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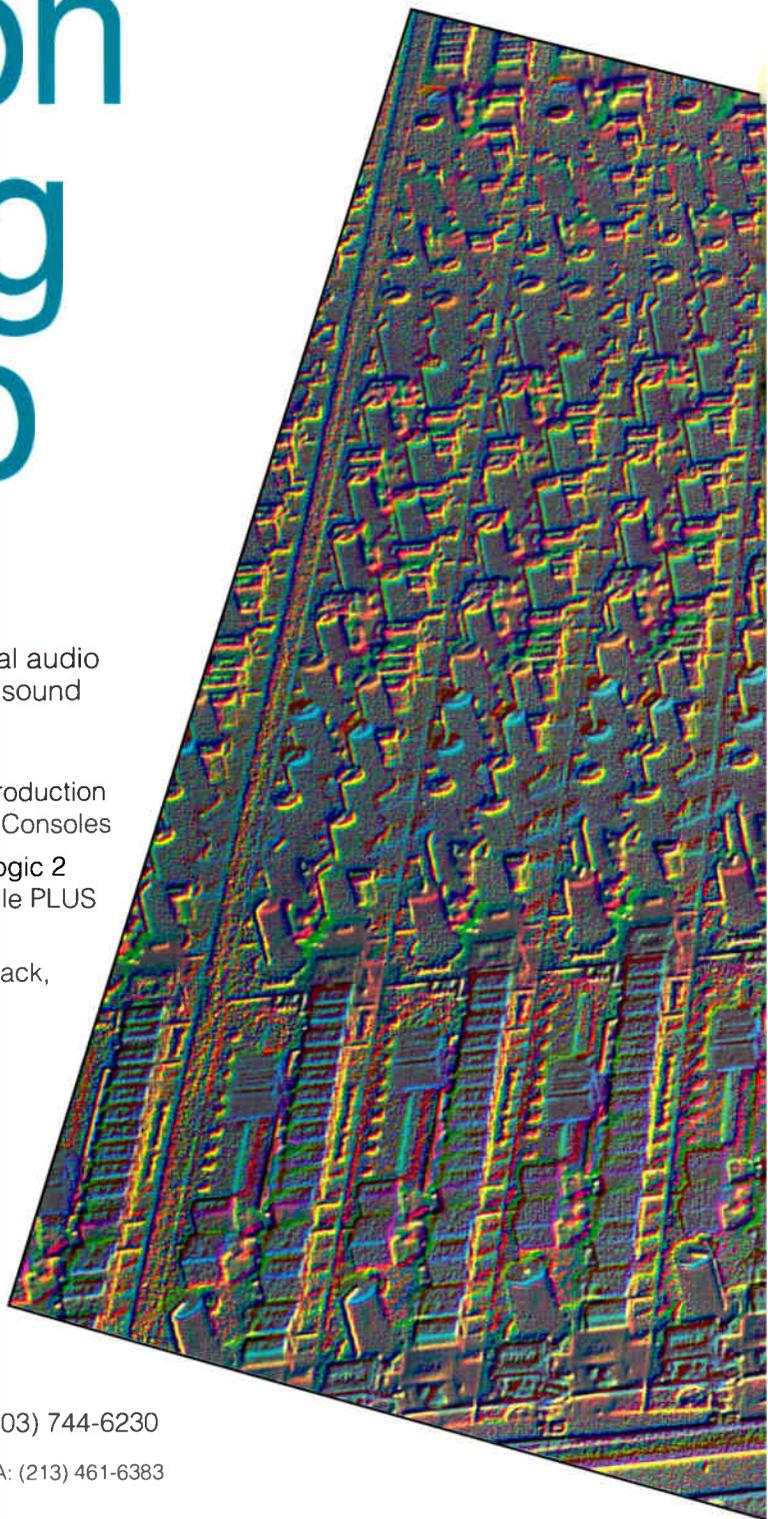
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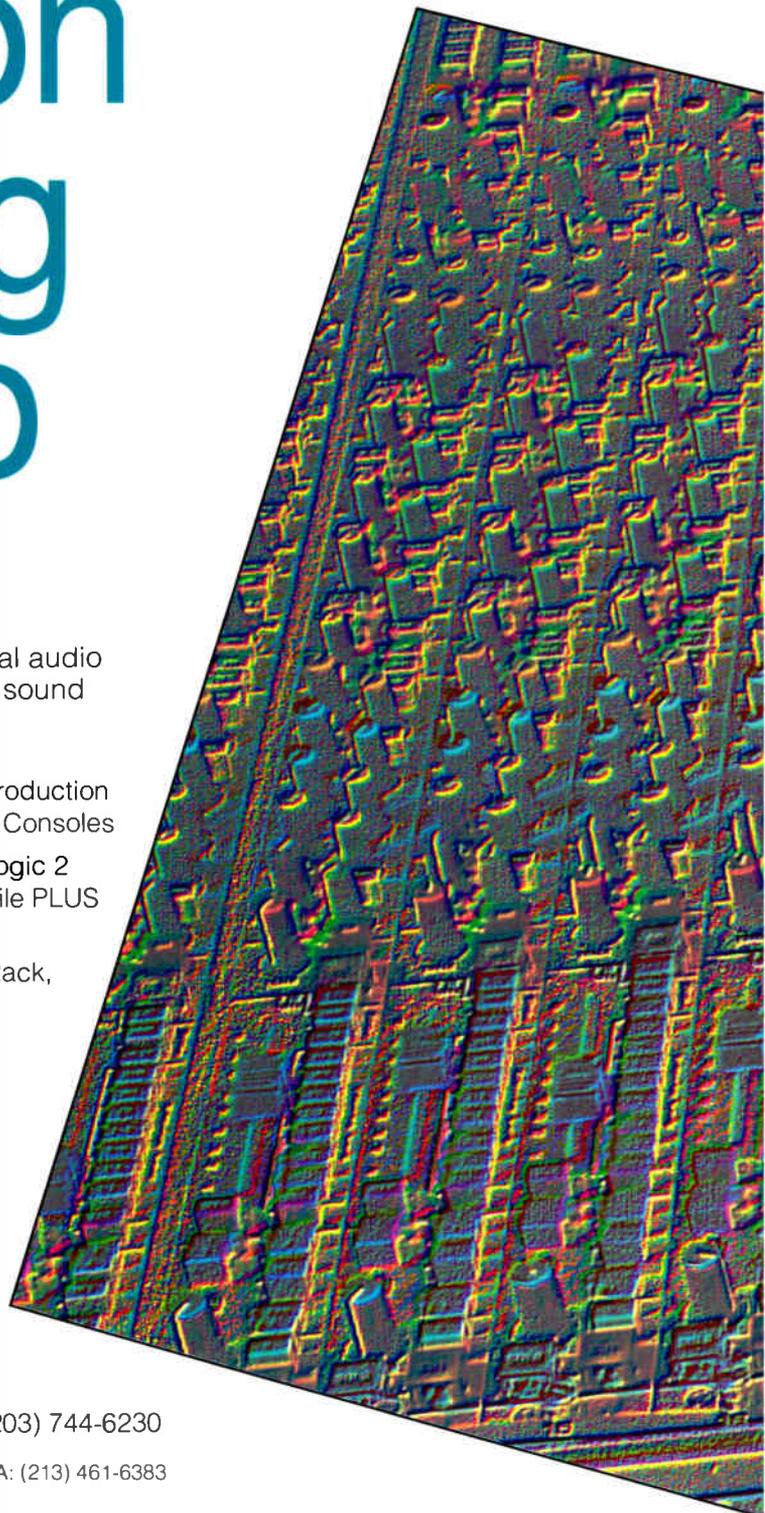
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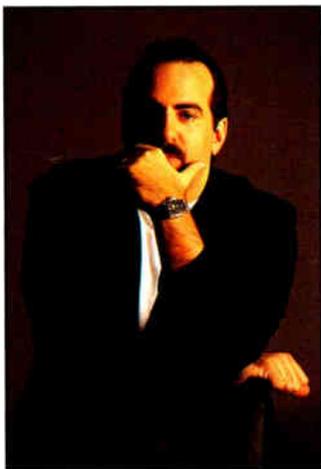
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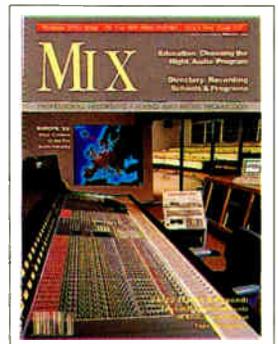
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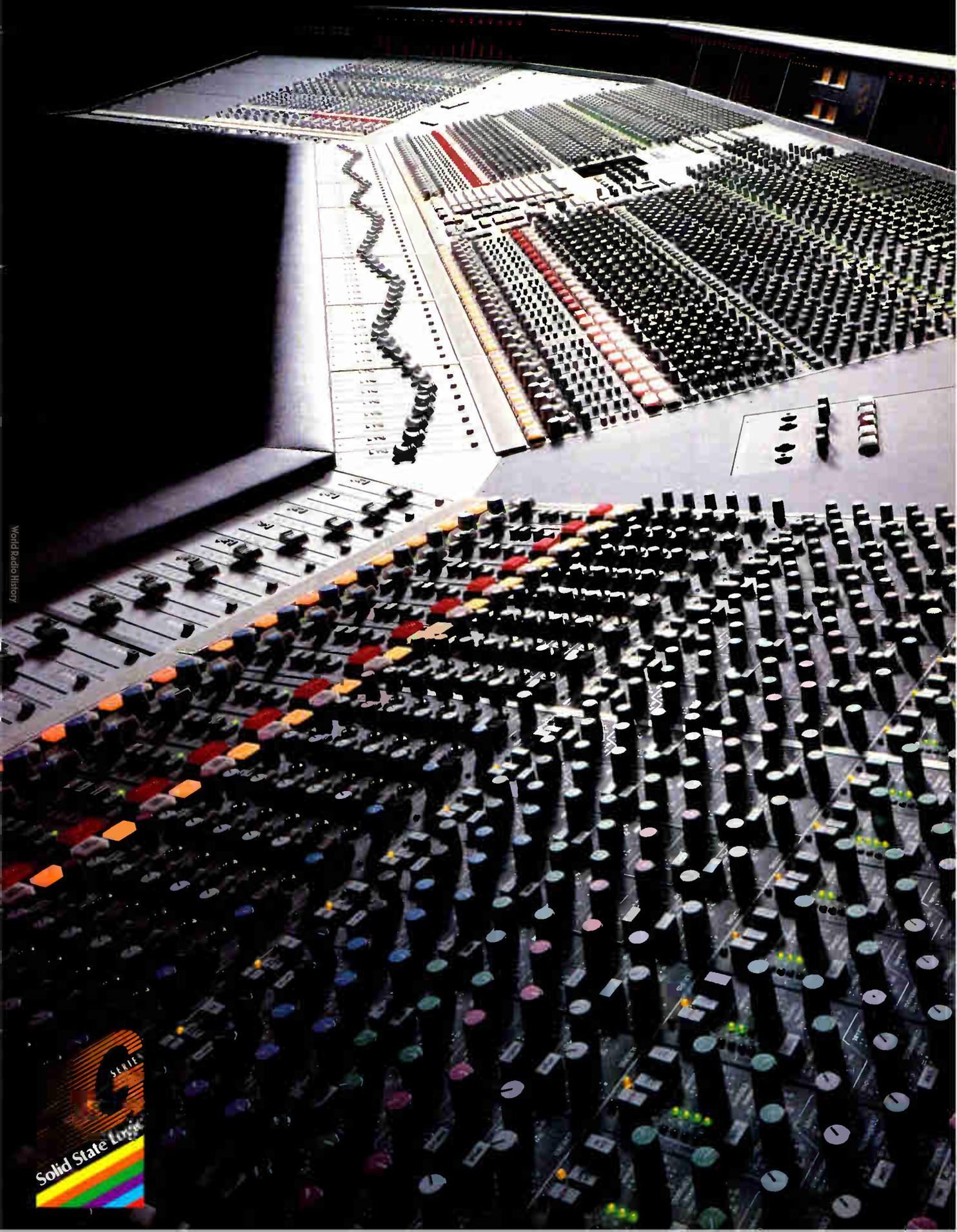
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Cover: The Studio 3 control room at Middle Tennessee State University in Murfreesboro is equipped with an SSL 4000 G Series console with Total Recall, Sony 3324A digital and Studer A827 analog multi-track recorders, Boxer monitors, and a Wave-Frame AudioFrame, among other gear. Pictured, too, is a classroom equipped with audio and video monitors, where students can learn about what's going on in the control room. **Photo:** Beth Gwynn. **Inset Photo:** © Image Bank/Terje Kveen.



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D R E A M M A C



World Radio History



H I N E

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■
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FROM THE EDITOR

Quite a few of you out there have been attending AES Europe conventions in order to get a handle on the international recording scene. It may be that more "international types" actually attend the U.S. show; however, it is the European gathering in late winter that seems to best represent the multicultural side of the pro audio biz. This year the industry meets in Vienna, beginning March 24.

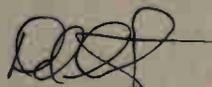
Especially of interest at this year's show will be the arrival of the Eastern Europeans, many of whom are just beginning to get their entrepreneurial feet wet in newly capitalistic societies. The relationships they build at this event will become pipelines for information, talent and equipment. In this changing world of international neighbors and former adversaries, opportunities will go to the prepared.

With the evolving consolidation of monetary systems into "intercredit" networks, new markets are springing up as the standards of exchange are simplified. This ease of entry also brings new competitors who are looking beyond their previous reach. Today's international economic doldrums are a precursor to the giant changes required to build this mondo-economic structure.

Manufacturers and service businesses are becoming more active in the world market, mainly for their own survival. Suppliers, which previously could not conceive of exporting to the West, have a new chance of building these extensions. With more and more solid alternatives available, world-class quality and maintenance, at fair market prices, will be virtually required in order to succeed.

For all of the world's traumas and conflicts, there has never been a time on this planet when more people have agreed to wage peace. The stage is being set for a new enlightenment in world politics and communication. This is a time for cooperation and understanding. It is a time for building bridges and mending fences, a time to share and prosper. As Alexander Graham Bell's ancestors in marketing used to say, "Reach out and touch someone."

Keep Reading,



David Schwartz
Editor-in-Chief

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World Radio History

CURRENT

Lion Share Closes Its Doors

Lion Share Recording Studios, the Los Angeles facility that was home to the "We Are the World" sessions, Donna Summer's "She Works Hard for the Money," and countless other big-name recording acts over the past decade, closed its doors effective December 27, 1991. The staff was given notice on December 13. At press time, no decision had been made on what to do with the equipment.

Primarily a mixing and overdub facility, Lion Share was opened by Kenny Rogers in 1981 and purchased by Terry Williams and Jay Antista in 1986. A third partner, Don Chickering, bought in soon after. "There are basically three reasons why we closed," Williams says. "The first is an unhealthy rate structure that I believe is a result of home studios. There is no profit left in our industry out here. Record companies are expecting \$600 to \$700 a day lockout, and there's no way a commercial studio can fly with state-of-the-art equipment at those rates.

"Second, we inherited 8,000 square feet in the Platinum Triangle—the former ABC Dunhill—and we had to tow the entire 22,000 square feet," he continues. "Finally, the poor economy over the last year-and-a-half was the knockout punch."

Williams' final day was December 13. He plans to pursue the development of a record label, and through the Hollywood Association of Recording Professionals, he plans to continue the fight with City Hall against "illegal" studios in the home. He says, "I think it is rather prophetic that the president of HARP is the first to go out of business. I won't be the last. [Home studios] are now starting to affect the post industry, too. If something is not done in the next

five years, there will be no commercial recording in L.A."

Convention News

AES Europe, the 92nd convention of the Audio Engineering Society, will be held March 24-27 at the Austria Center in Vienna. One of the more interesting areas for attendees should be the emphasis on sound restoration and tape preservation, with three sessions headed by a noted Viennese archivist. For more information, contact the AES at (212) 661-8528.

The Society of Motion Picture & Television Engineers will host its 26th annual Advanced Television and Electronic Imaging Conference February 7-8, 1992, at the Westin St. Francis Hotel in San Francisco. Contact SMPTE headquarters for more information: (914) 761-1100.

SPARS Code Retired

The DDD, DAD or ADD on the back of prerecorded music product might soon disappear altogether. The Society of Professional Recording Services decided during the AES convention in October to discontinue the labeling code, which was introduced in the mid-'80s to help identify those portions of the recording process that were digital or analog. The first letter referred to the recording medium, the second letter the mixing format, the third letter the mastering process.

"The SPARS code no longer fairly reflects the complexity of the technology we use today," says Pete Caldwell, SPARS chairman of the board. "A review of the current technological landscape, and the near horizon, pointed not only to a myriad of digital hardware and software formats, but also to the labyrinth of interfaces, conversions, transfers and the like—not to

mention the remarkably competitive progress of analog technology. It became clear that any attempt to revise the code to embrace all of these subtleties and nuances would become so complex as to be meaningless."

"The code has been in danger of degenerating to simply a marketing device rather than a useful piece of information to the consumer," adds Tom Scott of Skywalker Sound, representing board member Tom Kobayashi.

The discontinuation of the code may take awhile, as record labels figure out how they want to address the issue. They were not required to use it, and they are not required to discontinue it: it is simply a SPARS recommendation that the code be retired.

Grammys in the Commonwealth

The National Academy of Recording Arts & Sciences scored an international coup with an agreement to broadcast the entire 1992 Grammy Awards show in the new Commonwealth of Independent States. It would have been the first Western awards show broadcast in its entirety in the Soviet Union; now it's scheduled to be the first in the new Commonwealth.

The broadcast is expected to be received by 15 republics. Because of the uncertain political situation, though, deals had to be negotiated separately. NARAS expects up to 160 million viewers tuned into the First Channel, the major broadcast network linking the former Soviet Union. The broadcast licensee will be Central Television, the new name for Gostel Radio Soviet Television.

The 34th Annual Grammy Awards are expected to air in more than 80 countries around the globe, accord-

INDUSTRY NOTES

Jim Meres was promoted to vice president of engineering at Wave-Frame Corporation, based out of their Los Angeles offices...RPG Diffusor Systems of Largo, MD, welcomed Troy Jensen as the company's new general manager. In the post, Jensen will act as an online technical liaison with acoustical consultants and architects, and he will coordinate domestic and international manufacturer's reps... Neotek (Chicago, IL) chose Redwood Marketing of Nashville as its newest product representative. Redwood will cover console sales in the Southeast. For more information, call Tom Lay at (312) 929-6699...Richard Dean was named audio-visual director of sales for Telex Communications (Minneapolis)...Systems and facility design and engineering firm B & B Systems (Valencia, CA) appointed Norm Schnapper as director of marketing and sales. B & B also hired Kevin Bohn and Nathan Simmons as video systems engineers...Micropolis Corporation (Chatsworth, CA) welcomed Taroon Kamdar as senior vice president and general manager for the storage systems division... American Pro Audio outgrew its old location and moved to larger digs. The new address is 6026 Blue Circle Drive, Minnetonka, MN 55343. New phone number is (612) 938-7777; new fax is (612) 938-0096... Dale Taipale joined the Wenger Corporation's Performance Division as director of engineering. Taipale is responsible for directing product design and development, and he will operate out of the company's Owatonna, MN, headquarters...Marantz USA (Mount Prospect, IL) appointed Jeffrey R. Wilner to the position of national sales manager. Wilner will oversee the company's entire sales effort, manage the 13 independent rep firms and be responsible for sales support to dealers...Ron Camden was promoted from national sales manager to vice president of sales for Portland, OR-based Biamp Sys-

tems. Biamp also reported the promotion of Tom Lippel to engineering manager...Beyer Dynamic's new address is 56 Central Avenue, Farmingdale, NY 11735. The new phone number is (516) 293-3200; fax is (516) 293-3288...Symetrix Inc. (Seattle) hired Rick Chinn as applications engineer. His responsibilities include customer service and product support and documentation...Rane Corporation (Mukilteo, WA) saw some new hires and a promotion: Jeff Davies and Jon Ferrer were appointed regional sales managers, and Ray Bloom was promoted to director of sales and marketing...HHB Communications, the British pro audio distributor, welcomes Chas Rowden as field sales manager and Tony Musgrove as salesperson. HHB's London office may be reached at (011) 44-81-960-2141...Washburn International moved its corporate headquarters to a newly completed site in Vernon Hills, IL...Pacific Radio Electronics moved recently. The new address is 969 N. La Brea Avenue, Hollywood, CA...Rochester, NY's Applied Research and Technology expanded its engineering facilities to house current and future projects. More information may be obtained by calling Angelo Biasi at (716) 436-2722...National Academy of Recording Arts & Sciences selected 15 major U.S. cities to host the 1992 Grammy in the Schools program. The program is designed to help students interested in a music or recording industry career. For a list of the locations and more information, call (213) 849-1313...The National Association of Schools of Music elected Frederick Miller, dean of DePaul University's School of Music, the association's president...USITT 92, a conference and stage expo, is offering several seminars on sound. The conference will be held in Seattle from March 4-7; for details, call (212) 924-9088...Our condolences to the family of Dag Fellner. Fellner, of Lyrec UK, passed away in November of last year. ■

—FROM PAGE 9, CURRENT

ing to NARAS president Michael Greene. The show will again take place in Radio City Music Hall in New York City, February 25. Murray Allen, former president of Universal Recording in Chicago, will again coordinate sound services.

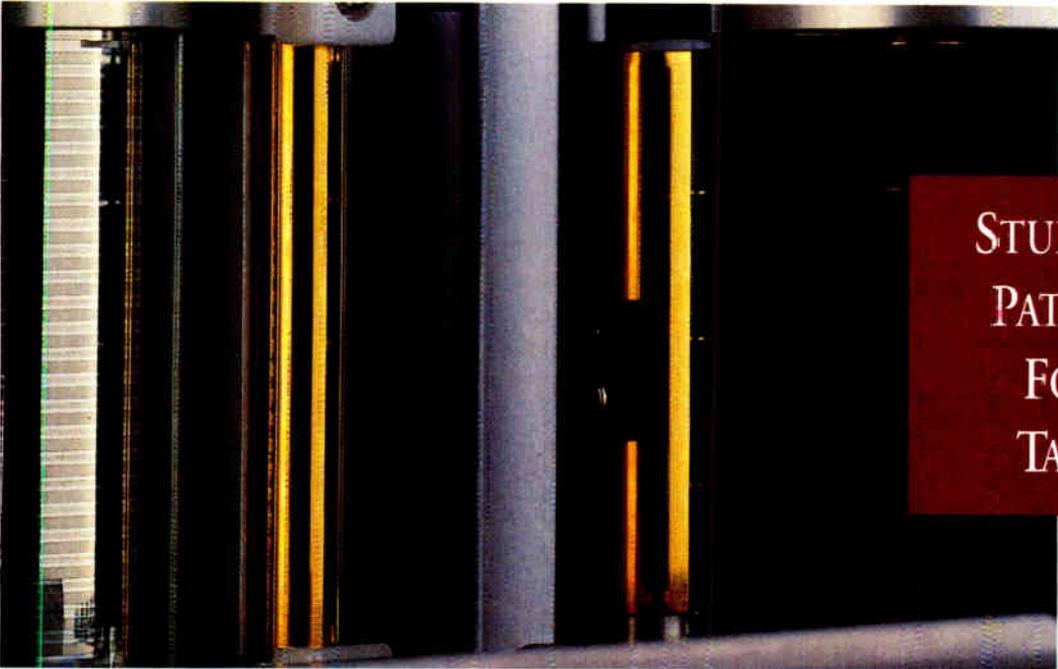
1992 TEC Awards

The eighth annual Technical Excellence & Creativity Awards, sponsored by the Mix Foundation for Excellence in Audio, will be held Friday, October 2, at the Westin St. Francis Hotel on Union Square in San Francisco. This marks the first time that the TEC Awards have been held outside of New York City or Los Angeles. For more information, contact TEC Awards Executive Director Karen Dunn at (510) 562-7519.

Hope Reports

Hope Reports, a compiler of financial and market information for the presentation media industries, should have released its 1991 figures by the time you read this, but already they are saying that 1992 promises to be a better year. "We have found that during every presidential election year, the AV industry has boomed," says Tom Hope. "1992 should be no different. It may not be a great year, but I look for a definite improvement. Producers will do more political commercials than ever. That, in turn, creates a positive chain reaction stimulating other aspects of our industry."

Making note of the increasing importance of commercial producers, Hope Reports will issue a sequel to its "Contract Production for the '90s," as well as two all-new reports covering the production field: "Producer & Video Post Wages and Salaries" and "Video Post-Production." For more information, contact Hope Reports at a new address: 58 Carverdale Drive, Rochester, NY 14618-4004; phone (716) 442-1310; fax (716) 442-1725. ■



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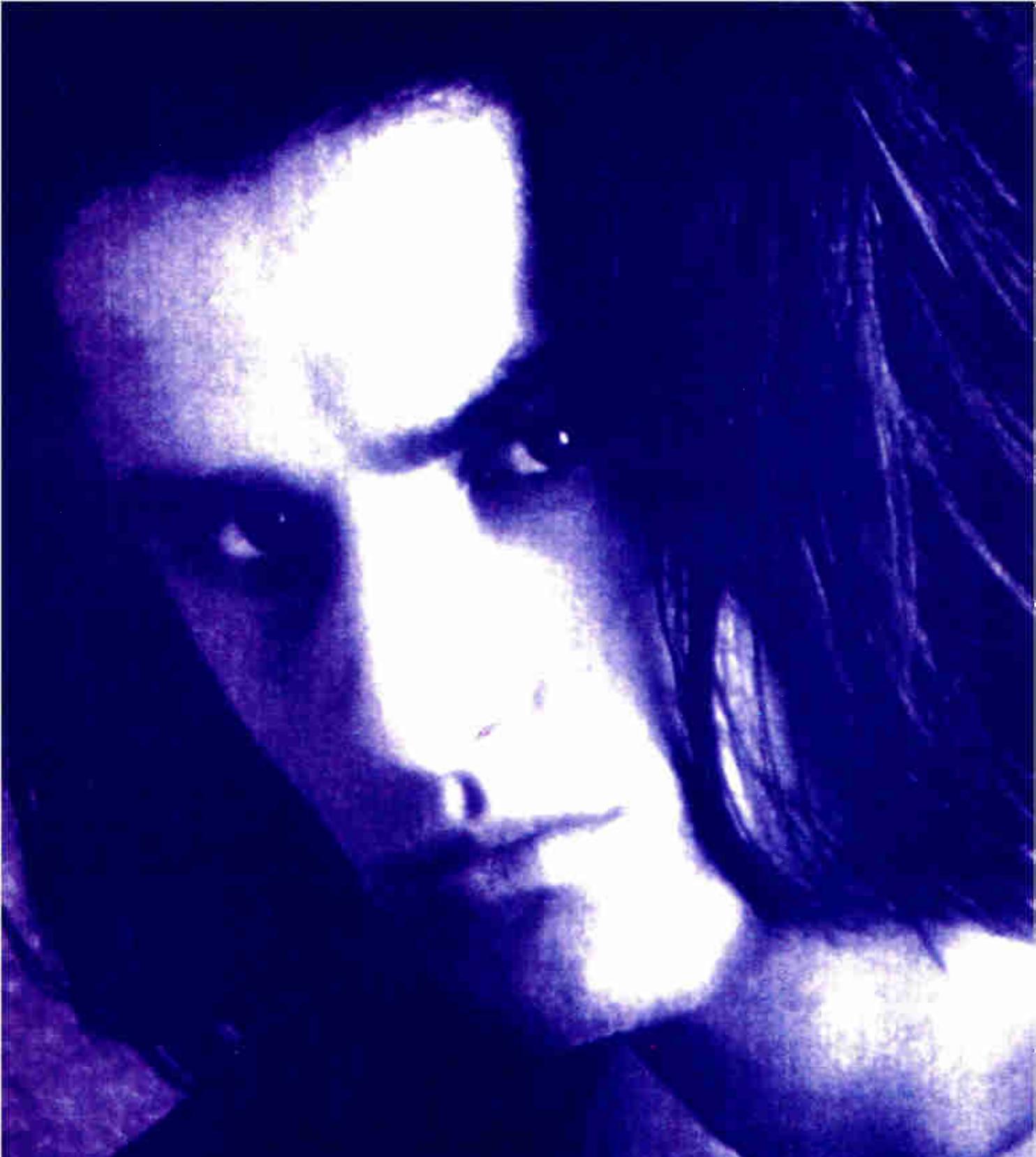
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by Ken C. Pohlmann

LOW-BIT A/D CONVERSION

PART 2

Last month we reviewed the theory of operation of low-bit A/D conversion. But one cannot live by theory alone; you also need hardware. This month, let's take a look at two low-bit A/D converter chip sets used in many professional digital audio products.

The DSP56ADC16 sigma-delta A/D converter was developed by Motorola. It is a linear 16-bit converter using 64-times oversampling, accommodating output sample rates up to 100 kHz and operating up to 6.4 MHz. The use of sigma-delta processing obviates the need for a brickwall, anti-aliasing filter and sample-and-hold circuit. As with other sigma-delta A/D converters, the input signal is oversampled to extend the noise spectrum well beyond the audio band. Noise shaping reduces noise in the audio band, and the lowpass filtering is used to remove out-of-band quantization noise. Finally, the signal is decimated to reduce the sample rate commensurate with the audio band and increase resolution.

The converter is designed around four major subcircuits: third-order sigma-delta modulator and noise shaper, 16:1 decimating comb filter, 4:1 decimating FIR filter, and serial interface. The third-order noise shaper places an 18dB/octave characteristic on the quantization noise. The converter's analog front end consists of three differential, switch-capacitor, linear integrators. Filtering and decimation are performed in two steps to reduce the complexity of the digital filter. For example, to achieve the desired stopband attenuation and filter steepness, a single-stage FIR with more than 2,800 taps would be required. The

use of a multirate decimation filter system also allows a dual-mode application, as described below. The output of the modulator is filtered by a fourth-order comb filter and decimated; the sample rate is decreased by a factor of 16:1. A comb filter is used because it contains only adders, thus eliminating the need for high-speed multiplication. The first-stage comb filter accomplishes initial filtering, as well as decimation of the input sample rate by a factor of 16:1.

An FIR filter is used to decimate the signal by a 4:1 factor with a lowpass

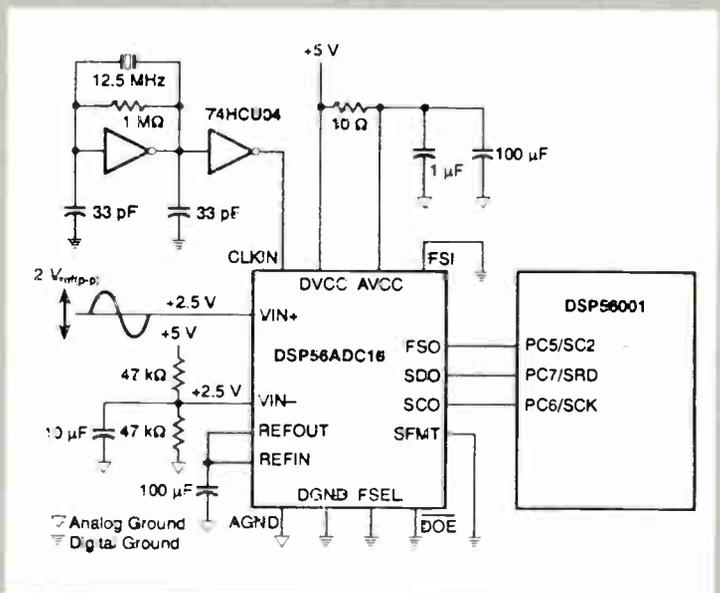


Figure 1: A typical application using Motorola's DSP56ADC16 analog-to-digital converter.

response. Overall, a 64:1 decimation ratio is achieved; in other words, 63 of every 64 output samples are discarded. A stopband attenuation of -96 dB is achieved. To compensate for the response (passband droop) of the fourth-order comb filter, the FIR uses inverse equalization to achieve an overall flat response. FIR images occur at multiples of the comb filter output

sampling rate; these are also zeros in the fourth-order comb response. The FIR stopband attenuates the comb response, leaving a negligible alias component at the overlap of the two responses.

A serial interface provides communication to a host processor; data format is 16-bit, two's complement serial, with sign bit (MSB) transmitted first. A serial interface, rather than a parallel interface, minimizes current drivers and hence noise. In all, this digital filter section is the equivalent of a 30th order analog Bessel filter. Sixteen-bit

resolution and S/N ratio of 90 dB, with sample rates up to 100 kHz, are achieved in this configuration.

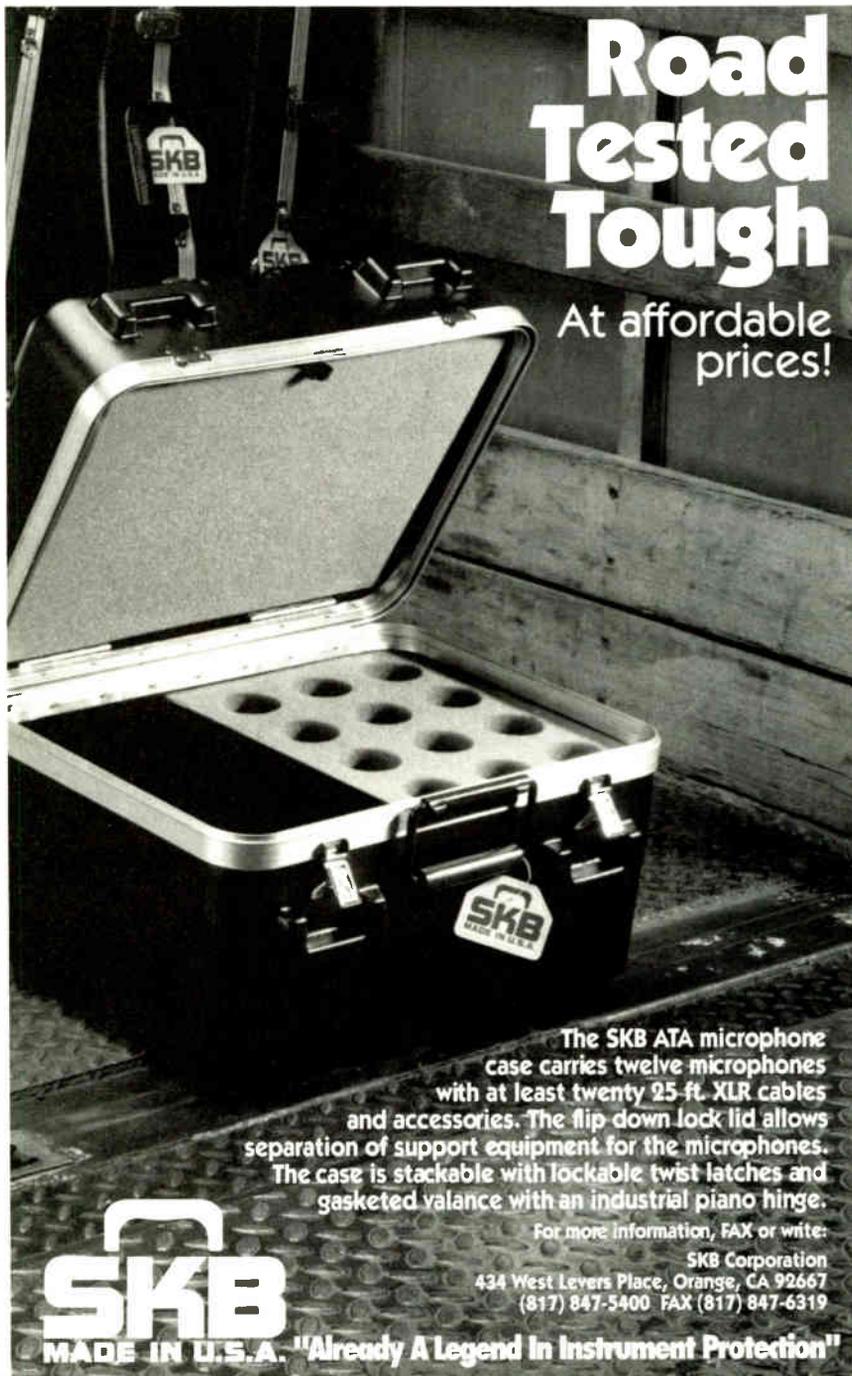
Because the cutoff frequencies of the comb and FIR filters are scaled by the input sampling rate, the converter may be used with any arbitrary sampling rate without changing component values. Furthermore, the chip is designed so that the 16:1 comb filter can be connected directly to the serial output. This permits operation at faster speed (output sample rate up to 400 kHz) at the expense of lower resolution (12-bit, and S/N of 72 dB). This is useful for ultrasonic applications and where lower resolution is tolerable. A

general application for this chip using its full resolution is shown in Fig. 1; the A/D converter is connected to a DSP56001 processor. Designers should also check out Motorola's DSP56ADA16; it provides sigma-delta A/D and D/A conversion on a single chip.

UltraAnalog's AFE20048 analog front end and D20C10 decimator chips can be combined to form a low-bit A/D converter with 128-times over-sampling, noise shaping, and 4-bit flash conversion to achieve 20-bit resolution. In this design, the sigma-delta method is modified so that a low-bit PCM quantizer is employed, effectively allowing the signal's amplitude rather than slope to be encoded. The complexity of the decimation circuit is thus reduced, though noise shaping is still mandated. Such a system is in fact a noise-shaped PCM converter. The front end acts as a 4-bit, noise-shaping A/D converter; it contains 15 comparators and a 15-to-4 priority encoder. Differential linearity is high because the output code transition never corresponds to an actual change in the analog input voltage. A change in the analog input causes the idle pattern at the output of the flash converter to shift by increasing frequency of occurrence of one code, while decreasing frequency of occurrence of another. Since the energy of the idle pattern is slightly larger than the flash converter's quantization noise, smooth transitions are ensured.

Because two adjacent comparators are simultaneously active, an averaging effect is produced. This smooths the staircase transfer function much like dither. Because the flash converter is within the feedback loop, its error is subject to negative feedback, so there is little effect on linearity. The precision resistor network consists of 15 20kilohm resistors matched to $\pm 0.02\%$ tolerance. Along with two octal flip-flops, the array forms the D/A portion of the A/D quantizer. A 4-bit D/A converter is used to convert the interim output word for feedback to the summing point before integration by the noise-shaping filter. The A/D converter's integral linearity is limited only by the internal D/A converter.

Three high-speed op amps with good open-loop linearity are used to implement the noise-shaping loop filter; one op amp is unity-gain stable, and the other two are stable for inverting gains greater than one. Together



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with other components, a fourth-order characteristic is provided so that the noise floor rises with the fourth power of frequency; in addition, the noise is random and uncorrelated with the audio signal. The loop filter employs four poles at low frequencies and, for stability, three zeros at high frequencies. The loop is stable because the roll-off rate is less than 12 dB/octave prior to a loop gain of unity at 500 kHz. The roll-off rate increases to 24 dB/octave at the passive pole. Filter values are selected so that three quantizer levels are used by the idling pattern with no input signal; this eliminates zero-cross distortion.

The decimator chip is a multirate filter designed to decimate the 6.144MHz input sampling rate by a factor of 128. Two stages are employed. The first decimator is a simple high-speed filter comprising three cascaded moving-average filters, each with a window of 64 4-bit samples; the filters output the average of the last 64 samples. The frequency response contains periodic zeros at multiples of twice the output sampling rate. Although the response of the filter is

relatively flat (-1.9 dB at 20 kHz), compensating equalization must be applied at the input in the form of a two-pole filter. This filter also removes components above 3 MHz.

A half-band standard FIR lowpass filter performs final decimation; it attenuates signals above the audio band so that the signal may be downsampled by 2:1. Symmetry of the filter's frequency response causes half the coefficients to be zero. (Linear amplitude is 0.5 at one-quarter the input sampling rate.) The first filter provides attenuation of frequencies above $3fs/2$, and the second filter attenuates frequencies between $fs/2$ and $3fs/2$. The reduction in sample rate is accompanied by an increase in resolution from four bits to 20.

The 20-bit output is provided in both serial and parallel formats. As with other 1-bit converters, it is important to use a crystal or high-Q LC oscillator; a RC multivibrator must not be used because of the jitter it exhibits. A S/N ratio of 108 dB can be achieved with this A/D chip set. Performance can be enhanced by lowering the noise in the first integrator op amp, operating two parallel front-end circuits and adding their outputs to form a 5-bit output; this

yields a S/N ratio of 114 dB using the 20-bit output. When truncating 20 bits to 16, the effective quantization must be dithered; the LSB of the decimator chip may be used for this purpose.

Low-bit A/D converters such as these achieve high resolution with a very low noise floor. They extend the spectrum of the error between analog input and digital output far beyond the audio band, making the in-band noise quite small. Thanks to sigma-delta techniques, the same circuit that codes the signal into a low-bit stream also shifts the out-of-band noise components. In terms of phase linearity, amplitude linearity, noise and long term stability, A/D (and D/A) converters using low-bit architectures offer significant advantages over conventional conversion methods. With converters such as these, the digital audio chain has become significantly stronger.

[This material is adapted from *Advanced Digital Audio*, a new book edited and co-authored by Ken Pohlmann, and available from the *Mix Bookshelf*.]

Ken Pohlmann is a professor of music and director of Music Engineering at the University of Miami.

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ASHLY

by Stephen St. Croix

DANCES WITH WIRES

My youngest brother, Andy, is president of THD, a Seattle-based tube guitar amp company. His amps ship directly from the late '50s via time machine, and they sound like your best amp-dreams (if you have those; I have been told that some people actually don't!).

My next youngest, Gray, flies the Enterprise around aimlessly. He called yesterday to tell me to watch a particular banked U-turn in a certain orbit around some planet, right after the commercial. I did. He did great. Picard did not seem too shaken up by the maneuver, the ship held together, and I couldn't even see Gray's hands at all. Pretty impressive.

The next youngest, Brad, designs computer programs for "business." He does stuff that he says is not secret, but he won't tell me what it actually is. After I made him talk for a while, he told me that 90% of what he does is defense-related. He was defensive in this interview.

...Um, I play guitar. I've been playing guitar, bass and drums for about 25 years, and synthesizer since the ARP 2600 (tuning the ARP and the Minimoog has been the prime cause of my aging before my years).

I have been chief janitor at Marshall for over 20 years. I do hardware and software consulting for manufacturers in the audio and automotive industries, and I produce or engineer albums (or does one produce and engineer CDs these days?). One division of Marshall re-

moves noise and distortion from old films and records. I also write for you (and scuba divers).

My father (Doctor Dad) used to play a lot with brains at Johns Hopkins, some in jars, some in people. Much of what he developed decades ago is still in use in neurology and electroencephalography today.

The first person I ever met who would later become significant in the

recording industry was George Massenburg. That was 28 years ago. I moved east to live with my father, and there was George in the basement, electrocutting chunks out of the concrete floor with a high-voltage power supply. He taught me how to make

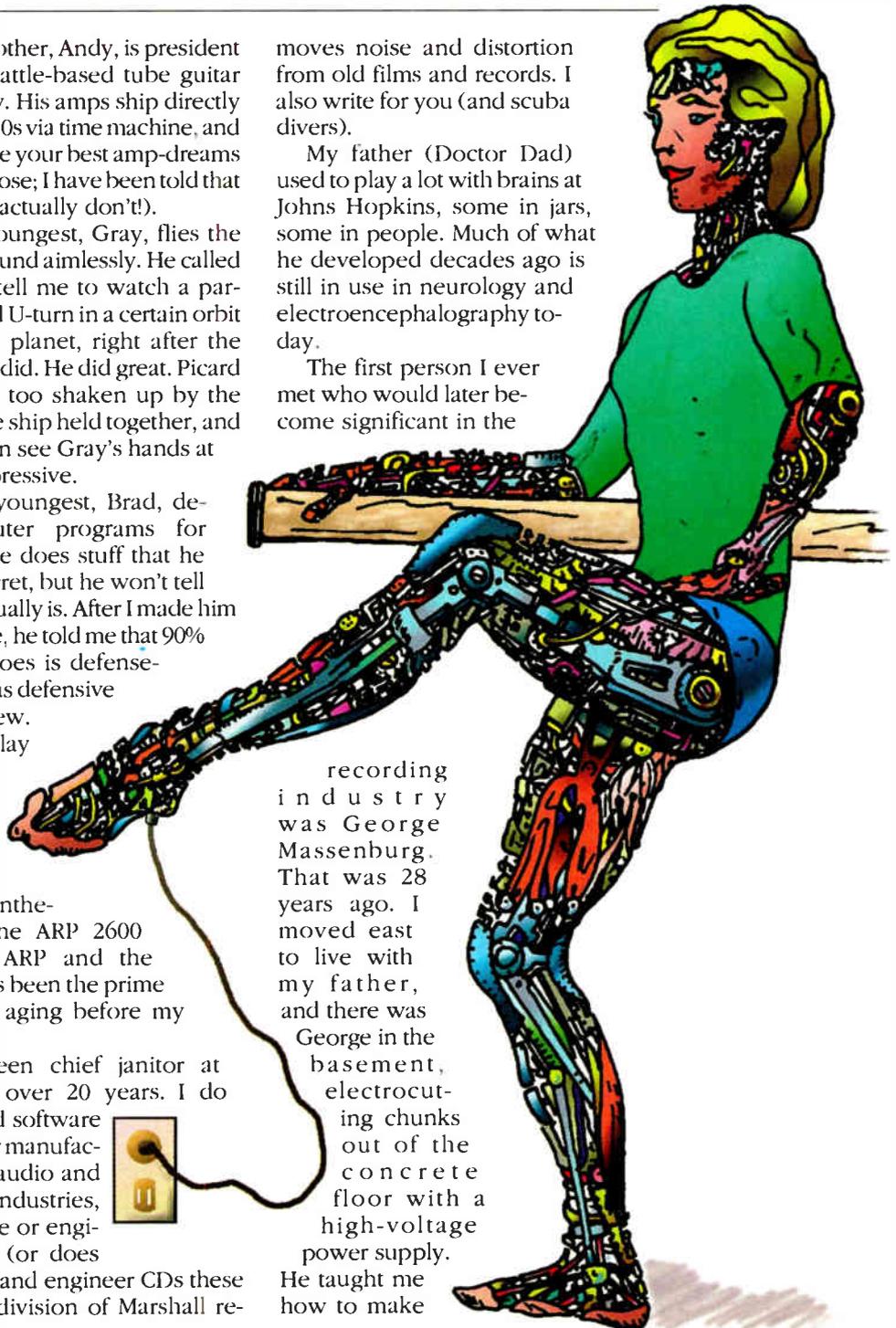


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anything distort.

