advanced Recording Techniques course provides continuing technical instruction and training, preparing the student to successfully tackle more complex production situations in sound recording, mixing, A/V production and audio-for-video. Smith/Lee Productions Inc. offers courses quarterly for eight weeks, meeting once a week. These courses are excellent training for students, professionals, musicians, record producers and recording artists. New offering university credit through a local university.

SOUTH PLAINS COLLEGE

Program Name: Sound Technology, Performing Arts Production Technology. 1401 S. College Ave.; Levelland, TX 79336; (806) 894-9611 ext. 280, 281. **Chief Administrator:** John Hartin. **Program:** Sound Technology: The Sound Technology program trains you for a career as a recording engineer, sound reinforcement specialist or broadcast audio technician. Training facilities include: Tom T. Hall Studio with 36-channel Sony automated console, 24-track analog recording with synchronization to video and Studer Dyaxis workstation; Wayton Jennings studio with MCI 24-track console and recorder, adjoining MIDI/synth studio, 12-track digital demo studio and electronic lab. Two-year program awards Associate of Applied Science degree. Contact: Jerry Stoddard, Performing Arts Production Technology: The Performing Arts Production Technology program prepares you to work as a production manager or technician in video production facilities, entertainment venues and theaters. The program provides training in video and audio production, TV, film, stage and concert lighting, stagecrafts and business management. Training facilities include three TV studios including the 60'x60' Tom T. Hall studio. Equipment includes Grass Valley switchers, Sony A/B roll editor, Dubner character generator, Ampex ADO, Sony CCD cameras, Sony 3/4" SP tape recorders with time code, and Strand-Century lighting. Two-year program awards Associate of Applied Science degree. Contact: Pat McCutchin.

SOUTH PLAINS COLLEGE

Program Name: String and Fretted Instrument Repair, Commercial Music. 1401 S. College Ave.; Levelland, TX 79336; (806) 894-9611 ext. 280, 281. **Chief Administrator:** John Hartin. **Program:** String and Fretted Instrument Repair: A unique nine-month certified program provides you with luthiery skill, a trade that will place graduates of the program among a specialized and highly marketable group of craftsmen. You will gain experience in minor repair as well as full-scale restoration and construction of all types of fretted instruments. Facilities include workstations for 15 students. Contact: Harry Miller. Commercial Music Programs: South Plains College has a literal smorgasbord of music programs in the commercial realm. Country music, bluegrass music, rock, contemporary Christian, gospel and jazz are available. One of the highlights of the Country music program is the Country Caravan, an annual summer traveling music production featuring students and faculty. The Bluegrass music program includes such renowned faculty members as banjo artist Alan Munde, and guitarist Joe Carr. Several degree plans are available including a program combining Performing Arts production with a music performance option. Contact: John Hartin.

SOUTHERN METHODIST UNIVERSITY

Program Name: Dual degree in Music and Computer Science. Division of Music; Dallas, TX 75275; (214) 768-2643; FAX: (214) 768-3272. **Chief Administrator:** Martin Sweidel

SOUTHWEST TEXAS STATE UNIVERSITY

Program Name: Sound Recording Technology. 224 Guadalupe Street; San Marcos, TX 78666; (512) 245-2651. **Chief Administrator:** Mark C. Erickson. **Program:** Southwest Texas State University is the only university in the state to offer a baccalaureate degree in the field of Sound Recording Technology. SWT owns and operates the “Fire Station,” a multipurpose recording facility housing both analog and digital 24-track recorders, a 48-channel Harrison console, and numerous professional microphones and outboard devices. Students participate in commercial recording sessions while pursuing their SRT degrees. Students have access to the Music Department’s Macintosh computer lab and electronic music lab, which contains several contemporary MIDI devices, a 16-track recorder, and personal computers. Admission is competitive, with less than 15 freshmen admitted annually. Program applicants should have significant musical abilities, well developed aural skills, and possess competencies indicating an ability to complete calculus and other technical courses. The curriculum emphasizes recording, music, math/science, general studies, and an internship. Graduates receive a Bachelor of Music degree with an emphasis in Sound Recording Technology.

TRANS AMERICAN SCHOOL OF BROADCASTING

Program Name: Recording and Music Technology. 600 Williamson St.; Madison, WI 53703; (608) 257-4600. **Chief Administrator:** Chris Hutchings.

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UNIVERSITY OF MISSOURI-KANSAS CITY
Kansas City, MO

UNIVERSITY OF MISSOURI-KANSAS CITY

Program Name: Conservatory Recording and Theatre Sound Design. **Center for the Performing Arts; 4349 Cherry; Kansas City, MO 64110; (816) 235-2964. Chief Administrator:** Tom Mardikes. **Program:** "Two sound-related programs are offered at the University of Missouri-Kansas City. The Conservatory of Music offers a series of Audio Recording classes designed to teach undergraduate students the fundamentals of recording and music production, both in multitrack studio techniques and concert recording. Courses are also offered in Electronic Music production and composition. The Conservatory maintains two concert hall studios, one multitrack production studio and two digital synthesis studios. The Department of Theatre offers a graduate MFA program in Sound Design where the successful graduate is prepared for working in all theater applications: small studio, main-stage drama, musicals and opera. The graduate will also be able to work as an audio production engineer in all sorts of recording studio applications. By completing the course curriculum required for the Design and Technology Program, the sound designer learns technical skills from all departments of theater production. Both programs are housed in the Center for the Performing Arts, which is also home to the Missouri Repertory Theatre.

UNIVERSITY OF WISCONSIN-OSHKOSH

Program Name: Music Merchandising—Recording Technology Emphasis. **800 Algoma Blvd.; Oshkosh, WI 54901; (414) 424-4224. Chief Administrator:** James Kohn. **Program:** The recording technology emphasis is an option of the music merchandising program, one of the majors offered by the Department of Music of UW-Oshkosh. This is a four-year program covering all aspects of the recording process: mixing to mixdown, production and contractual agreements. The final semester is spent in the field as an intern at a professional recording studio. The program offers 16-track recording, automation, MIDI sequencing, time code, and a full array of outboard gear. Recording technology students at UW-Oshkosh have won two of the ten NARAS Student Music Awards given in 1990 and 1991. The Department of Music at UW-Oshkosh is accredited by NASM. Early application for admission to the University is advised. Classes begin after Labor Day.

WESTERN MICHIGAN UNIVERSITY

School of Music, W.M.U.; Kalamazoo, MI 49008; (616) 387-4720. Chief Administrator: John Campos. **Program:** Western Sound Studios is a 24-track studio located in the school of music at W.M.U. The studio offers a unique opportunity for the student who wishes to gain hands-on multitrack recording and mixing experience without being committed to a major or minor in audio. Unlike other schools, where courses in audio are open only to students in a particular program, students in any curriculum at W.M.U. (i.e., music, business, E.E., communications) may take our courses. A select number of students, with permission of the director, can devise what is known as a "Student Designed Curriculum," combining audio with another discipline to create a major specific to the students' goals. Two courses are currently offered, with independent studies available thereafter for those who wish to gain further experience. Our students benefit from the flexibility that comes from using a studio that is not overrun with audio engineering majors. The quality of the students' work has been recognized with 1990 NARAS Student Music Award in the Pop/Contemporary category, a 1992 Downbeat International Student Music Award for Best Live Engineered Recording and 12 other Downbeat awards.

WEST

A RICHMAN PIANO/SYNTH TRAINING

Program Name: Private Professional Instruction. **15840 Ventura Blvd., Ste. 844-G; Encino, CA 91436; (818) 344-3306. Chief Administrator:** Howard Richman.

THE ART INSTITUTE OF SEATTLE

Program Name: Music and Video Business. **2323 Elliott Ave.; Seattle, WA 98121; (800) 275-2471. Chief Administrator:** Charles B. Kester

ASPEN MUSIC SCHOOL

Program Name: The Edgar Stanton Audio Recording Institute **250 W. 54th St., 10th Floor; New York, NY 10019-5585; (212) 581-2196. Chief Administrator:** John Hill. **Program Name:** The Edgar Stanton Audio Recording Institute (ESARI) is an intensive course in audio engineering offered during the first half-session of the Aspen Music School (June 16 - July 21). Lecture and lab sessions encompass a broad range of topics related to music recording and rein-

forcement, with particular emphasis on "classical" live-mixing techniques. Students gain hands-on experience in an audio control room equipped with state-of-the-art equipment supplied by JBL/UREI, Yamaha International, Shure Brothers Inc., Westlake Audio, Pacific Audio-Visual Enterprises, Apex Systems and Lexicon. Curriculum topics may include: fundamentals of audio, electroacoustics, psychoacoustics, the recording chain, mixers and consoles, analog tape and magnetic recording, digital audio, microphone theory, stereo mic techniques and perspectives, signal processing theory and applications, multitrack and live-mixing techniques, SMPTE and synchronization. Lecture/demonstrations are conducted by ESARI faculty and prominent guest lecturers from the professional audio community. The session is strictly limited to ten (10) students to insure maximum individual attention. Write for application materials.