Okay. What does all of this history have to do with anything? Well, *none* of these people, including myself, has "real" or organic jobs. In fact, essentially nobody I know has a real job. In a sense, all of these people do something artificial for a living. Not unimportant, but still artificial.

They all work with and survive through technology. They couldn't function for a day without their technical hardware. Everybody I know is dancing with wires.

Though many of us may plant trees and feed wild animals in our private lives, at work we are all wired in one way or another, be it analog or digital, be it copper or glass.

I suspect most of you qualify.

Let's see now. Andy's guitar amps would have an amazingly good noise floor but would be totally useless (no matter how hard you banged your guitar strings) without wires.

Gray's Enterprise would be a 4-foot wood and plaster mausoleum without all those little blue lights and neon engines. Picard would be bumping into walls in the dark, or peering out of

windows at a frozen computer-driven camera in a silent special effects house in Hollywood.

Brad—well, we all know how much software you can write without a computer.

My father? The first time that I can remember noticing a wire at all, it was stuck to a brain at Hopkins.

Me? When I play a synthesizer, it's obvious: I'm wired. When I play electric guitar, it's still pretty clear that the amp, the effects, the whammy bar, the

*More technology,
more power, more
potential, more
decisions.*

feedback, the speaker and tube artifacts are all contributing technologies.

Even when I play acoustic guitar, it's *still* an audio path through techno-hell. I usually use three mics, one where you would expect it, one special tack-on down below the bridge, and another high on the fretboard to pick up string noises. These are EQ'd, compressed, one is gated and expanded,

then all are mixed, and often a fourth "ambience" mic is brought in. Electronic environment simulation is always used, and I then generally consider the final composite result of all this to be my basic, unprocessed, acoustic guitar track.

This gives me control. Control to develop a special type of guitar for a special reason, or control to print an acoustic guitar that sounds like it's in your living room. In this last case, severe technology is used to hide the fact that today's technology is only marginally capable of recording real instruments so that they sound like they truly do sound when they are played back. You know: Please do that voodoo that you do so well.

My MIDI synthesizers never even get printed on my multitrack. They just lock up and go along for the ride, printing live directly to the target mixdown deck.

Multitracks. Yeah, well, I don't really use those too much any more, unless I do an album in Europe and bring it back for mixing. Everything is pretty much virtual now, disk-based. More technology, more power, more potential, more decisions.

If even *one* of the seven computers

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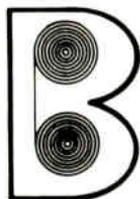
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has managed to connect the unit in question to, let's say, a particular workstation, but cannot repeat the same connection with Unit "X," which is now assumed to be faulty. What has often been overlooked, however, is the simple fact that the interface is being used in a way for which it was not originally designed; along comes a correctly implemented I/O, and the connection fails.

One case example might be useful. Awhile ago, I received a spate of calls from purchasers of a particular DAT machine, which I knew to be fitted with accurately implemented AES3-1985 and IEC-958 digital I/Os. Several users had attempted to offload stereo master mixes from a workstation to the DAT recorder using the XLR-equipped I/O. Having heard that an AES/EBU connection is more reliable, these users were less than thrilled that the connection either didn't work at all, or functioned intermittently. (For example, the DAT would enter Record-Ready mode, indicating that it was seeing a digital bitstream via AES/EBU input, but would drop out of Record-Ready after a few seconds.) The IEC-958 input, on the other hand, proved 100% reliable. What was the problem? A broken AES/EBU input, perchance?

The answer was particularly illuminating. One of the DAWs in question, of which there are several hundred in daily use around the world, features a programmable digital I/O that can be set to accommodate one of a half-dozen digital formats. In the AES/EBU setting, it generated the correct data bitstream except for two important bits within the Channel Status. Instead of correctly setting the Sampling Rate flag (bits #6 and #7) to indicate a sampling frequency of 48, 44.1 or 32 kHz, the I/O card expects the receiving device to extract such information from the sync blocks that define the start of each subframe.

For early equipment, such an arrangement works reliably. However, this new DAT machine sets its internal timing clocks according to the data found in bits #6 and #7 of the Channel Status. At sampling rates of 48 kHz (bits 6/7 = 00), this scheme worked, because the DAW was tidy enough to set all undefined bits to zero. At 44.1 kHz, however (bits 6/7 = 10), the DAT failed to match sync and wouldn't enter Record mode. The outcome? The

workstation manufacturer responded positively with a firmware upgrade for the I/O port, which now causes it to generate the correct Channel Status flags for all sampling rates.

Also, application-specific implementation of a consumer-grade I/O can be a good thing. For example, several brands of DAT recorders use various undefined bits within the Channel Status area to carry Program Numbers (PNOs) across the interface, thereby allowing a true digital clone to be made of a DAT master. (It's unfortunate that Absolute Time values cannot also be carried across the I/O, but let's at least be grateful for small mercies!) Because the AES3-1985/199X Recommended Practice is non-hardware specific, no provision has been made to accommodate such applications.

With such possible confusion on the part of the user regarding incorrect implementation of the format, it has been suggested that some sort of regulatory body be set up to evaluate I/O ports and test them for compliance with the accepted professional-grade AES3-1985/199X Recommended Practice. Is this a role for the Audio Engineering Society, given that it has spent considerable time developing a well-documented implementation? One possible scenario might involve the licensing by the AES of its shield logo, which would be applied to hardware whose digital I/O has been tested and found to be in compliance with the appropriate recommended practice.

Robert Finger, chairman of the AES Working Group on Digital Audio Interfacing, disagrees with such an idea, with just cause. "Aside from the fact that we don't have the resources to measure all new equipment for compliance with the standard," he says, "I *don't* consider it an appropriate role for a technical society such as the AES to undertake. Such testing, if the industry decided it's necessary, should be done by a trade association whose members could donate funds to set up a suitable testing center."

As Finger points out, both the EIA and NAB are currently promoting a new set of design requirements for AM receivers. This new AMAX logo would accompany receivers manufactured to new technical specifications and signify to the consumer that they can expect improved AM and AM Stereo reception.

"But, in our industry, we may need to rely on the reviews in trade magazines to alert users of possible interface problems," Finger adds. "The majority of reviewers are very knowledgeable about such matters and could determine if the interfaces are, in fact, conforming to AES3-199X."

One possible adjunct to magazine reviews might be the setting up of an "AES3 Interface Manufacturers Association," much along the lines of the highly successful MIDI Manufacturers Association (MMA), which meets regularly to discuss practical implementation of the current MIDI specification and also develops new enhancements, such as the emergent Machine Control commands.

So, to summarize the current situation, my advice would be as follows:

1. Always use correctly implemented AES/EBU I/Os, preferably ones that *are* known to meet the new AES3-199X Recommended Practice.

2. Ask questions of the equipment manufacturer. For example, determine which Channel Status bits have been included. And if the I/O is marked "AES3-199X," what Level of Implementation has been offered?

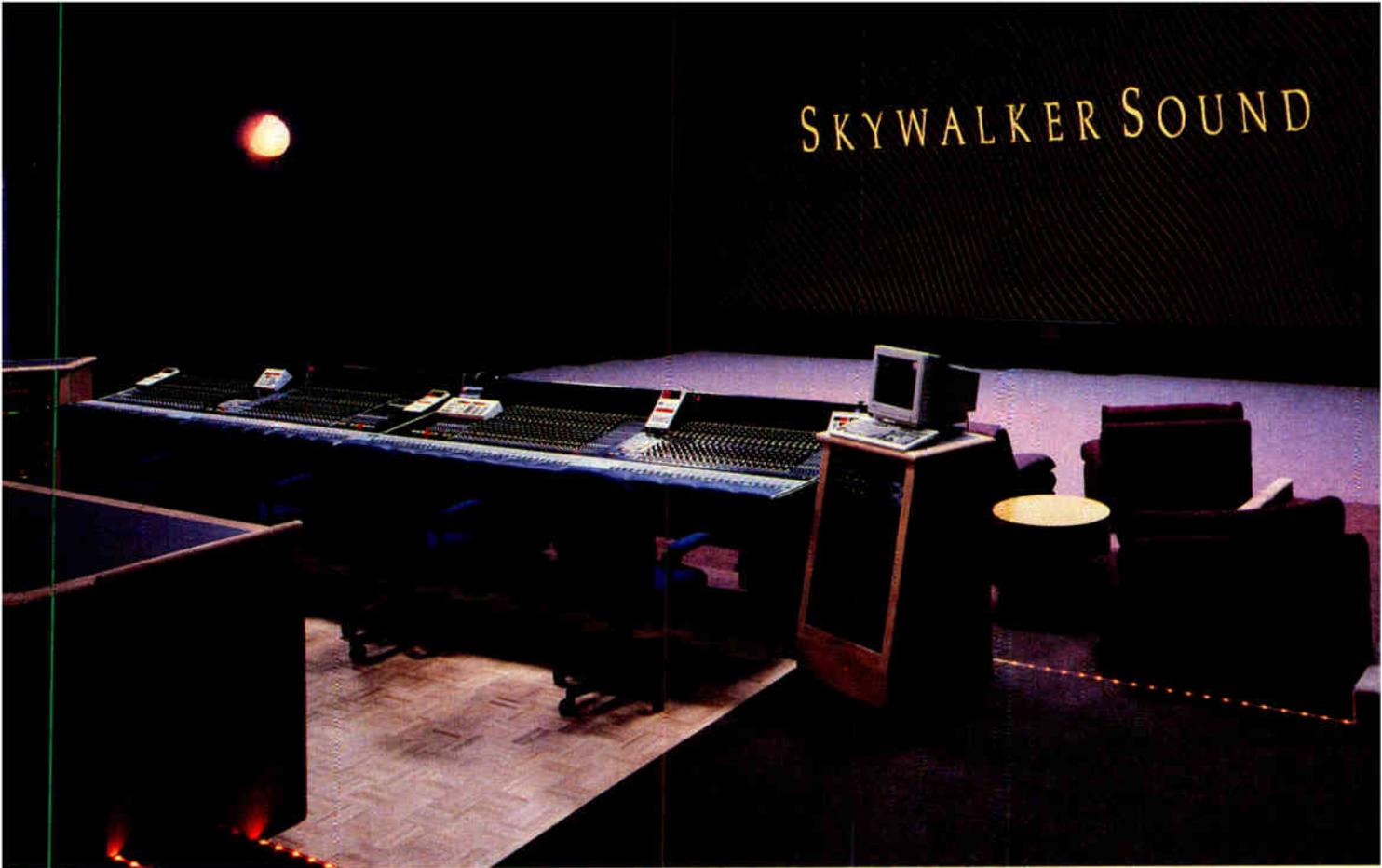
3. If you encounter a problem, first determine whether the manufacturer has really implemented *all* of the important Channel Status parameters, such as the sampling-frequency flags.

4. Having found at least one piece of equipment that works reliably in the majority of situations, until you have reason to update that belief, use the I/O as a "local standard" by which to assess others.

5. Don't assume that any particular manufacturer has an inside track on implementing reliable AES/EBU I/Os. Without access to test equipment that lets you analyze the timing accuracy of sync preambles, along with the 192-bit Channel Status blocks, it's virtually impossible to make any quantitative assessments about the interface.

In next month's "Juxtapositions," I'll have more inside information on digital interfacing and the thorny subject of digital synchronization. I'll also provide a few suggestions on implementing a reliable, system-wide digital I/O scheme. Stay tuned. ■

In a world of inevitable technical confusion, Mel Lambert sometimes feels that his role as a high-tech consulting and marketing guru might not be a bad way to make a living.



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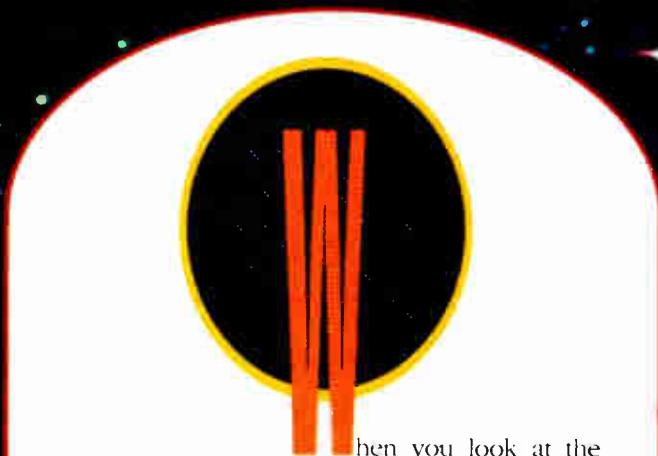


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When you look at the newest generation of professional multitrack recorders, one point becomes clear: The machines are better than ever. And it's not merely manufacturer hype. Microprocessor-controlled transports, improved analog and digital electronics, and refinements in LSI technology have significantly altered the current state of the art. Large-scale integration, for example, yields smaller recorders with fewer components, resulting in greater reliability, reduced power consumption and lower manufacturing costs. In fact, the latter has kept retail prices stable—and even dropping—despite

BY GEORGE PETERSEN



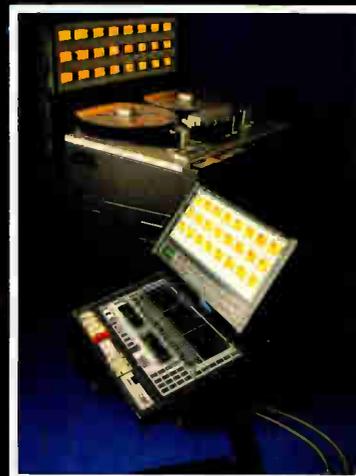
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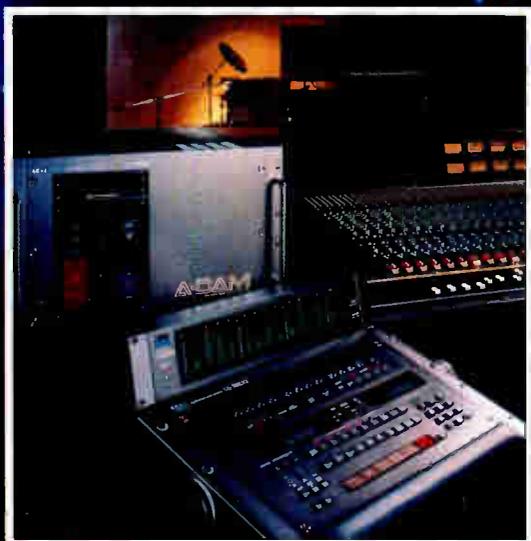
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the dollar's poor showing against foreign currencies.

Listed alphabetically, here are the latest offerings in the world of analog and digital tape recorders with 24 or more tracks—what's available, along with suggested retail pricing. Addresses are provided so you can contact the manufacturers directly for more information.

Akai

The Akai A-DAM is an expandable 12/24/36-track digital recording package offering up to 17 minutes of recording time on standard 8mm videocassettes. An optional modification increases A-DAM's running time to 21.5 minutes. For cueing or time code functions, an analog auxiliary track is provided.

The basic 12-track system comprises the DR1200 recorder, DL1200 programmable autolocator and DM1200 meter bridge (all rack-mountable). Since the autolocator can simultaneously control up to three DR1200 transports, users can upgrade the system to 24- or 36-track operation with the purchase of additional recorder/meter bridge units. The basic 12-track is \$25,000; a 24-track A-DAM is \$47,500 and a 36-track system is \$70,000.

A-DAM provides switchable 44.1/48kHz sampling rates and 16-bit linear

quantization. Features include +4dBm balanced XLR inputs/outputs, $\pm 6\%$ pitch change, selectable digital crossfade times for punch-ins/outs, auto punch-in/out capability, spot erase, and storage of up to 100 cue points and stack numbers. A proprietary digital terminal allows clone copying from one A-DAM unit to another in the digital domain and provides access for the optional Akai AES/EBU digital interface. Other options are a 7.5-meter cable for extending the locator-to-recorder separation; and the Klotz 12-channel interface (\$2,499) for transferring A-DAM tracks to/from Sony, Mitsubishi or Yamaha digital systems.

Akai Professional, 1316 East Lancaster, Fort Worth, TX 76102; (817) 336-5114.

Alesis

The Alesis' ADAT digital system, unveiled just a year ago, is a modular, expandable digital system based on rack-mount recording units, each having eight tracks and occupying three rackspaces. With the optional BRC remote controller (\$1,995), up to 16 ADATs can be slaved for 128 tracks. Each 8-track ADAT unit is priced at \$3,995. At suggested retail, a complete 24-track digital system (three ADATs and a BRC) costs under \$14,000; a 32-track system is under \$18,000, etc.

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ing on a standard S-VHS cassette, ADAT features 16-bit linear resolution, selectable sampling rates (42.7 to 50.85 kHz), variable pitch control (+8/-16%), balanced +4dBu connections (via a 56-pin Elco connector), unbalanced -10dBV 1/4-inch inputs/outputs, and optical digital I/O. With the BRC controller, ADAT supports both SMPTE and MIDI time code, and allows complex assembly editing and track bouncing within the digital domain. An AES/EBU-to-ADAT digital interface is optional.

Alesis Corporation, 3630 Holdrege Avenue, Los Angeles, CA 90016; (310) 467-8000.

Fostex

Offering 24 tracks on 1-inch analog tape and priced at \$14,999, the G-24S is the flagship of the Fostex line. The G-24S can operate in master or slave (chase-lock) modes, and sync operation controls are already built into the deck's detachable front panel, which can be located up to ten feet from the transport. With an optional SMPTE sync card, the deck's transport controls can also be externally controlled by a MIDI keyboard or sequencer, and a serial port is provided for connection to RS-232/422-equipped devices and PCs.

The G-24S operates at 15ips ($\pm 12\%$ pitch control is standard) and features a jog wheel with spot erase capability; phono jack inputs/outputs; Dolby S noise reduction; three metering modes; LED displays of real tape time and memory locations (used with a synchronizer, these show master and slave/offset times in units up to 1/64 frame); and easy access to the alignment trim pots. Autolocation functions include up to ten memory points, 1-9 second preroll and auto play/return modes, while the software-based design allows user access to internal functions (such as defining spooling speeds or resetting the timer to display remaining time). A rack-mount kit is optional.

Fostex Corporation of America, 15431 Blackburn Ave., Norwalk, CA 90650; (310) 921-1112.

Mitsubishi

The Mitsubishi X-880 ProDigi format 32-track recorder represents the company's third generation of digital multitracks and maintains complete tape compatibility with the earlier X-850 Series.

Recently, Mitsubishi unveiled an enhanced version of the X-880, the X-880EX, with features such as 18-bit A/D converters (now said to offer true 16-bit conversion and expanded dynamic range), 20-bit D/A converters, automatic calibration of converters, and a new clock providing 44.056kHz sampling (in addition to 44.1 and 48 kHz) for film and video post applications.

The extensive use of large-scale integrated circuits throughout the X-880 has dramatically decreased the unit's size and weight—50 pounds lighter than the X-850 models. Other improvements include a "remoteable" meter bridge and a pull-down front panel that conceals power on/off, emphasis select, ping pong (digital track bouncing) and system status controls.

The X-880EX is priced at \$150,000, and units in North America include Apogee 944 digital filter modules as standard equipment. Options include the CS-1 plug-in chase synchronizer (providing sync resolution of ± 20 microseconds for phase-coherent, 64-channel recording or intermachine editing), an analog remote interface for controlling the X-880 from SSL consoles, and an AES/EBU digital interface unit.

Last summer, Mitsubishi announced the development of a double-density machine, recording 64 tracks on 1-inch tape. Both Mitsubishi and fellow PD-proponent Otari have agreed on the standard, which has been submitted to the IEC working group in Tokyo, although at press time, no delivery schedules were available.

Distributed in the U.S. by Siemens Audio Inc., 7 Parklawn Drive, Berkshire Industrial Park, Bethel, CT 06801; (203) 744-6230.

Otari

Another ally in the ProDigi camp is the DTR-900 II, Otari's third-generation digital 32-track. The DTR-900 II offers expanded use of VLSIs for greater reliability and less power consumption, and improved ± 15 -volt power supplies to accommodate optional Apogee lowpass filters in the A/D and D/A sections.

Among the DTR-900 II's standard features are switchable 44.1/48kHz sampling rates, $\pm 10\%$ varispeed, parallel and serial control ports, built-in SMPTE time code reader/generator, digital overdubbing and ping-pong capabilities, one-hour recording time (with 14-inch reel), the ability to simultaneously record from digital and analog inputs, and a transport that resolves to any common time base reference such as composite video or line frequency.

Options include a plug-in chase synchronizer module (EC-104) that simplifies locking the DTR-900 II as a

slave to a master time code source, and a CB-503 PID-to-DASH-to-PD format converter enabling bidirectional transfers between the DTR-900 II and any DASH multitrack recorder—entirely in the digital domain. The DTR-900 II is priced at \$150,000; a dual-transport system with 64-track autolocator is \$300,000.

Otari's MTR-100A (\$59,950) is a high-performance, 2-inch analog 24-track offering fully automatic record and reproduce alignment capability in less than four minutes. The MTR-100A uses a gentle, pinch-rollerless tape transport operating at speeds of 7.5/15/30 ips ($\pm 50\%$ varispeed) with a maximum reel capacity of 14 inches. Four nonvolatile memory locations per tape speed are provided (12 total), storing alignment data for different tape types. A cue shuttle wheel allows jog and shuttle mode operations and the selection of library pack or fast winds, with speeds up to 474 ips. The transport even permits phase-locked

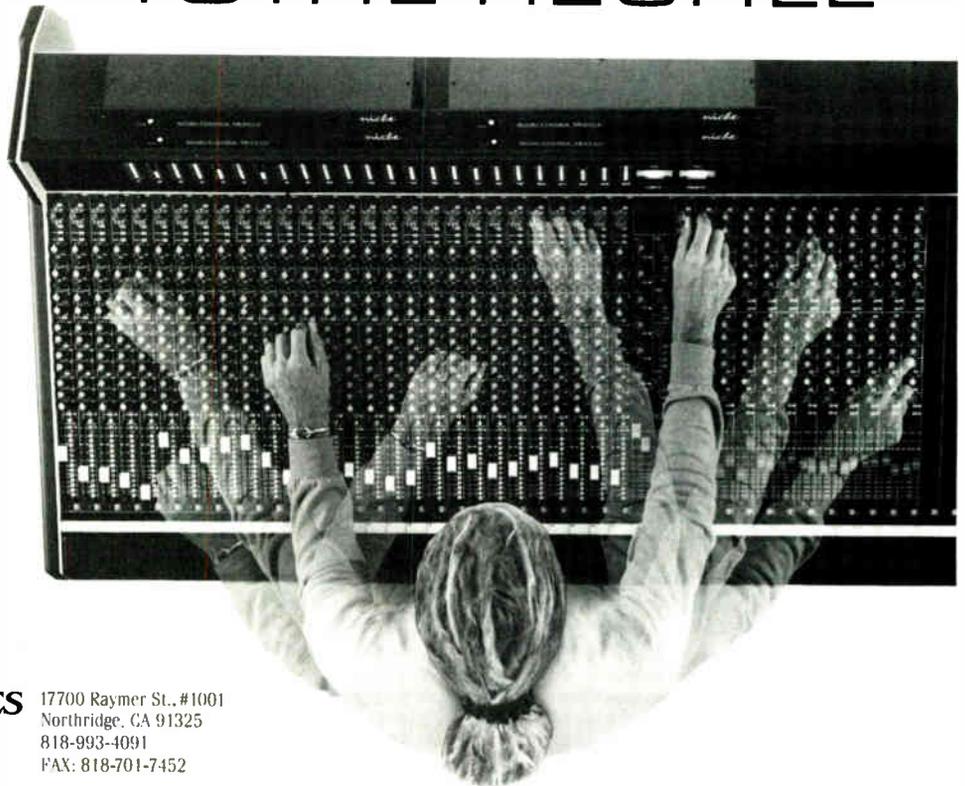
reverse play, as well as reverse recording/erase operations.

MTR-100A features include internal Dolby HX™ circuitry; automatic tape end detector for end-of-reel slowdown; tiltable VU meter panel for better visibility and improved service access; active, balanced XLR-type inputs/outputs; and room inside the machine for an optional Dolby SR card cage. A full-function remote session controller is standard and provides seven non-volatile cue memories and two speed-search functions. The controller can be placed up to 100 feet from the recorder. Among the available options are the EC-103 chase-lock synchronizer, an SSL console interface and the CB-120 autolocator (with up to 99 memories, tach or time code operation, and automated rehearse and punch-in/out capability).

Over the years, the MTR-90 has been the mainstay of Otari's analog multitrack line, and has seen constant upgrades since its introduction. The

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current model, the MTR-90 Series III, is available in 2-inch, 16-track (priced at \$39,350 and prewired for 24-track) and 24-track (\$42,950) versions. Two speeds (15 and 30 ips) are selectable, although a simple mod allows operation at 7.5 ips. The MTR-90 Series III offers 14-inch reel capacity; bidirectional shuttle operation; $\pm 20\%$ varispeed; transformerless, balanced inputs/outputs; full-function session remote controller; and end-of-reel sensing. Options include an accessory PCB for phase-locked reverse play, plug-in chase synchronizer (EC-101), CB-115 ten-memory locator, and the 99-memory

CB-120 autolocator.

The MX-80 is Otari's most affordable analog 24-track, priced at \$31,950. The transport handles 10.5-inch reels at speeds of 7.5, 15 or 30 ips, with $\pm 50\%$ varispeed. Inputs and outputs are transformerless, balanced XLR-type and switchable for operation at -10dBv or +4dBm levels (outputs can be jumpered for unbalanced use). Like the MTR-90 Series II and MX-70, the MX-80 includes a microprocessor-controlled, constant-tension transport, full-function remote session controller, and external control ports for interfacing to

SMPTE-based editors, synchronizers or controllers. Other features include Dolby HX-Pro™ bias-optimization circuitry, phase-locked reverse play and mini-autolocators on the machine and remote, with seven memory locations. The CB-119 (eight memory) and CB-120 (99 memory) locators are optional, as is an SSL control interface.

Otari Corporation, 378 Vintage Park Drive, Foster City, CA 94404; (415) 341-5900.

Saturn

Formerly available only in Europe, London's Saturn Research Ltd. has launched "Saturn Direct," offering its analog 2-inch, 24-track machines directly to U.S. customers at factory prices. The Saturn 824 is an advanced design, sporting a fast, microprocessor-controlled transport with spooling rates of up to 600 ips. Other features are 14-inch reel capacity, 7.5/15/30-ips tape speeds, balanced XLR and Elco multipin inputs/outputs, $\pm 50\%$ varispeed and auto alignment of all 24 tracks in eight minutes. The 824's remote controller provides three "soft" keys capable of storing frequently used routines of up to 32 keystrokes, storage of alignment data for four tape types, ten locator memories and full 24-track metering (a second set of meters are also on the deck itself). The 824 has a U.S. list price of \$45,000; the Saturn Direct price is \$33,000.

Designed for applications where budget considerations do not allow for an auto-alignment machine is the Saturn 624, a low-cost recorder with a factory-direct price of \$26,000. Other than the auto-alignment capability, the 624 shares many of the 824's features, such as 14-inch reel capacity and $\pm 50\%$ varispeed. The 624 includes a basic remote controller with RTZ, cue and cue cycle functions. A full-function autolocator is optional.

Saturn, distributed by Promusica Sales, 800 Park Avenue #109, Keene, NH 03431; (800) 553-2819.

Sony

Since introducing the PCM-3348 48-track digital recorder at the 1988 AES Convention in Los Angeles, Sony has delivered approximately 300 of the \$240,000 machines worldwide, with over 70 recorders in North America alone.

The recorder uses the double-density DASH format. Thus, basic tracks can be recorded on any standard 24-

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track DASH deck, and production can continue by using the (upwardly and downwardly) compatible PCM-3348, providing 24 extra tracks for overdubbing and mixing. Other features include a total recording time of up to 69 minutes, two-times oversampling, digital FIR-type filters and a power consumption of only 1,200 watts.

At the 1991 AES in New York, Sony unveiled a series of enhancements for the PCM-3348. New features include a multiple ping-pong mode for bouncing up to 48 tracks simultaneously; time code chase synchronization; 47.952kHz sampling frequency for film/video applications; and expanded sampling memory: 20 seconds of full resolution, 16-bit stereo audio (or 40 seconds in mono), with triggering manually or from external source and reverse sample playback. Implemented in all current production models, the upgrades are available on a series of cards retrofittable into earlier PCM-3348 machines.

Sony's 24-track DASH-format PCM-3324A recorder shares many of the performance upgrades of the PCM-3348, such as two-times oversampled digital input/output converters, linear-phase digital filters and low power consumption. The PCM-3324A offers comprehensive autolocate and auto punch in/out capabilities, one-hour recording time on 14-inch reels, $\pm 12\%$ varispeed and selectable 44.1/48kHz sampling frequencies. Price is \$120,000, including remote controller and stand.

The U.S.-made APR-24 is the first analog multitrack to be designed by Sony from the bottom up. Borrowing the audio cards, microprocessor control and alignment system from Sony's APR-5000 Series of mastering decks, the 24-track APR-24 improves on the technology with a few tricks such as alignment-preset storage and an internal SMPTE synchronizer for 48-track recording or locking to picture. Basically, the APR-24 is a 2-inch, 15/30-ips machine with $\pm 50\%$ varispeed, displayed in percent, ips or semitones. Other features include transformerless, balanced inputs/outputs on Tuchel multipin connectors; XLR time code input/output, external parallel synchronizer port; 14-inch reel capacity; tape spooling at up to 475 ips; storage of three alternative alignments per tape speed; and bi-color LED bar graph meters, with a "zoom" mode for 0.25dB resolution.

Included in the APR-24's list price of

\$39,900 is a full-function remote that duplicates the APR-24's transport controls, including the shuttle/jog wheel. Among its other features are selectable time code or tape timer displays, memory for up to 25 location points, rehearse functions, and five-edit registers for storing record-ready presets, pre/post-roll times, or any "snapshot" of the machine's operational status.

Sony Pro Audio, Sony Drive, Park Ridge, NJ 07656; (201) 930-1000.

Studer

No newcomer to the digital multitrack arena, Studer unveiled its first digital 8-

track design a decade ago, at the 71st AES Convention in March 1982. The D820-48, Studer's 48-track digital recorder is fully compatible with all 24- and 48-track DASH-format machines. Features include low-noise A/D converters with passive filtering, four-times oversampled D/A converters and 40 seconds of RAM-based internal sound memory, which can be used for track slipping and digital ping-pong manipulations. Also standard is an internal time code reader/generator; AES/EBU and SDIF-multi digital ports; onboard DSP processing for crossfading

— CONTINUED ON PAGE 91

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WHAT DOES IT MEAN TO THE PRO AUDIO INDUSTRY?

THE NEW EUROPE ALIGNMENT

by Paul Tingen

W

e Europeans sometimes wonder if Europe 1992 is as much of a catchphrase over in America as it is with us. Over here, the media and public seem to conspire in the impression that on January 1, 1992, something magical is going to happen. Europe will become some kind of United States of Europe, having one economic space just like its American counterpart.

On reading the European newspapers or watching the TV news, one sees lots of headlines on federalism, single currency and sovereignty, but little about what's going on right now on a practical level. That's odd. One prerequisite of a common economic space is a great number of pan-European regulations, so that any goods traded freely across Europe comply with legal requirements everywhere—whether it's safety regulations, environmental laws or technical standards.

To streamline all that is clearly a mammoth task, and some people should be up in arms about it. But few, if any, are. One immediate reason is that everything is *not* going to change on January 1, 1992. That's a widespread misunderstanding. The target date for a common European space and the implementation of all the necessary regulations and deregulations is January 1, 1993. 1992 is the deadline year during which all regulations will have to be introduced, and the cutoff date is the first day of next year.

The second reason is that although some important regulations are due to be implemented during 1992, the vast majority are already in place. Much of "1992" has already happened. No magic moment is coming; actually, it's much more of a gradual process. The fact that many Europeans appear unaware of these rather crucial facts illustrates that there's still a lot of confusion as to what exactly is going on. And if Europeans don't know, how are exporters into the European market supposed to cope? And to what extent will they have to redesign, repackage, remarket or redistribute

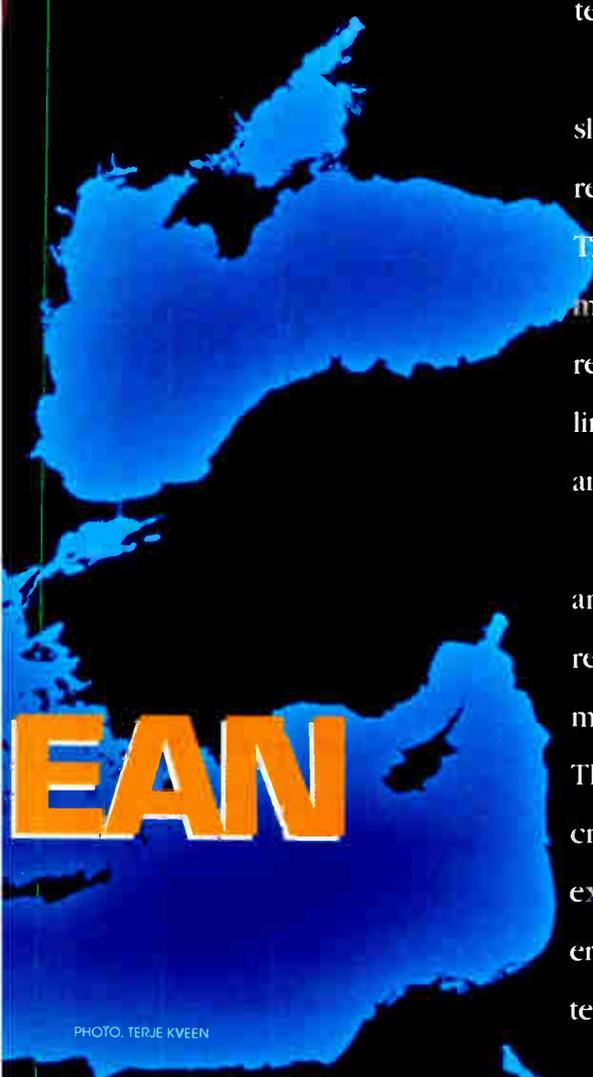


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their products? What kind of competition can they expect? What's this whole EC thing about anyway?

Bureaucrats

To understand more about the main sticking points of the single market, for EC members as well as for countries who export to the EC, it's useful to give a brief outline of the EC structure and its policy-making bodies. To many people, the EC is a jungle, typified by what skeptics call "the bureaucrats in Brussels," who draw up all sorts of rules and proposals, which in some cases are very sensible, in others very

out the EC; decisions are binding to whom they concern; directives leave the methods of implementation to the individual member states. The legislation for 1992 was set in motion by an agreement reached by EC member states in 1985 to remove all barriers of trade between members, making trade between Paris and London as easy as between, say, Boston and Chicago.

It's a complicated business. The number of directives, regulations, decisions and recommendations leading to a single marketplace is 282, 201 of which had been adopted by late 1991. Together, they effectively regulate the



Studio Spotlight: Silk Sound

Studio 4 at London's Silk Sound is one of four rooms equipped with an automated Lexicon Opus digital console and recorder. Established in 1979 by engineer Robbie Weston, actor David Tate and broadcaster Tommy Vance, Silk Sound's original room was designed as an 8-track radio studio. By 1983, the facility had expanded to four rooms with the opening of Studio 4, which was built for video editing and sound-to-picture work. The latest upgrade of all four rooms to the all-digital domain was completed in the spring of 1991.

silly indeed. (One of the latter sort states that unless a product is made in a certain place, it cannot be named after that place. Exit frankfurter sausages produced in the UK, or the many cheddar cheeses produced outside Cheddar.)

The group of "Brussels bureaucrats" who matter most to the pro audio industry is the European Commission, which proposes Community policy and legislation, ensures that EC member states comply with the rules and executes decisions from the Council of Ministers on a day-to-day basis. The Council of Ministers is the formal decision-making body of the EC, consisting of one minister from each member country. All countries send ministers or officials, depending on the subject debated; most decisions are taken by majority vote, some by unanimous vote.

The Council and European Commission issue four types of legislation: regulations, directives, decisions and recommendations (or opinions). Regulations are directly binding through-

removal of physical barriers affecting goods and individuals, the removal of fiscal barriers, and the removal of technical barriers between EC states.

The Compatibility Directive

If this sounds like a bureaucrat's Disneyland but a common citizen's nightmare to you, you're not alone. Philip Vaughan, chief executive of the Association of Professional Recording Services (APRS), the trade organization of the British pro audio industry, likes the "bureaucrats of Brussels" phrase. In his case, it's in relation to one particular directive that is causing the European pro audio industry problems and will have far-reaching effects for U.S. and Japanese manufacturers too: It's a technical directive concerning electromagnetic compatibility and interference (EMC, directive nr. 89/336).

Vaughan says, "The European Commission came up with some bright ideas about European standards to prevent the electromagnetic interference that can occur, for example, when you operate a hair dryer next to

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INTERNATIONAL UPDATE

SAE Expands

With the recent opening of three new colleges, the School of Audio Engineering, based in London, now numbers 15 colleges worldwide. The recent additions include SAE Singapore, one of the first audio-training schools in East Asia, SAE Frankfurt, the new center for coordination of the German-speaking colleges, and SAE Glasgow, opened in cooperation with the Warehouse record label.

SAE offers three principal courses: Audio Engineering Diploma, a one-year course that prepares students for entry-level positions in the audio industry; Production Course, a three-month program designed as a natural progression to the Diploma course; and the Tonemeister Program, an advanced training course with limited enrollment.

For further information about SAE, contact Sharon Quinn or Tom Misner at the London School: (011) 44-71-609-2653, fax: (011) 44-71-609-6944.

Euphonia Debuts as the "One-Stop" Classical Specialist

Conceived of as the ultimate classical recording one-stop, London-based Euphonia offers European record companies production and post-production engineering ex-

perience, as well as a broad range of supporting administrative services. The new venture is based at Trinity Mews, the West London complex that houses CD-mastering specialists Chop 'Em Out and tape duplicator Sound Cellar.

The Euphonia facilities include two Sonic Solutions suites, three rooms equipped with Sony CD mastering and editing systems, and an A/D transfer suite. An equally important part of the operation is the pair of brand-new location mobiles equipped with a choice of digital recording equipment and customized DDA consoles.

Former freelance music editor and producer Mark Edwards and Iestyn Rees, who was recently an in-house engineer at Meridian Records, are Euphonia's principal recording engineers. Nick Morgan assumes the role of projects coordinator.

UK Notes

Mayfair Recording Studios is opening a new facility featuring two SSL rooms with 48- and 32-channel consoles and a host of pre- and post-production facilities, including a cutting room and video editing suite. The new complex, dubbed *Mayfair Village*, is situated only 200 yards from Mayfair's residential facilities on Sharpleshall Street in London...Another major London residential facility, *Parkgate Stu-*

a TV set. The Commission decided on a general approach to this problem by imposing standard limits of electromagnetic emissions that no piece of electrical equipment is allowed to violate. This was supposed to be implemented by January 1992, but this is simply impossible. It means the redesigning and re-engineering of an awful lot of electrically based products. So the proposal at the moment is to try to postpone the whole directive by a few years."

Sam White is an independent audio, acoustics and electronics consultant who works mainly in the field of live sound. An American who's lived in Britain for 20 years, he's more positive about the whole EMC issue, but agrees that more time and different standards are needed. "The team that made the

specifications were working in a completely different field," he says, "and they didn't realize what the implications of their standards would be for the pro audio industry. For example, on low-level inputs like mic inputs or guitar inputs in guitar amps, standards for picking up airborne or cableborne radiation are simply impossible to meet. Also, many power amp manufacturers would have to redesign their products."

For White, the solution is for the pro audio industry and its organizations to make sure that they have representatives in standards-making committees. "Dealing with European legislation takes time and money," he says, "but I'm sure that it will lead to more consistent products and also to more compatibility. It will be easier to stack



diols, recently installed a Neve VR60 console with Recall and Flying Fader automation. The studio expects to attract clients to mix as well as track their album projects there...London's CTS Studios invested in a Neve VRP, a 60-channel board with Recall and Flying Fader automation. The new console has been customized to match the VRP60 installed at Lansdowne (CTS' sister studio), so that projects can be shared between the facilities...The BBC Radio Maida Vale facility underwent a refurbishment recently. The centerpiece of the new Control Room 4 is a 56-input Solid State Logic 4000 G Series console. Design consultants Harris, Grant & Associates oversaw the work, which also included specification and installation of RPG Diffusor systems... Amazon Studios, based for more than 15 years on the outskirts of Liverpool, relocated into the city center. The new complex features two large recording spaces, each with its own control room. Studio 1 is fitted with an SSL 4064E (G Computer), while a Neve V3 is installed in Studio 2. The building also offers 12 hotel-style accommodations... The SoHo-based Lexington Post ordered a Lightworks Random Access Editing System for use in broadcast and corporate film work, as well as posting commercials.

European Bits & Pieces

The Finnish Broadcasting Company

(YLE) purchased three Digital Audio Research DASS 100 units for its TV1 (Helsinki) and TV2 (Tampere) post-production facilities. YLE employs the DASS 100's sampling-rate conversion functions during digital audio transfers, converting mostly 44.1 kHz from digital multitracks, DAT machines and CD players to its 48kHz internal standard...Elsewhere in Scandinavia, the Norwegian Broadcasting Corporation (NRK) purchased two DAR SIGMA systems—in 8-channel and 16-channel configurations—for installation in its radio production department at the Oslo headquarters. The systems will be used for radio drama post-production...In other broadcasting news, the national Spanish television company, Television Española, ordered eight television OB vans equipped with Studer 990 consoles in preparation for the 1992 summer Olympics in Barcelona... Dutch-based Eurosound Mobile 3 installed a Raindirk Symphony 36-/32-channel desk following a "burn-in" test during the Luciano Pavarotti concert, which was transmitted worldwide from London's Hyde Park. The console is incorporated into the firm's Mobile 1 unit, which is used mainly for recording classical music...West Deutsche Rundfunk (WDR) selected the DynaudioAcoustics M1 near-field monitor as the main reference for its big band studio in Cologne. ■

equipment in racks without interference; audio products coming from one studio will be more compatible with those coming from another studio; products will become safer. But it will cost.

"So far, the pro audio industry has basically ignored standards," he continues. "Standards were for people who were manufacturing mass products for the domestic market. Now they'll have to shape up. The same goes for the Americans. My impression of the industry in the U.S. is that they've sometimes been a bit careless, which is why British mixer manufacturers have done so well in the States. So the Americans will really have to check on these things, too, especially power amp manufacturers."

EMC regulations appear likely to be

respecified for the pro audio industry and delayed by at least a year, if not more. It's the only directive which is currently giving the European pro audio industry a headache. With the relevant industry organizations—especially those from Britain—now suitably alarmed, it's unlikely that there will be another major area of potential catastrophe. Nevertheless, it's of paramount importance for American companies to learn of enforced or proposed EC directives and regulations as soon as possible. Two possibilities are to call the EC hotline in London at (011) 44-81-200-1992 and ask any question, but specifically ask for the booklet on EC directives, or ring (011) 44-71-215-6336 and ask for the White Paper Checklist, which lists all directive proposals and what stage the UK is at with their

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implementation.

Substantive or Psychological?

While all this has something to do with the "removal of technical barriers," it may sound more like the implementation of them, but that's Europe '92 for you. What about the removal of trade barriers? What are the effects of 1992 on trade within the EC and trade between EC countries and non-EC countries? Will the world's biggest market concentrate more on itself and leave less room for the U.S. and Japan? In the 20 years that Britain has been part of the EC, its exports to EC countries went up from 34% to 50% of total UK exports, and its imports from EC countries went from 35% to 53%. Is this a trend that will continue?

A canvass of opinions around sev-

SSL UK, agrees: "The UK market isn't sizable enough to support a company like SSL. We have offices in Milan and Paris and have always looked at the international market, whether EC or worldwide. Also, we're dealing with a very finite and well-informed client base, so I think it's unlikely that somebody will suddenly discover SSL after 1992 just because some regulations have changed. We welcome the reduction of paperwork, and any import levies that will be saved will benefit clients. But frankly, we don't expect things to change very much. Perhaps there's a psychological difference for some companies after 1992, but things have always depended on the skills of individual manufacturers, and that's not going to change."

Frank Massam, sales and marketing

EC Facts

The European Community is a group of 12 countries: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain and the United Kingdom. Six of these countries signed the Treaty of Rome in 1957, which laid the foundations of the EC. Over time, they were joined by the other six, and today there are various applications for membership. Lichtenstein, Sweden, Norway, Finland, Iceland, Austria and Switzerland are united in EFTA, a kind of EC waiting room, in which they have recently committed themselves to adopt most EC regulations by January 1, 1993, the same date set for the completion of the single market.

From the outset, the aim of the EC was to ease trade between member countries and create a single market. The former British prime minister Edward Heath, who led his country into the EC in the early '70s, has called the EC "one of the 20th century's greatest success stories." With the EC now being one of the most prosperous areas and the biggest single market space in the world, and with almost all non-member European countries showing interest in membership, he might have a point.

—Paul Tingen

eral European pro audio manufacturers and some distributors results in a consistent and extremely uneventful picture. They all welcome the single market wholeheartedly, but for them 1992 almost seems to be a non-event, simply more of the same. For most pro audio products, import tax has been abandoned for years. So, less paperwork? Wonderful, but it wasn't too bad anyway. Streamlining of taxes? Great, but was there a big problem?

Vaughan emphasizes that the pro audio industry has always been very international, so British companies are not likely to suddenly discover that Italy had some recording studios after all, and vice versa. "No UK pro audio manufacturer has survived on an exclusively UK market for at least the last 30 years," he remarks.

Colin Pringle, marketing director of

manager of AMS, has a similar story: "We're not taking any special steps and don't see any major impact coming from 1992. Everything will become cheaper for everybody in Europe, which is great, but companies like ours, which work in the premium price market, are least likely to be affected."

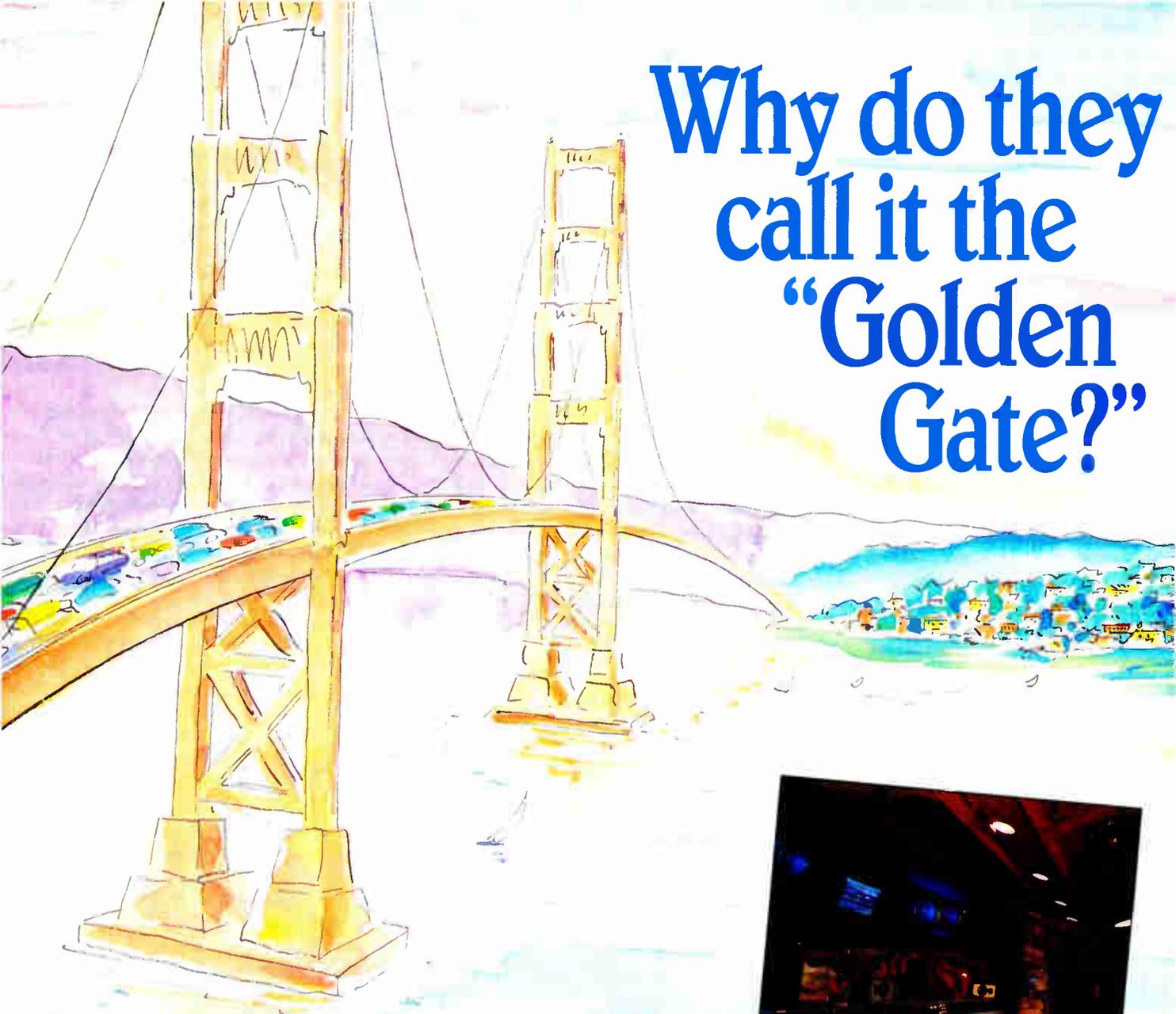
It's a similar story elsewhere. Phil Beaumont of TC Electronic UK asserts that Europe '92 will help them open up business even more, but he's been thinking along these lines for years: "TC Electronic has stabilized its prices across Europe for a while, adapting for a single market. I noticed that some Japanese companies have done the same."

Aggressive

So is nothing going to change radically?

—CONTINUED ON PAGE 77

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WISSELOORD STUDIOS

Located in the small Dutch town of Hilversum, about 30 minutes outside of Amsterdam, Wisseloord Studios manages to allure musicians from not only most of its neighboring European countries, but also from as far away as Poland, Africa, Mexico, the United States and Japan. Over the past ten years, Wisseloord has evolved from a relatively little-known in-house studio into a globally oriented operation that not only attracts foreign artists, but is *dependent* on them. According to

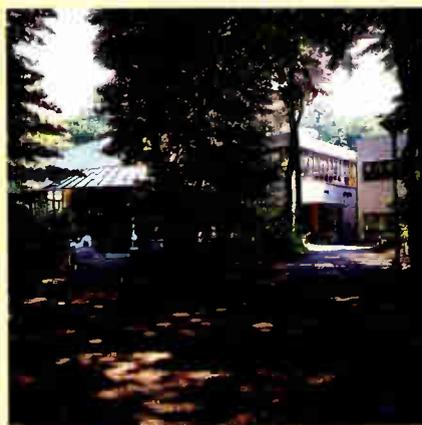
Mick Jagger and Tina Turner?

The story begins back in the mid-70s, when the record business was booming and Phonogram Records was outgrowing its office and studio space in The Netherlands. According to Baars, when the decision was made to build new facilities, Phonogram's parent company, PolyGram, decided to build "a 'parade horse,' to show its international artists that they had the best studio in the world." To help design the new complex, they brought in Tom Hidley, his associate Jeff Cooper, and a Dutch architectural firm. The result is an impressive yet unpretentious structure, with three main studios situated side-by-side along a two-story, sunlit corridor that resembles a quiet city lane, complete with trees, street lamps, post box and bus stop.

Each studio has an almost identically sized control room, equipped with an SSL console, Quested 215 monitors, two Studer 24-track machines (A800s in Studio 1 and 2, A820s in Studio 3), Adams-Smith synchronizer, Sony F1, PCM-1630 and DAT recorders, and the usual array of outboard gear. The Wisseloord complex also houses a post-production facility, MIDI/pre-production room, digital editing suite and an office of the British equipment rental firm, Hilton Sound, through which Wisseloord provides clients with any gear they don't have in-house.

When the studios were completed in 1978, the initial focus was mainly on the relatively small Dutch market, where a record selling 25,000 copies was considered a hit. At that time, only artists on the various PolyGram-affiliated labels, like Phonogram, Polydor and Decca, had access to the facilities. Within a few years, however, the bottom had fallen out of the Dutch music market, and Phonogram Holland began to cut costs by closing its studios, one by one.


**FROM
IN-HOUSE
TO
INTERNATIONAL**



deputy manager Bert Baars, "If we would depend only on Dutch clients, Wisseloord would not exist in its present form." How did Wisseloord transform itself into an international enterprise, with a client list that includes names like David Bowie, Paul McCartney, The Police, Elton John, Def Leppard,

BY JOHN MICHAEL WEAVER

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clients. The studio replaced its custom-built PolyGram consoles with SSL consoles "because everybody is used to working on them," Korff says. Studio 1 now contains a Model 4056, Studio 2 a 4048 and Studio 3 a 4072 G.

From an equipment and maintenance perspective, Wisseloord's goal continues to be to meet or exceed industry norms around the world. Producer Robert John "Mutt" Lange, who worked at Wisseloord with Def Leppard on their *Hysteria* album, says, "They have very, very good studios—as good as anywhere. It's nice to be somewhere outside England and America and find a studio that has everything you need."

"Running a studio is like being in the fashion world," Baars says. "There are all kinds of trendy things happening. You have to be very aware of these; you have to listen to a lot of records, and you have to have an open eye for new developments." Wisseloord also has shown that it is not afraid to take the lead in implementing new technological advances. According to Baars, Wisseloord was the first studio on the continent to purchase digital multitrack recorders in the early 1980s. Currently, they own a Sony PCM-3324, Mitsubishi X-850 and Sony PCM-3348.

After Wisseloord made the necessary organizational and technical adjustments, they still needed a strategy for attracting foreign clients. Neither Sloothaak nor Baars believes that you can advertise a studio effectively by conventional means. "The informal acquisition," says Sloothaak, "is, for me, the one and only way." He explains that his method of getting people to come to Wisseloord is by *going to them*. Thus, he spends a great deal of time traveling abroad, "trying to catch the client on a purely informal basis."

As an example, he describes how Mick Jagger came to record at Wisseloord after a chance encounter in England. Sloothaak had been invited by Elton John to one of Elton's concerts in London. After the show, he was introduced to Jagger. "I didn't do the work," Sloothaak says. "Elton said, 'Hey Mick, this is Bart Sloothaak. He has a studio in Holland. You should try it.' He would never do that if I was not there."

Considering the time, hassle and expense of traveling, what motivates Wisseloord's clients to transport themselves, in some cases thousands of miles, to work in a foreign country? Sloothaak cites *creativity* as a prime

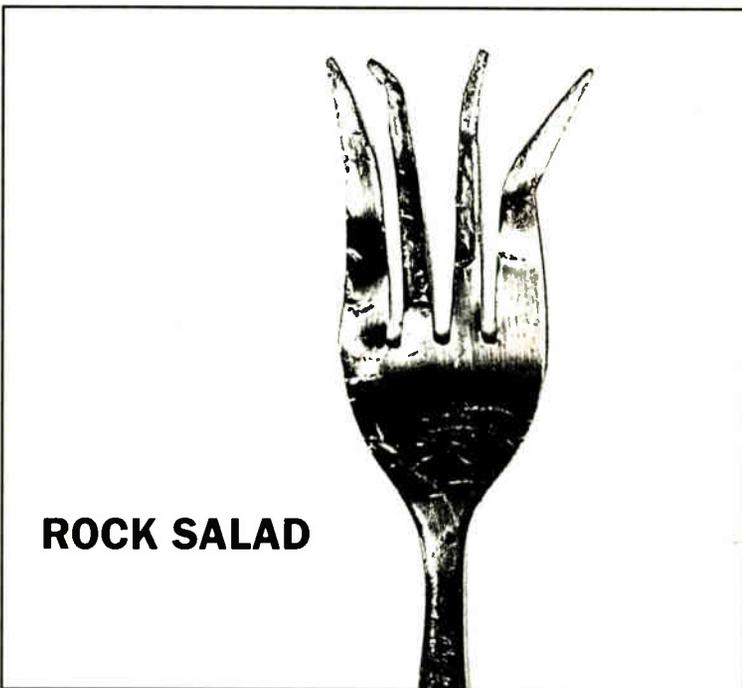
motivation for artists to go abroad to record. He suggests that if "you want to have a different feel, [find] another approach, go to another country."

One specific advantage of going to Holland, according to Baars, is that an artist can not only escape familiar surroundings, but also familiar hassles. "Mick Jagger could go into a disco in Hilversum and have a beer and relax for a few hours, and nobody would bother him," he says. "No one would even ask for his autograph, because nobody would believe that he would come here. All they would say is, 'My God, that guy looks like Jagger!'" For

similar reasons, when The Police were recording at Wisseloord and the studio rented bicycles for them, they were able to travel back and forth from their hotel to the studio by bike, unaccosted.

Another big plus for foreigners visiting Wisseloord is that because most people in Holland are multilingual, "We have never had any 'language barrier' in here," says Baars. "The reason, of course, is that Holland, being a fly speck on a map, has always been obliged, whenever we would like to trade, to speak another language—not Dutch, because nobody would understand you. The funny thing is, though,

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The attitude of the people at Wisseloord seems to be that if clients are willing to come to Holland to record, they are going to do everything possible to make it a comfortable stay. And no problem is too big, no detail too small for them to handle. For example, Lange says, "I had a car crash when I was there, and the tendons of my leg were actually severed. I couldn't walk at all and was in a really bad way. They completely took over *everything*—the insurance, the hospital—I didn't have to bother about a thing. It was exceptional."

On the other end of the spectrum, knowing that producer Gary Lyons is partial to herring, the staff always makes sure that this Dutch "delicacy" is near at hand whenever he's in the studio. Likewise, when they heard that Elton John was very fond of a special kind of cookie available only at Harrod's in London, Wisseloord had tins of them flown in. "When people from Taiwan were here," says Baars, "they expected to find a kind of tea that they drink in Taiwan. No problem. We were able to find their tea [here in Holland]."

At first glance, such "amenities" may seem to have little to do with operating a facility whose principle business is renting studio time. But, in the highly competitive international market, where everyone with adequate funding has access to more-or-less the same technology, the working atmosphere and the quality and range of services provided may be among the more significant factors distinguishing one top-flight studio from another. "When you look at the other studios in the world," Baars says, "you see that all the equipment is almost the same. We had to find something that made Wisseloord special. We went for service." ■

John Michael Weaver teaches sound design and recording at Loyola Marymount University in Los Angeles. He thanks Megan Weaver (no relation) for her assistance with this article.

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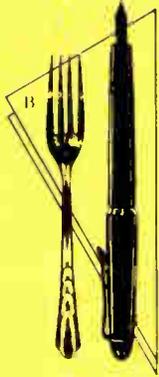
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MEGAS STUDIO

by Mr. Bonzai

GAETANO RIA

SOUND ITALIAN STYLE



Once upon a time (1963), Gaetano Ria was a 19-year-old assistant engineer at RCA's studios in Rome. He was asked to go solo on a small Sunday session, and within a month, "*I Watussi*" had sold a million-and-a-half copies. An engineer was born.

At last count, Ria's work has generated sales of more than a million records. He's the first choice among Italy's reigning stars who typically rack up platinum. And he's recorded hit Italian versions for artists such as Paul Anka, Stevie Wonder, Jose Feliciano, Neil Sedaka, The Supremes and the Four Tops. His volumes of film work include Ennio Morricone's score for *Sacco and Vanzetti* (with the title track performed by Joan Baez) and Henry Mancini's music for *The Sunflower*. Ria has done his part in

raising the audio consciousness of television viewers with live shows like the *San Remo Festival*, seen and heard by an incredible 3 billion folks around the globe.

In 1990, Ria gave up his freelance career to collaborate as chief engineer in the creation of Capri Digital Studios, a lavish resort facility aimed at the top of the superstar market. We met at the studio, which was built into the shell of a hillside hotel overlooking the legendary Isle of Capri and the deep blue



PHOTO: MR. BONZAI

PHOTO: MR. BONZAI



waters of the Bay of Naples. The first superstar to settle on Capri was the Emperor Tiberius, who ruled the Roman Empire from his pleasure palace for ten years in the first century. Since then, the island of the sirens from the tales of brave

Top: Gaetano Ria, chief engineer, Capri Digital Studios. Bottom: (L to R) Max Carola, programmer/MIDI specialist; Robert Russo, main tech.; Carloquinto Talamona, owner; and Jon Mansey, tech manager.

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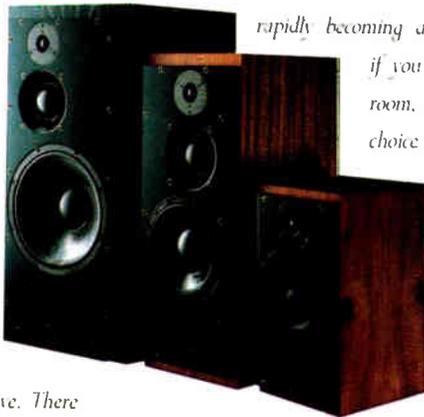
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ATC loudspeakers can be auditioned at IHHB and a network of leading distributors worldwide. Once you've heard them, you won't stop talking about them either.



Ulysses has been a home for countless painters, poets and musicians. The studio was christened in 1991 by Sting, who recorded "Mioio Per Te" ("Mad About You") for the Italian CD of *The Soul Cages*.

Gaetano Ria has the classical patrician features of a Roman emperor, but when he talks audio his face lights up with boyish charm. We spent many hours in the control room playing his favorite albums as he enthusiastically pointed out the finer moments of our best engineers. Ria has grown up with the European recording industry, but he is surely a man with a global view.

Bonzai: How long have you been in this business?

Ria: Thirty years last June. I started with RCA in Rome in 1961. After two years as a technician, I became an assistant engineer. A year later, the chief engineer asked if I could work on a Sunday session. I said, "Okay, I'll try."

The opportunity to work at RCA was very important because I became involved with every type of music. I started with pop music, but later recorded classical music, big orchestras, jazz and rock. I worked with Ennio Morricone and learned the sound of the orchestra. We recorded many records together. He wrote the arrangements, but he asked me to play him records with current grooves of guitars and percussion.

Bonzai: You also worked with Henry Mancini.

Ria: Yes, a very beautiful experience for me. If you ask me what it means to be an engineer, the best feeling I have in my heart and my mind is when I worked with Henry Mancini. I had the opportunity to record a 120-member orchestra and 100-person chorus for the Vittorio De Sica film, *I Girasoli* with Marcello Mastroianni and Sophia Loren. When I opened the faders and listened to the sound that came from the microphone I got goosebumps. It's my most beautiful memory in the studio.

Bonzai: When you were beginning at RCA, did you meet with American engineers?

Ria: Yes, I was fortunate for the first ten years to meet engineers from New York. We had courses in the new technology, for the microphone, tape, recorders, equalization. RCA in the States wanted the same sound all over the world. This was the theory of

the '60s.

In 1971, I went to work in Milan and took my experience of ten years. I realized that the system was different in northern Italy—it was a German style of recording. By this time, I was known throughout Italy for the American style. At this time, it was difficult for American or English engineers to come and work in Italy, because there was no budget for the freelance engineer. From 1979 to 1986 I worked at Trafalgar Recording Studios in Rome recording top artists in the Italian pop scene.

Then in 1987 I decided to become a freelance engineer. I contracted with RAI, the Italian television network, to do a new show called *DOC*. It was a live show, with many American artists coming here. We had four different artists every day, for 120 days. They performed live, and I gave the stereo transmission to the network. This was a very good experience, because I wanted to introduce the network to the idea that the sound is as important as the picture. For this occasion, I fought to obtain the best quality, like the sound in a recording studio.

We had a similar situation with the *San Remo Festival*, a very big musical show. Many international artists came to perform in a live theater. We do one week of transmission live, and the last three days are Eurovision. The last show I did was seen by people throughout Europe, Asia and Latin America. It had a big orchestra plus a chorus. We really changed the way of thinking about television audio. For example, Ray Charles came and he liked the sound so much that he used the recording of the TV show for a record.

Bonzai: Could you give me an overview of your experiences in European recording?

Ria: When I started to do this work, I saw that there were four schools of recording—American, English, German and French. It was very important for me to start out with RCA. When I moved to Milan, it was more of a German system of working. The style was very different—the type of microphone, the positioning of the orchestra for recording, and the technology. When I started with RCA, we used a 3-track Ampex machine. The German school used a 4-track Telefunken.

My training at RCA was very good for my work with orchestral recording.

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LUNCHING WITH BONZAI

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Bonzai: Capri has all the major formats—how do you compare them?

Ria: When I first started working with digital recording, I preferred the Mitsubishi 32-track over the Sony 3324. The Sony machine was a machine for the engineer, Mitsubishi was the machine for the artist—that was my feeling. Now, I think they are basically equal. The Sony 48-track is a very good machine, a monster. I think they understood the market and made changes. Now it may be time for Mitsubishi to proceed further.

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Bonzai: You gave up your freedom as a freelance engineer to work here at Capri. What is your hope?

Ria: I look forward to the opportunity to meet engineers and producers I admire, to exchange information and opinions. For me, it's important to have a very positive attitude and to believe in one world of recording.

Bonzai: How can you help the engineer who comes from far away?

Ria: The sound of the studio is so sweet. I am just happy to assist in the project in any way possible. Or if they prefer to work alone, maybe we can have a pizza together afterward. ■

When not toughing it out overseas, roving editor Mr. Bonzai lives a quiet, contemplative life in the greater Los Angeles metropolplex.

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by Paul Tingen

LEVEL 42'S MARK KING

In the early 1980s, Level 42 established themselves as an act to be reckoned with, especially in their native England. Their brand of British white funk was punctuated by Mark King's spectacular bass playing, which earned him the title "best bassist" in various magazine readers' polls. The group's 1985 album, *World Machine*, and 1986's *Running In The Family* sparked several hit singles and put them in rock's upper echelon. *Staring at the Sun*, the 1988 LP with deceased guitarist Alan Murphy, was slightly less successful, and since then the group's been relatively silent, apart from a highly successful tour of Britain in late 1990, which included a stint of 15 nights at the Hammersmith Odeon in London that attracted 52,000 fans.

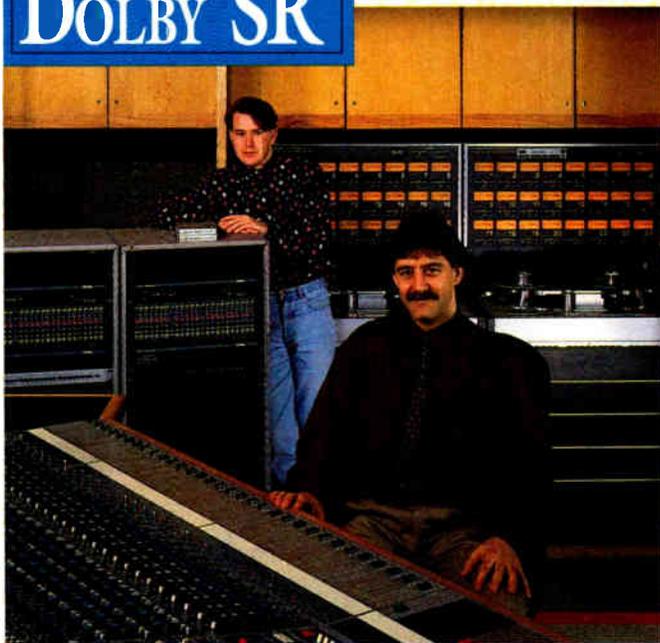
Mark King's home studio is located a few miles outside of the picturesque hilltop village of Rye, in rural southern England. The house overlooks the site where, in a gray and distant past, Bob Dylan and Jimi Hendrix played the Isle of Wight Festival. Now there are only hills, grass and cows. And an incredible studio equipped with a 48-channel SSL E Series desk, two Otari MTR-90 recorders (with 48 tracks of Dolby SR) and walls filled with outboard gear. Sitting center stage on the day I visited the studio were more than a dozen Alembic and Status basses—the main tools of King's trade. The studio also boasts a Macintosh SE30 with Performer software and SRC SMPTE-to-MIDI converter, an Adams-Smith Zeta-3 synchronizer, and Yamaha NS10 and Tannoy DTMS monitors. Sound sources include a

Juno-60, Yamaha TX816, E-mu III and Emax, Casio CZ-101, plus an Akai-Linn MPC60 workstation and ddrum 2 drum sampler. Certainly an impressive "home" studio.

King is someone who entered the record game for the joy of writing and playing, and his infectious enthusiasm for it had him dashing about his studio in no time. Unlike many of his colleagues, he didn't just stop at explain-



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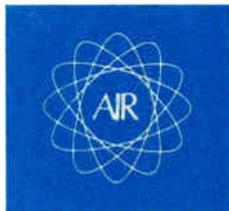
“I was startled by the absence of tape modulation noise. From the looks on their faces, so were my engineers!

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ARTIST'S STUDIO

ing how he does things. No, he actually demonstrated. In the one-and-a-half hours we spent together, King got all his equipment up and running, played bass and sang, played me half-finished demos and unreleased final versions, and even did some instant writing, improvising a short sequence into the MPC60. It was a highly unusual, and informative, treat.

King showed how he uses the

“If you need blaring volumes to make your mix sound good, you’re doing something wrong.”

MPC60 with the ddrum 2 for demoing his songs. They stood in one corner, together with a battered DX7, which functions as the master keyboard. An equally battered Casio CZ-101 stood right next to it, along with a MiniMoog that he uses for bass lines.

King explained that once he’s got a clear idea of the song structure and arrangement, he records his MPC60 demo onto 24-track and starts replacing and adding parts: “I replace the ddrums and Moog bass with real drums and bass, although sometimes I’ll keep the Moog when I want a sound that’s got that Moog honkiness. But I never keep the sequenced drums. There’s nothing as good or organic as real drums. If you’re working with such fantastic drummers as Gary Husband or Phil Gould, a drum machine can offer you nothing.”

For that reason King had a wooden extension added to his studio, designed as a recording area. There's a Steinway piano and a full drum kit to be found, the latter occasionally manned by King as well.

King is frank in admitting that he didn't give great consideration to the acoustic environment of his studio when he built it in 1989. "The acoustic design I have in the drum room is a curtain with which I can deaden or wetten the room, but in the control room I didn't bother at all," he says unapologetically. "To my mind a room only gets important when you crank up the levels. Only when you whack the volume up does the room start working and you start needing your Eastlake/Westlake acoustic treatments.

"So we never play back that loudly in here," he adds. "If things sound good at low volume, you can trust them much more. Look at the masters of mixing. Our new album was mixed by Tom Lord-Alge. One track was mixed here, and the rest was mixed in New York. Tom does things like whack the sound into mono, kill the left-hand side and listen to one Auratone speaker, dead quietly, just to make sure that the vocal is right. If you need blaring volumes to make your mix sound good, you're doing something wrong."

With two MTR-90s and 48-track Dolby SR, King is well-catered-for. But what made him decide to go for analog SR, instead of digital? "With Dolby SR, the sound quality is so good that a lot of people still prefer it over digital," he says. "There's also a school of thought who say that it's best to work with 24 tracks of analog and 24 tracks of digital, doing all your drums and guitars on analog and vocals and keyboards on digital. I, personally, can't hear the difference between analog SR and digital. On top, if the signal you have is dirty anyway, it negates any reasons for having digital. I engineered the album myself, and when there was a bit of background noise, I wasn't so worried about it.

"But there's no doubt the future will be digital," he says in summary. "I think analog has reached its limits and digital still has a long way to go. On digital, it's all too clean. And in rock music, as opposed to classical, recording is about what sounds *good*, not about what sounds truthful." ■

Paul Tingen is a London-based writer and musician.

See Page 152 for Reader Service



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MASTERING THE DIGITAL DOMAIN

World Radio History

by Dan Daley

“Mixers and engineers are in some cases becoming more important than the producers. There are so many mixers and engineers, and they have to get their name known somehow, so they look for representation.”

THE REP GAME

“I don't have an agent; I'm with William Morris.”
—Bob Hope

I'm not sure Bob Hope actually said that; I think it might have been Dave Thomas doing Bob Hope. But it's a good opening line for what's becoming a hot topic. Technology trends tend to get the lion's share of the ink these days. God knows there's been plenty to talk about, between-systems incompatibility, new equipment creating new market niches and obsolescence time-frames that are measured in weeks.

However, lost amid the technoclutter is another, very human trend, one that's also changing the face of the industry: engineers who have retained business representation via managers and agents. This is not a completely new practice, but it was generally employed by a few people at the very pinnacles of their professions. What's new is that many more engineers, including those with relatively brief (though respectable) resumes, are choosing the manager/agent route, not as a means to manage existing careers, but to create them.

In many cases, any management of an existing engineering career is

viewed as financial maintenance until the ultimate objective is achieved: graduating to the producer's chair. Those who employ agents are to a large degree products of the decline in staff engineers over the last decade. Studios, looking to cut costs, keep fewer engineers on salary. As a result, the studio-managed career, in which a facility manager propelled an engineering career along within the studio, is a declining phenomenon.

Tony Maseratti, a former staffer at the original Sigma Studios in New York City and engineer for C&C Music Factory, Mariah Carey and James Brown, was at one time managed in that traditional way by Skyline studio manager Barbara Moutenot. “When I first came up as a staff engineer five years ago, the producers would be using the staff engineers at studios,” Maseratti says. “The studio management had the network hooked up, and it worked on a hierarchy basis. That's how it all began. The studio managers advanced engineers' careers. Then some of those studio managers left the studios and started managing engineers [on their own].”

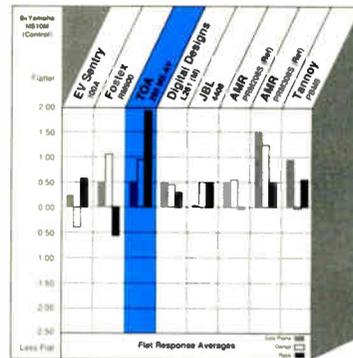
Maseratti is now managed by Andrew Stephanopoulos, a former A&R administrator at Virgin Records. Last May, Stephanopoulos started Red Shift, a management company specializing

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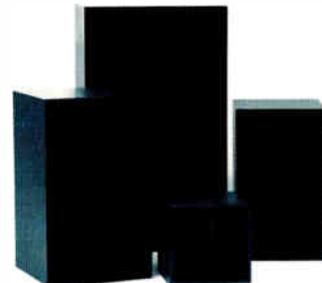
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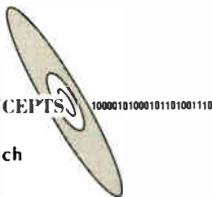
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in engineers and producers, as well as video directors and graphics designers. In addition to Maseratti, Stephanopoulos manages two other engineers in New York and two in Los Angeles. Stephanopoulos met Maseratti at Sigma, where Stephanopoulos interned during college seven years ago while Maseratti served as a staff engineer.

Stephanopoulos acknowledges that younger and newer engineers are seeking representation in numbers not seen before. He attributes this to the growing importance of the engineer in an increasingly complex technological environment and to the fact that the relatively new but rapidly expanding title of mixer or post-producer has pulled a lot more names into the pool of credits. "Mixers and engineers are in some cases becoming more important than the producers. There are so many mixers and engineers, and they have to get their name known somehow," Stephanopoulos notes, "so they look for representation."

Tony Maseratti says, "I want to be a producer and a songwriter; I don't find it satisfying to deal with the politics of the business. Also, I'm quiet and shy by nature, and I don't find it easy to promote myself."

Current Skyline Studios manager Barbara Moutenot remains in the engineer management game, repping Tom Durack, a young engineer who went from assistant at Skyline to primary engineer for Nile Rodgers when the producer was headquartered out of that studio. Since leaving Rodgers, Durack has engineered for the B-52's, Diana Ross and the Dan Reed Network. Moutenot manages Durack's time and bookings as well as his negotiations, which Durack says frees him from having to wear more than one hat in the control room. "That's what's really valuable," he says. "When I'm in the thick of it, I don't like talking about money to clients. I negotiate through Barbara. I think she's very valuable in that she handles the things I don't have either the time or inclination to do."

Durack also says that having an ally in the early stages of a career is a plus, and he stresses connections in the record industry and with producers as particularly important. He adds that he feels no conflict of interest given Moutenot's position at Skyline: "I haven't worked there as an engineer in

some time, and the place is so busy it's hard to get in there."

Moutenot maintains that she isn't rushing her client's career. "As an engineer, there's nothing Tom can't do," she says. "If you [engineer] a Top 10 record, I don't see why that performance can't be repeated." But she's more cautious about a client moving from engineer to producer. "That should be a slower transition," she says. "You have to move at the right time, and you have to develop the right skills first."

Not all managers agree that engineers benefit from early representation. Sandy Robertson, a former producer-turned-manager, is wary of the idea. Robertson's Los Angeles-based Worlds End America Inc. (there is also an office in London) mainly manages accomplished producers: Danny Kortchmar, Don Gelman, Tom Werman, Gary Katz and Femi Jiwa. However, Robertson also manages several engineers, including Ed Cherney, who has tracked for several of Don Was' projects and whom Robertson wants to help move to producer. Robertson believes that there are few people who can adequately manage an engineer's career, and that management too early does more harm than good.

"Managers in many cases rush an engineer's life too far too fast," he says. "There are maybe four or five people in the United States who are truly qualified; the others are signing people who don't have enough experience. The danger is that engineers can be pushed into a good project, but they don't meet the standards because they aren't really ready. It's a small business; people can bad-mouth you and it gets around. A career can be over quickly."

Tom Durack's response puts the mantle of responsibility on the engineer: "If you're an independent engineer and you've gone far enough to want management, then you should be prepared for whatever comes along [as a result]," he says. "I understand [Robertson's] point, but I don't agree with it. It's difficult to move along without taking chances. If you're worried about the risk, then maybe you should stay an assistant a bit longer."

Stephanopoulos agrees that experience is a necessity, but says the amount of woodshedding necessary should depend on the individual's level of capability. "Engineers have to spend a couple of years getting experience," he says, "but I don't think they have to spend ten years doing it."



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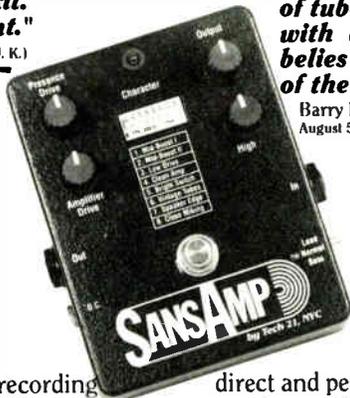
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STUDIO VIEW

Stephanopoulos says that at least one year's tenure at a studio that attracts name acts and lets the engineer mix some tracks is necessary.

While these managers may have philosophical differences, they are all getting a lot of calls from would-be management candidates looking for something to give them an edge in a crowded field. "People approach me looking for representation and they've hardly done anything," says Robertson, who adds that he averages about eight such calls a week. Moutenot also says she gets inquiries.

Contracts between managers and engineers hover around the 10% to 15% level, with both single-year and multiyear terms, generally mutually renewable. Stephanopoulos usually goes with a three-month trial run before moving to a one-year, annually renewable agreement. Managers look for an engineer with a combination of ambition and talent, and they prefer someone looking to become a producer (at least partly because the producer's numbers are potentially more lucrative, thus increasing the manager's percentage). However, while producers' fees tend to be higher and points on sales are usually part of the deal, mixers are increasingly participating in the royalty pie.

From the engineer's point of view, business savvy and an active and wide-ranging network of contacts—especially within the record labels—is important in a manager. You want someone who knows the numbers and gets their calls picked up or returned. "They have to have their ear to the ground," Stephanopoulos says. "Managers have to know about projects before they're happening and be able to get their clients in. They should also have some clout within the industry." It goes without saying that an engineer should never sign a binding contract without having it looked over by an attorney first.

Everyone interviewed agrees that there has to be some kind of chemistry between agent and manager. "The respect level has to be high, and it has to go both ways," Maseratti says. "If respect's not there, then nothing else will be." ■

Dan Daley is Mix's East Coast editor. He manages to do quite well, thank you.

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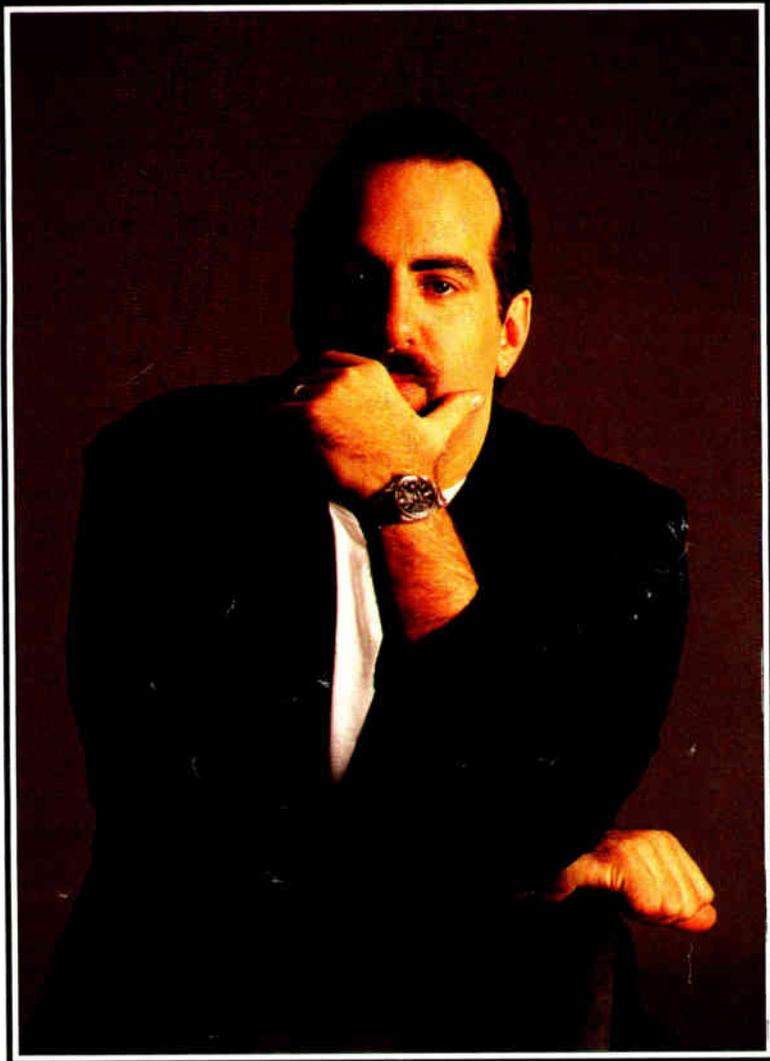
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ARTHUR BAKER

THE ORIGINAL MIXER MOVES BACK TO HIS ROOTS

It was a bit eerie walking in. The space that was once Studio A of Pyramid Recording Studios Inc., my first foray into commercial studio ownership, was now Shakedown Sound, a name that producer/mixer Arthur Baker previously used for his former digs on West 37th Street. (Pyramid, under different ownership and modified form, still operates on the other side of the small lobby area, in what had been Studio B.)

Since I left the company

nearly two years ago, I found that Baker's arrival prompted some changes in the studio's configuration. An SSL 4000 E Series console was snugly fit into the control room; the UREI's soffits were covered in favor of the Tannoy Little Golds mounted on the console; and the recording room was smaller due to a recent control room extension, now serving as the machine isolation room for a pair of Otari MTR-90s.

by Dan Daley

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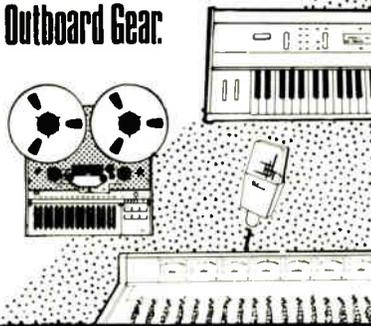
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PRODUCER'S DESK

perhaps, was the presence of Baker himself. Shakedown is not a show-place, nor was it ever meant to be one. Rather, it's very much a place of business—music business. It's strewn with the debris of constant session work—a bit like Baker's own discography, which, were I to list it, would substantially increase this publication's printing bill.

Baker started off as a clerk in a Boston record store, moving from there to spinning records at a local club where he met and formed a lasting relationship with Tom Silverman of Tommy Boy Records. Soon after, in 1980, Baker moved to New York City where he began working with acts like Afrika Bambaataa, a cornerstone in the burgeoning hip hop movement. Later came "Candy Girl," a UK Number One for New Edition, an act Baker says he scouted himself.

New Credits

Baker was establishing himself on the cutting-edge of the ethnic groove influences that were to have a tremendous impact on mainstream music. Ironically, it was his work as a producer and writer on these records that got him the attention of other, more pop acts. David Bowie, Mick Jagger and Cyndi Lauper approached him not to produce their records but to remix them; in a sense, to *re-produce* them. "I was one of the first to get the 'additional production' credit," says Baker, describing the influence that club deejays were about to make on the production scene. "On certain records it becomes a category all to itself when you're keeping only the vocal and recutting everything else. It's really a step beyond production, because producers often use the act's arrangement. But when you're working off nothing but the vocal, you have to do a lot of arranging. A remixer sometimes does a lot more than the original producer did."

Baker did plenty of remixing over the course of the decade: Lauper's "Girls Just Wanna Have Fun" and "She Bop" made big splashes that brought him tracks like Art of Noise's "Dragnet," Fine Young Cannibals' "Ever Fallen In Love," Daryl Hall's "Dream Time," four Hall & Oates tracks and plenty of others, including Lou Reed, the Bee Gees, Tom Tom Club and Fleetwood Mac.

Yet Baker doesn't feel stigmatized

as a mixer. "It's really funny, but different people see me as different things," he says. "In England they think of me one way, because I had a lot of dance hits as a producer in Europe. If you're a Dylan fan, then you know I produced his [1985] *Empire Burlesque* LP. It's just that the dance stuff had the greatest commercial success. I never would have been a remixer if that's what I had started out to be. People wanted me to make their records sound the way the records I produced sound."

Baker didn't let his production aspirations become frustrated during the meteoric rise of his mixing star, however. He signed with Epic in 1984 to do a solo record. The label was expecting a redux of his dance work, but instead he turned in a rock record. The A&R team that made the deal had already moved on to another label, and Epic was less than receptive to Baker's non-disco offering. It was never released. "If it had been a dance record, they would have given it some support," he sighs.

Baker came back in 1989 and wrote, produced and mixed *Arthur Baker & the Backbeat Disciples*, released on A&M Records. He culled a number of programmers, players and vocalists to manifest the music he devised, since Baker admits to being neither a major-league singer or musician. The record spawned a hit, "The Message Is Love," sung by R&B-meister Al Green, an idol of Baker's adolescence. A&M wanted more from Baker, who declined and jumped over to BMG in 1989 to begin working on *Give In to the Rhythm*, his debut BMG/Arista release that was only recently finished and distributed.

More Than the Mix

Baker has already refocused himself in the wake of that release, however, looking to put the remixes behind him and get back to what started his career in the first place: developing acts and producing them. To that end, he's constructing a studio across the Hudson in Jersey City—a large, renovated loft with 40-foot ceilings where he can cut live tracks. The new room is being put together with Will Schillinger, who did most of the renovation for him at Shakedown, and Steve Lindsay, an acoustician who was recommended to Baker by Bob Ludwig after Lindsay did work on the new Master Disk facility.