BARTON AUDIO RECORDING SCHOOL

Program Name: Recording Engineer Hands-On Training. **4718 38th Ave. NE; Seattle, WA 98105; (206) 525-7372. Chief Administrator:** Kearney Barton.

BRIGHAM YOUNG UNIVERSITY

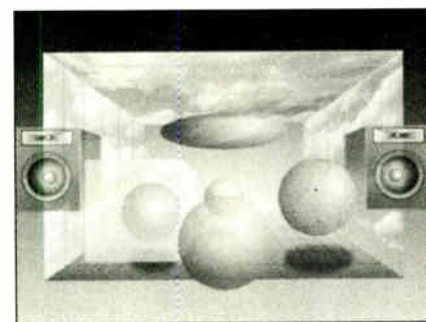
Program Name: Sound Recording Technology. **Dept. of Music, 20A KMB; Brigham Young University; Provo, UT 84602; (801) 378-6395. Chief Administrator:** Ron Simpson. **Program:** Sound Recording Technology is taught at B.Y.U. as a professional specialization within the Bachelor of Arts degree program in Music. A 24-track studio is dedicated to student projects, and there are smaller production and MIDI rooms, as well as access to a second 24-track studio equipped for professional film projects. Students receive hands-on experience working with recording and reinforcement of on-campus concerts and recording and producing a variety of student creative projects in all styles. The challenging classroom work is both theoretical and practical in nature. While students are expected to be music majors, the coursework is also available as an elective package to some non-majors.

CALIF. INST. OF CONCERT SOUND ENG.

Program Name: Concert Sound Engineering Program. **1733 S. Douglass Rd., Ste. F; Anaheim CA 92806; (714) 634-4131. Chief Administrator:** Jim Paul. **Program:** Our 15-month Concert Sound Engineering Program offers a comprehensive education for individuals seeking a career in the exciting world of Live Concert Sound Reinforcement. Successful graduates are qualified for employment by national touring companies, regional and local sound companies, nightclubs, churches, theaters and performance venues. In-depth lectures are provided by working sound engineers. Troubleshooting, repair and equipment maintenance are included. Mixing labs, using state-of-the-art equipment are an essential part of the curriculum. Students mix a wide variety of musical groups on a weekly basis under the guidance of a qualified instructor, learning skills normally acquired only on the job. Our advanced students, in preparation for employment, are required to plan, staff, manage and mix off-campus concerts and shows in a real world environment, complete with all the associated challenges. A demanding program, but well worth it. Extensive Job Placement and Financial Assistance programs for qualified students.

CALIF. INST. OF THE ARTS, SCHOOL OF MUSIC

Program Name: Composition (includes computer music and technology emphasis.) **24700 McBean Parkway; Valencia, CA 91355; (805) 255-1050; FAX: (805) 254-8352. Chief Administrator:** David Rosenboom, Dean.



CALIFORNIA RECORDING INSTITUTE
Menlo Park, CA

CALIFORNIA RECORDING INSTITUTE

Program Name: Recording Arts and Technology. **970 O'Brien Dr.; Menlo Park, CA 94025; (415) 324-0464. Chief Administrator:** David A. Gibson. **Program:** One-year program and six-week classes in the San Francisco Bay Area. Hands-on intensive program with a wide array of complementary classes. Classes in The Art and Technology of Production, Equipment Maintenance, MIDI and Computers, The Music Business, Live Sound Reinforcement and Television/Video Production. You will get extensive hands-on time in five studios on the same equipment used by top professionals in the industry—four 24-track studios (one automated!), 16-track studio and MIDI/mastering studio. The program also utilizes "The Virtual Mixer," which uses visuals of the mix to teach "Mixing Theory." The visuals help describe different structures and styles of mixes that can be created for different styles of music and songs. Not only can you "see" everything you do in the mix, you can use images of the sounds between the speakers to mix with! Serious internship program and placement assistance. Call or write for free brochure.

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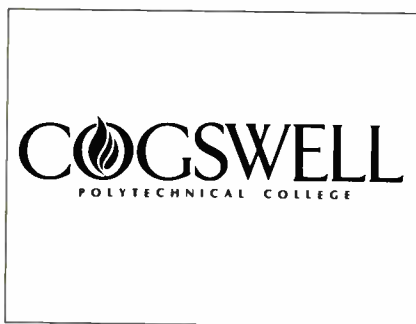
Program Name: Recording Arts (BA and minor). **Department of Music; Chico, CA 95929; (916) 898-5152. Chief Administrators:** Raymond Barker, Keith Seppanen, Daniel Craik. **Program:** The Department of Music at California State University, Chico, offers two programs in recording arts: the Bachelor of Arts in Music with an option in Recording Arts, and the Minor in Recording Arts. These programs are being offered in newly constructed facilities in the west wing of the Performing Arts Center. These facilities include a 24-track control room, a performance studio and an electronic music studio. A music major in the Recording Arts option will take courses in music history, music theory, composition with electronic media, audio recording, audio-for-video and the music industry, along with courses from other departments in electronics and physics of sound. The option in Recording Arts for music majors includes a capstone "internship" course that will provide the opportunity to record the major productions on this campus and to acquire experience in selected recording studios off campus. Call or write for information packets.



CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS
Carson, CA

CALIF. STATE UNIV., DOMINGUEZ HILLS

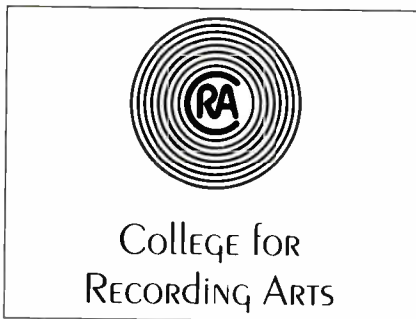
Program Name: Audio Recording and Music Synthesis (ARMS). **1000 Victoria Ave.; Carson, CA 90731; (310) 516-3543. Chief Administrator:** Dr. Rod Butler. **Program:** CSU, Dominguez Hills, offers four-year BA music degrees in Audio Recording and Music Synthesis and a certificate program in Audio Technology. The curriculum includes lecture and hands-on lab courses in audio engineering, music synthesis, music production, studio electronics and equipment maintenance. Elective studies in video production are available. Recording labs are conducted in an automated 24-track facility that includes a Soundcraft 2400 console, Sony/MCI JH-24 with Dolby SR, digital and analog 2-track machines for mixdown, and an assortment of state-of-the-art microphones and signal processors. The adjoining MIDI studio (with SMPTE lock) is configured around an 8MB Emulator III system. Students use an extensive software library for music sequencing, patch editing/storage, music printing, algorithmic composition, and visual sample editing on the Macintosh and Atari ST computers. Expander synthesizer modules include products by Yamaha, Roland, Oberheim, Casio, Alesis and Korg.



COGSWELL
POLYTECHNICAL COLLEGE
Cupertino, CA

COGSWELL POLYTECHNICAL COLLEGE

Program Name: Bachelor of Science degree in Music Engineering Technology. **10420 Bubb Rd.; Cupertino, CA 95014; (408) 252-5550; FAX: (408) 253-2413. Chief Administrator:** Garland Peed, III; **Chancellor.** **Program:** A program of study offering the only Bachelor of Science degree in Music Engineering Technology in the world. It is a degree program combining mathematics, science, electronics, computers, and music, located on the campus of a respected private, fully accredited (academic) engineering college. The 8/16/24-track labs are accompanied by a MIDI and a sound design lab as well as the latest in electronic labs. Two complete video and imaging labs are available for electives in sound and video graphics. Located in the heart of Silicon Valley, adjacent to key music hardware, software, and sound design companies. A trimester system allows for traditional (4-year) or three-year graduation program.