He's also planning on an album

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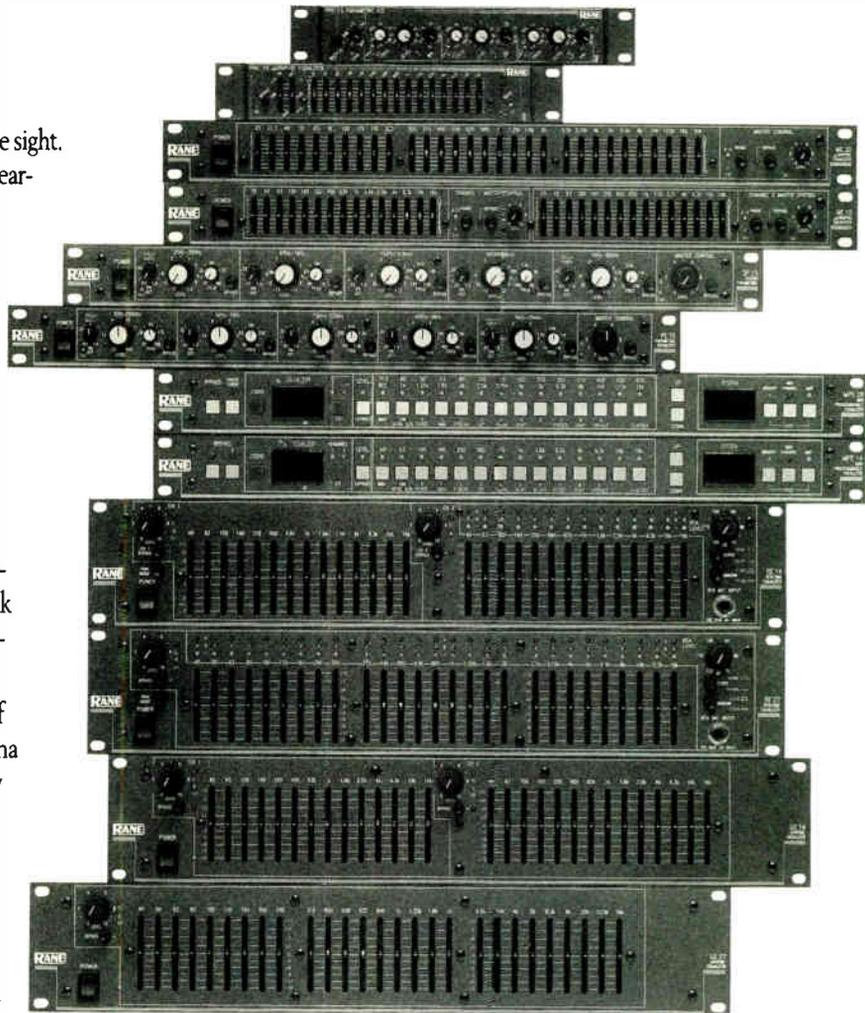
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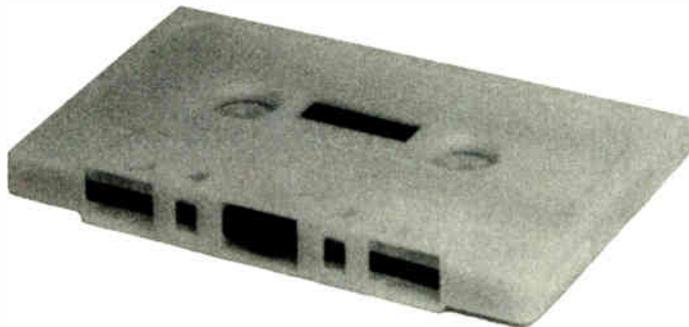
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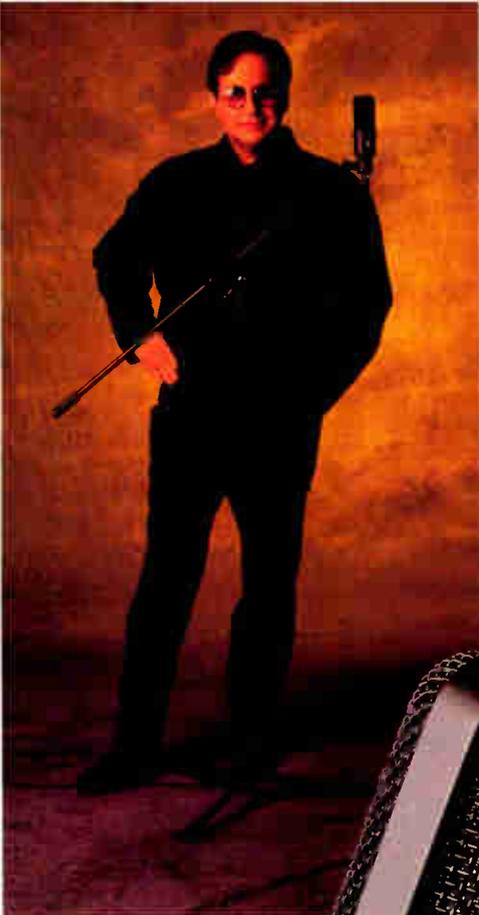
project with Al Green, who's spent the last 14 years making Grammy-winning gospel records. Baker went down to Memphis and convinced the Reverend Al that the secular side could once again use some of his vocal ministrations. That record will be released sometime in 1992.

Though Baker's owned his own studio for years, he does not let that determine where he'll do his work. "It depends on the vibe and the artist," he says. "I do a lot of remixes here because it's easy and I'm familiar with the place, but when it comes to production, I let the vibe make the decisions."

Baker is a democrat in a technocracy. He is a remixer who depends on engineers and musicians to achieve sounds. "I'm not into technology," he states flatly. "I'm more of a song and music person, even in remixes. I became an engineer by default, and I don't call myself one. I know how to work the SSL and play some keyboards, but [my reliance on others to deal with the technology] is an advantage in some ways because I get to concentrate more on the song."

He became familiar with MIDI while working for two years at Unique Recording, which in the early '80s was on the cutting-edge of the new electronic protocol. "I know I should be more into the technology, but, quite frankly, I don't have the time," he says, trusting instead in a number of engineers, such as Louis Scalise and Dave Darlington, and programmers, such as Eric Kupper and Axel Kroell. "I've always worked with different people rather than get tied down to one or two all the time," he says. "I used to use Chris Lord-Alge all the time until his career took off and he wasn't there anymore."

The conversation never seems to swing toward tech-speak with Baker unless he's guided there. Instead, like a hunter with a guide, he's less concerned with the terrain than the object of the hunt—in Baker's case, the song. And the vibe. "I'm not interested in doing remixes anymore," he says. "I'm more into writing and producing," although he acknowledges that remixes he's heard lately are below the par he's accustomed to. Still, Baker is philosophical: "That was then, this is now. I'm more into producing Al Green than remixing even a Janet Jackson record." ■



Phil Ramone photos by Michael Bloom

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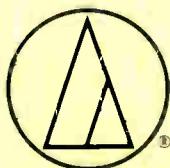
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—FROM PAGE 42, EUROPE 1992

Is 1992 just another step in the gradual process toward European integration? It appears that the answer is, by and large, "yes." But there will be a number of accentual changes. One is that distribution contracts will have to be made with more care. It's no longer automatic that a dealer in The Netherlands will assume that only The Netherlands is his territory. If a manufacturer is not careful, it might find a distributor selling in other countries, too.

Colin Pringle notes "Europe is not a homogenous culture like America. There are language difficulties, and there's no pan-European infrastructure for advertisement. For those things to happen it will take time."

Dave Simpson, owner of Thatched Cottage Audio, the UK's fastest growing pro audio dealer, who's planning to expand his business to Florida and Los Angeles this year, says, "1992 or not, Europeans remain xenophobes. A Frenchman will prefer to buy something from a Frenchman, and the UK is not suddenly going to be flooded with German manufacturers. Every company will still have to go through a distributor [in each] country who knows his territory and will be responsible for after-sale service in the area. I know that some U.S. manufacturers want to create a European distribution base, but I don't see what practical difference that's going to make. You're just putting another piece of bureaucracy at the top end."

Low-key, perhaps almost blasé, as these Europeans might be about their "success story of the century," they do observe that things might become more difficult for American companies. With European products becoming cheaper for European consumers, a French customer might now prefer a German piece of equipment to an American one. American companies are going to have to stay abreast of technical EC requirements. And Terry Finn of FWO Bauch, UK pro audio dealer and UK importer for Studer and Neumann, says, "The competition will become stronger within Europe. U.S. companies will have to be more cooperative than they have been in the past. They'll have to be more aggressive in their marketing and possibly spend more time over here, in the same way that the Japanese did." ■

Paul Tinggen is a London-based freelance writer.

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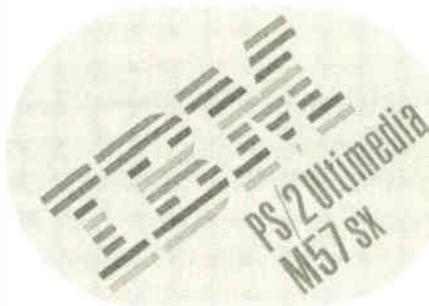
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by Paul Potyen

MULTIMEDIA UPDATE

WHO'S ON FIRST? (AND WHERE IS IT?)

Events in the computer and media production industries in the last quarter of '91 indicate a growing awareness on the part of both producers and consumers of the potential of multimedia or, as Apple Computer prefers to call it, integrated media. The October unveiling of Philips' CD-I (see "The Byte Beat," October 1991) and Sony's announcement in November of its Data Discman Electronic Book Player have spawned a flurry of full-page ads and multimedia articles in newspapers. (By the way, I took some time to check out the CD-I demonstration kiosk at a local TV/stereo discount outlet where,



without really wanting to, I managed to crash the system. I seem to have a knack for that sort of thing.)

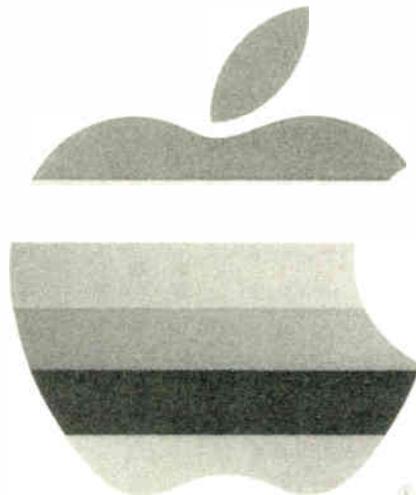
Real Products

The first significant results of the Multimedia PC platform—announced by Microsoft, Tandy, NEC and others in October '90—were on display at this year's Multimedia PC Exhibition, which took place last October in New York. Tandy showed its first-generation Multimedia PC, and there was no shortage of announced software for it. More than 40 software developers demoed over 60 MPC titles on CD-ROM, and the MPC catalog listed more than 100 titles in three categories: working, learning and playing. Some were announced by company names familiar to readers of these pages; oth-

ers emerged from unexpected places. The following are a few of the more noteworthy in the realm of audio:

MacroMind **ClipMedia** announced a CD-ROM with graphics, animation, video, sounds and music for use in multimedia presentations. Music is licensed from the Killer Tracks production library house, while sound effects come from Hollywood Edge. It includes about 55 30-second clips in 8-bit, 22kHz stereo and 11kHz mono.

Applied Optical Media Corpo-



Apple Computer

ration's **Mediasource** offers the first of a series of CD-ROMs of images and audio. It includes 1,500 images and more than 90 minutes of music and sound effects.

There was the **Media Music Sampler** from Passport Designs (see "The Byte Beat," December 1991). It consists of original production music available on CD-ROM in several digital audio and MIDI formats, and includes over 20 song clips of production music in various spot lengths and musical styles.

Prosonus showed **MusicBytes**, a CD-ROM formatted with modular production music, MIDI data, sound effects and instrument samples for MPC.

Presentation Graphics Group **Digi-sound** has developed a CD-ROM containing more than 600 sound effects and MIDI music clips. The 200 music clips contain over two hours of continuous music conforming the MPC General MIDI format. The title was slated to be available through Radio Shack Super Stores.

Hypermedia Group announced its **HyperClips**, a CD-ROM with 1,001 animation and sound clips (sound effects in 22kHz, 8-bit WAV format), indexed in a simple-to-use graphical storage and retrieval system.

It will be interesting to see who buys these products and how popular they will be. Apparently a lot of developers are willing to roll some pretty big dice on the bet that it will pay off.

When Worlds Kaleida

When the Multimedia PC platform was announced, IBM was conspicuous in its lack of participation. Then, in a series of announcements that continues to leave experts pondering their significance, IBM announced an alliance with Apple Computer. Part of that agreement described a joint venture dubbed Kaleida, whose mission is to develop a platform-independent multimedia software architecture that will be available for licensing. Key people from both companies have been selected to head up this effort. On the surface it seems like a positive step—and one that has parallels in the Middle East Peace Conference. No jointly announced intention to cooperate will magically create a successful partnership between two companies whose employees have been trained for years to compete with each other. I've heard one industry pundit wonder whether the whole thing is nothing more than a ploy to bolster consumer confidence in both companies. Tsk, tsk, such skepticism.

Ultimedia: Another Road to Market

On the heels of the Apple-IBM alliance came the announcement from IBM of its Ultimedia technology. The set of Ultimedia products includes a PS/2 Ultimedia Model M57 SLC; a PS/2 ActionMedia II digital video and 16-bit audio capture and playback adapter; PS/2 TV, a video adapter/tuner/speaker/software solution; and a PS/2

TouchSelect screen. Also described as part of the Ultimedia package is a set of Ultimedia Solutions that includes video monitoring on the desktop, Multimedia Integrated Kiosks, and a

videodisc training series to assist the unemployed.

According to Peter Blakeney, manager of IBM multimedia marketing and support, Ultimedia is not intended to

Chip Shots

OSC (San Francisco, CA), which designed DECK and Pro Deck software for Digidesign, has introduced "A Poke in the Ear with a Sharp Stick," an "alternative sample library" on CD-ROM in Sound Designer II format, with instruments and banks for SampleCell. Over 1,350 short-length samples—such as "Weaselphone" and "Chainsaw Surprise"—have been digitally recorded, effected, edited and transferred to disc at 44.1 kHz or higher. The disc, priced at \$149.95, is available directly from OSC.

Prosonus (North Hollywood, CA) has released its SampleCell Volume Two, a 600MB CD-ROM with sounds that complement its Volume One disc. The collection is designed with film scoring, post-production and other musical applications in mind, and is priced at \$399.95.

A CD-ROM disc from Greysounds (Northridge, CA) for SampleCell has also been announced. The disc features traditional and synthesizer sounds as well as sound effects, and is available for \$299.95.

Ariel Corporation (Highland Park, NJ) is shipping the ProPort Model 656, a flexible, self-contained digital audio interface for Sun, Macintosh, Hewlett-Packard and NeXT computers via the DSP port serial interface. Sample rate is selectable from 5 kHz to 96 kHz, with 16-bit oversampling A/D and 20-bit, eight-times oversampling D/A converters. Analog inputs have an A-weighted dynamic range of more than 95 dB, and the A-weighted outputs attain 100dB dynamic range. The unit is priced at \$1,595.

The MIDI Time Piece from Mark of the Unicorn (Cambridge, MA) is now available for IBM/PC compatibles. The IBM version of the multicable MIDI/SMPTE interface

features an 8-bit card that allows connection of up to two MIDI Time Pieces to the computer for a MIDI network with 256 channels and 16 MIDI inputs and outputs. A bundled software accessory provides control over all of the MIDI Time Piece's functions and allows users to save and load configurations. Suggested retail price for the IBM MIDI Time Piece is \$595.

Focal Point is a package from Bo Gehring (Niagara Falls, NY) that brings directional binaural sound to the Mac. The system includes a



specialty modified Digidesign AudioMedia/FP card for each channel and Midi3D software, which puts 3-D sound position under MIDI control. Midi3D is MIDI Manager-compatible, generating real-time binaural output of MIDI sequencer and/or audio events using head-related transfer functions. Focal Point is available now for \$1,495 per channel.

Avid Technology Inc. (Burlington, MA) has released Version 3.0 software for its Series 200 and Series 2000 Media Composer systems. The new features include 24-track, CD-quality audio, multicam editing, and enhanced JPEG video compression for high-resolution images.

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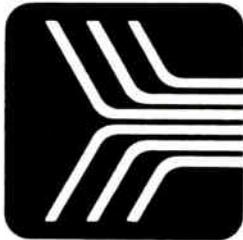
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be a standard. "Rather, it's designed to establish in our customers' minds an image of multimedia's capabilities," Blakeney notes. "It offers a collection of technologies: video, image, animation, audio and new user interfaces. Our view is that MPC addresses a very small part of the spectrum of multimedia opportunity: It offers a minimum playback standard, and it addresses primarily the edutainment [home entertainment] market, which is nascent at best. The MPC industry's focus on that is a red herring. It doesn't address education, training, merchandising, public information, public presentations or networked desktop. [The MPC industry, along with] CD-I and CDTV are chasing an elusive home entertainment market."

In an approach consistent with its history, IBM is more interested in offering solutions to corporate clients like GE Aerospace, Shell Oil, Sears and the State of California, who have the needs in one or more of these other market areas, and the budget to cover the cost of a network of \$6,000 386-based PS/2 machines, touchscreens, DVI-based video adapter cards and assistance in the design of custom applications. When asked whether he thought that Kaleida could be expected to incorporate the best parts of the Ultimedia technologies, Blakeney replied, "Not necessarily, [but] theoretically they should."

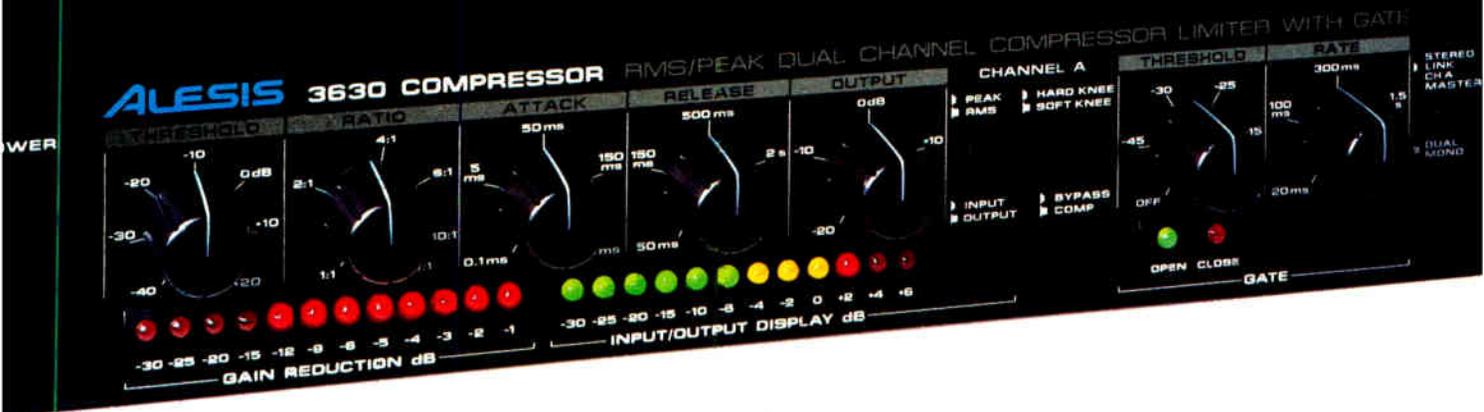
Sound From Apple

On the other hand, Apple's January release of QuickTime software [see "The Byte Beat," September 1991], together with its new line of high-end Mac Quadras and PowerBook Portables, brings the potential for multimedia production on the Macintosh desktop a sizable step closer to reality. In the area of audio, the new Quadra Series incorporates an improved custom sound chip that is a superset of that found in the IIsi and LC. The Quadra 900 also includes dual line-ins and an internal adapter for playing audio from an optional internal CD-ROM drive. Stereo audio out from the CD-ROM drive can be played via a stereo mini-jack on the Quadra. The speaker in the new flagship is considerably larger and about eight times more powerful than the 1/2-watt, 3.5-inch speaker found in the earlier models.

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Apple's new spokesman for the functional technologies sound group, at one of the spate of multimedia-based expositions that have sprouted up in the last year. Liebermann recently came to Apple with his 15 years of experience in the fields of computers and sound, including R&D stints at Bose and Avid Corporation. If he gets his way, Macs in the near future will be designed with much more attention paid to sound—what he refers to as “a big underachiever” in computer design.

“I would not say the Quadra has improved sound performance,” Liebermann says. “The breakthroughs have not yet been revealed. The computer should be able to emotionally engage the user more than it does. The power that sound has to affect people's emotions has not been recognized by designers and developers of this medium. People who write movie soundtracks certainly recognize the power that sound has, and [in the future] we will be just as manipulated and engaged by soundtracks in computer software as we are by films. Apple will do whatever is required to engage its public. That includes the use of speech, sound effects and music on software soundtracks. Also, there will be an integrated acoustical system in terms of speakers and sound chips. If you know the relationship between the speaker and the listener, you can do a lot of things that have not been done before on any consumer-oriented application. Basically, it's a matter of taking an under-recognized resource and exploiting it.”

Liebermann feels that the Macintosh—with its integrated sound-chip technology—is the only PC capable of exploiting sound without incurring a host of incompatible third-party solutions as has happened with other platforms.

Lastly, in a related set of developments, the terms of the recently settled lawsuit between Apple Records and Apple Computer have freed the computer maker to develop any music- or audio-related product except audio CDs. The evidence suggests that Apple intends to take advantage of the opportunity. ■

Paul Potyten is an associate editor at Mix, and a freelance producer, composer and musician.



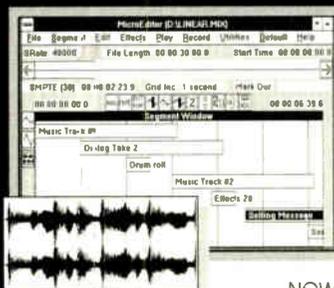
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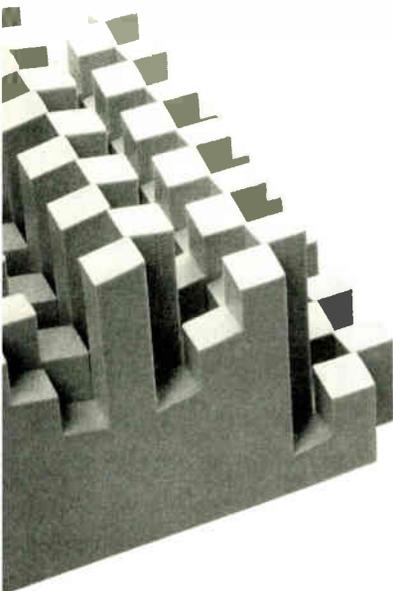
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NEW PRODUCTS



A¹ DIFFUSOR MODEL P

Systems Development Group, Poolesville, MD, debuts the A¹ Model P (\$64), providing five octaves of diffusion (250-8,000 Hz) in two dimensions from a lightweight, rigid, polyurethane material. Each diffuser is approximately 15x15 inches, with a 9-inch depth. Units can be mounted with construction adhesive and painted to match any decor.

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RANE ME 60 EQ

New from Rane (Mukilteo, WA) is the ME 60, a stereo, 1/3-octave, graphic equalizer. The two-rack-space unit features two independent channels of constant-Q filters from 25 to 20k Hz, along with sweepable high/low-cut filters and unbalanced RCA inputs/outputs.

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DIGITAL DESIGNS SUBWOOFER

The DDBP12 band-pass studio reference bass monitor from Digital Designs (Oklahoma City) uses a custom 12-inch, cast-frame woofer with dual-voice coils set into a long magnet gap. Designed for use with 4- or 8-ohm studio monitors from Digital Designs and other manufacturers, the 16x16x24-inch woofer is also available in versions for dual-subwoofer configurations and a non-crossover model for bi-amped applications.

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APHEX MODULAR SERIES

Designed for multichannel processing in a compact space is the Modular Series 9000 from Aphex Systems of Sun Valley, CA. Format-compatible with the dbx 900 system—with power supplies available to power any Aphex or dbx module—Aphex's rack holds 11 modules, with servo-balanced inputs/outputs. Available modules are the Model 9251 Aural Exciter™, 9301 Compellor™ compressor/limiter, 9611 expander/gate and the 9651 Expressor™ with modules scheduled for release soon.

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BASF 911 STUDIO TAPE

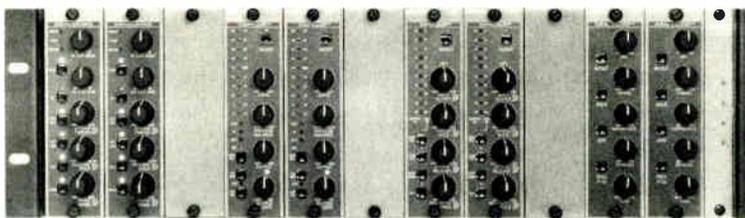
Popular in Europe, 911 Studio Mastering Tape from BASF Corporation (Bedford, MA) is now available in the U.S. A bias-compatible mastering tape, 911 features a high output level (+11 dB above reference level 320 nWb/m) with a print-through ratio of 57 dB. It's available in 1/4-, 1/2-, 1- and 2-inch configurations.

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FOX'S RACK 'N ROLL

From Sound Designers Studio of New York City comes Fox's Rack 'n Roll, a system of eight-space, steel-frame units (14 inches high, 20 inches deep) that can be stacked or combined to create custom rack configurations. Rack rails are tapped for front or rear mounting; the open-frame design allows free air circulation and simplifies the use of cable ties. Each eight-space unit is \$99.95, including rack screws; casters, side panels and wooden case are optional.

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MYTEK PRIVATE Q

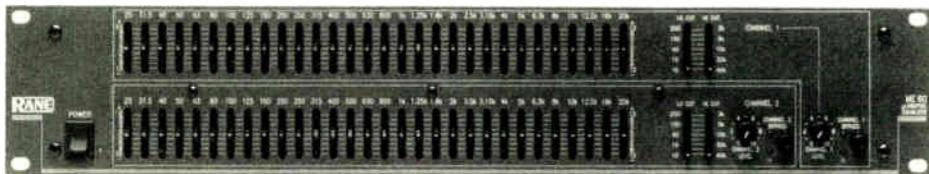
From Mytek of New York City comes Private Q, a multichannel cue system that allows performers to adjust their own headphone mixes in the studio. Private Q includes 12 balanced line inputs, tone controls, a stereo 25-watt/channel amp (for driving small speakers or up to three headphones) and snap-DL multipin connectors for daisy-chaining multiple units. Each unit weighs 2.5 pounds and can be mounted on a mic stand.

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AMEK MEDIA

Intended for film and post-production applications is Media, a new console from Amek (North Hollywood, CA). Accommodating one to four engineers, Media can be configured in large numbers of channel inputs, each with 32 buses and multiformat panning (pan, divergence and surround), supporting formats from mono through Dolby Surround. Also featured are RAM storage of routing assignments and channel switches, and 4-band EQ (with steep HP/LP filters) designed by Rupert Neve. Supermove automation (based on the Mozart console's Supertrue automation) is optional and supports up to 128 moving faders per section.

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Call (413) 584-6767 for info...Upgraded: Otari's MX-50 II 1/4-inch, 2-track recorder now includes a built-in cue speaker with channel-select switches. At your dealer or call (415) 341-5900 for info... The Westlake BBSM-6 and BBSM-8 studio monitors are now available in vertical versions, which are also bi-ampable. Both models are three-way, all-cone designs: The dual 6-inch woofer BBSM-6 VF are \$2,800/pair; the dual-8 BBSM-8 VF are \$3,700/pair. Call (213) 545-1212... Marion Systems' \$295 SCSI Interface kit for the Akai MPC60 and MPC60-II MIDI production workstations offers up to 780 MB of storage using any Macintosh-compatible hard disk. Call (510) 283-4631... Tice Audio's TPT Line Enhancer (\$350) is said to improve audio clarity and soundstage performance and lower the noise floor by enhancing the AC power line. Call (516) 467-5254...Designed for vocalists and narrators, Bernard Industries' Steam Inhaler (\$49.95) is a portable (7.5-inch) unit said to improve vocal performance; call (800) 544-6425 or (305) 861-2536...Metasonics' Common Audio Tube Evaluator (\$850) provides performance checks—distortion, noise, gain, filaments and more—on typical power, preamp and rectifier tubes used in audio gear. Call (702) 358-2019...The Digidesign Information Service provides product info, literature, seminar schedules and compatibility information on all Digidesign products. Call (800) 333-2137 or (415) 688-0600.



AUDIX DRUM MIC

The Audix (Pleasanton, CA) D-One is a dynamic mic designed for high-SPL (144 dB) drum-miking applications. The D-One's hypercardioid pattern increases rejection of adjacent drums, while the mic's compact 3-inch housing allows placement in tight spaces. Its high-output capsule and transformerless design provides a frequency response said to be 35-17k Hz.

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AUDIO PRECISION PORTABLE ONE PLUS

Like the award-winning Portable One, the Portable One Plus from Audio Precision (Beaverton, OR) is a complete 2-channel test set. The Plus version adds graphic sweeps and hard-copy output to printer features, along with support of external source sweeps for recorder and disc-reproduction measurements. Price is \$4,600.

Circle #285 on Reader Service Card

LAYERED AUDIO BOXES

Series 7 from Layered Audio (St. Louis, MO) is a range of compact boxes for interfacing a variety of pro audio devices. An optional shelf allows for rack-mounting up to seven self-contained boxes. The line includes six direct boxes (priced from \$59.95); balanced mic and line splitters; isos; 12/18/48-volt phantom supplies; preamps; summing and distribution amps; mini-mixers and more. All use quality parts, such as high-quality transformers, metal film resistors and aircraft-grade aluminum enclosures. Transformers are also available on an OEM basis.

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B&K 2012 ANALYZER

Brüel & Kjaer's instrumentation group (Marlborough, MA) offers the Type 2012 audio analyzer, with three test modes: Time Selective Response for measuring the free-field response of microphones, speakers and other transducers in an ordinary room; Steady State Response for distortion measurements; and a 1,600-line FFT for spectrum analysis. The 2012 features a hi-res color display, onscreen help in English/French/German, two sine generators, mic and line inputs, 3.5-inch floppy drive and RS-232 printer port.

Circle #284 on Reader Service Card



SONY PCM-7050

TIME CODE DAT RECORDER

Sony has been at the forefront of digital audio recording and editing since devices for performing these tasks became commercially available. The PCM-1610 processors, DAE Series editors, PCM-3324 multitracks and their descendants set strong precedents and became established workhorses in the audio industry. Similarly, Sony has been involved in DAT development from early on, believing the medium is sufficiently popular to justify high-end pro DAT components and systems with time code capabilities. Sony's first effort in this area—the PCM-2500—received mixed reviews, but the first generation of any new technology is always a little shaky. Now...look out. The second generation is here.

Sony's PCM-7000 Series of time code DAT components consists of three recorders (PCM-7010, 7030,

by **Larry Oppenheimer** 7050), a number of optional plug-in cards, and the RM-D7300 editor/controller, which works in conjunction with two of the 7000 Series recorders to make an all-digital editing system. For our review, we examined the top-of-the-line PCM-7050.

It is hardly necessary to say that the 7050 is a professional tool. Its size, front and rear panels, and 2-inch-thick notebook of manuals speak for themselves. So do features like the jog wheel, AES/EBU interface, four-head drum for direct-read-after write monitoring, time code synchronization and the vast multitude of configuration parameters.

Starting on the rear panel, the 7050 has balanced XLR analog inputs and outputs, with a 600Ω termination switch on the inputs. In addition, Sony has thoughtfully provided a pair of

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independent producer

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"A lot of engineers and producers want to really be able to slam levels to achieve a certain sound. 3M 996 gives them more options and opens more doors, sonically speaking." —Barry Bongiovi, Power Station

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unbalanced 1/4-inch outputs. Digital I/O is available in AES/EBU format on two more XLR connectors. Clock synchronization with other digital gear (not to be confused with time code locking) is achievable via BNC word sync in and out connectors. The WS input connector has a termination switch (75Ω), as do the analog inputs. An external sync switch allows clock synchronization to be derived from either the AES/EBU input or from the WS input (in which case, the WS output becomes a loop-through).

The stock 7050 has no less than three remote connectors: an 8-pin DIN for a start/stop fader, a 37-pin D-type for the optional RM-D7100 remote, and a 9-pin D-type for the RM-D7300 edit controller. Priced at \$1,500, an optional time code board (installed in our review unit) provides XLR time code input/output jacks, a time code switch for selecting either the internal generator or an external source for recording time code, and a pair of BNC connectors (with 75Ω termination switch) for input and loop-through of an external video sync reference (i.e., house sync). An RS-232 option adds a 25-pin D-type connector to fill up the remaining rear panel space.

The much busier front panel can be broken down into three functional groups: transport, display and control. To the right of the power switch and headphone level control are the cassette well (not a drawer) and basic transport buttons, including start ID search buttons. A row of status LEDs alert the user to undesirable conditions. The large, fluorescent display is a busy bit of business. Level meters are 28-segment LED ladders with OVER indicators, as found on other Sony units. Two eight-character displays indicate time code: one reads code off the tape, the other is for inputting code, reading an external code source and so forth. These also serve any alphanumeric functions required, such as menu selections and parameter values. Other dedicated indicators inform the user of operational parameters such as selected sampling rate (or the rate of incoming digital audio), time code format, the current menu displayed and external sync source.

Beneath the display are a number of control function buttons (varispeed, chase, input monitor and jog wheel, to name a few), most with accompanying

LEDs to indicate when they are active. The right portion of the front panel has basic controls: analog level pots and switches for selecting analog/digital input, sync and sampling rate. The lower right corner is dominated by the jog wheel, flanked by a row of buttons that, in conjunction with the wheel, allow selection and adjustment of the many 7050 menu parameters.

Recording with the 7050 is straightforward. You simply select analog or digital input, make appropriate value selections (for analog, set levels and select sample rate; for digital, choose external sync source), select the record mode (Assemble, Insert Audio, Insert Sub), and you're on your way. Normally, monitoring is off-tape, but an input monitor function allows monitoring the input even if there is no tape in the machine. Delving into the menus, one can select from several peak-hold metering modes, view input or peak-hold levels numerically, and even set the number of clipped samples necessary to illuminate the OVER indicator. For a completely blank tape, Assemble mode, which writes both audio and subcode data, is used. Assemble mode allows striping a tape with time code *before* recording audio; audio can later be recorded in the Insert Audio mode, which doesn't affect subcode data. The subcode data recorded includes time code or absolute time, start IDs, program numbers, and skip or end IDs.

Playback provides many options, the most obvious being locate functions. The 7050 can locate using start IDs, absolute time (used by most consumer DAT decks) or SMPTE/EBU time code. If the Auto Rec function is selected, the unit writes a start ID every time it is placed in "record." A memory start function uses onboard RAM to store the first couple of seconds of sound, allowing instantaneous playback by pressing the "play" button. This feature can also be used in conjunction with the jog wheel to write start IDs with great precision.

Variable speed playback (up to ±12.5%) is achieved by pressing the varispeed button and dialing the jog wheel to the desired speed. This setting is retained when you exit the varispeed function, which is handy if you have to redo a section or vary a different section by the same amount. The jog wheel is also used with the spot-erase function, which enables the noiseless erasure of clicks or pops in the original

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FIELD TEST

source material (the 7050 itself makes no such glitches when entering or leaving "record"). The manual does not indicate the period of time that is erased by this feature or any way of changing that time; it appears to be about 10 milliseconds.

All of the menu functions mentioned (and many not mentioned) are implemented in a hierarchical structure of menus, available by pressing the display or menu button and rotating the jog wheel until the desired parameter is displayed. Submenu access is enabled from an appropriate menu selection, though getting to a particular function may require paging through several levels. For example, the time code setup submenu is not seen until the "setup menu grade" function is dialed from the setup menu and set to "enhanced," thus making it possible to dial up the time code setup function and setting it to "open," which, finally, makes the submenu available. Once a desired function is brought to the display, parameter values are changed by holding the data button and rotating the jog wheel. Fortunately, after completing this song-and-dance and realizing the specific configuration you need, those parameters can be stored in ten memory locations.

With the time code option, the 7050 reads and writes SMPTE or EBU time code in four frame rates (25, 29.97, 29.97df, 30), plus 50/60 Hz "film" formats. Generator and synchronizer operations can be referenced to external video or house sync. The 7050 synchronizes as a slave using only master time code (i.e., no master transport tallies are required) and locks up from park (when parked near the master's time code address) within four seconds or so. If the master code is far from the 7050's, the deck enters fast wind to get close to the address and then into "play" for lockup. Audio can be set to remain muted until lock is achieved or begin when the unit enters "play." Setting up the 7050 for chase-locking is as simple as connecting master time code and pressing the chase button.

I used the 7050 in a variety of contexts, including direct-to-2-track recording of an acoustic trio (two violins and mandola), digital-to-digital dubbing using a Lexicon 300 for enhancement, mastering a computer music

composition directly out of the computer, and syncing digital audio tracks to a MIDI sequence.

First and foremost, this recorder is intended for mastering applications, and, as you would expect of a mastering deck, the 7050 sounds excellent. I did not detect any of the harshness or spectral or spatial distortion that results from poor analog audio or A/D/A conversion. The machine read DAT cassettes recorded on other brands of recorders well, with the "playback condition" LED seldom lighting. This LED is the only indication that error correction or interpolation is occurring; there is no numeric indication of error rate. The transport operated smoothly, with quick autolocating and start ID searching, fast winding and good tape handling.

Digitally interfacing the 7050 to the Lexicon required no setup other than switching the input to digital and the sync select to D-I, then connecting a mic cable. (In spite of Lexicon's insistence that regular mic cable is not reliable for digital audio, my feeling is that this will be the typical case in the field. I experienced no problems using Canare StarQuad or even a cheap no-name brand, but the cable lengths were kept well under ten feet.) Without the editor (or the "Edit Memory" option), there is no way to control level of a digital input, which was one of the reasons for using an external processing device.

On the computer music mastering session, we were unable to stay completely in the digital domain because the 1/8-inch, three-conductor phone jack(!) AES/EBU output of the computer's D/A converter card did not function correctly. Consequently, clicks appeared at the beginning and end of each sound file playback when we used the analog outputs. This situation allowed us to try the spot-erase function. The 7050 left our master clean as a whistle. Because this master was for CD premastering, we needed to place the start IDs very precisely, so we used the Memory Start function to facilitate rewriting these IDs. Again, the result was perfect.

Locking up the 7050 was equally successful: setup was easy and operation was simple—a flawless performance. The onboard generator fulfills basic functions, but you may still need an external generator if you do a lot of time code work.

The 7050 is not without annoying

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shortcomings, such as the pesky user interface for the menu system. As mentioned earlier, adjusting one simple parameter can get pretty involved. Activating auto-record of start IDs requires enabling two submenus, and you must page through 14 menu parameters just to get to the first submenu enable. I suppose that once you configure and store everything, you won't often need to delve this deep, but some functions, such as activating time code regeneration, will need to be changed from time to time and can be a pain to get to.

Sony provides some helpful menu flow charts in the manual, with page indications for the explanation of each menu entry, but these explanations and the rest of the manual are not organized in a functional manner. For example, information about time code functions is scattered throughout the first five chapters. This would be fine if there were a functionally grouped, cross-referenced listing. As it is, I frequently found myself paging through large chunks of the menu explanations to find out whether the 7050 included a certain feature. Even when you find the information you're looking for—all the features are covered somewhere in the manual—the text is occasionally less informative or clear than I would like.

Sony envisions this level of recorder as a replacement for analog 2-tracks, and adding features like spot erasing, the jog wheel and variable speed playback goes a long way toward answering complaints that have been voiced in the past about using DAT for mixing and mastering. Although the 7050 we reviewed was incapable of punch-in recording from the front-panel controls, Sony says the feature should be operable by the time you read this.

In sum, the 7050 is a top-drawer DAT machine, suitable for the most critical applications and excelling in the most important areas of sound, synchronization and features. Other time code-equipped machines in the 7000 Series start at \$5,000, and while the PCM-7050 carries a top-drawer price tag of \$11,500, it nonetheless is justifiable to anyone whose applications demand—and budget allows—such a purchase. ■

Producer, musician and engineer Larry Oppenheimer has been a Mix contributing editor since 1984.

— FROM PAGE 35, MULTITRACK RECORDERS

and switching, and a function for copying from track to track in the digital domain. The D820-48 retails at \$199,000, including full-function autolocator.

At a U.S. price of \$65,000—including remote control, autolocator and prewired drawers for Dolby Spectral Recording (SR cards *not* included)—the Studer A820-24 is not for low-budget analog recording applications. The microprocessor-controlled A820-24 is a 2-inch, 24-track machine featuring 14-inch reel capacity, three tape speeds, reverse play capability, precision modular headblocks for simplified interformat transitions, Dolby HX Pro and fast wind speeds of up to 600 ips.

All of the A820-24's operating keys are user-programmable, with a choice of more than 40 functions from its internal software. The machine also offers the automatic alignment of audio parameters for all 24 channels simultaneously, with onboard storage for two tape formulations, along with programmable control of tape tension, spooling speeds, etc. For convenience in machine room installations, the meter bridge can be located up to 300 feet from the transport (via a single 4-conductor cable), and Studer recently announced the availability of a compact bar graph meter option that mounts in the remote control stand.

Priced at \$45,000 (including remote control and autolocator), the A827-24 is an analog 2-inch, 24-track recorder offering the same transport, head assembly and audio quality as its elder sibling, the A820-24. Features include 14-inch reel capacity, three tape speeds, switchable Dolby HX Pro, microprocessor-assisted alignment, reverse play with varispeed, RS-232/422 ports and an optional chase-lock SMPTE synchronizer.

Studer Revox America, Inc., 1425 Elm Hill Pike, Nashville, TN 37210; (615) 254-5651.

Tascam

With a worldwide installed base of 36 units is Tascam's DA800/24, a 24-track DASH-format digital recorder featuring proprietary ZID circuits in the opto-isolated D/A converters, two-times oversampling in record and playback, analog and digital cue tracks, 30-point autolocator, 40-character alphanumeric display, and both AES/EBU and SDIF digital I/O ports. Onboard synchronization is standard on this \$99,000 ma-

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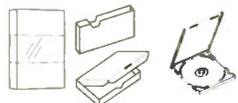



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chine, which can operate either as a slave or master code source. Some of the recorder's convenience features are emphasis and control logic switching at the remote control (under a hidden panel), an hours/minutes/seconds calculator, and an optional second meter bridge for remote use. Due to the DA800/24's extensive use of LSI circuitry, power consumption is only 850 watts.

The ATR-80 is a series of 2-inch recorders from Tascam, available in 24-track (the \$34,999 ATR-80-24) and 32-track versions (the \$44,999 ATR-80-32). Both recorders offer a microprocessor-controlled transport, with 14-inch reel capacity and a choice of 15 or 30-ips operation, with $\pm 20\%$ varispeed. Forward/reverse shuttle (at up to 150 ips) is provided via a rotary control found on the transport and the supplied RC-824 remote controller. Inputs and outputs are electronically balanced, XLR-type, and the outputs can be switched to unbalanced operation if desired.

Options for the ATR-80 include an RS-232/422 interface unit, a transformer-balanced input/output kit and the AQ-80 autolocator. The latter offers 20 memory locations, programable pre-roll times of up to 20 seconds and a digital stopwatch for convenience.

For those on a budget, Tascam's MSR-24 analog 24-track is priced at \$12,499. Using a 1-inch format with 10.5-inch reel capacity, the MSR-24 offers 7.5- or 15-ips tape speeds ($\pm 15\%$ pitch control), built-in dbx noise reduction, two location memories (and return to zero), table-top or rack-mount use, outboard power supply, bar graph meters with peak hold, and parallel and serial control ports. Options include the RC-424 full-function remote control. The MSR-24/S, a version with

Dolby S noise reduction, is \$13,999.

Tascam, 7733 Telegraph Road, Montebello, CA 90640; (213) 726-0303.

Yamaha

Yamaha's DMR8 is an integrated package combining a 20-bit, 8-track digital recorder and 24-input automated digital console with snapshot recall of all console parameters, moving fader automation and onboard digital effects (reverb, delay, chorus, parametric EQ, compression, etc.). Along with the eight digital audio tracks, two aux audio cue tracks and a time code track are provided. The DMR8 can chase-lock to incoming SMPTE time code; additionally, the unit slaves to optional DRU8 8-track recorder/expanders to provide a complete 16- or 24-track digital production system.

Audio data is recorded via a stationary head block onto Yamaha's proprietary metal particle cassettes, which record 22 minutes at 44.1 kHz or 20 minutes at 48 kHz. Rear panel connections include AES and S/PDIF digital, MIDI, time code, word clock and video sync jacks. To use the system with analog inputs, Yamaha offers an optional 8-channel AD8X analog-to-digital converter, with analog line inputs and Yamaha-format digital output.

All effects changes are resettable and automatable in real time; a similar procedure provides access to sends, monitor and cue mixes. Autolocation and sync capabilities are extensive, with 32 memory points, automated punch-in/out and several track-bounce modes for assembly editing and digital ping-pong. The DMR8 is \$34,000; the DRU8 expanders are \$22,000. Just released is the RC24 controller, which allows the use of up to three DRU8 expanders as a stand-alone 16- or 24-track digital recorder.