COLLEGE FOR
RECORDING ARTS
San Francisco, CA

COLLEGE FOR RECORDING ARTS

Program Name: Sound Engineering/Music Production Business. **665 Harrison St.; San Francisco, CA 94107; (415) 781-6306; FAX: (415) 781-0115. Chief Administrator:** Leo de Gar Kulk. **Program:** One-year course for recording engineers and others intent on a career in the music/recording industry. C.R.A. is accredited by the Career College Association, and provides approved training to veterans. C.R.A. is approved to issue M-1 visas to non-immigrant students who are eligible as prescribed by the U.S. INS. Diploma Course approved for more than 600 hours of instruction by the Council for Private Postsecondary Education. Start Dates: February, June, October.

COLORADO INSTITUTE OF ART

Program Name: Music and Video Business. **200 E. 9th Ave.; Denver, CO 80203; (303) 837-0825; (800) 275-2420; FAX: (303) 837-0825. Chief Administrator:** Robert Yablans.

CONSERVATORY OF REC'G ARTS & SCIENCES

Program Name: Master Recording Program. **1110 E. Missouri Ave., Ste. 400; Phoenix, AZ 85014; (800) 562-6383; FAX: (602) 230-7235. Chief Administrator:** Kirt R. Hamm. **Program:** The Conservatory of Recording Arts and Sciences was founded with the idea that an individual desiring to be a successful recording engineer must be proficient in a variety of skills including: Audio Recording Production, Live Sound Reinforcement, MIDI, SMPTE, Music Business, Troubleshooting and Maintenance. All of which are included in the Master Recording Program. Classes are limited to ten students. In the classroom, ample hands-on training is available at the variety of consoles and outboard gear provided. After completion of classroom training, the Conservatory assists students in obtaining the 280 hours of internship, in the working world, required for graduation. Employment assistance is provided to graduates. The Master Recording Program is the only fully accredited private post-secondary education program of its type in the State of Arizona. Financial Aid is available to those who qualify. Affordable housing is plentiful and within walking distance.

GLOBAL MEDIA INST. OF ARTS & SCIENCES

Program Name: Audio Engineering. **6325 N. Invergardon; Paradise Valley, AZ 85253; (602) 948-5883; FAX: (602) 948-7863. Chief Administrator:** Dave Cornelius.



GOLDEN WEST COLLEGE
Huntington Beach, CA

GOLDEN WEST COLLEGE

Program Name: Commercial Music/Recording Arts. **15744 Golden West St.; Huntington Beach, CA 92647; (714) 895-8780; FAX: (714) 895-8243. Chief Administrators:** David Anthony, Scott Steindinger, Evan Williams. **Program:** A well-deserved international reputation has brought students from around the world to this "model" program. The program is unique in the generous amount of "hands-on" time and experiences available in the three well-equipped studios and four workstation/labs. Studio A features: MCI 24-track recorder, 40-channel Neotek Elite automated console, Q-Lock synchronizer, Lexicon 224XL reverb, digital recording plus extensive outboard signal processing. Studio B features: Neve 16-channel mixer, MCI 16-track recorder, digital recording and editing, plus analog and digital signal processing. Studio C features: a mixing capacity of over 60 inputs, 16-track recorder, extensive signal processing and an array of over 60 MIDI-sequenced synthesizer channels (Yamaha TF modules, Kurzweil 250, Roland D-50, D-110, S-550 sampler, Proteus 1 and 2, Korg 01W, drum machines, plus much more!) The system is controlled by a Macintosh computer system and various software programs. The program is an integral part of the college's Academy of Creative Technologies and as such offers cross discipline learning with the Television Production and Operations and Theater Technology programs. A leader in music technology since 1972.

INSTITUTE OF AUDIO-VIDEO ENGINEERING

Program Name: Audio-Video Engineering. **1831 Hyperion Ave.; Hollywood, CA 90027; (213) 666-2380; (800) 551-8877; FAX: (213) 660-1007. Chief Administrator:** Kevin Tiernan.

LONG BEACH CITY COLLEGE

Program Name: Commercial Music Program. **4901 E. Carson St.; Long Beach, CA 90808; (310) 420-4309; FAX: (310) 420-4118. Chief Administrators:** Priscilla Remeta, George Shaw. **Program:** Facilities include 24-track, 16-track (TEAC and Fostex), 8-track and 4-track studios. A state-of-the-art MIDI classroom comprises 21 individual computer-controlled songwriting stations. Each station is equipped with a Macintosh, synthesizers, drum machines, effects and recording equipment. Commercial music instructors are all professionals in the music recording and performance fields. Students are given hands-on training and receive certificates in record producer, recording engineer, songwriter/arranger, copyist, vocal, instrumental including MIDI applications. New facilities are currently under construction. A video production studio and 23 more MIDI stations. Music/video production and newly remodeled recording facilities will double the amount of "hands-on" student labs.



LOS ANGELES RECORDING WORKSHOP
Studio City, CA

LDS ANGELES RECORDING WORKSHOP

Program Name: 300-hour Recording Engineering Program; 300-hour Video Operator Program; 600-hour Video Production Technician Program. **12268 Ventura Blvd.; Studio City, CA 91604; (818) 763-7400. Chief Administrator:** Christopher Knight. **Program:** The Los Angeles Recording Workshop is a hands-on training facility that offers the following programs: 300-hour Audio Engineer Program; 300-hour Video Operator Program; and 600-hour Video Production Technician Program. Think of us as a "driving school for audio and video training." A truck driving school would have trucks, instead we have audio and video equipment. Lots of it. Ten mixing consoles, three 24-track multitracks, a 16-track, an 8-track, three fully equipped recording studios, including our Audio-for-Video Post-Production Studio, three Video Editing Bays including our A-B Rolls

Video Production Suite with full Digital Video Effects, Sound Tools Hard-Disk Digital Editing, and a six-console 24-track MIXLAB where you can practice mixing until you're blue in the face! Our hands-on sessions are always small, usually 5 or 6 people, so you really learn it by doing it. We're nationally accredited by ACCEIT, we're certified by the U.S. Dept. of Education, and we're approved by the Immigration and Naturalization Service to admit foreign students and to issue I-20s. Full and part-time schedules are available, as are dorm-style housing and job placement assistance, and financial aid is available to qualified applicants. Call or write for our free catalog.



LOS MEDANOS COLLEGE
Pittsburg, CA

LOS MEDANOS COLLEGE

Program Name: Recording Arts. 2700 E. Inland Rd., Pittsburg, CA 94565; (510) 439-0200. **Chief Administrator:** Frank Dorritie. **Program:** Los Medanos College in Pittsburg, California, offers a degree program in Recording Arts, including courses in multitrack recording, sound reinforcement, acoustics, MIDI sound synthesis, producing and troubleshooting, Theory, hands-on experience, a state-of-the-art recording studio and a faculty honored with ten Grammy nominations make the Los Medanos Recording Art. program the finest in Northern California. **Fees:** California resident: \$10 per unit; out-of-state \$110 per unit plus enrollment fee.

LOYOLA MARYMOUNT UNIVERSITY

Program Name: Recording Arts. **Communication Arts Dept.:** Loyola Blvd. at W. 80th St., Los Angeles, CA 90045; (310) 338-3033 (office); **FAX:** (310) 338-3030. **Chief Administrator:** Patricia Oliver, Chair; John Michael Weaver, program coordinator. **Program:** LMU Recording Arts is a four-year program that offers students the opportunity to explore both the aesthetic and technical challenges of sound design and recording, through in-depth study and hands-on experience. Emphasis is placed on both the art of music recording and the creative use of sound in film and television. Students take classes in mass communications, the art of cinema, screenwriting, film and television production, sound design, recording technology, acoustics, production and post-production sound, recording practices and techniques, contemporary issues advanced recording and related music courses. Among LMU's recording facilities are a 16mm film re-recording studio, a video-assisted film and television post-production suite, and a 24-track recording studio containing equipment from AKG, Ampex, JBL, Lexicon, Neumann, Orban, Otari, Sennheiser, Sony, Trident and UREI. Classes are kept small to ensure that the needs of the individual student can be met.

MAY TECHNICAL COLLEGE

Program Name: Radio/TV Broadcasting. 1306 Central Ave., Billings, MT 59102; (406) 259-7000. **Chief Administrator:** Michael May. **Program:** Students in the Radio/TV Broadcasting course complete training in eight months with an emphasis on hands-on training in a full 24-track studio plus three individual MIDI-equipped studios and four advertising production studios. Students learn TV/video production using the school's main TV studio and three video-editing studios. Students also study Broadcast Journalism and Air Personality work. Accredited by the Career College Association. Provides job placement assistance, student financing, professional staff. Classes start every eight weeks. Call or write for free catalog and financial aid information.