Yamaha Pro Digital Products, 6600 Orangethorpe Avenue, Buena Park, CA 90620; (714) 522-9011. ■

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World Radio History

by George Petersen

PRODUCT CRITIQUES AND COMMENTS

A

Audio-Technica AT4033 Studio Microphone

When it comes to selecting microphones, studio engineers are among the most conservative creatures on this planet. Perhaps "obstinate" would be a better term, since 99 times out of 100, engineers reach into the mic locker for those same "old standard" mics they've used on a zillion sessions. So a few years ago, when Audio-Technica debuted its 40 Series of condenser microphones, it was no wonder that it took a couple of years before industry pros started becoming hip to these high-performance transducers.

Now Audio-Technica has expanded its 40 Series with the 4033, a large-diaphragm cardioid mic that combines a gold-plated, "aged diaphragm" condenser element with low-noise transformerless electronics. Just under seven inches long, the 4033 is not large, and although weighing in at nearly a pound, the mic provides a substantial heft. At the back of the 4033 are two recessed switches for selecting a -10dB pad or low-cut filter. The 4033 is priced at \$699 with carry case and a shock-mount.

The 4033 employs a side-address design, with its capsule pointing in the direction of the A-T logo on the front. An open-cell, foam windscreen (about the diameter of a 50-cent piece) is permanently attached inside the mic body, between the grille and the capsule. The capsule is anchored via a floating mount that reduces the transmission of vibration and noise to the mic element.

I was anxious to test drive the 4033 on some studio sessions, although I was briefly stymied by the elastic suspension shock-mount. While the mount is seemingly straightforward, there are no instructions on its use. I expected something ingenious; this



was *ingenious*. After a minute or so, I deduced that one merely presses the mic downward into the mount until the elastic band snaps into the collar below the grille. The shock-mount proved to be effective in isolating vibrations and securing the mic, whether used upright or hanging from above.

The first task for the 4033 was kazoo (!) solos for the opening and closing credits on a comedy show theme for local TV. With three instrumentalists 20 inches back from the mic, it was apparent that the off-axis players were noticeably attenuated. There was a surprising lack of tonal change in the off-axis response—it sounded exactly like the front of the mic, just at a lower volume.

At this point, I accepted the reality that the 4033 is a single-pattern cardioid mic. With a multipattern microphone, I could have just switched to an omni or wide-cardioid pattern; however, by moving the least-loud kazoo player on-axis, the problem was solved. Of course, a cardioid pattern

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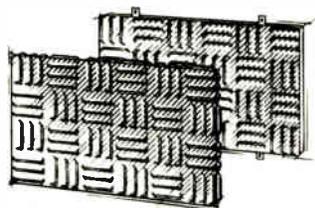
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AUDITIONS

can handle about 90% of all studio miking chores, and it is my guess that most multipattern mics are usually used in the cardioid position anyway.

On vocals of all types (narration, lead and background singers) the 4033 performed superbly, with the mic's capsule and electronics combination reproducing source material without any apparent coloration. In some instances this may prove detrimental, especially with vocalists who are accustomed to hearing their voice through vocal mics with presence peaks. However, a gentle touch of equalization can always help in those cases.

Incidentally, the 4033's cardioid design provides a quite noticeable proximity effect, which can be advantageous when recording vocals. The frequency response is uniformly flat, and the all-discrete, transformerless

from overloading the capsule's rear vents. Perhaps Audio-Technica could offer such an option in the future.

At \$699, the Audio-Technica 4033 is an affordable, versatile, clean, high-performance mic that sounds great on just about anything—as long as you remember to keep it indoors. Thumbs up on this one.

Audio-Technica U.S., 1221 Commerce Drive, Stow, OH 44224; (216) 686-2600.

Orban 290 R, Adaptive Enhancement Processor

For years, Orban has earned a reputation for delivering solid, dependable tools for pro audio and broadcast applications. While there are a lot of "me-too" products in the audio marketplace, there's nothing quite like Orban's 290 R_x™ Adaptive Enhancement Processor, a unit combining harmonic restoration circuitry and single-ended noise reduction capability in a



Orban 290 R_x

design of the amplifier provides for a signal-to-noise ratio of 77 dB with an A-weighted self-noise spec of 17 dB, which ranks with the best of any condenser microphones.

The mic's lightweight diaphragm has a thickness of two microns, which contributes to the 4033's impressive transient response. With a maximum SPL rating of 140 dB (150 dB with the pad switched in), the 4033 proved suitable for close-miking of horns and drums and other loud sources. Large-capsule microphones are not usually known for their high-frequency response, but the 4033 excelled on stringed instruments, struck percussion (chimes, bells, triangles, etc.) and sound effects/sample recording.

Speaking of the latter, the 4033 is designed for *indoor* recording applications, as the mic is highly susceptible to wind noise. While the low-cut filter helps reduce wind noise, an external foam windscreen would keep breezes

two-rackspace chassis.

Suitable for use on single tracks or mixed program material, the R_x is designed to increase the detail and intelligibility of single tracks or mixed program material. Its harmonic restoration sections add second harmonics (one octave above the source frequency) without introducing difference-frequency intermodulation (IM) distortion. Each channel's noise reduction section consists of a dynamic (program-controlled) lowpass filter that is placed *before* the restoration circuitry and a downward expander *after* the restoration circuitry. Therefore, noise originating from both the input source *and* increased from the enhanced portions can be dramatically reduced.

The unit's front panel is logically laid out, with each channel's controls clearly marked. A central switch allows use of the unit as two independent mono channels or linked in stereo.

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The 564E is equally at home on the road, thanks to its rugged steel chassis, industrial-grade PC boards and wide input voltage power supply. The XLR connectors accept balanced or unbalanced line level signals, so your lines will never be left hanging.

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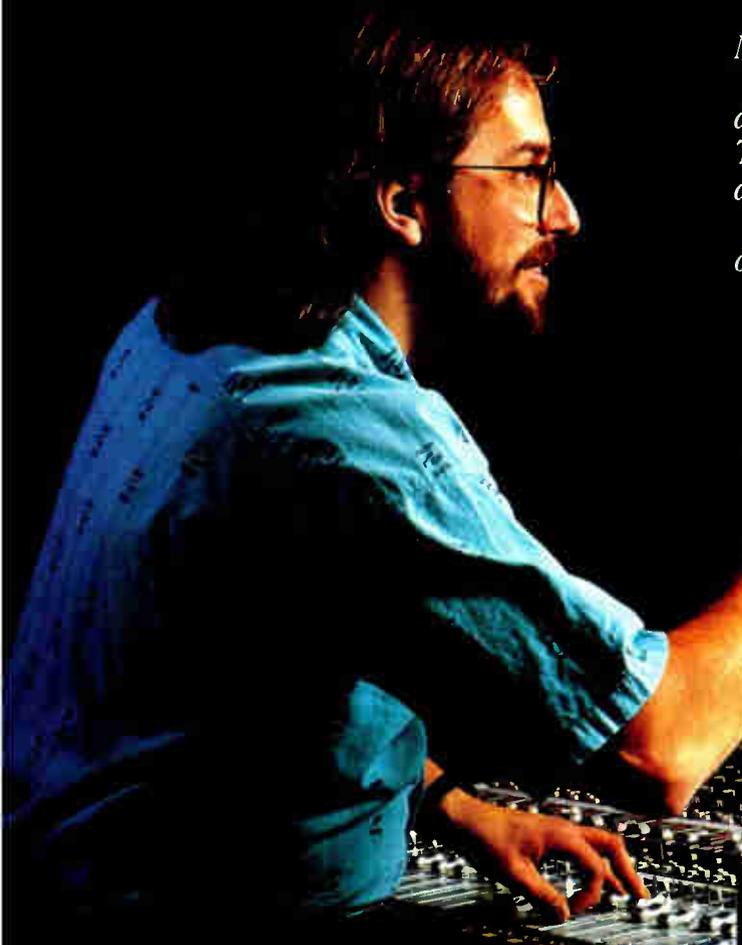
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**Prosound Japan, February, 1990*

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AUDITIONS

Large, bright LED ladders display the action of the dynamic filters, gain reduction circuits and output levels. The restoration and noise reduction sections of each channel have individual bypass switches. There is no overall bypass control, so all four bypass switches must be pushed simultaneously for certain A/B comparisons.

One nice touch is "detail," a third position on the restoration in/bypass switch, which allows the user to hear only the enhanced elements that are added to the main signal. This feature really lets the engineer hear what is being added to the signal and speeds

up the process of tweaking sounds.

Rear panel connections include both balanced XLR and barrier types, operating at +8dBu; users with -10dBV systems can convert the R_x for semi-pro levels via internal jumpers.

Operationally, the R_x is a breeze, especially to anyone familiar with typical harmonic enhancement and single-ended NR systems. The unit's wide-ranging controls allow effects from subtle to overbearing, and after a few minutes with the R_x anyone can become an expert. Most applications can be handled using the spectral level (dynamic phase and amplitude equalization) control, with a slight amount added via the harmonic restoration

Studio Seconds: An Assistant Sound Engineer's Handbook

Those zany, fun folks at First Light Video Publishing are at it again. Having conquered the world of audio instructional videos with their acclaimed "Shaping Your Sound" series, they've unleashed another volume, this one entitled *Studio Seconds: An Assistant Sound Engineer's Handbook*.

Like the earlier videos in the series, this also features noted author/clinician/engineer/producer Tom Lubin; however, *Studio Seconds* was produced by AFTRS (the Australian Film, Television & Radio School) and is distributed by First Light. The package, including an 80-minute VHS tape and 150+-page manual, is priced at \$99.95 for individuals or \$179.95 for schools and institutions.

The first thing I wondered about the course was whether it covered the nuances (ha, ha) of being a second engineer, such as making coffee. And sure enough, the video opens with a comedy relief sketch featuring a bumbling second engineer starting off the day by making coffee for the clients. Of course, the humor is not used to belittle the importance of the second engineer (no one really appreciates a *good* assistant engineer until they have worked with a bad one) but to reinforce the point that being a second engineer requires an organized, detail-oriented person who can handle many tasks simultaneously.

In both the video and the ac-

companying text, *Studio Seconds* emphasizes both the technical and "people" aspects of the job. The course covers recorder alignment in great detail. While a seemingly mundane task, tape alignment must be done correctly, and in doing so, the second engineer is responsible for handling the client's valuable (and sometimes priceless) master tapes—hardly the sort of task assigned to the kid who gets the coffee. Also covered are various studio operations procedures (such as studio setup and bookings), SMPTE time code, tape editing, tape handling/storage methods and more. Perhaps more importantly, the course stresses professionalism in handling client relations/problems—after all, such people skills are essential to anyone who expects to succeed in an industry where egos are bound to clash.

Studio Seconds: An Assistant Sound Engineer's Handbook offers an excellent presentation on the basics of the job, giving prospective entrants to the field an insider's look at this all-important, entry-level position. Tom Lubin's authoritative yet easygoing manner gets the details across, while the combination of the text and video work synergistically to help the viewer assimilate material quickly.

First Light Video Publishing, 8536 Venice Boulevard, Los Angeles, CA, 90034; (310) 558-7880. Also available through Mix Bookshelf: (800) 233-9604. ■

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AUDITIONS

controls for a little extra zing on top.

In mix sessions, the R_x is especially useful on vocals and solo instruments (especially sampler and synth sounds), where the unit adds clarity and punch to tracks without appreciably adding level or emphasizing sibilants. In tracking, it provides a nice sparkle to drum overheads without becoming harsh. One caveat: The R_x 's sonic restoration effect can lull the user into using too much, particularly when dealing with program material or after spending a few hours on a high-level tracking date. If a little sounds good, then a lot must sound great, right? A bit of subtlety can go a long way, sometimes.

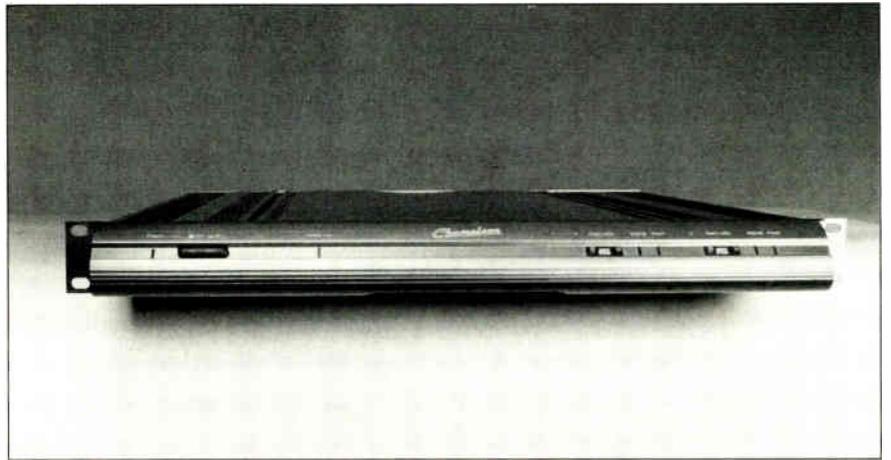
Priced at \$1,200, Orban's 290 R_x Adaptive Enhancement Processor is a flexible unit that fits nicely into a lot of audio applications: recording, broadcast, sound reinforcement, disc mastering and tape duplication chains. But before you check it out, be warned that this is one addictive little box that can become habit-forming.

Orban, a division of AKG Electronics, 1525 Alvarado Street, San Leandro, CA 94577; (510) 351-3500.

Hill Chameleon Amplifier

While Chameleon is probably not the most likely name for a power amplifier, it seems appropriate for Hill's latest offering. Like the changing colors of its animal namesake, the Hill Chameleon provides a number of surprising at-

Hill Chameleon can push a 1,200-watt, bridged-RMS sine wave into a 4-ohm load. Second, while Hill has produced high-powered amps for years, aren't they a little on the heavy side, such as the 900 W/ch DX3000, which topped the scales at nearly 80 pounds? Wrong

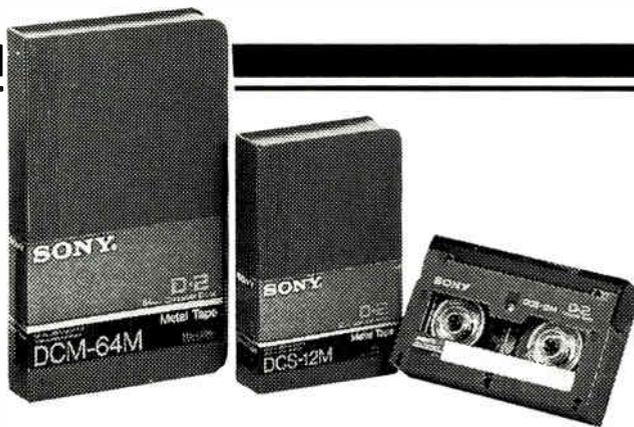


Hill Chameleon Amplifier

tributes. First, everybody knows what to expect from a single-rackspace amplifier: Aren't they great for low-power applications such as driving headphones or tweeters? Wrong. The

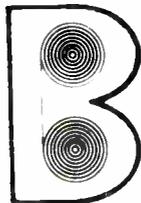
again, as the Chameleon weighs in at a svelte 29 pounds.

From even a quick glance at the amp's front panel, you can tell something's different. The sloping front-



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World Radio History

AUDITIONS

panel recessed switches and illuminated attenuators look more like part of the Starship Enterprise than something out of a pro audio rack. Inside, Chameleon employs a high-speed, bipolar design combined with a *non*-switching power supply. Cooling—a major concern in high-power amplifiers, particularly those in compact packages—is accomplished via a variable-speed fan and heat sinks that are an integral part of the chassis.

A sensing circuit keeps the fan off when the amp is idling or driven intermittently, such as in studio applications. The low fan speed doesn't even kick in until the heat sinks reach 113°F. Above 140°F, the fans gradually begin speeding up.

Chameleon features electronically balanced XLR and 1/4-inch inputs, five-way binding post outputs, mono bridging switch, push button gain attenuator controls and a five-level protection scheme that protects against direct shorts and other catastrophes. If thermal overload threatens, a "Head Lok" mode automatically shifts the Chameleon from normal operation

(with transient reproduction of up to 210V p-p at a 20% duty cycle) to a limited 40% duty cycle with maximum transients in the 160V p-p range. Thus, amp operation can continue, but at a reduced dynamic range.

Over a period of months, I used Chameleon in a variety of situations, ranging from driving bass bins in live sound systems to powering studio monitors, large and small. Overall, I was pleased with the results. Although Hill literature and ads tout a power spec of 2,000 watts, referring to 8-ohm bridged mono of "program power," the amp really delivered over 680 watts/channel RMS continuous into a 4-ohm load, but it's clean and very musical. Transients were crisp and accurately reproduced, thanks to the Chameleon's 100V/μs slew rate, which is respectably fast for such a high-power amp.

Even at the higher fan settings, fan noise was not objectionable and is comparable to the fans on some hard disk drives I've heard. At all speeds, the fan is effective and does an admirable job of keeping temperatures under control. One clever innovation is the fan inlet located just beneath the front

panel; this cutout doubles as a handle for carrying the Chameleon or pulling it out of the rack, and also provides access for removing the outer foam air filter for routine cleaning.

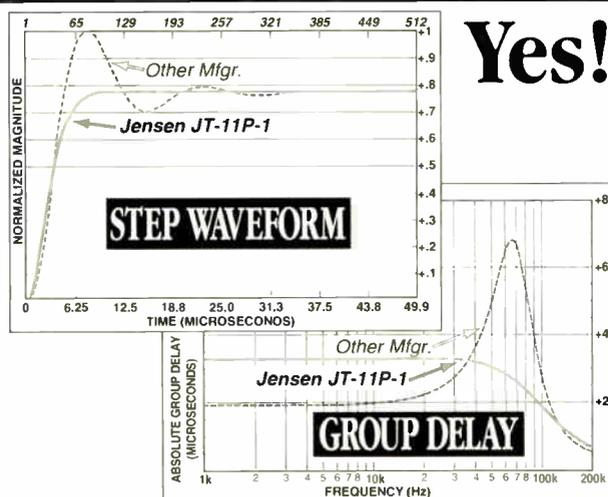
One minor quirk I encountered concerns the unit's ample depth, which may prove problematic, depending on the configuration of your studio or live sound racks. With a front-to-back dimension of over 20 inches (not including connectors), Chameleon may have a problem fitting into many cases or studio racks.

Overall, the Hill Chameleon is a solid performer that packs a wallop for its \$1,599 price. According to the manufacturer, Chameleon is the first in a series of new power amplifiers, and it will be interesting to see what the future holds for the design talents of Malcolm Hill.

Hill Audio, Box 2344, Fort Worth, TX, 76113; (817) 336-5114. ■

George Petersen began working in professional audio 25 years ago, and has written more than 200 articles covering nearly every aspect of recording, live sound and music production.

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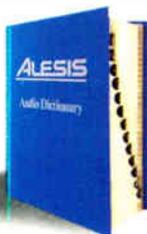
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* Total Harmonic Distortion + Noise: too low to measure. Keyboard Magazine July 1990.

by David (Rudy) Trubitt



SOUND CHECK

Cinema Sound

Vancouver's Orpheum Theater was the site of a private screening of *Terminator 2* for the Beacon Group, a Canadian film investment company. Leader Sound Technologies Corp. of Vancouver was contracted to provide sound for the 2,700-seat venue, which is the regular home of the Vancouver Symphony. System designer Michael Leader decided early on to provide a full Dolby SR surround system for the event, with a subwoofer system capable of handling the film's low-end effects.

The concert hall has a mid-band RT60 of just over 2.5 seconds, with fairly hard walls. To preserve the intelligibility of the dialog, a slightly narrower-than-usual 60° coverage pattern was chosen for the mains, which kept reflections from the walls to a minimum. EV MT-4H cabinets were used for the left/center/right under-screen speakers (see photo). Four Intersonics Servo-Drive subwoofers filled out the low end. "Even in the balcony,

the dialog was smooth and intelligible," Leader says. "The low-frequency effects were astounding. I think we set this concert hall into resonance." QSC amps were used for the MT-4s and Crest 8001s were used for the subs.

Surround was provided by EV S-1202 boxes with 90° x 40° coverage patterns. Custom steel stands up to 15 feet tall were constructed for the 70-pound enclosures. Aside from the ServoDrives, which came from Equity Sound of Toronto, all rental audio equipment was provided by Vancouver's Western Sound, whose Craig Zarazun and Dan McGee were on hand to help put up the system. Time constraints prevented the use of as many surrounds as originally envisioned, but that turned out to be an advantage. "I thought we were going to need many more surrounds, but it became a case of more is less. The comb filtering we would have had with 15 or 20 channels would have been a detriment," according to Leader. By all accounts, the screening was a success, with

Leader Sound Technologies' Terminator 2 sound system—MT-4s and ServoDrive cabs.

many attendees commenting on the added excitement the sound system brought to the film.

Fall Tour News

Electrotec (Canoga Park, Calif.) had nine tours out, including Alabama, Tom Petty, Queen, Rush, Cher, Barry Manilow, Ricky Van Shelton, Rod Stewart and Randy Travis. The company is also in rehearsals with Guns N' Roses. "The winter last year was as bad as I've seen in the tour business," Pierre D'Astugues says. "Since March, it's been a very busy year for us. We've been lucky to work with artists who are working through the end of year. It's coincided with the introduction of our new loudspeaker system, the LAB-Q2. We've built a new flying array on an integrated system concept. It forms a curve, with an underhung box at the bottom for front fill. This opens up the sight-lines even more by eliminating the need for ground-supported floor fill." Electrotec also added four more Gamble EX consoles and two more Crest drive systems, including the new Crest 4601s for high-frequency applications. "Design requirements are different for high-end amps," D'Astugues says. "They don't need a big power reserve. Crest has developed the amp [the 4601] for our needs."

Clair Bros (Lititz, Pa.) was in rehearsals with Prince at Paisley Park in Minneapolis. Added to their list of ongoing tours is Bob Dylan, Richie Sambora, Kenny Rogers, C&C Music Factory, and a coliseum-sized contemporary Christian show, The Young Messiah tour, done in the round. The long-running Sting tour played a date in Mexico City, and Paul Simon's tour continued through China, Singapore, Australia, South America and Mexico.

Showco (Dallas, Texas) had several tours going in Europe,

—CONTINUED ON PAGE 108

Live Sounds Reba McEntire

Performer: Reba McEntire
Venue: Oakland Coliseum,
 November 1, 1991
Rental Company: Showco
FOH Mixer: Ricky Moeller
Monitor Mixer: Robert Kosloskie
System Engineer: Doug Hall

"I've been mixing Reba for eight years—from rodeos and county fairs to the big time," house engineer Ricky Moeller says. As with many country acts, McEntire tours constantly—about ten months each year. This time out they've played sell-out shows at everything from proscenium theaters and state fairs to 15,000-seat arenas, with the occasional plane ride to corporate dates.

Moeller describes his daily routine: "First, we do a systems check and make sure all of our components are happening. Then I run it up with 60 Hz and set the delays between the sub-bass and the array." He sets the delay time by listening for the largest level peak while watching 60 Hz on an RTA. "Some people go by set formulas," he continues, "but I like to listen to the room. If you walk it off with

the formula, it works out about the same. Then I run pink noise up and look at what the room's doing before EQ." Moeller runs the Showco EQs uniformly boosted across the band, which leaves extra range for up to 20dB cuts when required.

The domed ceiling of the

Harrison console and Crown amps at monitor position.



venue presented a challenge to Moeller. "The main problem in this room," he says, "is throwing HF up to the very top. With the low trim, I couldn't go much higher. The beauty about the Prism system is that if you get your points and get trimmed, you can fill up the room. I also like the way it loads into—and how much you can get in—the truck."

A Yamaha PM3000 is shared by

Reba and her support acts at the FOH. "I like to run that console low," Moeller says, "because the summing amps on the main outputs get a little grainy—that's why everybody seems to mix the output and the cue buses in the same range, so your summing amp's not sitting up there freaking out." Stage volume of the nine-piece band is also held to moderate levels. "We don't have any onstage amplifiers, and Reba's using Future Sonics Ear Monitors.

We may move the vocalists and wind players to them soon."

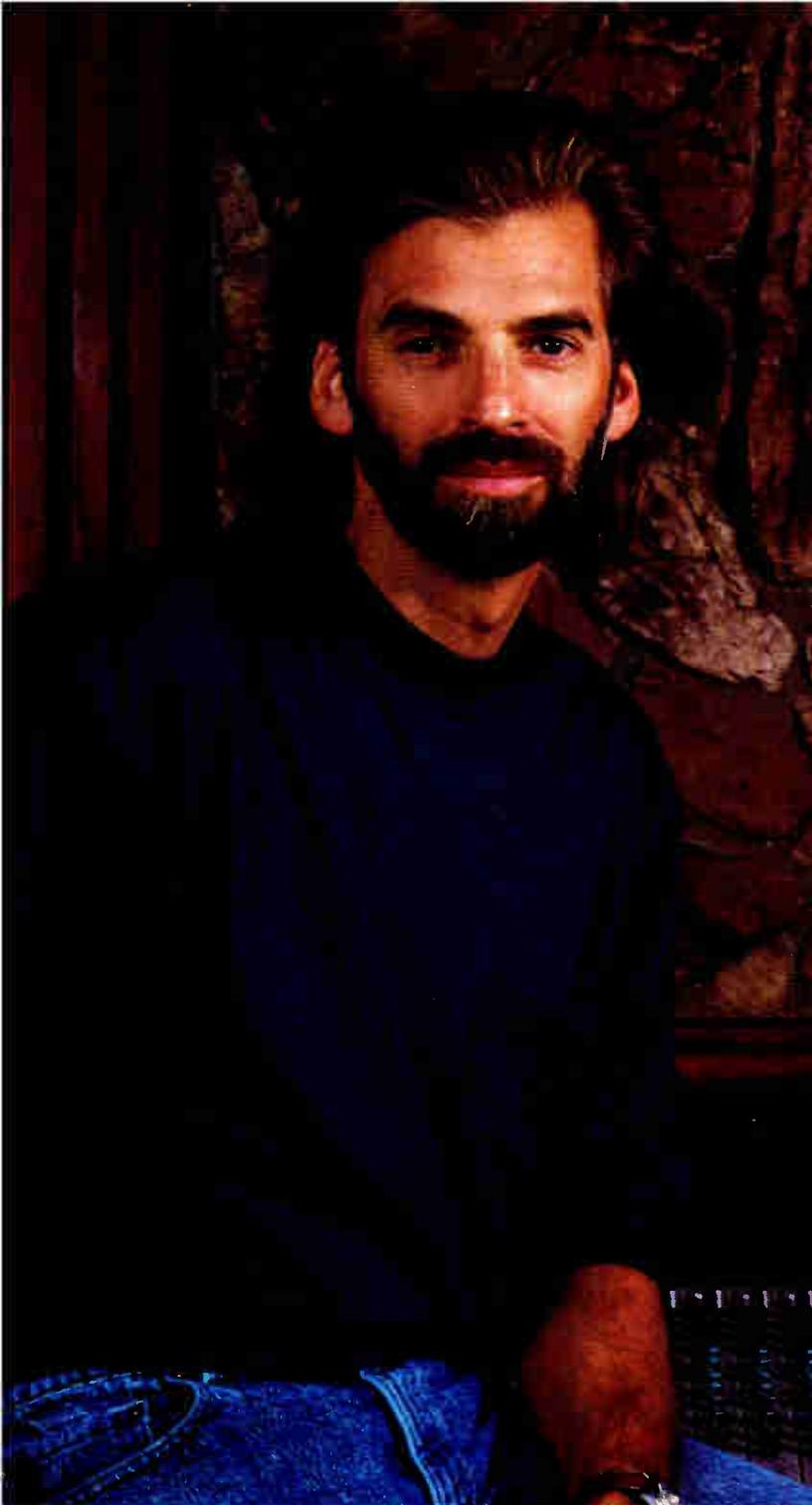
However, Moeller's not looking to replace all stage monitors. "If you put everybody on them, you just have drums sticking out. You want a nice little rhythm balance up there. People who need high-volume monitors should go on Ear Monitors, and

their troubles will be over."

Robert "Kosmo" Kosloskie has been mixing Reba's monitors for more than five years. Until recently, he practically surrounded her with monitors. "I had them everywhere—on the floor, in the sky, front and back—it was really loud." Switching to the Ear Monitors dropped the stage level and reduced the box count. The transition took a little adjustment. "She and I are both getting used to it a little more," says Kosmo. "We know what to expect and what we can and can't get out of it." Initially, Reba wanted only her



Ashen White Sound (Rexdale, Ontario) fields four sound and light systems in Eastern Canada and the Northern U.S. The five-year-old company uses Turbosound TMS-3s and TMS-4s, Soundcraft and Yamaha consoles, and Crown amps. Pictured is one of their rigs at a recent Rikah concert at the CNE Coliseum in Toronto. The show included 22 kW of Turbosound with 24x8 monitoring.



When I return from the road, it's such a relief to have a home studio equipped with a console that gives me the freedom to be creative and experiment when the mood hits. My AMR console has all the professional features I need including a MIDI command center and up to 56 inputs available at mixdown. The possibilities are endless with this console."

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World Radio History

vocal in her ears, but gradually asked for more and more instruments. "I have a full band mix going in there," Kosmo says. "I try to make it sound as much like the record as I can." An Aphex Dominator limits the Ear Monitor levels. "I'm using 15 sends [on the Harrison monitor console]," he adds. "She's got a left, right and a reverb send. I've got 11 band mixes and a sub for the drum monitor. I've got a PCM70 on her reverb, an SPX90 as a delay for the background vocals, and a Brooke-Siren DPR 402 dual limiter. I've got a couple of 904s on the drums and 903s on the backing vocals. It's pretty straightforward."

Mix duties during the show are shared by system engineer Doug Hall. "There's a lot of movement happening on the faders," Hall says. "I have half-a-dozen faders that I run for just solos, acoustic guitar, steel guitar and one of the electric guitars. There's a lot more blending of levels in this type of show than in a lot of rock shows." Levels are in keeping with the music's varied audience. "The acoustic stuff is 90 db, and we go over 100 db for some of the hot numbers," Hall adds.

Already, Moeller is looking ahead. "Next year we'll go with the Harrison," he says. "We'll either keep the 3000 or add another for the opening acts. I'm going to add more effects. I just have the bare essentials—a Lexicon 224, an Eventide 910. Next year I'll be going to a Yamaha DMP-7 with the two SPXs built-in. I'm going to MIDI everything and go to a Lexicon 480, three PCMs and an Eventide H3000. We'll label the songs on the PCM70 and just step through them with a MIDI foot-pedal [using program change messages]. We'll also add a delay and equalizer for tying into shed lawn systems." However, Moeller keeps an eye on his own wish-list. "I try to give her as much fidelity as I can and stay within the budget. We don't want to price ourselves out of venues, because that's our bread and butter. We try to cooperate with the big picture but still not compromise any details."

The bill at the Oakland show started with Aaron Tippin, followed by Vince Gill. Tippin's FOH mixer, Tim Prince, added a word of advice for would-be opening act mixers. "Learn to work with every piece of gear and any console," he cautions. "because if setup runs late, that time comes out of your soundcheck. You can work on instrument sounds during the set, but make sure your lead vocal is happening during soundcheck, because that's the most impor-

tant thing."

"This is a combat audio gig," says Gill's FOH man, Hugh Johnson. "It's a different P.A. just about every night. We're fortunate to work with a P.A. like this one. Next year we'll probably have [our own] production for 50 to 75 percent of our shows." Gill's monitor engineer, Sam Parker, adds. "Trying to get the level of consistency that the band and Vince want on different stuff every day is quite challenging." ■

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by Linear Productions (Emeryville, CA) and Theatrical Rigging (Half Moon Bay, CA)... Sound Reinforcement Services (Athens, GA) has been busy with several installs, including The 40 Watt Club and The Foundry, both in Athens. SRS is also doing church and sports field installs in Boston and Nashville. The company has sold 36 SR1 Mirror System stacks to other rental companies since July, and has added a Soundcraft Europa to its own rental inventory... American Audio Production Services (Pacheco, CA) has taken delivery of a 32x12 Soundtracs Megas Stage monitor console. The company already has a 40x8 Soundtracs house console. John Monson told *Mix*, "I looked at a lot of consoles. For the money, this can't be beat. I haven't had any complaints from the many engineers who've worked on it, even the skeptical ones." The company has done installs for years and is moving into more rental and one-off work... Pro Media (El Sobrante, CA) is providing its Schoeps BLM Plate mic system to the San Jose Symphony, which uses sound reinforcement for its Pops Series concerts held in venues ranging from basketball arenas to lawn shows. The company is also providing two complete Meyer Sound systems to leapfrog Pavarotti through a South American stadium and arena tour... QSC has published a guide, "How To Buy A Professional Power Amplifier." The non-partisan guide covers important topics in lay terms, and is available through dealers or the company directly: QSC, 1926 Placentia Ave, Costa Mesa, CA 92627... Speaking of literature, Electro-Voice is offering a new chapter in its PA Bible Series, covering electronically controlled speaker systems. The chapter was prepared by Ray Newman, who was a driving force in the development of the DeltaMax line. Send \$5 to EV, Attn: Dolly Anderson, 600 Cecil St., Buchanan, MI 49107. ■



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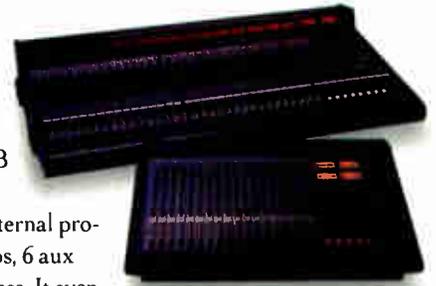
"There are two more PM series consoles. And they start at a mere \$5,500 MSRP. So obviously, they're for those situations where you want the best console available. But you don't have the space or the budget to get the 3000.

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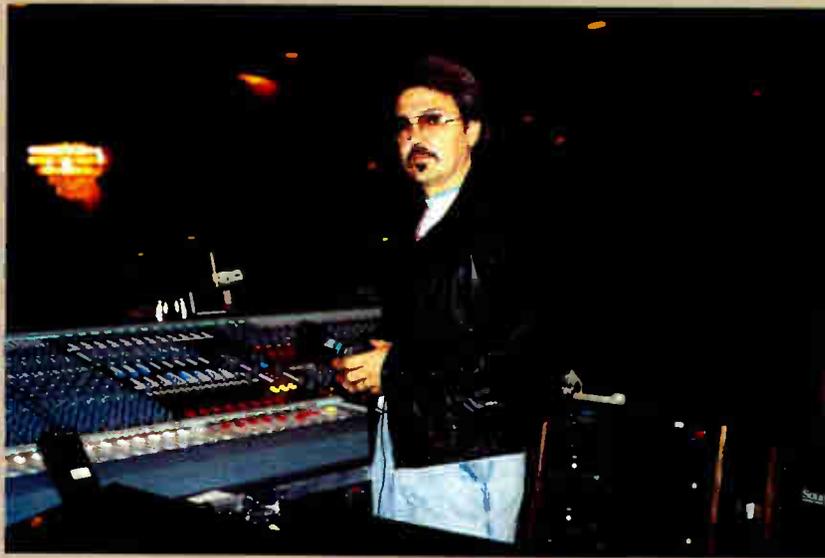


“Obviously,
they're both
ripoffs of
the Yamaha
PM3000.”

On Tour with Baryshnikov, White Oak and Europa

Brian English thought he was done with the road. He was happily working in Atlantic City, mostly at the Taj Mahal, mixing everything from lounge acts to his personal favorite, full orchestras. But it was his affection for orchestral sound reinforcement that pulled him away from house and home a few years ago to mix an arena tour with dancer Mikhail Baryshnikov. He's out with him again, touring concert halls with the White Oak Dance Company. The show also happens to be carrying the first Soundcraft

Brian English at the console.



Europa console in the States, fresh off the floor of the fall AES. The production's audio equipment is provided by Pro Mix (New Rochelle, N.Y.).

What role does English see for sound reinforcement in this setting? "To embellish without being noticed," he says. "To make the listeners feel that they did not

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hear a reinforced concert, but a well-adjusted hall. We're traveling with 16 musicians, but one of the pieces we're doing in the show was written for a 90-piece orchestra. Misha [Baryshnikov], being very much a purist, was reluctant to do it with less, but with a little coaxing from myself and the conductor, we convinced him that we could pull it off. I'm trying to give the impression of that many players without being over-reinforced. I don't use

chorusing. I don't want to change the tonality in any way. It's got to be pure—it can't sound electronic. A little creative reverb and room ambience gives that impression.

"The Europa has a couple of neat tricks," he continues. "The aux return section of this console can expand the stereo image. You can widen things out—do little 30° phase inversions and what-not. It gives the hall a little wider feel. You can use three identical reverbs, and just by playing with

your spacing, you can give different presence within your stereo field. It gives it just enough room to breathe."

English is a firm believer in a left/center/right stereo image. "You can really get creative in a proscenium when you're using a center cluster and you make it an active part of your stereo field, as opposed to mono with stereo happening around it," he says. However, the Europa is not exactly a three-image stereo board. The solution? "You can achieve a three-image stereo field, you just can't travel it [from hard left to hard right]," he notes. "If you give up four subgroups and you assign subgroups 1 and 2 to left-left/center and 3 and 4 to right/center-right, you have two fields of stereo to place things in."

English elaborates on the console's design: "The console has a lot of well-thought-out bells and whistles. It has a lot of flashing lights, and it's very attention-getting in an audience, and that's bad in a situation like this. On the positive side, the VCAs on this console have muting, so when you cue a VCA, you wind up getting a stereo mix of all channels assigned to that VCA, so you can sub-stereo cue different groups, which is really interesting. Also, any VCA you mute, mutes all channels assigned to it. In essence, that's giving you an additional eight master mutes, so you wind up with 16 master mutes. In this show, it's great because they reconfigure the pit every movement. I double-mic a lot of the chairs because we don't have the luxury of being able to move the mics. The 16 memory mutes are valuable because as soon as a string player stops playing, they're going to hit that microphone. It's written in a law somewhere! You've got to be able to mute these guys out, and if you're running 40 or 50 channels on an orchestra, you don't want to do it manually."

His speaker system of choice is Apogee: "My normal rig is three clusters up, four AE5s in the center, and a single AE10 sub with three AE5s underhung on the left

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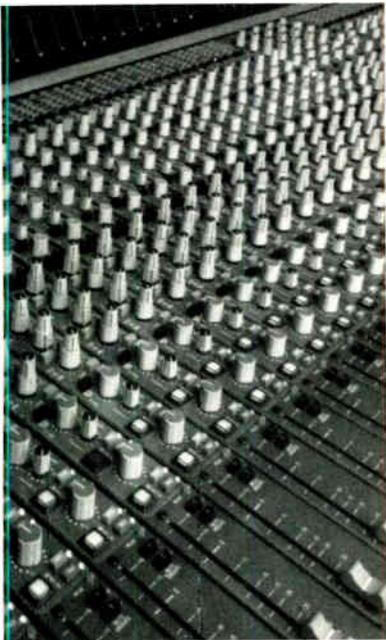


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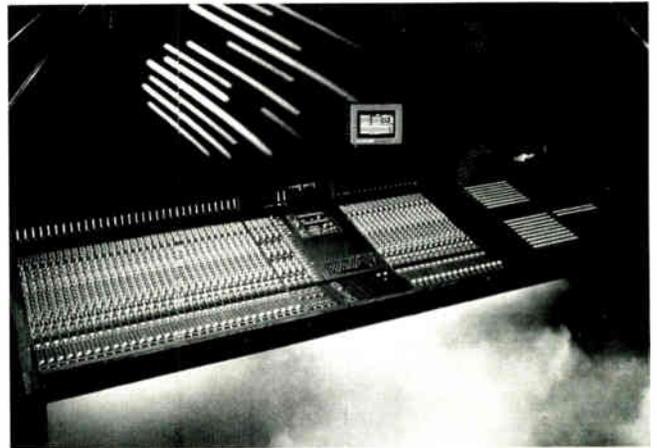
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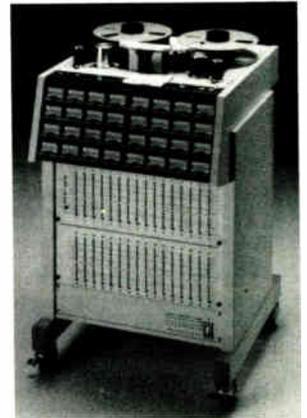
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and right. On the deck, I usually use a pair of 10s with three 5s, and I try to keep them real low; the real coverage is from the air. The thing I like about Apogee speakers is that they do not color what I'm doing. I'm not going to say they're flat out of the gate—you have to work them a little bit—but it's a warm box. Meyer boxes, the small ones, are very good pop boxes, but for this I feel they have a little too much of an edge. [On the last shed tour] I went with the rig I have now, plus long-throw 3x3s. Some people tried to talk me out of the 3x3s. I heard that they were just a loud box. But they really do throw a nice, full range. When you get them up really high, they do the trick." Simple stage monitoring is provided to the pit and the dancers. Two Hot Spot monitor mixes go to two members of the orchestra, and a few AE5s are flown above the stage to help the dancers stay real-time with the orchestra, instead of following the hall's slapback.

How about microphones? "For the piano, I use a Neumann U87 on the top and an AKG 414 on the low end and 451 for the mids," he says. "Woodwinds are usually AKG 535s or Sennheiser 518s. Snare drum, a 57. I use Sony ECM-77s on the upper strings and Crown GLM 100s on the lower strings—they're a little bit warmer.

"You couldn't ask for a better tour to be on," English concludes. "The people are great, and you have high-class music to mix every day. Misha is very in tune with what is happening around him technically—the lighting, the sound, every nuance the musicians play. He hears it and sees it all, so he's the toughest critic. So far he's happy, and that makes me happy." ■

David (Rudy) Trubitt lives and works in the San Francisco Bay Area.



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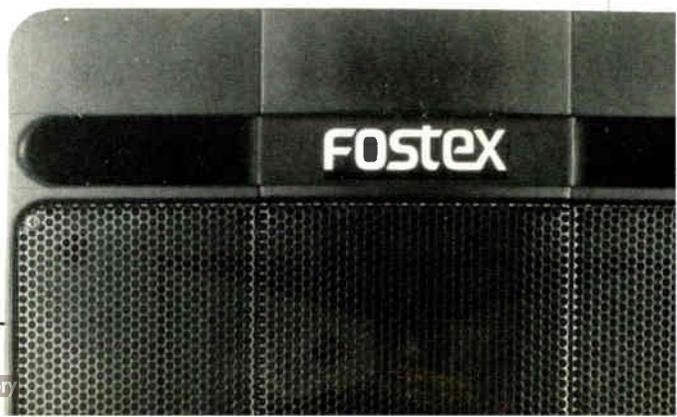
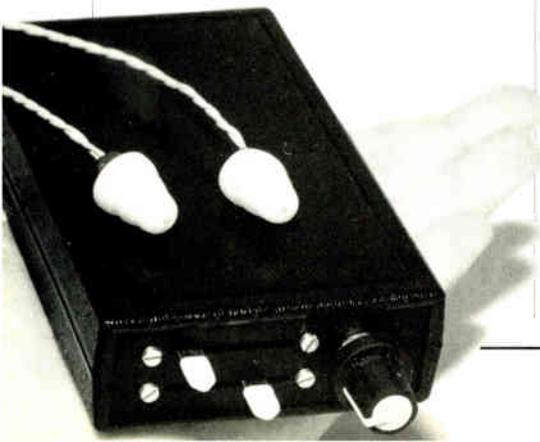
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Johnson (Carl Bradshaw), the catalyst in dark glasses, who eventually joins Aloysius and Inga and turns their romantic idyll into a near tragedy when the ménage à trois forsakes the harmless pleasures of ganja and fornication for money and violence.

Produced by Paul Heller (*My Left Foot, Withnail & I*) and executive-produced by Island Pictures' Chris Blackwell and Dan Genetti, *The Lunatic* has successfully achieved what no other film about Jamaica has managed since *The Harder They Come*. With its blend of humor and poignancy and an infectious soundtrack that includes cuts by the likes of Toots & the Maytals, Black Uhuru, Burning Flames, Donovan, Admiral Tibet, J.C. Lodge, Wally Badarou and Aswad, *The Lunatic* introduces a cast of vividly realized characters that, once met, you don't want to leave.

The Lunatic was filmed over a period of ten weeks in various locations around Jamaica, including Ocho Rios Harbor, Falmouth and Runaway Bay. Post-production took five months, with some additional remixing, and audio post took six weeks. It was completed at EFX Systems in Burbank, Calif., a digital facility whose feature credits include *The Rapture*, *Torch Song Trilogy* and *Talk Radio*.

"One of the reasons we chose EFX and were so excited about going there was that they do all of their sound editing and recording on digital," Genetti explains. "We also chose them because Lol has the background and experience and interest in digital audio, and because *The Lunatic* has some very unusual audio demands. It made sense to record and then mix the picture digitally.

"We got several other bids from different facilities that were highly competitive," Genetti adds, "but we decided to go the less traditional route."

The film presented several challenges, particularly in post-production, for Genetti and associate producer Marnee Bie (whose credits include *The Whales of August* and *Far North*). "First off, all of the environmental sounds were particularly important to this film because it was shot on location in Jamaica, and we were very keen to give it the right atmosphere," explains Bie. "So we were all intent on getting a good sound effects mix that we could

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play almost like part of the musical score."

According to Genetti, the other big challenge was "all the speaking voices of the trees, the bushes and the animals. It's an element that makes *The Lunatic* really unusual, and to be honest, we weren't sure how we were going to handle the audio for all those effects."

At one point, the filmmakers toyed with the idea of using a musical sound or theme to symbolize the voices. "Lol started working on some initial soundtrack themes and ideas with producer Trevor Horn, and they came up with various ways of doing it," reports Genetti. When Wally Badarou was brought on to compose the music and coordinate the soundtrack, he also played around with similar ideas.

"Using various harmonizers and computers, he created this intriguing, gurgling sound to accompany the tree voice," reports Genetti. "It suggested sap rising through the tree, but it also took the concept a little too far out and made it sound too surreal when we started playing with it on the mix."

Ultimately, the post-production team went back to using the tree voices as originally recorded—actor Reggie Carter provided the voice—and then treated them. "In some cases we added a touch of reverb, and to give it a larger-than-life effect, we put it through all the channels of stereo so that we got surround sound instead of just up-center where you usually have your dialog channels," Genetti says.

"We also spent a lot of time auditioning bushes and cows," admits Genetti. "That's got to be one of the strangest calls I ever put out in post, but the actors were pretty understanding. The director and producer had already recorded a lot of the voices earlier while on location in Jamaica, but when we got to post we discovered that some of the voices weren't right for a variety of reasons—because of the way the picture had been cut, or the timing wasn't right, or the accent was too strong to understand."

Faced with having to revoice some of the bushes and trees, Genetti and Bie returned to Jamaica and booked a sound studio in Kingston where they recorded half-a-dozen local actors. "Those sessions gave us the voices for the cricket ball and the cows, in addition to the bushes. They were unusual sessions," Genetti recalls.

Genetti adds that "even more important was the overall audio question of the 'sound picture' that the director wanted to draw with *The Lunatic*. For instance, we put a lot of effort into creating the sound of wind. Wind is very important to Jamaica and this film, and it's also an extraordinarily difficult sound to capture and reproduce realistically."

Naturally enough, during production the sound recordists spent a lot of time "trying to eliminate the wind sounds," says Genetti. "We had some wild tracks of wind that we weren't really happy with, so Lew Goldstein, our sound editor at EFX, created what you could call a symphony of wind. He had about five different wind sounds, which he then blended. We used some or all of them at various points in the film soundtrack.

"It was the most difficult effect to achieve—a believable and non-intrusive wind," he adds. "By contrast, insects and animal sound effects were more standard, although we did have some trouble in one or two scenes, especially in one sequence where there is a close-up of a bee on a flower."

According to Genetti, the post-production team quickly decided that the only believable bee sound was in fact "a human imitating a bee. We went through all the library stock sound effects available, and none of them sounded realistic in the film. We discovered that there are sound effects editors who specialize in different types of sound effects, and there are 'bee experts,' and that's what we used in the end."

In another night scene, the production was plagued by "a very annoying cicada bug," reports Genetti. "The angle would also change as the boom man altered the position of the mic, so when we got down to post, one of the first things we tried to do was to eliminate as much of the sound as possible by gating and filtering out those frequencies."

Speaking of the pros and cons of using digital versus analog systems in post-production, Genetti states, "Generally, there's a bit of a controversy raging over which is superior. Those who are familiar with analog say that their system is better because they get to make the cuts and have a lot of hands-on contact with the sound, whereas those editors who are more

—CONTINUED ON PAGE 135



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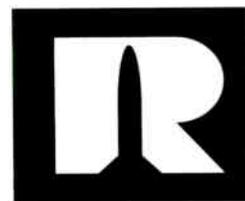
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SONIC DEVELOPS CD CUTTING SOLUTION

The introduction of the compact disc was a revolutionary event in audio history. Combining digital audio encoding with optical disc storage, Sony and Philips created a product that still retains its aura of futurism nearly a decade after its debut. But the techniques developed to make possible the manufacture of the discs were far from a total break with the past. Rather, they evolved through adaptation of existing technologies.

CD pressing, like record manufacturing, uses presses mounted with stampers. The stampers themselves are created in a galvanic (electroplating) process similar to that used for

record stampers. Even the process for cutting the masters from which stampers are derived is conceptually similar for vinyl and CD. But for CD, a laser is used to expose (or ablate) an emulsion coated on glass, rather than using a stylus to scratch a groove in lacquer-coated aluminum.

This difference in cutting technique results in CD master recorders that are far more costly than the cutting lathes found in mastering houses and require stringently maintained clean areas for proper operation. So, early on, the decision was made that the actual cutting of master CDs would be done at CD-replication plants. The role of storing

by Phil De Lancie

the program en route from "pre-mastering" at the mastering house to master cutting at the plant fell to Sony's videotape-based digital audio format, the PCM-1610.

The choice of the 1610 format (subsequently upgraded to the PCM-1630) made sense at the time. The system was already available. It had the required auxiliary tracks for time code and PQ code data, as well as sophisticated error-detection/correction capability. The fact that it was made by Sony no doubt influenced the decision as well. But the system, which combines the PCM-1630 audio processor with the DMR-4000 3/4-inch U-matic tape recorder, is not without its weaknesses.

Anyone who's tried to use a 1630 master just two or three years old knows that the tapes are unreliable for long-term storage of digital audio. (Not surprisingly, the bulky and expensive U-matic decks on which the DMR-4000 is based are considered outdated in the professional video field from which they originated.) And until discs are actually manufactured, there's no way to verify that the track-index information provided with (or on) the tape correctly defines the desired start of each selection on the CD.

In recent years, as DAT and CD recorders have entered the scene, it's been suggested that it might be time to consider alternatives to the use of 1630-format tapes as CD masters (see "Tape & Disc," July 1990). Though DAT machines with time code and error-readout capabilities have been introduced, tape-based formats don't fully lend themselves to emulating the behavior of finished CDs. Recordable CD-based systems do. The first such system to address the CD-cutting process, MasterMaker from Sonic Solutions, is now on the verge of use in CD-replication plants. If accepted by CD manufacturers, MasterMaker could have as revolutionary an effect on the CD pre-mastering and cutting processes as the CD had on consumer audio.

The PreMaster CD

MasterMaker is one of several "application-specific packages" available for Sonic Solutions' Sonic System. According to a technical memorandum provided to *Mix* by company president Bob Doris, the packages are designed around a basic combination of hardware that includes an Apple Macintosh II computer, input/output

modules and SCSI hard drives for information storage. Signal processing is performed in the Mac by Sonic's SSP card, which includes four Motorola 56000 digital signal processing chips, a SCSI controller, four digital I/O channels and four serial ports.

The Sonic System grew out of Sonic Solutions' work on NoNoise, a program for restoration of audio with surface noise, hiss or incidental noises. But the system may also be used for a variety of digital audio editing and signal processing applications unrelated to NoNoise. The CD PreMastering system, for instance, is used for final preparation of audio for release on CD.

The pre-mastering module allows audio files stored on the hard drive to be enhanced with equalization, level correction and dynamics processing. It also supports PQ code editing—the creation of the subcode information (track timings, index points, ISRC codes, etc.) that aids the listener in using the finished CD. Once prepared, the file is generally dumped (in the background) to a 1630-format master tape for the CD plant.

The pre-master file may also be written to a recordable CD, using the CD Maker system from Start Lab, a joint venture of Sony and Taiyo Yuden. The CD Maker hardware, made by Sony, consists of an Encoder, SCSI-interfaced to the Sonic System, and up to 32 Writers (the recording drives). At present, recording must be continuous from beginning to end, although start/stop capability is in the plans. The write-once system will not allow insert editing of material onto already-recorded areas of a disc.

The CD Maker records on CD-Rs developed by Taiyo Yuden. Available in 63- or 74-minute recording times, the pre-grooved discs are similar in construction to conventional CDs, but with a layer of photosensitive organic dye between the polycarbonate substrate and the reflective coating. Blank discs sell for about \$40. (See "Insider Audio," June 1990, for a more detailed description of CD Maker.)

The initial purpose of bundling CD Maker with the Sonic System was to allow pre-mastering engineers to make reference CDs (a capability that is not unique to the Sonic System). Without a reference, a client must wait for finished discs, or request a costly test pressing, before confirming that a CD performs as expected. The ref-

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Dissatisfaction with 1630-format CD masters soon suggested another application for the Sonic/CD Maker combination. In early 1990, the company began work on a special "PreMaster CD," intended to serve as both reference disc and cutting source for the glass CD master. PMCDs may be created not only for CD-Audio discs, but also for CD-ROM and related formats (CD-I, CD-ROM/XA, etc.). A PMCD differs from a standard CD-R reference disc in the way that it stores subcode information.

PQ codes normally get onto the glass master CD via a subcode generator in the recording system. Prior to recording, that generator needs to be loaded with a complete data structure describing subcode placement on the CD. When cutting from a 1630-format master, the subcode generator may be loaded from a "burst" of subcode data recorded at the head of the tape. But a typical CD-reference disc, like a prerecorded CD, has no provision for describing all the subcode information in one convenient location, where it may be read into the subcode generator "at a glance." Sonic's solution for PMCDs was to use a recording area on the CD-R that was not reserved for data specified under the Red Book (CD-Audio) or Yellow Book

Figure 1: Conventional CD Mastering

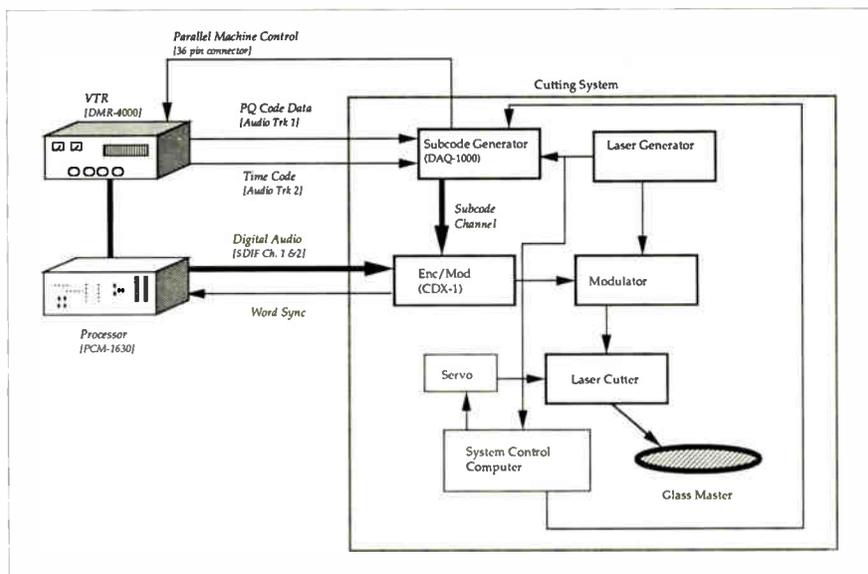
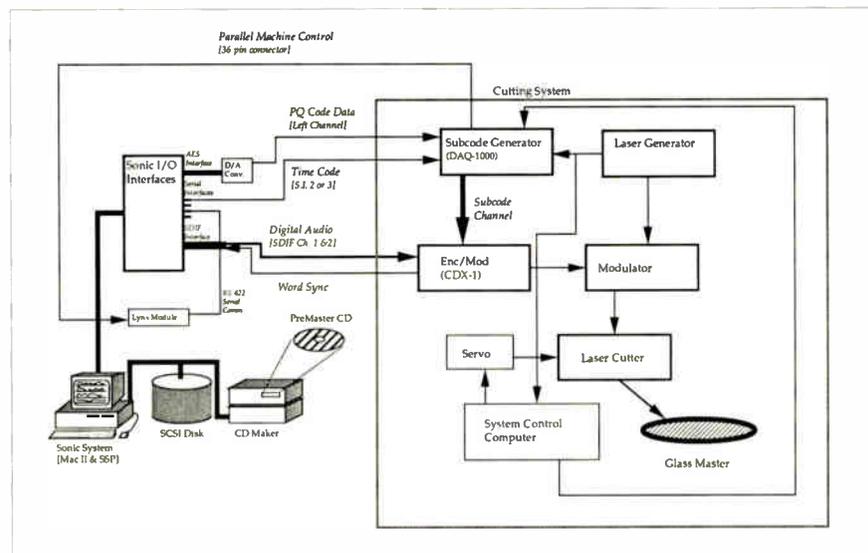


Figure 2: MasterMaker CD Mastering



(CD-ROM) standards.

So how does the performance of PMCDs compare to that of 1630-format masters, especially in the crucial area of reliability? Sonic places the CD-R reject rate due to media defects at "well below 1%." As for average Block Error Rates, the company notes that CD-Rs fall into the two (for 63-minute discs) to four (74-minute discs) per second range, lower than the six to ten per second typical of prerecorded CDs.

Regarding durability, Sonic says that Taiyo Yuden reports "no detectable difference in CD-R discs after 20,000 playbacks," which would definitely exceed the usage one might expect from a U-matic tape. And Taiyo Yuden claims that its accelerated aging tests on CD-Rs show both shelf life and archival life under "normal" conditions to exceed ten years.

MasterMaker

The substitution of PMCDs for 1630-format CD master tapes would seem to make a great deal of sense from the point of view of the mastering houses—especially those who already have a Sonic System with CD Maker—and their clients. But before Sonic Solutions could ask CD plants to accept PMCDs, the company had to devise a system for using the discs in CD-cutting rooms. So Sonic developed the MasterMaker version of the Sonic System, which may be used for cutting both CD-Audio and CD-ROM.

For CD-Audio mastering, it's not likely that 1630s will suddenly be completely abandoned in favor of PMCDs. So initially, at least, cutting rooms will need to be able to easily switch back and forth between cutting from tape and cutting from disc. With that in mind, Sonic designed MasterMaker to emulate the role of the standard PCM-1630/DMR-4000 combination found in conventional CD-cutting systems and to be plug-compatible in interfacing with the other components.

In conventional setups (see Fig. 1), the subcode generator (DAQ-1000), under the control of the system control computer, relays commands to the DMR-4000 via its parallel machine control interface. It tells the DMR when to rewind, park and play the master tape, and it receives PQ code data and time code from the DMR's two auxiliary tracks. Digital audio data, meanwhile, is routed from the DMR through the PCM-1630 to the master encoder (CDX-1), which returns word sync back

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In the MasterMaker setup (see Fig. 2), the Sonic System and its various interface modules are interposed where the DMR and the 1630 would be. The subcode generator's machine control commands are routed through the Sonic System to the CD Maker, which acts as a playback drive for the PMCD. The Sonic System generates time code, which is fed back to the subcode generator in a manner consistent with what would normally be coming from the DMR. The subcode data on the PMCD goes from the CD Maker to the Sonic System, which creates a PQ code data burst. Stored on the hard drive, this burst is fed to the subcode generator at the appropriate moment in the cutting process. Digital audio data is routed from the CD Maker through the Sonic System to the master encoder, which returns word sync.

As currently configured, MasterMaker costs about \$70,000, compared with roughly \$45,000 for a 1630/DMR setup. But by mid-year, a new CD recorder is expected to be available from Start Lab to replace the CD Maker system. Instead of a separate CD Encoder and CD Writer, the CD Printer will incorporate both functions into one unit. The drive will also be able to operate at two-times real time. Pricing is anticipated to fall in the \$10,000 range, thereby dropping the complete MasterMaker system to somewhere around \$55,000.

On Site at DADC

A series of tests using MasterMaker has been conducted at Digital Audio Disc Corporation, Sony's CD-replication facility in Terre Haute, Ind. "We've been working with the system off and on since summer," says DADC editing engineer John Macdonald. The first step was to integrate MasterMaker into the Sony cutting system. "That took some work," he notes, "because MasterMaker has to work with the code cutter's existing timing sequence. So, the Sonic people had to make their system feed back the same responses that would normally come from the DMR-4000." A similar break-in period may be expected the first time MasterMaker is used with a Philips cutting system.

Once integrated, the MasterMaker appears to compare favorably with the

—CONTINUED ON PAGE 128

Philips Says DCC Debut on Track

Philips Consumer Electronics' plans for U.S. release of DCC hardware in the summer of 1992 are on schedule, according to Philips marketing manager Mike Piehl. Piehl refutes a recent *Billboard* report in which "informed sources" suggest that the U.S. release might be held up until late in the year. The timing is important not only because record labels need to plan releases and line up duplication capacity, but because a year-end introduction would coincide with Sony's plans for launching Mini Disc.

Piehl confirms *Billboard's* linking of the DCC debut with passage of the Audio Home Recording Act, which embodies the recent compromise between hardware and software interests over consumer digital recording. But Piehl has no doubt that the bill will pass in time. "Right now we are planning on no problems," he says, "and all of our product plans are developing accordingly. If something unforeseen happens, we will address it when we come to it. That would be a hypothetical situation, and we aren't in a position to divulge our contingency plans."

Industry Inundated with Plethora of Packages

Rhino Records has been at the forefront of the struggle to rid the record industry of the wasteful longbox package for CDs. Ironically, the company has chosen a longbox format for its new line of children's product on the Kid Rhino label. But unlike the disposable longbox for grown-ups, the Kid Rhino packages feature an internal vacuum-formed plastic tray to hold the CD. Kid Rhino cassettes will be marketed in similar packages. The boxes, printed on recycled paper, are meant to be retained.

Kid Rhino's packaging solution won't work for the general CD market, of course, because the 6x12-inch format won't fit in with existing jewel box-compatible storage systems. So, the search goes on for an environmentally sane package that meets the various criteria of retailers, consumers and record companies. *Billboard* re-

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ports that Sony is taking another stab at the open-jewel-box concept, this time using the CD tray to hold the package open at retail. The approach is unlikely to please the ecologically minded, however, because it uses a 5x11-inch throwaway paper cover, which Sony expects to pass off as a "collectible poster."

The Sony effort is just one more entry in a field that already includes the EcoPak, DigiTrak, Inch Pack, Laser File and JAM-Pak, not to mention the humble shrinkwrapped jewel box, which is standard in the rest of the world. According to recent surveys conducted for both Sony and EcoPak-backer Warner Bros., consumers are open to more than one type of packaging, and opposed to the current longbox/jewel box combination. But it looks as if that's what they're going to get for the time being, as only the Warner Music Group has actually committed to an alternative package.

While everybody waits for this mess to sort itself out, it's helpful to remember that some longboxes are better (or less bad) than others. Music Annex Duplication in Menlo Park, Calif., recently announced its entry into the custom CD-packaging field. The company has been researching the use of recycled, non-bleached paperboards printed with soy-based inks. According to plant manager Brian Herndon, sources for these less-destructive products include printer Ross-Ellis ((818) 993-4767 or [212] 645-6110) and paperboard supplier Minneapolis Pioneer Paper Box Co. ((612) 339-0395).

SPLICES

Trutone relocated and expanded its mastering, duplication and administrative operations to a new 14,300-square-foot facility in Hackensack, NJ. The company's new mastering suites were designed by Russ Berger and Maurice Wasserman. The duplication operation expanded from real time to high speed with the purchase of a Lyrec 80:1 master/slave setup...Lyrec (Skovlunde, Denmark) reports an upsurge in its Far Eastern sales activity with the placement of orders for masters, slaves and quality-control gear from Nara Technics, Shinsagae Sound and Dukyun Industries, all from Korea...Hollywood's Artisan Sound reports recent mastering work by en-



Saki Magnetics replacement heads for Otari DP-1610 and Studer A-80-QC quality-control decks.

gineer Mark Wilczak on a live CD/video package by Queensryche for EMI...Saki Magnetics (Calabasas, CA) introduced ferrite replacement heads for Studer A-80-QC and Otari DP-1610 quality-control decks. The playback heads are completely interchangeable with factory-supplied models...Tape Duplication Technology of Fort Wayne, IN, plans to deliver six complete duplication systems to four duplicators in south Florida. The systems feature 8MHz bias and duplication at ratios up to 128:1. ■

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—FROM PAGE 126, MASTERMAKER

1630/DMR combination in terms of ease of use. "The DMR requires tracking, time code and PQ-code-level adjustments," Macdonald says, "to optimize signal read-back into the code cutter. The PMCD will allow you to just drop in the disc and give a start command, after which the system will do all the formatting on its own."

Before being approved for cutting, incoming PMCDs will be screened with a burst-error-rate analysis. Even so, data integrity needs to be confirmed while cutting. Just as the 1630/DMR system runs error analysis on the master tape, MasterMaker will collect error-activity data from the CD Printer as it plays the PMCD. This feature has already been implemented on systems at Sonic's offices in San Francisco, though not yet on DADC's setup.

Using MasterMaker, DADC has mastered and manufactured test CDs that are apparently indistinguishable from conventionally mastered discs. Byte-for-byte data integrity tests are now being conducted by Dr. Toby Mountain of Northeastern Digital Recording, using a similar approach to that used for his October 1991 *Mix* article, "The Integrity of Digital Copying." Macdonald is confident that those tests will confirm that data on the manufactured CDs is identical to that on the PMCDs from which they were mastered.

Space and Time

If Mountain's tests confirm the data integrity of the PMCD approach, technical reservations about the use of MasterMaker at DADC should be resolved. But why should DADC and other CD plants be interested in departing from the established 1630-format standard? One of the biggest reasons is the seemingly mundane question of storage space. A PMCD in a jewel box is about one-eighth the size of a U-matic tape in its case. For an operation the size of DADC, the use of PMCDs could drastically reduce future master storage requirements.

MasterMaker also offers the possibility of eliminating the vast catalog of existing 1630 masters that plants keep on hand for recuts. That's because some plants, like DADC, also keep a library of sample discs from the production run of every CD they replicate. These discs have been thoroughly tested prior to shipping the order from

which they came. Because MasterMaker supports cuttings not only from PMCDs, but also from conventional CDs, the sample discs could substitute for the 1630s that the plants are currently storing.

Using a manufactured CD as a source requires a variation on the way mastering is done from a PMCD. The subcode information stored on a given 1630 master would be played into a Sonic System in the plant's editing facilities. The information would then be stored to a floppy disk, after which the 1630 tape may be returned to the client.

When it's time to master, the floppy would go to the cutting room with the sample CD. To prepare the data burst for the subcode generator, the MasterMaker would retrieve the subcode data from the floppy. From that point on, cutting would proceed as if from a PMCD.

In a similar process, recordable (Orange Book) CDs that are not PMCDs could be used as masters if Sonic's PQ-editing software is first used to create a floppy with the required subcode information. Eventually, however, Sonic hopes that the PMCD approach to storing subcode data will be accepted as a standard among makers of recordable CD systems.

Another possibility for the future is that the MasterMaker approach will be used to save cutting room time by cutting masters at double-speed or faster. CD Printer is a SCSI drive and is not necessarily limited to reading data from the PMCD in real time. The implications for cutting room productivity are obvious, though the required modifications to the cutting system have yet to be implemented.

Macdonald was unable to specify if, and when, DADC would officially begin accepting PMCDs for replication. But Sonic Solutions is evidently confident; they were predicting in November that the big day would come before the end of 1991. According to Sonic's Doris, several other plants, domestic and foreign, are already exploring the MasterMaker option. So, the day when CDs are accepted into master cutting rooms appears to be at hand, a mere nine years after they began to be accepted into the living rooms of consumers. ■

Tape & Disc editor Phil De Lancie is a mastering engineer at Fantasy Studios, Berkeley, Calif.

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- D19 Video

DUPLICATION/DISC MFG.

- E20 CD Manufacturing
- E21 Tape Duplication
- E22 Mastering Only
- E23 Other (please specify)

ACOUSTICS/DESIGN CONSULTANT

- F26 Acoustics/Design Consultant

SOUND/VIDEO CONTRACTOR

- F27 Sound/Video Contractor

BROADCAST PRODUCTION

- G30 Radio Station
- G31 TV Station
- G32 Other (please specify)

MEDIA

- H35 Ad Agency/PR Firm
- H36 Magazines/Newspapers/Books

RECORD COMPANY

- J39 Record Company

INDEPENDENTS

- K42 Audio Producer
- K43 Audio Engineer/Technician
- K44 Video Producer/Director
- K45 Video Editor/Technician

EDUCATIONAL/INSTITUTIONAL

- L47 Corporate Facility
- L48 Music/Recording/School/Program
- L49 Trade Association
- L50 Government

RETAIL/RENTAL/MFRS.REP

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- M52 Video/Film
- M53 Rep/Sales

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INDUSTRY-RELATED

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- N57 Music Publisher
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- C11 Post-Production Company
- C12 Remote Truck
- C13 Multi-Image Production
- C14 Videotape Duplication

EQUIPMENT MANUFACTURING

- D17 Audio
- D18 Music
- D19 Video

DUPLICATION/DISC MFG.

- E20 CD Manufacturing
- E21 Tape Duplication
- E22 Mastering Only
- E23 Other (please specify)

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SOUND/VIDEO CONTRACTOR

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BROADCAST PRODUCTION

- G30 Radio Station
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- H35 Ad Agency/PR Firm
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- K42 Audio Producer
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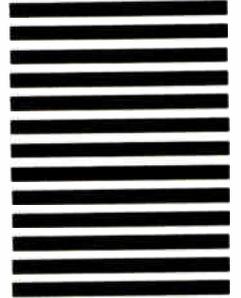
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L.A. GRAPEVINE

by Amy Ziffer

Okay, I know you're reading this in 1992, but let's suspend the magic of magazine production for a moment...I'm writing this after the Thanksgiving turkey is barely cold. November was a month in which economic and other pressures really began to manifest themselves in the Los Angeles market.

Just last summer, the owners of Amigo, a large recording complex in North Hollywood, were planning to expand and remodel to stay competitive. In November, after two decades in business, Amigo closed and its equipment was auctioned off. I

—CONTINUED ON PAGE 132

NASHVILLE SKYLINE

by Dan Daley

Good locations don't stay available long, and that's just what happened with the now-defunct Digital Recorders, Norbert Putnam's facility on the Row that went south in September. Midtown Tone and Volume Inc., a single-room studio in the same building, grabbed the lease on two of Digital's four rooms and moved over there as of mid-November under the Midtown name. Mike Clute, Midtown's chief engineer and one of its co-owners along with producers Van Stephenson, Ray Kennedy and Marty Powell, says they might go ahead and exercise an option to take over the remaining rooms sometime in the future.

Much of Digital's equipment was

either sold off or taken out by the previous owners. Midtown's current gear includes Otari MTR-9011 multitracks, a TAC Matchless console and a CAD M a x c o n board. There were no major structural changes to the facility, but new i s o booths will be

built in Studio A, and API aux mixers are expected to be added shortly.

Midtown was formed two years ago as one of Nashville's first and best-equipped project studios, taking in hourly and daily rate clients as the need arose. "The new Midtown is going to take the same approach,"

Clute notes. "It's still there mainly for our own projects."

Speaking of project studios, Moon Dog Music is just such a facility. It opened last March and has been pretty steadily booked since then. Some credit must go to the six musician-owners of the room, including Garry Tallent of Springsteen's E Street Band and Bucky Baxter, steel guitar player for Steve Earle. Located in a former plumbing garage ("It helps keep the overhead low," Baxter says), Moon Dog has a Peavey 1600 Production Series console and a Fostex 1-inch, 24-track deck crammed into a small but effective space designed by Baxter. The studio's marketing plan, to deliver finished song demos to the huge publishing industry in Nashville, has proven successful as the studio approaches its first anniversary. Addressing the price that publishers allot to writers to create demos (generally in the \$300- to \$500-per-song range), Baxter explains, "Instead of charging a fixed hourly rate, we work off what we know the publishers want to pay." If one of the owners can't do a date, Baxter culls players from a pool of about 20 top-notch musicians and takes a song from scratch to completion, including arrangements, production and mixing. "I also handle the administration," he says. "The publisher just cuts one check and that covers the musicians, the tape and everything else. It's less work for them, and they love that."

Woodland Digital opened its A room in late November, according to studio manager Jake Nicely. The second room (B had been operating for most of 1991) sports a vintage Neve 8086 console that was formerly part of Frank Zappa's remote truck; Nicely says the console was totally reconditioned after a dip in an Ultrasonic cleaner bath. Multitracks are an Otari MTR-100 analog deck and a Mitsubishi X-850 32-track digital deck with Apogee filters.

—CONTINUED ON PAGE 133



At Brooklyn Recording Studio (Hollywood), Hugh Padgham was recently in engineering and co-producing the debut A&M album from singer/songwriter Sheryl Crow.

PHOTO: DAVID GOGGIN

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SESSIONS & STUDIO NEWS

by Jeff Forlenza

SOUTHERN CALIFORNIA

At Valley Center Studios in Van Nuys, Paul Sabu and Lance Bulen were in Studio 1 cutting demos for MCA Records. Sabu engineered with Eric Vaas assisting...Producers L.A. Reid and Babyface were at Summa Music Group (West Hollywood) overdubbing for Bobby Brown's latest MCA release and capturing Whitney Houston's vocals for a future film release. Barney Perkins engineered both projects with Jim Champagne assisting...Def American recording artists Trouble finished tracking their latest album at Indigo Ranch in Malibu with Rick Rubin producing and Chris Kupper engineering. Overdubs on the project were done at Indigo's sister company, Studio II in Culver City...Award-winning engineer Charlie Watts was producing and engineering an album project for the Honky Tonk Hellcats at Front Page Records (Costa Mesa)...

NORTHWEST

Eclectic electric guitarist Henry Kaiser was at Fantasy Studios (Berkeley, CA) recording and overdubbing in Studio B with engineer Oliver DiCicco and assistant Vince Wojno...Thrash-rockers Faith No More were at Brilliant Studios (San Francisco) with producer Matt Wallace and engineer David Bryson working on an upcoming album...Triad Recording Studios (Eugene, OR) had More Time in mixing their new cassette and Elsker Dog mixing their upcoming album. Michael Setton and Alwin Sauers of Triad are producing a radio show called "Hit The North," which will feature up-and-coming groups from all over the Northwest. Interested bands should contact Sauers at (503) 687-9032...At Ironwood Studios in Seattle, engineer Jay Follette was working with former Kingston Trio bassist-turned-

producer Cary Black on a project for Cyd Smith...Pianist Gary Lamb recently finished recording a new album for Golden Gate Records at Vine Hill Studios in Santa Cruz, CA. Russell Bond engineered and co-produced the instrumental project with Lamb...

NORTH CENTRAL

Brian Roseman of B.L.R. Studios in LaPorte, IN, reports engineer/producer Dan Blood was in mixing his latest demo; Chuck Galloway was in producing a demo of Sue Atkinson for Wenco Records...At Studio A of Dearborn Heights, MI, producer Eric Morgeson digitally mixed the debut album from Warner's bilingual pop artist Miguel Tomas for EMP Productions Ltd. John Jaszcz engineered the mix with Ed Marx assisting...

SOUTHWEST

Fire Station Studios (San Marcos, TX) had engineer Gary Hickenbotham and engineer/producer Bill Halverson putting the finishing touches on a solo album from Texas Tornado-man Flaco Jimenez. The Warner Bros. project includes tracks from Linda Ronstadt,

—CONTINUED ON PAGE 134

N.Y. METRO REPORT

by Dan Daley

The Hit Factory will open a new studio complex two blocks west of its current main location on West 54th Street sometime in March. The 100,000-square-foot facility, which is described as a multi-use space that will house studios and offices to be made available for a variety of entertainment companies, will be a "sort of Brill Building for the 21st century," according to Hit Factory spokesman Yon Elvira. This will be Hit Factory's fourth location; besides the existing W. 54th facility, there is also a Times Square mastering studio and a London location. The architect is

—CONTINUED ON PAGE 133

At NYC's The Edison recording studio (l to r) are co-producer Charles Wallert, George Benson and The Edison's chief engineer Gary Chester working on Benson's upcoming release.



— FROM PAGE 130, L.A. GRAPEVINE

talked with studio manager Victor Levine about the reasons for the closure. A hoped-for lease agreement could not be worked out (many studios in L.A. are suffering from inflated real estate values, and hence unreasonable rents and mortgages), and payments on new equipment outstripped income. It's no surprise, given the HARP controversy, that Levine laid some of the blame at the feet of "home" studios operating commercially but illegally. Levine said he had a choice between running the facility the right way (with adequate staff and tech support) while losing money, or cutting losses and closing the doors. It is rumored that several other facilities in town are in financial trouble, and the new year may see more closures.

News isn't all bad, though... Music Grinder, whose move to Hollywood Boulevard was reported in the September '90 *Mix*, just completed construction on a new Studio B, and plans are still afoot for a third. Opened in 1975 by Ron Filecia and Gary Skardina, Music Grinder has constantly been upgrading to maintain the state-of-the-art. Like Studio A, B is a Neve/Studer

room designed by Vincent Van Haaff. B has Necam 96 automation, smaller control room and studio dimensions, and a single isolation booth. Studio B's monitoring is supplied by a custom bi-amped system incorporating T.A.D. drivers, Northwest horns and T.A.D. woofers. The new room was broken in by some new and established artists doing album projects: RCA's Mitch Mallog, Virgin's Mark Curry, LL Cool J, and Ritchie Zito with the Warner Bros. band Hoey Ellis.

Take One, part of the old Kendun Recorders facility (I sometimes wonder who wasn't), reopened late last summer after several months of remodeling work. The Tom Hidley-designed control room is relatively unchanged; additions include a vocal booth, a Trident 80C console, Otari MTR-90 MkIII multitrack and a variety of mics.

Another in the list of studios being successfully marketed to a broad range of clients is Kingsound in North Hollywood. The ten-year-old studio started as a 4-track facility but grew steadily, building a reputation in part on the sound of several Bruce Hornsby & the Range singles tracked and mixed there.

Studio manager Steve Cormier says a fairly major remodel of their tracking room was finished around the end of September. It now features a Neve V Series board with Flying Faders, and a Studer 827. Ice T was the first to try it out, with his thrash/rap band Body Count. A second room with a Dyaxis digital audio workstation appeals more to Kingsound's corporate clients, such as Royal Viking Cruise Lines (for which they do on-ship shows) and Disney.

Otari gained ground in Los Angeles with placement of a Series 54-P console and Diskmix 3 automation in the new Venice studio built by well-known sound designer and composer Frank Serafine. The 54-P, with a specialized design for LCRS mixing, is Otari's acknowledgment of the growing complexity of that market's needs. Serafine Studios consists of two interfaced rooms, a film mixing stage and a sound design and composition suite.

Sony Studios, formerly known as Columbia/Westside, also went with Otari in the form of a Premiere console, Diskmix automation and Virtual Monitor system for its Studio 15 dub stage. *Full House*, *Family Matters* and other sitcoms will be posted on the Premiere. ■

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— FROM PAGE 130. NASHVILLE SKYLINE

The entire wiring system has been replaced in the room by in-house tech Ron Puckett. Bill Heath, late of Digital Recorders, is installing new iso booths.

Nicely says he was aware of the fact that sessions were off slightly in general in town late last year. But he says the fact that Studio B had been booked fairly consistently since it opened has made him cautiously optimistic about opening the second room. "We'll get a better idea about the overall climate once A has been open awhile," he said as 1991 wound down. "It's booked through December and into January."

County Q Studios in Berry Hill bought its building late last year after leasing for several years. No immediate technology upgrades are planned, but the two-room facility got a thorough cosmetic renovation, according to co-owner Scott Merry. Berry Hill has been known as Music Row Jr., an enclave of studios that has been nurtured by the community's zoning ordinances and is now more interactive with the rest of the Nashville studio scene. "One of the things I like about Berry Hill is that the community police are very into the recording studios here

and like to brag that they can respond to a burglar alarm four times faster than Metro Police can," Merry says. "There's never been a studio burglary here." Studio Q's Trident- and Sound Workshop-equipped rooms have remained busy with publishing and artist demos, according to Merry. "That market is still rocking here despite home studios." ■

— FROM PAGE 131. N.Y. METRO

Stephen Wang of Proctor & Wang, and acoustical design is by Neil Grant of Harris, Grant & Associates, whose credits include Peter Gabriel's Real World in the UK and INXS's Rhinoceros facility in Australia.

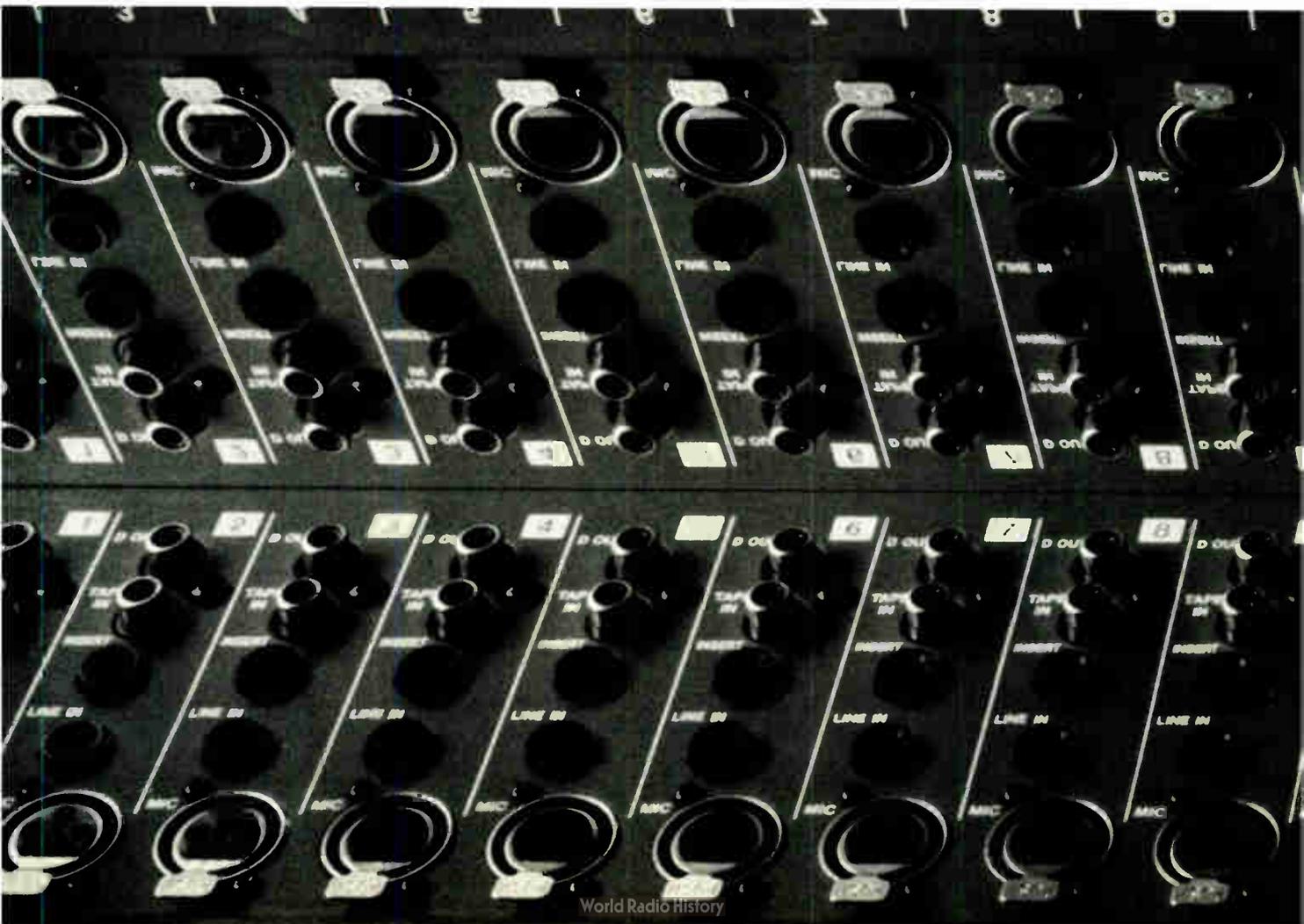
There will be several recording studios in the new location, including one that will be able to hold about 100 musicians simultaneously. No hard information about equipment yet, although at least one Neve console has been ordered for the facility.

Deep Pockets—One of those increasingly popular piggyback studio arrangements in New York passed a successful anniversary. Russo Grantham Productions opened Back Pocket Studios as part of Hip Pocket Recording Studios on West 20th Street in Novem-

ber 1990 in a collaboration with Hip Pocket owner Bob Merrill. Since then, according to company president John Russo, the Russo/Grantham end of the operation has expanded to three studios. Two are equipped with Sony APR-24 multitracks, each with a Synclavier, a Soundcraft TS 12-automated console and an incoming Neve console. The third, known as Button Productions, is a radio suite with a 12-track Spectral Synthesis hard disk system run by Rich Macarr.

"This is what a MIDI studio is intended to be for television," Russo says. "The live rooms are big enough for [vocal] groups or small ensembles, but they're intended to be the core of a sound supported by synthesis. You need to be able to create an opera out of four singers and a couple of live instruments, do it fast and well, and do it with less manpower than ever before. That's how a studio/production company can stay competitive these days." Back Pocket is also rented out on an hourly rate basis, but only as a financial bolster to the production company, according to Russo.

Ruggieri Music will be adding another MIDI suite early this year to



accommodate its recently opened Hispanic music division, Ruggieri Latino. The new division is headed by Gerardo Velez, percussionist and co-founder of the group Spyro Gyra. No firm decisions on gear yet other than several Akai 1000 samplers. Velez says that the new division will aggressively target Latin companies looking to market in the U.S. as well as American companies, including Coca-Cola and AT&T, who want to market directly to the growing domestic Hispanic community. "Music is a strong sales tool," Velez says, "and it's also an international language." ■

— FROM PAGE 131, SESSIONS & STUDIO NEWS

Dwight Yoakam, Emmylou Harris, Chris Isaak, Stephen Stills and John Hiatt. Also at Fire Station, Christopher Cross was recording tracks for an upcoming album with Eric Johnson playing lead guitar and Bill Johnson engineering...

SOUTHEAST

Chainsaw rock group Jackyl completed a five-song demo at Master Sound Studios in Atlanta. The demo, which

helped the Atlanta rockers snag a record deal with Geffen, was produced by Warren Tuttle and engineered by Jeff Tomei... Athens, GA, band Widespread Panic completed their new Capricorn Records release at Duck Tape Music (Decatur, GA) with production by Johnny Sandlin and the keyboards of Dixie Dregs virtuoso T. Lavitz. The project was engineered by Steve Tillisch and Jeff Coppage...

NORTHEAST

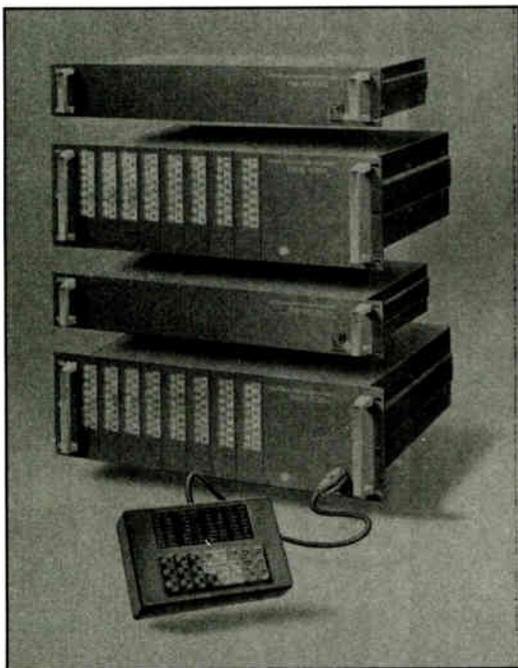
Don Grolnick was at Westrax Recording Studios (NYC) producing jazz singer Jean O'Conner. The songs were mixed and recorded by Jeremy Harris... Kid N Play were at Power Play Studios of Long Island City, NY, with producers Large Professor and Quick Silver and engineers Anton Pukshansky and Yianni Papadopoulos as they remixed new singles for Select Records... Kajem Studios of Gladwyne, PA, hosted rappers 3X Dopes for the recording of their third LP for Arista. Chuck Nice produced, while Josh Chervokas and Craig Caruth engineered... Producer/engineer Jack Danger was at D&D Recording (NYC) working on the single "Killer Inside Me" for MC 900 Ft.

Jesus... Englishman John Wesley Harding produced a 13-song album from the Detroit-based hillbilly/punk rockers Goober & The Peas at Boston's acclaimed Fort Apache studio. Sean Slade and Paul Kolderie (both of Dinosaur Jr. and Firehose fame) engineered...