NORTHWEST MUSIC & RECORDING

Program Name: Audio Pro '93. 1911 SW Campus Dr., Ste. 378; Federal Way, WA 98023; (206) 874-2706; **FAX:** (206) 874-2706. **Chief Administrator:** Bill Gibson. **Program:** Audio Pro '93 with Bruce Swedien, September 25 and 26, 1993, features a large professional audio equipment manufacturers trade show plus an extensive series of seminars and workshops, ranging from serious student to master level. The Grammy Award-winning Bruce Swedien is the keynote speaker. Bruce has engineered Michael Jackson's biggest hit albums, including *Thriller*, *Bad*, and most recently *Dangerous* (which he co-produced). Quincy Jones and Sergio Mendes are also among his extensive list of clients. Audio Pro '93 also includes several other major industry pros involved in panel discussions and workshops. The forum for this weekend in Seattle is designed to give you an opportunity to network with potential employers, employees, and peers. Plus, you'll have the chance to learn from audio pros who set the standards for the recording industry. For more information about registration and accommodations call (206) 874-2706 today.

PRAIRIE SUN

Program Name: Audio Engineering. PO Box 7084; Cotati, CA 94931; (707) 795-7011; (707) 795-8114. **Chief Administrator:**

Mark "Mooka" Rennick. **Program:** We offer a full-time, hands-on course in engineering and audio production. Classes are taught in two world-renowned recording studios. We cater to everyone, from novice to expert, to enable our students to take on most audio situations, both studio and live. Featured are two automated 24-track studios with a large collection of vintage and modern microphones. Classes cover tracking, mixing, editing, splicing, calibration, alignment, mic type and placement, plus studio recording skills. Some of our clients include: Damn Yankees, Faith No More, The Tubes, Van Morrison, The Doobie Brothers, Exodus, Testament & Tom Waits. Our school offers more than just classes and a diploma. We feel this will prepare you for the real world of recording. Classes meet two times a week, so for those looking for a full-time curriculum, PSR may not fulfill all your needs. Great for California and Northern State areas. Call or write for a free brochure.

RECORDING ASSOCIATES

Program Name: Sound Recording and Mixing. 5821 SE Powell Blvd., Portland, OR 97206; (503) 777-4621. **Chief Administrator:** Jay Webster. **Program:** Video programs available: two hours at \$39 answers beginners' most-often-asked questions—connectors, connections, phasing, microphones, tone control, room tuning, mixing boards, sound mixing, band setup, recording, echo/effects and more. 12 hours at \$239 is a must for the pro or soon-to-be-pro. Here's the relationship between theory and the choices you make operating equipment and effects: vocabulary, basic theory, adv. theory, connectors, connections, phasing, mic theory, mic application, adv. mic theory, tone theory, adv. tone theory, tone application, acoustics, room tuning, studio consoles, console operation, mix theory, adv. mix theory, compression, recorders, maintenance, echo, reverb, other effects, production and studio tips, glossary, and more. Students enrolled in the 12-hour course who complete the final quiz with a passing grade will be issued a certificate of completion. You may write or call for free assistance in answering test questions or questions in general regarding sound and recording.

R.O.P. MENDOCCINO COUNTY OFFICE

Program Name: Radio/Recording Technician. PO Box 226; Mendocino, CA 95460; (707) 937-1200. **Chief Administrator:** Paul Tichinin; Bob Evans, instructor. **Program:** Mendocino County Schools' Regional Occupational Program (ROP) audio recording studio for adult and high school students offers individualized instruction in recording techniques, sound reinforcement, introduction to MIDI radio production, safety and studio etiquette. Equipment includes Tascam 16-track recording facility, 2/4-track mixdown, Panasonic SV-3500 DT, Soundcraft S8 MIDI automated mixing board, Yamaha SPX90, Korg DVP-1 digital voice processor, Macintosh Quadra w/Studio Vision, Galaxy, DX-TX librarian, Deluxe Music Construction Set, Music Time, Encore, Roland SDE-3000 digital delay, Yamaha DX7, Sequential Circuits, MAX, Korg DS8, Korg M1R, Casio C7-100, Yamaha DX100, SD89 digital drums. Mics: Sennheiser 421, AKG condensers, Shure SM57, Audio Technica dynamics. Facility: drum isolation booth, large main tracking room, control room. No charge for training; program requires a small materials fee for tapes, disks, books and equipment repair. Open entry/open exit. Sept.-June only. Certificate awarded upon completion, 1,200 hours maximum. Contact Bob Evans, studio manager/instructor.

S & S SOUND ENGINEERING COURSE

Program Name: Sound Engineer Home Study Course. PO Box 1156; Torrance, CA 90505; (310) 375-0768; **FAX:** (310) 791-1075. **Chief Administrator:** Sherman Keene. **Program:** The S&S Sound Engineer Home Study Course is based on the best-selling book "Practical Techniques for the Recording Engineer." Sherman Keene is the author of the book and personally narrates each of the 24 tape cassettes making up the course lectures. The S&S course is an ideal study method for anyone having access to sound engineering equipment who does not wish to leave home and job to receive training.



SACRAMENTO CITY COLLEGE
Sacramento, CA

SACRAMENTO CITY COLLEGE

Program Name: Associate in Arts Degree: Commercial Music. 3835 Freeport Blvd., Sacramento, CA 95822; (916) 558-2130; **FAX:** (916) 441-4142. **Chief Administrator:** Don Young. **Program:** The Commercial Music Associate in Arts Degree offers four areas of emphasis: Audio Production, Music Business Management, Songwriting and Performance. Students in Audio Production work in a 24-track recording studio with Otari/Sound Workshop Series 54 automated console, Otari MX-80 MTR, Digidesign Sound Tools, Lexicon, Eventide, Aphex, Adams-Smith outboard gear as well as three small—LISTING CONTINUED ON NEXT PAGE

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Recording Schools

SEMINARS AND PROGRAMS

—LISTING CONTINUED FROM PREVIOUS PAGE

er 8-track studios. (34) Macintosh computers are used for training in MIDI, and the college has a full Electronics Technology Dept. Undergraduate tuition is \$10 per unit for California residents.

SAN DIEGO RECORDING WORKSHOP

Program Name: Recording Theory—Levels I, II and III. PO Box 7632; San Diego, CA 92167; (619) 571-5965. Chief Administrator: Steve Grossman.

SAN FRANCISCO STATE UNIVERSITY

Program Name: Broadcast Communication Arts Department/Audio Production Emphasis Area. 1600 Holloway Ave.; San Francisco, CA 94132; (415) 338-1787; FAX: (415) 338-6159. Chief Administrators: Dr. Ronald J. Compesi (chair), Dr. John E. Barsotti (audio coordinator). Program: A four-year Bachelor of Arts program in Broadcast Communication Arts (Radio-TV) with an audio production emphasis. Class in audio production covers basic audio theory and production, aesthetics of sound, radio production, music recording and mixing; audio for multimedia, television and film; complete soundtrack production and Foley work utilizing state-of-the-art SMPTE synchronization; sound reinforcement systems and live concert sound. Dedicated facilities include one fully equipped recording studio, four audio production labs, campus cable-FM radio station, three television studios, and online and offline video editing systems. The recording studio utilizes the 2" 24-track recording format and up to 500 virtual MIDI tracks using a 386 MS-DOS computer and is equipped with digital recording, sampling and processing equipment. Our flexible Master of Arts program can accommodate graduate students with an interest in audio production, aesthetics and/or criticism.

SF STATE UNIVERSITY EXTENDED EDUCATION

Program Name: Music Recording Industry Certificate Program (MRI). 425 Market St., 2nd Fl.; San Francisco, CA 94105; (415) 338-1372; FAX: (415) 974-6107. Chief Administrator: Mary Pieratt. Program: The Music/Recording Industry Certificate Program (MRI) offered through San Francisco State University focuses on the music business and studio engineering. Classes offer academic credit and are taught by Bay Area professionals in the field. The program is designed for both students and professionals who want to gain experience and education in the music industry through a structured course of study. Musicians, managers, agents and engineers will benefit from courses that cover a wide range of topics. Courses include audio engineering (beginning, intermediate, advanced, mixing and MIDI, offered in all 24-track studios), artist management, music video, songwriting, industry history, publishing, artist and repertoire, legal aspects, music press, career options, concert booking and production, and the history and aesthetics of popular record promotion. New courses offered regularly. Expand skills with one or more classes or earn the MRI certificate. Courses are offered evenings. Formal university application is not required.