STUDIO NEWS

Cue Recording Studios of Falls Church, VA, added an SSL G Series console with Total Recall and a Studer A827 24-track to Studio A. Chief engineer at Cue, Jim Ebert, wasted no time putting the equipment to use with bands such as Sinister Grin, Theories of the Old School and New Potato Caboose, while still finding time to teach Cue's "Recording Workshop" seminars... Barking Spider Studios opened its doors in Sudbury, MA, featuring a Soundtracs Quartz 4800 console, Genelec S30 monitors, Otari MTR-90II multitrack and lots of tube outboard gear. Room designs were done by Alacronics using RPG Diffusors... River City Sound Productions moved its entire recording production facility to 916 S. Cooper, Memphis, TN 38104; the new phone number is (901) 274-7277. ■

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—FROM PAGE 121, *THE LUNATIC*

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According to Genetti, some observers point out that dialog will sometimes be "a little problematic digitally, because the reproduction is so pure and so clean. Personally speaking, we didn't have any problems in those areas on this production."

While Genetti and his team worked on post, Wally Badarou composed the score and all the source cues—a total of 16—at his home studio in Nassau. Everything was recorded digitally and then shipped on DAT back to Island Pictures.

"In fact, we ended up doing two mixes, because the first had to be rushed in time for the Jamaican premiere," states Bie. "For the second mix, Wally flew to L.A. and we were able to make decisions on the spot with him at EFX about the placement of cues and the music. It worked out well, because doing the first mix was like a run-through, and by the time we did the second, we were all a lot more creative."

The production sound was recorded by Kim Ornitz, the sound editor was Lew Goldstein, and the film was edited by Michael Connell. Other credits include assistant editor Simon Cowper, sound mixers Ken Teaney and Bill Freesh, and dialog editor Richard Corwin. *The Lunatic* is being released this month and distributed by Triton in association with Island Pictures. ■

L.A.-based Iain Blair is Mix's post-production editor.

Post Notes

Indian Hill Video Solidly Booked

Indian Hill Video of Claremont, Calif., has been busy. The company is finishing up audio and video post on several projects for Johnson & Johnson's IOLAB facility, and was chosen by Claremont McKenna College to produce a 90-minute documentary video of their '91 commencement festivities. Meanwhile, Night In Dixie Productions also wrapped an audio and post marathon, editing a 60-minute documentary that required the use of every audio and video format in

the facility. Indian Hill Audio/Video's 24-track studio has been booked solid with three artists recording albums—Ruthless Records' Dre B Gone, Songdogs and The Thrillbillies.

Big Apple's Sync Sound Expands

Sync Sound completed the expansion of its West 56th Street facility and signed former NED senior product specialist Bill Cavanaugh as mixer/editor for the new NED PostPro Sound Design Suite, Sync Sound's fourth mixing/editing suite. Featuring a PostPro SD and a Sony MXP-3000F console, the new room offers clients the combined functions of an audio editing and mixing suite with a random access mode and the option to go to tape or film. Says Cavanaugh, "The primary function of the room is recording, editing, designing sound and mixing, and it's unique because the PostPro SD is virtually online. All mixing, editing and sound design processes are nested into one, making it very time- and cost-efficient."

John Alberts Sound Design Builds New York Studio

John Alberts, the award-winning sound designer/mixer whose post-production credits include *Saturday Night Live* and projects for ABC, NBC and CBS, completed a new state-of-the-art, audio-for-video room for his projects at VCA Teletronics. Designed around the SSL ScreenSound system, the post-production suite offers clients a Sony 3324 digital multitrack, Studer 2-track, Sony D2 and 1-inch video machines, as well as an SL 6000 G Series console. Alberts recently completed production of Sting's current tour performance in Holland, Billy Connelly's HBO Special and three pilots for NBC.

WaveFrame and Magna-Tech Join Forces

WaveFrame Corporation and Magna-Tech Electronic Co. Inc. joined forces in the development of a multitrack disk-based recorder/reproducer for film mixing applications. The two companies plan to integrate disk-based digital audio technology with film-based technology, allowing users to produce a higher quality audio track for their films, at a lower cost and a faster speed. WaveFrame CEO Chuck Grindstaff says, "The application of digital audio to film-based productions

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will allow increased audio quality and editing flexibility."

Graham-Patten Systems' New Digital Mixer Success Story

The new D/ESAM 800 Digital Edit Suite Audio Mixer from Graham-Patten Systems is being used by some post-production facilities to deal with digital audio in their editing rooms. Current users include HBO Productions, Broadway Video, ABC Television and Modern Videofilm. The mixer is capable of handling both digital and analog audio together, and more than

50 of the mixers have been shipped to users in Europe, Japan and throughout the States. They will also be used in telecasting the 1992 Olympic Games from Barcelona.

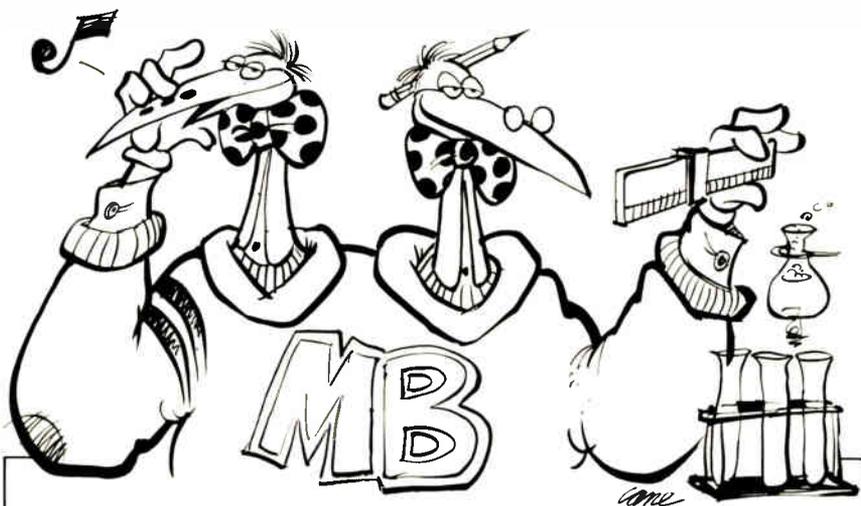
Skywalker Sound South Installs First TimeLine CCU

Skywalker Sound South, a division of LucasArts Entertainment Company, has installed the first production models of the new Console Control Unit (CCU) from TimeLine. The CCU operates the TimeLine System Supervisor multiple machine controller that interfaces to standard console automation software. Using Lynx Time Code Modules, the

CCU controls analog or digital audio tape recorders, VTRs or sprocketed film transports. Skywalker chief engineer John Brunnick says, "Based on the reliability of Lynx modules and TimeLine's expertise in system synchronization at our facilities here and in San Rafael, we had no hesitation in expanding with the new CCUs. The music, dialog and effects mixers can control the entire synchronized lockup to picture directly from the console."

Post Briefs

Pittsburgh film composer **John Gorr** recently completed the 90-minute soundtrack for the new Carnegie Science Center's Omnimax Theatre at Audiomation Studios with engineers **Dean Becker** and **Joe West**...Nashville's **615 Productions** completed a music theme package for WUSA-TV in Washington, D.C. **Randy Wachtler** produced the spot, which consisted of ten themes and mix outs to 88 total cuts, then mixed digitally to DAT and transferred to CD at **Georgetown Masters**...**Greg Youngman Music** moved from Long Beach, CA, to the Santa Ynez Valley last year, and business is booming. Recent clients include Hughes Aircraft, Winchell's Donuts, New Horizon Pictures and The Ballard Store...**Creative Sounds Concepts** of Atlanta completed a ten-minute original music score for Pratt & Whitney's *Trio: Technologies United*, a marketing video to introduce the company's space propulsion unit. The clip was shot at **Crawford Post Production** and then posted at Creative...New York's **Howard Schwartz Recording** recently hosted New York Giants quarterback **Phil Simms'** debut recording session when he recorded "Play With The Pros Sweepstakes"...**Corbell Publishing** announced its third edition of the *Video Industry Statistical Report*, which covers 1991-1992 as well as incorporating five-year statistics and projections. To order, call (213) 821-6675...New York's **Pomann Sound** completed sound design and editing work on *Doug*, the first animated series produced by Nickelodeon, using SSL's ScreenSound digital audio-for-video system...**Creative Media** of Cypress, CA, recently went on location to **Carl Karcher Enterprises** to digitally record segments used on a video introducing a new computer system, and also finished soundtracks for a five-part series for Unocal. ■



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READIN', WRITIN' & RECORDIN'

You read their brochures. You see their ads in *Mix*.

You even hear about them on late night TV. There are plenty of recording schools to choose from (sometimes it seems like every backwoods community college offers an engineering class), but you want a program that's right for *you*.

Unfortunately, no one school will give everyone the best possible education and guarantee jobs after graduation. We can't look into our crystal ball and decree where you should go, but we can tell you some important questions to keep in mind while you make your search. Use these questions to evaluate the schools you're considering, and you should be able to find an education that best suits your needs.

First, examine your expectations. Studio engineers put in long hours for little pay. Second or assistant engineers—where everyone inevitably starts out—are often no more than glorified gofers or janitors, and even graduates of name institutions are not assured of this position. Knowing all of this, are you still convinced you don't want to chuck it all and become a CPA?

Next, determine how much time and

money you can spend. Don't neglect to honestly appraise your own experience—if you're a novice in the field, you'll need to learn from the ground up. Once you've figured out the most you can afford, set your limits there. Be aware, though, of factors like internships that may extend the time you'll be without a paycheck or financial aid that may cover some of your expenses.

A harder thing to determine is what program length best fits your time/money needs. "Schools" can vary from a two-hour audio cassette to a four-year college or university, and all have their peculiar concerns. For example, you may need a good grasp of recording basics to succeed in some short-term trade schools. Or say you plan to get a degree from a four-year college or university. You'll have to take general education courses, and you should evaluate the quality of the school's core classes (not just their audio program) before you make your ultimate decision.

Andrea Weatherhead attended American University in Washington, D.C. While Weatherhead participated as a graduate student, most audio engineering students

THE BASICS OF FINDING A RECORDING SCHOOL

BY TERRI STONE

attend American University for four years and receive a liberal arts degree. "The program gave me a very fundamental education in physics," Weatherhead says. "I'm much better equipped in the studio, because I understand what I'm doing." Elena Previtt, a graduate of the four-year program at Berklee College of Music in Boston agrees. "I had to take a class called Math and Science for Producers and Engineers, where you learned about things like sine waves and how to figure out how long sound takes to travel from point to point. It's very practical information." Previtt also feels

that four-year schools are good because "there's time to absorb everything."

On the other hand, some people prefer short-term (generally one year or under) trade institutions. Eduard Dommond graduated from the Recording Workshop's (Chillicothe, Ohio) two-month program. "I'm glad I didn't go to a longer school. Short programs are intense and difficult, especially if you don't know much before you get there, but I learned a lot. Besides, I couldn't take any more time off work." Liana Massey attended the nine-month program at Full Sail Center for the Record-

ing Arts in Winter Park, Fla. "It's wonderful for giving you a little taste of everything," Massey believes. "You can pick and choose individual classes depending on your needs."

Whatever the length of the program, a balance between theory and hands-on experience is important. A background in theory is central to an engineer's understanding of the studio, but application of theory is just as crucial. Brochures and school staff can give you some information, but try to talk with recent graduates as well. Graduates can tell you the facts behind the numbers: Was equipment readily accessible, or were there long waiting lists? How many people were on one piece of equipment at the same time? Was there a good mixture of book vs. real-world knowledge? Ask about the location and condition of the studios, too. Some schools have agreements with manufacturers and can boast the latest equipment, while others have excellent working agreements with local studios.

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BEFORE YOU ENROLL

Have you...

- Fulfilled any necessary prerequisites?
- Gathered information from the Financial Aid department?
- Examined a sample syllabus from classes that interest you?
- Put together a list of questions for recent grads?
- Asked the school for recent grads phone numbers?
- Investigated intern and job placement possibilities?
- Contacted a studio to find out what they look for in entry-level employees?
- Visited the school?

You'll also want to determine if the school has an interdisciplinary emphasis. Audio engineering has always been a competitive field, and our country's current recession has underlined the need for an engineer to be familiar with (and thus employable in) many different fields within the industry. School literature can help you out here, but it is again advisable to ask graduates about their experiences. See if the school will give you names of graduates who are working in fields like sound reinforcement or post-production, not just the stereotypical recording studio engineer.

Students always seem to be short of money, and recording school attendees are no exception. The availability of financial aid may play a large part in determining where you're able to go, and all avenues should be explored. Ask if the school you're considering offers government funding such as Stafford loans or Pell grants—and if you're eligible. There may also be other, more esoteric, sources of aid. Andrea Weatherhead, for example, had herschooling paid for and received a stipend because she was that rare breed, a graduate student in American University's audio engineering department. Some schools offer special payment plans.

Don't forget to look into what schools will do for you after you graduate. Internships and job placement are vital to your success, and there is considerable variation in the amount of assistance a school will offer you. Some merely give you a list of studio names; others claim to provide a resume service and lifelong job placement. Plan on doing some research if you expect an accurate answer to this question; in addition to reading the brochures and speaking to school staff, call studios where the school says it has placed interns or graduates. Ask if the experience was good and one the studios are likely to repeat. Recent graduates can also help you interpret the placement statistics: Did the majority of the "successful placements" get assistant positions, or were they swabbing bathrooms for months?

When you've narrowed down the field to one or two possibilities, it's always a good idea to visit the campus before you invest what could be thousands of dollars and years of your life. It may seem like an unnecessary expense, but wouldn't you rather see that the "spacious, state-of-the-art" studio described in the literature is really

a cramped hole with cobwebs on the faders *before* you enroll?

Finally, some advice from people who have already been through the indecision and hard work. Neil Anderson, a Full Sail graduate now working at Century III in Orlando, believes that no school can fully prepare you for a session: "There's no pressure in a class. There are so many different kinds of clients, and you're not prepared for them. You need to realize that you have a lot more learning to do."

"Any school is only as good as the individual student," Liana Massey adds.

"Some want to apply themselves, others live in a fantasy land and never realize the work and effort that's necessary to be an audio engineer. Even after going to school, you still have to prove yourself, but it's so much easier. At least you can ask intelligent questions." Andrea Weatherhead cautions prospective students not to go into the field for "glamour or money. Make sure your aesthetic for sound outweighs your need for secure living or a high salary." ■

Terri Stone is an assistant editor at Mix. Assistant editors don't swab bathrooms.

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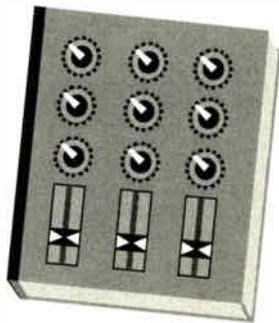
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Institute of Audio Research
64 University Place, Greenwich Village, New York, New York 10003

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
Montgomery, AL

ALABAMA STATE UNIVERSITY; Course/Program Title: Music Media Technology; 915 S. Jackson St.; Montgomery, AL 36101; (205) 293-4346. **Chief Administrator:** Van Tony Free III. **Program:** The Music Media program is a new career option for those interested in commercial music. The Music Media program leads to a Bachelor of Arts degree in music. This program is designed to train students in the current technology developments of the music industry. Specialized coursework will involve recording studio techniques, music writing and arranging, digital sound production and other computer-operated functions. Our professional faculty is always ready to provide individualized guidance to each student enrolled in the Music Media program. Dr. George Butler, vice president/executive producer for Columbia Records is our distinguished lecturer. Internship program is available. Scholarships are available. A complete recording studio features a MIDI recording system utilizing the Mac II/DigitalDesign, 24/16- and 8-track recorders, Roland Octave Pad II, Panasonic SV-3700 Professional DAT, Emax sampler, E-mu Proteus II, Roland, Yamaha, Korg keyboards, etc. The Music Computer lab includes Macintosh Classics and IBM compatible PC computer workstations.

ALPHA WAVE RECORDING STUDIOS; Course/Program Title: 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
Washington, DC

THE AMERICAN UNIVERSITY; Course/Program Title: Audio Technology; 4400 Massachusetts Ave. NW; Washington, DC 20016-8058; (202) 885-2743; (202) 885-6000 admissions office. **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 professors 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 Revox 2-track mastering decks, dbx noise reduction throughout, 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 Alan 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.

THE ART INSTITUTE OF FT. LAUDERDALE; Course/Program Title: Music & Video Business—Broadcasting; 1799 S.E. 17th St.; Ft. Lauderdale, FL 33316; (800) 275-7603. **Chief Administrator:** Eileen L. Northrop.

AUDIO RECORDING TECHNOLOGY INSTITUTE; Course/Program Title: Theory & Practice of Audio Recording; 756 Main St.; Farmingdale, NY 11735; (516) 454-8999; (800) 543-ARTI (in NY or CA). **Chief Administrator:** James J. 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 two school locations in Long Island, NY, a location in Anaheim, CA, and the newest location in Orlando, FL.

THE AUDIO WORKSHOP SCHOOL (DIV. COMMUNICATIONS RESEARCH GROUP); Course/Program Title: 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 Lehman, Walter Lenk and Stuart Cody. No prerequisites for SSP-301. Licensed by the Massachusetts Department of Education.



BELMONT UNIVERSITY
Nashville, TN

BELMONT UNIVERSITY; Course/Program Title: Music Business Program; 1900 Belmont Blvd.; Nashville, TN 37212-3757; (615) 386-4504. **Chief Administrator:** Robert E. Mulloy, Director of Music Business. **Program:** Established in 1974, 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 24-track professional analog and digital recording studio is housed on the campus, with a second studio scheduled for completion this year. Both studios are 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. Six full-time and 11 adjunct professors.

BERKLEE COLLEGE OF MUSIC; Course/Program Title: Music Technology; 1140 Boylston St.; Boston, MA 02215; (617) 266-1400. **Chief Administrator:** Don Pulise, 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, and the use of synthesizers and computers in writing, recording and performing

—LISTING AND PHOTO/LOGO CONTINUED TOP OF NEXT PAGE



BERKLEE COLLEGE OF MUSIC
Boston, MA

music. Facilities include an array of multitrack studios, a digital/video post production/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 U.S. studios including Conway, Hit Factory, Power Station and Unique.

CALHOUN COMMUNITY COLLEGE; Course/Program Title: Music Industry Communications; PO Box 2216; Decatur, AL 35609-2216; (205) 353-3102 ext. 254. Chief Administrator: Dr. Art Bond, Fine Arts chairperson.



CAREER INSTITUTES OF AMERICA
(MUSIC AND VIDEO TRAINING CENTER)
Miami Beach, FL

CAREER INSTITUTES OF AMERICA (MUSIC AND VIDEO TRAINING CENTER); Course/Program Title: Music/Video and Entertainment Management; 1205 Washington Ave.; Miami Beach, FL 33139; (305) 531-3300; (800) 762-4466. Chief Administrator: Admissions. Program: Comprehensive 15-month Specialized Associate Degree features hands-on training with 8- and 16-track Tascam, 24-track SSL 4040E mixing desk, Yamaha and JBL P.A., Otari, Tascam, Studer, Mitsubishi, digital and analog tape. Full MIDI facilities using such equipment as Proteus and Akai digital samplers. Video production facilities include a state-of-the-art studio and control room with offline and online post suites for A-B roll and special EFX with Video Toaster on Amiga graphics-based computer. To enhance our students' marketability within our industry, the course of instruction also includes professional development, marketing, business and legal classes. MVTC students are supervised by experienced industry professionals. MVTC is fully accredited by NATTS and offers federal financial aid programs for eligible students, student housing and employment assistance. Contact the office of admissions for information on requirements for acceptance.

CAYUGA COMMUNITY COLLEGE; Course/Program Title: Radio/TV Broadcasting; Audio Technology; 197 Franklin St.; Auburn, NY 13021; (315) 255-1743. Chief Administrator: Steven Keeler.

You can FAX your listing application to:
Mix Directories (510) 653-5142

COLLEGE OF ST. ROSE; Course/Program Title: BS in Music, concentration in Studio Music; 432 Western Ave.; Albany, NY 12203; (518) 454-5178. Chief Administrator: Mary Ann 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 on studio production, recording technology and television production. Admission is by audition. Catalog and application information: CSR Admissions Office (518) 454-5150. Program Director: Mary A. Nelson (518) 454-5278.

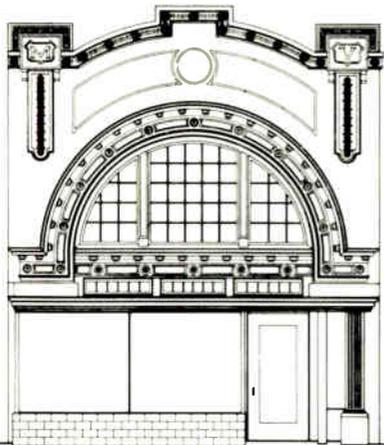
COMMUNITY COLLEGE OF THE FINGER LAKES; Course/Program Title: Music Recording Program; 4355 Lakeshore Dr.; Canandaigua, NY 14424; (716) 394-3500. Chief Administrator: Frank Verget.

DEAN JUNIOR COLLEGE; Course/Program Title: Communication Arts; 99 Main St.; Franklin, MA 02038; (508) 528-9100. Chief Administrator: Nancy Kerr.

DUQUESNE UNIVERSITY; Course/Program Title: 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. of Rec. Arts; Francisco Rodriguez, technical director. 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. Students will also complete traditional elements of the music curriculum such as piano studies, music theory, solfège, eurhythmics, 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 digital audio workspace. For additional information and equipment list, please contact the Sound Recording Technology Department at (412) 434-5486 or by fax at (412) 434-5479.

DUTCHESS COMMUNITY COLLEGE; Course/Program Title: Communication and Media Arts; 53 Pendell Rd.; Poughkeepsie, NY 12601-1595; (914) 471-4500. Chief Administrator: Eric Somers. Program: Audio coursework is part of a larger audio/video production program leading to an AS degree. Facilities include 30x40 16-track recording studio, three radio production rooms, 40x60 television studio with high-end broadcast equipment, SMPTE editing, animation lab, etc. Open admissions policy. Scenic Hudson Valley location. Easy access by commuter train or car to NYC.

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ELIZABETH CITY STATE UNIVERSITY
Elizabeth City, NC

ELIZABETH CITY STATE UNIVERSITY; Course/Program Title: BS Music Industry Studies with concentrations in: Music Business Administration, Music Engineering & Technology; Music Industry Studies Program; 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 (\$637/\$2,631 per semester).



FIVE TOWNS COLLEGE
Seaford, NY

FIVE TOWNS COLLEGE; Course/Program Title: Audio Recording Department; 2165 Seaford Ave.; Seaford, NY 11783; (516) 783-8800. Chief Administrator: Dr. Martin Cohen. Program: Five Towns College offers a two-year A.A.S. business degree or four-year Bachelor of Music degree, both with concentrations in Audio Recording Technology. A.A.S. program is centered around a core of sequential audio classes starting with acoustics and studio electronics, culminating in full-blown, student-produced and -engineered 24-track projects. Audio classes are augmented by a solid business education including marketing, business law, independent record production, accounting, business organization and management, and electives related to the music industry. B.M. degree expands the A.A.S. degree with classes in MIDI, music theory, harmony, composition, arrangement and performance. Audio classes are taught in the college's on-campus, fully equipped automated recording studio and MIDI laboratories. Faculty are active in New York metropolitan locale and hold album credits. Situated 30 minutes from N.Y.C., the college maintains a vigorous internship program with many of the area's "world class" studios. Scholarships, financial aid, housing available.

FRANKLIN INSTITUTE OF RECORDING SOUND TECHNOLOGY (F.I.R.S.T.); Course/Program Title: "One-on-One" Studio Engineering & Design; PO Box 1121; Franklin, TN 37065; (615) 794-3660. Chief Administrator: Danny M. Hillyer.

Recording Schools Seminars & Programs

(Eastern continued)



FULL SAIL CENTER FOR THE RECORDING ARTS
Winter Park, FL

FULL SAIL CENTER FOR THE RECORDING ARTS; Course/Program Title: Recording Arts Specialized Associates degree and/or Video and Film Specialized Associates degree; 3300 University Blvd.; Winter Park, FL 32792; (800) CAN-ROCK. Chief Administrator: Jon Phelps, founder/CEO. Program: The TEC Award-winning school for three consecutive years offers degree programs in audio or video/film, which cover the major aspects of their respective industries—recording engineering, record production, studio maintenance, the tapeless studio, digital recording, music video production, concert sound and lighting, MIDI, music business, video/film production, lighting, special effects, post-production, creative writing and set design. Over 2,700 contact hours of training are offered with more than 1,350 hours of hands-on labs using ten studios equipped with: Neve, SSL, Sony and Tascam consoles; Studer, Otari and Ampex recorders; Synclavier and Direct-to-Disk digital recorders; Montage digital picture processing suite; CMX, Chyron, Grass Valley, Sony, Ampex and Ikegami video gear; 1", 3/4" and Betacam SP storage mediums. 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 and Montage; nationally accredited by NATTS; eligible for financial aid to those who qualify. Call and tell us about your career goals. We take your dreams seriously.

GEORGIA STATE UNIVERSITY; Course/Program Title: Music Industry Program, School of Music; University Plaza; Atlanta, GA 30303-3083; (404) 651-3676. 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 or 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 recording concentration requires an 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; Course/Program Title: 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

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INSTITUTE OF AUDIO RESEARCH
New York, NY

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 600C G Series 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—ELIZABETH SETON SCHOOL OF ASSOCIATE DEGREE STUDIES; Course/Program Title: Radio/Television; 1061 N. Broadway; Yonkers, NY 10701; (914) 378-8024. Chief Administrator: Ann Huntington.

LEBANON VALLEY COLLEGE OF PENNSYLVANIA; 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.

MEDIA ARTS CENTER; Course/Program Title: School of Modern Recording; 753 Capital Ave.; Hartford, CT 06106; (203) 951-8175. Chief Administrator: Jack Stang, director.



MEMPHIS STATE UNIVERSITY
Memphis, TN

MEMPHIS STATE UNIVERSITY; Course/Program Title: 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 1990 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 Synclavier digital 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; Course/Program Title: TV Production/Electronic Music; 13125 SW 72nd St.; Miami, FL 33183; (305) 385-4255. Chief Administrator: Daniel B. Sell. Program: Sunset offers a four-year curriculum in television production and electronic music (recording engineering). Students in TV work in a four-camera color studio with computer-assisted editing, computer graphics, telecine and interformat dubbing. Students produce commercials, live close-circuit broadcasts and daily news, and record schoolwide events including four-camera remotes. Students involved in audio use the eight-channel Tascam/Tapco studio complete with dbx and many outboard accessories. Students also study sound reinforcement using our Yamaha P.A. system. Most projects include combining the TV, recording and sound reinforcement equipment. These programs are open to all full-time students in the school.



MIAMI-DADE COMMUNITY COLLEGE,
SOUTH CAMPUS
Miami, FL

MIAMI-DADE COMMUNITY COLLEGE, SOUTH CAMPUS; Course/Program Title: 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 South are associated with the Music Department. This is a natural relationship because sound engineering students require a wide variety of sound sources 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 South. 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 South 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; Course/Program Title: Recording Industry Management Dept.; PO Box 21; Murfreesboro, TN 37132; (615) 898-2578; FAX: (615) 898-5682. Chief Administrator: Dr. Richard Barnett. Program: Recording Industry Management (RIM) is a Bachelor of Science degree program covering both the business and production sides of the industry. RIM offers 25 different courses covering all areas of the industry, with minors available in Mass Communications, Electronics, Entertainment Technology, Music Industry and Business Administration. Production students work in three on-campus digital audio recording studios. Facilities also include a ten-station MIDI lab, two digital audio workstations, video production and post-production studios and a remote recording truck. Eleven full-time faculty are on campus to assist the 600-plus majors, who have come to Middle Tennessee State University from over 35 states. Current tuition, per semester full-time, \$691, in state; \$2,373, out —LISTING AND PHOTO/LOGO CONTINUED TOP OF NEXT PAGE



MIDDLE TENNESSEE STATE UNIVERSITY
Murfreesboro, TN

of state; residents of certain Southern region states qualify for in-state status.

MUSIC FACTORY ENTERPRISES INC.; Course/Program Title: Audio Engineering Seminar; Ford & Washington Sts.; Norristown, PA 19401; (215) 277-9550. Chief Administrator: Jeffrey Calhoun.

NEW YORK UNIVERSITY; Course/Program Title: Music Technology; 35 W. 4th St., Rm. 777; New York, NY 10003; (212) 998-5422. Chief Administrator: Kenneth Peacock. Program: New York University offers specialized courses in Digital Sampling, MIDI, SMPTE, Advanced FM Synthesis, Computer Synthesis, Audio Engineering, Studio Production, Film Scoring and other newly evolving technologies. Four year programs lead to Bachelor of Music degrees in music business and technology, composition, performance, jazz studies and music education. Graduate studies leading to MA, DA, Ed.D and PhD degrees are also offered. The NYU facilities are equipped with an array of analog and state-of-the-art digital synthesis systems, which are continually being upgraded. All studios are MIDI-equipped with the most common PCs, digital mastering to DAT, and the latest in professional music sequencing, notation and sound design software. The newly equipped advanced computer music facility utilizes a "MacII/Sound Tools" digital audio editing and sound design workstation. Five of the studios are linked to the university's mainframe computer network via a LAN using the studio PCs. This enables students to explore powerful programs like "C Sound" running under UNIX. The studios are also used for research in music education and music therapy.

JOSH NOLAND MUSIC STUDIO; Course/Program Title: Introduction to the Art of Recording; 760 W. Sample Rd.; Pompano Beach, FL 33064; (305) 943-9865. Chief Administrator: Josh Noland.

THE OMEGA STUDIOS' SCHOOL OF APPLIED RECORDING ARTS AND SCIENCE; Course/Program Title: 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 14th 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) and a Music Business Program (24 hours, \$395). The courses include lectures and workshops covering acoustics; microphone, signal processor and tape machine theory both 24- and 48-track analog and 32-track digital; console operation (taught on SSL, API and Audiotronics consoles); computer sequencing; synthesizer operation and programming; 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 four of Omega's control rooms 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.

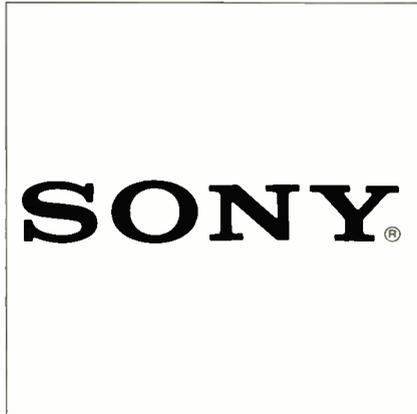
ORACLE RECORDING STUDIO; Course/Program Title: Beginning Recording Techniques; PO Box 464188; Lawrenceville, GA 30246; (404) 921-7941. Chief Administrator: Gene Smith.

PEABODY INSTITUTE OF THE JOHNS HOPKINS UNIVERSITY; Course/Program Title: Bachelor of Recording Arts and Sciences; 1 East Mt. Vernon Pl.; Baltimore, MD 21202; (800) 368-2521. Chief Administrator: Alan P. Kefauver. 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; Course/Program Title: Sound and Recording Workshop; 220 Special Services Building; University Park, PA 16802; (814) 863-2911. Chief Administrator: Peter Kiefer.

RECORDING SKILLS AND MUSIC BUSINESS WORKSHOP; Course/Program Title: Intensive Training Program for Sound Recording and the Business of Music; 8795 SW 57 St.; Cooper City, FL 33328-5930; (305) 434-1377. Chief Administrator: Dennis Hetzendorfer. Program: A high-quality, intensive recording skills and music business training program. Classes are taught by industry professionals and designed to meet the needs of the serious professional or novice. Recording classes are conducted in full-service 24-track studios, using state-of-the-art equipment and techniques. Actual recording sessions with professional artists provide hands-on experience and insight. Songwriting classes offer a unique opportunity for personal guidance and development. Instruction in music publishing and in marketing your talents as a recording artist help to further your knowledge of the business of music. Workshops are a-la-carte style, with classes to suit all interests and backgrounds. Enrollment is limited, classes are small. It doesn't take a year of school or costly loans to gain the knowledge you need to be successful. Completion will fulfill all the requirements suggested by most recording studios for the position of assistant engineer.



SONY PROFESSIONAL AUDIO TRAINING GROUP
Boca Raton, FL

SONY PROFESSIONAL AUDIO TRAINING GROUP; 6500 N. Congress Ave.; Boca Raton, FL 33487; (407) 998-9922; FAX: (407) 998-6700. Chief Administrator: Ray Callahan. Program: All courses are available as "factory" training sessions at our Boca Raton, FL, facility. Some courses are offered at our new facility located in San Jose, CA. The alternative to "factory" training is our custom on-site training package. The curriculum is two-fold: 1) Technical service training, which is designed to provide the service engineer with the knowledge required to service and maintain Sony Professional Audio products. A two-year electronics degree and one year of experience are the minimum requirements for this course type. 2) Applications classes designed to provide the student with the operational knowledge necessary to effectively operate specific Sony Professional Audio equipment. All courses stress hands-on time, enabling students to become confident with the operation and/or servicing of the specific equipment.

STATE UNIVERSITY OF NEW YORK AT FREDONIA; Course/Program Title: Bachelor of Science in Sound Recording Technology; SUNY Fredonia, School of Music; Fredonia, NY 14063; (716) 673-3221; (716) 672-3151. Chief Administrator: Ros Ritchie. Program: Applicant must satisfy the academic entrance requirements; an audition is required. Studies include liberal arts, music, physics, acoustics, electronics, recording basics, techniques and practices, practicum, and seminar. Studio and performance recording are required for lab sessions. Students graduating are required to have 650 hours of session/lab experience. Facilities include analog 1/4" 2-tr, 1/2" 4- and 8-tr, and 2" 24-tr recorders, and 2-channel digital recorders.

STUDIO TECHNIQUES; Course/Program Title: Analog/Digital Multitrack Audio Recording; PO Box 147; Lanham, MD 20706; (301) 552-2716. Chief Administrator: Mark Greenhouse.

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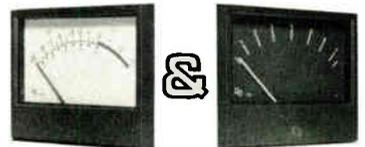
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Recording Schools Seminars & Programs



(Eastern continued)

UNITY GAIN RECORDING INSTITUTE; Course/Program Title: Audio Recording Comprehensive Program; **2976-F Cleveland Ave.; Fort Myers, FL 33901; (813) 332-4246. Chief Administrator:** Anthony Iannucci; Admin. Asst., Patricia Frangello. **Program:** Fort Myers' newest recording institute offers a 36-week program in Audio Recording. Classes are limited to five, providing each student with semi-private instruction. Our 108-hour program includes over 70 hours of hands-on time using the institute's professional multitrack facility. The course comprises three levels: Introduction to Audio Engineering, Advanced Techniques in Audio Engineering and the Audio Recording Workshop. Throughout the course, each student participates in recording 14 different musical groups. Equipment used in lab includes: Soundtracs PC MIDI 24 console; Lexicon, Eventide, Korg, Aphex and dbx outboard gear; Mac SE, Professional Performer sequencer, Akai S950 sampler and Roland D-50 synthesis; AKG, Sennheiser, Electro-Voice, Neumann and Shure microphones. Upon completion of course, each student receives a certificate of completion, a complete listing of all audio facilities nationwide and is provided with placement assistance in the area of his/her choice. For further information, or to receive a free catalog, please call or write.

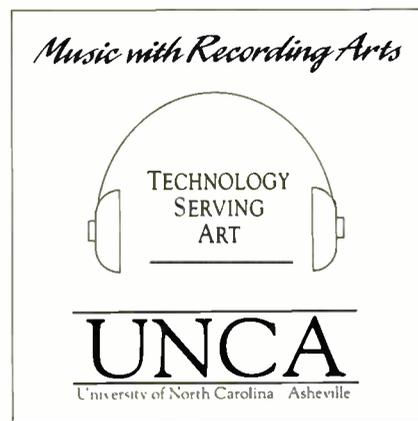
UNIVERSITY OF MASSACHUSETTS—LOWELL; Course/Program Title: Sound Recording Technology; **One University Ave.; Lowell, MA 01854; (508) 934-3850. Chief Administrator:** Dr. William Moylan. **Program:** The University of Massachusetts—Lowell offers three degree programs in Sound Recording Technology: the Bachelor of Music degree with a major in Sound Recording Technology and minors in SRT for Electrical Engineering and Computer Science majors. The program's facilities include: 24-track studio (automated and digital), video post-production and 8-track studio, sound synthesis and MIDI studio, beginning mixing, sound synthesis and editing studio, maintenance & repair laboratory and critical listening classroom. The major program is the Bachelor of Music in Sound Recording Technology. It produces musically sophisticated and sensitive professionals with sufficient technical knowledge to excel in the present production industry and to easily keep pace with the changing technology. The program combines studies in physics, electrical engineering, computer science and calculus with traditional studies in music and at least nine courses in the art, practical applications and technology of audio recording. The University of Lowell's interns have been placed from Tanglewood to Hollywood.

UNIVERSITY OF MIAMI; Course/Program Title: School of Music; **Music Engineering; School of Music; Coral Gables, FL 33124; (305) 284-2245. Chief Administrator:** Ken Pohmann. **Program:** The Music Engineering program at the University of Miami offers a four-year Bachelor of Music Engineering degree, with a minor in electrical engineering, as well as a two-year Master of Science Audio Engineering degree. Courses in undergraduate curriculum include recording engineering, digital audio, acoustics and studio design, studio maintenance, video production, computer programming, circuit theory, music business, music theory, arranging and performance. The graduate curriculum includes study in advanced digital audio, video, psychoacoustics, electrical engineering and a research thesis. Only students of the highest caliber are considered for admission to these programs. The principal recording studio houses an automated Sony MXP-3036 console, Sony APR-24 and APR-5002 recorders, Macintosh with Digidesign, Audio Kinetics synchronization system, Sony 3 1/4" video recorders, a Synclaver system and other equipment. Our recent graduates enjoy the highest placement rate in the professional audio industry, and have engineered gold, platinum and Grammy-winning albums.

UNIVERSITY OF NEW HAVEN; Course/Program Title: BA/BS in Music & Sound Recording, BA in Music Industry; **300 Orange Ave.; West Haven, CT 06516; (203) 932-7101. Chief Administrator:** Michael G. Kaloyanides. **Program:** The University of New Haven offers a Bachelor of Arts and a Bachelor of Science in Music and Sound Recording as well as a Bachelor of Arts in Music Industry. All Programs include courses in music history, theory, musicianship and performance. The recording classes, which include Recording Fundamentals, Multitrack Recording I and II, and Recording Seminar I and II, cover such topics as acoustics, recording-related electronics, multitrack recording, equipment maintenance, sequencing, digital audio and MIDI. The Bachelor of Science program provides a stronger background in the science and technology of recording through courses in calculus, physics and electrical engineering. The music industry program includes courses in

music production, promotion, publishing and distribution, accounting, management, marketing, copyright law and concert management. Facilities include a new 24-track on-campus recording facility designed to excel as both a teaching and professional recording environment, a 16-track recording studio, and a concert hall designed for 16-track recording. Minors are available in Electrical Engineering, Communication, Computer Science, Management and Marketing.

UNIVERSITY OF NORTH ALABAMA; Course/Program Title: Bachelor of Arts/Science in Commercial Music; **Box 5040, University of North Alabama; Florence, AL 35632-0001; (205) 760-4361. Chief Administrator:** Dr. James K. Simpson. **Program:** General Studies: 44 to 55 semester hours. Music Core: Music Theory, 12 to 15 sem. hrs.; Music Literature & Music History, 9 sem. hrs.; Conducting, 2 sem. hrs.; Orchestration, 2 sem. hrs.; Musical Activities, 5 sem. hrs.; Class and/or Applied Music, 7 sem. hrs.; Music Electives, 4 sem. hrs. Prescribed Business Administration minor and supporting sources (24 semester hours): Accounting 291, 292 (6), Elementary Accounting, Business Law 280 (3), Business Law I, Management 330 (3), Principles of Management, Marketing 360 (3), Marketing 373 (3), Principles of Advertising, Math & Computer Science (6), Commercial Music (18 semester hours); Music Publishing (3), Record Company (3), Studio Techniques (3), Production (3), Commercial Music Practicum (3). Music Department is a member of the National Assoc. of Schools of Music. Survey of the Music Industry (3) is a new course we have added. Popular Songwriting (2) is an elective course.



UNIVERSITY OF NORTH CAROLINA-ASHEVILLE Asheville, NC

UNIVERSITY OF NORTH CAROLINA-ASHEVILLE; Course/Program Title: Bachelor of Science in Music with Recording Arts; **UNCA Department of Music; Asheville, NC 28804-3299; (704) 251-6432. Chief Administrator:** Dr. Wayne J. Kirby. **Program:** Bachelor of Science in Music and Recording Arts or Bachelor of Arts in Music. The BS degree program is designed for aspiring musicians interested in both the creative and technological aspects of music recording and production. This program includes practical experience in on-campus facilities, which house a multitrack recording studio, computer-based electronic music/digital synthesis laboratory, digital editing lab and maintenance/repair lab. Studies include MIDI, SMPTE, digital recording, sound reinforcement, synthesis, sound sampling, multitrack recording, acoustics and studio performance. Electives include: composition, jazz improvisation, arranging, music business and other profession-oriented courses. Minors are available in computer science, management, communications and theater. Internships are available to qualified students. In-state tuition and fees for one semester, approximately \$578; out-of-state, approximately \$2,815. Limited enrollment by audition.

WILLIAM PATERSON COLLEGE OF NEW JERSEY; Course/Program Title: Audio Technology/Electronic Music; **William Paterson College of New Jersey, Music Dept.; Wayne, NJ 07470; (201) 595-2315. Chief Administrator:** Dr. Stephen Marcone.

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CAPITAL UNIVERSITY CONSERVATORY OF MUSIC; Course/Program Title: Music Industry; **2199 E. Main St.; Columbus, OH 43209; (614) 236-6411. Chief Administrator:** Bob Breithaupt. **Program:** A Bachelor's degree (four-year program) with elective options in music merchandising and music media. Designed to provide undergraduates with a solid base of traditional and contemporary musical training. Music study is supplemented with studio recording techniques taught in conjunction with The Recording Workshop in Chillicothe, Ohio. This degree can be combined with a second major (business, communication, etc.) or a minor in one of the liberal arts areas.

CEDAR VALLEY COMMUNITY COLLEGE; Course/Program Title: Commercial Music Recording Technology; **3030 N. Dallas Ave.; Lancaster, TX 75134; (214) 372-8127. Chief Administrator:** Heien Spencer, Ph.D. **Program:** Commercial Music Recording Technology (two-year associate degree). This two-year program is designed to provide the technical and musical skills necessary in the field of recording technology. Musical skills include vocal, instrumental and MIDI-based, computer-driven synthesis. Technical skills include electronic and acoustical theory, multitrack recording, automated mixing, session planning, session procedure, digital recording and troubleshooting.

CENTRAL MICHIGAN UNIVERSITY; Course/Program Title: Dept. of Broadcast and Cinematic Arts; **340 Moore Hall; Mt. Pleasant, MI 48859; (517) 774-3851. Chief Administrator:** Dr. B.R. Smith.

THE CLEVELAND INSTITUTE OF MUSIC; Course/Program Title: Audio Recording degree program; **11021 East Blvd.; Cleveland, OH 44106; (216) 791-5000. Chief Administrator:** Tom Knab, department head. **Program:** The Cleveland Institute of Music offers an intensive conservatory setting for learning audio/music production while pursuing a BM degree in Audio Recording. Courses cover audio system design and operation, digital audio, advanced microphone techniques, multitrack recording, signal processing, acoustics, maintenance, digital editing, audio-for-video and MIDI/synthesis. Internship, independent projects and four years professional experience in audio service round out the program. Classical music recording studies are conducted under the guidance of multiple Grammy winner Jack Renner of Telarc International. Acoustics studies are undertaken with Dr. Peter D'Antonio of RFG Diffusor Systems. The Institute offers excellent orchestras and top-quality musicians for collaboration. Musical and aural acuity as well as technical excellence are emphasized. Two well-equipped studios and limited enrollment allow for plenty of hands-on studio time and personalized instruction. Strong musical and academic requirements. Minor in Electrical Engineering available through Case Western Reserve University.

COLLIN COUNTY COMMUNITY COLLEGE; Course/Program Title: Commercial Music; **2800 East Springcreek Pkwy.; Plano, TX 75074; (214) 881-5807. Chief Administrator:** Michael Crawford.