SHAPING YOUR SOUND VIDEOS

Program Name: Sound Recording Education on Videotape; First Light Video. 8536 Venice Blvd.; Los Angeles, CA 90034; (800) 777-1576; (310) 558-7880; FAX: (310) 558-7891. Chief Administrators: David Lebrun, Andy Romanoff, Rosey Guthrie.

SONOMA STATE UNIVERSITY

Program Name: Minor in Music Recording Arts. 1801 E. Cotati Ave.; Rohnert Park, CA 94928; (707) 664-2324; FAX: (707) 664-2505. Chief Administrators: Arthur Hills. Program: Sonoma State University's recording program features an Alesis A-DAT 8-track digital recorder with a Soundcraft "Spirit" 24 input console and an assortment of outboard gear by Lexicon, Yamaha, Delta Lab, and others. Along with the LEDE-style control room, is a good size main recording room with a 6' Kawai grand piano and two isolation booths. The program philosophy follows a "hands-on" approach that enables the students to get extensive session experience both in the engineering aspects as well as the musical disciplines of the recording arts. A minor in recording is available for both music and communication arts majors. The program includes three semesters of instruction in recording technology, a semester of internship, along with additional courses in business and production. For further information, contact the Music Department or the Admissions Office at the above address.

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SONY

SONY INSTITUTE OF
APPLIED VIDEO TECHNOLOGY
Los Angeles, CA

SONY INST. OF APPLIED VIDEO TECHNOLOGY

Program Name: Production Audio for Video/Post Production Audio for Video. 2021 N. Western Ave.; Los Angeles, CA 90027; (213) 462-1982; FAX: (213) 462-3559. Chief Administrator: Mike Alvarez. Program: The Sony Video Institute. Courses offered: Production Audio for Video. An in-depth look at production audio for video. Emphasis: Pre-Production Planning, Production Techniques and Trouble-Shooting. Post Production Audio for Video: Offline editing process, online editing process, problem-solving solutions for post audio. Also, multitrack building and more. Includes tours of state of the art facilities. Introduction to Digital Audio Post-Production for Video: This new class offered by the Sony Institute explores in-depth the use of Macintosh computers combined with Pro Tools by Digidesign. This course discusses the needs for going digital, digital's capabilities and limitations. Contact: Mike Alvarez.

SOUND MASTER



RECORDING ENGINEER
SCHOOL
AUDIO/VIDEO INSTITUTE

SOUND MASTER
RECORDING ENGINEER SCHOOL
North Hollywood, CA

SOUND MASTER REC'G ENGINEER SCHOOL

Program Name: Record Engineer/Video Production. 10747 Magnolia Blvd.; North Hollywood, CA 91601; (818) 650-8000. Chief Administrator: Barbara Ingoldby. Program: The Sound Master Recording & Video Institute offers training in Recording Engineering, MIDI, Video Production, Technical Maintenance, Mastering and Synchronization. Training is conducted at the Sound Master state-of-the-art recording complex, which includes three studios. Classes are taught by a staff of top professionals. The training is designed for both novices and working engineers wishing to broaden their knowledge in the field. Day and evening classes are available. Sound Master is accredited by ACCET, and financial aid is available for those who qualify. Job placement assistance. For information please call (818) 650-8000.

SOUTHWEST INSTITUTE

Program Name: Audio Recording Engineering. 4831 N. 11th St., Ste. C; P.O. Box 17010; Phoenix, AZ 85011; (602) 241-1019; FAX: (602) 241-0645. Chief Administrator: Billy Moss. Program: The Southwest Institute of Recording Arts and Sciences offers a 16-week, 200-class-hour course which is designed to teach audio recording and engineering. The program progresses from a classroom study of basic recording concepts, moving quickly to hands-on, student-engineered sessions, using state-of-the-art recording equipment, thereby gathering an academic and practical knowledge of the many aspects of audio recording. By starting with the basics, then working through the fully automated digital mixdown (SSL 4040 E/G, Sony 3324), this course will enable graduates to successfully compete in any audio recording environment as fully qualified, entry-level audio engineers. Class size is limited to 4 students per class to ensure comprehensive work loads, with a major emphasis on hands-on training. Cost of the program is \$3,500, which includes all materials, fees, and textbooks. For students wishing to continue their training, SWIRAS offers a 16-week Internship Program, where the student will be learning in actual working sessions, advancing and honing his/her skills. The SOUTHWEST INSTITUTE OF RECORDING ARTS AND SCIENCES is fully licensed by the Arizona State Board of Private Post Secondary Trade Schools and is approved to grant a certificate of completion upon graduation from any of our courses.



TREBAS INSTITUTE
Hollywood, CA

TREBAS INSTITUTE

Program Name: Recording Arts & Sciences. Recorded Music Production, Audio Engineering Technology; Music Business Administration (M.B.A.). 6464 Sunset Blvd., The Penthouse; Hollywood, CA 90028; (213) 467-6800. Chief Administrator: David P. Leonard. Program: Established in 1979, one-year program. Almost 100 courses to choose from 11 tracks of study, including music, production, synthesis and MIDI, video, computers, digital, audio engineering theory and studio recording, electronics, music business, management and general education. Diplomas in Recording Arts & Sciences (w/specialization in Production and Engineering) and M. B. A. One entrance scholarship offered at each of four campuses across North America, valued at \$5,000 each. Goldmark Memorial Scholarship for advanced studies at each location. Other Awards of Merit available. Consult admissions office. Transfer of credits between campuses. Facilities: professional multitrack recording studios, electronic music/synthesis/MIDI studios, electronics lab, computer labs, audio/video post-production mixing lab and analog/digital mastering rooms (at selected campuses). Resource center including library of several thousand volumes (books, magazines, articles) on the music business, audio/video, recording and music production. Accredited by ACCET. Internships. Job placement. Graduates working with major record companies, studios and artists. TEC Award nominee: Recording School Program of the year 1989 and 1990.



UCLA EXTENSION
Los Angeles, CA

UCLA EXTENSION

Program Name: Certificate Program in Recording Engineering. 10995 Le Conte Ave., PO Box 24901; Los Angeles, CA 90024; (310) 825-9064. Chief Administrators: Lisa Brewer Herring, program counselor; Van Webster, program coordinator. Program: The UCLA Extension Certificate Program in Recording Engineering is a rigorous training program that prepares the student in both the art and science of sound recording. Drawing on the talent and studio facilities of Los Angeles, one of the music industry capitals of the world, UCLA Extension has created a sequential curriculum of required and elective courses that covers both theory and practice in audio technology, equipment, musicianship, and business practice. All classes are taught by working professionals in the recording industry, who bring a wealth of practical knowledge to the classroom and studio workshops. The objective of the program is to enable future engineers to acquire vision and problem-solving techniques that meet the challenges of rapidly evolving technology and a dynamic sound recording market. Prerequisite classes are available through UCLA Extension. The Certificate Program in Recording Engineering is a State of California-approved program of significant educational accomplishment in a professional field. Additional certificate programs are offered in recording arts, songwriting, electronic music, film scoring and film/television/video. Call or write for the Professionals in the Entertainment Industry course catalog.

UNIVERSITY OF ARIZONA

Program Name: School of Music. Tucson, AZ 85721; (602) 621-1341. Chief Administrator: Jeff Haskell. Program: A recording studio production class is offered to music and RTV students. The class includes a basic overview of studio equipment use and terminology, in addition to music production and music law. Courses in computer and MIDI applications are offered. The recording studio features an audiophile-quality 24-track facility with numerous pieces of signal processing equipment, including: Lexicon PCM70, Drawmer gates, dbx 165A compressors, Pultec EQP-1A EQ, Prime Time delay,

etc. The recording studio is very accessible to students for gaining experience writing, producing and performing in professional-quality recordings.

UNIVERSITY OF COLORADO AT DENVER

Program Name: Music Engineering. Department of Music; Campus Box 162, PO Box 173364; Denver, CO 80217-3364; (303) 556-2727; FAX: (303) 556-2335. **Chief Administrator:** Roy Pritts. **Program Director:** Rich Sanders. **Assistant:** Program: This program is designed to provide professional training for musicians, educators, producers and media personnel seeking employment in audio-related careers. A Bachelor of Science degree in Music is offered, as well as graduate and undergraduate studies in Reinforcement, Recording, Applied Synthesis, Digital Music Techniques, Studio Calibration/Maintenance, Music Video Production, Audio Sweetening, Music on the Personal Computer and Internships. A sound musical training is offered with large and small ensembles, solo and group instruction and general musicianship. This program is supported by companion studies in Music Business, Performance and in Scoring and Arranging. Facilities include two 16-track studios with Neve and Audionics consoles, automated mixing, two MIDI/teapeless studios, five performing suites, Macintosh/IBM Kurzweil computer/keyboard labs, DAT, hard disk recording, and extensive microphone holdings. An internship program with SPARS provides on-site learning across the nation. Graduate degrees in allied areas are available.


UNIVERSITY OF DENVER LAMONT SCHOOL OF MUSIC

Program Name: Bachelor of Music in Commercial Music. 7111 Montview Blvd.; Denver, CO 80220; (303) 871-6400. **Chief Administrator:** F. Joseph Docksey, III, director.

UNIVERSITY OF SOUTHERN CALIFORNIA

Program Name: Bachelor of Science in Music Recording. USC-School of Music, MUS 409; Los Angeles, CA 90089-0851; (213) 740-6935. **Chief Administrator:** Richard J. McIlvery. **Program:** The Bachelor of Science Degree at USC is a four-year program offered through the School of Music. Candidates for the degree are expected to play and audition on a musical instrument, participate in musical ensembles, study music composition as well as the technical aspects of recording. Classes are given in the School of Music's recording studio featuring a Solid State Logic console, Mitsubishi X850, Studer A800 24-track, JBL and UREI monitors and amps. Faculty for the program are recruited from the music industry in Los Angeles and selected for their particular expertise in a field within professional audio. Applicants should submit paperwork by March 1, 1993 for the fall semester. Those interested should write or call for a detailed brochure.

OUTSIDE U.S.



The Banff Centre

THE BANFF CENTRE FOR THE ARTS
Banff, Alberta, Canada

THE BANFF CENTRE FOR THE ARTS

Program Name: Media Arts Audio Associateships. Office of the Registrar; PO Box 1020, Stn. 28; Banff, Alberta, Canada, T0L 0C0; (403) 762-6180; FAX: (403) 762-6345. **Chief Administrator:** Kevin Elliott. **Program:** Audio recording associateships are offered to creative technologists with mature artistic insight and advanced technical skills (significant professional experience within an artistic environment, or a master's level degree in music and sound recording). Associate engineers receive full scholarship, room and board, and stipend. They work in a recording complex that includes 24-track digital, 16-track analog/MIDI and multiple digital audio work stations. Activities are driven by proposals from composers, musicians and audio/video/performance artists whose work lends itself to sophisticated and experimental applications of audio technology. Associate engineers collaborate creatively and provide technical expertise and operations for these projects. Duties include multitrack productions; audio-for-video; support for computer music and MIDI/interactive performance and recording; live-to-2-track studio; and location recording (classical, new music and jazz). Associates generally continue for one to two years.

WANT MORE INFORMATION?

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HARRIS INSTITUTE FOR THE ARTS
Toronto, Ontario, Canada

HARRIS INSTITUTE FOR THE ARTS

Program Name: Recording Arts Management (RAM) & Producing/Engineering Program (PEP). 296 King St. E.; Toronto, Ontario, M5A 1K4 Canada; (416) 367-0178. **Chief Administrator:** John Harris. **Program:** RAM—Recording Arts Management (904 hours), PEP—Producing/Engineering Program (901 hours). One-year Diploma programs are taught by leading industry professionals and culminate in the formation of production and management companies and internship placements in studios and companies within the industry. Full and part-time programs start every October, February and June. Harris Institute for the Arts is registered and approved by the Ministry of Colleges and Universities in the Province of Ontario. Six industry-funded scholarships are awarded for academic excellence. Financial assistance is available to qualified students. For further information and to receive a syllabus, contact the Office of the Registrar, Stan Janes at (416) 367-0178.

INSTITUTE OF COMMUNICATION ARTS

Program Name: Recording Arts Multi-Media. 3246 Beta Ave.; Burnaby, British Columbia, V5J 3H1 Canada; (604) 298-5400; FAX: (604) 298-5403. **Chief Administrator:** Niels Nielsen.

MCGILL UNIVERSITY, FACULTY OF MUSIC

Program Name: Master's of Music in Sound Recording. 555 Sherbrooke St. W.; Montreal, Quebec, H3A 1E3 Canada; (514) 398-4538. **Chief Administrator:** John Grew. **Program:** Master's of Music in Sound Recording degree. Duration: one preparatory undergraduate year plus two years graduate. Course titles: Sound Recording (Theory and Practice), Analysis of Recordings, Technical Ear-Training, Analog and Digital Audio Editing, Advanced Digital Editing and Post-Production, Audio with Vision, Studio Equipment Maintenance, Digital Studio Technology, Audio Measurements, Computer Music/Sampling/MIDI, Classical Music Production, Audio Research. Facilities: two concert halls, one recital hall, four control rooms, one two-room studio, 24-track and 2-track digital recording, computer-assisted mixing, digital editing on DAE 3000, Sonic Solutions, Dyaxis, computer/MIDI/electronic repair shop. Costs/tuition: Canadian citizens \$1,350 CDN/year, foreign students \$7,600 CDN/year tuition and student services. General information: program established in 1979. Admits four or five students per year (competitive). Bachelor of Music degree is required for admission. Non-McGill applicants are admitted to a prerequisite undergraduate year to do preparatory work in sound recording, electronic music, physics and psychophysics of music, musical acoustics, electroacoustics, mathematics, orchestration and computers.



MEDIA PRODUCTION FACILITIES

MEDIA PRODUCTION FACILITIES
London, England

MEDIA PRODUCTION FACILITIES

Program Name: Advanced Sound Recording & Production Techniques. Bon Marche Bldg., Ferndale Rd.; London, SW9 8EJ England; (44) 71-737-7152; (44) 71-274-4000, ext. 323; FAX: (44) 71-738-5428. **Chief Administrator:** Paul Halpin. **Program:** This one-year, full-time program, composed of 3-month modules that may be taken independently, commences January, May and September each year. Directed by our Grammy award-winning course leader, Simaen Skolfield, the program combines lectures from leading audio industry professionals with extensive hands-on experience in state-of-the-art facilities. Media's 24-track studio features a 32-channel Amek Mozart automated console, Otari multitrack, a wide range of outboard effects devices, microphones, digital stereo sampling and mastering systems. A digital programming suite provides a variety

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ONTARIO INSTITUTE OF
AUDIO RECORDING TECHNOLOGY
London, Ontario, Canada

ONTARIO INST. OF AUDIO REC'G TECHNOLOGY

Program Name: Audio Engineering. 500-2 Newbold St.; London, Ontario, N6E 1K6 Canada; (519) 686-5010; FAX: (519) 686-5060. **Chief Administrators:** Paul Steenhuis, Geoff Keymer. **Program:** Intense. Thorough. Concentrated. Professional staff, professional 24-track studios and a fully integrated program of study converge on ALL ASPECTS OF AUDIO/MUSIC TECHNOLOGY. Courses include: Acoustics, Audio for Visuals, Computer Sequencing and Automation, Digital Recording/Editing, Equipment Alignment, Live Sound, MIDI, Music Business, Music Theory, Music Production, Psychoacoustics, Recording Engineering, Sampling, Signal Processing, Studio Electronics, Synchronization, Synthesis Techniques, and a great deal more! WE DELIVER: Highly personalized instruction, hundreds of hours of lab time, no more than 3 students per instructor/recording labs, extensive individual workstations. All lectures delivered in our own studios. Est. 1983. Registered and approved by the Canadian Ministry of Education and the U.S. Dept. of Education. Graduate program and graduate placement assistance. Financial assistance may be available to qualified students. DIART is an OUTSTANDING, competitively priced private school truly unlike any other. No bureaucrats or retirees, no pretensions, no hidden fees. Compare before you choose. Then live it. For 8 months. Solid.

RECORDING ARTS PROGRAM OF CANADA

Program Name: One year Diploma Program in Audio Engineering and Production. 28 Valrose Dr.; Stony Creek, Ontario, L8E 3T4 Canada; (416) 662-2666. **Chief Administrator:** John Keca. **Program:** One year Diploma program in Audio Engineering and Production. Since 1983, R.A.P. has established itself as a leader in audio education. Our focus on audio engineering and production is reflected by our intensive recording facilities, small classes (ten students per class), co-op work program and job placement statistics. R.A.P. continually moves in step with the technological and commercial developments in audio. Our Ontario facility features two 24-track studios, a computer music suite (Mac Iix, E-mu, Roland, Yamaha, Opcode, Performer), post-production systems (Cipher Digital Softouch PC, Shadow II, Sound Ideas sfx Library), and a Sound Tools direct-to-disk system (Digitidesign). R.A.P. is one of the best-equipped recording schools in North America, offering some of the finest educational services to audio production students. Student assistance may be available to those that qualify: Canada Student Loan Program, Ontario Student Loan Program, Ontario Student Grant Program, U.S. Guaranteed Student Loan Program.