COLUMBIA COLLEGE; Course/Program Title: Sound Engineering; **600 S. Michigan Ave.; Chicago, IL 60605; (312) 663-1600, ext. 354. Chief Administrator:** Douglas R. Jones. **Program:** The Columbia College Sound Program is designed to educate tomorrow's professional sound person. Our curriculum includes classes in recording, video post-production, acoustics, sound contracting, system design, CAD, analysis using TEF, SYSid and Audio Precision, digital audio, psychoacoustics and more. All instructors in the program are experts in the audio community. The program has a strong emphasis on computers in audio on both the Macintosh and PC platforms. Students may earn a Bachelor of Arts degree or a two-year certificate.

ELMHURST COLLEGE; Course/Program Title: Music Business Program; **190 Prospect; Elmhurst, IL 60126; (708) 617-3515. Chief Administrator:** Tim Hays. **Program:** Located in the Chicago metropolitan area, Elmhurst College is a nationally accredited institution that offers both a BS and a BM in music business. In addition to classwork in music, business and business of music, students get hands-on industry experience through internships, industry speakers and course tours to locations as diverse as Los Angeles, New York City and West Germany. Resources include a 16-track studio with digital mastering that has just come online in the college's new Computer Science and Technology Center, courses ranging from Music Theory to MIDI, recently expanded practice and recital facilities, and an artist faculty of over 40. Industry support is provided in the form of scholarships from trade organizations such as NAMM and NARAS, corporate sponsorship, a student chapter of MEIEA and an intern/job bank. Offering students individualized instruction in music business for over 19 years, Elmhurst provides a specialized career track integrated within a four-year degree.

GREENVILLE COLLEGE; Course/Program Title: Contemporary Christian Music; **Recording Emphasis; 315 East College; Greenville, IL 62246; (800) 345-4440; (800) 248-2288**

(IL), 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 with a JH-600 Series console, fully automated. 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, NORTHWEST COLLEGE; Course/Program Title: Audio and Recording Technology. **901 Yorkchester, Houston, TX 77079; (713) 468-6891. Chief Administrator:** Mark C. Erickson. **Program:** Fully accredited college offering two-year associate and certificate programs in recording technology. Cost of instruction is extremely competitive. Great emphasis is placed on practical, hands-on experience. Students have access to four fully equipped multitrack studios, each with a wide 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-track and MCI 2-track recorders, Panasonic DAT, numerous outboard equipment from Lexicon, dbx, UREI, Aphex, Eventide and ADR. Monitors from Yamaha, UREI, Fostex, JBL and Auratone. Other equipment includes an Akai S-950 sampler, Simmons TMI, Proteus Sound Module and Korg M1 keyboard. Twin studios B and C contain Tascam M-520 20-channel console, Tascam 8-track and 2-track recorders and outboard equipment from Alesis and Symmetrix. Studio D contains a Tascam M-520 20-channel console, Fostex 16-track and Otari 2-track recorders, Panasonic DAT, Akai S-950 sampler, Alesis drum machines, keyboards from Roland, Yamaha, Korg, Kawai, Moog, Oberheim and direct-to-hard disk recording/editing from Digidesign.

HUTCHINSON TECHNICAL COLLEGE; Course/Program Title: Audio Technology. **2 Century Ave.; Hutchinson, MN 55350; (800) 222-4424; (612) 587-3636. Chief Administrators:** Dick Lennes, David Igl. **Program:** Two-year intensive technical audio program, AAS degree option. Extensive hands-on training in audio electronics (analog and digital), studio and remote recording systems design and installation, acoustics, signal processing and sound reinforcement for pro sound market. Heavy on lab and practical applications. 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 and production skills for today's pro sound market.

INDIANA UNIVERSITY; Course/Program Title: Associate of Science in Audio Technology/Bachelor of Science in Audio Recording. **School of Music; Bloomington, IN 47405; (812) 855-1900. Chief Administrator:** Dr. David A. Pickett. **Program:** 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 techniques and multitrack studio. 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 this degree must demonstrate a keen interest in classical music and aptitude for core music studies. Performance not required. Students record all official concerts ranging from solo and chamber music through symphony orchestras, 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. 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. University financial aid and some work scholarships available. Departmental assistance offered in job placement.

INTERLOCHEN CENTER FOR THE ARTS; Course/Program Title: 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.

LANSING COMMUNITY COLLEGE; Course/Program Title: Media Technology. **52-Media, PO Box 40010; Lansing, MI 48901-7210; (517) 483-1670. Chief Administrator:** Dr. James C. Greene, program director. **Program:** The Media Department at Lansing Community College offers a variety of courses in Audio Production, Audio Recording and Sound Reinforcement. These courses are geared toward developing entry-level skills for students interested in these audio fields. The courses are progressive and offer a balance between theory and practice. Lab facilities offer students access to a variety of

analog and digital equipment, including hard disk-based recording and editing. A two-year degree in Media Technology is available for students wishing to pursue an academic degree. The Media Department also offers courses in radio, video and photography (including multimedia and film). Lansing Community College offers an open enrollment policy.

MCLENNAN COMMUNITY COLLEGE; Course/Program Title: Audio Technology/Commercial Music. **1400 College Dr.; Waco, TX 76708; (817) 750-3578. 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.

MIDLAND COLLEGE; Course/Program Title: Commercial Music/Audio Technology. **3600 N. Garfield; Midland, TX 79705; (915) 685-4648. Chief Administrator:** Robert Hunt.

MOORHEAD STATE UNIVERSITY; Department of Music; Moorhead, MN 56563; (218) 236-2101. Chief Administrators: Dr. Robert Pattengale, dept. chair; Mike Coates, recording studio director; Dr. Mark Fasman, electronic music curriculum director. **Program:** The Department of Music offers NASM-accredited Bachelor's 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 LC computer.



NORTHEAST COMMUNITY COLLEGE
Norfolk, NE

NORTHEAST COMMUNITY COLLEGE; Course/Program Title: 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, TEF®, 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. Northeast Community College is accredited by the North Central Association of Colleges and Schools and the Nebraska State Department of Education.

OAKLAND UNIVERSITY—K&R'S STUDIOS; Course/Program Title: MUS 353 Recording Techniques (2 credits). **2653 Greenfield; Southfield, MI 48076; (313) 557-8276. Chief Administrator:** Ken Giazza.

OBERLIN CONSERVATORY OF MUSIC; Course/Program Title: Technology in Music and Related Arts (TIMARA). **Oberlin College; Oberlin, OH 44074; (216) 775-8900. Chief**

Administrators: Conrad Cummings, Gary Nelson. **Program:** Completed in spring 1989, TIMARA's new electronic and computer music studios are among the best-equipped in the world, with technical resources that are often unavailable at the undergraduate level. This seven-studio complex holds equipment ranging from the earliest analog synthesizers to the most recent digital synthesis technology. Some of the equipment includes recording decks by Otari, Ampex, Scully, Sony and Revox; Macintosh microcomputers; synthesizers by Moog, Buchla, ARP, Putney, Korg, Yamaha and Ensoniq. The TIMARA program has two academic faculty members and a full-time music engineer. Through the TIMARA program, the Oberlin Conservatory of Music offers a Bachelor of Music degree with a major in electronic and computer music. Our courses stress musical and technical fundamentals and individual creative projects. Student works range from popular idioms through jazz to "avant-garde" music, with multimedia production and live performance encouraged.

OHIO UNIVERSITY; Course/Program Title: School of Telecommunications—Audio Production Sequence. **253 Radio-Television Bldg.; 9 South College St.; Athens, OH 45701-2979; (614) 593-4860. Chief Administrator:** Jeff Redefier. **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 stereo production and 8-track studios and a four-station audio editing studio. Other campus facilities include a Synclavier studio, film 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.



RECORDING INSTITUTE OF DETROIT INC.
East Detroit, MI

RECORDING INSTITUTE OF DETROIT INC.; Course/Program Title: Recording Techniques. **14611 E. 9 Mile Rd.; East Detroit, MI 48021; (313) 779-1380. 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 4000 G Series, API and DDA consoles; Lexicon 480L, 224X plus 22 other 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 II; sequencing on Amiga and Macintosh computers and Akai MPC 60; loads of additional outboard 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 song writing. 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 (87.5% placement rate 1990-91). Tuition is \$3,349 for entire program (or \$799 for first class).

Pro Audio dictionaries and technical reference guides are available through the Mix Bookshelf catalog. Call toll-free (800) 233-9604 for your free copy.

Recording Schools Seminars & Programs



(Central continued)



THE RECORDING WORKSHOP
Chillicothe, OH

THE RECORDING WORKSHOP; Course/Program Title: Recording Engineering and Music Production Program; 455-X Massieville 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 6-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 State Board of Proprietary School Registration. Please call for a free brochure.

SMITH/LEE PRODUCTIONS MEDIA SCHOOL; Course/Program Title: 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.

SOUTH PLAINS COLLEGE; Course/Program Title: 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; Waylon 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 produc-

tion 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; Course/Program Title: 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 certificated program provides you with luthery 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 OHIO COLLEGE; Course/Program Title: Audio Video Production; 1055 Lairdlaw Ave.; Cincinnati, OH 45237; (513) 242-3791. **Chief Administrator:** Mark R. Turner, department chairperson. **Program:** The Audio Video Production Department features four recording studios, two multitrack. Instruction includes: audio sweetening, ADR, Foley, digital audio editing, mixing techniques for voice and instruments, location audio and audio-for-video. Video instruction includes: studio and location production, computerized A/B roll editing, 2-D and 3-D computer graphics and animation, chroma key, lighting and set design. Facilities include: three edit rooms, three graphic workstations, four EFP packages and a 40x25 studio. Southern Ohio College offers an associate degree and is accredited by the North Central Association of Colleges and Schools and the Career College Association.

TEXARKANA COLLEGE RECORDING AND MIDI STUDIOS; 2500 N. Robison Rd.; Texarkana, TX 75501; (214) 838-4541 ext. 257, 360. Chief Administrator: Dr. Murry Alewine. **Program:** Two-year associate degree in commercial music; classes in MIDI, arranging, printing and the recording studio. A state-sponsored college with two 16-track studios. Each 16-track studio has complete facilities with modern, up-to-date equipment. Professional-quality equipment with professional faculty. Classes begin each September, January and June. Fees/tuition schedule available on request. Hands-on instruction and lab time for all students beginning first semester. Fourth-semester students have access to professional 24-track studio in city. Many clubs, lounges, restaurants available in vicinity for employment. MIDI studio available. Three courses (Elementary/Intermediate/Advanced) in MIDI instruction. New program: Music Printing—two semesters. Macintosh SE30 with 80MB hard disk, laser printer NTXII, Finale by Coda and Music Publisher graphic notes.



UNIVERSITY OF MISSOURI-KANSAS CITY
Kansas City, MO

UNIVERSITY OF MISSOURI-KANSAS CITY; Course/Program Title: Conservatory Recording and Theatre Sound Design; Center for the Performing Arts; 4949 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 Missoua Repertory Theatre.

UNIVERSITY OF WISCONSIN-OSHKOSH; Course/Program Title: Music Merchandising—Recording Technology Emphasis; 800 Algoma Blvd.; Oshkosh, WI 54901; (414) 424-4224. **Chief Administrator:** John Minnear. **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 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 (WESTERN SOUND STUDIOS); School of Music, WMU; 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 WMU. 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 WMU (i.e., music, business, EE, 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 student's 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 Students Music Award in the Pop/Contemporary category and 15 *downbeat* awards.

Western

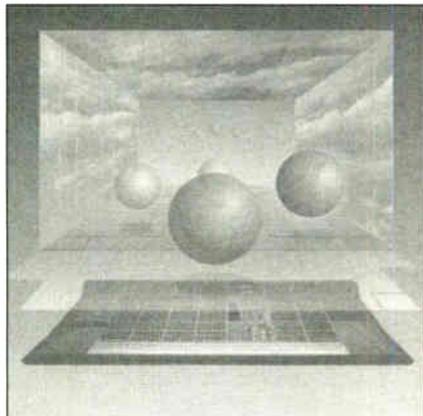
AJS MEDIA CONSULTANTS; Course/Program Title: Quality Assurance for Audio & Video in the Digital Domain; 7038 DeCelle Pl., Ste. 9; Van Nuys, CA 91406; (818) 782-4741. **Chief Administrator:** Allan J. Scholnick.

ASPEN MUSIC SCHOOL; Course/Program Title: The Edgar Stanton Audio Recording Institute; 250 W. 54th St., 10th Fl. East; New York, NY 10019-5597; (212) 581-2196. **Chief Administrator:** John Hill. **Program:** The Edgar Stanton Audio Recording Institute is an intensive, full-time clinic workshop, conducted in Half Session I (June 17-July 22) of the Aspen Music School. Participants may assist in recording the daily concerts and rehearsals of the Aspen Music Festival. A full range of recording experience is offered on state-of-the-art equipment provided by JBL/UREI, Yamaha International, Shure Brothers Inc., Westlake Audio, Pacific Audio-Visual Enterprises, Apex Systems and Lexicon. Faculty is drawn from noted representatives of the recording industry and broadcasting. Lectures and lab sessions encompass a broad range of topics, which 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. The session is limited to ten students to insure maximum individual attention. For application materials, write to the New York office.

AUDIO INSTITUTE OF AMERICA; Course/Program Title: Home-Study Course for Recording Engineers; PO Box 15427; San Francisco, CA 94115; (415) 931-4160. **Chief Administrator:** Peter R. Miller.

BRIGHAM YOUNG UNIVERSITY; Course/Program Title: 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.



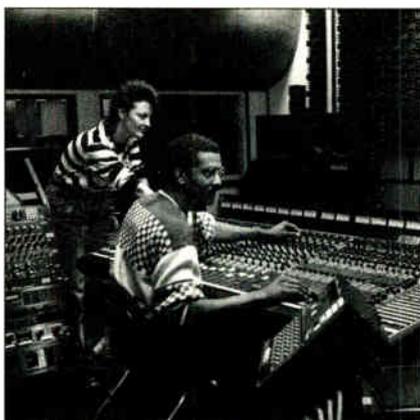
CALIFORNIA RECORDING INSTITUTE
Menlo Park, CA

CALIFORNIA RECORDING INSTITUTE; Course/Program Title: 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—three 24-track studios (one automated!), 16-track studio and MIDI/mastering studio. The program also employs "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.



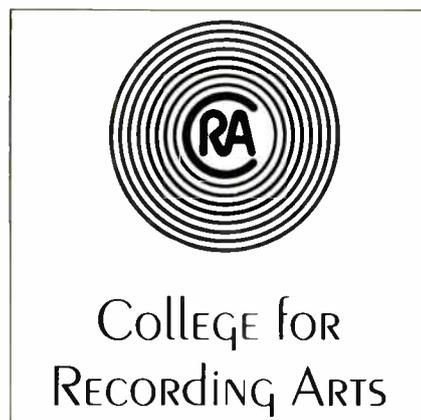
CALIFORNIA STATE UNIVERSITY, CHICO
Chico, CA

CALIFORNIA STATE UNIVERSITY, CHICO; Course/Program Title: 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

CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS; Course/Program Title: Audio Recording and Music Synthesis (ARMS); 100D 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.



College for Recording Arts

COLLEGE FOR RECORDING ARTS
San Francisco, CA

COLLEGE FOR RECORDING ARTS; Bi-Cultural Foundation Inc.; 665 Harrison St.; San Francisco, CA 94107; (415) 781-6306. **Chief Administrator:** Leo De Gar Kalka. **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 National Association of Trade and Technical Schools (NATTS), approved for veteran training and authorized under federal law to enroll non-immigrant, alien students. Semesters start the first full week of June, October or February. Over 18 years of providing quality graduates to the music/recording industry.

COLORADO INSTITUTE OF ART; Course/Program Title: Music and Video Business; 200 E. 9th Ave.; Denver, CO 80203; (303) 837-0825; (800) 275-2420. **Chief Administrator:** Robert Yablans.

FIRST LIGHT VIDEO PUBLISHING; Course/Program Title: Instructional Videos on Sound Recording; 8536 Venice Blvd.; Los Angeles, CA 90034; (800) 777-1576; (310) 558-7880. **Chief Administrator:** Bettina Domingue.



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Recording Schools Seminars & Programs



(Western continued)



GOLDEN WEST COLLEGE
Huntington Beach, CA

GOLDEN WEST COLLEGE; Course/Program Title: Commercial Music/Recording Arts; 15744 Golden West St.; Huntington Beach, CA 92647; (714) 895-8780. **Chief Administrators:** David Anthony, Scott Steidinger, 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-Link 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 S-550 sampler, Roland D-110, Proteus, Yamaha controller keyboard, drum machines, plus much more!) controlled by a Macintosh computer system and various software programs. A leader in music technology since 1972.



Grove
SCHOOL
OF MUSIC

GROVE SCHOOL OF MUSIC
Van Nuys, CA

GROVE SCHOOL OF MUSIC; Course/Program Title: Recording and Engineering Program; 14539 Sylvan St.; Van Nuys, CA 91411; (818) 904-9400. **Chief Administrator:** Todd Ferguson. **Program:** GSM believes in "hands-on experience in real-time working conditions" and has designed the GSM Recording and Engineering Program with that philosophy in mind. With the variety of performing groups at GSM, students get to work with all styles of music, from rock and country western to fusion, jazz and large orchestras. Film scoring, overdubbing, MIDI sequencing, tracking and mixing are just some of the areas

studied at Grove. The recording industry has diverse career opportunities: dubbing mixers, boom operators, pre-lay and Foley engineers, studio construction, installation and maintenance, remote recording, live sound and much more. Grove offers training and practical expertise in all of these fields with an emphasis on handling deadline pressure and developing professional work ethics. Students work in 4-, 8-, 16-, and 24-track studios with a large selection of microphones and outboard gear, and students also get hands-on experience with the most advanced automated recording consoles through field trips to some of the finest studios in the world. All instructors in this program are active professionals, thus assuring students that the education they receive relates directly to today's music industry.

LONG BEACH CITY COLLEGE; 4901 E. Carson St.; Long Beach, CA 90808; (213) 420-4309, (213) 420-4517. Chief Administrators: Priscilla Remeta, Dr. 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 including 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

LOS ANGELES RECORDING WORKSHOP; Course/Program Title: 200-hour Recording Engineering Program, 300-hour 1st Engineer Program; 12268-X Ventura Blvd.; Studio City, CA 91604; (818) 763-7400. **Chief Administrator:** Christopher Knight. **Program:** The Los Angeles Recording Workshop offers 200-hour and 300-hour programs in RECORDING ENGINEERING. These are intensive, hands-on training programs designed specifically to train students for jobs in the recording industry. Job placement assistance is included. Our students train in FOUR studios on premises and THREE outside studios. The programs include training in Session Procedures, Mixing Technique, Outboard Gear, Console Operation, Live Engineering, Audio-for-Video Post-Production, Digital Mastering and Hard-Disk Digital editing. Full-time (5-week or 10-week) and part-time (10-week and 15-week) schedules are available. We are fully accredited by ACCET, and financial aid is available to qualified students. Dorm-style housing is available. Call or write for our full-color brochure.



LOS MEDANOS COLLEGE
Pittsburg, CA

LOS MEDANOS COLLEGE; Course/Program Title: Recording Arts; 2700 E. Leland Rd.; Pittsburg, CA 94565; (510) 439-0200. **Chief Administrator:** Frank Dorrite. **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. The theory, hands-on experience, a state-of-the-art recording studio and a faculty honored with ten Grammy nominations make the Los Medanos Recording Arts program the finest in Northern California. Fees: California residents \$5 per unit (\$50 max. per semester), out-of-state \$92 per unit.

LOYOLA MARYMOUNT UNIVERSITY; Course/Program Title: Recording Arts; Communication Arts Dept.; Loyola Blvd. at W. 80th St.; Los Angeles, CA 90045; (310) 338-3033 (office); FAX: (310) 338-3030. **Chief Administrators:** Donald J. Zirpola, 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; Course/Program Title: Recording Engineer and Radio/Television Broadcasting; 1306 Central Ave.; Billings, MT 59102; (406) 259-7000. **Chief Administrator:** Michael May. **Program:** Students in the Recording Engineering course complete training in four 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. Recording students also learn TV/video production using the school's main TV studio and three video-editing studios. Radio/TV broadcasting students do all of the coursework in the Recording Engineering course plus an additional semester (four months) of study in Broadcast Journalism and Air Personality work. Accredited by the Career College Associations. Provides job placement assistance, student financing, professional staff. Classes start every eight weeks. Call or write for free catalog and financial aid information.

MESA COMMUNITY COLLEGE; Course/Program Title: Studio Music Recording I, II; 1833 W. Southern Ave.; Mesa, AZ 85202; (602) 461-5753. **Chief Administrators:** Grant Wolf, Andy Seagle.

MILLS COLLEGE; Course/Program Title: Center for Contemporary Music (CCM); 5000 MacArthur Blvd.; Oakland, CA 94613; (510) 430-2191. **Chief Administrator:** Chris Brown, acting director. **Program:** The Mills College Center for Contemporary Music (CCM) offers programs in composition, electronic and computer music systems, and recording engineering to undergraduate women and graduate co-educational students. In the context of an experimental music composition program, the CCM provides hands-on training in computer music languages, software synthesis, multitrack recording and synchronization, MIDI instrumentation and control, and digital audio technologies. The Electronic Music emphasis is a track in the undergraduate Music major program at Mills, with courses also available to the student body at-large. Graduate-level courses are offered as part of the MFA in Electronic Music and Recording Media degree, as well as to students pursuing the MA in Composition. These are generally two-year programs, with most students meeting an application deadline in early April and entering in the Fall semester. For more information contact either the CCM at (510) 430-2191, the Office of Graduate Study at (510) 430-3309, or the Admissions Office at (510) 430-2135.

PRAIRIE SUN; Course/Program Title: Audio Engineering; PO Box 7084; Cotati, CA 94931; (707) 795-7011. **Chief Administrator:** Mark "Mooka" Rennick. **Instructor:** Arron Johnson. **Program:** We offer a full 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 basic studio recording skills. Some of our clients include: Damn Yankees, Faith No More, The Tubes, Van Morrison, Doobie Brothers, Exodus, Testament & Yngwie Malmsteen. Our school offers more than just classes and a diploma. We feel this will prepare you for the real world of recording. We also offer on-premises lodging. Call or write for a free brochure.

RECORDING ASSOCIATES; Course/Program Title: 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, reverberation, 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. (REGIONAL OCCUPATIONAL PROGRAM) MENDOCINO COUNTY OFFICE; Course/Program Title: 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- and 4-track mixdown, Panasonic SV-3500 DAT, Tascam multichannel mixing board, Yamaha SPX90, Korg DVP-1 digital voice processor, Macintosh Plus w/Opcode 2, Pro MIDI interface, Opcode Vision sequencer, DX-TX librarian, Deluxe Music Construction Set, Roland SDE-3000 digital delay, Yamaha DX7 Sequential Circuits, MAX, Korg DS8, Casio C7-100, Yamaha DX100, SD89 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, although program requires a small materials fee for tapes, disks, books and equipment repair. Open entry/open exit. Sept.-June only. Certificate awarded to completers, 1,200 hours maximum. Contact Bob Evans, studio manager/instructor.

S & S SOUND ENGINEERING COURSE; Course/Program Title: Basic, Intermediate, Advanced Levels; **PO Box 1156; Torrance, CA 90505; (213) 375-0768. Chief Administrator:** Sandra Hiland.



SACRAMENTO CITY COLLEGE
Sacramento, CA

SACRAMENTO CITY COLLEGE; Course/Program Title: Commercial Music Associate in Arts Degree; 3835 Freeport Blvd.; Sacramento, CA 95822; (916) 558-2130. **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 smaller 8-track studios. Thirty-four Macintosh computers are used for training in MIDI, and the College has a full Electronics Technology Dept. Tuition is \$6 per unit for California residents.

SAN DIEGO RECORDING WORKSHOP; Course/Program Title: 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; Course/Program Title: Broadcast Communication Arts Department/Audio Production; 1600 Holloway Ave.; San Francisco, CA 94132; (415) 338-1787. **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,

radio production, music recording and mixing; audio for multi-media, television and film; complete soundtrack production and Foley work using 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 uses 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.

SAN FRANCISCO STATE UNIVERSITY EXTENDED EDUCATION; Course/Program Title: Music/Recording Industry Certificate Program; **SFSU Downtown Center; 814 Mission St., Ste. 201; San Francisco, CA 94103; (415) 338-1372. 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, studio management, publicity, promotion, tour 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.

SOUND MASTER

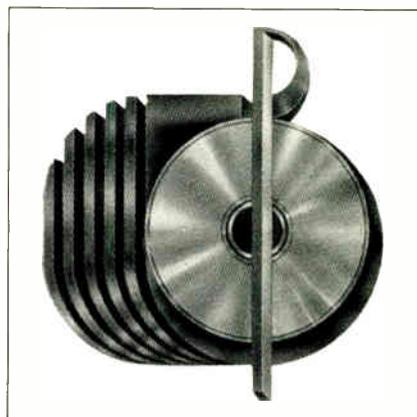
RECORDING ENGINEER SCHOOL AUDIO/VIDEO INSTITUTE

**SOUND MASTER RECORDING
ENGINEER SCHOOL**
North Hollywood, CA

SOUND MASTER RECORDING ENGINEER SCHOOL; Course/Program Title: Record Engineering/Video Production; 10747 Magnolia Blvd.; North Hollywood, CA 91601; (213) 650-8000. **Chief Administrator:** Barbara Ingoldsbey. **Program:** The Sound Master Recording & Video Institute offers training in Recording Engineering, Video Production, Technical Maintenance, Mastering and Synchronization. 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 ACET, and financial aid is available for those who qualify. For information please call (213) 650-8000.

SOUTHWEST INSTITUTE OF RECORDING ARTS AND SCIENCES; Course/Program Title: Audio Recording Engineering; 4831 N. 11th St., Ste. C; Phoenix, AZ 85014; (602) 241-1019. **Chief Administrator:** Billy Moss. **Program:** A 16-week, 310 class-hour learning system designed to teach audio recording and engineering. Students will progress from a firm understanding of the most basic recording concepts through student-engineered sessions using the most sophisticated of modern recording equipment, thus gathering an academic and practical knowledge of all the most common aspects of audio recording. By starting with the basic (2-track date), then working through the fully automated mixdown (SSL 4040 E/G automated mixing desk) of a state-of-the-art, multitrack digital recording (Sony 3324 digital multitrack and Mitsubishi X-80 digital 2-track), this system will enable students to successfully compete in any audio recording environment as fully qualified, entry-level audio engineers. Seats in this class will be limited to ensure comprehensive work loads with a major emphasis on hands-on training. Cost of program is \$3,500, which includes all material, fees and textbooks.

You can FAX your listing application to:
Mix Directories (510) 653-5142



TREBAS INSTITUTE
Hollywood, CA

TREBAS INSTITUTE; Course/Program Title: Recording Arts & Sciences, Recorded Music Production, Audio Engineering Technology, Music Business Administration; 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 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 five 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 ACCT. 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; Course/Program Title: 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

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Recording Schools Seminars & Programs



(Western continued)

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programs are offered in recording arts, songwriting, electronic music, film scoring and film/television/video. Call or write for the Professions in the Entertainment Industry course catalog.

UNIVERSITY OF ARIZONA; Course/Program Title: School of Music; Tucson, AZ 85721; (602) 621-1655. **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 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, DEPT. OF MUSIC; Course/Program Title: Bachelor of Science in Music—Emphasis in Music Engineering; Campus Box 162, PO Box 173364; Denver, CO 80217-3364; (303) 556-2727. **Chief Administrator:** Professor Roy Pritts. **Program:** This program provides professional training for musicians, educators, producers and media personnel seeking careers in audio-related professions. A Bachelor of Science degree is offered as well as graduate and undergraduate studies in Sound Reinforcement and Recording, Synthesis Digital Techniques, Studio Calibration and Maintenance and a wide range of internships. Comprehensive music training is available, including a wide variety of performing ensembles, music theory and history, and applied music study. Additional areas of instruction include Music Management, Scoring and Arranging and Performance. Facilities include two 16-track studios with Neve and Audionics consoles, two MIDI tapeless studios, five performance suites, Macintosh and Kurzweil computer-keyboard labs, DAT and PCM mixdown, as well as extensive microphone holdings. Internships in conjunction with SPARS and other national sponsors provide on-site learning at locations around the nation.

UNIVERSITY OF DENVER
Lamont School of Music

**UNIVERSITY OF DENVER,
LAMONT SCHOOL OF MUSIC
Denver, CO**

UNIVERSITY OF DENVER, LAMONT SCHOOL OF MUSIC; Course/Program Title: Bachelor of Music in Commercial Music; 7111 Montview Blvd.; Denver, CO 80220; (303) 871-6952. **Chief Administrator:** F. Joseph Docksey III, director. **Program:** This degree is for the student who wants to develop into a first-rate freelance or sessions player and/or commercial arranger/composer, ready to enter the world of high-tech music. Within the structure of a Bachelor of Music degree, commercial music majors will participate in a well-rounded general education program, enhanced by special offerings appropriate to developing commercial musicians. Commercial music majors will take courses in commercial composition and arranging, applied commercially oriented harmony at the keyboard, business, law and contracts for commercial musicians, basic electronics, history of synthesis, synthesis programming, sampling and courses in sound recording in the home and professional studio. Sound reinforcement is included, and

advanced students will intern as recording engineers and sessions players.

UNIVERSITY OF NEVADA, LAS VEGAS; Course/Program Title: Audio Engineering and MIDI; 4505 S. Maryland Pkwy.; Las Vegas, NV 89154; (702) 739-0819. **Chief Administrator:** Curt Miller. **Program:** The University of Nevada, Las Vegas, currently offers three courses in Audio Engineering and MIDI Environments. MUS180: A one-semester course in audio engineering theory and live stereo recording techniques. No prerequisites required. MUS280: A one-semester course in multitrack recording techniques; at least one project band will be used during the semester. Prerequisite: MUS180. MUS166: A one-semester course in advanced MIDI theory. Keyboard experience not necessary, the course is geared for engineers and musicians wishing to learn the MIDI language in detail with hands-on experience in synthesizers, sequencers, drum machines, samplers, etc. Prerequisites: none. The university recording studio features state-of-the-art equipment, including MCI 24-track; Soundcraft 2400 28x24x2 console, disk-based recording by Digidesign, Macintosh-based sequencing. Outboard gear by UREI, Trident, Lexicon, Yamaha, etc. These courses are extremely popular, so register early.

UNIVERSITY OF SOUTHERN CALIFORNIA; Course/Program Title: Bachelor of Science in Music Recording; USC-School of Music, MUS 409; Los Angeles, CA 90089-0851; (213) 740-6935. **Chief Administrator:** Richard J. McIlvrey. **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, 1992 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

THE BANFF CENTRE FOR THE ARTS; Course/Program Title: Media Arts Audio Recording and Production Associateships; **Office of the Registrar; PO Box 1020; Banff, Alberta, T0L 0C0 Canada; (403) 762-6651; FAX: (403) 762-6699.** **Chief Administrator:** Kevin Elliott. **Program:** Audio recording associateships (internships) are offered to artist/engineers with mature artistic vision and advanced technical skills (Master's-level degree or equivalent professional experience). 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 workstations. 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, and also pursue their own creative and research work. 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. Program head: Kevin Elliott, (403) 762-6309.

HARRIS INSTITUTE FOR THE ARTS; Course/Program Title: Recording Arts Management (RAM) & Producing/Engineering Program (PEP); 296 King St. E.; Toronto, Ontario, M5A 1K4 Canada; (416) 367-0178. **Chief Administrator:** —LISTING AND PHOTOLOGO CONTINUED TOP OF NEXT COLUMN

**HARRIS
INSTITUTE
FOR THE
ARTS**

**HARRIS INSTITUTE
FOR THE ARTS
Toronto, Ontario**

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.

ICA INSTITUTE OF COMMUNICATION ARTS; 5787 Marine Dr.; Burnaby, BC, V5J 3H1 Canada; (604) 430-4092; FAX: (604) 430-0215. Chief Administrator: Niels Hartvig-Nielsen. **Program:** ICA puts you in a class of your own. The ultimate learning environment is you, one-on-one with the equipment. ICA programs feature up to 50% more equipment access and instructional hours than other schools. Our graduates are in demand. Begin professional studio work immediately: recording, production, performance, video, digital music, music business. Programs include post-graduate studio access, multiple studios, personal workstations, advanced digital training, job placement assistance, comprehensive graduate benefit package. Student financing.

MCGILL UNIVERSITY, FACULTY OF MUSIC; Course/Program Title: 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, Audio with Vision, Studio Equipment Maintenance, Digital Studio Technology, Computer Music/Sampling/MIDI, Classical Music Production. Facilities: two concert halls, one recital hall, two control rooms, one two-room studio, 24-track and 2-track recording, computer-assisted mixing, digital and analog recording and editing, 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 computer.

MEDIA PRODUCTION FACILITIES; Course/Program Title: Advanced Sound Recording & Production Techniques; **Bon Marche Bldg., Ferndale Rd.; London, SW9 8EJ England; (44) 71-737-7152; (44) 71-274-4000, ext. 328, 323; FAX: (44) 71-738-5428. Chief Administrator:** Paul Halpin. **Program:** This one-year, full-time program, comprised of 3-month modules that may be taken independently, commences January, May and September each year. Directed by our Grammy award-winning course leader, Smaen Skoifield, 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 of computer-based sequencing and editing software, with 24 channels of fully automated digital mixing. Other features include an extensive series of digital audio lectures presented by John Watkinson; tricks-of-the-trade seminars with notable British recording engineer/producers; exposure to a wide range of pro audio systems and studios—made possible by support from companies such as DAR, Amek, Neve, Akai, Sony, Mitsubishi, etc. Short courses also available.

ONTARIO INSTITUTE OF AUDIO RECORDING TECHNOLOGY; Course/Program Title: Audio Engineering; 500 Newbold St.; London, Ontario, N6E 1K6 Canada; (519) 686-5010. Chief Administrators: Paul Steenhaus, Geoff Keymer. Program: An intensely focused, full-time program of study, one academic year in length (Sept. - April), designed to prepare the student for a career in the audio and music recording industry. Course headings: Recording Technology, Recording Practical Labs, Studio Electronics, Equipment Alignment, Digital Technology, Acoustics, Music, Music Business, Music Production, Audio for Visuals and more. Courses begin at introductory levels and accelerate rapidly, combining to provide the student with knowledge and practical skills in all aspects of audio recording. The program is a "step-through" process, with smaller concepts and skills building on each other until, within five months, our students are responsibly operating a \$350,000 recording facility. Theoretical material is strongly supported with practical labs, each lab having a maximum of three students per instructor. Lab time: 200+ hours. Classes held in studios: 400+ hours. Studio equipment: Mitsubishi, Studer, Lexicon JVC, Sony, Roland, MCI, ADAP, Adams-Smith, Fairlight III, etc. Seven full-time instructors and a maximum enrollment of 50 students ensure individual attention. Registered and approved by the Canadian Ministry of Education and U.S. Department of Education.

RECORDING ARTS PROGRAM OF CANADA; Course/Program Title: Recording Engineering & Production; 28 Valrose Dr.; Stoney Creek, Ontario, L8E 3T4 Canada; (416) 662-2666. Chief Administrator: John Keca. Program: 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 impressive 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 (Digidesign). 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. R.A.P. is recognized by Ministries of Colleges and Universities (Canada), Canada student loans, U.S. Department of Education and U.S. student loans.

RECORDING ARTS PROGRAM OF CANADA; Course/Program Title: Recording Engineering & Production; 34 Chemin des Ormes; Ste. Anne des Lacs, Quebec, J0R 1B0 Canada; (514) 224-8363. Chief Administrator: John Keca. Program: R.A.P. is one of the best-equipped recording schools in North America. With extensive in-studio instruction, students learn and work in a sophisticated production climate. Our new Quebec school is located in the Laurentian Mountains, an incredibly beautiful and creative environment. Our facility features a custom Neve 36-channel console, Studer 24-track, Lexicon 480, PCM70, LXP 1s and 5s, PCM42, Drawmer gates and compressors, Neumann, AKG, Sennheiser and Shure microphones, and four API 560 equalizers. Our computer music system includes an Akai S1000 sampler, E-mu Proteus, Ell, Opcode and Performer software, and various synths. Our post-production audio suite features a Sound Tools direct-to-disk system, Mac Iix, Sound Ideas sfx Library, JVC 3/4" VTR, Cipher Digital Softouch and Shadow II units. R.A.P. is recognized by Ministries of Colleges and Universities (Canada), Ministry of Education (Quebec), Canada student loans, U.S. Department of Education and U.S. student loans.



TREBAS INSTITUTE
Montreal, Quebec

TREBAS INSTITUTE; Course/Program Title: Recording Arts & Sciences. Recorded Music Production; Audio Engineering Technology; Music Business Administration (M.B.A.); 451 Saint 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 engi-

neering 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 five 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; Course/Program Title: Recording Arts & Sciences. Recorded Music Production; Audio Engineering Technology, Music Business Administration (M.B.A.); 440 Lauries Ave. W.; Ottawa, Ontario, K1R 7X6 Canada; (613) 782-2231. 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 five 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; Course/Program Title: 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 five 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; Course/Program Title: 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 five 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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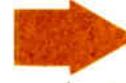
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- 15. Management-President, owner, other manager, etc.
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- 19. Artist/Performer-Recording artist, musician, composer, and other creative functions
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3 Please check the statement below that best describes your role in the purchasing of audio, video and musical equipment, supplies and/or services:

- 21. Recommend the purchasing of a product or service
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4 What is your company's annual budget for equipment, supplies and services? (check one)

- 25. Less than \$50,000
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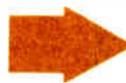
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FEEDBACK

This Just In...

We appreciated George Petersen's thorough coverage of the CD recorder market in his article, "CD Recorders: Available and Affordable." The Yamaha YPDR601 now is available, and, as this article was going to press, became more affordable. The suggested retail price has been reduced to \$13,980 (\$11,200 for the recorder and \$2780 for the remote control). We thought your readers might want to know. Peter Chaikin
Sales and Marketing Manager
Yamaha Professional Digital Products
Buena Park, CA

The Sound of a Revolution

"Cinema Sound Revolution" by Barry Farrell (*Mix*, September 1991) emphasized the need for most motion picture owners to seriously look at and plan for an audio system upgrade, in order to deliver to audiences the digital soundtracks of the future. Mr. Farrell also points out that each of the new data packing systems (and those of the future) maintain full bandwidth discrete audio channels, with five discrete full bandwidth channels to be a minimum standard.

The first question that arises then for the so-called surround positions, is distributed array vs. point source. This then leads to the next question: If each new digital data packing system maintains full bandwidth discrete audio channels, why is it assumed by the hardware providers that a solo summed subwoofer in a theater, coupled with a distributed surround array, improves the "experience" of moviegoers?

My advice? Subwoofers belong with each loudspeaker location; and point source surround positions are clearly an order of magnitude superior to that of a distributed array. As a matter of fact, this is standard operating procedure for

large-screen specialty theaters now being designed which include 15perf70mm and 8perf70mm.

There is absolutely no reason for theaters to upgrade their sound systems without deferring to those who generate the software in the first place. Hardware-driven audio design will be the kiss of death for the "cinema sound revolution," stillborn by the same attitude that buried Quad in the early 1970s. Just because your data storage system is digital rather than analog does not in itself make for a superior soundtrack.

Brad S. Miller
Mobile Fidelity Productions
Incline Village, NV

Testing One, Two, Three

We represent Audio Precision test instruments in Canada, and it was with great interest that I sat down and read your article on "Understanding and Using Test Equipment" (Aug. '91). In this article, Stephen Paul mentions two specific products as follows: "The best of the stand-alone units, such as Hewlett Packard's 339 and the Tektronix AA501, have circuitry that automatically determines the frequency of the fundamental and automatically tunes the notch filter to a null."

In fairness, I believe Mr. Paul has actually left out the best example of the feature, which is found on the Portable One made by Audio Precision. The Portable One not only offers better distortion measurement specifications, but its speed of nulling out the fundamental is (either from the internally generated sine wave or an independent, external sine wave source) the fastest I have experienced.

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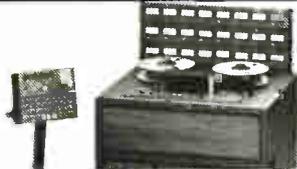
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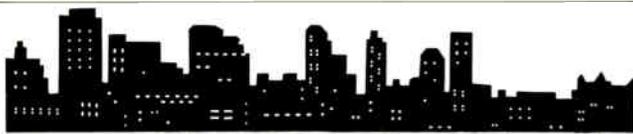
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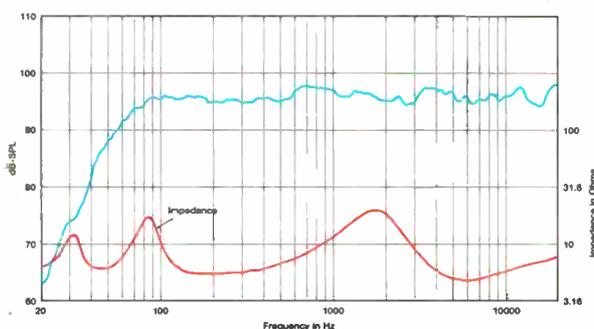
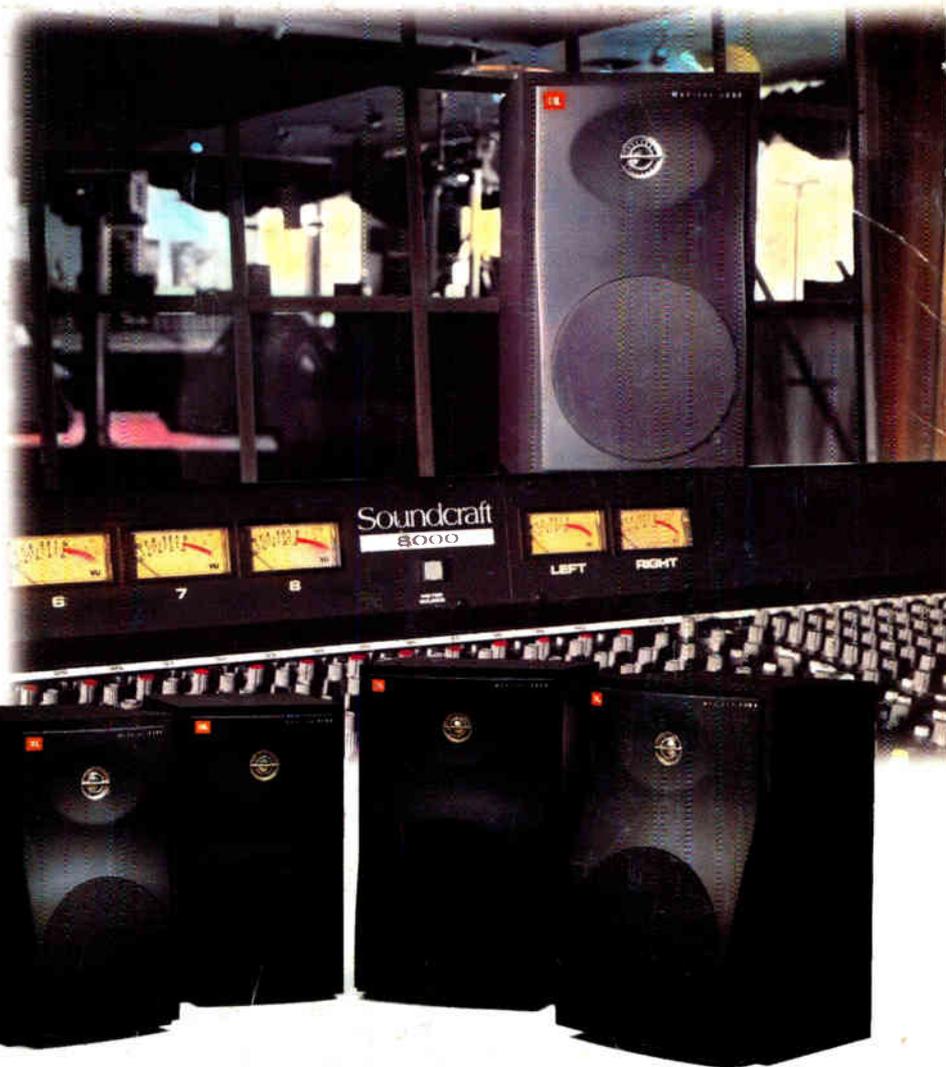
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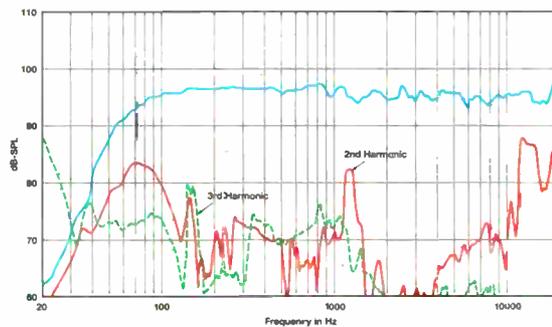
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