SAE, AMSTERDAM

Program Name: English Program. Vondelstraat 13; 1054 GC; Amsterdam, The Netherlands; (31) 20 689-4189; FAX: (31) 20 689-4324. **Chief Administrator:** Guy Nicholson. **Program:** (Applicable in Australia, New Zealand, Holland, Singapore and Malaysia). International Network of Recording Schools—16 colleges with their own in-house MIDI, 8-track, 24-track and hard disk recording studios, used exclusively for training. Audio Engineer Diploma—15 months:



SAE SCHOOL OF
AUDIO ENGINEERING, AMSTERDAM
Amsterdam, The Netherlands

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SAE, ADELAIDE

Program Name: See SAE Amsterdam. 18-20 Deeds Road; Camden Park 5038; Adelaide, Australia; (61) 8 376-0991. **Chief Administrator:** Mr. Michael Davison.

SAE, AUCKLAND

Program Name: See SAE Amsterdam. 18 Heather St.; Parnell, Auckland, New Zealand; (64) 9 373-4712; FAX: (64) 9 373-4713. **Chief Administrator:** Ms. Renee Martin.



SAE SCHOOL OF AUDIO ENGINEERING, BERLIN
Berlin, Germany

SAE, BERLIN

Program Name: German Program. Seestr. 64; 1000; Berlin 65, Germany; (49) 30 456-5137; FAX: (49) 30 456-5173. **Chief Administrator:** Mr. Thomas Nommensen. **Program:** (Applicable in Germany, Austria and France, and taught in German and French). **European Administration Office:** SAE Amsterdam, contact Mr. Guy Nicholson. **International Course Director:** Mr. Tom Misner, contact SAE Sydney. **Audio Engineer (Diplomstufe), 18 months:** This course is a combination of the English Diploma 15-month program and the 3-month Production course. Covers all subjects as per above English program. **Tonmeister Program—12 months.** **Post Graduate Program:** These programs are conducted at our Frankfurt, Vienna and Munich schools, and have the same course prerequisites as the English program. Each campus specializes in various forms of music, e.g., Vienna-Classical, London-Dance, Munich and Frankfurt-Hard Rock and Metal. **Tonassistenten-Kurs, 6 months:** Course divided into monthly blocks covering basic electronics and audio technique, MIDI Sequencing and Sampling, Microphone technique, effects processors, studio procedure and live sound. **Seminars and Short Courses** available identical to the English program.

SAE, BRISBANE

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SAE, FRANKFURT

Program Name: See SAE Berlin. Homburger Landstr. 182; 6000; Frankfurt a.M. 50, Germany; (49) 69 543262; FAX: (49) 69 548-4443. **Chief Administrator:** Mr. Bernhard Birkner-Hortachter.

SAE, KUALA LUMPUR

Program Name: See SAE Amsterdam. Lot 5, Jalan 13/2; 46200 Petaling Jaya; Selangor D.E., Malaysia; (60) 3 756-7212; FAX: (60) 3 757-2650. Chief Administrator: Mr. Darien Nagle.

SAE, LONDON

Program Name: See SAE Amsterdam. United House, North Road; London, N7 9DP United Kingdom; (44) 71 609-2653; FAX: (44) 71 609-6944. Chief Administrator: Mr. Michael Pollard.

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SAE, PARIS

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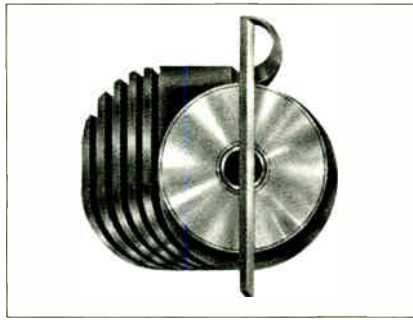
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SAE, VIENNA

Program Name: See SAE Berlin. Leystrabe 43, A-1200; Vienna, Austria; (43) 1 330-4133; FAX: (43) 1 330-4135. Chief Administrator: Mr. Mike Bruck.



TREBAS INSTITUTE
Montreal, Quebec, Canada

TREBAS INSTITUTE

Program Name: Recording Arts & Sciences. Recorded Music Production, Audio Engineering Technology; Music Business Administration (M.B.A.), 451 St. Jean St.; Montreal, Quebec, H2Y 2R5 Canada; (514) 845-4141. Chief Administrator: David P. Leonard. Program: Established in 1979, one-year program. Almost 100 courses to choose from in 11 tracks of study, including music, production, synthesis and MIDI, video, computers, digital, audio engineering theory and studio recording, electronics, music business, management and general education. Diplomas in Recording Arts & Sciences (w/specialization in Production and Engineering) and M.B.A. One entrance scholarship offered at each of four campuses across North America, valued at \$5,000 each. Goldmark Memorial Scholarship for advance studies at each location. Other Awards of Merit available. Consult admissions office. Transfer of credits between campuses. Facilities: professional multitrack recording studios, electronic music/synthesis/MIDI studios, electronics labs, computer labs, audio/video post-production mixing lab and analog/digital mastering rooms (at selected campuses). Resource center including library of several thousand volumes (books, magazines, articles) on the music business, audio/video, recording and music production. Accredited by ACCET. Internships. Job placement. Graduates working with major record companies, studios and artists. TEC Award nominee: Recording School Program of the Year, 1989 and 1990.

TREBAS INSTITUTE

Program Name: Recording Arts & Sciences. Recorded Music Production, Audio Engineering Technology; Music Business Administration (M.B.A.), 410 Dundas St. E.; Toronto, Ontario, M5A 2A8

Canada; (416) 966-3066. Chief Administrator: David P. Leonard. Program: Established in 1979, one-year program. Almost 100 courses to choose in 11 tracks of study, including music, production, synthesis and MIDI, video, computers, digital, audio engineering theory and studio recording, electronics, music business, management and general education. Diplomas in Recording Arts & Sciences (w/specialization in Production and Engineering) and M.B.A. One entrance scholarship offered at each of four campuses across North America, valued at \$5,000 each. Goldmark Memorial Scholarship for advance studies at each location. Other Awards of Merit available. Consult admissions office. Transfer of credits between campuses. Facilities: professional multitrack recording studios, electronic music/synthesis/MIDI studios, electronics labs, computer labs, audio/video post-production mixing lab and analog/digital mastering rooms (at selected campuses). Resource center including library of several thousand volumes (books, magazines, articles) on the music business, audio/video, recording and music production. Accredited by ACCET. Internships. Job placement. Graduates working with major record companies, studios and artists. TEC Award Nominee: Recording School Program of the Year, 1989 and 1990.

TREBAS INSTITUTE

Program Name: Recording Arts & Sciences. Recorded Music Production, Audio Engineering Technology, Music Business Administration (M.B.A.), 112 E. 3rd Ave.; Vancouver BC, V5T 1C8 Canada; (604) 872-2666. Chief Administrator: David P. Leonard. Program: Established in 1979, one-year program. Almost 100 courses to choose in 11 tracks of study, including music, production, synthesis and MIDI, video, computers, digital, audio engineering theory and studio recording, electronics, music business, management and general education. Diplomas in Recording Arts & Sciences (w/specialization in Production and Engineering) and M.B.A. One entrance scholarship offered at each of four campuses across North America, valued at \$5,000 each. Goldmark Memorial Scholarship for advance studies at each location. Other Awards of Merit available. Consult admissions office. Transfer of credits between campuses. Facilities: professional multitrack recording studios, electronic music/synthesis/MIDI studios, electronics labs, computer labs, audio/video post-production mixing lab and analog/digital mastering rooms (at selected campuses). Resource center including library of several thousand volumes (books, magazines, articles) on the music business, audio/video, recording and music production. Accredited by ACCET. Internships. Job placement. Graduates working with major record companies, studios and artists. TEC Award Nominee: Recording Program of the Year, 1989 and 1990.

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IN THE

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- 38. Private (personal) production facility
- 39. Corporate or institutional facility
- 40. Remote or variable locations

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MIX Reader Service

P.O. Box 5069, Pittsfield, MA 01203-9856

Issue: *Mix*, February 1993 ♣ Card Expires: June 1, 1993

Name _____ Title _____

Company _____

Address _____

City _____

State _____ Zip _____

Phone (____) _____

1) Your company's primary business activity (check ONE):

- 01. Recording studio (including remote trucks)
- 02. Independent audio recording or production
- 03. Sound reinforcement
- 04. Video/film production
- 05. Video/film post-production
- 06. Broadcast/radio/television
- 07. Record company
- 08. Record/tape/CD mastering/manufacturing
- 09. Equipment manufacturing (incl. rep firm)
- 10. Equipment retail/rental
- 11. Contractor/installer
- 12. Facility design/acoustics
- 13. Educational
- 14. Institutional/other (please specify)

2) Your job title or position (check ONE):

- 15. Management—President, owner, other manager
- 16. Technical & Engineering—Engineer, editor, design engineer, etc.
- 17. Production & Direction—Producer, director, etc.
- 18. Sales & Administration—Sales rep, account executive, etc.
- 19. Artist/Performer—Recording artist, musician, composer, other creative
- 20. Other (please specify)

3) Your role in purchasing equipment, supplies and services (check ONE):

- 21. Recommend the purchasing of a product or service
- 22. Specify makes, models or services to be purchased

23. Make the final decision or give approval for purchase

- 24. Have no involvement in purchasing decisions

4) Your company's annual budget for equipment, supplies and services:

- 25. Less than \$50,000
- 26. \$50,000 to \$149,999
- 27. \$150,000 to \$249,999
- 28. \$250,000 to \$499,999
- 29. \$500,000 or more

5) Purpose of inquiry:

- 30. Immediate purchase
- 31. Files/future purchases

6) Where you got this copy of *Mix*:

- 32. Personal subscription
- 33. Recording studio/production facility
- 34. Audio/video retailer
- 35. Newsstand
- 36. From a friend or associate

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7) Where your audio-related work takes place (check all that apply):

- 37. Commercial (public) production facility
- 38. Private (personal) production facility
- 39. Corporate or institutional facility
- 40. Remote or variable locations

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—FROM PAGE 54, THOMAS DOLBY

have my faders in a line, I want to know my aux sends are here, and I want to have my knobs up here.”

The manufacturers believe that the Roger Nicholsons of this world are the market that they should be aiming at. Wrong. That's a tenth of the market they should be aiming at. They should be aiming at all the people who have nothing of his knowledge of the studio who want to make records and talk in musical terms. Music is a universal language. Two musicians from completely different walks of life can talk about how much punch is on a snare drum. And they know what they are talking about.

I believe that the manufacturers are being incredibly short-sighted about these interfaces. A young kid who is into techno-rave, and who was a DJ in a nightclub until last week when some indie label gave him a deal, he doesn't want to learn all that stuff. He wants two throbbing orbs that he can fondle, so that he can manipulate his sound. That is

the kind of interface I am talking about. Intuitive, musical—and that is *not* what we are getting.

Bonzai: Is anybody getting close to your dream?

Dolby: Possibly in software. Inspired people are coming up with, for example, Mac-based software

“These days, as an explorer, I feel like I am seeing footsteps in the snow, like somebody else has been there first.”

MIDI mixers that are more intuitive in that way.

Bonzai: Are you active in product development?

Dolby: Not in an official capacity, but there are products that I have

used a lot and ones that have excited me. I have seen possibilities that maybe the manufacturers hadn't foreseen, so I have made suggestions. They are open, but they have their own agenda.

Bonzai: You don't want to become a manufacturer, do you?

Dolby: No, I don't. In fact, Dolby Labs won't let me, not that I would want to.

Bonzai: You have certain restrictions on the use of the name?

Dolby: Yes, we got into a legal tussle six or seven years ago, which ended up with us agreeing that I would never attempt to manufacture noise reduction equipment.

Bonzai: Why did you choose the name in the first place?

Dolby: It was a nickname in school, because I used to record onto cassettes when I was 15 and 16. People used to call me “Dolby.” When I started looking at the possibility of appearing professionally, it just made perfect sense. ■

Roving editor Mr. Bonzai is slowly making the mental transition from analog to digital thinking.

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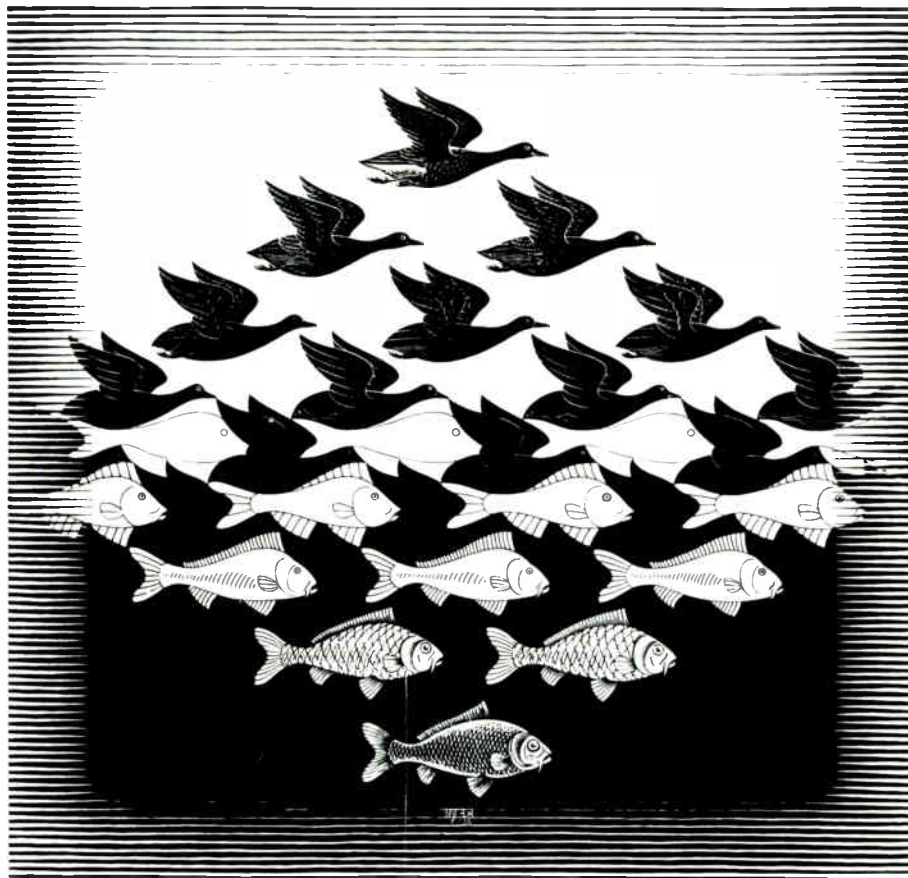
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USE READER SERVICE CARD FOR MORE INFO

If you think only your eyes can play tricks on you...



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Study the illustration. Are the geese becoming fish, the fish becoming geese, or perhaps both? Seasoned recording engineers will agree that your eyes *and* your ears can play tricks on you. In the studio, sometimes what you think you hear isn't there. Other times, things you don't hear at all end up on tape. And the longer you spend listening, the more likely these aural illusions will occur.

The most critical listening devices in your studio are your own ears. They evaluate the sounds that are the basis of your work, your art. If your ears are deceived, your work may fall short of its full potential. You must hear everything, and often must listen for hours on end. If your studio monitors alter sound, even slightly, you won't get an accurate representation of your work and the potential for listener fatigue is greatly increased.

This is exactly why our engineers strive to produce studio monitors that deliver sound with unfailing accuracy. And, why they create components designed to work in perfect harmony

with each other. In the laboratory, they work with quantifiable parameters that do have a definite impact on what you may or may not hear. *Distortion*, which effects clarity, articulation, imaging and, most importantly, listener fatigue. *Frequency Response*, which measures a loudspeaker's ability to uniformly reproduce sound. *Power Handling*, the ability of a

loudspeaker system to handle the wide dynamic range typical of the digital domain. And, finally, *Dispersion*, which determines how the system's energy balance changes as your listening position moves off axis.

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If you're looking for a new pair of studio monitors, look into the 4400A Series. We think you'll find them to be a sight for sore ears.



Models pictured (L-R)
3-Way 10" 4410A, 2-Way 8" 4408A and 3-Way 12" 4412A



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